HLPE consultation on the

V0 draft of the

Report:

Water and Food Security

From 3 October to 7 November 2014

http://www.fao.org/fsnforum/cfs-hlpe/water-food-security-V0

– Collection of contributions received –

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Topic

In October 2013, the Committee on World Food Security requested the High Level Panel of Experts on Food Security and Nutrition (HLPE) to prepare a report on Water and Food Security. Final findings of the study will feed into CFS 42nd session in October 2015.

As part of the process of elaboration of its reports, the HLPE now seeks inputs, suggestions, comments on the present **V0 draft**. This e-consultation will be used by the HLPE to further elaborate the report, which will then be submitted to external expert review, before finalization and approval by the HLPE Steering Committee.

HLPE V0 drafts are deliberately presented at a work-in-progress stage – with their range of imperfections – early enough in the process, when sufficient time remains to give proper consideration to the feedback received so that it can be really useful and play a real role in the elaboration of the report. It is a key part of the scientific dialogue between the HLPE Project Team and Steering Committee and the rest of the knowledge community. In that respect, the present draft identifies areas for recommendations at a very initial stage, and the HLPE would welcome any related evidence-based suggestions or proposals. We would also appreciate if this draft is not cited or quoted until it is finalised.

In order to strengthen the related parts of the report, the HLPE would welcome comments and inputs on the following important aspects:

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?
2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?
3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interact with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?
4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?
5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

We are aware that we have not yet adequately covered, in the V0 draft, some issues of importance. We invite respondents to suggest relevant examples, including successful ones and what made them possible, good practices and lessons learned, case studies, data and material in the areas of:

a. Comparative water performance (productivity and resilience) for food security and nutrition of different farming systems, and food systems, in different contexts

b. Water use in food processing

c. Water for food and nutrition security in urban and peri-urban contexts

d. Water governance and management systems capable of better integrating food security concerns while tackling trade-offs between water uses/users in an equitable, gender just and deliberative manner. We are particularly interested in examples that have enhanced social justice and also benefitted marginalised groups.

e. We welcome also examples on how the role of water for food security and nutrition is accounted for in land governance and management and land-use, including links between land tenure and water rights.

We thank all the contributors in advance for their time to read, comment and suggest inputs on this early version of the report.

We look forward to a rich and fruitful consultation.

The HLPE Project Team and Steering Committee.

Contributions received

1. Eric Sievers, Ethanol Europe Renewables Limited, Ireland

Dear Mr. Gitz:
We welcome the October publication of the draft Water and food security report by The High Level Panel of Experts on Food Security and Nutrition and take particular note of the sections in the draft relevant to biofuels, which we summarize below:
While some kinds of renewable energy, such as wind and solar photovoltaic (PV) power, do not consume much water, other renewable energy processes such as concentrated solar power and biofuels consume significant quantities of water. . . . Biofuels can add pressure to 'water supply and water quality problems' (HLPE 2013) especially if irrigated (Lundqvist, de Fraiture and Molden 2008). Although regional variation is large, de Fraiture et al (2008) estimate that on average it takes around 2 500 litres of crop evapotranspiration and 820 litres of water withdrawals to provide one litre of biofuel. It is at the country or local level that the trade offs between water for food and water for biofuels are felt. For example, in India water for biofuels can compete directly with water for food such as cereals and vegetables (ibid). Also as concluded by the HLPE, biofuel production usually does not benefit small-holder farmers in water scarce contexts (HLPE, 2011).
We note that only one source is used for the draft's conclusions about the biofuels and water nexus, a desk research paper submitted in 2007 about China and India (de Fraiture, C., Giordano, M. And Liao, Y. 2008. Biofuels and implications for agricultural water use: blue impacts of green energy, Water Policy 10 Supplement 1: 67-81), which we will call the "Paper". We have no criticism of the Paper save one- which is that it seems unaware that most biofuels processes result in just as much animal feed as biofuel. Yet, in the draft Water and food security the Paper is (i) misquoted, (ii) unsuited as a source for global conclusions, and (iii) not actually about biofuels as all. We urge you to make changes to the final report to avoid misinterpretation and explain our reasoning below.
For almost a decade the Paper has been used by anti-biofuel campaigners to suggest that biofuels production facilities consume and pollute huge amounts of water, which, of course, the Paper does not say at all. In fact, where the Paper says "biofuels" it actually only means "biofuel feedstock". A modern maize ethanol plant pollutes no water and uses (often recycling this water) only 3 liters of water to produce one liter of ethanol.
Water and food security currently states both that "biofuels consume considerable amounts of water" and "on average it takes around 2 500 litres of crop evapotranspiration and 820 litres of water withdrawals to provide one litre of biofuel". Yet, the Paper takes pains to stress that US maize ethanol and EU rapeseed biodiesel are rain fed and have almost no water scarcity impacts, both directly and in context (e.g. "From a water perspective, it makes a large difference whether biofuel is derived from fully irrigated sugarcane grown in semi-arid areas or rain-fed maize grown in water-abundant regions."). To a lesser degree, the Paper makes the same point about Brazilian sugarcane. And, the Paper unfortunately ignores the undeniable fact that both maize ethanol and rapeseed biodiesel processes (as opposed to sugarcane ethanol) result in just as much high protein animal feed as biofuel, belying the suggestion that water used by the underlying crops should be booked only as an energy use.
We must take great exception to the suggestion that biofuel production "usually does not benefit small holder farmers", although we appreciate the context of the phrase that follows. Our concern is because most of the biofuel feedstock processed into biofuels in the Northern Hemisphere (whether ethanol or biodiesel) is produced by family farmers.
The "average" in 2006 is not the average in 2014. Almost no biofuel produced in the world's three largest biofuel producing areas (Brazil, Europe and the United States) is accurately described by the

above statements in the current draft. Since these biofuels constitute the vast majority of 2014 biofuels, there is no basis to include either phrase above in the final report.
The Paper is about theoretical impacts in China and India, which is clearly what Table 1 of the Paper states. Accordingly, we respectfully request that the relevant passages of the draft be revised as follows:
While some kinds of renewable energy, such as wind and solar photovoltaic (PV) power, do not consume much water, other renewable energy processes may~~such as concentrated solar power and biofuels~~ consume significant quantities of water. . . . Biofuel feedstocks can add pressure to 'water supply and water quality problems' (HLPE 2013) especially if irrigated (Lundqvist, de Fraiture and Molden 2008). ~~Although regional variation is large, de Fraiture et al (2008) estimate that on average it takes around 2 500 litres of crop evapotranspiration and 820 litres of water withdrawals to provide one litre of biofuel.~~ It is at the country or local level that the trade offs between water for food and water for biofuels are felt, particularly in water-scare regions. For example, in India water for biofuels can compete directly with water for food such as cereals and vegetables (de Fraiture et al (2008)~~ibid~~). Also as concluded by the HLPE, biofuel production usually does not benefit small-holder farmers in water scarce contexts in the Southern Hemisphere (HLPE, 2011).
Respectfully yours,

Eric W. Sievers
CEO
Ethanol Europe Renewables Limited

2. Thoeurn Yap, CFAP-Cambodia, Cambodia

We have implement a project on water storage to improve the growing of vegetables.
Please kindly see in the attached file.
http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Folder%20CFAP%20(1).pdf

3. Bernard Wonder, Consultant, Australia

Hi Joanna
As requested, I have had a quick look through this report. It wasn't what I expected. I thought it would be a guide to what needs to be done, both nationally and internationally, to ensure water policy is part of the solution for food security rather than another problem area alongside land tenure and management, trade and competition policy, the legal environment, infrastructure, gender opportunities etc inhibiting progress. Instead, it read like an inventory or catalogue of who thinks what about various aspects of water without a clear methodology to identify underlying issues worthy of priority attention.
To be useful, I feel a report of this nature should give guidance concerning what reforms are needed in the water space. I appreciate that is a huge task, particularly when the geographical focus is so broad but I do think there is scope to lay out what are the major problems around the countries of interest and then distil a framework that each country could assess itself against for potential reforms. Some assessment may need to be regional, certainly international and possibly catchment based to capture the areas where water is collected and flows rather than focus exclusively on where it is administered (ie national boundaries).
I am left floundering by this report when I try to answer the question what specific changes might be proposed to better enhance water management for food security. The list of recommended actions

at the end of the report is too general to be useful and far too much space has been wasted in the report traversing the literature with little to show for the effort. There are some key aspects of water policy which have been addressed in Australia over the years that might help the assembly of a framework for international consideration. Unfortunately, they aren't covered in Box 17. They include 1.Independent assessment of available surface and groundwater resources, 2.Planning and regulation of sustainable water extraction volumes, 3. Allocation of property rights to owners, either using historical, customary use as a guide or auction systems or a mixed system, 4. Pricing of water for extracted volumes and their delivery, 5. Trade (both within season and permanent) in water rights, 6. Monitoring and enforcement of property rights by relevant authorities and 7. A competition policy mechanism to address any anti-competitive behaviour surrounding potential concentration and distribution of water rights.

The Australian story is well covered in the publications of the National Water Resources Commission which should be available on-line. However, that organisation was scrapped in the 2014 Budget and I understand its responsibilities may be taken up by the Productivity Commission. It could be worthwhile making contact with Daryl Quinlivan from the Commission if you need something drafted with the imprimatur of the Australian Government.

Just a few more comments/observations on details of the report using my points 1-7 above. On 1 & 2., sustainability is a key issue. I like the provision for community input provided for in the report but each country of interest really needs to have a national organisation responsible for water regulation with the appropriate hydrological, NRM and economic expertise to establish suitable water extraction quotas. Sometimes, particularly where water and catchments cross national boundaries, an international body will be appropriate as in the case of the Mekong and a bit like administration of the Murray-Darling Basin (although MDB is national). Rights addressed in 3. also require assessment – water needed for household use (eg drinking and sanitation), agricultural use and manufacturing and non-consumptive uses, including the environment. I note that rights in the way that I see them are different to the use of the term 'right to water' used in the report which seems to be more emotionally based without quantification and not suitable for operationalising. The rights I describe can have varying securities attached as is done in Australia for urban versus agricultural water use. One point on future use of water that I didn't understand in the report is Figure 5-why is it that industrial uses of water will become so much more important in the decades ahead? On 4, pricing is a sensitive issue but the report needs to address options for overcoming the sensitivities. For example, water purchased by the poor can be eligible for a specific and transparent government subsidy such that the price received by the relevant authority is unchanged but the payment comes from the government as well as the consumer.

The report doesn't give sufficient emphasis to the advantages of a water trade regime (5. above), particularly the advantage markets provide with respect to moving water to its highest value use, a task the report seems to suggest (I am not sure on this) is best done administratively. The latter will never succeed and will require an army to 'pick all the winners'. On trade more broadly, I was left with the impression that the report is assigning a low priority to addressing food shortages by trade liberalisation as it puts great emphasis on the rights to water and food without much weight given to comparative advantage and specialisation of nations. These issues need to be addressed with a far more balanced treatment.

Whatever framework nations finally adopt, it is vulnerable without some capacity to monitor and enforce key provisions, particularly property rights but also validation of water consumption, trade and compliance more broadly. The institutional support must also embrace related policy issues such as competition policy (point 7 above). There is considerable danger in just setting a framework and 'letting the market rip' if there is potential for monopolisation of assets and concentration of trade. These are issues the international community should be thinking about to help strengthen international governance.

Finally, storage (along with hydropower) is raised in the report but there isn't a convincing discussion of how infrastructure investment needs might be met in the decades ahead, as demand for water increases, climate change threatens supply and there are 2 billion more people on the planet (by 2050). What are some of the options that might help us secure water supplies for food production?
All these issues suggest an ongoing program of work that international partners could undertake over an extended period. Bit by bit, the jigsaw could be put together.
I hope these brief comments are of some assistance Joanna. I could provide some further comments later in the process should that option be of interest.
Regards
Bernard Wonder

4. Ali Abdalrahman, Arab Union of Sustainable development & Environment(AUSDE), Egypt

Agriculture can play an essential role in achieving a green economy since it accounts for 70% of global water withdrawals and provides employment for 40% of the global population. Furthermore, GDP growth generated by agriculture contributes to food security, to raise revenue for the rural poor and is also associated with a great number of employment opportunities. Green growth requires that in the coming decades enough food is provided for an expanding population (mostly in the least developed countries and especially in Sub-Saharan Africa), of which a proportion will be increasingly affluent in Least Developed Countries (LDCs) and Developed Countries (DCs). A green economy requires the achievement of food security, but by using less natural resources. This could be achieved through improved resource efficiency, substantial investments and innovations. It implies increasing crops that ensure a higher efficiency in terms of nutrition per drop of water.
Smallholder farms are essential in the transition towards a green economy. They can contribute to economic growth, poverty reduction and food security. However, without the means to control and effectively manage water, poor farmers are unable to turn agriculture from a subsistence activity into an income-generating enterprise. Water is not the only constraint to improving crop production and nutrition, but if farmers do not have reliable access to water, interventions to address the other constraints will fail. For example, reliable access to water gives farmers the security to invest in inputs, such as fertilizers and improved seeds, and enables them to grow higher-value crops, such as fruits and vegetables.
http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Dear%20Gentlemen.doc

5. Said Zarouali, HCP MOROCCO, Morocco

Il est important de signaler que nous avons élaboré un rapport sur la rareté de l'eau et la sécurité alimentaire au Maroc. Ce rapport a été validé lors d'une rencontre nationale en présence d'une délégation importante de la FAO et des différents représentants des organismes internationaux et des départements ministériels et des ONGs.
Le rapport V0 sur l'eau et la sécurité alimentaire, qui fait l'objet de cette consultation, constitue une plate forme pour identifier les principaux liens d'échanges entre LA SECURITE ALIMENTAIRE comme une priorité des nations, la nutrition ET la pénurie de L'EAU qui devient de plus en plus une vraie menace pour un grand nombre de pays notamment pour les pays d'Afrique et de l'Asie. En général, le rapport constitue un modèle de réflexion sur l'identification de la problématique nourriture-eau dans les pays en voie de développement. Cependant, chaque pays constitue un cas particulier (modèle) dans la gestion de la rareté de l'eau et les efforts fournis dans l'économie de l'eau notamment dans l'agriculture.
Le rapport a abordé la thématique d'une manière plus large. Les projections des indicateurs relatifs à la disponibilité de l'eau face aux besoins de la population (eau potable) et les besoins alimentaires donnent la vraie image de l'importance des risques et des menaces liés à une mauvaise gestion de

l'eau à long terme. L'analyse doit focaliser sur la présentation des cas concrets dans les pays en voie de développement (économie de l'eau) et présenter les expériences réussies.
La sécurité alimentaire implique un échange commercial de produits agricoles, et un échange virtuel d'eau. Le commerce agricole a différentes interactions avec l'eau et la sécurité alimentaire, lesquelles varient pour les pays importateurs d'aliments, les pays exportateurs d'aliments, les pays pauvres en eau vis-à-vis des pays riches en eau. Pour cette partie, l'analyse des échanges des produits agricoles doit être faite à plusieurs niveaux et de différents angles (multidimensionnels) : bilan comptable des échanges, durabilité des ressources, la gouvernance, la gestion des bassins versant et la gestion des ressources souterraines en eau.

6. Mbonjoh Lilian Frekie, Researchers of International Agreements, Cameroon

My contribution will center on Water and Sanitation,Drinking and Cooking Water plus women and girls the challenges the face especially in rural communities.
Water is every where in Cameroon but not all water is safe to drink, the responsibilities of policy makers in terms of the MGDs of the United Nations has not in any way favoured poor communities. The Costly Bottle water which is purely business owned by multinational companies have taken over the idea for governemnts to provide affordable and sustainable drinking, cooking and washing water to the bigger part of the population and families living in rural communities.
This keeps the sanitary aspects of girls and women at the brink to health epidemics and nutritional uncertainties.
We have to roll back and providing for giant projects with pipe borne water that is costly free to poor communities and can reach communities where girls and women can endanger their lives travelling longer distances to fetch water or face rape cases.

7. Kuruppacharil V. Peter, India

Right to food and water is right to life and living. To quote Gandhiji "hunger is shame to humanity and a curse to mankind". Availability, Access and Absorption of food are vital for civilised living.
Availability is ensured by good agricultural practices. Agricultural production is art and science involving appropriate government policy, use of science and technology and efforts of farmers. Marketing and demand-supply economics have made food production a specialised occupation. Area under farming is getting reduced, irrigation water dwindling and farm labour and energy costly' food production is becoming a challenging avocation with a lot of challenges and opportunities as well. Green Revolution during 1962 onwards made India self sufficient in food production, but the purchasing power of people being low, subsidised food has to be made available. Minimum Support Prices have made producer-farmers sure about an income in a world of economic uncertainty. Even with a reasonable food buffer stock and subsidised food, about 260 million people in India go to bed without a meal.
A hungry stomach is a violent stomach leading to violence. Any talk on food security should take into consideration level of education, health care and population density.WTO should be consumer friendly and pro-poor.

8. Mohamed Yassin, University of Udine, Italy

The Nile Basin Territories has witnessed significant demographic growth, since its independence, its popualtion went from around 60 million to the current 450 million and the projections for 2100 is expected to reach around 888 million persons.....this demographic growth combined with rapid urbanization put major demands and pressures on the ecological foundation (Land, Water, Climate, biodiversity etc)....which make imperative wise-management of the Nile Basin territorail capital on sound priciples of sustainablity and responsible investments in all capitals.

The university of Udine is conducting research in food security (food wastage), urban waste and resource amangements and will be happy to share its experience, accumulated knowlodge and research findings.
Feel free to share this video containing interviews conducted with key informants during the 4th Nile Basin developemt forum.....
http://youtu.be/-Cb_aW2C2O8
For more information, link with this forum or the NBDF or send an email to: mohamed.yassin@uniud.it
Thanks

9. Andrea Ferrante, European Coordination Via Campesina (ECVC)

European Coordination La Via Campesina position paper on water - March 2012.
Main message: the issue of water is inseparable from food sovereignty

The issue of water is inseparable from Food Sovereignty
European Coordination Via Campesina position paper – March 2012.
Food Sovereignty guarantees that the rights to use and manage land, water, seeds, livestock and biodiversity and should remain in the hands of those who produce the food. (Nyeleni declaration 2007).
The Food Sovereignty movement is well aware of the fact that the struggle for water is part of the broader current context of privatisation of nature that is promoted by the policies introduced by the WTO, the IMF and the World Bank, the World Water Council and the CAP. As we have previously stated on the question of seeds and land, the struggle for water is an integral part of our strategy for introducing Food Sovereignty and preventing all forms of privatisation.
For ECVC, water is a resource that should be considered as a Commons, and managed by public authorities as a common good. We are against the privatisation and commodification of water. Access to water for all is a social and human right, (a right that is shared by all life); it is fundamental and indispensable to all life and to the identity of communities. Water is neither a good that can be privatised nor a tool for market speculation.
Rights "to" and "of" water in the perspective of Food Sovereignty
The water cycle is central to our preoccupations and reflections. Water rights involve the constant and integral respect of the water cycle. If we are unable to guarantee the respect of the water cycle, the availability of water will be undermined. The right "of" water is a prerequisite of the right "to" water.
The right of access to water: water is a Commons and not a commodity. We wish to see users' rights and not owners' rights implemented. These users' rights should enable fair distribution of water, collectively determined for all kinds of different use, and guaranteed free access to water for vital needs as well as for food self-sufficiency.
Access to water forms an integral part of our fundamental right of access to natural resources, as defined in the context of Food Sovereignty (cf the Nyeleni Declaration 2007).
Our commitment to the water issue is part of our general strategy in the struggle for the recognition of Food Sovereignty.
These rights include the traditional water management methods of local communities. Our first priority is the respect of the water cycle. This leads to the recognition of the following water-usage priorities in order to:
- Maintain sustainable land and marine ecosystems
- Guarantee basic food and hygiene-related functions for households

- Provide small- and medium-sized farms with water to produce food for local consumption that respects the principles of Food Sovereignty
- Public services (gardens, fountains...)
- Crafts and trades
- Agribusiness, industrial use, tourism, industrial-scale fish-farming
- Hydro-electric power production

It is essential that the way all water is used be defined according to management criteria and priorities linked to human consumption and agriculture.

These priorities are based on how important water is for agriculture, especially in the Mediterranean zone, where irrigation plays an essential role in maintaining and consolidating small-scale sustainable family farms, and helping to avoid people leaving the countryside.

If water is to be properly managed in the different geographical zones (or watersheds), we need to know how much water is necessary for different activities; this would enable us to promote water conservation.

Against privatisation, for participatory sustainable management of water resources

We are against the privatisation process of water distribution and sanitation, as this is contrary to fundamental rights “of” and “to” water.

In Portugal, for example, the government used the economic crisis as a pretext to legally privatise water distribution in 2005. This loss to people’s sovereignty was amplified by the soaring water rates. The most fragile sectors of society - including agriculture - are now those who suffer the most from this law.

In Turkey, over 2000 dam-building hydroelectric projects are being implemented; this corresponds to real privatisation of the water users’ rights. The dams stop the water from returning to the land, and livestock no longer have access to the water. The privatisation system does not only affect water however: it also affects the land along the rivers, whose owners are expropriated to the benefit of the multinational corporations. There are also disastrous impacts on biodiversity, and the modification of the water cycles is endangering the entire agro-ecological balance in these regions. Finally, when this process is implemented, the farmers have to pay for the water they use to irrigate their fields.

We support a system of public water management that is both collective and participatory. Such systems should be managed locally, be independent and autonomous, and serve the local population. Examples of this kind of practice are the “Comunidades de regantes” in Spain, “Consorzio di bonifica” in Italy and “Water user communities”. They respect the universal right of access to water, and local ecosystems as well as preserving ecological continuity . They limit the modifications to rivers as much as possible. The geographical dimension of this management should be linked to the local watershed. It should also respect transnational solidarity and contribute to building peace.

On users’ responsibility, and the different uses of water

All water users (including water used by civil society for domestic purposes and by industry) need to take responsibility for the need to preserve the water cycle. Water that returns to this cycle is always lower in quality than that from which it came.

We decry the externalisation of social and environmental costs by industrial production and agribusinesses and their repercussions on distribution and sanitation, and wish to see them replaced by more sustainable water-saving methods.

Models of production or how small-scale farmers and peasants are rising to the challenges of agriculture.

Agriculture needs to adapt to available water supplies - as defined by the above priorities - rather than attempting to adapt the available water supplies to the needs of pre-programmed agriculture.

The industrial agricultural model strongly reduces soil fertility and is far more water-dependent than its agro-ecological counterpart. The industrial model uses great quantities of water, and the earth becomes heavier and devoid of its natural nutrients. Groundwater supplies and rivers also become

polluted by the use of pesticides, fertilizers and factory farming of animals. It also involves standardised farming and the use of standardised seeds that are poorly adapted to the local climate, to the soil and to the available water resources.
The programme of reallocation of rural land caused by this kind of production (removal of hedges, ditches and wetlands...), is also one of the reasons for the lesser responsiveness of land to local water cycles; in extreme cases it even causes disastrous floods that affect both towns and countryside.
These systems are also symptomatic of the economic model to which they belong and upon which they depend. This economic model promotes maximum exploitation of available resources and the economic competitiveness of the actors comes at the social cost of the destruction of rural employment and the environment (pollution, intensive use of land). A particularly striking example is that of "virtual water", that represents the quantity of water required to produce a given product. It is an important parameter - and an oft-neglected one - and should be taken into consideration in the case of massive food exports from one region to another, as is the case at global level today.
Finally we need to bear in mind that today's agribusiness model is responsible for water pollution and scarcity in agriculture, and that the IMF, the WB, WTO, the World Water Council and the CAP have historically supported it.
The agro-ecological production methods that the European Coordination Via Campesina support provide a genuine alternative to the agro-industrial system that we condemn. Agro-ecology airs the soil, and enables it to hold moisture; water is also needed by the animals and the insects that allow our plants to grow without having to use any artificial fertilizers, and therefore without any agro-chemical contamination. Breeding local landraces that are more likely to survive in the region helps plants to adapt and make the best use of available water supplies. Produce is of a higher quality, and contains less water. These production methods use far less water.
In order to encourage these methods of production, we need to encourage and support research by farmers' groups and partnerships between public research and the farmers' groups to improve water usage in the framework of an agro-ecological model of small-scale family and peasant farming.

Water, agriculture and climate change

Just as in the case of water consumption, and for the self-same reasons, the agribusiness model plays an important role in climate change , unlike peasant agriculture. Peasant agriculture and the agro-ecological techniques it uses mean that water is used sparingly and therefore present a certain advantage in terms of mitigating the phenomenon. They also present the only possible way forward of long-term adaptation (through breeding suitable varieties, soil fertility, compost, the diversity of varieties grown and agricultural systems).
From a more global point of view, it is necessary to consider dams and hydro-electrical power stations not merely from the point of view of limiting greenhouse gas emissions, as is often the case with a view to commodifying carbon and nature, but rather to include their disastrous economic, social and environmental impacts

Agricultural and water policies versus the rights "of" and "to" water

WTO, CAP, the ambiguity of the European Framework Directive on Water, the WB, the World Water Council, the fora dedicated to commodification of living beings such as the World Water Forum are the main actors in the policies that have led to today's situation.
Water policies are increasingly present in political discussions in Europe. As ECVC, we wish to see these discussions focus on promoting an agricultural model that will safeguard water supplies in the European Union. Rather than supporting agribusiness, agricultural policies should defend and protect Commons such as water. Likewise, the management, distribution and sanitation policies should be linked to - and influence - agricultural policies at all levels.
Finally, concerning water rates for agriculture, we support the right to free water supplies up to a certain quota, and a progressive scale of rates based on social, environmental criteria that is also linked to methods of production that use water more or less sparingly.

10. Nicholas Senyonjo, Uganda Environmental Education Foundation (UEEF), Uganda

We do think the topic is very imprtant especially to Africa where many go without food. We propose that we have done many intervections on food security and our our organisation is wiling and ready to work with you in this noble cause.

Nicholas SSenyonjo
CEO
Uganda Environmental Education Foundation.

11. Jose Goldemberg, University of São Paulo, Brazil

Comments on the report "Water and Food Security"
The description of the work of the World Commission on Dams is accurate.
What is inaccurate is the paragraph that followed.
"The World Bank, which was a founding member of the WCD, rejected its conclusions alongside key dam-building nations such as India, China and Turkey as well as the International Commission on Large Dams and the International Commission on Irrigation and Drainage".
and particularly the statement "In recent years dams have made a comeback". In reality only China and Turkey ignored the recommendations of CDM.
The World Bank reacted to some recommendations but followed others and never abandoned financing of dam construction. In any case the WB loans where only part of the money needed and the rest comes from local resources.
The paragraph referring to Ansar et al clearly misrepresents the reality
"A recent study by Ansar et al (2014) draws upon cost statistics for 245 large dams built between 1934 20 and 2007. Without even taking into account social and environmental impacts, the study finds that "the 21 actual construction costs of large dams are too high to yield a positive return" (Ansar et al., 2014: 44). This study also found that dam construction costs were on average more than 90% higher than initial budgets, while 8 out of 10 suffered a schedule over-run, thus seriously questioning their economic/financial viability (ibid)".
The evidence that the WCD amassed shows that some projects costed more than anticipated but this is a common characteristic of large infrastructure projects over the world.
The fact that 40-80 million people have been displaced by large dams has to be weighted by the fact that at least 1 billion people have been greatly benefited from the electricity supplied by large dams as shown clearly in the WCD Report.
Sao Paulo, 21 October 2014
Jose Goldemberg

12. Subhash Mehta, Devarao Shivaram Trust, India

Wishing you all a very happy 'Divali'.
A simple technology assures continuous moisture supply for agriculture in water-scarce arid and rain fed areas.
Read more: http://www.downtoearth.org.in/content/orchards-desert
K.S. Gopal's presentation Youtube: http://www.youtube.com/watch?v=ip7j3k3CEZU
Also attached is a doc on re charging of 'Bore Wells', solving the ground water problem.
http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Borewell%20recharge%20SDRS%20Hubli,%20India_1.docx

13. George Pulikuthiyil, Jananeethi, India

Thank you very much indeed for this info.
Surely, we all at JANANEETHI, are interested in participating in the consultation proposed. Let us see the proposals emerged in the consultations. We hope we too will have to contribute from our experiences and policy changes drastically happening in the country in favour of the corporate lobbies endangering the future of the generations to come.
George Pulikuthiyil
Executive Director
JANANEETHI

14. Amadou Tall, freelance consulrtant, Côte d'Ivoire

Different UN MDGs are water-related, health and education as well as gender equality in our education system. The most difficult MDGs have been those related to infant and material mortality – often linked to infectious diseases and lack of access to clean water.
Globally the objectives are to cut by 50% the proportion of people unable of accessing potable water and 100% access by 2025. In Africa, a number of about 330 million African peoples have no access to potable water and 600 million no access to sanitation.
Many water initiatives have been taken to improve food security in Africa. The African Development Bank Rural Water Supply and Sanitation Initiative aims at meeting the basic water and sanitation needs of rural peoples – at least 80% – by 2015. Further, the African Water Facility, established in support of African Water Ministers, has the goal to enhance water management and enhance the investment environment. Furthermore, the NEPAD/AU Water and Sanitation program has the goal on the preparation of bankable projects for investment both by the public and private sector.
In Africa, food security is compromised by inadequate infrastructure for water storage, water management; and management and protection of our river basins, trans-boundary waterways, such as the Nile, the Congo, the Niger, the Zambezi, and Mano River. In the same vein, the Lake Chad is shrinking and farmers cultivating agricultural products around this Lake are recording famine. The Lake Victoria is showing high rate of pollution and its populations are recording low agricultural production.
At the continent level, several water programs to be implemented both in rural and urban areas, concern building new water storage capacity, water supply systems, rehabilitating networks and protection of our lakes, rivers and river basins, for water access and sanitation in order to contribute better irrigation, hydro power and other economic utilizations. All these activities to enhance nutrition and food security.

15. Lizzy Igbine, Nigerian women agro allied farmers association. (Niwaafa), Nigeria

Water is life and so water forms part of our every day life. Water is life to man , animals and plants.
Water is a landmark and demarkates borders. We will be contributing shortly what water is both to man ,animal and plant with emphasis on Agriculture and livelihood.. We have text cases and models to discuss.
Lizzy Igbine mrs
Niwaafa.

16. Florence Egal, Italy

Thanks for eliciting contributions on a really timely initiative. I'm sorry however my comments do not seem to fit with the suggested questions.
In a way this draft is still very supply-dominated. Water is essentially perceived as an input for commodity (in particular cereal and meat/dairy products) production. A lot of attention to value

chains, not enough on food systems. Agro-ecology and local governance come at the end. One of the problems probably being that we departed from local governance in the first place (the role of colonization is well acknowledged in the document). An initial section retracing historical changes in water use could be useful.
More attention should be given to community dimensions. The attention to rain fed agriculture is well appreciated but the need to protect subsistence agriculture and/or accompany change where relevant should be explicitly mentioned. Access to water is not only important for health and hygiene, but also in terms of time management and social linkages.
The projections of water demand are flawed by the simplistic prevailing economic modeling, which does not take into account necessary dietary changes (in particular reduction of animal protein consumption) and reduction of food waste. The promotion of sustainable diets (healthy, safe, environmentally friendly and socially equitable) can bring consumers back to the governance table. The importance of health and nutrition education and communication should therefore be emphasized.
The draft covers the impact of climate change on water availability, but the impact of production systems and related use of natural resources (including forests and water) on climate change would need to be more explicitly mentioned. It is urgent to plan production systems on an environmental basis, rather than adapt the environment (e.g. through irrigation) to standard commodities.
Water use for food processing is certainly an important dimension. It would be important to have a better understanding of small-scale vs. industrial processing. The impact of contaminated effluents on local food production (including subsistence agriculture) should be extended to non-food industrial processing (e.g. mining, textile industry…) and linked to the right to food.
The attention given to right to food is well appreciated. “Successful” hydrological management (Sénégal river, Mekong basis) have led to changes in local diets and livelihoods, and erosion of local biodiversity and indigenous food systems, resulting in increased food insecurity and malnutrition of the local population. It is important not to limit impact evaluation to “beneficiaries” but also assess indirect impacts at community and local level (third party effects). [shouldn’t the reference to Jordan be extended to Occupied Territories along the Jordan valley?].
This draft points out yet again to the importance of territorial planning/watershed management (including city-regions food systems) to deal with complexity and promote sustainable development. Adopting an eco-system approach would help deal with cross-border and trans-boundary issues, as well as conflicts over access to water and other natural resources (e.g. pastoralists vs. sedentary farmers).
With best wishes for the next stage, I remain at your disposal for any clarification.

17. Gianluca Ragusa, International Independent consultant - Fisheroies and aquaculture specialist, Italy

Dear Madam/Sir,
Thank you for this opportunity to contribute.
Despite the fast revision, the report seems to be well structured and consistent in all parts, exempt in the 2.4.5. fisheries and aquaculture section, that seems to be very poor in the decription and lacking of data, that can be integrated and completeted completely or partially with eg According the FAO The State of fisheries and aqauculture 2014 (kindly find attached) : "Some 58.3 million people were engaged in the primary sector of capture fisheriesand aquaculture in 2012. Of these, 37 percent were engaged full time. In 2012, 84 percent of all people employed in the fisheries and aquaculture sector were in Asia, followed by Africa (more than 10 percent). About 18.9 million were engaged in fish farming (more than 96 percent in Asia). In the period 2010–2012, at least 21 million people were capture fishers operating in inland waters (more than 84 percent in Asia).

Employment in the sector has grown faster than the world's population. In 2012, it represented 4.4 percent of the 1.3 billion people economically active in the broad agriculture sector worldwide (2.7 percent in 1990). Overall, women accounted for more than 15 percent of all people directly engaged in the fisheries primary sector in 2012. The proportion of women exceeded 20 percent in inland water fishing and up to 90 percent in secondary activities (e.g. processing). FAO estimates that, overall, fisheriesand aquaculture assure the livelihoods of 10–12 percent of the world's population".
And sentences such as "Inland fisheries challanges include sustaining current level of production and other ecosystem service and improved management of capture fisheries" seems to me has to be better redrafted and completed in "Inland fisheries challanges include sustaining current level of production and trade (including post-harvest losses reduction) and other ecosystem service as well as an improved sustainable and equitable development and management and co-management of the capture fisheries",
Hope it is useful
I look forward to hear from you
Sincerely
Gianluca
Looking forward to hear from you, let me thank you, Madam/Sir, for the efforts that your Organization do to enhance the International cooperation, sustainable development and to eradicate poverty and hunger.
Sincerely.
Gianluca RAGUSA – International consultant (Fishery and aquaculture specialist)
Via Tuscia, 7 . 00191 Rome (Italy)

18. Gerhard Flachowsky, Friedrich-Loeffler-Institute, Germany

Dear Colleagues,

Many thanks for sending this interesting Draft V0.

First of all, I want to congratulate HPLE for dealing with this substantial topic. As mentioned in your introduction, we should consider this Draft as a startpoint for further improvements. Please, read my comments/remarks under this aspect. I would distinguish the comments in general remarks and some minor comments. My comments will mainly underline the importance of research in the field of plant breeding for a sustainable water management and for its significance for developing countries.

Let me start with some general remarks:

1. First of all, to include in the topic of food security is very useful and laudable. Water is for me the most important food and nutrient. If I consider the title of the paper, I expect the text-proportion between water and food of about 1:1. But water is considered in the documents as the most important prerequisite to produce food. Therefore I would propose to change the title into:

„Water for food security" (s. also headline to 3.5.1 on p. 66 in your draft)

2. At the end of Introduction (p. 10), I miss a clear statement of the objective of the paper.

Furthermore, specific recommendations for policy and practice should be given. I miss some challenges for science/research for a more efficient use of water, e.g. as objective for plant breeding. Plant breeding should be considered as the starting point for the human food chain and there is a large potential for a more efficient water use (e.g. see SCAR 2008; The Royal Society 2009; Reynolds 2010; Newman et al. 2011; Flachowsky et al. 2013). The paper should not be only a report/description of the present stage of water (miss)management, it should also mention/demonstrate real challenges for science and motivate the policy for adequate scientific projects, e.g. as formulated/proposed by the Royal Society (RS; 2009) some years ago. Potentials of plant breeding incl. biotechnology to increase drought tolerance and to improve water efficiency are described by many authors, e.g. such as Cominelli and Tonelli (2010), Reynolds (2010), Newman et al. (2011) and Deikman (2012).

3. p.27, 2. Improved Water Management…, This chapter should contain clear challenges for science/research (esp. plant breeding: Increase of efficiency of water use by plants, Effects in C3 and/or C4-plants; Influence of water household of plants; Mechanism for more efficient water use in plant metabolism, consequences of expected climate change). RS (2009) spent much attention to the more efficient use of „limited“ natural resources such as water, fuel, arable land, some minerals etc. and an maximal use of „unlimited“ natural resources, such as sunlight/energy, carbon dioxide and nitrogen from the air as plant nutrients.

4. p.29. l. 43: Which types of research to you propose in the case of water productivity in livestock (see also p. 78; l. 5-7)?

There exist many papers about the requirements for drinking water of various animal species/categories (e.g. Meyer et al. 2004 or Nutrient Requirements of food producing animals by various scientific societies; such as NRC or GfE; which include information about water intake and water quality) or on global scale (e.g. Schlink et al. 2010). Much more water as for drinking by animals is needed for feed production (about or more than 1 m3 per kg dry matter).

5. p. 45, l. 44 ff.: There are some new knowledge/developments in the case of global phosphorus availability. Scholz and Wellmer (2013) used a more dynamic model to calculate the global P-resources and came to the conclusion that P is much longer available (about 1 000 years) than expected previously. Similar conclusions were drawn by the US Department of geological resources some years ago.

6. Subchapter 3.3.3 deals with „The role of the private sector….“, but I miss a similar subchapter for the role of the public (research) sector for a sustainable water management.

I beliefe that the private research sector will presently not be able to contribute substantial to an improved and sustainable water management in the field of plant breeding. More public investment (including public-private collaboration) will be needed to make this new `genetic revolution` beneficial for all people including people from developing countries (see Flachowsky 2013).

I underline public activities in this field, because I don´t believe that private investments would be able to overcome the present imbalance between Planet (P) – People (P) – Profit (P; three P-concept) under consideration of ethical aspects and to contribute substantially to a more balanced 3P-concept (see IUCN 2005; Casabona et al. 2010; Makkar and Ankers 2014). Presently, we have a strong exploitation of natural resources (Planet) and population (People) to make more (and more) Profit.

Some minor comments:

1. Abbreviations should be explained after first use of the full term (e.g. FSN in 1 Water for food security and nutrition (FSN) on p. 4

2. p. 8: Water use in % of total water need of various users should be mentioned in the introduction

3. p. 8: in l. 5; Table 1 is mentioned, but I could not find any Table 1, which shows the water per capita in the future. Table 1 (p. 31) shows the „Global survey of groundwater irrigation"

4. p.11, Figure 1 is not full clear to me. Some percentages of water use may be helpful (e.g. in text of p. 13).

5. p. 28, Figure 9: Apart from yield per ha; t water/t grain yield should be also given (or in a separate table).

6. p. 38, Table 4: Where from (references) are the data for water productivity of beef? Which yield did you use for calculation in the case of beef (e.g. body weight gain, slaughtering body weight gain, meat yield, edible protein or what)? Further animal yields (e.g. milk, pork, chicken for fattening and eggs) should be included in this Table or a table for food of animal origin should be introduced.

7. p. 47; 2.5.1. Water footprint: I would propose to include a table of „Water footprints" for some important feeds and food and also for some industrial products in the paper.

8. p. 48; 2.6. Policy implications: I would include a paragraph concerning „Support of public research for a more sufficient use of water by plants with the objective of more and sustainable water efficiency to produce valuable phytogenic biomass"

9. p. 69; 3.6 The right to water and the right to food, but in 3.6.1; you started with the right to food, followed with the right to water (3.6.2). I think, it should be other way round.

Conclusion

The paper should more focus on development and research for a more sustainable water management. The authors should give clear recommendations to policy makers for further research. Plant breeding by public research with the objective of more efficient water use to produce high amounts of available biomass for more people with less limited resources (such as water) can be considered as one of the main aims for the future in this field.

The paper is mainly focussed to the policy, but we should also focus on more long-term public research to the policy in order to contribute or to solve the problems of water scarcity in many regions of the world. A lower need of water by feed and food producing plants (e.g. reduction of water need per kg dry matter from about 1 to 0.8 or 0.6 m3 per kg dry matter) may substantial contribute to overcome this global problem (also in developing countries, if such seeds are available in developing countries).

Progresses in plant breeding to more efficient plants in using limited natural resources (incl. water) and plants with high and stable yields which sustainable contribute to stabilize human nutrition with food of plant and animal origin could be considered as the starting point for an improved food chain and to overcome imbalances present in the 3P-concept.

Some references mentioned in the comments above:

Casabona, C.M.R., Epifanio, L.E.S., Cirion, A.E. (2010) Global food security: Ethical and legal challenges. Wageningen Academic. Publ., Wageningen, The Netherlands, 532 p.

Comibelli, E., Tonelli, C. (2010) Transgenic crops coping with water scarcity. New Biotechnology 27, 473-477

Deikman, J., Petracek, M., Heard, J.E. (2012) Drought tolerance through biotechnology: Improving translation from the laboratory to farmers´field. Current Opinion in Biotechnology 23, 243-250

Flachowsky, G. (2008) What do animal nutritionists expect from plant breeding? Outlook on Agriculture 37, 95-103

Flachowsky, G. (2013, ed.) Animal nutrition with transgenic plants. CAB International, Vol. 1; Biotechnology Series, Wallingford, UK, and Boston, USA, 234 p.

Flachowsky, G., Meyer, U., Gruen, M. (2013) Plant and animal breeding as starting points for sustainable agriculture. In: Lichtfouse, E. (ed.) Sustainable Agriculture Reviews 12, Springer Science-Business Media, Dordlecht, Netherlands, pp. 201-224

Makkar, H.P.S., Ankers, P. (2014) Towards sustainable animal diets: A survey based study. Animal Feed Science and Technol. (in press)

Meyer, U., Everinghoff, M., Gädeken, D., Flachowsky, G. (2004) Investigations on the water intake of lactating dairy cows. Livestock Prod. Sci. 90, 117-121

Newman, J.A., Anand, H., Hal, M., Hant, S., Gedalof, Z. (2011) Climate Change Biology. CAB International, Wallingford, UK, and Cambridge, Massachusetts, USA, 289 p.

Reynolds, M.P. (2010) Climate Change and Crop Production. CAB International, Wallingford, UK, and Cambridge, Massachusetts, USA, 292 p.

SCAR (EU Commission on Agricultural Research; 2008) New challenges for agricultural research: Climate change, rural development, agricultural knowledge systems. The 2nd SCAR Foresight Exercise, Brussles, December 2008, 112 pp.

Schlink, A.A., Nguyen, M.-L., Viljoen, G.J. (2010) Water requirements for livestock production: A global perspective. Revue Scientifique et Technique-Office International des Epizooties 29, 603-619

Scholz, R.W., Wellmer, F.-H. (2013) Approaching a dynamic view on the availability of mineral sources: What we may learn from the case of phosphorus. Global Environmental Change. 23 (11), 11-27

The Royal Society (RS; 2009) Reaping the benefits: Science and the sustainable intensification of global agriculture. RS policy document 11/09, issued Oct. 2009 RS 1608, ISBN: 978-0-85403-784-1

Dear Colleagues,

I hope that you may understand my ideas mentioned above. Please ask me, if you have further questions.

Best regards

Gerhard Flachowsky

Prof. Dr. G. Flachowsky
Senior Visiting Scientist
Institute of Animal Nutrition
Friedrich-Loeffler-Institute (FLI)
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Bundesallee 50
38116 Braunschweig
Germany

19. Vijaya Khader, Food Technology, e-PG Pathshala, India

The concept of Food and nutrition security implies that every individual has the physical, economic, social and environmental access to a balanced diet that includes the necessary macro & micro nutrients, safe drinking water, sanitation, environmental hygiene, primary health care and education so as to lead a healthy and productive life.

A sustainable national nutrition security system should address the three issues of Availability, Access and Absorption. The decline in per capita food grain availability and its unequal distribution have serious implications for food security in both rural and urban areas.

Rural Food Insecurity: Several Studies have shown that the poverty is concentrated and food deprivation is acute in predominantly agriculture and rural areas with limited resources. In India of the 310.7 million rural workers, 103.12 million are agricultural labourers. Of these, about 48.37 million are females. Female Agricultural labourers are especially vulnerable to food insecurity on account of lower wages as well as the effects of migration.

Urban Food Insecurity: It is often presumed that, since urban areas are covered by the PDS, food security is not a major issue in urban areas. This is not true. During the 1990, the PDS has been weakened both by repeated increases in the issue prices of food grains and by the switch to a system of targeted PDS. People should be able to access grains from PDS whenever they want, wherever they want and any quantity they want, subject to a few ground rules to prevent purchase for hoarding and subsequent sale at high prices,

Action Plan:

A. Reform of the Delivery System: Restructure the delivery systems relating to all nutrition support program on a life cycle basis, starting with pregnant women and 0-2 infants and ending with old and infirm persons.

A. Community Food Security Systems: Promote the establishment of Community grain and water banks, involving Panchayats and local bodies. This program should be based on the principle "Store grain and water everywhere".

B. Eradicate hidden hunger: Nutrition literacy should be promoted at the school level. High priority should go to the elimination of iron deficiency anemia among pregnant women through fortification of salt and kitchen gardens.

C. Designing and introducing a Food Guarantee Act: A National Food Guarantee Act should lead to a decentralized network of grain storage structures and thereby help to prevent panic purchase of food grains during periods of drought of flood.

D. Every Village a knowledge centre: 21st century Agriculture will be knowledge intensive. Knowledge connectivity should there be a key component of Bharat Nirman, designed to provide a new deal for Rural India.

E. Convergence and Synergy among Public, Private and Academic Sector initiatives: There is a need for convergence and synergy among numerous initiatives of Central and State Governments in the area of ICT for good governess and development.

Strategies to address micronutrient malnutrition: Three of the main strategies for addressing micronutrient malnutrition are dietary diversification, fortification (including bio fortification) and supplementation.

Supplementation: It is a technical approach in which nutrients are delivered directly by means of Syrup or Pills. Supplementation is most appropriate for targeted population with a high risk deficiency or under special circumstances such as during pregnancy or in an acute food shortage.

Fortification: This strategies utilize widely accessible, commonly consumed foods to deliver one or more micronutrients. The most widespread effort to date has been fortification of Salt with Iodine. However, many other foods may be used as vehicles for a variety of micronutrients.

Governments often assisted by International Agencies for many decades taken steps to eliminate or reduce micronutrient deficiencies. Building on the impressive results of the reduction iodine deficiency disorders (IDD) through the fortification of table salt with Iodine.

Bio-fortification: Bio-fortification, or plant breeding for the specific purpose of enhancing the nutritional properties of crop varieties, reflects the new application of an ancient technique. Recently breeding trials have been undertaken for the specific purpose of enhancing the nutritional value of crops with the specific objective of improving human nutrition. There have been some reported successes, including high protein maize, high carotene sweet potato and cassava and Iron enhanced rice (IFPRI 2002)

Dietary Diversification: Dietary diversity can be augmented by variety of foods by expanding the production, processing, marketing and consumption of a wide variety of foods. This information needs to be disseminated to the public through traditional information channel.

Factors for Success: Increased food collaboration and political commitment: Complimentary public health interventions that can help reduce micronutrient malnutrition including de-warming, Malaria prophylaxis, improved water and sanitation facilities and childhood immunization. Holistic strategies

using mixture of direct and indirect interventions and public health measures as well as education and awareness campaign have proved to be the best successful in reducing micronutrient malnutrition (Underwood, 1999)

First, there is a need for the FFS programs to link crop choice and diversification to food consumption, nutritional needs and dietary practices within local communities.

Incorporating nutrition in Former Field Schools (FFS): In many developing countries food insecurity in combination with the high incidences of infection continuous to have detrimental effect on the nutrition and health status of poor households. However there are a large number of Agricultural Extension Activities including large scale Former Feed School Programs in more than 50 countries. The FFS are participatory and hand on Adult education courses that focus on topics ranging from Pest Management and Dairy Production to food security.

Demand Projections and Constraints: In the next 10 years we have to add 55 million tones of food grains, 5 million tones of edible oil, 65 million tones of vegetables and fruits, 70 million tones of milk, 1 million tones of fish, 3 million tones of meat & chicken and 100 billion eggs. As 80% of the estimated addition has to come from vertical growth, productivity has to be 64% 120% and 136-157% respectively.

The major problems are rapid decreasing production – productivity growth of food grains :shrinking water resources; declining soil health and soil productivity; over two-thirds of the area remaining rain-fed with very low and inconsistent productivity; declining farm net-return; shortage of farm labor due to mass migration of rural folk to urban areas; increasingly limiting but badly required genetic variability; continued reservation against genetically modified crops; and unfolding adverse effects of climate change.

Technological and Development Interventions for Advances in Sustained Production: Integrated Crop Management (ICM) Modified form of System of Rice Intensification (SRI) designed and promoted by the Food and Agricultural Organization is an effective strategy to realize the maximum of the potential yield of a crop variety. Designed with two broad objectives of (i) maximizing productivity by narrowing the yield gap and (ii) maximizing sustainability by optimally using natural and monitoring inputs, the ICM is site and farmer-specific.

Sustaining the natural endowments: Conservation and optimal utilization of natural resources – soil, water and plant genetic resources hold the key to sustainable future growth of agriculture. Yet another natural resource that has not been receiving due attention for long is conservation of genetic resources, which are crucial for progressive improvement of crop plants and farm animals. Indian subcontinent is one of the gene rich regions of the world. Sadly, not even 15% of the available diversity could be utilized for crop improvement and hardly any variability of value, known to occur in the native breeds, has been taken advantage of for desired improvement of our livestock.

Climate change is a real and it is bound to adversely impact all our life-supporting systems and mainly Agriculture, given the size of crop losses being experienced due to unusually erratic monsoon behavior and / or rising temperature.

Favorable Policy Environment for maximizing the benefits from Technological and Developmental Interventions: The following are some of the issues and areas, where clear and pro-growth policy directions are important to sustain farming and the farmer.

(1)Enhanced Investment on Agriculture; (2) Credit Facilities and Crop Insurance are very important for the availing of government extended credit, subsidy and crop insurance facilities. Significantly in such group forming, land ownership will remain with the farmer concerned and land consolidation though desirable, would be optional.

Underutilized human capital in rural areas: Over one-half of our population is in the age group of 20 – 35. Youth in rural India accounts for 296 million as against 131 million in urban India. Majority of this human resource remains under utilized. Our failures to create rural bio-resources based employment opportunities and develop appropriate skill in them continued to be the reason for mass exodus of young people from rural areas to urban areas.

Spiraling Food Prices: The most challenging problem now, the world-over is unaffordable and escalating food prices. Food inflation at an all time high of 18-20% during the last few years, leaving many more lakhs to go to bed hungry is of great concern. Of the many factors that contribute such price raise, the more important are; demand-supply gap in food commodities, high economic growth, triggered raise in the income level of poor, unfolding globalization factors and lack of checks on speculative trade in food commodities

Thanks & regards,

Prof.(Mrs) Vijaya Khader, PhD
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20. Aziz Elbehri, Food and Agriculture Organization of the United Nations, Italy

Comment on the CFS/HLPE Report: WATER AND FOOD SECURITY (DRAFT V0-OCT 1, 2014)

By Aziz Elbehri, Trade and Market Division, FAO

My comment will be restricted to the question of trade which the draft report has not adequately addressed in my opinion. There are scattered references to trade in the report, but these do not amount to a coherent treatment given the potential role of trade in correcting national imbalances of water. The following are further elaborations on trade-related themes for consideration into the future version of the report:

1. “Virtual water” is a concept developed to examine the role that trade could play to correct for water imbalances across countries and to contribute, in part, to solving the projected negative impacts on food security. Virtual water allows countries to assess the value of producing a specific crop locally versus importing it. Given different water endowments across countries, it is proposed that water-abundant countries produce water-intensive products and export to water deficit regions. However, this is not as easy as it looks, as they are several difficult policy trade-offs to consider, not mention to the political feasibility of such an approach.

2. The main issue is that trade is closely tied with policy (including related farm and energy policy more broadly). It can be fairly assumed that improvements in agricultural water productivity through

investments in improved rainfall and irrigation systems, through better demand management (including through improved water pricing and water trading) as well as better governance of water management, distribution and use, can go long way in alleviating much of the water shortage problems, while the rest can be filled by trade. However, overreliance on imports could increase country vulnerability to global market volatility, sudden food market shortages, or even political decisions (export bans or sanctions). Local food production has also other socio-economic and developmental benefits to rural areas. A more reasonable strategy would be to combine investments in rainfed and irrigated agriculture with strategic complementary trade policies both of which can contribute to reducing the amount of additional water required to meet food demands. Moreover, trade policies need to be closely aligned and harmonized with farm subsidies, energy subsidies, competition policies so as to avoid unintended detrimental consequences on water supply and demand, and hence on the country's food security. Finally, as water is becoming a global concern, this has implications for multilateral trade rules and arrangements. One issue to ponder here is whether the existing WTO rules are flexible enough and with sufficient safeguards to allow water-deficit countries to source their food requirements through trade or are new multilateral mechanisms and safeguards required.

3. Beside trade there is also the question of investments. Promoting open trade to facilitate imports of water-intensive commodities may also open the door to inflows of foreign investments which can be "a double edged sword". Investments may bring in capital and technology but could also create risk of diverting water resources away from much needed food security uses. A typical example is the investment in land for biofuel feedstocks (which would also require huge amounts of water resources, especially under intensive production systems). A particular concern in developing countries. Appropriate investment policies and safeguards that could balance between protecting investors rights and those of the local communities, are very much needed for water as much as for land investments.

4. Climate change is expected to exacerbate water scarcity and induce future irrigation shortages in many parts of the world. This brings to the fore the role of trade as a potential correcting mechanism. Again potential is underlined since trade and or climate policy could direct the trade impacts in a positive or negative way. While an open trading system has the potential to correct part for the water variability and increased scarcity problem, there are many unanswered issues that need further investigation. Among these is the search for the correct balance between investing in improving water & food productivity versus relying on imports and between promoting foreign investments versus protecting communities' interests and right to food and water.

In conclusion, the above considerations call for more analysis on the role trade can play in correcting the emergence water imbalances and their implications for food security. International organizations, such as FAO, WB and others along with water specialized research centers need to partner to develop the technical and economic knowledge base required to support developing countries and to assist the formulation of appropriate national water policies as well as engage in global policy dialog on water and food security issues.

21. Santosh Kumar Mishra, Population Education Resource Centre, Department of Continuing and Adult Education and Extension Work, S. N. D. T. Women's University, Mumbai, India

Contributor Submitted to "The HLPE Project Team and Steering Committee": (a) online on web link: http://www.fao.org/fsnforum/cfs-hlpe/water-food-security-v0, & (b) Email: fsn-moderator@fao.org [Note: Submitted on Tuesday, October 21, 2014].
Institutional Affiliation of the Contributor: Dr. Santosh Kumar Mishra (Ph. D.), Technical Assistant, Population Education Resource Centre, Department of Continuing and Adult Education and Extension Work, S. N. D. T. Women's University, Patkar Hall Building, First Floor, Room. No.: 03, 1, Nathibai Thackerey Road, Mumbai - 400020, Maharashtra, India. (http://sndt.ac.in/) [Email: drskmishrain@yahoo.com Tel.: +91-022-22066892 (O), +91–022–28090363 (R), +09224380445 (M)].
We are aware that we have not yet adequately covered, in the V0 draft, some issues of importance. We invite respondents to suggest relevant examples, including successful ones and what made them possible, good practices and lessons learned, case studies, data and material in the areas of:

Comparative water performance (productivity and resilience) for food security and nutrition of different farming systems, and food systems, in different contexts:
CARICOM Project: From Farm to Fork: Improving Food and Nutrition Security in the Caribbean: This project is aimed at improving the nutrition and health of CARICOM populations through sustainable agricultural technologies that increase food availability and diversity of food choices. This initiative was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada, and with the financial support of the Government of Canada provided through the Canadian International Development Agency (CIDA).
The CARICOM (Caribbean Community and Common Market) is an economic grouping of 15 developing countries in the Caribbean, many of them small islands, identified by FAO as experiencing food insecurity. These countries have a long history of reliance on exportation of plantation crops for economic development, but have paid limited attention to local food production, particularly vegetables and fruits. Additional constraints on vegetable and fruit production in CARICOM include seasonality and scarcity of water supply, inefficient use of land and agricultural technologies, and imperfections in market structures and incentives. Consequently, there is a high dependence on importation of energy-dense foods leading to low rates of consumption of vegetables, fruits and pulses, creating a paradox of obesity and under-nutrition, and threatening population health.

The project was conceptualized based on the release of two land-mark reports (the "Jagdeo Imitative" and the Report of Caribbean Commission on Health and Development) adopted by CARICOM Heads of Government, and stressing the need for linkage between agriculture and human health to improve CARICOM development. The overall goal of the project is to improve nutrition and health outcomes of CARICOM populations through an integrated, gender equal, environmentally sustainable systems approach to availability, safety and quality of food. Through a combination of socio-economic and community surveys, field research, and nutrition interventions in schools, the project addresses problems of land and water degradation, inefficient pre- and post harvest practices that underlie food and nutrition security. Innovations in inclusive market-oriented development and environmental management could lead to policy changes for sustained food security in CARICOM.

The project is regional in nature, and piloted in four countries (Guyana, Trinidad & Tobago, St. Lucia, and St. Kitts & Nevis); it is multidisciplinary in scope, and its scientific merit lies in its "farm-to-fork" systems approach to human health. Project benefits include human capacity building through education and training and community sensitization programs for a range of stakeholders. A major expected outcome is a change in consumer behaviour towards the consumption of a more diversified diet of fruits and vegetables.

The King Abdullah Initiative for Saudi Agricultural Investment Abroad (KAISAIA): This project was launched January, 2009. In June 2012, the Saudi Cabinet set certain parameters for projects and

investment and green-lighted projects financed by KAISAIA so they may finally get under way. Up to 60 percent of the financing is to be provided by the government. Target countries need to agree to allow export of at least 50 % of the crops. Investors should be able to benefit from agricultural equipment owned by local farmers in the host country. It is a joint initiative by the Government of the Kingdom of Saudi Arabia and the Saudi private sector. It is managed through the Ministry of Agriculture. Key objectives of the project (KAISAIA) are:

maintaining food security for Saudi Arabia,
enhancing international food security, and
encouraging Saudi Investors to utilize their resources and experiences abroad.
Current targeted Countries: Sudan, Egypt, Ethiopia, Turkey, Ukraine, Kazakhstan, Philippines, Poland, Vietnam, Brazil, and other suitable countries with agricultural investment. Priority actions in this project are:

Provide funds, credit and logistics to Saudi investors to invest abroad in agriculture;
Establish a strategic reserve for basic food commodities, to meet the Saudi needs for food and to avoid future food crises;
Identifying the suitable hosting countries for agricultural investment;
Studies to define local requirements for basic food products (present and future);
Studies to define strategic reserves for basic food commodities;
Establishing a holding company;
Signing bilateral agreements with hosting countries to identify and preserve the rights and commitments of all parties; and
Identifying the suitable forms of off-taking agreements between the government and the investors.
Water use in food processing:

Water recycling for sustainable food manufacturing in Australia: New water recycling research aims to reduce the reliance on drinking water by food manufacturing and processing plants and address consumer concerns about the use of recycled water. This research aims to enable more sustainable use of water across the agri-food industry. Food processing is Australia's largest and thirstiest manufacturing industry. Each year the food processing sector consumes about 215 gigalitres of water (equivalent to 86 000 Olympic size swimming pools). This is a third of the total water used for all manufacturing across Australia.
The industry has recognized the need to adopt alternative water management strategies ahead of a future with greater water scarcity and cost. However, consumer perceptions and economic and regulatory barriers have prevented many food businesses from recycling water. Research through the "Australian Water Recycling Centre of Excellence" aims to reduce the reliance on fresh water throughout the agri-food supply chain.

Led by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the research will identify water recycling opportunities for food manufacturers by demonstrating economic, environmental and social benefits. Working closely with the food manufacturing, dairy and meat industries, the researchers will examine the full potential of water reuse, from energy recovery and nutrient re-use through to the use of spent process water for external purposes.

The team will also identify consumer and regulatory barriers hindering water recycling and propose strategies to overcome these barriers based on sound science. The research will:

inform water recycling strategies for the agri-food industry,

deliver decision making tools for the industry to assess water recycling options based on the value proposition and available technologies,
improve understanding of consumer attitudes and emotions when consuming foods associated with recycled water and communicate positive messages to help increase consumer confidence, and
provide advice to industry on regulatory guidelines for recycling water in food manufacturing plants.
This project ties into other work by the Australian Water Recycling Centre of Excellence that is examining public attitudes and perceptions related to water recycling. The project's research activities began in early 2012. As of September 2013 the following progress has been achieved:

targeted literature reviews for water recycling in the dairy, meat, food and municipal water sectors in relation to all sub-project areas;
the collection of data and information from key stakeholders;
completing a choice modelling experiment to understand the attitudes, values and emotions of consumers when consuming a food product associated with recycled water;
developing a methodology to assess the value proposition for water recycling scenarios;
developing a framework to select technology options for recycling water for different applications;
identifying and understanding the regulatory framework for water recycling in the agrifood sector;
mapping the sources and sinks of water in the dairy, meat, food and utility sectors in Australia;
completing a preliminary study for salt and nutrient uptake modelling when dairy effluents are used in irrigation; and
commencing industry base trials and desktop studies in water recycling for the dairy, food and meat sectors.
The main focus of the project is to collaborate with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. The project will pursue a holistic cross-sector approach with stakeholders in meat, dairy and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies are also involved. The project established an industry reference group to help ensure expected project outcomes are aligned to the requirements of external stakeholders, to seek advice and guidance in collecting relevant data and information, and to organise site visits. Administered through the Australian Water Recycling Centre of Excellence, the project partners include:

Australian Meat Processors Corporation,
Meat & Livestock Australia,
Dairy Innovation Australia Ltd.,
Australian Food & Grocery Council,
Queensland Government, and
Industry partners.
Water recycling in food production and manufacture, Australia: The project identified and enabled water recycling opportunities in the agri-food industry through integrated systems analysis, technology assessment and targeted research to address implementation barriers. The project focused on addressing industry challenges, including regulatory and policy pressures, developed strategies to increase acceptance by consumers, and undertook customer attitude surveys.

The project collaborated with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. The project pursued a cross-sector approach with outcomes addressing water recycling interests with stakeholders in meat, dairy, horticulture and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies were involved and participated with industry partners. The project team has met all major milestones including case studies for:

recycling water options at Kellogg's Botany site, based on physical constraints at the site and other factors
salt and nutrient modelling, the regulatory framework, and demonstrating the value proposition tool for Bega Cheese and Dairy Innovation Australia Ltd (DIAL)
evaluating a complete system to produce potable water (phosphorous recovery, membrane bioreactor, reverse osmosis and disinfection) for Warnambool Cheese and Butter and DIAL
the meat sector (Australian Meat Processor Corporation and Meat & Livestock Australia), with a series of fact sheets, a review of the removal of oils, fat and greases from effluents of meat processing plants, and a position paper dealing with the reduction of nutrients from meat processing effluents and the reduction of salt from reverse osmosis retentate.
The project's framework for assessing appropriate technologies for treating waste water for different recycling and irrigation purposes has now been trialled by a couple of industry sectors (food processing and dairy), and the value proposition tool for calculating the net present value of water recycling investment has also been validated in industry-based trials (dairy and food. An industry forum organized for September 2014 for food, dairy and meat sector stakeholders aims to identify the cross-sector learnings from this project and to synthesise the broader opportunities for water recycling within these industries.
Lead organization is the CSIRO Animal, Food and Health Science. Partner organizations are:

Meat & Livestock Australia,
Australian Meat Processors Corporation,
Dairy Innovation Australia,
Australian Food & Grocery Council,
Southern Rural Water, and
Melbourne Water.
Recycled Water Opportunities in Sustainable Food Production and Manufacture, Australia: AMPC and MLA are participating in a multi-party, cross-sector project to identify and enable water recycling opportunities in the agri-food industry. Led by CSIRO Animal, Food and Health Sciences and the Water for a Healthy Country Flagship, the project will collaborate with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. It will focus on current industry challenges, including regulatory pressures, the value proposition driving water recycling, and develop strategies to increase acceptance by consumers and enhance the sustainability positioning with customers.

The project will pursue a holistic cross-sector approach with outcomes addressing water recycling interests with stakeholders in meat, dairy, horticulture and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies are also involved and will participate in joint initiatives with the agri-food industry participants.

The project will be integrated with AMPC's Core R&D Sustainability Program over the next two years and will involve integrated systems analysis, technology assessment and targeted research to address water recycling implementation barriers. Activities in the meat sector will involve two main areas:

A broad assessment of water recycling and reuse in the red meat processing sector including:
Review of existing water recycling and reuse practices in the red meat processing sector;
Comparison of these practices with other food manufacturing supply chains (e.g. Dairy, Pork, etc.);
Identification of current and future regulatory barriers and opportunities;
Development of an outline strategy for future R&D for three, five and ten year timeframes;
Identification of specific demonstration trials and case studies.

Identification and development of trial sites including the following activities:
Collection of information from industry on water usage and disposal, volumes and types of waste streams;
Collation of existing information on water quality and nutrient content of effluent streams (supplemented by collection and analysis of samples);
Design and implementation of treatment trials based on the initial review;
Identification of potential recycle/reuse applications of treated water within the industry (e.g. non-food contact applications like cleaning, washing, cooling, heating, steam etc.);
Assessment of residual water utilization (e.g. nutrient recovery, fit for purpose, farming, etc.).
The initial phase of the project included a survey of the AMPC membership which enabled data gathering on water use, recycling and disposal at red meat processing facilities. A total of 25 responses were received of which 23 contained useable data for the red-meat processing industry. Respondents ranged from the largest in Australia to small country abattoirs processing around 30 tonnes of hot standard carcase weight (HSCW) per month. There were thirteen beef-only plants, one sheep-only plant and nine multi-species plants. The average water usage for all respondents was 7.21 kL/tHSCW processed and ranged from 1.15 to 15.91 kL/tHSCW. The smaller plants used much less water per unit production than the larger plants because they did not carry out any further processing such as boning of carcasses or rendering of by-products. The average water usage for red meat plants producing greater than 1,500 tHSCW per month was 8.64 kL/tHSCW. This is a slight reduction on the figure of 9.4 kL/tHSCW obtained during the environmental sustainability survey of 14 sites done for AMPC and MLA in 2008-09.

All plants that responded to the survey reuse water for some purpose. For most, treated effluent was used for irrigation of pasture, farms or gardens on-site and off-site. In addition over 60% of respondents recycled water to replace potable water in a variety of uses such as yard and stock washing, initial tripe washing, cooling applications, boiler feedwater, etc. Only two plants recirculated water within the same process. These related to beef hot water decontamination systems where the used water was treated and re-heated before being sprayed back on the beef sides.

The data gathered from the survey will be used to benchmark water recycling within the red meat processing sector for comparison with other sectors, such as dairy and horticulture, as well as to identify potential water recycling opportunities. Having collated, interpreted and analyzed the survey results, CSIRO are now planning a series of site visits to determine:

Process-related and technology-related opportunities for recycling water;
Priorities for processors for water recycling;
The site specific needs in relation to water recycling, and;
Trial sites for the next phase of the project.
Recent meetings have also been held between AMPC, CSIRO, the University of Queensland and a range of other R&D providers working with AMPC and the meat processing industry, to identify options for collaboration and share information on the progress of current projects. These meetings have assisted in identifying the options for commercial trials, which will likely build on other work underway with AMPC members that relates to water and energy efficiency through tripe waste water re-use, steam sterilization of chillers and viscera water recycling.

In addition, the industry project to establish “environmental benchmarks” or performance measures in relation to water, energy and other natural resource use is now underway. This project will review and collect new data since the previous examinations conducted in 2003 and 2008. This project will

also provide indicative analysis of the future targets for the red meat processing industry so as to benchmark environmental measures.

Water for food and nutrition security in urban and peri-urban contexts:

Using water wisely to feed growing cities, Tunisia: North Africa contains 5 per cent of the world's population but only has 1 per cent of the world's available water resources. In Tunisia, water availability is as low as 350 m^3 per person per year, but rapid urbanization and climate change are placing further stress on water resources and food production. Use of treated wastewater for irrigation has helped to sustain agriculture in peri-urban areas, but severe government restrictions on wastewater use are constraining production.

With greenhouses, crops can be grown in the earth and suspended above ground (© M Bouraoui and B Houmane)

“With greenhouses, crops can be grown in the earth and suspended above ground”

In the town of Soukra, six kilometres from the capital city, Tunis, hundreds of low-income families live off the crops they grow. In recent years, however, rapid urbanisation has caused the city to expand, encroaching on farms, driving land speculation and threatening the livelihoods of Soukra's farmers. Since the 1990s, nearly 30 per cent of arable land has disappeared. Farmers are also facing significant water stress: climate change has altered rainfall patterns, causing more extreme droughts and floods and leading farmers to draw more water from wells. As a result, saltwater from a nearby lagoon has been seeping into the groundwater, leaving some fields waterlogged and others too salty to grow healthy crops.

With funding from Canada's International Development Research Centre (IDRC), the Tunisian NGO Club UNESCO/ALECSO pour le savoir et le développement durable (FTCUA Tunisie) set out to find comprehensive ways to mitigate the environmental threats farmers face, while helping them secure and improve their livelihoods. "We spent a year with experts, researchers, regional and local NGOs and the municipality to understand the origin of these problems, the farmers' perspectives and their aspirations for the future," says Moez Bouraoui of FTCUA Tunisie and president of the Urban Agriculture Association of the Middle East and North Africa.

This led to the development of a plan that would address environmental threats to agriculture while improving farmers' incomes. The idea was to deploy new, environmentally-sustainable sources of water for irrigation to increase agricultural production, and create small businesses for the farmers who had largely been growing subsistence crops. "These farmers only have small plots ranging from 1,500 m^2 to one hectare," Bouraoui explains, "so we opted for greenhouses which help conserve water, protect crops from grazing animals and theft, and allow for more intensive farming. This much more intensive form of agriculture has vastly increased yields by allowing crops to be grown in the earth and suspended above ground”.

Snails, which provide fertiliser, are farmed in containers (© M Bouraoui and B Houmane)

“Snails, which provide fertilizer, are farmed in containers”

Technicians then installed ground-level basins adjacent to farmers' land to store rainwater and deliver it to crops. This water is directed to the greenhouse crops using highly efficient micro-irrigation. “After a few months of experimentation and research, we installed rainwater collection systems on the greenhouses”, Bouraoui adds. Gutters built into the greenhouses’ support structure channel the rain into storage tanks, which can meet up to 60 per cent of its water needs. Wastewater - including water used for household bathing and cleaning - was also captured, filtered and used for irrigation. Following Tunisia's strict regulations on wastewater use, it is only used to grow flowers, which are a lucrative crop. To restore saline soil, fresh earth was added and olive trees planted which will tolerate a large range of soil conditions and can be irrigated with wastewater.

Greenhouses usually have to be moved every five years to avoid soil depletion, but this is impossible because of a lack of space. Farmers began to experiment with lucrative crops that could be grown in containers above the soil - such as strawberries and lettuces - to allow the ground to lie fallow. Snails, which provide fertilizer, are also farmed in containers. Farmers who once grew crops for subsistence are diversifying and cultivating more cash crops, including ten kinds of fruit and vegetables, which they sell in nearby markets. Greenhouses have also extended the growing season and increased incomes, as farmers can earn much more for produce such as tomatoes, when they are out of season. For example, one greenhouse produces six tonnes of tomatoes, worth around US$4,600. Farmers who were once amongst the poorest are enjoying better lives. One mother paid for her daughter's wedding, others have expanded their homes. One of the most tangible signs of success is that some farmers are reinvesting their profits into building more greenhouses.

In the town of Soukra, hundreds of low-income families live off the crops they grow (© M Bouraoui and B Houmane)

“In the town of Soukra, hundreds of low-income families live off the crops they grow”

The research team has worked closely with the city government to help it recognize the ecological and economic value of urban agriculture, and to include small-scale farming in land use planning. Bouraoui explains: “Together we thought about how to develop a structure that could unite the farmers that could defend their interests, and provide them with services to support the development and growth of their businesses. We put in place a cooperative which is gradually taking over the research and gives farmers a stronger voice in local decision-making. In some ways, this is one of the greatest achievements of the project”.

This model of urban agriculture and the technical innovations that have been produced are now being disseminated throughout Tunisia through mass media, journal articles, workshops and conferences. Through associations like the Arab Network for Urban Agriculture, the knowledge gained in Soukra is being shared with groups throughout the region. “The solutions pioneered in Soukra provide excellent examples for countries in the region coping with water scarcity and climate change”, Bouraoui concludes.

Ensuring water security in urban areas through better understanding and management of the water, energy, food nexus (WEFN), China: China faces the challenge of developing resource efficient livable cities for a growing population and economy in areas of increasing water scarcity. Therefore new and innovative solutions need to be found in the design of urban water infrastructure and the institutional planning and management of water in the cities, associated industries and surrounding

rural areas. This means integrating water and energy efficient solutions in the urban planning and design of new cities and in the re-development of existing cities.

The co-lead partnership on the water-energy-food nexus was initiated by Sweden and China through the Swedish Ministry of Environment, Ministry of Water Resources of China, Nanjing Hydraulic Research Institute (NHRI), Institute of Water Resources and Hydropower Research (IWHR), MWR Development Research Centre (DRC), Stockholm International Water Institute (SIWI) and Stockholm Environment Institute (SEI). A closely linked co-lead partnership on the water-energy nexus was initiated by the United Kingdom focused on ensuring water security by better managing the interactions between water and energy in the process of urban development and the energy resources that support that development. The co-lead projects bring together technical experts to work with policy makers and municipal governments to apply best international practice and innovation to practical problems and identify the areas, where European and Chinese enterprises can work together in a mutually beneficial manner.

The WEFN is an important component of the overall Urban Water Challenge, the WEFN projects will coordinate with Integrated Urban Water management projects and with the EU-China Urbanization Partnership for the development of resource efficient Low carbon Cities. Key activity areas with programs jointly developed by Chinese and European partners encompass:

Taihu Basin Region Urban Water Security Program,
Managing water risks in China's energy sector – especially the impact on water resources of Development of Shale Gas and Synthetic natural gas supplies,
Managing energy risks in China's Urban Water Sector – especially the influence of energy use of different source in planning the water resources development strategy for Qingdao, and
Sustainable and intensive agriculture for urban areas.
Participating organizations are:

Swedish Ministry of Environment,
UK Foreign Commonwealth Office,
Stockholm Environment Institute,
Stockholm International Water Institute,
Atkins International,
Stockholm Royal Institute of Technology (KTH),
Ministry of Water Resources,
P.R. China,
China CEWP Secretariat,
Nanjing Hydraulic Research Institute,
Institute of Water Resources and Hydropower Research (IWHR),
Development Research Centre (DRC) of the Ministry of Water Resources,
Tai Lake Basin Authority,
Applied Energy Innovation Center (AEI) in Ningbo,
ChangCE, and
World Resources Institute.
Water governance, policies and management systems capable of better integrating food security concerns while tackling trade-offs between water uses/users in an equitable, gender just and deliberative manner. We are particularly interested in examples that have enhanced social justice and also benefitted marginalised groups:

Policy Partnership on Food Security (PPFS), Hong Kong: Policy Partnership on Food Security (PPFS) will play a significant role in identifying the key challenges in improving food security in the APEC region, and in recommending appropriate policy initiatives going forward. The long term goal of the PPFS shall be the attainment of a food system structure by 2020 sufficient to provide lasting food security to APEC member economies. The PPFS should look to further define the elements of a food system structure as part of its objectives.
It is emphasized that, APEC's approach to food security must reflect member economies' commitment to facilitation of investment, trade and markets and sustainable development of the agricultural sector as outlined in the Niigata Declaration on Food Security. Each APEC member government may nominate private sector representatives to sit on the PPFS for an initial period of three years. ABAC may also nominate private sector representatives, who shall be endorsed by SOM in consultation with ABAC. Private sector participants may represent agrifood-related industry bodies, farmers' groups or individual companies and should strive to see that their views represent consensus within the industry.

The private sector representatives to the PPFS will nominate a principal advisor to serve as a vice chair along with the government representatives in the PPFS management council. The selection process for the principal advisor will be an open and transparent process, conducted by ABAC and approved by APEC Senior Officials. The APEC Business Advisory Council (ABAC) has been engaged in food security efforts since 1999 when APEC Leaders endorsed a plan for a unified APEC Food System.

In the year 2009, ABAC issued a strategic framework for food security which among its recommendations called for the establishment of an ongoing mechanism at a high level to ensure the policy and technical cooperation necessary to achieve an integrated food system. This mechanism should include direct input and participation from the private and research sectors, as well as the public sector in the form of a formal, institutionalized "Food Dialogue". This laid the foundation for the creation of a Policy Partnership on Food Security (PPFS) three years later.

In 2010, APEC Ministers Responsible for Food Security agreed to consult with relevant stakeholders and instructed Senior Officials to integrate ABAC into APEC's food security efforts in a more substantive manner. In the year 2011, APEC Senior Officials agreed to create a Policy Partnership on Food Security (PPFS).

"A partnership towards the goals of food security"

In February 2012, PPFS was established, and the 1st PPFS Management Council Meeting was held in Moscow, Russia. The meeting was chaired by Mr. Sergey Aleksashenko from the Russian Federation. The three Vice-Chairs were Mr. Bradley Fenwick from USA, Dr. Haryono from Indonesia, and Mr. David Dodwell from ABAC (also the Executive Director of the HK-APEC Trade Policy Group). Government and private sector representatives from APEC member economies also attended the meeting. The blue print of the work of the PPFS were discussed and endorsed in APEC Senior Officials Meetings in May and the APEC Leaders' Meeting in September 2012. The ABAC played a lead role in championing for the establishment of PPFS. In the years ahead, ABAC members and the private sector will continue to engage in the work of PPFS towards the goals of food security in the APEC region.

Increasing irrigation water productivity in Mozambique, Tanzania and Zimbabwe through on-farm monitoring, adaptive management and Agricultural Innovation Platforms: This project aims to find

means of meeting the African government's plans for greater food security while using limited water resources more sustainably. The project is funded with $3.3 million from the Australian Government via the Australian International Food Security Research Centre (AIFSRC) of the Australian Centre for International Agricultural Research (ACIAR), with additional contributions from participating organizations.

A trans-disciplinary team has been assembled to address the recalcitrant problems of poor yields, low profitability leading to under-investment in infrastructure, market failure and degradation and abandonment of irrigated lands. The project will be led in Australia by the UNESCO Chair in Water Economics and Transboundary Water Governance at The Australian National University, with contributions from CSIRO Land and Water and the University of South Australia. Partners in Africa include the Food and Natural Resources Policy Analysis Network (FANRPAN), International Centre for Crop Research in the Semi-Arid Tropics (ICRISAT), the University of Pretoria, Ardhi and Sokoine University of Agriculture in Tanzania, and the National Institute for Irrigation in Mozambique.

An estimated one in four people go hungry in Africa; it is the region with the largest proportion of people living in extreme poverty. At the same time the agricultural potential of Africa is considered enormous; in terms of uncultivated farming land, reserves of exploitable water and in the levels of productivity that can still be achieved. Irrigation is under-developed in sub-Saharan Africa, and could potentially make a significant impact on food security.

Irrigated onions, Igomelo Irrigation Area. Credit P. Ramshaw, ANU

"Irrigated onions, Igomelo Irrigation Area"

This project builds on a scoping study that reviewed the work of International Water Management Institute, International Food Policy Research Institute, World Bank, Challenge Program, Gates Foundation and others on how irrigation could contribute to food security in nine sub- Saharan African countries. This research (scoping study) into use of harvested rain (dams, rivers, aquifers) for sustainable food production aimed to understand how better water management can be achieved at the farm and community scale. The research examined what the farmers need in terms of technology and training, and how governance and learning systems can sustain productive use in a whole-of-catchment context.

The region seeks investment of 10% of national budgets to increase agricultural production at six times the current rate under the African Union's Comprehensive Africa Agricultural Development Program initiative. The land and water resources for such expansion are theoretically available. Set against these agricultural expansion plans are:

a history of irrigation in the region failing to provide adequate return on investment,
weak market integration and weak water governance institutions, and
significant degradation and abandonment of irrigated land.
Furthermore, surface water is scarce and subject to competition in key river basins, such as the Limpopo and Rufiji. Despite these drawbacks, irrigation expansion will take place, and so research is needed to increase water productivity, the economic value per volume of water consumed. It is also needed to mitigate environmental degradation in current and new irrigated lands.

There are no "silver bullet" interventions to improve water productivity in Africa. The irrigation 'problem' is systemic in that there is failure at several levels including technical capacity, institutional arrangements and market linkages. These hurdles include the need:

to develop water resources within the sustainable limits of the catchment / aquifer,
to schedule water and nutrients to enable high crop yields,
for farmers to actively participate in the value chain to ensure there is sufficient profit for investing in operation & maintenance costs and purchasing inputs, and
for farmers to participate in governance arrangements that ensure efficient and equitable distribution of water.
In response to such complex problems, an FAO (2012) report calls for the introduction of adaptive management approaches that will lead to social and institutional learning. This project seeks to implement such a program by deploying on-farm monitoring of water applied, soil water, nitrate, salt and groundwater depth and using this as a basis for identifying options for improving water productivity. At the same time the project will use existing farmer organisations as a basis for establishing agricultural innovation platforms which comprise farmers, political representatives and players across the market value chain in order to identify obstacles and stimulate opportunities for change. The platforms will consider water productivity as well as other constraints to irrigated agricultural productivity. The objectives are to:

develop, test and deploy innovative water and solute monitoring systems to stimulate farmer learning toward greater water productivity.
evaluate whether agricultural innovation platforms, based on existing community organizations can identify and overcome institutional and market barriers to greater water productivity.
identify and communicate economic and policy incentive mechanisms for greater water productivity.
Project leader Jamie Pittock standing next to the Madibira Irrigation Scheme. Credit P. Ramshaw, ANU

“Project leader Jamie Pittock standing next to the Madibira Irrigation Scheme”

The project is expected to work directly with approximately 5,000 smallholder irrigator households in six or more irrigation areas in Tanzania, Mozambique and Zimbabwe. The research will model the adaptive learning and innovation platform approach with government and non-government organisations so that they may scale up application to benefit hundreds of thousands of smallholder irrigator households in the region. The project intends to influence national and multi-lateral policies for water, agriculture and food security by providing evidence to enhance sustainability components concerning water and small holder-irrigation.

The project started in July 2013. In August, representatives from all partner organizations attended an inception workshop held in Maputo, Mozambique. The project will conclude in 2017.

We welcome also examples on how the role of water for food security and nutrition is accounted for in land governance and management and land-use, including links between land tenure and water rights:

Implementing water reform in Queensland, Australia: Australia implemented a series of reforms to the water sector in the State of Queensland, including the use of a ‘whole of river basin’ strategic plan approach within which local resource operation plans are prepared and implemented. The key lesson learnt is that an incremental approach, with water planning developing in “bite-sized chunks” allowed government to be flexible in response to changing circumstances.
A series of legislative and policy developments to reform the water sector in the State of Queensland, Australia were put in place over 1999-01 (and ongoing), following Commonwealth (national) government water reform initiatives in 1996. The measures include:

Use of consultation across the stakeholder spectrum from high level of government through to farmers to help develop plans
Preparation of draft policy papers then Bills used to drive process
Preparation of supporting legislation for regulation of service providers, reform of water authorities; introduction of third party enforcement for offences, compliance notices, increased penalties;
Introduction of legislation to enshrine environmental flow requirements in the Development of Water (Allocation and Management) Bill
Use of a 'whole of river basin' strategic plan approach within which local resource operation plans are prepared and implemented
Integration of the reforms with the local planning processes of Queensland
The case illustrates how environmental flow requirements for rivers can be built into a planning process: includes assessment scenarios to demonstrate what makes a river 'healthy'. It also demonstrates how river basin scale water planning can be developed incrementally by engaging end-users, and how it can be linked to local government planning initiatives. It is applicable to many other GWP regions which sub-humid/sub-tropical environments and which are struggling with water reform. Lessons learned are:

An incremental approach, with water planning developing in "bite-sized chunks" allowed government to be flexible in response to changing circumstances.
However, the process would have been streamlined action had been taken earlier to separate regulatory functions from supply or service provision roles
Furthermore, a clearer definition of roles and responsibilities should have done earlier
In water allocation to local governments (and, presumably, to other users), the government should not mandate how the allocated water is to be used. Instead, it should limit itself to the allocation, and allow the local governments to specify how the allocated water is to be used.
Albania Natural Resources Development Project: Forests cover more than 50 percent of Albania's surface area. Agriculture and forestry have been two important sectors for the development of the rural areas and the national state economy. The post-communist transition period in Albania was characterized by massive internal and external migration of population, weak enforcement of laws and regulations, and overuse of natural resources all of which resulted in the considerable degradation of forests and pastures and erosion of soil. In response, the World Bank and the Swedish Government are supporting participatory forest and pasture management planning and investment in 240 Local Government Units (LGUs) through the National Resource Development Project (NRDP) to restore the forests and land of Albania.

In terms of challenges, after about two decades of transition, illegal logging, overgrazing of forests and pasture lands, and continuous degradation, the Albanians living in rural areas started to become conscious of the damaging effects these practices were having on the environment. To address this, residents organized community-based organizations with their main goals of protecting and rationally using their resources. Farmers, as part of forest and pasture users' associations, pressured the Government to transfer the rights of use and ownership of both forest and pasture lands to them.

In terms of approach, In June 2008, the Government of Albania formalized the land rights transfer to 345 LGUs, as a concluding response to a former pilot process in 1998. The pilot, which was part of the Albanian Forestry Project financed by the World Bank, gave rights to 30 LGUs. Following the Government's decision, an additional 315 LGUs benefited from the agreement. As of now, 60 percent of forests and pasture lands have been transferred from state to communal ownership, resources which are used by almost one million people.

In terms of results, the Project totaling US$19.4 million, including an IDA credit of US$7 million, US$5 million from the Global Environmental Facility (GEF), and co-financing of US$5.2 million from the Swedish Government, aims at establishing or maintaining sustainable, community-based natural resource management in about 240 communities in upland and mountainous erosion-prone lands across the country. This, in turn, is leading to increased productivity and incomes for the rural families as a result of their involvement in the management of forest and pastures, including:

25 percent increase in income earned from forest activities in communal forest and pasture lands;
50 percent increase in income earned from forest and agriculture activities in micro-catchment;, and
employment of about 6,000 workers, including 1,900 women and 1,900 beneficiary families, since the project's start-up.
The transfer of land ownership and user rights to the people has created incentive to manage and protect these resources, which have led to:

400,000 tons of erosion reduced;
improved water management, and conservation of biodiversity, and
forest protection, which is contributing to less sedimentation in the irrigation channels and hydropower dams.
Besides forestry, watershed, and agriculture, the project is also supporting carbon sequestration measures in degraded lands through simple protection measures such as fencing, control of animal grazing, and afforestation in very nude areas. Albania is one of the first countries to sequester carbon on eroded land. The Biocarbon Fund of the World Bank has reached an agreement with the Government to purchase emission reductions received from these carbon sequestration activities. The country will sell emissions reductions worth an estimated US$11 million to the World Bank's Biocarbon Fund.

According to Drita Dade, WB Project Team Task Leader, "Given its large areas of abandoned and highly eroded lands, Albania had great potential for carbon sequestration. This would attract the attention of other investors to help Albania afforest its degraded lands, while at the same time be able to sequester some carbon, bringing direct benefits to the communities that are part of this scheme as well as to the globe". According to a farmer from Gjalish, Uleza Commune, Mat, "You have to have been here 10 years ago to see – no vegetation but much degraded lands and overgrazed forests. Through some interventions under the World Bank Project we made a huge service to the forest. We cleaned and thinned it to allow good woods to grow better and to open space for the wildlife to come back in our forests. We stopped goats and animals from grazing for the first three years. What we see here now shows that with proper management we can have good quality of timber, and animals and other plants are coming back". In terms of future course of action, more sustainable, community-based natural resource management in Albania will lead to enhanced productivity, incomes, and, overall, improvements in land and water resources for the public sector.

Brief Bio of Contributor (Dr. Santosh Kumar Mishra)

Dr Santosh Kumar Mishra is researcher & demographer employed with the S. N. D. T. Women's University (SNDTWU, http://sndt.ac.in/) located at Mumbai in India. He underwent training in demography from the IIPS, Mumbai, India. (http://www.iipsindia.org/). He acquired Ph. D. in 1999. He is Reviewer/Editorial Board Member for 31 international journals. He has also reviewed papers for 5 international conference sessions, including EURAM 2014 Conference (4-7 June 2014, University

of Valencia, Spain, http://site.aace.org). His subject areas of interest include: population & development education, issues pertaining to population-development linkages, education for sustainable development, adult & continuing education/non-formal/extension education, etc.

Dr. Mishra has (a) co-authored 5 research studies (published by the SNDTWU); (b) presented 32 papers for national conferences & 11 papers for international conferences, & (c) authored/co-authored 5 handbooks/booklets (published by the SNDTWU, 5 books, & 11 book chapters. In addition, he has 30 articles published in national journals and 18 in international journals. Dr. was previously awarded Government of India fellowship at the IIPS (1986-1987) and travel scholarship for sharing his research views at international conferences and summits held at Karachi (Pakistan), Dare es Salaam (Tanzania), Stockholm (Sweden), Madison (USA), Dushanbe (Tajikistan), Canberra (Australia), and Manila (Philippines). He is Advisory Board Member of the American Academic & Scholarly Research Center (http://aasrc.org/?page_id=38) and Reviewer–cum–International Advisory Board Member for the AASRC 2013 International Conference – Beirut, Lebanon (http://aasrc.org/conference/? page_id=803). He was invited as Guest Speaker at the Pakistan's 11th International Convention on Quality Improvement-ICQU, 2007 (organized by PIQC Institute of Quality Improvement, Lahore), Karachi, Pakistan, November 26-27, 2007.

Contribution to HLPE consultation on the V0 draft of the Report: Water and Food Security

Note:

Contributor Submitted to "The HLPE Project Team and Steering Committee": (a) online on web link: http://www.fao.org/fsnforum/cfs-hlpe/water-food-security-v0, & (b) Email: fsn-moderator@fao.org [Note: Submitted on Tuesday, October 21, 2014].
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We are aware that we have not yet adequately covered, in the V0 draft, some issues of importance. We invite respondents to suggest relevant examples, including successful ones and what made them possible, good practices and lessons learned, case studies, data and material in the areas of:

Comparative water performance (productivity and resilience) for food security and nutrition of different farming systems, and food systems, in different contexts:
CARICOM Project: From Farm to Fork: Improving Food and Nutrition Security in the Caribbean: This project is aimed at improving the nutrition and health of CARICOM populations through sustainable agricultural technologies that increase food availability and diversity of food choices. This initiative was carried out with the aid of a grant from the International Development Research Centre, Ottawa, Canada, and with the financial support of the Government of Canada provided through the Canadian International Development Agency (CIDA).
The CARICOM (Caribbean Community and Common Market) is an economic grouping of 15 developing countries in the Caribbean, many of them small islands, identified by FAO as experiencing food insecurity. These countries have a long history of reliance on exportation of plantation crops for economic development, but have paid limited attention to local food production, particularly vegetables and fruits. Additional constraints on vegetable and fruit production in CARICOM include seasonality and scarcity of water supply, inefficient use of land and agricultural technologies, and imperfections in market structures and incentives. Consequently, there is a high dependence on

importation of energy-dense foods leading to low rates of consumption of vegetables, fruits and pulses, creating a paradox of obesity and under-nutrition, and threatening population health.

The project was conceptualized based on the release of two land-mark reports (the "Jagdeo Imitative" and the Report of Caribbean Commission on Health and Development) adopted by CARICOM Heads of Government, and stressing the need for linkage between agriculture and human health to improve CARICOM development. The overall goal of the project is to improve nutrition and health outcomes of CARICOM populations through an integrated, gender equal, environmentally sustainable systems approach to availability, safety and quality of food. Through a combination of socio-economic and community surveys, field research, and nutrition interventions in schools, the project addresses problems of land and water degradation, inefficient pre- and post harvest practices that underlie food and nutrition security. Innovations in inclusive market-oriented development and environmental management could lead to policy changes for sustained food security in CARICOM.

The project is regional in nature, and piloted in four countries (Guyana, Trinidad & Tobago, St. Lucia, and St. Kitts & Nevis); it is multidisciplinary in scope, and its scientific merit lies in its "farm-to-fork" systems approach to human health. Project benefits include human capacity building through education and training and community sensitization programs for a range of stakeholders. A major expected outcome is a change in consumer behaviour towards the consumption of a more diversified diet of fruits and vegetables.

The King Abdullah Initiative for Saudi Agricultural Investment Abroad (KAISAIA): This project was launched January, 2009. In June 2012, the Saudi Cabinet set certain parameters for projects and investment and green-lighted projects financed by KAISAIA so they may finally get under way. Up to 60 percent of the financing is to be provided by the government. Target countries need to agree to allow export of at least 50 % of the crops. Investors should be able to benefit from agricultural equipment owned by local farmers in the host country. It is a joint initiative by the Government of the Kingdom of Saudi Arabia and the Saudi private sector. It is managed through the Ministry of Agriculture. Key objectives of the project (KAISAIA) are:

maintaining food security for Saudi Arabia,
enhancing international food security, and
encouraging Saudi Investors to utilize their resources and experiences abroad.
Current targeted Countries: Sudan, Egypt, Ethiopia, Turkey, Ukraine, Kazakhstan, Philippines, Poland, Vietnam, Brazil, and other suitable countries with agricultural investment. Priority actions in this project are:

Provide funds, credit and logistics to Saudi investors to invest abroad in agriculture;
Establish a strategic reserve for basic food commodities, to meet the Saudi needs for food and to avoid future food crises;
Identifying the suitable hosting countries for agricultural investment;
Studies to define local requirements for basic food products (present and future);
Studies to define strategic reserves for basic food commodities;
Establishing a holding company;
Signing bilateral agreements with hosting countries to identify and preserve the rights and commitments of all parties; and
Identifying the suitable forms of off-taking agreements between the government and the investors.
Water use in food processing:

Water recycling for sustainable food manufacturing in Australia: New water recycling research aims to reduce the reliance on drinking water by food manufacturing and processing plants and address consumer concerns about the use of recycled water. This research aims to enable more sustainable use of water across the agri-food industry. Food processing is Australia's largest and thirstiest manufacturing industry. Each year the food processing sector consumes about 215 gigalitres of water (equivalent to 86 000 Olympic size swimming pools). This is a third of the total water used for all manufacturing across Australia.
The industry has recognized the need to adopt alternative water management strategies ahead of a future with greater water scarcity and cost. However, consumer perceptions and economic and regulatory barriers have prevented many food businesses from recycling water. Research through the "Australian Water Recycling Centre of Excellence" aims to reduce the reliance on fresh water throughout the agri-food supply chain.

Led by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the research will identify water recycling opportunities for food manufacturers by demonstrating economic, environmental and social benefits. Working closely with the food manufacturing, dairy and meat industries, the researchers will examine the full potential of water reuse, from energy recovery and nutrient re-use through to the use of spent process water for external purposes.

The team will also identify consumer and regulatory barriers hindering water recycling and propose strategies to overcome these barriers based on sound science. The research will:

inform water recycling strategies for the agri-food industry,
deliver decision making tools for the industry to assess water recycling options based on the value proposition and available technologies,
improve understanding of consumer attitudes and emotions when consuming foods associated with recycled water and communicate positive messages to help increase consumer confidence, and
provide advice to industry on regulatory guidelines for recycling water in food manufacturing plants.
This project ties into other work by the Australian Water Recycling Centre of Excellence that is examining public attitudes and perceptions related to water recycling. The project's research activities began in early 2012. As of September 2013 the following progress has been achieved:

targeted literature reviews for water recycling in the dairy, meat, food and municipal water sectors in relation to all sub-project areas;
the collection of data and information from key stakeholders;
completing a choice modelling experiment to understand the attitudes, values and emotions of consumers when consuming a food product associated with recycled water;
developing a methodology to assess the value proposition for water recycling scenarios;
developing a framework to select technology options for recycling water for different applications;
identifying and understanding the regulatory framework for water recycling in the agrifood sector;
mapping the sources and sinks of water in the dairy, meat, food and utility sectors in Australia;
completing a preliminary study for salt and nutrient uptake modelling when dairy effluents are used in irrigation; and
commencing industry base trials and desktop studies in water recycling for the dairy, food and meat sectors.
The main focus of the project is to collaborate with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. The project will pursue a holistic cross-sector approach with stakeholders in meat, dairy and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies are also involved. The project established an industry reference group to help ensure

expected project outcomes are aligned to the requirements of external stakeholders, to seek advice and guidance in collecting relevant data and information, and to organise site visits. Administered through the Australian Water Recycling Centre of Excellence, the project partners include:

Australian Meat Processors Corporation,
Meat & Livestock Australia,
Dairy Innovation Australia Ltd.,
Australian Food & Grocery Council,
Queensland Government, and
Industry partners.
Water recycling in food production and manufacture, Australia: The project identified and enabled water recycling opportunities in the agri-food industry through integrated systems analysis, technology assessment and targeted research to address implementation barriers. The project focused on addressing industry challenges, including regulatory and policy pressures, developed strategies to increase acceptance by consumers, and undertook customer attitude surveys.

The project collaborated with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. The project pursued a cross-sector approach with outcomes addressing water recycling interests with stakeholders in meat, dairy, horticulture and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies were involved and participated with industry partners. The project team has met all major milestones including case studies for:

recycling water options at Kellogg's Botany site, based on physical constraints at the site and other factors
salt and nutrient modelling, the regulatory framework, and demonstrating the value proposition tool for Bega Cheese and Dairy Innovation Australia Ltd (DIAL)
evaluating a complete system to produce potable water (phosphorous recovery, membrane bioreactor, reverse osmosis and disinfection) for Warnambool Cheese and Butter and DIAL
the meat sector (Australian Meat Processor Corporation and Meat & Livestock Australia), with a series of fact sheets, a review of the removal of oils, fat and greases from effluents of meat processing plants, and a position paper dealing with the reduction of nutrients from meat processing effluents and the reduction of salt from reverse osmosis retentate.
The project's framework for assessing appropriate technologies for treating waste water for different recycling and irrigation purposes has now been trialled by a couple of industry sectors (food processing and dairy), and the value proposition tool for calculating the net present value of water recycling investment has also been validated in industry-based trials (dairy and food. An industry forum organized for September 2014 for food, dairy and meat sector stakeholders aims to identify the cross-sector learnings from this project and to synthesise the broader opportunities for water recycling within these industries.
Lead organization is the CSIRO Animal, Food and Health Science. Partner organizations are:

Meat & Livestock Australia,
Australian Meat Processors Corporation,
Dairy Innovation Australia,
Australian Food & Grocery Council,
Southern Rural Water, and
Melbourne Water.
Recycled Water Opportunities in Sustainable Food Production and Manufacture, Australia: AMPC and MLA are participating in a multi-party, cross-sector project to identify and enable water recycling

opportunities in the agri-food industry. Led by CSIRO Animal, Food and Health Sciences and the Water for a Healthy Country Flagship, the project will collaborate with industry to demonstrate higher-value water recycling opportunities that deliver economic, environmental and social benefits to the agri-food industry and community. It will focus on current industry challenges, including regulatory pressures, the value proposition driving water recycling, and develop strategies to increase acceptance by consumers and enhance the sustainability positioning with customers.

The project will pursue a holistic cross-sector approach with outcomes addressing water recycling interests with stakeholders in meat, dairy, horticulture and broader food manufacturing and retail sectors. Water authorities and regulatory and policy agencies are also involved and will participate in joint initiatives with the agri-food industry participants.

The project will be integrated with AMPC's Core R&D Sustainability Program over the next two years and will involve integrated systems analysis, technology assessment and targeted research to address water recycling implementation barriers. Activities in the meat sector will involve two main areas:

A broad assessment of water recycling and reuse in the red meat processing sector including:
Review of existing water recycling and reuse practices in the red meat processing sector;
Comparison of these practices with other food manufacturing supply chains (e.g. Dairy, Pork, etc.);
Identification of current and future regulatory barriers and opportunities;
Development of an outline strategy for future R&D for three, five and ten year timeframes;
Identification of specific demonstration trials and case studies.
Identification and development of trial sites including the following activities:
Collection of information from industry on water usage and disposal, volumes and types of waste streams;
Collation of existing information on water quality and nutrient content of effluent streams (supplemented by collection and analysis of samples);
Design and implementation of treatment trials based on the initial review;
Identification of potential recycle/reuse applications of treated water within the industry (e.g. non-food contact applications like cleaning, washing, cooling, heating, steam etc.);
Assessment of residual water utilization (e.g. nutrient recovery, fit for purpose, farming, etc.).
The initial phase of the project included a survey of the AMPC membership which enabled data gathering on water use, recycling and disposal at red meat processing facilities. A total of 25 responses were received of which 23 contained useable data for the red-meat processing industry. Respondents ranged from the largest in Australia to small country abattoirs processing around 30 tonnes of hot standard carcase weight (HSCW) per month. There were thirteen beef-only plants, one sheep-only plant and nine multi-species plants. The average water usage for all respondents was 7.21 kL/tHSCW processed and ranged from 1.15 to 15.91 kL/tHSCW. The smaller plants used much less water per unit production than the larger plants because they did not carry out any further processing such as boning of carcasses or rendering of by-products. The average water usage for red meat plants producing greater than 1,500 tHSCW per month was 8.64 kL/tHSCW. This is a slight reduction on the figure of 9.4 kL/tHSCW obtained during the environmental sustainability survey of 14 sites done for AMPC and MLA in 2008-09.

All plants that responded to the survey reuse water for some purpose. For most, treated effluent was used for irrigation of pasture, farms or gardens on-site and off-site. In addition over 60% of respondents recycled water to replace potable water in a variety of uses such as yard and stock washing, initial tripe washing, cooling applications, boiler feedwater, etc. Only two plants recirculated water within the same process. These related to beef hot water decontamination

systems where the used water was treated and re-heated before being sprayed back on the beef sides.

The data gathered from the survey will be used to benchmark water recycling within the red meat processing sector for comparison with other sectors, such as dairy and horticulture, as well as to identify potential water recycling opportunities. Having collated, interpreted and analyzed the survey results, CSIRO are now planning a series of site visits to determine:

Process-related and technology-related opportunities for recycling water;
Priorities for processors for water recycling;
The site specific needs in relation to water recycling, and;
Trial sites for the next phase of the project.
Recent meetings have also been held between AMPC, CSIRO, the University of Queensland and a range of other R&D providers working with AMPC and the meat processing industry, to identify options for collaboration and share information on the progress of current projects. These meetings have assisted in identifying the options for commercial trials, which will likely build on other work underway with AMPC members that relates to water and energy efficiency through tripe waste water re-use, steam sterilization of chillers and viscera water recycling.

In addition, the industry project to establish “environmental benchmarks” or performance measures in relation to water, energy and other natural resource use is now underway. This project will review and collect new data since the previous examinations conducted in 2003 and 2008. This project will also provide indicative analysis of the future targets for the red meat processing industry so as to benchmark environmental measures.

Water for food and nutrition security in urban and peri-urban contexts:

Using water wisely to feed growing cities, Tunisia: North Africa contains 5 per cent of the world's population but only has 1 per cent of the world's available water resources. In Tunisia, water availability is as low as 350 m^3 per person per year, but rapid urbanization and climate change are placing further stress on water resources and food production. Use of treated wastewater for irrigation has helped to sustain agriculture in peri-urban areas, but severe government restrictions on wastewater use are constraining production.
With greenhouses, crops can be grown in the earth and suspended above ground (© M Bouraoui and B Houmane)

“With greenhouses, crops can be grown in the earth and suspended above ground”

In the town of Soukra, six kilometres from the capital city, Tunis, hundreds of low-income families live off the crops they grow. In recent years, however, rapid urbanisation has caused the city to expand, encroaching on farms, driving land speculation and threatening the livelihoods of Soukra's farmers. Since the 1990s, nearly 30 per cent of arable land has disappeared. Farmers are also facing significant water stress: climate change has altered rainfall patterns, causing more extreme droughts and floods and leading farmers to draw more water from wells. As a result, saltwater from a nearby lagoon has been seeping into the groundwater, leaving some fields waterlogged and others too salty to grow healthy crops.

With funding from Canada's International Development Research Centre (IDRC), the Tunisian NGO Club UNESCO/ALECSO pour le savoir et le développement durable (FTCUA Tunisie) set out to find comprehensive ways to mitigate the environmental threats farmers face, while helping them secure

and improve their livelihoods. "We spent a year with experts, researchers, regional and local NGOs and the municipality to understand the origin of these problems, the farmers' perspectives and their aspirations for the future," says Moez Bouraoui of FTCUA Tunisie and president of the Urban Agriculture Association of the Middle East and North Africa.

This led to the development of a plan that would address environmental threats to agriculture while improving farmers' incomes. The idea was to deploy new, environmentally-sustainable sources of water for irrigation to increase agricultural production, and create small businesses for the farmers who had largely been growing subsistence crops. "These farmers only have small plots ranging from 1,500 m² to one hectare," Bouraoui explains, "so we opted for greenhouses which help conserve water, protect crops from grazing animals and theft, and allow for more intensive farming. This much more intensive form of agriculture has vastly increased yields by allowing crops to be grown in the earth and suspended above ground".

Snails, which provide fertiliser, are farmed in containers (© M Bouraoui and B Houmane)

"Snails, which provide fertilizer, are farmed in containers"

Technicians then installed ground-level basins adjacent to farmers' land to store rainwater and deliver it to crops. This water is directed to the greenhouse crops using highly efficient micro-irrigation. "After a few months of experimentation and research, we installed rainwater collection systems on the greenhouses", Bouraoui adds. Gutters built into the greenhouses' support structure channel the rain into storage tanks, which can meet up to 60 per cent of its water needs. Wastewater - including water used for household bathing and cleaning - was also captured, filtered and used for irrigation. Following Tunisia's strict regulations on wastewater use, it is only used to grow flowers, which are a lucrative crop. To restore saline soil, fresh earth was added and olive trees planted which will tolerate a large range of soil conditions and can be irrigated with wastewater.

Greenhouses usually have to be moved every five years to avoid soil depletion, but this is impossible because of a lack of space. Farmers began to experiment with lucrative crops that could be grown in containers above the soil - such as strawberries and lettuces - to allow the ground to lie fallow. Snails, which provide fertilizer, are also farmed in containers. Farmers who once grew crops for subsistence are diversifying and cultivating more cash crops, including ten kinds of fruit and vegetables, which they sell in nearby markets. Greenhouses have also extended the growing season and increased incomes, as farmers can earn much more for produce such as tomatoes, when they are out of season. For example, one greenhouse produces six tonnes of tomatoes, worth around US$4,600. Farmers who were once amongst the poorest are enjoying better lives. One mother paid for her daughter's wedding, others have expanded their homes. One of the most tangible signs of success is that some farmers are reinvesting their profits into building more greenhouses.

In the town of Soukra, hundreds of low-income families live off the crops they grow (© M Bouraoui and B Houmane)

"In the town of Soukra, hundreds of low-income families live off the crops they grow"

The research team has worked closely with the city government to help it recognize the ecological and economic value of urban agriculture, and to include small-scale farming in land use planning. Bouraoui explains: "Together we thought about how to develop a structure that could unite the farmers that could defend their interests, and provide them with services to support the development and growth of their businesses. We put in place a cooperative which is gradually taking

over the research and gives farmers a stronger voice in local decision-making. In some ways, this is one of the greatest achievements of the project".

This model of urban agriculture and the technical innovations that have been produced are now being disseminated throughout Tunisia through mass media, journal articles, workshops and conferences. Through associations like the Arab Network for Urban Agriculture, the knowledge gained in Soukra is being shared with groups throughout the region. "The solutions pioneered in Soukra provide excellent examples for countries in the region coping with water scarcity and climate change", Bouraoui concludes.

Ensuring water security in urban areas through better understanding and management of the water, energy, food nexus (WEFN), China: China faces the challenge of developing resource efficient livable cities for a growing population and economy in areas of increasing water scarcity. Therefore new and innovative solutions need to be found in the design of urban water infrastructure and the institutional planning and management of water in the cities, associated industries and surrounding rural areas. This means integrating water and energy efficient solutions in the urban planning and design of new cities and in the re-development of existing cities.

The co-lead partnership on the water-energy-food nexus was initiated by Sweden and China through the Swedish Ministry of Environment, Ministry of Water Resources of China, Nanjing Hydraulic Research Institute (NHRI), Institute of Water Resources and Hydropower Research (IWHR), MWR Development Research Centre (DRC), Stockholm International Water Institute (SIWI) and Stockholm Environment Institute (SEI). A closely linked co-lead partnership on the water-energy nexus was initiated by the United Kingdom focused on ensuring water security by better managing the interactions between water and energy in the process of urban development and the energy resources that support that development. The co-lead projects bring together technical experts to work with policy makers and municipal governments to apply best international practice and innovation to practical problems and identify the areas, where European and Chinese enterprises can work together in a mutually beneficial manner.

The WEFN is an important component of the overall Urban Water Challenge, the WEFN projects will coordinate with Integrated Urban Water management projects and with the EU-China Urbanization Partnership for the development of resource efficient Low carbon Cities. Key activity areas with programs jointly developed by Chinese and European partners encompass:

Taihu Basin Region Urban Water Security Program,
Managing water risks in China's energy sector – especially the impact on water resources of Development of Shale Gas and Synthetic natural gas supplies,
Managing energy risks in China's Urban Water Sector – especially the influence of energy use of different source in planning the water resources development strategy for Qingdao, and
Sustainable and intensive agriculture for urban areas.
Participating organizations are:

Swedish Ministry of Environment,
UK Foreign Commonwealth Office,
Stockholm Environment Institute,
Stockholm International Water Institute,
Atkins International,
Stockholm Royal Institute of Technology (KTH),
Ministry of Water Resources,

P.R. China,
China CEWP Secretariat,
Nanjing Hydraulic Research Institute,
Institute of Water Resources and Hydropower Research (IWHR),
Development Research Centre (DRC) of the Ministry of Water Resources,
Tai Lake Basin Authority,
Applied Energy Innovation Center (AEI) in Ningbo,
ChangCE, and
World Resources Institute.
Water governance, policies and management systems capable of better integrating food security concerns while tackling trade-offs between water uses/users in an equitable, gender just and deliberative manner. We are particularly interested in examples that have enhanced social justice and also benefitted marginalised groups:

Policy Partnership on Food Security (PPFS), Hong Kong: Policy Partnership on Food Security (PPFS) will play a significant role in identifying the key challenges in improving food security in the APEC region, and in recommending appropriate policy initiatives going forward. The long term goal of the PPFS shall be the attainment of a food system structure by 2020 sufficient to provide lasting food security to APEC member economies. The PPFS should look to further define the elements of a food system structure as part of its objectives.
It is emphasized that, APEC's approach to food security must reflect member economies' commitment to facilitation of investment, trade and markets and sustainable development of the agricultural sector as outlined in the Niigata Declaration on Food Security. Each APEC member government may nominate private sector representatives to sit on the PPFS for an initial period of three years. ABAC may also nominate private sector representatives, who shall be endorsed by SOM in consultation with ABAC. Private sector participants may represent agrifood-related industry bodies, farmers' groups or individual companies and should strive to see that their views represent consensus within the industry.

The private sector representatives to the PPFS will nominate a principal advisor to serve as a vice chair along with the government representatives in the PPFS management council. The selection process for the principal advisor will be an open and transparent process, conducted by ABAC and approved by APEC Senior Officials. The APEC Business Advisory Council (ABAC) has been engaged in food security efforts since 1999 when APEC Leaders endorsed a plan for a unified APEC Food System.

In the year 2009, ABAC issued a strategic framework for food security which among its recommendations called for the establishment of an ongoing mechanism at a high level to ensure the policy and technical cooperation necessary to achieve an integrated food system. This mechanism should include direct input and participation from the private and research sectors, as well as the public sector in the form of a formal, institutionalized "Food Dialogue". This laid the foundation for the creation of a Policy Partnership on Food Security (PPFS) three years later.

In 2010, APEC Ministers Responsible for Food Security agreed to consult with relevant stakeholders and instructed Senior Officials to integrate ABAC into APEC's food security efforts in a more substantive manner. In the year 2011, APEC Senior Officials agreed to create a Policy Partnership on Food Security (PPFS).

In February 2012, PPFS was established, and the 1st PPFS Management Council Meeting was held in Moscow, Russia. The meeting was chaired by Mr. Sergey Aleksashenko from the Russian Federation. The three Vice-Chairs were Mr. Bradley Fenwick from USA, Dr. Haryono from Indonesia, and Mr. David Dodwell from ABAC (also the Executive Director of the HK-APEC Trade Policy Group). Government and private sector representatives from APEC member economies also attended the meeting. The blue print of the work of the PPFS were discussed and endorsed in APEC Senior Officials Meetings in May and the APEC Leaders' Meeting in September 2012. The ABAC played a lead role in championing for the establishment of PPFS. In the years ahead, ABAC members and the private sector will continue to engage in the work of PPFS towards the goals of food security in the APEC region.

Increasing irrigation water productivity in Mozambique, Tanzania and Zimbabwe through on-farm monitoring, adaptive management and Agricultural Innovation Platforms: This project aims to find means of meeting the African government's plans for greater food security while using limited water resources more sustainably. The project is funded with $3.3 million from the Australian Government via the Australian International Food Security Research Centre (AIFSRC) of the Australian Centre for International Agricultural Research (ACIAR), with additional contributions from participating organizations.

A trans-disciplinary team has been assembled to address the recalcitrant problems of poor yields, low profitability leading to under-investment in infrastructure, market failure and degradation and abandonment of irrigated lands. The project will be led in Australia by the UNESCO Chair in Water Economics and Transboundary Water Governance at The Australian National University, with contributions from CSIRO Land and Water and the University of South Australia. Partners in Africa include the Food and Natural Resources Policy Analysis Network (FANRPAN), International Centre for Crop Research in the Semi-Arid Tropics (ICRISAT), the University of Pretoria, Ardhi and Sokoine University of Agriculture in Tanzania, and the National Institute for Irrigation in Mozambique.

An estimated one in four people go hungry in Africa; it is the region with the largest proportion of people living in extreme poverty. At the same time the agricultural potential of Africa is considered enormous; in terms of uncultivated farming land, reserves of exploitable water and in the levels of productivity that can still be achieved. Irrigation is under-developed in sub-Saharan Africa, and could potentially make a significant impact on food security.

Irrigated onions, Igomelo Irrigation Area. Credit P. Ramshaw, ANU

"Irrigated onions, Igomelo Irrigation Area"

This project builds on a scoping study that reviewed the work of International Water Management Institute, International Food Policy Research Institute, World Bank, Challenge Program, Gates Foundation and others on how irrigation could contribute to food security in nine sub- Saharan African countries. This research (scoping study) into use of harvested rain (dams, rivers, aquifers) for sustainable food production aimed to understand how better water management can be achieved at the farm and community scale. The research examined what the farmers need in terms of technology and training, and how governance and learning systems can sustain productive use in a whole-of-catchment context.

The region seeks investment of 10% of national budgets to increase agricultural production at six times the current rate under the African Union's Comprehensive Africa Agricultural Development

Program initiative. The land and water resources for such expansion are theoretically available. Set against these agricultural expansion plans are:

a history of irrigation in the region failing to provide adequate return on investment,
weak market integration and weak water governance institutions, and
significant degradation and abandonment of irrigated land.
Furthermore, surface water is scarce and subject to competition in key river basins, such as the Limpopo and Rufiji. Despite these drawbacks, irrigation expansion will take place, and so research is needed to increase water productivity, the economic value per volume of water consumed. It is also needed to mitigate environmental degradation in current and new irrigated lands.

There are no “silver bullet” interventions to improve water productivity in Africa. The irrigation ‘problem’ is systemic in that there is failure at several levels including technical capacity, institutional arrangements and market linkages. These hurdles include the need:

to develop water resources within the sustainable limits of the catchment / aquifer,
to schedule water and nutrients to enable high crop yields,
for farmers to actively participate in the value chain to ensure there is sufficient profit for investing in operation & maintenance costs and purchasing inputs, and
for farmers to participate in governance arrangements that ensure efficient and equitable distribution of water.
In response to such complex problems, an FAO (2012) report calls for the introduction of adaptive management approaches that will lead to social and institutional learning. This project seeks to implement such a program by deploying on-farm monitoring of water applied, soil water, nitrate, salt and groundwater depth and using this as a basis for identifying options for improving water productivity. At the same time the project will use existing farmer organisations as a basis for establishing agricultural innovation platforms which comprise farmers, political representatives and players across the market value chain in order to identify obstacles and stimulate opportunities for change. The platforms will consider water productivity as well as other constraints to irrigated agricultural productivity. The objectives are to:

develop, test and deploy innovative water and solute monitoring systems to stimulate farmer learning toward greater water productivity.
evaluate whether agricultural innovation platforms, based on existing community organizations can identify and overcome institutional and market barriers to greater water productivity.
identify and communicate economic and policy incentive mechanisms for greater water productivity.
Project leader Jamie Pittock standing next to the Madibira Irrigation Scheme. Credit P. Ramshaw, ANU

“Project leader Jamie Pittock standing next to the Madibira Irrigation Scheme”

The project is expected to work directly with approximately 5,000 smallholder irrigator households in six or more irrigation areas in Tanzania, Mozambique and Zimbabwe. The research will model the adaptive learning and innovation platform approach with government and non-government organisations so that they may scale up application to benefit hundreds of thousands of smallholder irrigator households in the region. The project intends to influence national and multi-lateral policies for water, agriculture and food security by providing evidence to enhance sustainability components concerning water and small holder-irrigation.

The project started in July 2013. In August, representatives from all partner organizations attended an inception workshop held in Maputo, Mozambique. The project will conclude in 2017.

We welcome also examples on how the role of water for food security and nutrition is accounted for in land governance and management and land-use, including links between land tenure and water rights:

Implementing water reform in Queensland, Australia: Australia implemented a series of reforms to the water sector in the State of Queensland, including the use of a 'whole of river basin' strategic plan approach within which local resource operation plans are prepared and implemented. The key lesson learnt is that an incremental approach, with water planning developing in "bite-sized chunks" allowed government to be flexible in response to changing circumstances.
A series of legislative and policy developments to reform the water sector in the State of Queensland, Australia were put in place over 1999-01 (and ongoing), following Commonwealth (national) government water reform initiatives in 1996. The measures include:

Use of consultation across the stakeholder spectrum from high level of government through to farmers to help develop plans
Preparation of draft policy papers then Bills used to drive process
Preparation of supporting legislation for regulation of service providers, reform of water authorities; introduction of third party enforcement for offences, compliance notices, increased penalties;
Introduction of legislation to enshrine environmental flow requirements in the Development of Water (Allocation and Management) Bill
Use of a 'whole of river basin' strategic plan approach within which local resource operation plans are prepared and implemented
Integration of the reforms with the local planning processes of Queensland
The case illustrates how environmental flow requirements for rivers can be built into a planning process: includes assessment scenarios to demonstrate what makes a river 'healthy'. It also demonstrates how river basin scale water planning can be developed incrementally by engaging end-users, and how it can be linked to local government planning initiatives. It is applicable to many other GWP regions which sub-humid/sub-tropical environments and which are struggling with water reform. Lessons learned are:

An incremental approach, with water planning developing in "bite-sized chunks" allowed government to be flexible in response to changing circumstances.
However, the process would have been streamlined action had been taken earlier to separate regulatory functions from supply or service provision roles
Furthermore, a clearer definition of roles and responsibilities should have done earlier
In water allocation to local governments (and, presumably, to other users), the government should not mandate how the allocated water is to be used. Instead, it should limit itself to the allocation, and allow the local governments to specify how the allocated water is to be used.
Albania Natural Resources Development Project: Forests cover more than 50 percent of Albania's surface area. Agriculture and forestry have been two important sectors for the development of the rural areas and the national state economy. The post-communist transition period in Albania was characterized by massive internal and external migration of population, weak enforcement of laws and regulations, and overuse of natural resources all of which resulted in the considerable degradation of forests and pastures and erosion of soil. In response, the World Bank and the Swedish Government are supporting participatory forest and pasture management planning and investment in 240 Local Government Units (LGUs) through the National Resource Development Project (NRDP) to restore the forests and land of Albania.

In terms of challenges, after about two decades of transition, illegal logging, overgrazing of forests and pasture lands, and continuous degradation, the Albanians living in rural areas started to become conscious of the damaging effects these practices were having on the environment. To address this, residents organized community-based organizations with their main goals of protecting and rationally using their resources. Farmers, as part of forest and pasture users' associations, pressured the Government to transfer the rights of use and ownership of both forest and pasture lands to them.

In terms of approach, In June 2008, the Government of Albania formalized the land rights transfer to 345 LGUs, as a concluding response to a former pilot process in 1998. The pilot, which was part of the Albanian Forestry Project financed by the World Bank, gave rights to 30 LGUs. Following the Government's decision, an additional 315 LGUs benefited from the agreement. As of now, 60 percent of forests and pasture lands have been transferred from state to communal ownership, resources which are used by almost one million people.

In terms of results, the Project totaling US$19.4 million, including an IDA credit of US$7 million, US$5 million from the Global Environmental Facility (GEF), and co-financing of US$5.2 million from the Swedish Government, aims at establishing or maintaining sustainable, community-based natural resource management in about 240 communities in upland and mountainous erosion-prone lands across the country. This, in turn, is leading to increased productivity and incomes for the rural families as a result of their involvement in the management of forest and pastures, including:

25 percent increase in income earned from forest activities in communal forest and pasture lands;
50 percent increase in income earned from forest and agriculture activities in micro-catchment;, and
employment of about 6,000 workers, including 1,900 women and 1,900 beneficiary families, since the project's start-up.
The transfer of land ownership and user rights to the people has created incentive to manage and protect these resources, which have led to:

400,000 tons of erosion reduced;
improved water management, and conservation of biodiversity, and
forest protection, which is contributing to less sedimentation in the irrigation channels and hydropower dams.
Besides forestry, watershed, and agriculture, the project is also supporting carbon sequestration measures in degraded lands through simple protection measures such as fencing, control of animal grazing, and afforestation in very nude areas. Albania is one of the first countries to sequester carbon on eroded land. The Biocarbon Fund of the World Bank has reached an agreement with the Government to purchase emission reductions received from these carbon sequestration activities. The country will sell emissions reductions worth an estimated US$11 million to the World Bank's Biocarbon Fund.

According to Drita Dade, WB Project Team Task Leader, "Given its large areas of abandoned and highly eroded lands, Albania had great potential for carbon sequestration. This would attract the attention of other investors to help Albania afforest its degraded lands, while at the same time be able to sequester some carbon, bringing direct benefits to the communities that are part of this scheme as well as to the globe". According to a farmer from Gjalish, Uleza Commune, Mat, "You have to have been here 10 years ago to see – no vegetation but much degraded lands and overgrazed forests. Through some interventions under the World Bank Project we made a huge service to the forest. We cleaned and thinned it to allow good woods to grow better and to open space for the

wildlife to come back in our forests. We stopped goats and animals from grazing for the first three years. What we see here now shows that with proper management we can have good quality of timber, and animals and other plants are coming back". In terms of future course of action, more sustainable, community-based natural resource management in Albania will lead to enhanced productivity, incomes, and, overall, improvements in land and water resources for the public sector.

Brief Bio of Contributor (Dr. Santosh Kumar Mishra)

Dr Santosh Kumar Mishra is researcher & demographer employed with the S. N. D. T. Women's University (SNDTWU, http://sndt.ac.in/) located at Mumbai in India. He underwent training in demography from the IIPS, Mumbai, India. (http://www.iipsindia.org/). He acquired Ph. D. in 1999. He is Reviewer/Editorial Board Member for 31 international journals. He has also reviewed papers for 5 international conference sessions, including EURAM 2014 Conference (4-7 June 2014, University of Valencia, Spain, http://site.aace.org). His subject areas of interest include: population & development education, issues pertaining to population-development linkages, education for sustainable development, adult & continuing education/non-formal/extension education, etc.

Dr. Mishra has (a) co-authored 5 research studies (published by the SNDTWU); (b) presented 32 papers for national conferences & 11 papers for international conferences, & (c) authored/co-authored 5 handbooks/booklets (published by the SNDTWU, 5 books, & 11 book chapters. In addition, he has 30 articles published in national journals and 18 in international journals. Dr. was previously awarded Government of India fellowship at the IIPS (1986-1987) and travel scholarship for sharing his research views at international conferences and summits held at Karachi (Pakistan), Dare es Salaam (Tanzania), Stockholm (Sweden), Madison (USA), Dushanbe (Tajikistan), Canberra (Australia), and Manila (Philippines). He is Advisory Board Member of the American Academic & Scholarly Research Center (http://aasrc.org/?page_id=38) and Reviewer–cum–International Advisory Board Member for the AASRC 2013 International Conference – Beirut, Lebanon (http://aasrc.org/conference/? page_id=803). He was invited as Guest Speaker at the Pakistan's 11th International Convention on Quality Improvement-ICQU, 2007 (organized by PIQC Institute of Quality Improvement, Lahore), Karachi, Pakistan, November 26-27, 2007.

22. Raziq Kakar, SAVES, Pakistan

The native/indigenous livestock breeds for food and agriculture are highly adapted to the ecosystems where water is one of the main limiting factor. Such breeds are highly adated to the harsh and hostile environments of such ecosystems and ensure food security in turn of very low in put. Camel is one of the best example in this regard. Camel produce health promising milk in conditions where she take an amount of 2-3 liter of water for production of 1 liter milk where the ambient heat is 40 + Celcius. In the same condition high yielding exotic cow needs 10-20 liter of water for 1 kg milk production.

I think one of the best option to ensure food production undre scarce water conditions is the promotion and conservation of the native livestock breeds. The keepers of such breeds are always neglected while formulating policies regarding their breeding pattern and production systems. Such policies are always a failure story. I strongly support the involvement of the small scaled livestock keepers in the policies fabrication regarding food security and sustainable production systems.

My best regards

23. Emad Mahgoub, Sudan

With 15 international river basins, southern Africa relies on water as a driver of economic growth and social development. Climate change is expected to increase water variability and lead to more frequent and intense floods and droughts while regional constraints imposed by the management of Tran boundary.

Waters make the water landscape more complex. The World Bank is scaling up support to water resources management in the region to provide a platform for broad-based economic development.

Water supply for growth centers and the institutional and infrastructure capacity to build resilience to climate change. To strengthen the quality and impact of projects, and leverage investment and policy dialogue the World Bank, through the WPP, brings innovation in water resources management.

The Water Partnership Program (WPP) supports a coordinated approach to this regional challenge. WPP-funded study found that nearly €1.8 billion in investments to curb pollution is needed to comply with EU standards. The study also identified six pollution hotspots in the eastern Adriatic that will require around €400 million in priority investments. These investments, aimed at addressing the sea's major economic, environmental and coastal management challenges, are now being planned through the Adriatic Sea Environment Program (ASEP), to be funded by several regional stakeholders.

24. Abdul Razak, Ayazi Afghanistan Embassy, Italy

Informal Comments on “Water and Food Security” (HLPE Study V0 Draft)

(by Abdul Razak Ayazi, Agriculture Attaché, Afghanistan Embassy, Rome)

General Comments on the HLPE Study

1. It is a well prepared study based on the thorough review of available literature on water resources, their management and their governance. One may say that it is an inventory of the knowledge at hand which is true. However, it is a thoughtful and analytical assessment of the inventory. In view of the importance of the topic, the length of the study is not excessive, despite some repetitions here and there.

2. The structure of the document is fairly balanced, though some sub-sections can be beefed up as I shall mention later. That said, the separation of water management (Part 2) from issues of water governance (Part 3) is a wise approach. It fits the water problems currently facing the people in all parts of the world. It is becoming increasingly clear that water governance at national and sub-regional level is most critical for all countries and especially for countries and regions facing severe water scarcity.

3. The study presents sound and clear recommendations each covering a specific feature of water management and/or governance. The division of the recommendations by 12 key areas provides a better focus. However, the 70 Actions under the 12 Recommendations may benefit from consolidation leading to some reduction.

4. The content of the 23 boxes has enriched the substance of the HLPE report, though it has added to its length.

5. The presentation of a better matrix of global water resources would have been useful. This could have been done by the inclusion of a table to show how the annual precipitation of 400,000 Km3 on our earth is distributed i.e. amount falling on land surface, amount evapotranspired, amount flowing into the sea, amount going under the ground and amount forming surface water. It is only 40,000 Km3 of fresh water, 10% of all precipitation, which is available to meet the needs of human beings, animals and plants. This figure is finite and the projected 9 billion population of 2050 has to rely on this finite quantity of fresh water. The matrix could also have shown how this available 40,000 Km3 is distributed by regions and sub-regions within the region.

6. Figure 1 on page 11, though not very neat, does illustrate how the availability, access, stability and utilization of freshwater are interrelated. For planning purposes this interrelationship is essentials but unfortunately often overlooked at the national level.

7. Table 4 on page 38 which shows water productivity for different food products is useful. Perhaps non-food crops should have been added. By the way the values could change if the water required is provided through irrigation only.

8. Policy implications for water management (pages 48-49) presents some valuable and decisive points based on the information and analysis presented in Part 2 (Improved Water Management for Improved FSN). Readers should appreciate the policy implications.

9. Part 3 (Governing Water for FSN) : This part is well structured and each sub-section is well articulated. It hits the basic features of water governance, the complexities facing its installation and conflicts among users. The journey from equity and universality (the so-called New Delhi Statement) to declaring water as an economic good (the so-called Dublin Statement) is convincingly presented. Sub-section 3.4 presenting the national experience of water governance in 5 developing countries (Bangladesh, Bolivia, China, Jordan and Tanzania) is useful. Sub-section 3.5 is also a good synthesis of the global water governance regime. Far too many actors are involved in water governance. The UN Water alone consists of 30 UN Organizations and 25 other international partners. The field is crowded.

Some Specific Comments

Sub-section 1.1.2 (pages 13-14): is well done as the quality of drinking water has a direct effect on human health and this is more so in the treatment of waste water for household use which is rising globally.

Section 1.2 (page 14) : It needs to be beefed up to show water resource distribution by water basins, and by regions and sub-regions. In addition, it would be useful to have a special section on regions where water resources are extremely limited and are the source of major concern not only for food security but for providing safe drinking water. This is particularly the case of the 29 countries of the Near East, Central Asia and North Africa (13 countries of West Asia, 6 in Central Asia and 10 in North Africa). These 29 countries have 7.6 % of the world population but only 1.9 % of the world's renewable freshwater resources. On the other hand, these countries account for 12% of the world's annual freshwater withdrawal of 3.9 trillion cubic meters.

Part 2 (Improved Water Management for Improved FSN) : This part is adequate in coverage and depth. While the sub-section on Groundwater for Irrigation is well presented mention could have been made to situation where aquifers are mined with no consideration for future generations. In this respect, it may be useful to show by sub-regions where groundwater resources are over-exploited and where less exploited and regions where groundwater resources are not exploited. A small sub-section comparing the cost-benefit of irrigation by groundwater versus surface water irrigation would have been helpful.

Sub-section 2.2: It could be shortened by eliminating tables 2 and 3 because lines 33-51 on page 33 makes it clear that the data on the use of water in food processing is incomplete and in any case low in terms of volume. In line 37-38, it cannot be true that in 2005 the amount of water for industrial use in the USA was 70 cubic meters per day (may be it is 70,000 cubic meters?).

In 2.3.1 on page 35: The point could have been made that the cost of recycling water is fairly high due to rising energy cost.

2.3.2 : Because of the importance of desalination in some parts of the world, it would have been useful to beef up this sub-section. In the Arab countries, especially the Gulf countries, desalinated water is on the rise. At present 55% of water supplied to the cities in the Gulf countries is desalinated water. It is projected that by 2025 the desalinated capacity will reach 83 million cubic meters per day. Although the running cost per cubic meter of desalinated water has declined considerable, the cost of installation per cubic meter still remains high.

2.4.2 : The upgrading of rainfed agriculture (pages 39-42) is well covered.

2.4.3 : The sub-section on investing in irrigation could have demonstrated how costly on-farm modern irrigation is, especially for smallholders and also the enormous investment required in developing large irrigation structure which IFIs no longer wish to entertain. On irrigation efficiency the report hits it right. Measurement of irrigation efficiency should include both original water application plus recycling and the experience of Egypt is a good one. In South Asia not much reuse is made of irrigation water due to lack of drainage and hence water logging.

Part 3 (Governing water for FSN) : It may be advisable to bring sub-section 3.6 (The right to water and the right to food) forward because it is the starting point for water governance and water management. Box 21 could be included in it.

3.2.3 : On water user associations, it may be advisable to include a box on one of the several successful cases in Asia, e.g. Indonesian water Supply Association and Philippine Association of Water Districts or some other successful water user association in the Asian continent.

One issue that does not come out of the study is shared water, not only surface water but also groundwater. There is adequate knowledge on shared surface water but not enough knowledge on shared groundwater. This knowledge is important because globally groundwater accounts for 43% of the total consumptive use of irrigation water and irrigates some 113 million hectares, with India, China and USA at the top of the list.

Recommendations: The twelve recommendations is a good and balanced set. All the 12 Recommendations are useful and indeed pertinent. Their rationale is embedded in the analysis presented in Parts 2 and Part 3 of the study.

That said, one sees that the number of Actions proposed for the implementation of the 12 Recommendations amount to 70 Actions. The range varies from 3 to 9 Actions per recommendation. One wonders if there is room for reduction in the number of the Actions. Also there are some 32 Actions which are of a joint nature by States, Donors, UN Organizations and NGOs. One wonders if this a clean way of delegating responsibilities for different Actions and actors.

Actions by the private sector is mentioned only three times. One action relate to Recommendation 5 (Addressing Changing Diets) and two Actions relate to Recommendation 10 (Water Governance). Actions by private sector could equally relate to some of the other 10 recommendations, especially recommendation 2 (Access to sufficient and safe water by poor women and men needs to move up to the top of political agendas for long-term FSN) and Recommendation 4 (Sustainable use of groundwater).

The 12 Actions by CFS relate to seven Recommendations (Recommendations 1, 6. 8, 9.10, 11 and 12). With respect to monitoring CFS also has a role in the remaining 5 Recommendations.

With respect to Recommendation 1 (water and sanitation nexux), it is advisable to link it to Goal 6 of the Post-2015 Development Agenda (Ensure availability and sustainable management of water and sanitation for all) and its 8 targets.

25. Jon Vandenheuvel, Africa Atlantic Holdings Ltd, Ghana

Thank you for the opportunity to comment on the V0 draft study Water and Food Security. I own a farming operation in Ghana, on the shores of Lake Volta, so I've had the opportunity to consider the role of water as it relates to food production, efficiency, and the sustainability of our investment in Ghana, and its impact on our Ghanaian farmer friends and neighbors.

The draft report is excellent, but here are some ideas that may be useful to consider as the committee seeks to examine the full extent to which water can optimize food security. My comments relate to Africa, so this is a limiting factor, but perhaps these themes could be relevant in other food insecure regions.

1. Access to water increases land productivity; makes African farm enterprises more bankable; reduces risk of crop loss; and increases land real estate value.

Access to water unlocks value in four ways:

(1) increases the productivity of the land (this addressed in the study relating to irrigation);

(2) increases a farmer's access to seasonal and operational finance (this is not addressed in the study);

(3) reduces the risk of crop failure/loss due to drought, thus making crop insurance more economically feasible (this is not addressed in the study); and

(4) helps poor African farmers build tangible assets (with proper land title) that can appreciate in value and can be sold/transferred to create wealth for African farm enterprises (this is not addressed

in the study). (e.g. un-irrigated, untitled land is worth less than $100 per hectare; irrigated, titled land is worth $10,000+ per hectare)

2. Access to bulk and cold chain transport by water will save money and reduce post-harvest loss.

Think about the Mississippi River (and other waterways) transport systems impact on U.S. agriculture industry: billions per year in cost savings vs. ground transport. Bulk and cold chain transportation by water costs a fraction (per km, per kg) of road transport and should be included as an important "food security" variable.

Improved water transport will unlock value in four ways:

(1) will reduce COGS (cost of goods sold); (this is not addressed in the study),

(2) will reduce post-harvest losses (this is not addressed in the study);

(3) will reduce the cost of food for consumers (this is not addressed in the study); and

(4) will increase farmer incomes (this is not addressed in the study).

Summary Comments

Again, the study is excellent as far as it goes. But it leaves billions of dollars off the table of value for food security related to leveraging water resources. The increase in productivity is covered very well, as is water quality; but farm enterprise bankability, crop insurability, and land value appreciation etc is what will unlock commercial-grade investment, which is absolutely required for sustainability in African food production. And water transport efficiency will provide a dramatic increases in direct and indirect cost savings, passed on to farmers and consumers alike, in the form of more affordable food, less reliance on imports, etc.

These items - billions of dollars of value to farmers and ultimately African consumers, offered by improved water policies, land values, improved crop banking and insurance risk profiles, infrastructure, systems - are unaccounted for in this draft study.

I would be happy to pursue these themes in more depth with the HLPE, if interested.

Best,

Jon

Jon Vandenheuvel
CEO
Africa Atlantic Holdings Ltd
www.AfricaAtlantic.com

26. Vincenzo Lo Scalzo, AgoraAmbrosiana, Italy

WATER SECURITY

A - Comparative water performance (productivity and resilience)
B - Water use in food processing
C - Water for food and nutrition security in urban and peri-urban contexts
D - Water governance, policies and management
E - Role of water for food security and nutrition

WATER is " a resource under increasing stresses…"

Preliminary statements at INTRODUCTION:

Water performance , comparative or other, is worthy of an effort of definition. While productivity is a common shared defined, resilience is not. Per se the definition stated in Wikipedia (In ecology, resilience is the capacity of an ecosystem to respond to a perturbation or disturbance by resisting damage and recovering quickly) is not a direct quality aspect of water, but water in fact takes part active or passive to a varied number of ecological events and aspects.
The term resilience is tipical of science's properties of materials, where a resilient materiali is nearer to a tough material and the definition of resilience is much an effect of intimate energy and resistance of a material based on molecular structure and its potential to resist to external stresses.
Without entering the debate, the interpretation appears to cause most common doubts of understanding the useful use of the term.

AgoraAmbrosiana suggest a revision of use of the term "resilience" and "resilient" in reference to the word "water", that should also make a difference in its "molecular state" (altready providing a complex material per se, with effects of states, aggregation and resistance to disturbances not only determined by pressure and temperature, also derived by micro.impurity determine by other materials in contact, from air – to any other surface.

Please take care of use of: "Increasing pollution in many parts of the world from both agriculture and industry are rendering water unfit for use and impacting on human and ecosystem health." The diffused "Unsustainable resource management is reducing ecosystem functions and services", but new important examples of complete recovery of edible water have been gained in small quantities at use of Astronauts in ISS orbit and in large industrialized processes by NESTLE and by the facilities operating in Milano at the "DEPURATORE of NOSEDO", providing a final top quality standard for SPACE USE.

NO REFERENCE IS CONTAINED IN THE DOCUMENT - SAVE ONE BIBLIOGRAPHIC CITATION - FOR NESTLE (The case of Nestlé, Bunge and Cargill. Water Alternatives 5(3): 619-
47 635) none for SATELLITE observations, nor SPACE or ASTRO or ISS (international spatial station).

AgoraAmbrosiana draft issue of a plan of debate theme contains references updated up to 2012 while the results cited above are derived from information obtained months ago from NESTLE and from the top management of DEPURATORE DI NOSEDO. Both provided relevant information… with poor "echo" in the mass media.

The chapter of interest of the PRESENT DRAFT VO (in addition to INTRODUCTION) is like to be chapter "2.3 Water re-use - 2.3.1 Dealing with wastewater and marginal quality water – Urban agriculture – 2.3.2 Dealing with Desalination COULD be updated with ongoing projects and applications which are operating in the Arabian Gulf.

Chapter 1.3.4 Water and energy linkages provides a short info on the new important and popular source of energy as is “shale gas and oil” which interfere largely with water contamination and recovery processes, while on the site of energy sources no mention is made to tidal energy, sea wave energy that are at the industrialization phase in many spots of the Globe.
Similar inclusion of future availability of innovative resources and usages shall be discussed and debated as it is during the last five years in US, where a large open debate is ongoing in reference to the large industrial exploitations of shale gas and the definition of the law and regulations. The approach is made STATE BY STATE with non uniform trend statements.

3.1 Local water governance regimes: accessing water for FSN should take in a proper focus the subsequent points of 3.1.1 Multiple ways to allocate and access water, as each exploitation is open to family exploitation of shale gas or oil well or of wide grids of fields for industrial operation. The state of the debates and regulations at work in a continuous challenge versus other socio political pressures. Europe is far back on this theme and at present Poland appears as the most advanced among the European states.

Similar issues shall become valid also for 3.2 Water reform processes (3.2.1 From New Delhi to Dublin, 3.2.2 Water reform processes and Integrated Water Resources Management (IWRM).
The present state of the draft VO is hereafter quoted and could be given more emphasis as future tag of more specific rules and definition of impact to the resource of water/energy needs which must adapt to local territories situation.

“Moreover the increasing use of the drilling practice of hydraulic fracturing, or "fracking," as it is more commonly known, raises concerns on its impact on water resources. Most studies of the impacts of fracking on water have focused on water quality, but some studies have also looked that impacts on water quantity and competition for use with other sectors, including the agricultural sector. There has been little quantification of the actual water use because requirements are dependent on the nature of the shale, well depth, the number of fracking stages and the length of the lateral pipes underground (Nicot & Scanlon 2012). Frac sand mining— an off shoot of hydrofracking industry—is a related sector whose impact of food systems is yet to be assessed as well.”

My limited appreciation of the new scenario is edited in two articles in Italian in PLAST, ex Reed Business Information Italy magazine (now acquired by EDB Italia, who continue the editions) under my authorship.

The regularly ongoing of special contribution provided by NESTLE to water experts and organizations is daily part of the accessible documents at the corporation home sub title “Creating share values”.

- What is CSV?
- Nutrition
- Rural development and responsible sourcing
- Water
    - Water efficiency
    - Water policies and stewardship
    - Water treatment

  - Supplier engagement
  - Access and conservation
  - Water challenge blog
- About this blog
- House rules
- Archive

Water Challenge - a blog by Peter Brabeck-Letmathe – ex CEO of Nestle

From http://www.water-challenge.com/post/2014/10/21/A-water-secure-world-for-everyone-a-shared-responsibility.aspx

17 October 2014 - by Peter Brabeck-Letmathe

Creating Shared Value (CSV) begins with the understanding that for our business and our shareholders to prosper over the long term, the communities we serve must also prosper, through actions that substantially address a social or environmental challenge. At Nestlé, we focus on three areas - rural development, nutrition and last but not least, water. In all three areas our efforts are about concrete initiatives on our own and in partnerships, but obviously, public policy dialogue is also an essential part of the concept.

On an annual basis we invite stakeholders to stimulate thinking around how business can deliver on this concept of CSV. The last meeting of this series on 9 October 2014 was co-organised by Nestlé and the United Nations Conference on Trade and Development (UNCTAD).
I took part in the water session; below is the transcript of some of my remarks pointing to the urgency of this problem. If you would like to watch the full session it is available here.

On 9 October 2014, the President of the Swiss Confederation, Mr. Didier Burkhalter joined the Creating Shared Value Forum 2014 organised by Nestlé and UNCTAD to deliver the closing address. With his permission, I post his important speech (also on YouTube, starting after 1 hour 09' 40''), as usual with an invitation to comment.

12 September 2014 - by Peter Brabeck-Letmathe

- Tags: water, water pricing

4,500 years of sustainable water management in Oman – can we learn from it?
We risk running out of water long before we run out of oil.
But the crisis can still be avoided. For this, water management and potential shortages must be looked at locally first - global averages are not relevant.
Given the nature of the problem, solutions to the water challenge are not possible company-by-company, along supply chains or linked to products (so-called "footprints"). The approach has to be watershed-based, comprehensive, fact-based and cost effective, rather than one based on ideas on one-fits-all global solutions. In the end - water is local.

Water management – part two: on different users and overuse of freshwater

26 August 2014 - by Peter Brabeck-Letmathe

In my first part I outlined some basic principles for access to water for basic needs in families and water as a human right. Let me now broaden the perspective by looking at other water users and drivers of their demand, and look into the issue of widespread and increasing overdraft of freshwater. When talking about water management, tap water often comes to mind first. But the water used in households represents only a small percentage of total freshwater withdrawals for human use, some 10-15%.

Water is also withdrawn by and for industry, and we need rapidly increasing amounts of water for energy generation.
One of the big misunderstandings here is often about water for bottled water – usually when people criticise this form of water use, they talk about the litres withdrawn. But the relevant measure in the global picture is cubic kilometres, and actually total water withdrawn by Nestlé to be filled in bottles is less than 0.0009% of total global water withdrawals for human use. And when it comes to efficiency: if you agree that the most important use of water is for human hydration, bottles are the most (water-)efficient way to bring it to the people who need it (compared, e.g., to leakage losses in pipes of up to 70%).
Most water that goes to industry is for energy generation. This is less about hydropower; here water is just temporarily deviated to go through a turbine. Much more relevant is the water for cooling all kinds of thermal power plants (the water evaporates and is no longer available in the original watershed). In 2010, already some 200 litres of freshwater per capita of world population and per day were used for the generation of thermal energy; by 2050, we estimate that it will be more than 800 litres. Water is also needed to operate solar cells and increasing amounts of water are being withdrawn to extract fossil fuels (petrol from oil sandsand shale gas).

Even more freshwater is withdrawn for agriculture. On a global average, farmers withdraw about one litre per calorie grown.
Increases in freshwater withdrawals for agriculture in the coming years are driven by population growth (about 1% p.a.) and the increase in prosperity. Especially in developing countries higher incomes mean more meat on the table; they are no longer satisfied with eating one or two bowls of rice per day; they also want some chicken or beef to accompany it. The higher the meat content in the daily diet of consumers, the higher the water needs per calorie. People in California, for instance, “eat” an average of 6000 litres of freshwater per day.

Californian breakfast
It’s true that meat consumption in the developing and emerging countries is still very far from Western averages, even farther from sometimes absurdly high daily meat intakes in some specific industrialised countries. It is also true that increases in meat consumption per capita per day in developing countries remain very modest – at present it is only an some 1.5-2 grams annually. But multiplied with the very large number of people in developing countries even small per-capita increases have a significant impact on global meat consumption, and, hence, water withdrawals in agriculture.

As a result of these uses growing with global population and prosperity, water withdrawals exceed sustainable supply (natural renewal minus environmental flows) by more than 10% today. In the 2030 Water Resources Group (WRG) we defined sustainable supply as natural renewal minus environmental flows. And as water is local, it is only counted as available if at the disposal for human use in the right form, at the right time, in the right place. Excess fresh water here in Switzerland does not help when there is lack of water in Sahel.

The Aral Sea dried up due to excessive use of water of its affluents for irrigation, and falling water tables of underground aquifers are testimony.

If we continue, without any policy and usage changes, the gap in freshwater availability for all uses will widen dramatically, leading to massive risks for global food security.

The initiative of the Corporation looks to me as serious contribution of a global eye opened on the issue. The basic contribution was given by a consortium of companies providing regular reports reports. Refere to : http://www.nestle.com/csv/downloads.

From October 22, 2014 press release by Nestle:

Reusing water
The Cero Agua dairy factory takes fresh cow's milk, normally around 88% water, and heats it at low pressure to remove some of its water content. The resulting steam is then condensed and treated and used to clean the evaporating machines themselves. Once the machines have been flushed out, the water is then collected once more, purified and recycled a second time. The water can then be reused for watering gardens or cleaning.

Reusing water from the milk in this way removes the need to extract groundwater for operations.
The amount of groundwater that the Cero Agua dairy saves each day, around 1.6 million litres, will amount to roughly 15% of the total water used by Nestlé in Mexico each year in its factories, operations and offices.

Cutting Nestlé water use
Such water savings are part of Nestlé efforts to promote the "conservation, treatment, recycling and water efficiency in our operations and among farmers, suppliers and other partners in our supply chain," said Marcelo Melchior, who heads Nestlé Mexico. The Cero Agua project is just one of a number of water-saving initiatives the company has introduced at its factories around the world in recent years. These have allowed Nestlé to reduce total water withdrawal in absolute terms by almost one-third globally over the past 10 years, while increasing production; water use per tonne of product has fallen by half.

Worldwide, Nestlé aims to further reduce its water withdrawal per tonne of product by 40% by 2015, compared to 2005. In 2013, Nestlé published its Commitments on Water Stewardship, highlighting the importance of water access and conservation.
These W.A.T.E.R. commitments are to:

- Work to achieve water efficiency across our operations
- Advocate for effective water policies and stewardship
- Treat effectively the water we discharge
- Engage with suppliers, especially those in agriculture
- Raise awareness of water access and conservation

A chapter of AA Final text-3 Cibo e Sicurezza 2011 - English edition - Draft 3 – JUNE 2013

REFERENCE
8 - Schematic plan debate: 1.1.2 - Under Theme target – FOOD - TERRITORY - RESOURCES – Database: Statistics and background information updated

TASK 4 - MARINE RESOURCES AND AQUACULTURE – Database: To be developed for establishment of database similar to that for CROP Agricultural.

The CO2 emissions show also influence the impact on ocean flora and fauna. From Le Figaro: “acidification des mers menace coraux et coquillages”. An example of research is ongoing around the island of Ischia. The Italian island offers an exceptional ground for scientific investigation of the topic. The quality of water prefigures the expected results of 30 - 40 years in the ocean: a reduction of biodiversity by about a third, without coral and shells. The project is called Epoca (European Project on Ocean Acidification). Marine flora. And it is wellknown in the laboratory on the attack of shells for effect of CO2 that turns into calcium carbonate, in addition to the effect on plankton (microscopic, the base of the food chain) and on the coral.

On the ground of the complexity of the phenomenon is magnified. The backdrop of the island is rich in CO2 emissions from the fault that allow you to find the conditions under which it is assumed will reach the bottom of the ocean with the progression of the concentration CO2 into the atmosphere in the long term. At 200 m are measured 800 ppm CO2, halfway concentration expected for the 2100. The decrease of biodiversity is nearly up to 30%. As a counterpart proliferate other forms of flora: poseidonia, suitable for feeding to animals and herbivorous marine alga from
hatchery for other species. Acidification could instead bring benefit to other invasive algae, which are kept under control, but that appear in steady growth in the Mediterranean.
Similar searches are also taking place in the Arctic Ocean. The change of acidity of the seas today seems to be the fastest to 2050 that 55 million life on the planet.

The five ages of extinction that have happened in the world have coincided with

- acidification of the oceans,
- heating of waters,
- depletion rate of oxygen (hypoxia):

the results quantify a loss of 50% of marine life in about 55 thousand years. The symptoms are similar to those apparent today and that man is able to reliably detect. And it is worrying admit that the fish are decreasing their long life cycle (tuna) and instead is increasing the presence of jellyfish who is credited with the destruction of entire ecosystems. Evidence arises that the countermeasures taken to this effect are judged by many as insufficient. Among them it includes in the first place “overfishing”, the destruction of marine habitat, pollution and toxic chemical with permanent “billions of micro-déchets of plastics “. Scientists require the addition of strict measures of governance of international waters and acquisition a collective political consciousness.

NOTES - The above cited document respond to 50 citations of the word “water” in various relationship with food and energy security contest. Some of relevance to be confronted with the Draft VO of October edition is:

- page 4 - Water resources and soil…
- page 12 - cereals human and animal consumption, accelerates the reduction of water resources
- idem - observation of the satellite system agricultural resources, marine, forest, desert areas and the water resources of the planet is desirable…
- idem - TASK 4 - MARINE RESOURCES AND AQUACULTURE - … The CO2 emissions show also influence the impact on flora and fauna ocean. From Le Figaro: L’acidification des mers menace coraux et coquillages. Example of research done around the island of Ischia. The Italian island offers an exceptional ground for scientific investigation of the topic. The quality of water prefigures the

expected results of 30 - 40 years in the ocean: a reduction of biodiversity by about a third, without coral and shells. The project is called Epoca (European Project on Ocean Acidification). Marine flora. And it is well-known in the laboratory on the attack of shells for effect of CO2 that turns into calcium carbonate, in addition to the effect on plankton (microscopic, the base of the food chain) and on the coral.

- page 13 – Same TASK 4 - … Countermeasures taken to this are judged by many as insufficient. Among them it includes in the first place "overfishing", the destruction of marine habitat, pollution and toxic chemical with permanent "billions of micro-déchets of plastics ". Scientists require the addition of strict measures of governance of international waters and acquisition a collective political consciousness.

- page 15 –TASK 7 - DESERT RESOURCES FROM THE TERRITORIES - To be developed

…Database from AA File: Innovative food technology, field applications space observation satellite in parallel observation on the ground of the main factors of conservation, development or exploration of new resources, on earth and in water must still a long way before becoming useful tools for daily application.

The research is involving hundreds of experts and scientists in meetings of international cross-fertilization. We should disclose information more effectively stimulate hearths of ideas. Niches for testing!

The scenario is too vast to tackle even superficially programs under exploration initiatives for UNESCO, by ESA, for example in emerging countries on water resources and on the issues of desertification

- page 18 – TASK 11 – Interactions Food Energy – … Database July 29, 2011 – From Linkedin – Data on eolic energy offshore:

The capacity of offshore wind installations in Europe grew 4.5% during the first half of 2011, according to the EWEA. The European Wind Energy Association (EWEA) has published offshore wind energy statistics for the first half year of 2011, showing a 4.5% increase in installations of offshore capacity compared to the first half of 2010.

101 new offshore wind turbines, with a total capacity of 348 MW, were connected to the power grids in the UK, Germany and Norway during the first 6 months of 2011. In Europe, 11 offshore wind farms worth around €8.5 billion and with a total capacity of 2,844 MW are currently under construction in European waters. The size of the installed offshore wind averaged 3.4 MW – up from an average of 2.9 MW during the first half of 2010.

As of 30 June, there were 1,247 offshore wind turbines fully connected to the grid with a total capacity of 3,294 MW in 49 wind farms spread between 9 European countries.

- page 22 - 22 June 2011 - Source: http://www.thehindubusinessline.com/companies/article2128741.ece

- Other programs in the exploration stage for initiatives of UNESCO, ESA, for example in emerging resourced water and desertification monitored through observation space.

- page 23 - TASK 2 - WATER AND Desertification

Programmes under exploration initiatives for UNESCO, ESA, for example in emerging resource water and desertification. Through the satellite system as Meteosat, ERS and Envisat not only contributes to continuous monitoring of weather conditions on the planet but the database generated forms the basis for building patterns of life on the planet (Living Planet).

- "Charting_Our_Water_Future" speech signed by the experts of The Barilla Group, The Coca-Cola Company, The International Finance Corporation, McKinsey & Company, Nestlé SA, New Holland Agriculture, SABMiller plc, and Standard Chartered Bank that are part of the "2030 Water Resources Group." The study focuses on the resource "WATER" with 195 pages. It 's a Copyright © 2009.

- PLAST plant respiration and photosynthesis (see Page 18 Photosynthesis - TASK 8, Scheme 1.1.2 debate)

- TIGER is dedicated to water resources in Africa

- BEG is related to the monitoring and management of areas of the biosphere reserve of the planet made from Amazonian forests.
- page 23/24 - TASK 3 - MARINE RESOURCES AND CRISIS OF PROFIT RESERVES
… Many nations, countries, are not able to breed farm animals and beasts for their own food needs and they resorted to the resources of fish. The ocean covers about 75% of the Earth's surface. The salt water is not healthy for humans and animals set in the ground. Fishing from the sea is 80% of the total fishing: the remaining 15% comes from the farm and 5% from fishing in waters sweets. Fishing in the sea 95% takes place in coastal waters…
- page 32 –TASK: 8 - FAOSTAT: will provide data over time and cross-UP food and agriculture for 200 countries.
… "The SMOS measurements in such areas are probably two to four times more accurate than those with other satellite sensors or models," said Yann Kerr, SMOS lead scientist for soil moisture at the CESBIO centre for studying Earth's biosphere from space in Toulouse, France. Launched in November 2009, SMOS is helping us to understand Earth's water cycle with its specialised sensor…
- page 35 - …"And there is no point to use GMOs, use the current varieties", says the leader of FAO. For the problem background "is that irrigation with 3% of the rain water is used for agriculture. The rest goes to the sea", he laments. It also involves the construction of new roads and storage areas.
"30 to 40% of crops are destroyed for lack infrastructure", he says. Only thing missing is the political will to break the deadlock.

The complete document of reference is filed at Lo Scalzo Mac library under AA-1 Cibo e Sicurezza 2011 - English edition - Draft 2.doc.

This contribution is edited to the attention of the HLPE Secretariat at cfs-hlpe@fao.org and FSN-moderator@fao.org.

Milano – Mandelieu La Napoule – 23 Octobre 2014

Dr Vincenzo Lo Scalzo – Founder of AgoraAmbrosiana
Lo Scalzo Associates snc

27. Bratindi Jena, ActionAid, India

This report on water and food security is well documented and quite rich in terms of information and coverage of subject matter.

I would like to share two concerns and experiences from India to be included in this report. One is also related to trans boundary water commons with Bangladesh and Nepal.

1.Sand mining as it impact both the quality and quantity of water in river and affects food production of the people depend on river beds.

2.River bank erosion that leads to internal displacement of persons (IDP) located on river bank which has direct impact on food security of people

In case you feel these are important and should be covered please go through the attachment. These are our experiences with the marginalised communities who are living on river bank and struggle for their survival – especially female headed households.

Sand mining issue was covered during our Padayatra (foot march) in 2012 and this report is published and released. I have extracted portions of the report for your reference http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Input%20on%20HLPE%20Water%20&%20Food%20Report.docx.

River bank erosion issue has emerged in our ongoing research around trans boundary water commons and this report is yet to be finalised and published.

My colleague Mr. Biren Nayak and I have worked on this input. Thanks Ruchi, for sharing this information.

Warm regards

Bratindi Jena|Head - Knowledge Activist Hub Natural Resources

331/A, Saheed Nagar, Bhubaneswar, Odisha,India

28. Suman, CPPCIF, India

Dear Sirs:

Thank you for the opportunity to contribute some observations on the V0 draft.

1)Frames of reference for the identified food-water nexus variables : The high level frame for the food-water intersection variables remain in the background through out the draft. For e.g.

At the Agri-food Systems level : The key water -food nexus variables can be water demand-supply, water trade, water governance/reforms, water infrastructure investments, water technologies investments..

At the Health-Disease Systems level : The key water -food nexus variables can be water quality.

Similarly at the Environmental Systems level - Climate change and Environmental flows and at the Socio-Economic Systems level : water rights, cultural norms/preferences, water use and water pricing.

Clearly a systems level perspective bringing out the key water-food nexus variables under each of the system headers may prove beneficial to not only identify intra-variable and systems level dynamics but also help clarify the granularity of the recommendations.

2)Missing food-water nexus variables : Water infrastructure and technology investments, cultural norms/preferences are two important food-water nexus variables that remain to be addressed in the draft.

3) Comprehensive Food-Nutrition Security Index : An approach of drawing up a comprehensive food-nutrition security index and linking evidence /patterns of the key food-water nexus variables with

such an index may prove beneficial to systematically gather and synthesize the current on-going integrated assessment models , projects and outputs from across the word.

4)Scenarios based approach to Recommendations:The dynamics of various external pressures in the form of migration - urbanization - population growth - economic development devised into possible scenarios , mapping the food-water nexus variables to the FSN index against such scenarios may prove valuable to draw up comprehensive recommendations at various levels - global, regional, national or sub national level. Such granularity of recommendations can also further help in mobilizing , enabling and catalyzing concrete actions from various stakeholders.

5)Cross cutting themes identification and discussion : Key cross cutting themes in gender, research /development/ innovation, knowledge management, measurement and evaluation , development indicators access may need to be comprehensively inventoried and discussed in a separate section in order that several more stakeholder perspectives can enrich the discussion, recommendations and ensuing actions.

We hope the observations prove useful in further refining the draft.

Sincerely

Suman,

Managing Trustee , CPPCIF

29. Stella Joy, Active Remedy Ltd, United Kingdom

Thank you for this chance to give feedback to your report concerning water and food security and nutrition and to highlight anything we feel to be missing.

It is a thorough report covering many sides of the water equation. However without including the crucial part that ecosystems play in maintaining the regenerative functions of the global water cycle and hence fresh water quantity and quality there will not be adequate supplies of fresh water for global water or food security. Since adequate nutrition is based upon these elementary factors then this issue needs to be seriously considered in your equations.

In 2012 the issue of healthy ecosystems for maintaining quantity and quality of fresh water was explored by a UN Task Force of which, the FAO was a member. In March 2013 the Analytical Brief was released to guide world governments and UN departments on the findings concerning global water security. Within the brief it states:

“Ensuring that ecosystems are protected and conserved is central to achieving water security – both for people and for nature. Ecosystems are vital to sustaining the quantity and quality of water available within a watershed, on which both nature and people rely. Maintaining the integrity of ecosystems is essential for supporting the diverse needs of humans, and for the sustainability of ecosystems, including protecting the water- provisioning services they provide.”

Previously in 2012 world governments agreed upon this issue when they signed ‘The Future We Want’ in which it states:

"We recognize the key role that ecosystems play in maintaining water quantity and quality and support actions within the respective national boundaries to protect and sustainably manage these ecosystems." (The Future We Want RES/A/66/288 para.122)

This was recognised by UNEP in 2009 in their report 'The Critical Connection'

“We live in a world of ecosystems – and our existence would not be possible without the life-supporting services they provide. Properly functioning ecosystems in turn are fundamentally related to water security.” (Achim Steiner Executive Director of UNEP, Water Security and Ecosystem Services: The critical connection)

This was also echoed by UNESCO in their 2013 ‘Climate Change impacts on Mountain Regions of the World' report

“Given their important role in water supply and regulation, the protection, sustainable management and restoration of mountain ecosystems will be essential.” (UNESCO, 2013, ‘Climate Change impacts on Mountain Regions of the World’)

We hope that you will give this due consideration and add this vital issue into your report.

For further information on this issue please visit:

http://www.activeremedy.org/

30. V Prakash, India

Thank you for sending me the e-consultation document on the Water and Food security with the V0 draft.

The following are my comments:

1. The focus of the document in relating Water and Food Security lacks the real temperature and the correct mining because it talks of both water and food security and in a sense does not link it in such a way that how one affects the other.

2. Water used in Food processing or water for Food and Nutrition and water for Industry is a very Important subject.

3. I am very radical in giving this comment because it is the conservation of water that has the long run agenda for Food Security. It is not what is used today that is only a matter of water losses. So therefore on a similar footing on Food Losses and Waste we must first address the Water Losses and Waste and readdress some portion of the document into the water management that has to do both in the urban, rural, semi rural and semi urban and how this conservation and preservation of wastage can be used to better Food Security. Food Security also means Nutrition Security. Therefore the right to water and the access to water should form a major agenda. This has been very well covered from pages 69 to 73 but what is really lacking is the right to water is not only for drinking but right to water is for agricultural purposes, non-agricultural purposes, industrial purposes, household

purposes as well as kitchen gardening purposes and how do we differentiate in terms of right to water including using rain water harvesting (India has been one of the leading exponent in that).

4. In the larger abundant availability of water generally water is classified into water obtained from sky which percolates down to the soil and comes out as a Spring water and whatever is not absorbed goes as river water or water in the lakes. So this is the overall cycle of water from sea which is affected by not only global climate changes but also local weather turbulences therefore affecting the water below the ground, the water above the ground and the quality of water. Hence when we look at water as a holistic approach of all these addition whether it is a manmade lake to recharge the ground water or it is a traditional reservoir or it is a river that takes away the top soild and at the same time we are looking at various kinds of quality water including smoke free water and the excess water that is now flowing from Arctic and Antarctica which we are not able to handle in the rise of the sea level affecting the coastal regions in hundreds of countries. So therefore that in turn affects the Food Security in those regions including Fisheries and the Ocean Food that comes to the rescue of the Food Security. Therefore the nature of havoc sometimes water creates has an effect on biodiversity and the document must become biodiversity giving standard example of how certain bio-diverse plants are species on the sea or on the land or on the amphibians are lost in the tradition of the ecological balance and water becomes imbalanced parameter in nature.

5. An important point is how water will be charged in tomorrow's world in terms of putting a value for it and it is just like mining under control fashion the stored water below the ground cannot be emptied just like that by a few people because they live above it. It has to be controlled by a policy system and recharging the ground water perhaps is the longstanding long range objective of any policy.

6. Quality of water is simply a matter of importance. Today with the chemicals dumping into the system, the pollution running around rivers, lakes, the recharged water also becomes highly polluted water. Once we contaminate the sea below the earth then for ever we cannot use that water. It is this perspective that are not been brought out in the report and requires urgent attention even covering a paragraph or two with proper references.

7. The climate change has made a lot of difference in terms of local weather and the way water pours down or there is no water ending to drought and how do we really mobilise our water systems across the areas of floods to across the areas of drought in terms of connecting the "have"s and "have not"s very similar to what was done in the Food Losses and Waste report in terms of winners and losers!

8. At this point and at any point looking trade as an option to ensure water, food and nutrition security may be a little bit lopsided approach. The focus has to be on management of the natural resource rather than trading. The trading will unnecessarily make water equivalent to Petrol !

9. I strongly feel that the Food Sustainability issue and the Food Security issue has not been highlighted in this report as related to water. It is this analysis that is so important without which it is an independent document which talks about water but does not address the role of water in Food Sustainability and Food Security and ultimately Food Security has to be a larger umbrella of Nutrition Security and therefore if there is any single comment I would make on this very well documented information I would say the most important is that this connectivity of this agenda and not enough argument to show how excess water destroys Food Security and how no water can bring in Food insecurity. This has to be brought in with the Boxes, Tables, Figures, Facts from a global level so that the local countries and the regions can adopt it as a solution, as a means of the draft

recommendation focussing on water, food sustainability and food security which is the mandate of the CFS and HLPE.

The current VO Draft desires much more and needs a very deep look at the TOR for the Document to address the Sustainability Issue and the Food Security issue which is the Crux of the matter. The draft requires considerable work and I hope the Panel and HLPE will address these issues more than that it is done now.

With Very Warm Personal Regards,
V Prakash

Dr.V. Prakash, Ph.D, FRSC, FIFT, FINAE, FIAFoST, FNAAS, FAFST(I), FINAS, FNAS

Distinguished Scientist of CSIR - INDIA,
Immediate Past Director, CSIR - CFTRI, Mysore, India
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Padmashree, Bhatnagar and Rajyothsava and Three different Life Time Achievement Awardee
VICE PRESIDENT, International Union of Nutritional Sciences (IUNS) : 2014 to 2017
Advisory Member, International Union of Food Science and Technology (IUFoST)
President, International Society for Nutraceuticals , Nutritionals And Naturals (ISNNAN)
Chairman, India Region of Eur. Hygienic Eng. Design Group(EHEDG)
Executive Council Member, Global Harmonization Initiative (GHI)
Chair, Scientific Panel on Nutraceuticals, Nutritionals, Functional Foods and Dietary Supplements, FSSAI, Govt. of India
IUFoST Visiting Professor of Saigon Technology University,Vietnam
IUFoST Life Time Acheivement Awardee 2014.
Former Coordinator, United Nations University Programme at CFTRI, Mysore, India
Immediate Past President, Nutrition Society of India
Past President of IAFoST
Chairman NUTRA India Summit 2015
Project Team Leader for the HLPE Report on Food losses and waste in the context of sustainable food systems

31. Inland Fisheries Branch, FAO, Italy

Comments on the V0 draft of the HLPE report on Water and Food Security from the FAO Inland Fisheries Group:

Importance of Inland Fisheries to Food Security

Although the document is referring to fisheries several times, the first and second chapter give the impression that the authors are not appropriately appreciating the importance of inland fisheries, and therefore freshwater ecosystems, for Food Security and Nutrition for many people in the poorer segments of the poorest countries.

Freshwater ecosystems are increasingly under threat by several challenges impacting the goods and services they provide. Fisheries production is one of those impacted services, which has as a

consequence a direct impact for many poor and food-insecure countries, as fish is a key source of protein and micro-nutrients for in many cases the poorest segments of society. For millions of people in low-income countries, adequate nutrition, health, and income are directly tied to ecological functioning of freshwater.

Inland/freshwater capture fisheries have a yearly catch of around 11.6 million tons (FAO 2012), valuing around USD 9 billion, without any waste due to discards; however this estimate does not include catch from subsistence fishers and recreational fishers, which together may amount to an additional harvest of many millions of tons. 61 million people are employed in inland fisheries worldwide, of which 60 million in the developing world. 65% of the reported catch from inland fisheries is caught in low-income food-deficit countries. Over 200 million of Africa's 1 billion people regularly consume fish and nearly half of this comes from inland fisheries (UNEP 2010). Whereas fish consumption is increasing in most of the world, in many parts of Africa per capita consumption of inland fish is decreasing due to over-fishing and habitat degradation.

Freshwater capture fisheries will continue to be a key component for Food Security and Nutrition, particularly for poor and landless people, because small, wild-caught fish are generally more accessible, cheaper and have high nutritional value.

Inclusion of fisheries governing water

Having made our statement above with respect to the importance of inland capture fisheries for Food Security and Nutrition, we would like to express our appreciation with respect to the Chapter concerning Governing Water for FSN. The chapter draws attention to often forgotten peoples (including fishers) when water rights, or water user rights are managed. The text is truly inclusive, for which the authors are congratulated.

Specific comments per chapter:

Agriculture water demand (1.3.2)

On page 19 (line 1) a statement is made which is not a correct reflection of the statement made in the article referred to. "It is widely accepted that animal food products require much larger quantities of water per unit of nutritional energy compared to foods of plant origin (Gerbens-Leenes et al, 2013)" We would like to clarify that the article referred to is dealing with poultry, pork and beef, not with fish. We propose therefore to improve the sentence to: "It is widely accepted that poultry, pork and beef require much larger quantities of water per unit of nutritional energy compared to foods of plant origin (Gerbens-Leenes et al, 2013)"

We would also like to point out that inland capture fisheries and aquaculture are compatible with other uses of fresh water, however the water must be managed appropriately. Withdrawals for and effluents from agriculture can have adverse impacts on fisheries whereas managing water for fisheries may restrict its use for other purposes. None-the-less, inland capture fisheries do not degrade water quality and do allow for multiple uses.

Water and Energy linkages (1.3.4)

The part dealing with water and energy linkages does not cover the potential disruptive effect(s) dams can have on biodiversity in the catchment area where they are placed, as they might be blocking essential migration routes of fish to their spawning grounds and vice versa. This might result

in the significant depletion of concerned stocks, with its obvious effects on fish production downstream. Through dams, water flows might become regulated, reducing inundation periods and intensity, reducing the associated fisheries production. These effects need to be considered and mitigated when investigating and operating dams for irrigation and hydropower.

Rainfed agriculture systems (2.1.1)

On page 29 line 28, we would like to see fish added to livestock so that the sentence would read: "Livestock and aquaculture are an important part of multi-functional agriculture, providing milk, meat, eggs, fish, cash income, farm power and manure that can"….. Especially in Asia aquaculture is an integral part of households systems, being an efficient addition to rural livelihoods.

Diversifying with fisheries and aquaculture (2.4.5)

We agree with the statement made that findings of the HLPE report on sustainable fisheries and aquaculture should not be repeated in the present report, and that it would be inappropriate not to note the importance of fisheries and aquaculture in the context of food security and nutrition. However, from line 16 onwards there seems to be a misconception or misunderstanding by the authors on the differences between aquaculture and inland capture fisheries. The authors mention fish and aquaculture, but do not mention capture fisheries or are mixing the two concepts; aquaculture is the farming of fish, inland capture fisheries is the hunting or trapping of fish. It is therefore incorrect to state that "fisheries are mostly run by small farmers with wide participation at all levels and scales including farming, processing and marketing". The sentence should read: "aquaculture operations are frequently run by small farmers with…"

It would be good to expand the sentence (starting at line 20) that inland capture fisheries often being critical to local food security etc. lack of understanding of this importance by people outside the sector is what often causes non-inclusion or non-consideration of capture fisheries in basin water management, investment plans, etc

Line 22, here there is again the omission of fisheries and fish and aquaculture is mentioned. The sentence should read: "When considering the issue of water for food security and nutrition it is critical that the role of capture fisheries and aquaculture in meeting the nutritional needs of poor rural communities in many areas, but also of the world at large, are considered in water policy and practice."

Starting at line 24: The sentence should read: Several species of fish are seriously overexploited. Causes for this include environmental pressures such as low water quality and habitat destruction.

Line 26: As competition for water resources increases fish and inland capture fisheries and aquaculture suffer most as the priorities for water allocation are usually focused on other sectors

Line 31: This will require building partnerships between fishers, aquaculturists and other interest groups concerned with more efficient ways to increase the overall benefits of water productivity to food security and poverty reduction as well as achieve higher level of integration in agricultural systems.

2.5.1 Water footprint

It is disappointing to see that fish from inland capture fisheries is not mentioned in this chapter, as this is one of the products with the lowest water footprint. Clearly authors use the concept for comparison of land-based products, but it would be good to include capture fisheries in this, so that the benefits/importance of the sector is truly appreciated.

2.6 Policy implications

Page 48, Line 38: we assume that the term agriculture includes capture fisheries and aquaculture

3.1 Multiple ways to allocate and access water

Page 52, line 13: We would like to propose the change the term cultivators into users, and add fishers, so that the sentence would read: "It is also important to note that many small-holder users, most women, fishers and pastoralists have use rights in customary arrangements that are largely invisible to policy makers and these play a critical role in ensuring their food and livelihood security"

3.3.2 Hydropower

We appreciate the chapter on hydropower, and the reflection of the discussions around the issue. The example given on the Mekong river is very important. Box 19 is appreciated.

Page 68, Box 21. We would like to suggest to include in the Box two Voluntary guidelines:

· Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security http://www.fao.org/docrep/016/i2801e/i2801e.pdf, and

· Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (FAO. 2014)

3.6.3 Unresolved matters

Page 72, line 1: We appreciate the report's mentioning of expanding the scope to address the importance of adequate water for ecosystem sustenance and subsistence agriculture

Recommendations

We would like to see a recommendation drawing (States) attention to the specific importance of the inland fisheries sector (providing animal protein and micronutrients with limited alternatives) to food security and nutrition for often poorest segments of society. Before taking water management actions with potential impacts on inland fishery production and biodiversity, States should include the inland fisheries sector in their impact assessments. (fishers are mentioned in some recommendations, but without a link to the importance of the production of the sector to nutritional status of people. When fishers are mentioned it is more in the context of their rights)

Page 75, line 34: we would like to see fishers added to the text: "Water and land tenure and use right systems are seldom coordinated, which can lead to sub-optimal outcomes on the ground, especially for small or marginalised farmers, fishers, and other food producers"

Felix Marttin
Devin Bartley

David Lymer
Inland Fisheries Branch
FAO of the UN

32. Oleh Kam, Université Felix Houphouet Boigny, Côte d'Ivoire

Dr Kam Oleh ; Sociologue du développement rural ; Enseignant chercheur
Université Félix Houphouët Boigny, Abidjan

La problématique de la gestion de l'eau : l'expérience de Guiglo dans la Région du Cavally en Côte d'Ivoire

Je souhaiterais partager une expérience qui s'est soldée par un échec dans la question de la gestion de l'eau. Cette contribution rentre fans le cadre des systèmes de gouvernance et de gestion de l'eau capables de mieux intégrer les préoccupations pour la sécurité alimentaire et d'aborder la question des arbitrages entre les utilisations/utilisateurs de l'eau de façon équitable, respectueuse de l'égalité entre les sexes et délibérative. Cette expérience permet de tirer des leçons pour renforcer la justice sociale et de bénéficier des groupes marginalisés. Cette expérience a eu cours en Côte d'Ivoire, dans une localité de l'Ouest du pays. Les populations, surtout les femmes et les petits agriculteurs étaient confrontés à des problèmes de pénurie d'eau pour les activités domestiquées (boire, faire la cuisine), mais aussi pour les activités agricoles (riziculture). Au début de l'année 1994, la région fut confrontée à une importante pénurie d'eau due à une sécheresse prolongée, à l'état désastreux des nappes d'eau souterraines, et au manque de politiques de préservation des sources d'eau

Pour faire face à ce problème, un projet, dénommée projet Bad-Ouest, a été initié par les autorités politiques et gouvernementales avec l'appui financier de la Banque Africaine de Développement (BAD). Dans le cadre du projet, des pompes hydrauliques villageoises ont été mises en place dans les villages. Les résultats de l'étude que nous avons menée montrent que les forages d'eau et les pompes hydrauliques villageoises installées ont été abandonnés par les populations. Elles ont recours à l'eau de puits et marigots pour leurs besoins alimentaires. Cela est source de maladies liées à l'eau. Les comités villageois de gestion de l'eau mis en place n'ont pas fonctionné, les populations ne réparaient pas les pompes abimées. Pourquoi les populations abandonnent-elles l'eau potable pour se diriger vers l'eau souillée ? cette question de recherche pose la problématique de la gestion de l'eau en milieu rural. L'étude menée montre que cela est du à l'approche utilisée par les initiateurs du projet. En effet, les populations n'ont pas été associées à l'installation des infrastructures hydrauliques qui ont été installées parfois dans les lieux de culte (forêt sacrée) et de rituels (cimetière). Aussi, l'accès à l'eau était payant. Le seau d'eau de 20 l coutait 25 FCFA, prix élevé pour les populations rurales pauvres et surtout les femmes. Les femmes n'étaient pas membres des comités de gestion de l'eau. L'installation des pompes n'a pas servi ni pour les problèmes d'alimentation, ni de pour la riziculture.

Les conclusions qui se dégagent de cette expérience est que le succès des interventions en matière de l'eau en milieu rural doivent tenir compte des réalités socioculturelles des populations, de la participation des populations surtout la place de la femme. Il s'avérait tout aussi urgent et important de travailler en lien avec la communauté pour encourager des changements d'attitude et de perspective au sein de la société rurale dans son ensemble, afin que les communautés puissent assumer des responsabilités plus importantes dans le domaine du contrôle et la gestion des réseaux d'eau. Ce processus de changement, appelé « Démocratisation de la gestion de l'eau », était axé sur

les trois enjeux fondamentaux suivants : (i) parvenir à fournir en eau les personnes non alimentées, d'une façon qui garantisse (ii) l'équité (avec pour objectif prioritaire une distribution équitable) et qui soit fondée sur (iii) les principes de la justice sociale. L'approche technocratique du service de l'eau et l'absence d'un sentiment de propriété collective chez les usagers ont entraîné un manque d'implication de la population et des différents acteurs concernés, ainsi qu'une réticence imposée des pratiques durables de consommation de l'eau potable.

33. Kate Bayliss, SOAS University of London, United Kingdom

I would like to make the following comments on the V0 draft report on Water and Food Security.

First I would like to congratulate the authors on framing this potentially huge subject in a coherent and comprehensive structure.

Second, my concern is that more attention is needed to the increasing role played by global private capital in shaping local water delivery systems. For example, the financial sector is increasingly involved in water delivery as water has become an asset class for financial investors. See for example Emerging Capital Partners http://www.ecpinvestments.com/index.php/finagestion-3/ . Private equity firms also have stakes in English water companies. These developments lead to much more complex governance structures as water delivery becomes part of a global investment portfolio. And these issues are likely to become more important as the pressing need for investment finance is putting further emphasis on privatisation and private sector finance (see for example http://www.icafrica.org/en/topics-programmes/water/).

Finally I think if the report is to propose water trading (p.81) the potential drawbacks need to be articulated. An alternative may be water sharing and I think there is some precedent for this in Asia.

I hope this is useful. I would be happy to discuss further if required.

Best wishes

Kate Bayliss

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Dr Kate Bayliss
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London WC1H OXG.

34. Richie Alford, Send a Cow, United Kingdom

Thank you for the chance to comment on this draft report, timely in the need to consider water security in line with food security. The right to water and the right to food need to be viewed in an inter-related way, and protected over other competing interests.

There is much to commend this draft report for, as other commentators have shared. It is encouraging to see frequent mentions of the potential of agro-ecological approaches, with the integration of livestock and crops, to increase productivity within a smallholder and local context, an experience we have observed as an organisation working in sub-Saharan Africa. Typically, the productive potential of smallholder farmers, when equipped with appropriate knowledge and skills, is under-estimated, and they are dismissed as a contributor to the problem, never being seen as one of the solutions.

Water is clearly a global resource, but also has to be considered in its very local context, and its utilisation at this local level be optimised, such as growing appropriate crops to the local rainfall. Change in land use or crops grown has a significant local consequence. Maize is a very thirsty crop, yet is now the predominant crop for sub-Saharan Africa having replaced more drought resistant crops (e.g. sorghum and millet). Irrigation may enable an increase in the yield of maize per unit area, but a better use of water will be observed in the increase of sorghum and the (potential irrigated) water used to grow vegetables and fruit for the local market. In Ethiopia, local water courses are now polluted from run-off of chemical sprays from export focused flower polytunnels.

The livestock sector is a growing consumer of water, and a growing influencer of local and international agricultural practice. The demands for meat by the burgeoning middle classes across the world are putting a huge level of demand on water – in terms of impacts on water (through deforestation for soya growth, etc.); livestock consumption during production and processing (contamination of water for cleaning sheds and abattoirs, etc.

The danger of such a report is that it proposes singular global solutions to the issue. A more appropriate response would be the enabling of many diverse local solutions to be identified. By resolving water issues locally, the global challenge of water availability will be resolved through these multiple local responses.

35. Siegfried Mengoung, CECOSDA - Center for Communication and Sustainable Development for All, Cameroon

Cher M. GITZ,

Qu'il nous soit permis avant tout de signifier notre plaisir de contribuer à l'élaboration du Rapport de la FAO sur les questions d'Eau et de Sécurité Alimentaire, qui avec l'Environnement, constituent les trois domaines prioritaires d'action de notre Centre de Communication. Aussi, notre contribution sera relative à votre section sur l'eau dans les systèmes agricoles. Vous y faites mention tant des systèmes dépendant de la pluviométrie que de ceux basés sur l'irrigation. Dans cette seconde catégorie, vous semblez davantage faire la part belle à l'irrigation des zones arides. Cependant, il existe à notre sens, un autre cadre de culture qui mériterait intérêt: les bas-fonds. Notre contribution sera donc relative à la mise en exergue, sur la base d'exemples camerounais, de l'apport de ces zones quant à la garantie de la sécurité alimentaire et du développement durable.

L'agriculture camerounaise, en dehors des plantations agro-industrielles et de quelques grosses fermes privées est dominée par des petites exploitations familiales. La plupart d'entre elles sont manuelles, font souvent appel à la main-d'œuvre occasionnelle et utilisent peu ou pas d'intrants extérieurs.

De façon générale, si l'on dénombre au Cameroun une quinzaine de systèmes de production différents, ces derniers peuvent être regroupés en deux grands systèmes, que sont:

- Le système pluvial qui peut-être extensif (ou itinérant), semi−extensif ou intensif itinérant ;
- Le système irrigué intensif ou traditionnel.

Ce dernier qui fait l'objet de notre intérêt, est destiné à compenser les déficits hydriques passagers, au travers de l'usage de petites motopompes, des déviations de ruisseaux, ou des mares d'eau. Ce système qui au départ était pratiqué pour les zones arides, se fait de plus en plus dans les bas-fonds.

L'adoption des bas-fonds comme cadre agricole participe de pratiques particularistes mises en œuvre au départ par les exclus du système foncier (femmes, orphelins, allogènes …) pour survivre ; Cependant, au regard de leur forte productivité, ces zones sont rapidement devenues de véritables pôles de production maraîchère et vivrière. En effet ces zones qui selon la loi de 1974, appartiennent au domaine national, ont le mérite d'être « sans maitres » et de jouxter des cours d'eaux ou mares qui les rendent fertiles en toutes saisons. En outre si l'eau utilisée pour l'irrigation en zone urbaine peut paraitre fortement polluée ; celle usitée en zone rurale reste bonne, compte tenu de la faible utilisation de produits chimiques dans l'agriculture. Longtemps interdites aux populations de par les risques de catastrophes civiles qu'elles présentaient, ces zones au regard de la conjoncture économique et de leur apport à la garantie de l'autosuffisance alimentaire, ont été légitimées par l'Etat, sous réserve de leur aménagement.

Par ailleurs, malgré les résultats obtenus au plan de la productivité, en raison des coûts d'investissement, des frais de fonctionnement et des charges périodiques très élevés qu'ils ont engendrés, mais aussi de leur manque de flexibilité ; les grands périmètres ont montré leurs limites. Les bas-fonds aménagés apparaissent alors comme l'avenir des grands bassins de production agricole, où seront développées d'intenses activités économiques.

La prise de conscience de l'importance de ce secteur a été marquée au Cameroun par la création au sein du Ministère de l'Agriculture et du Développement Rural (MINADER), d'un Programme de Valorisation des Bas-Fonds (PVBF). Financé sur le budget d'investissement public du MINADER, le PVBF ambitionne d'aménager 4000 hectares de terrains dans les zones irrigables et marécageuses dûment identifiées et cartographiées sur l'ensemble du territoire camerounais, afin de contribuer à l'augmentation de la production vivrière et maraîchère du pays.

Il est cependant à relever que ce Programme n'est pas le premier du genre au Cameroun. En 2006, sur financement de la Banque Islamique de Développement, Le Gouvernement du Cameroun a mis en place dans le Département du Noun (Région de l'Ouest), le Projet de Développement Rural du Mont Mbappit (PDRM).Ce projet qui a aménagé et mis à la disposition des communautés 1200ha de bas-fonds dont 940 avec contrôle total de l'eau et 260 sous contrôle partiel ;a permis l'installation de 3000 exploitants agricoles modernes. Ces derniers ont bénéficié d'un encadrement particulier pour le développement d'une agriculture intensive susceptible d'augmenter de façon significative la production des cultures vivrières et maraîchères (maïs, arachide, haricot, riz, patate douce, tomate, carotte, etc. …). De fait, cette zone est devenue le véritable grenier maraîcher et vivrier du Cameroun, voire de l'Afrique Centrale.

Bien plus comme effets induits de ce projet, les populations ont bénéficié de :

- La réhabilitation de 105 Kms de pistes rurales dont 60kms d'accès aux bas-fonds ;
- La construction de 10 Ecoles de trois salles de classes chacune équipées ;
- La construction de 06 Centres de Santé équipés ;
- La construction de 16 forages d'eau équipés ;
- La construction de 04 marchés ruraux ;
- La construction de 03 cases communautaires.

En somme il nous a semblé important au terme de cet apport, d'insister sur la place des bas-fonds dans le sous-système irrigué. Au regard de l'inadéquation entre les espaces réservés à l'agriculture dans les pays en développement, la productivité desdits espaces, la problématique de la gestion des ressources en eau et les exigences de la sécurité alimentaire ; les bas-fonds méritent pour nous un intérêt.

36. Anne Roulin, Nestlé, Switzerland

The report is a very comprehesive review and an impressive summary of the key issues. However, in the context of systemic actions/ solutions/ approaches to enhance water governance, management and use for food security, I think that more attention should be devoted in the report to the issue of water pricing in relation to water scarcity. In many cases the price of water bears no relation to scarcity and the cost of water can range anywhere between approximately 9$/m3 in Copenhagen to 0.03$/m3 in Karachi. This issue, and the relationship with food security, would warrant expanded discussion and potential remedial actions.

With respect to actions of the private sector, Nestlé has made a comprehensive set of external commitments relating to water in the areas summarised below. Progress is reported annually in Nestlé's annual Creating Shared Value report.

WATER: Work to achive water efficiency across our operations. Advocate for effective water policies and stewardship. Treat the water we discharge effectively. Engage with suppliers, especially those in agriculture. Raise awareness of water access and conservation.

37. Sabina Anokye Mensah, ANOMENA Ventures, Ghana

The zero draft has adequately addressed the diversity of linkages between water, food security and nutrition.

However, agricultural production alone is not sufficient to guarantee stable food supply and sustainable use of water. Water use in processing, packaging and information technology could be carefully analysed to facilitate access to information which is one definite way of sharing and fostering linkages.

There is the need for education, research, policy, advocacy and partnerships on the use of water. What kind of partnerships do we need as we consider the weak linkage between agricultural processing and water use where more women are found and industry?

Agriculture must be cast beyond production objectives to include agri-business related linkages and the relation to water. The bulk of the foods consumed in Africa are processed using very simple technologies and methods which diminish the use of water. These are indigenous food technologies where a lot of women are found. A typical example is in the processing of shea butter at Gbimsi in northern Ghana. The use of appropriate technology completely eliminates the use of water which indirectly saves the environment. Modernizing agriculture to eliminate pollution of water bodies will require a holistic, value chain approach. Women's involvement makes a difference on the global scene since gender is cross-cutting. Gender mainstreaming must be considered in all steps in the food production and value addition activities if water is to be saved for other purposes.

These technologies affect the economic and social life of the operators who are mostly women and contribute to family nutritional status. Modernising to reduce water use may require Setting-up small scale co-packing facility to provide services to the small- and medium-scale food enterprises where women abound.

This could lead to less capital expense for equipment, plant or water. Informal education and other information sharing strategies should promote good handling and use of water, processing and packaging. Social equity and environmental justice must remain at the heart of sustainable development not forgetting equitable use and distribution of water.

38. Samuel Ayuba Hamisu, Yobe State college of Agriculture, Gujba, Nigeria

1. Water should be free from corosive material.

2. Rivers in the areas of mining and oil refinaries should free from oil spillage to enhence fishing.

3. Water need need to be clean free from microorganisms.

4. Areas in Sub Sahara should be provide with wells for available water.

5. Fish and other living animal in water need to have water condusive to their survivals.

This is to provide clean drinking water and shelter to animal who uses water for living and those farmer using it for sourcve of income.

39. Food Safety and Quality Unit, FAO, Italy

Dear HLPE Secretariat,

We think it would be important to include something in the document about water quality implications to food safety. Looking at the zero draft, we thought that this could be done right upfront in the section 1.1.2 Water quality and food security and nutrition.

We therefore suggest to add the following text on page 13 line 19.

Many, if not most, foodborne illnesses can be related back to poor water quality used in food production and/or postharvest processing. Water can in fact be the vehicle for both pathogens and chemical contaminants to be transferred from the environment into the food chain, thus impacting on Food Safety and Public Health. Water quality implications should be carefully considered not just from an environmental and agricultural perspective, but also taken into account to integrate Water Management, Public Health and Food Safety into joint policies and decision making. Furthermore, the growing demand for quality water accompanied by the increasing water scarcity and pollution, calls for a more systematic and at the same time safe approach to water re-use (see section xxxx).

Thank you and best regards,

Vittorio Fattori
Food Safety and Quality Unit

40. John Weatherhogg, Italy

The draft report is quite correct in drawing attention to the need for coordination of water for domestic sanitary and health purposes (WASH) with food security. One problem is that there seems to be much support for self-standing WASh projects, when such development can be a very valuable catalyst for a much wider agricultural and rural development. These self standing WASH projects to a large extent "run off with the jam" and make wider agricultural and rural development harder.

This thought is spelled out a bit more in a piece I prepared earlier this year which is below.

The Corriere della Sera for 23 January gave favourable coverage to a press conference at the Davos World Economic Forum given by the co-founders, Gary White and the actor Matt Damon of a non-profit entity, Water.org. The aim of the agency is to assist developing countries to improve their domestic water and sanitation through micro-credit arrangements modelled on the Gramin Bank experience. Their target is to raise US$100 million by 2020 and, according to the Corriere's report on the level of enthusiasm shown at the press conference - they may well be successful.

The Water.org initiative seems to be in line with the UN Global Compact CEO Water Mandate by which CEO's of multinationals agree to undertake public-private partnerships to address problems of water scarcity. From only six signatories in 2007 some 93 multinational corporations have now endorsed the Mandate. The PepsiCo Foundation has pledged US$35 million to water programmes in developing countries, of which US$12.1 million goes to Water.org. According to the Economist other multi-nationals investing in water (but not necessarily through Water.org) include the Caterpillar Foundation (US$11.3 million), IKEA Foundation (US$5 million), the Swiss Re Foundation, Bank of America Foundation, Levi Srauss & Co and Mastercard.

All of this would appear to be extremely encouraging and a cause for celebration, if only all development assistance was equally easy and of equal attractiveness to both donors and beneficiaries. Unfortunately that is not the case. Drinking water and sanitation projects are at the top of the list of favourites for donors, governments and beneficiaries. They have the great advantage of being self-targeting to the poor, since the better-off have generally already made their arrangements; they tend to have a benefit bias towards women, since water provision for the family is generally considered women's duty; and they make excellent political publicity. From the beneficiary's viewpoint they have a beneficial and immediate impact on family welfare as soon as the

works have been completed as well as providing employment during their construction. Technically water provision solutions are relatively straightforward and a sizeable programme can be mounted over a quite short, 2 or 3 years, implementation period.

In sharp contrast to water investments many rural project challenges are very much more difficult.

Take, for example, watershed management or forest rehabilitation projects. In both cases the usual situation is a steadily deteriorating physical and community condition, which somehow has to be turned round so that the areas are stabilised, environment better protected, hydraulic regime improved, productivity of the area and family incomes increased. All too often the background to such projects is a number of failed attempts funded either by government or donors.

To make any impact in this situation any project has to have the full commitment of the beneficiary population - and for this the beneficiaries have to have full confidence in the project. Initially beneficiaries are likely to be highly sceptical, not least because of bad past experiences. Moreover the project cannot realistically promise any breath-taking change in living standards. Better managed watershed or village forest means some improvement in living standards, but through items such as better feeding of housed livestock, planting of grasses along terrace edges, increased non-timber forest products and such-like relatively small - even if important - changes.

As well as falling well outside the “get-rich-quick” category, such projects also require quite a bit of social engineering. User groups and committees need to be established at local, community and higher levels to help carry through the programme and to try to ensure equable sharing of costs and benefits. This is a complex and time consuming exercise[1][1][1].

This is the point at which inclusion of a drinking water or drinking water and sanitation component can have such a good impact. If the component is implemented early on in the project it can demonstrate immediately that the project is capable of delivering benefits, which is then reflected in greater interest and commitment to group formation and participation in project implementation.

The water component can therefore be said to have played a truly catalytic role in project implementation which will ultimately lead to a much more successful project outcome.

It is for these reasons that a strategy of having self-standing water or water and sanitation projects is likely to prove counter-productive. Not being able to include a water component means that it is going to be more difficult to get full beneficiary participation, particularly of women. Not only do they have a direct interest and traditional responsibility for water provision, but in many instances become responsible for collection of money for maintenance and repair of the system, which can also develop into small communal processing enterprises or savings and micro-credit schemes.

[1][1][1] Formation of any sort of a group, whether it be for watershed management, village forest management or even water users group normally takes about four years from the time of initial discussions to the point at which the group is stable in structure and self-financing.

41. Ravindra Botve, India

Water Problems in Rural India and Our Possible Intervention in 2014-15

By: - Ravindra Botve & Mendu Srinivasulu

Water is a fundamental to human food security and nutrition. Water of sufficient quantity and quality is an essential input to all types of agricultural production, as well as the preparation and processing of food.

In this document we try to focus what problem rural India face when we meet farmers across country at the same time we also learn possible solution. We hope our little learning will useful to in V0 draft and meet FSN challenges.

In 2014-15 Social Advancement Venture Foundation and Rural Youth Agriculture Research Foundation committed to launch following possible intervention to meet FSN.

1. Problem: - Lack of Farm planning as per farm resource and microclimate

As per our observation 90 % of farmer not plan his crop as per farm resources likes water, livestock, capital, soil, man power and climate which affect crop yield and economic condition some time overutilization of farm resources affect ecosystem (ex. Monocropping, soil salaination,and pest and diseases outbreak)

A) Possible intervention: - Individual Farmer profiling to meet FSN by SAVe Foundation

Case study: - Mr. Prallad Sontakee in viral village of Maharatsra has 5 acre (2 ha) land , one 1 cow and 12 feet well . Last 5 year he grows only cotton because his neighbour farmers grow cotton but he unable to make profit. In April 2014 we meet him plan his land as per availability of water and market situation so we plan half acre vegetable (coriander) as per water situation in well and market demand 2 acre cotton and 2.5 acre soybeans when sufficient rainfall occur after 2month (June) as per our discussion with IMD expert team (Indian Metrological Department) Pune they predict less rainfall so we suggest farmer to shift on soyabean (low water requirement crop as compare to cotton) so he plan to cultivate 4 acre Soyabean crop and 05 acre hybrid jawar for his cow.

After 1.5 month he get income 25,000 income from fresh coriander which he was sell in local market at Rs 5 per 50 gm because in month of May fresh coriander leaves has good market and price from this money he buy good quality seed and fertilizer for soybeans . He gave supplement irrigation to soybeans which was available in his well. Last month (November 2014) he harvest 20 qt soybeans which market cost Rs 60,000 and also got sufficient fodder for his cow from 0.5 . If he plan cotton in 5 acre this year his whole crop fail to due to lack irrigation and his cow unable to get fodder.

We think if individual farmer plan his crop as per farm resources available in his farm it will help making more profitable and fulfil Food security demand . Need to farm planning at individual level not village level.

Provide agriculture advisory at Right time from Right person to Right Place

2. Problem :- loss of water due to deep tillage

Every year farm carried out deep tillage operation to make soil lose and break hard pan with help of tractor or bullock pair which increase gravitational water (after rainfall water goes to deep layer so plant root unable to extract or absorb it) which rise cost of production as well as water use

Possible Intervention

We think only training will not change this custom for that need Field demonstration In May-2015 through SAVe foundation we will sensitise farmer on shallow tillage operation with field demonstration.

3. Problem :- Water requirement at critical growth stages

Farmer provide irrigation to crop as per soil condition if it dry then they will start to give irrigation which loss water and increase soil salinatiztion

Most of farmer unaware about critical growth stage of crop if farmer give water at this stage 50 % more the chances to increase yield if miss more than 50 % reduction

Possible intervention: - Need to Find out critical and most critical growth stage of crop so farmer can store or plan to irrigate crop .

Through the Rural Youth Agriculture Research Foundation in 2015 we conduct research trail on critical and most critical growth stages of soybean , pigeon pea and Gram crop through that learning SAVe foundation organise village level work shop on water for grain to sensitize farmer on critical and most critical growth stage of crop

4. Problem :- 50 % loss of water due to evaporation

We observe and study evaporation cause 50 % water loss from field. Farmer are aware about that but they can't afford plastic mulch due to low level income.

Most of sugarcane grower farmer burn sugarcane trash to destroy pest and good root emergence which cause environment pollution

Possible intervention:-

Rural youth Agriculture Research foundation establish demonstration how soybean , Gram , pigeon pea , paddy , sugarcane and wheat crop straw act as as a mulch , manure as well as reduce evapotranspiration . through SAVe foundation we will scale this model

5. Problem :- Monoculture of high water requirement crop in rainfed or dryland area

Marathwada come under rain fed zone but more than 40 % farmer which having more water supply from bore / well / pipeline from lake grow high water requirement crop like sugarcane , banana and flower due high income and less care management which decrease water table some time rural people face drinking water problems.

Possible intervention:-

Need to sensitize farmer on cost benefit ratio of high water demanding crop compare to pulses and other Millets with its effect on ecology after that they will move to region and climate specific crop otherwise one day these people not get drinking water . For that need to establish community managed water responsible group to avoid extraction water from lake for high water requirement crop.

6. Problem :- why farmer avoid drip irrigation

Farmer know drip irrigation save water and increase yield but till that date they avoid use of drip irrigation when we meet farmer we receive following information

1. Cost of drip irrigation goes beyond the Rs. 50,000 per acre for that marginal farmer can't afford

2. Government provide subsidies for drip irrigation but in block level no dealer ship available to purchase drip irrigation set

3. Farmer unable to know its technical details how to install drip irrigation

4. Salt accumulation and rodent cut pipe is major constrain

Possible intervention:

Private sector drip irrigation company need to establish dealership at block or local level so farmer can purchase its drip irrigation set with assign one consultant to install drip irrigation set as well slove problem face by people

Government should encourage drip irrigation farmer by giving nominal incentive to his produce in the name of water star like energy star in electrical items or If possible not give 3 phase electrical connection those farmer who not use drip

Try to increase subsides 60 % with quick loan sanction with least document process

7. Problems :- why urban waste water not utilised in agriculture

Everyone know single house in urban area use minimum 25 lit of water think about multi-storey building why this water not use for fruit or other crop production because all water (wash and swedge water is mixed) which is very hard to treatment or recycle

Possible intervention: - Green Building

if builder plan separate pipe wise outlet of wash and sweade water then people can use wash water to raise fruit and agriculture purpose . it is fact even swedge contain more nutrient to increase crop yield but no one wish to raise crop from this water . if we make wash outlet people defiantly use this water for greenery purpose .

Use this water for fruit, ornamental, and flower crop

8. Problem :- Industrial waste water pollution

Lot of sugar and textile industry in maratwada region discharge water to river or lake which create river /lake water unsafe for drinking purpose , kill fish and affect agriculture production . Even raising this issue government not take action due to their nexus with industry leader

Possible solution: - Media and Community

Role of Media in that case is very active it can raise this issue so Government can take some action

SAVe foundation will planning to establish Green Warrior Youth in such affected village to legally fight such matter to save environment

9. Problem :- waste of good Processing water

Most of industries use water only for clean purpose like wash vegetable , some electronic part , bottle and other thing without any modification of water (heating , mixing chemical or other process)

Possible intervention: - if these industry set up silvi-horticulture plant around industry then this water become useful for production of fruit crop as well increase owner income for that we plan to meet Industry leader with such Plan.

10. Water bucket challenge -2014-15

SAVe foundation participate Seva-mela in Hyderabad in that mela we organise water bucket challenge for that we announce

Chose a village which is challenged by the availability of Safe water access and work in collaboration with public – private institutions to ensure that the selected village gets access to 100% clean and safe drinking water within one year!

Are you ready for this Challenge?

Please do provide your details in the register.

We will work together for this Social Infrastructure Revival Initiative…

Social Advancement Venture Foundation

Vision: - To be a dynamic Social Development organization that continuously works in collaboration with public, private institutions for necessary social advancements.

Mission: - Reaching the unreached to promote a happy living society with dignity and equality

Our approach: - Social Advancement Ventures Foundation (SAVe Foundation) will work on some of the most pressing problems of the society in sustainable way to bring happiness to each family and the society.

SAVe Foundation is committed to bring the desired positive changes in the society by offering various products, services, technologies either produced and or delivered by SAVe Foundation or offered through Joint Ventures, Collaborations or by distributing the products/services/technologies to the needy people/institutions. SAVe Foundation is intended and committed to engage in those products, services and technologies that have high potential to advance the society to next level by bringing value addition, improving their living standards and bringing happiness to the individuals, families and society as a whole.

Rural Youth Agriculture Research Foundation

- Vision :- Discover what help the rural people to brings prosperity in life

- Mission :- Design and evaluate program in Real context with real people and provide hands on assistance to brings successful program in scale

- Our Model: - Innovate --- evaluate & design potential solution – evidence – mobilise and support decision maker.

- Establishment :- 15 October 2014

We are committed to do research which suit in farmer field '

Mr.Ravindra Botve:-Founder of Rural Youth Agriculture Research Foundation, Certified Crop Advisor. Work as Agriculture advisor in GIZ, Cohesion foundation, Yuva Mitra , Jeeven Tirtha and SAVe foundation .

Mr. Mendu Srinivasulu:- Founder of Social Advancement Venture Foundation and Assistant Vice President at BASIX

42. Abdul Rahim Khan, Post Harvest Research Centre, Pakistan

Food security is directly related to water availability for crops. There should be law (not just law, prove by implementation) in UN to manage the available water in the World. In many fertile countries mostly water is lost just due to because they do not have any water management resources due to certain political issue. There is need to address Water and Food Security on priority bases without involving political issues. One fertile country can support a big part of human being from hunger.

Regards

Abdul Rahim Khan
R.O/P.I/T.L
Post Harvest Research Centre
Ayub Agricultural Research Institute
Faisalabad-Pakistan

43. Gerhard Flachowsky, Friedrich-Loeffler-Institute, Germany

Please, let me add and practical example, published recently in „Biotech Crops, Annual Updates 2013; Maize“:

„In the dry region of the USA, a drought tolerant maize wiil be cultivated in 2015 on a larger area and an increase in yield from 5.5 to 7.5t/ha is expected“.

In addition to maize, I would also add some aspects to rice, because rice used about 30% of freshwater for crops worldwide. There are already some older studies (2005-2007) which

demonstrate a higher salinity and drought tolerance by plant breeding (e.g. Oh et al. 2005, Karaba et al. 2007; see references below).

I think that these examples will underline my requirements for more public fundamental research for a more efficient use of the limited resource water by plants. These results will improve the water efficiency and/or the water footprints per t of crops (L/t) and could be considered as sustainable contributions for food security.

Refernces mentioned above:

A.Karaba, S. Dixil, R. Greco, A. Ahoroni, K.R. Trijatmiko, N. Marsch-Martinez, A. Krishnan, K.N. Nataraja, M. Udayakumar, A. Pereira (2007) Improvement of water use efficiency in rice by expression of HARDY, an Arabidopsis drought and salt tolerance gene. PNAS 104; 15270-15275

S.H. Oh, S.I. Song, Y.S. Kim, H.-Y. jung, S.Y. Kim, M. Kim, Y.-K. Kim (2005) Arabidopsis CBF3, DREB1A and AFB3 in transgenic rice increased tolerance to abiotic stress without stunting growth. Plant Physiology 138, 341-351

44. Rosewine Joy, Cochin University, India

Dear HLPE committee

The report has touched key points to explain the relationship between water security and food security. Water security from the water quantity perspective has been explored well, but from a quality perspective is less addressed; esp when we look water quality as an input for food production .For example in case of aquaculture, water quality is an important input. For small- medium fish farmers who generate 90% of aquaculture output this quality is an ecosystem service blessed through tidal functions. Today with over use of the ecosystems by different stake holders have made this input costly for fish farmers which could push them from traditional/ extensive/ improved extensive fish farming practices to livelihood vulnerablities.The result is they are deprived of fish as food (subsistence safety bracket) as well as fish as Income (loss of export earnings due to fish disease and fish mortality). With deteriorating water quality, the ability of aquaculture as an important player to ensure food security looks scanty.

As a research scholar, I try to explore this relationship. The thesis is due for submission in few months

Regards

Rosewine Joy
Research Scholar
Cochin University, Kerala, India

45. Subhash Mehta, Devarao Shivaram Trust, India

INDIA IN DEEP WATERS, by VARUN GANDHI

http://www.deccanchronicle.com/141028/commentary-op-ed/article/india-deep-waters

Attachéd is a doc on recharging of bore wells (http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Borewell%20recharge%20SDRS%20Hubli,%20India.docx)

A simple technology assures continuous moisture supply for agriculture in water-scarce arid and rain fed areas. Full report at:

http://www.downtoearth.org.in/content/orchards-desert

K.S. Gopal's presentation Youtube: http://www.youtube.com/watch?v=ip7j3k3CEZU

46. Australia

General comments

Types of water: the draft report addresses the issue of types of water and water usage. We would like to draw the attention of the HLPE to the Codex international standards such as the Code of Hygienic Practice for Fresh Fruit and Vegetables that have quite prescriptive requirements around the types of water that can be used in production and measures to be taken to prevent contamination of the produce and/or water used. The Code may assist around water usage, particularly where it might concern re-use of water.

Integrating water quality into water quantity policies: It would be good to have more description about integrating water quality into water quantity policies and decisions, particularly for water resource allocation. There was a comment late in the report about quantity impact on quality but it did not appear to be discussed earlier on in the report. For more information, the report could refer to the report prepared on characterising the relationship between water quality and quantity on the Department of Environment's website: http://www.environment.gov.au/resource/characterising-relationship-between-water-quality-and-water-quantity.
The report could also look at the Australian Murray Darling Basin Plan for an example of integrating water quality targets into water resource allocation plans: http://www.mdba.gov.au/what-we-do/basin-plan

Water for agricultural systems – Irrigation: On approaches and methodological issues (page 29, line 50), we believe that metrics and data for water and food security are adequate and valuable. However, we would like to suggest to incorporate more maps on irrigated area that have positive outcomes on food security including systems used for these achievements and more graphs (especially scatter plots) for a broad understanding and critical review of the correlation between water usage across the globe and food security with emphasize on best practices used in irrigation. An Australian a case study in Victoria is found below as an example.

Case study: Victorian On-Farm Priority Project

"The Victorian On-Farm Priority Project was designed to deliver on the Commonwealth Government's environmental priorities for water-related programs in the Murray Darling Basin through on-farm efficiencies which increase the viability of farm businesses. The project is helping to maintain and grow milk production to meet increasing demand, despite the challenges of climate variability. In turn, a strong dairy sector maintains and creates regional employment: both directly (through on-farm roles) and indirectly (through associated industries).

The project is estimated to have boosted the regional economy and community with an estimated net present value of $78 million, and the creation of approximately 200 short- and long-term jobs. Additional benefits expected over the long-term include improved water quality and salinity management, and increased resilience of the regional economy to a range of socioeconomic and environmental pressures.

Victorian On-Farm Priority Project enabled farmers to invest in new technology to help combat climate variability, which had already impacted the value of production during years of lower water allocations.

The project strengthened the Goulburn Murray Irrigation District economy (estimated to be $1.6 billion at the farm gate, and $6.5 billion with processing and other value adding) as it provided a stimulus to farm infrastructure investment and retained 50 per cent of the resultant water savings for productive use.

In developing the Victorian On-Farm Priority Project, the Victorian Government estimated water use efficiency increases and productivity increases of 13 to 22 per cent, depending on the farming industry (e.g. dairy, grains, horticulture, etc.).

Irrigation upgrades:

- improve border-check irrigation by lasering, installing reuse systems, automating bay outlets, facilitating fast , establishing farm channel reconnections or installing pipes and risers
- install irrigation scheduling equipment including soil-, plant- or weather-based monitoring systems to calculate crop water requirements and water budgets
- lay piping and lining farm channels
- convert border-check irrigation systems to pressurised systems, including conversion to centre pivot, linear move, fixed sprinkler or surface and sub-surface drip systems."

Salinity: The draft report refers to two strategies are available to deal with salinity (page 30, lines 22-27). We note that the draft report covers a more worldwide perspective where in most cases salinisation of productive land is occurring due to salts being added to soils in cultivation processes, for example, from fertilisers or in the water being used for irrigation (particularly if it is from treated sewage effluent and/or storm water). The two methods described (cultivating more saline tolerant species or allowing leaching to remove the salts) are the two options. It should be noted that leaching would require the amount of salt being added to the soil be reduced through either better fertiliser management and /or lowering the salt level in the water being applied to allow leaching to occur. It would also be enhanced through increase drainage but this could lead to downstream impacts (i.e. the salts do not disappear; they get dissolved in water and moved somewhere else in the environment). The draft report focuses on agricultural productivity and does not seem to discuss any environmental risks associated with the transfer of the salts. The Australian dry land salinity issue is slightly different with the salts already in the soil being mobilised through changing land use practise and irrigation that leads to rising water tables. This means that in addition to the options from above, land management, such as tree planting, and optimised irrigation management which would both decrease water table rises, could be added to the list.

Water quality: We do not agree with some of the recommendations to address water quality (pages 76-77). While 'investing in water quality monitoring to address food security and nutrition and public health challenges' is a good idea, we think there needs to be words around monitoring being targeted and risk based otherwise it can be impractical and expensive.

Closing the nutrient cycle in water in wastewater: The recommendation to 'close the nutrient cycle in water and wastewater' should be investigated on a case-by-case basis. We suggest that it is more appropriate for smaller scale cases as economics and health and safety issues of re-using wastewater products as fertilisers have been difficult to resolve. We believe that while there are risks associated with stormwater and sewage re-use, these have to be balanced against the environmental effects and or the health and safety issues associated with the current practices, which may be very unsanitary and environmental damaging, and the benefits of increased environmental water (if extraction is reduced,) decreased nutrient transfer (eutrophication) and pathogen release and increased agricultural productivity.

Development and implementation of water-neutral industrial and domestic water and wastewater strategies: It is not clear to us what the recommendation means. We believe it may mean that significant resources even on the most basic scale, for example, a house that collect roof top rain water (i.e. not a farm dam or other interference with environmental flows), stores it in a tank, uses it for domestic purposes (which may require disinfection), collects the used water, treats it to remove pathogens and excess nutrient and applies it to crop or treats it further for domestic re-use. Even this basic model would require a tank, some plumbing for the collection of the used water, a septic or other biological treatment system, plumbing to and a pump to move the treated water to a crop or back to storage and possibly a disinfection and or filtration system, all of which would cost money to purchase and would require ongoing maintenance. There might need to be some clarification on what this recommendation is trying to achieve.

Water reform processes: we supply a copy of the study below conducted to help understanding the balance between the water needs of communities, industries and the environment as key to achieving a healthy working Basin.

Case study - Sustainable Rural Water Use and Infrastructure Program

'Within Australia, the Murray–Darling Basin is Australia's largest and most iconic river system. It is also one of the largest river systems in the world and one of the driest covering an area of over 1 million km^2. More than 2 million people live in the Murray–Darling Basin, with more than 1.3 million people who live outside the Basin also dependent on its water resources.

Irrigated agriculture in the Murray–Darling Basin makes an important contribution to the Australian and regional economies. In 2010–11, the Basin accounted for 61 per cent of Australia's total area irrigated and 40 per cent of Australia's irrigating agricultural businesses (ABS 2012). These businesses undertake a variety of irrigated agricultural enterprises, including vegetable crops, perennial tree and vine crops, pastures for grazing, hay, rice, cotton, cereals and oilseed crops. Many of these enterprises rely heavily on irrigation water.

Ensuring a balance between the water needs of communities, industries and the environment is key to achieving a healthy working Basin. The Basin Plan, which came into law on 22 November 2012, sets new long-term average sustainable diversion limits (SDLs) that reflect an environmentally sustainable level of water use (or 'take'). This is the amount of water that can be taken for town water supplies, industry, agriculture and other human or 'consumptive' uses, while ensuring there is enough water to maintain healthy river and groundwater systems.

The Australian Government is meeting the challenges of water scarcity through long-term strategic investments that will improve water management arrangements and deliver a range of water policy

reforms. More than $12 billion has been committed for programs in support of water reform in the Murray-Darling Basin. Of this, over $5 billion will be invested through the infrastructure component of the Sustainable Rural Water Use and Infrastructure Program (SRWUIP). SRWUIP provides funding for rural water infrastructure upgrades to improve water use efficiency on and off farm, with a share of water savings helping to 'bridge the gap' to the sustainable diversion limits in the Murray-Darling Basin Plan."

Miscellaneous general comments

The table below contains miscellaneous general comments for noting on a range of topics found throughout the report that may improve text/language clarity.

Page	Lines	Subject	Existing text	Comment
17	13-14	Groundwater	*Ground water is also often of special relevance because of its better quality, if preserved from source pollution*.	We believe it is not always accurate to describe groundwater as ***better quality***. In Australia, many groundwater resources are characterised by high salinity and acidity, and are vulnerable to contaminants such as heavy metals, industrial chemicals, and pesticides.
32	18-19	Climate Change	*...climate change is causing increased rainfall variability and the frequency of extreme events such as drought, floods, and hurricanes (IPCC 2013).*	In referencing the IPCC Working Group I report it perhaps would be more accurate to reword to '....Climate change is causing changes to rainfall patterns and an increase in the frequency of extreme events such as drought, floods and hurricanes (IPCC, 2013).'
32	29-30	Climate change	*... while they will increase productivity of crops in cool and water abundant environments for a period at least*.	Where nutrients are limited, increased CO_2 may not increase productivity. We suggest changing to '*while they will increase productivity of crops in many cool and water abundant environments ...'*
33	10-11	Climate change	*Rainfall patterns are likely to change in both dry and wet regions though predictions in rainfall changes lack precision.*	Climate change projections do not indicate that rainfall patterns ***are likely*** to change in all regions. In Australia, projections show that some regions (eg. Northern Australia) may not experience changes in rainfall. We suggest instead '*Rainfall patterns **may***

				change in both dry and wet regions ...' In addition, we believe it is not accurate to say "rainfall predictions lack precision". It would be preferable to say, '... *in both dry and wet regions, although in the nearer term (eg to 2030) natural variability is expected to be more significant than climate change in most regions.'*
33	11	Climate change	*More serious will be the intensity and distribution of rainfall.*	This sentence is unclear given the previous sentence includes reference to changes in rainfall patterns, which is the same as changes in rainfall distribution. Further, the paragraph does not yet establish that projections indicate a likely increase in the intensity of rainfall. We suggest removing this sentence and redrafting to '*Climate change projections indicate many regions may experience an increase in the intensity of extreme rainfall. Increased intensity will encourage more runoff ...'.*
42	11-14	Climate change	*Given growing water availability under climate change, irrigation systems will be called upon to provide even more water control .....*	This sentence is unclear as in some regions a decline in water availability is expected. We suggest redraft to *'Given changes to rainfall under climate change, irrigation systems may be called upon to provide even more water control....'*
54	Box 17	Climate change	*The over allocation of water resources, combined with record low inflows and the onset of climate change, were amongst the rationale for an extensive reform of the water governance, ...*	It is not possible to determine a specific time when the 'onset of climate change' has occurred. While climate change impacts may have played a role in the water reforms of the Murray Darling Basin for example, the reforms were implemented primarily due to the over allocation of water resources and low water availability. However, it is important to note that these water reforms help Australia reduce vulnerability to climate

				variability and the potential for declines in water availability and reliability due to climate change.
59	45-46	Climate change	*In the wake of climate change, ...*	'In the wake of' sounds like this is happening after and because of climate change. We suggest redrafting to *'In consideration of climate change'.*
60	26-27	Water storage	*A middle ground is actually to avoid talking about dams but instead to speak about storage and a continuum of storage options that include a 'continuum' of water storage options .....*	We suggest removing phrase 'avoid talking about dams' and simply note that it is important to consider a range of water storage and infrastructure options.
65	30-31	Dams	*Examples of these include the dams movement, ...*	We find it unclear as to what the 'dams movement' is referring to.
79	41	Climate change	*...as well as increasing climate variability etc*	We suggest caution in stating that climate variability is increasing as this is not accurate for all regions. We suggest to redraft to *'... as well as changes to climate'.*
81	41-44	Climate change	*As water variability continues to increase under climate change and extreme events are increasing in intensity and number, ...*	We believe not all regions will experience an increase in water variability and extreme events with climate change. We suggest redrafting to *'As rainfall patterns and water availability change with climate change, and some extreme events increase in intensity and number, ...'*

47. Jonny Greenhill, BIAC, France

Thank you for the opportunity to comment on this draft report. A couple of brief comments:

1. Section 1.3.5 refers to a "grabbing" of water by "big corporates". This sort of language is not constructive and only further accentuates the emotionally-charged public debate on such issues. The text makes it sound as though corporates purposefully withhold water from other parts of society simply for their own use. It needs to be borne in mind that corporates use water in their production processes in order to deliver products that consumers look to buy in global markets. The title and language used in this section of the report should be far more neutral and factual.

2. Section 3.3.1 infers that water pricing can conflict with the basic right to water. On what basis this assertion is founded? The Human Right to Water is quite clear that there is no conflict between water pricing and the right to water.

48. Themba Phiri, South Africa

Hi

Water and food security go hand in a glove, disease morbidity and mortality rates remain very high because of the lack of addressing these two key components. The lack of proper based WASH programs has resulted in many diarrhoeal diseases and some water borne diseases. Water Institutions should after drilling boreholes set up water committees who will in turn built the capacity of other community members, because a lot of contamination happens at the household level, such practices will reduce water problems. Again the lack of climate change implementation practices have led to food and water problems. A lot has been said about climate change, however recurrent droughts and flooding continue to persist because, institutions are not being reliable actors on the ground. On the other hand a lack of motives to move the food security front, researchers should use the farmer first approach and respect indigenous technology ideals.

Regards

Themba Phiri (Technical Specialist)

49. Syngenta , Switzerland

Below are a few of Syngenta comments on the High Level Panel of Experts on Food Security and Nutrition (HLPE) report on Water and Food Security, version zero. Syngenta is an agri-business company researching and developing seeds, seeds protection, and crop protection products enabling farmers to increase yield in an economically, environmentally and socially sustainable way.

Our comments on the report reflect an agriculture perspective and aim to strengthen a connection between agriculture sustainability, food security and water conservation.

1. Impact and dependencies of agriculture on water should be highlighted at the watershed level. Agriculture accounts for the majority of global water withdrawal. It is therefore an integral part of any global or national water strategy. In this context the role of:
    a. Farmers, as land and water stewards, and
    b. Agri-business companies, as solutions and resources providers should be explained in the report.

2. *A map of irrigated farmland* – A geographical map of world-wide distribution of irrigated farmland, guiding on lands that are irrigated and with what type of irrigation, would be an informative piece of information in the report.

3. The Water Resources Group "*Charting Our Water Future*" report highlights how input-use efficiency through better technology and related productivity increases is the economically most viable solution to close the water gap in agriculture dominated economies. It should

therefore be emphasized how productivity gains in agriculture will have long-term improvement in water use efficiency. The following measures could be considered, as they are deemed to be important in this context:

a. Sustainable Intensive Agriculture - *Grow More from Less* – we have to use water wisely and efficiently to grow more food and to reduce water wastages and losses throughout a product's value chain.1 Produce more crops per drop of water, per hectare of land, per hour of labor, per application of crop protection products.
b. We agree with the statement in the report that "*the challenge for irrigated agriculture in this century is to improve equity, reduce environmental damage, strengthen ecosystem functions, and enhance water and land productivity in existing and new irrigated systems.*" However, this could be tackled by focusing on maintaining and improving agriculture water demand and supply balance within a watershed, through for instance:
    i. *Alter traditional crop selection criteria* – to promote consideration of water supply (not water availability) in the crop selection process. For example, substitute water intensive crops by less water intensive crops or imports, in water scare regions.
    ii. *Maintain and improve soil structure* - to enhance soil water holding capacity and reduce soil based evaporation. This is mentioned at places in the report, but benefits of sustainable soil management and use or good water / irrigation management practices in controlling soil erosion and water contamination are not emphasized. (land productivity section)
    iii. *Advance water application systems in crop production* – to encourage adoption of water efficient irrigation techniques: sprinkler or drip irrigation; combined water, fertilizers, and chemical inputs application techniques.
    iv. *Trans-boundary cooperation* - to maintain and improve water demand and supply balance. For instance, there was not much mentioning in the report of the groundwater boom in Asia.

    1.

4. The section on gender equality in water management and use sector could be strengthened, showcasing accruing benefits of achieving such equality. (we recommend to refer to "*Effective gender mainstreaming in water management for sustainable livelihoods: From guidelines to practice*" from Dr. Margreet Zwarteveen, Irrigation and Water Engineering, Wageningen University.)

Policy recommendations

Below are a few proposed policy recommendations for water resource management in agriculture sector that could be considered for the report:

1 Approximately, 70 billion dollars' worth of crops is wasted every year. Additionally, some 15-35% of all crop irrigation is considered unsustainable and underground aquifers are overexploited. This can be seen around the world, such as the River Rio Grande failing to reach the Gulf of Mexico for the first time in 2001.

- The use of water in agriculture should be optimized and water optimization should be prioritized in agricultural policies. Policy frameworks which recognize the interdependence of energy, food, water, and health should be promoted as well as practical, feasible, and time bound water policy targets should be set for the achievement of a sustainable level of water efficiency in agricultural sector. Aim of agri-policies should be to get higher yield from every drop of water in a most sustainable manner, if we are to manage this scare resource more wisely.

2. Policies to be supported by productivity based indicators/metrics, which recognize the interdependence of water with other issues, particularly energy and food, as well as climate. For instance, water metrics based on food calories per unit of irrigated water could be a consideration.

- Improve the targeting of policies to areas where water wastage and pollution is most acute. This could involve:
    - *Integrated planning and management across competing uses of water* - to ensure that everyone gets a fair share of water. For instance, there is no mentioning of water user associations/farmer associations – they can be very effective in managing water use in developing countries.
    - *Establish and strengthen legal and governance frameworks for water* – to facilitate correct mapping and accounting of water scarce regions. For instance,
        - formalization of water sector to facilitate water valuation and establish water rights;
        - build capacity and knowledge of policy makers and decision takers to help them design and implement and to understand the impacts of policies in advance, as well as to monitor and track on-the-ground progress of enacted policies;
        - set-up information systems for dynamic mapping of water sources in order to support farmers, water managers, and policy makers;
        - support training and educational institutes to build capacities at local level to better manage water resources; and financial institutes that benefit rural poor and resource constraint growers to adopt better means for water resource management,
    - *Promote public-private partnerships – to* enhance water use efficiency and to support for inter-basin transfer infrastructure.
    - *Identify and promote technologies that develop and protect water resources* – to enhance agricultural productivity and simultaneously support mechanisms that help in the diffusion and dissemination of these technologies to the ones that need them most.
- Businesses must be encouraged to drive sustainable solutions at scale while linking development goals to core business interests, identifying and managing their impacts and collaboration with governments and civil society. For example,
    - Incentives for efficient irrigation systems could be tied-up to productivity improvements, or even to amount of calories produce.
    - Development of simple and pragmatic water accounting and reporting tools to measure agriculture water intensity (off-rain water).

50. Valerie Issumo, Prana Sustainable Water, Switzerland

Dear All,

For page 35

2.3.1 Dealing with wastewater and marginal quality water

the

ISO/DIS 16075-2

Guidelines for treated wastewater use for irrigation projects --

could be considered

Thanks and best regards

www.pranasustainablewater.ch

51. S. Jeevananda Reddy, India

Comments: Vo Draft – Water and Food Security [Committee on World Food Security – High level panel of experts on food security and nutrition]

Let me present few observations:

General comment: (1) Though the matter is very little but the number of pages are too lengthy, confusing, & hypothetical in nature. (2) In general, it is a poor quality report like IPCC reports. A simple example is Figure 3 on page 16 “Rainfall Variation around the mean”. If we look at the Figure it clearly indicate that only very few shades below the mean line and large shades above the mean line.

Subject comments: In India traditional agriculture provided food security and nutrition security to farming community and those living on agriculture related activities. With the mixed cropping the food produced is nutritious as well the fodder produced is nutritious for animal and thus farming included animal husbandry – milk, meat, etc. The people then were healthy & strong. They used to do hard work. There were no public toilets. All open fields are used and yet they are hale and healthy.

This was changed with the green revolution chemical inputs agriculture. With this pollution became a major factor – air, water, soil & food pollution. This lead to new diseases; these lead to establishment of hospitals & drug manufacturing industry and they in turn introduced new pollutants and new health hazards. This is a mono crop system destroyed the animal husbandry. FAO report showed

food losses around the world is around 30%. My estimate for India was 40 to 50% [I spoke this on All India Radio National Network] – the same figure was reported by Finance Minister in his budget speech in 2010. Supreme Court also pointed out this. The basic problem here was non-availability of storage and timely transport facilities at farmers' level. This wasted to that extent the natural resources that include water. This system works under heavy government subsidies, which is benefitting multinational chemical inputs companies.

Now government of India introduced new food security bill in which they added coarse cereals like pearl millet, sorghum & Ragi in addition to rice & wheat. But the government has not made any provision to collect the coarse cereals by FCI and made compulsory to by the coarse cereals under PDS. Through re-introduction of traditional agriculture, large part of nutrition security could be achieved. Here organic farming under cooperative farming system help to achieve the goal.

The following are some of the observations on pages 7 to 16 and rest I did not like to waste my time and as well your time.

(1) Page 7 lines 17, 18 & 19 – false statements – reducing the nutritional status;
(2) Page 8 lines 45-57 – false logic – population growth and shifts towards increased use of animal based protein in affluent communities;
(3) Page 9 lines 34-38 – not looked into the issue in right perspective – water entering in to the sea, wastage of water through wastage of food produced, through natural calamities, inter-state disputes, within the state disputes, etc;
(4) Page 11 lines 3-8 – It is highly hypothetical statement, on food security and nutrition. The title "Water quality and food security and nutrition" is inaccurate;
(5) Page 14 Box 2 -- is inaccurate statement. Lines 24-25 & Box 3 droughts – "There is some evidence that droughts have become more intense in recent decades" is a false statement and not based on scientific evidence;
(6) Page 15 lines 12-17 to page 16 – inaccurate statement
(7) Page 16 Figure 3 – below the mean are few years and above the mean are too many years;

You can see the following two books of mine [they are available in FAO, Rome Library or at www.scribd.com or Google books]:
1. Agroclimatic/Agrometeorological Techniques: As applicable to Dry-land Agriculture in Developing Countries, 205 pp [1993]
2. "Green" Green Revolution: Agriculture in the perspective of Climate Change, 160 pp [2011]

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Committee on World Food Security

High Level Panel of Experts on Food Security and Nutrition

Water and Food Security

V0 DRAFT

52. Peter Carter, Climate Emergency Institute, Canada

"Weather and climate extremes have significant impacts on agricultural production in the major breadbaskets of the world. Crop failures lead to increased food prices, with significant implications for national economies. The increasing frequency and magnitude of extreme weather events, such as floods, droughts, heat waves, etc., pose potentially disastrous consequences for agriculture and food security, especially in the rainfed areas of developing countries."

— World Meteorological Organization, Weather and Climate Extremes, Food Security and Biodiversity, 24 October 2014

I found the draft document on Water and Food Security interesting and informative. It provides good coverage of the water and food security improvements that are most needed in today's environmental and agricultural situation.

I did not see in the draft any mention of the melting of mountaintop glaciers and snowpack as a threat to water and food security for billions of people, nor the adverse impacts on the best food-producing regions in the temperate northern hemisphere. These would be large omissions.

Furthermore, the reality for food and water security assessment and planning today is that global climate has now changed and is committed to change very much more – for the worse. This is not a case of "can" or "might" change – it is certain. If we don't address water and food security as a dire climate change emergency of planetary magnitude (calling for action today), all the research indicates that our best efforts will provide only temporary relief from an increasingly unpredictable and inhospitable climate with increasing severe and extreme weather events – affecting all nations.

Today's committed global climate change defines world food security and food productivity in all regions.

My main recommendation to the High Level Panel of Experts on Food Security and Nutrition is to immediately communicate to the United Nations Framework Convention on Climate Change (UNFCCC) Secretariat and the FAO that the Intergovernmental Panel on Climate Change (IPCC) 2014 Fifth Assessment Report (AR5) shows world emissions must decline from 2020 (RCP2.6 scenario), for any chance of not exceeding 2.0°C, and that at warming over 2.0°C the IPCC projects all crops in all regions will be in decline, with losses of over 5% for temperate regions and 15% for tropical regions (IPCC AR5 WG2 Figure 7-4). The 2011 National Research Council assessment, Climate Stabilization Targets, which accounts for extreme weather events to some extent, projects 20% losses for selected temperate crops at 2°C global warming.

The crop model projections will tend to under-estimate because of many large adverse impacts not captured by the models. For the same reason, model adaptation projections cannot be relied on.

"Interactions among CO2 fertilization, temperature, soil nutrients, O3, pests, and weeds are not well understood and therefore most crop models do not include all of these effects, or broader issues of water availability, such as competition for water between industry and households. There are also uncertainties associated with generalizing the results of field experiments, as each one has been conducted relatively few times under a relatively small range of environmental and management conditions, and for a limited number of genotypes. This limits breadth of applicability both through limited sample size and limited representation of the diversity of genotypic responses to environment."

— IPCC AR5, Working Group 2, Ch. 7, p. 495

According to the IPCC (AR4 WG2 Figure 3.6), multiple adverse health impacts increase at below 1.0ºC, affecting the most vulnerable populations. For labour-intensive food production in vulnerable populations, this will add to the crop losses and, because of the negative interactions, bring about food production failures.

Model Projections

IPCC AR5 (2014) crop model ensemble:

Temperate regions: maize –5%, wheat –7%

Tropical regions: maize –11%, wheat –17%

National Research Council: Climate Stabilization Targets 2011 (2010):

Temperate: US maize –22%, India wheat –20%

Schlenker and Lobell (2010), Robust negative impacts of climate change on African Agriculture:

Available research on crop losses in Africa at 2C°: from 5-18% depending on crop

To assess food security risk (especially in view of the many large adverse impacts not captured by the crop models), it stands to reason that we would take groupings of the IPCC AR5 models that project the greatest decline. This results in crop yield declines of 30 to 50% for all regions, depending on crop, at 2.0°C global warming.

Having signed off on the AR5, all governments have approved the RCP2.6 best-case scenario, which has emissions declining from 2020. As RCP2.6 is the only IPCC scenario to limit warming to 2ºC, all governments are therefore obligated to act on RCP2.6 by declining their emissions from 2020 at the latest. Responsible international organizations are obligated to communicate this single, simple aspect of the AR5 urgently and widely.

Adopting the RCP2.6 scenario and ensuring that world emissions start to decline by 2020 or sooner means immediate policies by the governments of all nations to limit future crop yield losses. This is of the utmost urgency because the Lima COP20 UN Climate Conference takes place this year (December 2014). These policies must be written into the global agreement to be developed in Lima, for a new UN treaty to be signed at the Paris COP21 in 2015, a year later.

Also, the Panel should point out that IPCC assessments since 2001 (beginning with the Third Assessment Report, TAR) have projected that the most vulnerable developing nation populations would suffer climate-driven negative effects on crop yields and loss of food security (which are already happening) at 1.5°C and that very large losses at 2.0°C make this an emergency human rights issue.

The IPCC AR5 crop models show that all major crops in all major food-producing regions decline at a warming of 2.0ºC and that all crops in tropical regions decline at 1.5ºC. With higher degrees of warming, crop yield declines increase. This is a big change from past assessments, which reported that all crops in all regions would decline at 3.0ºC. The big change is that models now project that northern hemisphere temperate crops decline at 1-2ºC (depending on the crop). The general crop models do not capture extreme weather events, like extreme heat episodes. The IPCC AR5 shows extreme weather events are already increasing and will increase more with continued emissions (IPCC AR5 WG2 SPM Reasons for Concern).

The V0 Draft does not include the effect of mountaintop glacial and snow melting, which is predicted to affect natural irrigation at under 1.0ºC of warming for more than a billion people.

Complex localized negative impacts on smallholders, subsistence farmers and fishers – the largest source of world food production and the main source for Africa and the other most vulnerable regions – are predicted at under 1.0ºC global warming (IPCC AR4 WG2 Figure 3.6).

Crop yield insecurity in the temperate regions will further severely affect food security for vulnerable populations due to world food price volatility and increases. Regions of famine are unlikely to receive food aid because of crop yield uncertainty and declines in temperate regions. In the future, these populations affected by famine will increase and the death rate will increase many times over.

That means we are in a committed climate change world food security emergency. We cannot avoid a warming of 1.5ºC even if emissions decline from next year, due to climate system inertia. Most climate experts think it is too late to avoid going over 2.0ºC, which is disastrous to devastating for world food security.

What happens if we continue to allow a few governments to prevent any new climate treaty to switch increasing emissions into decline?

The only plan right now is to continue the same global growth in the fossil fueled economy and emissions of the past 15 years, which heats the planet 6.0ºC by 2100 (IEA) and risks a warming of over 7ºC by 2100 (IPCC AR5 WG3). If there are no improvements on current national formal pledges to the UN (and if all pledges are honoured), we will be at 4.5ºC by 2100 (Climate Interactive), which is a long-term commitment to over 7ºC after 2100.

Most nations want a binding UN agreement by 2015, with a warming limit under 1.5ºC, and emissions declining from 2015. A few nations continue to block any progress in the UN negotiations and are holding out for individual "voluntary" national "contributions," which is no new agreement at all.

The V0 draft has a lot of good ideas on adaptation and agricultural resilience. A long-standing principle of climate change science is that adaptation has to be combined with mitigation. Therefore these ideas cannot work for long if at all unless they are applied in the context of declining

greenhouse emissions. It is wrong to recommend adaptation to climate change without urging mitigation of climate change.

I also bring to the attention of the Panel that food production methods in both developed and developing nations are a major source of greenhouse emissions. That is to say, current food production is committing us to declining food productivity. This includes:

- CO2 (deforestation for pasture mainly)
- black carbon (soot), which is second only to CO2 in changing the climate (emitted by deforestation, slash and burn farming, primitive cook stoves)
- methane (emitted by livestock and rice paddies)
- nitrous oxide (emitted by manure and chemical fertilizer-intensive agriculture)

We have lost our food security to committed global climate change. If we act to rapidly internalize the large externalized costs of energy production and agriculture, we can limit crop losses. Doing this will require a rapid reform of energy and food production subsidies. This is all readily doable, but the sustained obstruction of any UN negotiations progress by a few nation governments, with no new legally binding UN treaty on the agenda, means it won't happen without climate involved international organizations taking an immediate aggressive approach to their recommendations for food and water security under climate change.

53. Ministry of Water and Irrigation , Jordan

Thank you for sending us the HLPE report thorough Jordan embassy in Italy.

Our main comment on the report is the need to stress in the last section on "Rights to Food and Water";the need of International Community to support the Right to water and food for countries with on going conflicts and countries receiving influx of refugee from neighboring countries with on going conflicts. Jordan is one of the countries that is suffering from exreme pressure on its water resources as a result of refugee influx from neighbouring countries.

Best regards

Rania Abdel Khaleq
Dirctor, Finance and International Cooperation
Ministry of Water and Irrigation-Jordan

54. Jan Lundqvist, Stockholm International Water Institute, Sweden

Dear colleagues

a few reflections on HLPE Draft Report: V0 WATER AND FOOD SECURITY
related to suggestions for comments:

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

Agree, it is a very broad topic. Perhaps equally significant, the challenges look very different today and in the future as compared to recent and, of course, historical contexts. Generally, the draft includes a large number of issues and linkages. It is good that you point out the need to look at nutrition security, which implies something more and different than intake of energy (kcal). For this reason, it is important to add something on what nutritional security means. -- Basically, I miss a food system perspective and comments about the drivers in the system. As I read the draft, its focus is on production and partly on supply. Figure 1 on p. 11 may be seen as an attempt to widen the perspective, but it is a complicated Figure and does not highlight the dynamic trends on the demand side. -- You argue that access to water for the poor is restricted due to overpricing (12:40). It is, of course, true that the poor have severe difficulties to access not only water but also other goods and services. I would welcome more comments/arguments; water provision and most water services are heavily subsidized. -- Box 8 (p. 31) is interesting, but the story involves additional interesting details of the political economy. One consequence of the modernization was an increase in production and, as far as I am told, a substantial overproduction in relation to what the market could absorb at prices that farmers expected. That was not the intention. Government had to make costly intervention a second time – Alberto Garrido can tell you more.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

A food system approach would require additional approaches and methodological issues. Metrics and methodologies about nutrition and overeating are missing. -- Your discussion about water scarcity follows conventional views, 23:22 ff. Could be relevant to discuss scarcity in relation to climate variability and as a function of the dynamics on the demand side. You talk about rainfall (page 9) but do not mention soil moisture and how it relates to rainfall, land use and soil properties,

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interact with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

Trade in food means not only virtual water but also virtual land, virtual energy, etc. Export and import of food do not reflect water distribution very much as far as I know?

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

This is a tricky issue. Morally and ethically, there is no, or very little, objection to a rights based approach. The devil is in practice and execution both at macro level (legal provisions and policies, including financing schemes, definition of rights in terms of quantity and quality for whom, and similar) and at micro level (e.g. logistics). There is a need for examples on how the practical challenges can be dealt with. SOFI 2104 offers some interesting examples in this regard. Those examples are, however, not very detailed. Links to subsidies are, for instance, not dealt with. If access to water and food are to be guaranteed under a constitutional rights scheme, I guess it must include all individuals. What happens when some communities do not obtain access? How do rights

link to responsibilities, e.g. payments and ownership? What is the quantity and type of food that should be included in the right to food? Where is the cut-off line above which people are supposed to take care of these needs through their own capacity/abilities?

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

As you can imagine from comments above, I think that a food system approach is warranted, maybe especially if nutrition security is the ambition.

Overall impression: The draft raises a number of important and relevant issues (e.g. nutrition, food safety, water and energy linkages) but the 'red thread' is not clear. Focus is on production and supply side. Some statements are made without proper argumentation (e.g. that water is overpriced). Some concepts (e.g. water scarcity) are discussed in conventional terms whereas nutritional security is mentioned but not defined or discussed. Could be very relevant to link nutrition to water and perhaps GHG emissions – I realize it is a big task.

55. Prosper Monde, Benin

I. PLAN CONTRIBUTION

1 WATER FOR FOOD SECURITY AND NUTRITION (FSN): CHALLENGES FROM GLOBAL TO LOCAL

1. Water for Food Production and Nutrition: Individual and Collective Challenges

2 IMPROVED WATER MANAGEMENT FOR IMPROVED FSN

2. Improved water management for increased food value and added food value

2.1 Water for agricultural systems
2.1.1 Rainfed agricultural systems
2.1.2 Irrigated agricultural systems

2.1.3 Subsidence food production *("Production vivrière de décrue" = cultures vivrières + trous à poissons + etc.*)

2.1.4 Resilience of agriculture to climate variability and change

3 GOVERNING WATER FOR FSN

3. Governing water for FSN: Individual and Collective Responsibilities

3.1 Local water governance regimes: accessing water for FSN
3.2 Water reform processes
3.3 Contestations around water
3.4 National Policies and processes that affect water for food security
3.5 The emergence of a global water governance regime?

3.6 The right to water and the right to food

3.7 Use of water for safe food transport and access: Inland coastal navigation

- **II. CONTENT CONTRIBUTION**

1 WATER FOR FOOD SECURITY AND NUTRITION (FSN): CHALLENGES FROM GLOBAL TO LOCAL

1. Water for Food Production and Nutrition: Individual and Collective Challenges

1.1 Water, key to Food Security and Nutrition (FSN)

- 1 1 1 Charting the multiple linkages
- Figure 1 The multiple interfaces between water and food security and nutrition (FSN)

Contribution : Inland coastal navigation
Interface relate to water use for Access to food, Access to market to sell food crops or food: use of rivers, lakes for transport householders and food products

2 IMPROVED WATER MANAGEMENT FOR IMPROVED FSN

2. Improved water management for increased food value and added food value

Contribution : List of technologies used to extract water

2.1 Water for agricultural systems

Contribution : Groundwater use for house agriculture and giant snails production (urban and rural house) – Promotion of "Maison Nourricière" (opposite of "Maison maçonnerie-désert") by Convivium Nourriture Saine Benin / Network for ecofarming Benin (NECOFA Benin)
Innovations 1: Use of **plastic can** to produce high quality of leaf and fruit legumes for **daily use at home**; more other plants are also concerned not.
Imported plastic cans contained vegetable oil. After this first use the empty plastic cans are used at home for agriculture. Its life delay is very long (above 10 years) in contrary of "Kenyan sack gardening". The quantity of water needed per day is between 1-2 litters depending the period of the year (wet or dry season).
See photos

Innovations 2: Use of **closed plastic can** and **kitchen water re-use** to produce **liquid fertilizers** recycling nutrients waste products, whether animal or crop waste back into the farming process.
Innovations 3: Use of groundwater to produce high quality of Giant West African Snails Achatina for **daily consumption and market at home**.
See photos

2.4 Improving water management and uses in agriculture and food systems
…… Irrigated agro-ecosystems will be affected by climate change in two ways (Wreford et al. 2010, IPCC 21 2014).
Contribution : Research is proving now that there are also Links between increased CO2 levels and **decrease of nutrients in some food crops.**
Contribution : Diversifying with fisheries and aquaculture**, and also Giant West African Snails Achatina**

3 GOVERNING WATER FOR FSN

3. Governing water for FSN: Individual and Collective Responsibilities

3.7 Use of water for safe food transport and access: Inland coastal navigation

56. UN Secretary General's Advisory Board on Water and Sanitation

I am writing you on behalf of UNSGAB, the UN Secretary General's Advisory Board on Water and Sanitation.

Tasked to advance the global water and sanitation agenda, our Board is very concerned about the improvement of water management that will be required to make the necessary increase of food production possible. We believe that the international community should pay more attention to the essential contribution of water to food production throughout its value chain. It is part of our advocacy work. There are too many reports on food security that ignore or underestimate the water-related constraints and opportunities. For example, last September, our Chair highlighted the need for FAO to include water considerations in its Voluntary Guidelines on the Responsible Governance of Tenure[1].

In this context, your future report on Water and Food Security may be very useful. This is why we have read the zero draft dated 1st October that you posted online for comments[2].

In this zero draft, there is unfortunately a draft recommendation with which our Board disagrees totally. This is the last recommendation numbered 12 that aims at "expanding the right to water to water for ecosystems reserves and water for subsistence production".

Further to a Board discussion on the matter, we request that this recommendation is not included in your final report.

As our Board did not discuss the other recommendations, this message is limited to this draft recommendation #12.

In your draft text, this recommendation #12 is not justified with any convincing arguments. Some of the arguments you use are even biased. For example, when the paragraph 3.6.2 mentions that the General Comment 15 to the ICESCR on the Right to water "suggests that States parties should ensure that there is adequate access to water for subsistence farming", this is factually true but, as presented, it makes the reader believe that this statement is a consequence of the Human right to water. However, this is not the case.

It must be noted that the draft text uses repeatedly the wording "right to water" or "human right to water" which hides the fact that the human right that was recognised in international law in

2010 is not a generic "human right to water" but a very specific "human right to safe drinking water and sanitation" (HRSDWS) that has no direct linkage with water for agriculture.

Water resources should not be confused with safe drinking water. Water only becomes safe when it has been purified for human consumption or its natural quality has been controlled to be exempt from any contamination. This is not the water that is needed and used in far larger volumes by farmers and ecosystems. Globally, the volume of 'drinking water' that is used by human beings is 20 times smaller than the volume of 'water' used for agriculture. This means that a generic "human right to water" would be very different from the "human right to safe drinking water and sanitation" (HRSDWS).

It is estimated that today, about half of the world population (more than 3 billion people) do not have its "human right to safe drinking water" satisfied3 and as a result has a harder or more dangerous life than the other half. We note with satisfaction that you refer to the important issue of water safety in sections 1.1.2 and 1.3.3 of your draft report. However, we suggest that the text of section 1.3.3 is made even more precise by taking advantage of the recent findings disclosed by the 2014 report of the WHO-UNICEF Joint Monitoring Programme4: more than 1.8 billion people use contaminated water! It would be also useful to delete the word "safe" from the sentence that introduces the Figure 4 ("Figure 4 shows the delivery of safe drinking water in nine regions across the world.") since this figure 4 provides data on access to improved water sources which may or may not be safe.

Out of respect for these billions of people who must have their needs for safe drinking water satisfied urgently and to avoid delay in the implementation of their human rights, we ask you not to confuse governments and the international community by opening debates on potential amendments of their existing rights established under international law.

The requirement of individual farmers to have the raw water that is necessary for growing their subsistence food is a completely different issue. Its satisfaction depends mainly on local rainfall and on their allocation of other accessible water resources. These are not the main drivers of the satisfaction of the HRSDWS. For all these reasons, the effective satisfaction of the water needs of individual farmers for subsistence production should be ensured through legal frameworks that must not be mixed with the legal framework of the HRSDWS.

Water for ecosystems is a third issue that also requires different regulations. If ecosystems need water of "good quality", this quality is very different from the one that is necessary for the water to be safe for people. These two different quality requirements should not be confused.

For all these reasons and to avoid adding confusions that might be detrimental to the satisfaction of the different water needs of people, farmers and ecosystems as well as of the human rights of people, we ask you not to include in your final report the last draft recommendation #12 that aims at "expanding the right to water to water for ecosystems reserves and water for subsistence production".

This would also require that you make adjustments to the narrative on this question in earlier parts of your report.

Gerard Payen, Member of UNSGAB

[1] We note that your draft report states the same in its paragraph 3.5.1
[2] www.fao.org/fsnforum/cfs-hlpe/water-food-security-V0

57. Secretaría de Desarrollo Agrario, Territorial y Urbano , Mexico

COMENTARIOS AL BORRADOR CERO DEL INFORME "AGUA Y SEGURIDAD ALIMENTARIA"

1. El alcance del tema del agua y la seguridad alimentaria es muy amplio. ¿Cree usted que el proyecto de V0 ha trazado adecuadamente la diversidad de los vínculos entre el agua y la seguridad alimentaria y la nutrición? ¿Hay pruebas importantes o aspectos que el presente proyecto no ha logrado cubrir?

El borrador cero del informe "Agua y Seguridad Alimentaria" contiene información básica para el análisis de los diferentes vínculos entre el agua, la seguridad alimentaria y la nutrición. En este documento se abordan varios temas relevantes, como las dimensiones del agua (disponibilidad, acceso, calidad y estabilidad), el incremento de la demanda del agua para la agricultura, los sistemas agrícolas de riego, los efectos del cambio climático en la producción de alimentos y nutrición, entre otros.

El texto también hace referencia a la limitación que tienen diversos documentos al no abordar el problema de acceso, derecho al agua y su vínculo con la seguridad alimentaria y la nutrición. "La importancia del abastecimiento del agua no debe medirse sólo en términos cuantitativos, sino por el hecho de tratarse de un sistema que cubre una necesidad social básica, por ser el objetivo primero y prioritario de la planificación hidrológica y por satisfacer las demandas de sectores estratégicos" (Paneque, 2006). Este concepto requiere integrar lo siguiente:

- Principios para la inversión responsable en la agricultura y los sistemas alimentarios.
- Directrices voluntarias sobre la gobernanza responsable de la tenencia de la tierra, la pesca y los bosques en el contexto de la seguridad alimentaria nacional.
- Directrices voluntarias para lograr la sostenibilidad de la pesca, a pequeña escala, en el contexto de la seguridad alimentaria y la erradicación de la pobreza.

Se sugiere incorporar una sección que haga referencia a diversas opciones de política pública para asegurar el uso del agua en cuatro dimensiones, como son la seguridad alimentaria, la nutrición en las regiones pobres del planeta y en los grupos de mayor vulnerabilidad como indígenas y mujeres. La carencia de agua es un factor de pobreza que afecta el bienestar de la población y que repercute en la adquisición de alimentos.

Al igual se sugiere dar seguimiento a la Conferencia de las Naciones Unidas sobre el Desarrollo Sostenible, titulado "El futuro que queremos", celebrada en 2012 en Río de Janeiro Brasil, principalmente en los siguientes numerales:

"108. Reafirmamos nuestros compromisos relativos al derecho de toda persona a tener acceso a alimentos sanos, suficientes y nutritivos, en consonancia con el derecho a una alimentación adecuada y con el derecho fundamental de toda persona a no padecer hambre. Reconocemos que la seguridad alimentaria y la nutrición se han convertido en un desafío mundial apremiante y, a este respecto, reafirmamos también nuestro compromiso de aumentar la seguridad alimentaria y el acceso de las generaciones presentes y futuras a alimentos suficientes, sanos y nutritivos.

109 (…) Reconocemos la importancia de que se adopten las medidas necesarias para atender mejor las necesidades de las comunidades rurales, entre otros medios… la reutilización del agua residual tratada y la captación y el almacenamiento de agua.

119. Reconocemos que el agua es un elemento básico del desarrollo sostenible pues está estrechamente vinculada a diversos desafíos mundiales fundamentales. Reiteramos, por tanto, que es importante integrar los recursos hídricos en el desarrollo sostenible y subrayamos la importancia decisiva del agua y el saneamiento para las tres dimensiones del desarrollo sostenible.

120. Reafirmamos los compromisos contraídos en el Plan de Aplicación de las Decisiones de Johannesburgo y en la Declaración del Milenio de reducir a la mitad, para 2015, la proporción de personas sin acceso al agua potable y a servicios básicos de saneamiento y de elaborar planes de ordenación integrada y aprovechamiento eficiente de los recursos hídricos, asegurando el uso sostenible de esos recursos.

120. Reafirmamos los compromisos contraídos en el Plan de Aplicación de las Decisiones de Johannesburgo y en la Declaración del Milenio de reducir a la mitad, para 2015, la proporción de personas sin acceso al agua potable y a servicios básicos de saneamiento y de elaborar planes de ordenación integrada y aprovechamiento eficiente de los recursos hídricos, asegurando el uso sostenible de esos recursos.

121. Reafirmamos nuestros compromisos relativos al derecho humano al agua potable y el saneamiento, que ha de hacerse efectivo gradualmente en beneficio de nuestra población, respetando plenamente nuestra soberanía nacional.

122. Reconocemos que los ecosistemas desempeñan una función esencial en el mantenimiento de la cantidad y la calidad del agua y apoyamos las iniciativas de protección y ordenación sostenible de esos ecosistemas emprendidas dentro de las fronteras nacionales de cada país.

123. Subrayamos la necesidad de adoptar medidas para hacer frente a las inundaciones, las sequías y la escasez de agua, tratando de mantener el equilibrio entre el suministro y la demanda de agua, incluidos, según proceda, los recursos hídricos no convencionales, y la necesidad de movilizar recursos financieros e inversiones en infraestructura para los servicios de abastecimiento de agua y saneamiento, de conformidad con las prioridades nacionales.

124. Destacamos que es necesario adoptar medidas para reducir considerablemente la contaminación del agua y aumentar su calidad, mejorar notablemente el tratamiento de las aguas residuales y el aprovechamiento eficiente de los recursos hídricos y reducir las pérdidas de agua. Destacamos que para lograr esos propósitos se necesita asistencia y cooperación internacionales."

2. ¿El informe abarca adecuadamente la diversidad de enfoques y cuestiones metodológicas, en particular en relación con las métricas y datos para el agua y la seguridad alimentaria? ¿Qué medidas le parecen especialmente útiles y cuáles no?

El documento presenta datos globales sobre el agua, sin embargo carece de indicadores que permitan hacer comparaciones entre los diferentes países del mundo. Asimismo, el documento reconoce que no hay fuentes disponibles de información por categorías de los usuarios de agua, por ejemplo por género o por nivel socioeconómico.

A manera de ejemplo, a continuación se presentan cuatro indicadores incluidos en el Programa Nacional Hídrico 2014-2018.

"1. Índice Global de Sustentabilidad Hídrica (IGSH)

Este índice mide la forma en que se realiza la gestión de los recursos hídricos para lograr la sustentabilidad en las cuencas y acuíferos del país, además de garantizar la seguridad hídrica. Toma en cuenta la cantidad de agua disponible y que se consume por los diferentes tipos de usuarios, la calidad del agua y la administración de los recursos hídricos.

Este índice considera cuatro componentes:

- Grado de presión sobre los recursos hídricos.
- Medición del ciclo hidrológico.
- Calidad del agua.
- Gestión hídrica.

2. Población y superficie protegida contra inundaciones

El indicador determina el número de personas y hectáreas que son protegidos por las acciones de las diferentes instancias e involucrados.

3. Índice global de acceso a los servicios básicos de agua

Este índice permite evaluar el impacto de la política hídrica en tres dimensiones: cobertura, calidad y eficiencia, de los servicios agua potable y saneamiento. Es evaluado a partir de los siguientes componentes que integran nueve variables:

- Acceso a los servicios de agua potable.
- Acceso a los servicios de saneamiento.

4. Productividad del agua en distritos de riego (kg/m3)

Mide la evolución de la productividad del agua en los distritos de riego. El avance se expresará en kilogramos por metro cúbico de agua aplicado. El aumento en la productividad en los distritos de riego mejora la eficiencia en el uso del agua en la agricultura".

Se sugiere incorporar un apartado que aborde el tema de diseño, evaluación y monitoreo de indicadores del agua, que considere aspectos como línea base, método de cálculo y medios de verificación para dar seguimiento metodológico al tema del agua y seguridad alimentaria.

Por otra parte, se sugiere incluir el tema de la investigación y desarrollo en indicadores y datos para prevenir los efectos del cambio climático sobre la disponibilidad del agua, pues las sequias e inundaciones afectan la producción de alimentos y por ende la seguridad alimentaria.

3. La seguridad alimentaria implica el comercio de productos agrícolas y un comercio virtual del agua. El comercio agrícola interactúa con el agua y la seguridad alimentaria de diversas maneras, y de manera particular con los países importadores de alimentos, los países exportadores de alimentos, etc. ¿Cree usted que el proyecto de V0 ha cubierto adecuadamente el asunto?

El proyecto V0 aborda el tema del comercio de productos agrícolas y el comercio virtual del agua desde un punto de vista de la eficiencia en el uso los recursos naturales. Una de las recomendaciones es considerar las importaciones de alimentos como una estrategia viable para garantizar la seguridad alimentaria y nutricional. Esta estrategia atiende a cuando los recursos naturales son insuficientes y se requiere satisfacer las demandas nacionales.

Sin embargo, es importante considerar otros aspectos que pueden afectar a los países importadores de alimentos, tales como las fallas del mercado en la asignación de los recursos y la distribución del ingreso, y la dependencia alimentaria cuando las políticas internas no consideran la productividad en la agricultura familiar.

4. En este informe, hemos considerado la posibilidad de una ampliación del derecho al agua para abarcar también los usos productivos. ¿Qué tipo de problemas prácticos y de política traería esto?

Como primer requisito se tendrían que mejorar los sistemas de gestión del agua para ampliar su disponibilidad, por ejemplo para el caso de México, la disponibilidad de agua per cápita ha disminuido: 18 035 m3/hab/año en 1950 a 3 982 m3/hab/año en 2013; 35 millones de mexicanos se encuentran en situación de poca disponibilidad de agua en términos de cantidad y calidad.

5. ¿Qué acciones/soluciones/enfoques sistémicos (as) serían las más eficaces para mejorar la gobernanza del agua, la gestión y el uso para la seguridad alimentaria?

Pilar Paneque (2004) hace un comentario muy importante que da respuesta a esta pregunta:

“Se requiere una transformación en la política de aguas, especialmente por la prioridad otorgada al uso racional y la accesibilidad al recurso, desde una perspectiva económica y social, a la recuperación del buen estado ecológico de los ecosistemas hídricos y a la participación ciudadana en las decisiones sobre el agua. La participación da entrada a la diversidad de perspectivas y valores existentes en torno a la gestión del recurso y, de esta manera, aumentar la calidad de las soluciones alcanzadas y evitar conflictos posteriores a la toma de decisiones”

También es cierto que cada Dependencia Gubernamental será la encargada de gestionar la manera en la que operará, pero resulta interesante poder integrar esta perspectiva, en torno a la participación de todos los legos interesados.

Para el caso de México, la Comisión Nacional del Agua (CONAGUA), en su Programa Nacional Hídrico 2014-2018 hace mención del siguiente párrafo sobre la gobernanza del agua:

“La experiencia que ha dejado en el sector hídrico la creación, operación y restructuración de los consejos de cuenca, demuestra que la inclusión de los usuarios y la sociedad en la gestión del agua ha sido un proceso más lento de lo esperado y es necesario continuar los esfuerzos para romper paradigmas de paternalismo gubernamental, establecer sinergias interinstitucionales en materia de gestión integrada del agua y buscar soluciones que privilegien el bienestar colectivo.

En materia de gobernabilidad en el sector hídrico, la problemática se relaciona principalmente con la administración del agua, que se ha convertido en un factor que limita el aprovechamiento sustentable de los recursos hídricos y empieza a inhibir el desarrollo social, económico y ambiental en nuestro país".

58. Dinesh Suna, Ecumenical Water Network , World Council of Churches, Switzerland

Comment of EWN to HLPE Study on Water and Food Security (Zero-Draft), Nov 4, 2014

The Ecumenical Water Network (EWN) is a program of the World Council of Churches - a fellowship of 345 churches in 110 countries and represents around 550 million Christians around the world. The EWN has a network of churches and Christian organizations promoting people's access to water and sanitation around the world. The EWN advocates for realization of human right to water and sanitation for all with a justice perspective. Enclosed please find a statement of EWN on water justice.

Thank you for the opportunity to comment on the Zero draft of the HLPE study on Water and Food Security (Zero-Draft) . The Ecumenical Water Network applauds the authors for extensively covering the broad range of water issues related to food security and nutrition. The study is timely initiative as not only water scarcity and conflicts are rising in many regions of the world but are affecting food security severely.

Right to adequate standard of living (recommendation Nr. 12)

We welcome the human rights' approach in the study. As the access to water is vital for food security and nutrition we think it is of utmost importance to secure the legitimate user rights of local communities. We would like to therefore propose some additional points to the recommendations:

- States should recognize the legitimate rights to water under the gamut of right to food , as they are essential for the livelihood of peasants, herders, fishers and others and it needs formal recognition.

- States should put policies and targets in place of its progressive realization. States should respect the water uses of local communities, should protect them against dispossession and take measures to fulfill their water rights. (This goes beyond merely individual rights).

- There is the need for national strategies for both ecologically and socially viable water use. States should ensure that their water policies are transparent and accountable. Water allocation should be fair, taking the food and water needs of the most vulnerable groups into account. Water management should be decentralized and take into account the participation of the water using communities as an important stakeholder.

- States should analyze the coherence of their FSN policy, their water policy with their investment policies. I.e. the investment agreements often undermine human rights.

- States should control the large scale water use by powerful private or public users. All investments (in agriculture, energy, infrastructure, industry and mining, bottling of water, etc) need

to have a thorough water right impact assessment concerning future access to water (blue and green water) and quality of waste water, concerning the impact on local communities and ecosystems.

- By no way states should sell out the rights to private actors (e.g., privatizations of rivers and lakes). Home states shall control corporates also operating in other countries (extra-territorial obligation) and make them accountable on their water use/abuse. Private actors have to follow a "do no harm" approach.

- We consider it very important that States build up grievance redressal mechanism, to address violation of human right to water and that of food!

- States should enhance the participation of the local population and their representations in the governance of water. The principle of Free Prior Informed Consent (FPIC) need to be applied (please add the consent to page 81, line 12).

Gender (Recommendation Nr. 9)

- Women's empowerment and participation in policy developments and decision making is key to overcome the discrimination and marginalization in their access to water.

- The right to water and the rights to food and nutrition need to be seen interlinked with women's rights. Without overcoming the existing gender discrimination practices in our society, the water and food goals cannot be achieved.

Stigma and Discrimination : (missing)

Often Stigma and Discrimination existing in the society, particularly in a multicultural context, can be seen as an impediment to realization of human right to water as well as to right to food. For example Gender, Caste, race, religion, ethnicity, diseases, physical condition can deter a particular individual or community from accessing water or food in a dignified manner, even if there are provisions for . The Special Rapporteur to Human Right to Water and Sanitation, Catarina de Albuquerque has dealt with this issue extensively in her report to the 21st session of Human Rights Council in 2012. This aspect is completely missing from the Study draft !

Water management and Agroecology (chapter 2.4.4)

- This chapter still stays rather general. We would welcome, that it would become clearer that the production systems impact differently on the natural resources.

- To our understanding the long-term and sustainable water availability should be a key criterion for the selection of crops and production method. They need to be site-specific and appropriate to the available natural resources.

- Agroecology is an alternative to the business as usual model of production, which is responsible of many problems, you are describing. Therefore the study should be more specific in order to make clear that agroecology is a system of production, which serves to keep the water where it is needed. Organic agriculture can lead to better infiltration, reduced evaporation through soil coverage, the build up of soil organic matter and enlarged root growth and all together to an increased soil moisture holding capacity. Integrated animal husbandry and low input of chemical fertilizers/ phytosanitary measures uphold the quality of waste water. Physical methods (terracing,

hedges, ditches and walls) help additionally in water harvesting and prevent erosion. Research needs to build up on traditional knowledge system .

Water and Food in occupied territories and protracted crisis: (Missing)

The water and food situation is most at risk in protracted crisis (Palestine, Dafur and others). This is not mentioned in the zero draft, but certainly needs particular attention. We have a clear position on this issue, expressed in a statement on water crisis in Palestine.

To be further explored: Transboundary conflicts

In many regions water is a highly sensitive issue. The use of upstream users of water resources (for purposes of agriculture and electricity production) has a direct impact on the downstream users. Israel's use of water from river Jordan, Ethiopia and Sudan's use of water from the Nile are examples where food security is directly affected. As water is a common good, and the physical nature of water is not limited to a certain territory water government goes beyond boundaries (be it states or regions) and exceed the human rights obligation of states (the same as air pollution or carbon emissions, in the context of climate change). Although it is mentioned under recommendation 7, we believe that the issue is far more complex. This should either be treated in a separate chapter or in a separate following study.

Water foot print (recommendation Nr. 5)

· Water consumption is not only related to growing food demands and changing diets. The water footprint of biomass production for energy requirements, e.g. bio fuel , or new demands from the bio economy need be discussed as well, as this has an impact of water usage on food production when industries consume water for increased biomass production.

- The nexus between energy- water- food in the old and the new "bio"- economy needs to be further analysed.

- States should investigate on how to make the water foot print (i.e. the blue and grey water) transparent (water usage for cotton, sugar, meat can be very different depending on production methods and places of origin).

- The water footprint shall not be burdened on consumers only. States should define goals and ways of reducing the national water footprints.

- Reducing the water footprint should be part of the environmental strategy of a business, as part of their corporate social responsibility. States do have the obligation to control them under their Human Right obligation and extraterritorial obligation.

Recommendation No. 11 (pg 81)

Under the heading "Improved efficiency along food chains and in food systems (2.5)" , "virtual water" has been explained that it makes sense that by using virtual water calculations, water intensive crops/meats can be imported, from countries where there are plenty of water and water starved country make the most of their available fresh water by less water intensive crops. Further in Recommendation No. 11, this argument is put forward that through trade, which is open and fair. However, as we all know, that "fair-trade" is far from reality in today cut-throat competitive market

economy. In water starved countries smallholders and peasants live from farming and husbandry. This approach could drive them out of business by imports (meat from Europe, not from the Sahel - from what do herders live then?) Food imports need to be very carefully thought out keeping these vulnerable groups' interest in mind and not to threaten the right to food of smallholders. Furthermore, the bottom line in virtual water/trade should be t "affordable" for all ! Otherwise, the human right to access water and food will be diluted !

On behalf of the International Reference Group of EWN

Dinesh Suna

Coordinator,

Ecumenical Water Network

World Council of Churches

Carolin Callenius

IRG Member, EWN,

(Focal Point, Right to Food)

59. Philip Goodwin, TREE AID, United Kingdom

The report is a very welcome one. However, the report does not address the relationship between "green infrastructure" (trees and extant vegetation) and water quality and availability.

TREE AID has been delivering a pilot initiative in Northern Ghana aimed at improving water quality and constancy in water stressed environments through improved natural resource management along rivers.

The project has been working with local communities along a 32km river corridor to mitigate silt load and gully erosion of river systems, restore riparian tree cover, develop income opportunities from those trees along with introducing agro-forestry and improved natural resource management approaches.
Our experience indicates that:

- understanding who are the users of the vegetation and plots along rivers is an important first step
- providing alternative income opportunities is crucial for riparian restoration
- participatory analysis of the livelihood opportunities to the [previously un-managed] use of the trees and crop plots along rivers and their relationship to natural resource use is critical to understanding incentives for behaviour change that will deliver long term improvements in water availability
- short-term improvements in water availability locally through the introduction of weirs and sand dams and using locally appropriate (and therefore sustainable) techniques and design is essential to secure support for longer-term initiatives, without significantly impacting downstream flow
- developing local natural resource management committees at site, upstream and downstream is important for managing, policing and resolving conflict over water resources

- with the right approach to community mobilisation, individuals are prepared to give up agricultural land along river banks to increase seasonal availability of water. However, community compensation mechanisms have to be agreed and water governance agreements that reconcile the potential commercial usership with local needs can be achieved.

We are seeking to build on the model we have used in Northern Ghana and extend it to other areas of the Upper Volta river system specifically Burkina Faso.

Indigenous and naturalised tree species are themselves repositories of nutrition through tree foods. They are also an as important influence on crop yields in addition to generating products that enhance the productivity of livelihoods and build nutritional security in water stressed areas.

60. International Dairy Federation, Belgium

The International Dairy Federation (IDF) appreciates the opportunity to comment on the HLPE Water and Food Security Draft V0.

GENERAL COMMENTS

1) This is a comprehensive and thorough report which covers all major issues.
2) More emphasis could be put on recycling of water and sourcing from other sources such as desalination of sea water.

SPECIFIC COMMENTS

1) Page 16: Comments on the poor predictive ability of current rainfall prediction models within the climate change realm (see e.g. the Berg River Catchment area in South Africa which is cited) could be elaborated on and studies accordingly encouraged. This is crucial for expectation scenarios and to manage them on a national, regional and local level.

61. Geoffrey Orme-Evans, Humane Society International, United States of America

Humane Society International (HSI) is one of the world's largest animal protection organizations working to protect all animals. HSI's farm animal welfare initiatives engage stakeholders at every stage in the supply chain for eggs, milk, and meat—including farmers/producers, governments, food retailers, financial institutions, and consumers—to improve the welfare of animals raised for food. We greatly appreciate the opportunity to provide input to the HLPE V0 Draft on Water and food security.

Generally, the V0 Draft could be significantly improved by:

I. More clearly outlining an approach to reduce the overconsumption of Animal Source Foods (ASF) and the related water resource and food security impacts; and

II. Ensuring that approaches pursued and recommended seek to maximize co---benefits and avoid negative tradeoffs, i.e. simultaneously promote and safeguard other important goals of sustainable development, including animal welfare.

Our feedback is formatted to the specific questions posed by the HLPE Project Committee and Steering Team.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

We appreciate the V0 Draft's recognition of the large role that Animal Source Foods play in water pollution and water use. According to the FAO, "The livestock sector…is probably the largest sectoral source of water pollution, contributing to eutrophication, 'dead' zones in coastal areas, degradation of coral reefs, human health problems, emergence of antibiotic resistance and many others."i

However, the role of industrial farm animal production (IFAP) on the emergence of antibiotic resistance is missing from the V0 draft. This issue must be explicitly addressed in future drafts to trigger rapid and strong action on the parts of governments to regulate IFAP. To accelerate weight gain and prevent disease in the stressful and unhygienic conditions characteristic of these industrial settings, many IFAP operations feed farm animals the same types of antimicrobials used to treat human disease. Non---therapeutic antibiotics used in industrial cattle, pig, and chicken operations have led to the emergence of Salmonella and E. coli strains resistant to antibiotics.ii

Freedom from disease, valuable in its own right, is also an important component of food security. Food usage/utilization, or the ability to translate food consumption into positive nutritional outcomes, requires clean water, sanitation, and good health,iii all factors jeopardized by IFAP.

In addition to the threat of disease due to IFAP and non---therapeutic antibiotic use, the rapid spread and growth of IFAP, particularly in developing countries, poses other clear threats to water and food security. In order to further emphasize the severity of problems and encourage policies and action to stem the rise in industrial farm animal production, the document should include more specific evidence/examples of the impacts of animal agriculture on water availability and quantity around the world. For example, water levels in the Perote---Zalayeta aquifer in Mexico have reportedly declined precipitously since industrial pig production first took hold in the region in the mid---1990s.iv Intensive pig production in Southeast Asia has been implicated in the flow of surplus nutrients and minerals into the South China Sea.v A study conducted in a pig producing region of the Philippines reported that the majority of commercial and small---scale pig producers dump waste directly into streams and other waterways.vi The same study reported a variety of negative environmental and public health impacts resulting from the proliferation of large pig farms in the area.vii

More information is available in our white paper, An HSI Report: The Impact of Industrial Farm Animal Production on Food Security in the Developing World.

However, additional studies may be required to motivate governments and industry to address the negative impacts of animal production on water quality and quantity. These studies could focus on areas with high concentrations of farm animals.

Some examples of this geographic clustering exist. Farm animal production is becoming increasingly concentrated and geographically clustered throughout Asia and Latin America.viii Brazil is just one example of a country with high levels of geographical concentration in the pork and poultry industries. For example, in 1992, 78% of Brazil's hen population occupied just 5% of the country's area. By 2001, the proportion of hens housed on this same land area had grown to

85%.ix The percentage of Brazil's pig population confined on just 5% of the nation's land area rose from 45% to 56% during the same time period.x The geographical concentration of farm animal production can cause environmental and public health threats,xi which in turn may reduce worker productivityxii and harm agricultural resources.xiii which are crucial to food security. Additional studies that evaluate food and water security in light of intensive geographic clustering could be useful, and future drafts should call for additional studies.

Even in parts of the world without such dramatic levels of geographic clustering in the animal agriculture sector, additional studies are needed to highlight the impacts of the farm animal sector on water and food security. In many places, there are several concurrent causes of nutrient loading and other water quality issues. For example both untreated human waste and waste from commercial farm animal production facilities may contribute to poor water quality in the same region. It is important for the impacts to be disaggregated, and for all sources of pollution to be addressed.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

Different methodological approaches can yield different perspectives on solutions. This is particularly the case with life---cycle approaches to environmental impacts, both in terms of the metric and categories of impacts evaluated. An example of this is in terms of greenhouse---gas emissions in farm animal production, discussed by Garnett (2011).xiv Thus, the methodologies should be made clear; and holistic approaches—those that evaluate multiple impacts on a variety of sustainability indicators—should be pursued. Metrics that rely on single indicators are not particularly useful. Where they are used, they should be reported in context. Conversely,metrics that incorporate multiple indicators and that are reported in the context of sustainable development are more useful.xv As mentioned above, animal welfare is a key indicator that should be included.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

While there may be a variety of techniques to mitigate the impacts of animal agriculture on water availability and quality, it is clear that a reduction in industrial farm animal production, and farm animal populations overall, are critical to addressing the very serious problems resulting from this sector. We are pleased to see a clear call for reduced consumption of animal source foods. However, the Draft Recommendations from the V0 Draft require more strength and specificity.

For example, Draft Recommendation 5 on changing diets should call for local and national level policies to stem the unsustainable demand for animal products, and initiatives to raise awareness about the health, climate and environmental benefits of reducing meat, egg and milk consumption, particularly in developed nations and amongst higher income urban consumers in mid---income nations. The private sector can also engage by increasing offerings of healthy, sustainable plant---based options and by participating in existing campaigns such as Meatless Monday. Additionally and importantly, future drafts should call on governments to end subsidies that support IFAP.

Further, the V0 Draft needs to clearly state the need to simultaneously promote multiple sustainable development goals, and avoid negative trade---offs. HSI is particularly concerned that animal welfare, an issue of growing global importance, may be compromised if not explicitly considered in

environmental mitigation efforts relating to animal agriculture. More than 75 billion land animals are raised each year for human consumption, and animal welfare is gaining more and more attention from governmental agencies, academic institutions, food retailers,
and producers worldwide. Driven by public opinion, governments throughout the world, including in emerging economies, as well as some of the largest food companies on the planet, have made improvements and commitments to animal welfare. Therefore, the V0 Draft should more clearly outline the holistic approach necessary to addressing water resource and food security issues, as well as specify global development issues of import, including animal welfare.

As stated above, and as indicated by the data in the V0 Draft, reducing reliance on ASF can provide significant improvements in water resource use, as well as provide a basis for enhanced food security. Thus, efforts by governments, private sector, and non---governmental
organizations towards public education, food labelling, or other solutions to reduce unsustainable demand for ASF should be encouraged and pursued.

Thank you.

i Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, and de Haan C. 2006. Livestock's long shadow:
environmental issues and options. Food and Agriculture Organization of the United Nations, p. xxii.
ii Greger, M. 2007. The Human/Animal Interface: Emergence and Resurgence of Zoonotic Infectious Diseases. Critical Reviews in Microbiology 33: 243---299. Pg 259 (salmonella) and Pg.256 (e---coli).
iii World Health Organization. 2011. Food Security. http://www.who.int/trade/glossary/story028/en/. Accessed April 22, 2011.
iv Mendez E, Timoteo A. 2009.Documentó conagua contaminación provocada por Carroll; luego "cedió a
presiones" y lo negó. Periódico La Jornada Miércoles 6 de mayo de 2009, p. 16.
v Huynh TTT, Aarnink AJA, Drucker A, Verstegen MWA. 2006. Pig Production in Cambodia, Laos, Philippines, and Vietnam: A Review. Asian Journal of Agriculture and Development 4(1): 69---90. p. 69.
vi Catelo, MAO, Dorado MA, and Agbisit E Jr. 2001. "Backyard and Commercial Piggeries in the Philippines:
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vii Catelo, MAO, Dorado MA, and Agbisit E Jr. 2001. "Backyard and Commercial Piggeries in the Philippines: Environmental Consequences and Pollution Control Options". EEPSEA Research Report No. 2001---RR6. Ottawa, Canada: International Development Research Centre. http://www.p2pays.org/ref/13/12938.pdf. Accessed July 6, 2011.
viii Food and Agriculture Organization of the United Nations. 2009. The state of food and agriculture: livestock in the balance, p. 4. http://www.fao.org/docrep/012/i0680e/i0680e.pdf. Accessed October 2,
2011.
ix Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, and de Haan C. 2006. Livestock's long shadow:
environmental issues and options. Food and Agriculture Organization of the United Nations, pp. 57---58.
x Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, and de Haan C. 2006. Livestock's long shadow:
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ftp://ftp.fao.org/docrep/fao/010/a0701e/a0701e00.pdf. Accessed October 2, 2011.
xi Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M, and de Haan C. 2006. Livestock's long shadow:
environmental issues and options. Food and Agriculture Organization of the United Nations, p. 262. ftp://ftp.fao.org/docrep/fao/010/a0701e/a0701e00.pdf. Accessed October 2, 2011.
xii Ajani OIY and Ugwu PC. 2008. Impact of adverse health on agricultural productivity of farmers in Kainji
Basin North---Central Nigeria using a stochastic production frontier approach. Trends in Agriculture Economics 1(1):1---7.
xiii Rosegrant MW, Ringler C, and Zhu T. 2009. Water for agriculture: maintaining food security under growing scarcity. Annual Review of Environment and Resources 34:205---22.
xiv Garnett T. 2011. What are the best opportunities for reducing greenhouse gas emissions in the food system (including the food chain)? Food Policy 36:S23---S32.
xv See, e.g., the Intergovernmental Panel on Climate Change's Fifth Assessment Report, Working Group III Chapter 11 on Agriculture, Forestry, and Other Land Use.

62. Jacob Burke, World Bank Group, United States of America

First it has to be asked why a document concerned with the water implications for food security chooses to concentrate its recommendations on water supply and sanitation. No doubt farming communities make multiple use of locally accessed water, but this is hardly a food security issue.

Second, rather than a generic description of water use in agriculture (for which the 2007 Comphrehensive Assessment was produced anyway), a more pointed examination of the water variable in the accepted definition of food security would be welcome.

Finally, the references to groundwater in section 1.2.2 really needs to take account of the authoriative FAO work on the partition of surface water and groundwater sources for irrigation (Siebert, S., Burke, J., Faurès, J.-M., Frenken, K., Hoogeveen, J., Döll, P., Portmann, F.T. (2010): Groundwater use for irrigation - a global inventory. Hydrology and Earth System Sciences, 14, 1863-1880) and the subsequent update of the Global Map of Irrigation Areas (Version)

63. Jack Moss, AquaFed, France

Water and food security - a zero-draft consultation paper

1. Overview

We thank you for giving us the opportunity to study the zero draft of this consultation paper on this very important question.

While there is much in the report to commend it, we regret that we find it both confusing and lacking in the balance and objectivity that is expected from a report for an UN body. Unfortunately, the current draft seems to be a mix of interesting material and facts with unsubstantiated and ideologically motivated assertions. This gives the impression that the report fails to fulfil its mandate and misses an important opportunity to provide good advice for policy makers on this pressingly important subject of water and food security.

Whilst we recognise that this is very much work in progress, we do believe that it requires a significant effort in re-drafting to improve its structure and ensure its readability, balance and credibility for decision-makers. At present, in some sections it reads more as a lobby document for a particular point of view rather than balanced analysis and advice. These comments apply particularly to section 3 of this draft, which seems to have drifted far from the subject and the mandate. We hope that this is unintentional and that it can be corrected by providing a more balanced view in subsequent drafts.

We would suggest that more effort is given to the section on draft recommendations to turn this from a "wish list" to something that provides constructive suggestions for decision makers, not only on what should be done, but also on how to do it.

2. Generic questions

In light of the above we attempt to give generic answers to the five key questions that you pose. This is not an easy exercise and as a result our replies are necessarily limited. However, we hope they will be seen to be constructive and helpful.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

The topic is indeed very broad. In our view the authors have attempted to introduce too many subjects that are not strictly related to the mandate given. This makes it extremely difficult for the reader to identify and comprehend the linkages in a meaningful way. We have made a few suggestions on matters that could be removed from sections 3.2.1, 3.3.3, 3.6.3, etc.

At the same time, some important issues that have very great importance in the real world (water energy linkages, competition for water between food and biofuels, fibre etc., the management of diffuse pollution, economic issues including financing and pricing etc.) are underplayed. A specific example is the pollution of water caused by food production.

The focus of the report is Water and Food Security. It should not be seen or understood as Water for Food at the expense of Water Security.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

On a general level, the metrics and data dimensions of the paper could be developed further to underline the water and food security challenges. At the heart of this is the question of how to grow enough food using no more water than that which is available today. In this regard, we believe the scenarios developed by the OECD in its work associated with the production of the Environmental Outlook to 2050: the Consequences of Inaction, offer an interesting example and useful data.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

This question is an important one and will become more so as the underlying drivers limiting food production and increasing demand for food evolve alongside the development of competing constraints and demands, including those on water. As the report's general philosophy appears to be weighted against the economic dimension of sustainable development in favour of the other two, its contribution to this discussion appears less fertile than it could be.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

It appears to us that the report takes the logic of human rights too far. Mixing the water needs of people with those of irrigation and ecosystems in this report is likely to add more confusion than provide solutions. This would not help decision-makers and is likely to devalue much of the rest of the content of the report. We suggest that the recommendation on extending the existing human to access to safe drinking water and sanitation beyond its current well-defined scope is removed from section 3.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

At this stage, we would suggest the report places more emphasis on the processes of water stewardship as a practical way to enhance water governance, resource allocation, and improve water management to ensure food security in ways that are consistent with the needs to meet other securities. In our experience, water stewardship is a more practical and operational approach to mitigate water security issues than the water footprint one. The water footprint is good for awareness raising, but does little to give real guidance for concrete action. We therefore suggest you add a section on water stewardship.

A more in-depth discussion of how states can develop national policies and priorities to improve water productivity in both rain fed and irrigated agriculture would be beneficial.

It also difficult to see how this question can be answered satisfactorily without a much more serious consideration of the economic dimensions of the challenge, including the questions of costs, price and value. Without this, the capital and operating investments necessary cannot be assessed and nor can the value of the benefits to be generated.

3. General comments on content

Given that this is an early draft, we do not believe it is of much value to make very specific comments on detailed drafting. Nevertheless there are a number of points which we believe it would be useful to highlight. Please do not consider this an exhaustive list.

a. Allocation and reallocation

One of the most difficult challenges that decision-makers will have to face in coming years, is the need to prioritise between competing interests and trade-offs of different parties, both individual and collective interests. At the heart of this will be the need to ensure the water, food, energy, land and other securities of individuals, communities, both state owned and private corporations, the environment, states, regions and global systems. The geographic scale and temporal constraints of these are likely to become less and less well aligned.

Much of this is inherent in the draft report, but obscured by the lens through which the report has chosen to examine this complex subject. Decision-makers at many levels of government will be called on to both allocate limited resources, such as water, and much more difficult, reallocate, which may mean removing or restricting and allocation that someone already has for the good of everybody else. Some such decisions have to be permanent and others temporary to respond to a drought or similar event. There are real practical challenges to align individual rights and collective interests. Whilst the report rightly draws attention to the need to include all stakeholders, including those with a weak or no voice, the report appears to champion these latter stakeholders without helping policy makers develop policies that satisfy all water demands simultaneously.

b. Pollution prevention, protecting water quality, water reuse and resources recovery

The questions of preventing pollution, catching and removing polluting substances from used or polluted water so the water can be reused safely and of recovering the resources thus removed for beneficial use is becoming widely recognised globally. These questions apply to agricultural as well as urban, industrial activities and to energy production. They are partially mentioned in the report. In our view however, this needs to be reinforced much more strongly because it could help to reduce the difficulties just mentioned above.

In many cases, agricultural activities are the cause of very significant amounts of both “point source” and “diffuse” pollution. Poor agricultural practices, including uncontrolled discharges, polluted run-off and erosion are one of the most serious causes of damage to the aquatic environment worldwide. They pose a real threat to water security at all levels. At the same time, they reduce the amount of usable water and lead to expensive waste of other resources.

Recent and ongoing work by the OECD could be referred to in this context.

Governments, farmers, food processors and consumers all need appropriate information, incentives, regulations and penalties, designed to overcome these pollution related issues. Action needs to be taken that is encapsulated in the 3R’s approach: Restrict pollution at source, Remove pollution from water after use and Reuse the water and other resources beneficially. We believe that there is considerable scope for the report to be reinforced to highlight this as a very important way of improving the water-food-energy-land security nexus.

It should also be recognised that the reuse of urban wastewater is growing steadily throughout the world as a means of mitigating water scarcity. It would be useful to add a paragraph to section 2.3.1 explaining that to mitigate potential health difficulties, WHO has produced guidelines that are periodically reviewed and improved[1].

The concluding point of the policy recommendations on page 49 – line 6, should have the words “water reuse and recycling, nutrient recovery and reuse” added after the words “urban agriculture”.

c. Increasing water use productivity in Agricultural production

The section of the report on this topic seems comprehensive. As indicated by the OECD in the Environmental Outlook to 2050[2], there will be little scope for increasing water for irrigation. This point should be introduced more clearly and developed further in the report. It is very important to understand this as a global constraint and quantitative limit to water available for agricultural production. This means that the water productivity of water used in agriculture will need to improve

very substantially. Building a virtuous circle of improved water productivity, primarily in irrigated agriculture, but also in rain-fed production, reduced wastes of water, energy and other related inputs and reduced damage to water resources, needs to be given more emphasis. Could you not also examine the potential for upscaling the approach outlined in section 2.4.4 to cover a wider range of producers than small scale subsistence farmers alone?

d. Section 3.2.1 From Delhi to Dublin

The way the report sets the fourth Dublin principle apart for the other three appears to be very unhelpful. Our understanding is that all four Dublin principles were intended to act together and inseparably. It seems much more helpful to recognise that water is a social good and an environmental and an economic good, and that it is also a common good and a private good. It is all of these things at the same time, with the relative importance of one dimension varying relative to another only in degree depending on circumstances. By isolating the fourth principle from the rest and apparently opposing the economic approach, the report perpetuates an outdated and unconstructive view. It is hard to see why this section is detailed in the report, in particular when it is well-known that water to farmers is under-priced in most parts of the world. This is a tendency that is further exacerbated by the unintended consequences of water and energy subsidies in a number of countries.

e. Section 3.3

As indicated above, several parts of section 3.3 seem to build on this unhelpful approach. Taking account of its title “Contestations around water”, it even appears that this may be the purpose of this section.

Section 3.3.1 valuing and pricing water could be made into a constructive and helpful discussion on the basis of developing the statement made in the first sentence “Water pricing policies can improve efficiency and sustainability when combined with appropriate supporting policies”. For example, the OECD highlights water pricing as a useful policy option to create incentives for water efficiency. “Water pricing can be used to signal scarcity and to create incentives for efficient water use in all sectors (e.g. agriculture industry, domestic). Social consequences are best addressed through well-designed tariff structures or targeted measures. In combination with regulations, standards and public support to innovation, water pricing will curb water demand and make alternative water sources (such as reusing untreated wastewater) competitive.”[3]

There is little in section 3.3. of real use for policy makers. Statements such as “water pricing may conflict with the idea that the provision of water services as a basic right to all individuals if water prices rise to a level that low income households cannot afford”, which is not based on the position of the human right to safe water and sanitation, are misleading and very far from the water for food topic of the report. Other statements have nothing to do with the context being discussed, for example, “and past and controversial attempts at water privatisation”; “The role of the World Bank has been particularly controversial around both the hydropower and privatisation debates.” They should be removed to avoid devaluing the report.

Section 3.3.3 provides a very distorted view of activities of the private sector and does nothing to recognise the constructive contribution made by many different firms and business organisations from different industrial sectors to improve the understanding of water issues including the water food energy nexus. Private companies also provide know-how, processes and technologies and

investment as well as implementing cooperative water management processes with governments and other stakeholders.

The first three pages of this section are exclusively on the provision of public drinking water and sanitation services, which is a long way from the topic of the report. In addition the section presents a distorted picture, implying that private water operators do not see water as a public good to be provided at affordable rates for everybody. This is contrary to the position defended for many years by our Federation of private water operators. This material should be deleted.

f. Section 3.6

Section 3.6 appears to stray further and further from the subject of the report and as a result becomes less and less helpful. It appears to be designed to put pressure on human rights specialists to accept a particular perspective rather than to provide operational advice to those working in the field of food and nutritional security.

The introductory paragraph concludes with the statement "the right to determine and set one's own priorities and strategies." There is a trap in this, because there have to be limits to what the individual can do when this intervenes with or impinges on the rights of other individuals or the community as a whole. This dilemma appears to be recognised in some of the comments in the rest of this section, but no helpful advice is offered..

Section 3.6.3 appears to be designed to exacerbate the supposed controversies rather than to resolve them. Again, much of this section has nothing to do with the subject, particularly box 22, which should be removed since it has no linkage with food security..

4. Draft recommendations

At this stage, we have little concrete to add concerning this section beyond what we said in our introduction. We reiterate that for the report to be truly useful effort should be made to turn this from a "wish list" to something that provides constructive suggestions not only on what should be done, but on how to do it.

As indicated above, we believe that expanding the existing right to safe drinking water to include "water for ecosystem reserves and water for subsistence production" would be detrimental to the billions of people who are still waiting to have their human right to access to drinking water that is really safe satisfied. For this reason, we suggest that recommendation 12 is removed and replaced by a recommendation that focuses on water for food production only.

[1] http://www.who.int/water_sanitation_health/wastewater/gsuww/en/

[2] OECD Environmental Outlook to 2050 : OECD 2012, http://www.oecd.org/env/indicators-modelling-outlooks/waterchapteroftheoecdenvironmentaloutlookto2050theconsequencesofinaction.htm

[3] OECD pamphlet supporting the Environmental Outlook to 2050: the consequences of inaction - key findings on water - OECD March 2012 – p4. http://www.oecd.org/env/indicators-modelling-outlooks/waterchapteroftheoecdenvironmentaloutlookto2050theconsequencesofinaction.htm

64. Zafar Lund, Hirrak development center, Pakistan

Issue of water and food security

Issues of water are following:

1. sweet water sources be made pollution free and sustainable for drinking and agriculture purpose.

2 equal use of agriculture water for poors and influential people.

3. new and cheep methods to be explored for making sweet to underground brackish water.

Solution:

1. All sweet water sources such as rivers and wetlands to be made pollution free by prohibiting use of poisons for catching fish.

2. no cash crops to be grown along 1 km area of the rivers and wetlands where chemicals and insecticides are being used and in this area jungles and trees to be promoted and it to be declared for food crops or as livestock area.

3. such food crops to be promoted that are eco-friendly and takes less water and is also economical for farmers such as wheat from local or natural seeds that can also be cut as grass for 2-3 times for animals before riping it

65. Manfred Kaufmann, Swiss Agency for Development and Cooperation, Switzerland

Thank your for the opportunity to comment on this important report.

The introduction does not mention the purpose and scope of the report. It would be helpful to clearly place this report in the context of the other reports prepared by the HLPE, and also to relate its recommendations to the previous recommendations made in the already published reports.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

The report addresses the broad topic comprehensively, which allows to obtaining a good overview, but in some chapters some more depth would be helpful:

- Chapter 1 would benefit a lot from a number of additional figures and maps, e.g. on global water availability, water scarcity, groundwater resources, expansion of irrigation, land and water use etc. Some of these figures could be taken from the CA report, which is cited extensively anyway.
- A figure on interfaces between water and food security is of major importance, your suggested figure 1 is a good starting point, and I assume that it is only a sketch that will be redrawn in a more professional way.

- Chapter 2.1.3 on resilience of agriculture to climate change is very basic, some more details including IPCC scenarios would be helpful
- Chapter 2.3.1 should be beefed up with more insights and figures on the potential of marginal water use for irrigation, as well as on associated health risk through contaminated food and measures to prevent it.
- Chapter 2.4.4 on agroecology is very general and lacks a more profound water focus. The chapter should qualify and quantify the potential of agroecological approaches to increase water productivity.
- Chapter 2.5.1: The use of the water footprint concept in water for agriculture would deserve a more detailed discussion of opportunities and challenges
- Chapter 3.5.1: The proposed SDG framework is only addressed very briefly and generally. The proposed SDG framework by the open working group suggests in goal 6 e.g. to substantially increase water-use efficiency across all sectors, and in goal 2 e.g to double agricultural productivity and to ensure sustainable food production systems and implement resilient agricultural practices. The way how these goals are finally formulated, how they are measured and implemented is probably one of the main drivers that shapes the water for food security discussion in the near future. The suggested SDG frameworks would thus deserve a much broader discussion. And how do these goals relate to the recommendations in the final chapter?

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

I miss a specific chapter on water metrics and availability of data. Some aspects (e.g. water accounting and scarcity of data) are covered in 1.4 on the dynamics of water scarcity, in chapter 2.4 water productivity is explained (but without giving a clear definition) and in chapter 2.5 the concepts of water footprint and virtual water are introduced. It would also be helpful to give a clear definition of water efficiency (as compared to water productivity), as e.g. the proposed SDG framework speaks about water use efficiency and water productivity. The recent IWMI report “On target for people and planet” gives a good introduction into water productivity, water efficiency and water accounting and could be used as inspiration.

The report mentions the challenge that global, regional and national data often lack granularity to understand the extremely different and local water contexts across the globe. Many global indices and debates in the water domain are highly generalized and often too aggregate to take on board local nuances and differences. The report is silent on how to tackle this challenge and I miss a recommendation that more locally relevant metrics should be developed.

The potential of new ICT approaches to monitoring water resources through both remote sensing and crowd sensing (through mobile phones) and to disseminate relevant information is mentioned in recommendation No 8, but not further reflected in the previous chapters.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

The concept of virtual water is very appealing for informed decision-making on where to grow what crop or whether to substitute domestic food production with food imports. However, in practice such decisions involve huge trade-offs for policy makers in terms of food sovereignty and in terms of economic development of domestic rural areas. The report covers this matter rather briefly. Is there already evidence that the virtual water concept has in fact shaped policy decisions for substitution of domestic food production with food imports? If yes, it would be interesting to mention this.

The challenge with the virtual water concept is that it looks only into one production factor (water) and its application might lead to economic inefficiencies. From a global water security perspective, the decision on where to grow what crop should be rather based on the long term sustainability of water withdrawals for a given area (where demand matches supply without depleting water tables and ecosystems). If long term sustainability of water withdrawals is not given in a certain area, some agricultural water use could be substituted by food import– but not necessarily from a region with the lowest virtual water amount for production, but from a region with a sustainable water use profile.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

The report discusses the existing and potential further linkages between the human right to food and the human right to water. We should definitely consider the human right to drinking water and sanitation and the human right to food jointly and assess their combined effect on protecting livelihoods and water resources. However, the recommendations in the report go much beyond the exploration of linkages, but suggest an expansion of the right to drinking water and sanitation which would include the right to water for productive use and the right to water for ecosystems.

Many developing countries are struggling to respect, protect and fulfil the human right to drinking water and sanitation, mainly due to lack of funds. While the importance of water for productive uses and water for ecosystems is not to be questioned, I don't expect that an expansion of the right to water to encompass productive uses and ecosystems would make any difference on the ground, but instead it could impede the progressive realization of the right to drinking water and sanitation by creating confusion and by shifting priorities and financial resources. It is important that countries respect existing water rights – be they formal or informal – for productive uses of vulnerable groups, but this should be achieved by other means than a human right to productive water use. The practical challenges of a human right to productive water use seem almost insurmountable: One would have to define the water amount for productive use that is sufficient for the right to be respected. This amount will vary significantly even on a local scale according to rainfall, cultivated crop, soil, etc. Furthermore, subsistence farming in developing countries is predominantly rain-fed, to respect a right to productive water use under the variable climatic conditions (and specifically in the case of a dry-spell) would entail the building of massive infrastructure (be it development of water harvesting infrastructure, pipelines or groundwater development) for which the financial resources would not available anyway. And it could potentially result in a misallocation of water that does not reflect economically and environmentally reasonable water use: wherever somebody decides to settle the state would be obliged to provide water for productive use.

As for the right to water to support the ecosystem, which is also suggested to be included in a more comprehensive right to water, the challenges to define what is needed to protect this right would be even bigger. Protecting water related ecosystems should be a matter of both domestic and international environmental law and not of an universal human right to water.

In recommendation 12 it is suggested that “the alignment of the rights to water and food would prioritize the right to water for food production over water use for other uses, at whatever scale”. While this is justified to a certain point, one should not forget the urban poor who depend on a job in order to buy sufficient food. They need industry to provide job opportunities – a too narrow focus that only looks into food security of smallholders misses the big picture and inherent trade-off in achieving food security for all.

Another issue that needs a clearer presentation in the report is the sustainability of water management and managing water within its local limits and its importance for future generations. A human right does not provide an excuse to overuse natural resources for the benefit of present populations and at the expense of future populations. This would go against the sustainability principle (environmental sustainability). This is clearly mentioned in many papers on Human Rights and it is also mentioned in this report but not as explicit (fundamental principle) as one would wish.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

Despite some criticism of the IWRM approach raised in the paper, I strongly believe that this approach, if followed in a pragmatic and flexible way and considering the local context holds the key for improved water governance and water management. The core element of IWRM is to look simultaneously into the different water use sectors and to try to balance the joint water use of all the sectors together with supply in a sustainable way. Existing challenges with the IWRM concept might stem from a too rigid and sometimes donor-driven application, but this does not mean that the concept as such is flawed or not valid. If the IWRM concept is not perceived as a blueprint approach with fixed expectations on the outcomes, but as a transitional process from a mostly informal to a mostly formal water economy, it is still the approach that holds the biggest potential to enhance water governance, including for food security.

66. Adel Cortas, Lebanese Association of the Water Friends, Lebanon

Dear Modeator,

In my capacity as President of the Lebanese Association of the Water Friends,

Please find below my comments on the HLPE Zero-Draft consultation paper entitled "Water and Food Security":

First: General comments.

1- The paper is very well written. It is highly concentrated. It is true. But it covers all the points related to Water and Food Security, all over the World.

2- Due to the importance of the problems discussed and the fact that not many readers have the patience to read all the points covered by the paper, I wish if the authors have expanded para, page 10, from line 14-25, as to make it an Executive Summary of the paper.

3- I know that there are many references, in the paper on the relevance, in many cases, of establishing Water Users Associations, due to the important role they play in the governance and

management of water, especially in developing countries. But, still some would argue that WUAs are not successful in many parts of the world. Is this true or not? Therefore, I would suggest that, starting page 75, on recommendations, a para should be added summarizing all the benefits of establishing Water Users Associations (WUAs).

4- There is no Glossary of abbreviations contained in the Paper. This should be corrected and a Glossary should be added.

5- I would like, kindly, to draw your attention that somewhere in the paper, maybe under governance, water laws customary arrangements, you have to say something about the Andalusian Water Court, in Spain. It is very old. It is in charge of preserving peace among farmers and ensuring fair water distribution.The Court is based on simplicity, verbal communication, speedy arrangementsand decisions and economic and minimal costs procedures.

6- I suggest that, on page 75, the title on the top of the page, should be: Conclusions and Recommendations One of the conclusions I suggest to add is related to further research to be undertaken, mainly in the MENA region by ICARDA, ACSAD, AOAD and AAAID,in areas of water for irrigation and FSN, water vulnerabilities and climate change in the Arab World.

Second: Specific comments.

There are some errata and typing errors, which should be corrected as follows:

1- Page 17-line 30: it should be Figure 5.

2- page 19-line 23: it should be Figures 6 and 7 and Box 5.

3- page 21 - line 18: it should be corrected as follows: energy is that it must be...

4- page 22 Section 1.3.5; Water grabbing should be associated with Land grabbing especially for countries rich in oil, like the GCC countries. They can afford to save on land and water and aim for better FSN

5- page 23-line 33: it should read: figure 8.

6- page 25, lines 25-34: How to produce more with less water? The case of harvesting rainfall in the Philippines, which is a rich rainfall country, they are very skillful in harvesting water rainfall, for domestic use and even for crop irrigation. In the Sultanate of Oman, they have started a very important project of fog collection in Dhoffar. In the whole country, farmers have to rely on the use of hydroponics and drip/bobbler irrigation for the modernization of the system, instead of the surface/flood irrigation, as it is presently practiced

7- page 28-line 26: it should read "figure 9 below" instead of "table 1 below".

8- page 29, lines 1-14: Yields of crops, under rainfed conditions should attract the attention of ICARDA and other CGIAR institutes. These research institutes should make more efforts in research on better high yielding varieties of wheat, barley and sorghum, under rainfed conditions . The concept of GAP (good agricultural practices) in drylands areas and the practice of rotation should be followed scrupulously. Cereals production should be preceded by fallows or legume production in order to maintain good nutritients in the soil for better yields in cereals production.

9- page 29, lines from 28-43: The poultry industry in Lebanon is a good successful example, whereby the business import animal feed from abroad at competitive international prices to produce eggs and broilers. Thus, the country became self sufficient, even exporter, in poultry products. The same for mutton and sheep milk, Lebanon benefits from the transhumance of sheep flocks, coming from Syria, Jordan, Turkey and Iraq, looking for pasture. Some of these flocks will be kept by sheep breeders, in the country, for the production of mutton and milk.

10-page 31-box 8: Changes in irrigation in Spain. What is relayed in this box is a good example and experience which should serve as a model for many MENA countries. This could be communicated to these countries through a training programme administered by the UPM (Union pour la Mediterranee), under the auspices of the European Union.

11-page 32-Box 9- Groundwater regulation. The problem here is how to administer, regulate and control the large number of wells by the Administration responsible for that. In general, the Administration is understaffed to do that in due form.

12-page 56, line 9, para:3.2.1.From New Delhi to Dublin. Here it should be remembered that in the Islamic World, water is considered as a gift of God. Therefore, we should not pay for water, at least for drinking purposes. Hence, the policy all over the Islamic countries, to subsidize the services of potable water.

13-Page 59, Para 3.3.1 Valuing and pricing water: with the present system of pricing and subsidies, in the majority of the Arab countries, we are forcing nature and the environment beyond any permissible limits, which will fire back on the entire economy. Look at Saudi Arabia digging for wells and pumping water for irrigation, as deep as 1000 m, to grow wheat, which is bought by the Government, at a subsidized price of $1200/ton, and sold at the international market for $300/ton. This was an insane policy, which was stopped, fortunately, by the Government.

Best regards: Adel Cortas, President of the Lebanese Association of the Water Friends

67. Right to Food team, ESA and LEGN FAO, Italy

Comments from the Right to Food team at ESA on the V0 draft of the HLPE report on Water and food security

The comments below relate to approaches to water governance/management/use (question 5 of cover letter) and to conceptual issues in the human rights-based approach. The report covers quite a lot of ground including in the human rights aspects of water and food security. A general comment is that the notes and discussions in the different parts could be better streamlined and systematized. We have seven main comments and other relatively minor textual comments.

1. the definition of human rights-based approach (HRBA): The first paragraph of section 3.6 is structured in a difficult-to-read way mainly because it attempts to make a condensed presentation of too many conceptual issues. The legalistic definition of HRBA could be restrictive as the approach is broader than protection “by law and legal mechanisms”. The questions do not quite capture the central elements of HRBA and the more important elements of participation, accountability and inclusion of the most vulnerable come up only later. These elements should actually be used as

defining features of HRBA in the first line – together with non-discrimination, transparency, empowerment... See FAO (2009) Guide on Legislating for the Right to Food, 78-83.

The human rights obligations are also better defined upfront in terms of the respect, protect and fulfil typology – rather than the positive/negative classification as the latter is used based on the potentially confusing criteria of whether the obligations are resource dependent or need actions or omissions.

2. The content of the right to water – entitlement v mechanism: in section 3.6.2, the report recites the elaboration of the right to water by the UN GA and the CESCR. It also refers to normative obligations of non-interference. The obligation to protect could be clearer, for example, in connection with land/water grabbing. The more contentious issue of access to water for agriculture/farming/food production is just mentioned as something recognized in GC15 of the CESCR. The obligation of states (fulfill?/facilitate?) is not clear in this respect, especially in the prevalent contexts of water scarcity. This has to either be clarified or at least be flagged as an issue. The report should further delineate the "entitlement" and "systemic" aspects of the right to water/food and HRBA. There is a tendency to look at the rights to food and water merely as sources of entitlements. In this regard, while it is made clear that the right to water doesn't imply access for free (page 70, line 31), it would make sense to add a similar sentence with respect to the right to food (that it is primarily a right to feed oneself in dignity and not a right to receive food for free) on page 69, Line 29. In the same vein, looking at "water for productive uses" merely as an entitlement could be problematic. The report should clearly highlight that HRBA provides a mechanism that helps manage resources and entitlements in various contexts in fair/equitable ways - by creating an enabling environment through participation, inclusiveness, non-discrimination, accountability, empowerment. It is worth mentioning that HRBA addresses critical governance issues in food security. See FAO (2011) Right to Food Making it Happen: Progress and lessons learned through implementation, pp 6-7.

3. The difference in implications of the right to food and the right to water: the recognition of any right (in a constitution) at least in principle requires that the state takes steps to ensure that its present and future policies and conducts are in line with the requirements of the right. The recognition of the right to water could be peculiar in this respect because it implies or relates to the role of the state in the management of water resources, which are hitherto regulated in non-right-based frameworks or are left to customary or private practices. Food is mainly produced by various (private) actors, whereas water is essentially a naturally available (public) good. The report could be clearer with regard to this difference because these features significantly affect the recognition as well as implementation of the right to food and the right to water. For example, the Parliament of EL Salvador had embarked on the amendment of article 69 the Constitution to provide for the right to food and the right to water. Although the amendment was approved in the first stage in 2012, the reform failed to get the support it needed in the second round of voting in October 2014 mainly because of the debates around the implications of the right to water. See "ACUERDO DE REFORMA CONSTITUCIONAL N° 3. AL ARTICULO 69, REFERENTE AL DERECHO AL AGUA Y ALIMENTACIÓN" (available at http://www.asamblea.gob.sv/eparlamento/indice-legislativo/buscador-de-documentos-legislativos/reformase-la-constitucion-de-la-republica). It is probably for the same reason that there are differing formulations of the provisions on the right to wáter in various national laws - see http://www.righttowater.info/progress-so-far/national-legislation-on-the-right-to-water/#AL

4. The informal food sector: The report should address the issue of access to clean/safe water by small scale "informal" food producers, including street food vendors, on which the livelihoods of millions of people (producers and consumers) depends in developing countries. This is important for

two main reasons. First, without access to clean water or policies that make it possible, the small scale (informal) food producers are forced to remain in the informal sector and would be marginalized from value chains. They are also exposed to arbitrary prosecution/extortion by local governments because of their inability to meet food safety and health standards in a context where that is not realistic or feasible due to lack of appropriate policies and services. Second, poor consumers that depend on the informal food sector are exposed to higher risks to their health than people that can afford to buy food through the formal channels. The number of people that depend on the informal food sector is quite high. In 2007, FAO estimated that 2.5 billion people have a meal provided by street food vendors every day (http://www.fao.org/AG/magazine/0702sp1.htm). Further see FAO (2003) The informal food sector http://www.fao.org/3/a-y4312e.pdf; FAO (2007) Promises and challenges of the informal food sector in developing countries http://www.fao.org/docrep/010/a1124e/a1124e00.htm

5. Transnational human rights obligations: Despite the close relationship between international watercourse law and extraterritorial obligations of states – whether or what obligations one (source) state holds towards people living in riparian (downstream) states - the two are treated in different parts of the report and no relationship is indicated (see page 71, lines 6-12 and section 3.6.5). The report should also address the issues of "regime conflict" (among international watercourse, trade, investment and human rights laws/treaties) and regulation of the conduct of TNCs/private companies more clearly, for example, with regard to their involvement in land/water grabbing that it alludes to. It must, however, be acknowledged that the extraterritorial dimension of human rights obligations, including the regulation of TNCs, is a bone of contention in international law. See FAO (2009) Guide on Legislating for the Right to Food, pp 133-134.

The notes under section 3.6.5 could be systematized. The first paragraph could preferably talk about "regime conflicts" in addition to the existence of lacuna in international agreements. Moreover, although the general focus is on international investment, the section may further look into the right to water issues in international trade and development cooperation. In this regard, the sentence in lines 36-39 on page 73 should be clearer.

6. Reference to relevant provisions of the Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security: Guideline 8(c) calls on states to improve access to and the sustainable use of water. The report should refer to the provision and relevant explanatory materials (e.g., FAO (2009) Guide on Legislating for the Right to Food, section 4.4, pp 212ff - if the South African example on the issue of fixing minimum entitlements to water is to be used, please have a look at the later judgment of Constitutional Court.

7. HRBA-related recommendation: it would be wise for the report to include a recommendation on the importance of following a human rights-based approach in efforts to ensure access to water or in water management/governance. This may complement recommendations 2, 9, 12 and elements of recommendation 10, which should be streamlined or at least be listed consecutively. The recommendations could stress the need for the adoption and implementation of (domestic) legal, policy and institutional frameworks for access to water/water management/the right to water in participatory, non-discriminatory, inclusive and transparent manners and to put in place easily accessible accountability mechanisms that redress possible violations of the right to water. This would go well with the recommendation that CFS should facilitate dialogue/work towards a framework instrument that supports the right to water.

In what follows, we provide specific textual comments with a view to improve the clarity and accuracy of the report in the section relating to the rights to food and water.

Page 69, Line 42: - suggested change "... the right to food is interdependent with the recognition of ...." – as it stands, it looks like a unilateral dependence. Furthermore, in this paragraph, it could be good to refer to the requirement of "free, prior and informed consent" as the criteria to be met in conditions where the listed indigenous people's rights may be infringed with under special circumstances.

Page 70, Line 28:- September of the same year?

Page 70, line 34:- please insert the underlined: "... water and sanitation, the right entitles....

Page 71, lines 11-12:- the last sentence is quite vague – not clear how the advisory nature relates to inclusion in the right to water – is the intention to indicate that the provisions are not binding?

Usage of the term "violation" – violation is a technical term that is used where there is an independent finding that a duty-bearer failed to carry out a human rights obligation. "impairment" or "non-realization" could be alternative terminologies in places such as page 72, line 33

Consistency in the use of some phrases/names – Special Rapporteur on the right to food/water rather than Special Rapporteur for food/water – see page 73, first paragraph

68. D. Mohamed Alsalimiya, Land Research Center - LRC, West Bank

Dear Sir,

Greetings.

On behalf of the Land Research Center- LRC as Palestinian NGO, kindly find below our comments on the HLPE Zero-Draft consultation report entitled "Water and Food Security": as general comment the report is very well written. it covers all the points related to Water and Food Security, as general over the World. For the specific comments please se below our comments:

1. Under the section 1.2. we suggest to add a new topic which is: accessibility to the high tech of water resources in which most of the water is limited as well as determined.

2. Under the section 2.1.2. example from Palestine " application of water harvesting techniques in areas arid and semi arid in the marginalized areas".

3. Under the section 2.4.1. example from Palestine " distribution of suitable drought resistant varieties of field crops, rangeland shrubs and fruit trees in areas arid and semi arid in the marginalized areas".

4. Under the section 3.6.5 rights under threats it should be including the manmade threats such as Israeli Occupation practices against the Palestinian, in this regard LRC reported in the last 4 years that 135 water cistern with average storage size approximately 1350 cubic meter were demolished and 2685 ha from the agricultural land were confiscated by the Israeli Occupation.

5. Under the section 3.1.4 we suggest that to add the Israeli violation against the Palestinian water rights " Israeli occupation in 1967 issued a military orders claiming that all of the region's water resources belonged to Israel and preventing Palestinians from drilling wells or even setting up irrigation systems. Israel also began drilling in the West Bank in violation of the fourth Geneva convention, which prohibits use of resources within occupied territory for the benefit of an occupier settlers. Still, today, as the occupation approaches its 47 years, Israel is bureaucratically obstructing new Palestinian wells and networks, and demolishing Palestinian water infrastructure with bulldozer and during military incursions. Israel also continues to drill deep wells that lower the water table and cause existing wells to be less productivity or dry up altogether.

best regards

D. Mohamed Alsalimiya

69. Tarek Soliman, Egypt

I would like to commend you on such a detailed text, especially when it comes to linking the right to water to the right to food. However, I found the argument in page 70 para 3 lines30- 33 quite alrarming, and does not sufficiently emphasise that the right to water should not be compromised by market based mechanisms, in many cases this is what happens.

In my country, there is a poor allocation of water resources from the Nile especially during Summer, where small farm holders are only given very poor quality water for irrigation, and not regularly enough resulting in crop failures, and decline in the soil quality, making the winter crop even more challenged than the year before. Larger holdings, get better quality water during summer, since these holdings export their produce to Europe, and hence are a more important investment. Like everything else in Egypt, the water allocaion infrastructure needs renovation, and the water allocation for agriculture legislations need to be revised to fit our current reality, where the need exceeds the supply, with no guarantee that there will be enough left for future generations. For that I suggest a binding international treaty for prioritizing the right to water and the measures that guarantee that all individuals enjoy that right.

70. Mary Ann Manahan, Focus on the Global South

Thank you very much for the opportunity to submit our comments on the HLPE. We congratulate the HLPE for hammering out a very timely and long overdue paper linking water, food security and nutrition. Below are my organization's comments on the document.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

We welcome the report as it’s indeed very comprehensive and a successful attempt to link the water with food security, nutrition and other important related issues such as energy. Other issues that we want to highlight, which in some ways have been addressed by the paper:

· Security of access and tenure to land, forests, watersheds and territories for small-hold agricultural communities, agricultural and forest workers, and indigenous communities are crucial to protecting watersheds, aquifers and the overall quality and supply of raw water. Such communities are integral to maintaining the multifunctionality of agriculture in which water is a central element.

· Too much water is captured by manufacturing industry, extractive industry, industrial agriculture and luxury/high end recreation and housing complexes—thus reducing the amount of water available for food and agricultural production. Such sectors and projects are increasingly located in sensitive watershed and aquifer areas, and are responsible for creating actual water scarcity as well socio-economic water scarcity. In addition to capturing majority of the water in the area, they also pollute and deplete water sources, and severely restrict the ability of local communities to access water for food and agricultural production, daily use and other livelihood activities.

· Water connects everyone from the farmer upstream to a city dweller downstream. It ignores all political boundaries and separations. Its pollution or overextraction in one region will affect both people and animals in another region. And it is likely to become the visual symbol of ever increasing climate change, as countries face unprecedented droughts in some regions and devastating floods elsewhere. The good news is that despite the doom-laden warnings of Water Wars, our history has shown that water is more often the cause of cooperation rather than conflict.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

· It is important to highlight that the discourse regarding 'scarcity', 'conflict' and 'security' put forward in the paper will not allow already dominant state and corporate actors to determine the parameters they are willing to accept in confronting the 'climate and water crisis'. In other words, thee discourse on water scarcity should not make things worse for those most vulnerable to the negative aspects of climate change and changed/ing hydrological cycles: water and land capture for the few; marginalization for the many.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interact with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

· Indeed the paper showed through the concept of virtual water, lots of the water we use comes from somewhere else in imported food. But virtual trade of water also highlights the narrative of resource capture by the few and ecological marginalization of the many (socially constructed scarcity vs. physical and economic scarcity). For example, many of the feeds imported by the Netherlands come from supposedly water resource-rich countries such as Indonesia. But this comes at a very high price and oftentimes at the expense of communities' access to water, which instead of being used domestically is used for export agriculture. The proposal for promoting virtual trade of water must be taken with a grain of salt as this can promote water scarcity and insecurity for many and in fact a form of indirect water grabbing as virtual water is an embedded/hidden/embodied water trade to produce commodities, minerals and energy for export.

· Here for example, the Council of Canadians highlighted that Canada is the second net virtual water exporter in the world—amounting to just under 60 billion cubic meter, enough to fill the

Rogers Center in Toronto 37,500 times. The virtual water trade concept, according to their report, is "useful in terms of looking at how impoverished and water poor countries are depleting their water supplies in order to maintain export markets, while other more wealthy countries import most of their water footprint in order to protect their own limited water resources". In essence, virtual water trade (though has its own conceptual limits and use for policy making) through investment and free trade agreements, effectively connects local water availability with global flows of trade and investment.

· A clear example which is connected to the land grabbing phenomenon is the production of biofuels. Water is needed especially during feedstock cultivation—estimates are in the range 500-4000 liters of water for every 1 liter of ethanol. Water consumption and agrochemical use during biofuel production could adversely impact both availability and quality of water (e.g. with runoff and soil erosion the high fertilizer application rates especially for corn crops in Midwestern US provide the greatest flux of nitrogen and phosphorus in the Mississippi river contributing to the hypoxic situation in the Gulf of Mexico). For biofuel processing, you also need 2-10 liters of water per liter of ethanol , which can have localized impacts on water quality and quantity. The assumption here is that as you increase land requirement for biofuels, there is also a corresponding increase in water use and demand .Scientists estimate that we need 50 gallons of water per mile driven using biofuels, and while large quantities of water are also needed to produce energy from traditional sources, the water requirements to produce an equivalent amount of energy from biofuels are comparatively large and more consumptive. The use of “water footprint” can however be a double edged sword—there are studies which show that if you mitigate the water footprint of biofuels, it will be alright to have them, without taking into consideration the land use and changes in property and social relations within which such production happen.

· The problem with focusing too much on scarcity is that it drives the neoliberal agenda, meaning, pricing water correctly and everything will be alright. This is problematic especially when you start to price raw water and the paper already showed the pitfalls of water rights trading in Australia and how it has allowed for the marginalization of small farmers.

· There are many positive points in terms of becoming more resource efficient vs. achieving food security and nutrition at different scales and across different sectors. But policy proposals for such must also challenge the dominant approach to water security, especially at the global governance level, which is security for the few and insecurity for the many.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

· In the context of the multiple crises, especially of a climate changed/changing world, expanding and linking the right to water and sanitation to other rights—the right to adequate food, food sovereignty, livelihood, right to land, and ultimately, to life itself are crucial. It is very important that at this day and age, the FAO and the UN embrace a much more comprehensive approach to the right to water as we cannot separate one from the other. This is why it’s important that the paper highlighted that when we talk about implementing the right to water, we need to understand the other threats to these right such as land and water grabbing, the destruction of our forests, the building of hydropower, mining, and extractive activities, and mega infrastructure, among others that are affecting the quality and availability of water, especially for food production

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

· Very important to revolutionise water management and governance. There are a number of approaches and models on this. One is democratization experiments and innovative models of public service delivery, which also covers rural water management. For example in Tamil Nadu, India, under the engineers of the Change Management Initiative of the Tamil Nadu Water Board, a public utility, water was supplied to 60 million people of Tamil Nadu and irrigation water was delivered to the farms of more than one million families. This was accompanied by attitudinal changes, shifts in perspective and transformation in the institutional culture of water engineers using a process-oriented participatory training methodology based on the traditional practice of Koodam, a Tamil word that means gathering, social space, and consensus-building, implying harmony, diversity, equality and justice. The transformation in the institutional culture of water engineers, and the changes in perspectives and relations between local communities and the Tamil Nadu water utility have facilitated the implementation of the joint management of water resources between them. Women in the communities took a pro-active role in taking care of their water sources, ensuring safe and quality drinking water for all members of the community as well as ensuring water for food production. The communities instituted their own oversight and monitoring systems to check the quality of their water sources. These have been strong positive tools for improving public water service delivery, caring for water sources and instituting community empowerment.

· Notions of what is 'public and publicness' have also been expanded and reclaimed by citizens and people in the global South. In Colombia, social participation has taken on new forms. A national public-community partnership led to the strengthening of communal aqueducts in the country, which is the primary pipeline that delivers water to households as well as to farms. Led by the water movement in Colombia, communities were systematically organized and provided with the necessary technical, legal and economic support to ensure that good quality water is delivered to both the rural and urban areas. Women also played a vital role as leaders in the strengthening and structuring of the aqueducts.

· There are also upstream-downstream partnerships, especially around managing competing claims over the same resource. In the Philippines, there have been initiatives by public utilities that have allowed communities to manage and maintain the water sources for the cities. The public utilities directly invest in agro-ecological farming practices and in community livelihoods, with the idea that a "good environment will produce good water." Public utilities have also taxed or levied industrial and commercial water users and ring-fenced it for watershed protection. In Thailand, the competing demands for water from households, agriculture, tourism and industry has led the different interest groups in the Ping River, one of the main tributaries of the Chao Phraya River, to negotiate and balance such competing demands. The Ping River Basin Committee had brought together various water users such as local non-government organizations (NGOs), residents of communities located upstream and downstream of the river, farmers and indigenous people relying on the river for livelihood and sustenance. The result was mutually agreed on ecologically sustainable and equitable system of water allocation for all.

· Similarly, diverse actors have taken collective actions to protect watersheds and sources of water against the threats of extractive industries like mining. When companies applied to mine inside the Sibalom watershed located in Central Philippines, local community-based water users, village and municipal governments, public water utilities and NGOs banded together to oppose the approval of the applications. They have also invited researchers to conduct studies to estimate the benefits of watershed protection as a means to oppose mining applications within the watershed area. In so doing, the various concerned groups, especially the riparian communities within the Sibalom watershed, were able to gain deeper insights into the laws of nature, motivating them to respect and

understand the interconnectedness of ecosystems, and thereby effectively oppose the mining projects.

· What perhaps the HLPE fails to mention or at least to articulate is the need for a new water vision that looks at the interrelatedness of water, food security and nutrition. The models and examples I mentioned above promote a new vision for water management, one that re-establishes water as commons and prioritises social and ecological justice and democratization within water governance. Water justice is key to ensuring that all communities, especially the poor and marginalised have equal and equitable access to safe, affordable and sustainable water use for various purposes such as drinking, food production, fishing, recreational and cultural uses—even at a time of additional stress.

6. On the recommendations: policies and actions

· The nature of agricultural production being promoted by governments and multilateral development industry negatively affects the quality and availability of water; this includes commercialised and industrial farming, aquaculture, agribusiness operations, etc. In order to restore and maintain the integrity of ground and surface water, and ensure sufficient availability, we have to reorient agricultural production systems away from chemically intensive and extensive agriculture and towards sustainable agriculture. We support the recommendation of the paper to promote agroecology as a viable and practical solution/policy.

· Water is an essential/crucial public good and public service, and should not be privatised and commodified in any form. Instead of public-private partnerships, we urge governments and FAO to accept and promote public-public partnerships through which, governments work with rural and urban communities and societal actors in the preservation, delivery, management, financing and governance of water.

· Water is a key ingredient in the multifunctional nature of agriculture; in fact, water itself can be considered multifunctional: not only does it serve multiple needs and purposes but also, it is used, shared, managed and protected through a variety of local systems in smallhold farming and indigenous communities. Government and multilateral agencies should promote agricultural systems that facilitate and support the multifunctionality of water.

· Rural communities-especially indigenous communities, smallhold and subsistence producers and workers—should have legally guaranteed and secure access and tenure to lands, forests, watersheds and territories.

- This will encourage local commitments and 'investments' to use, conserve and share water.

- It will encourage communities sharing the same eco-systems to work out how to share water, resolve water disputes, etc.

· One of the biggest threats to water quality and availability is large scale, industrial agriculture, especially plantations, monocultures and mono-cropping, etc. Large agribusinesses see water as a factor of production and do not recognise its full ecological, social, economic and cultural value. They tend to externalise the costs of pollution, waste, aquifer depletion and contamination, etc.

Ø Industrial agriculture should be discouraged.

Ø Industrial agricultural companies must be pay for the ecological, economic and social costs ("externalities") of pollution, contamination, aquifer depletion, etc.

· Industries, mining, tourism and recreational resorts/complexes, luxury housing, etc. located in or adjacent to watershed, wetlands and other water catchment areas divert water away from food production, food harvesting, daily use, livelihood activities, aquifer replenishment and crucial environmental flows. These trends are a major cause of water scarcity. As long as governments and multilateral agencies continue to promote high-growth oriented development that does not 'internalise' the social, economic and environmental costs of natural resource use, water scarcity will increase and result in negative impacts on local livelihoods as well as give rise to water related conflicts. In order to redress problems of water scarcity and prevent future scarcities, governments have to start moving towards an ecologically sustainable model of development.

· Water scarcity in relation to climate change cannot be addressed without first addressing the high-carbon, high-energy systems/models of agricultural production, distribution and consumption that are currently dominant. Governments and multilateral agencies must promote and actively support low carbon lifestyles, sustainable agriculture, localisation of production and consumption, and energy saving/conserving technologies.

71. Vijay Yadav, Postharvest Education Foundation (Trainee), India

Correlation of Food Waste/ Food Loss and Water Conservation:

Every food product is produced only after spending its share of resources, may it be water, fertilizers, etc. Wasting food means, indirectly one is wasting all the inputs/ resources spent for its production, processing, marketing etc.

So reducing food waste/ food loss can directly ensure food security and indirectly allow proper utilization of all the virtual water spent for production, processing, marketing the food product. Hence there is grave necessity to mention prevention of Food Wastage/ Food Loss in relation to Water Conservation

Different Levels for prevention of Food Loss/ Food Wastage and Water Loss/ Water Wastage:

Field Level:

Crop Diversification: Growing single crop in large areas at a stretch may lead to production more than needed leading to wastage. Improper production strategy of farmers would result in over production which ultimately leads to wastage and also very low returns to the farmer.

Growing different type of crops in an area and enlighten farmers about advances in farming practices and irrigation systems of different crops, along with care to be taken while harvesting and also after harvest would prevent loss of lots of produce. There should be a government policy to plan production strategy for farmers, to decide crop area based upon demand in the nation.

Improper cultivation practices: Lack of proper knowledge about cultivation, harvesting and package; lot of food grains, fruits and vegetables are lost.

Post Harvest:

Judging proper maturity indices, based upon market availability would prevent food loss to great extent. Enlightening farmers about proper post harvest, packing, storage techniques depending upon on crop, climate and demand would play a very important role in reducing food loss during storage and transport.

Quality of water plays a very major role in maintaining quality parameters of processed products. Storage capacity of processed products also widely depends on quality of water used. While in other hand, export value of processed foods also depends upon quality of water used while processing.

Consumer Level:

Educating people to prevent domestic food wastage by conducting campaigns in communities, schools, colleges and other public places. Make a strong policy to prevent food wastage by levying extra tax on people wasting food in the restaurants.

72. John Passioura, CSIRO, Australia

The report usefully covers many aspects of water and food security. However, in common with many similar high level analyses, it fails to recognise the enormous opportunities for improving the water productivity of semiarid dryland crops, as in, for example, North Africa and the Near East.

While there are often social and economic impediments to grasping these opportunities, the appropriate crop management techniques must be in place when such impediments are eventually removed, otherwise progress will remain painfully slow. Activity in this area in developing countries is often dismal.

Let us take NENA as an example:

An important FAO meeting on water and food security was held in Amman last December. This meeting focused almost exclusively on the region's supply of water for irrigation, the requirements of equity in its distribution, of predictability of supply so that robust plans for its use could be made, and of better techniques for making most effective use of it on farms. Certainly these are all issues that are critical for the well-being of the peoples of this region.

However, there was almost no discussion on rain fed agriculture. Rainwater is also very scarce in the region, and two thirds of the farming households rely solely on it. Further, most of the staple foods, the cereals and grain legumes, are produced on these farms, with a total production that is only 50% of the current requirement. The rapidly increasing population in NENA is certain to result in this proportion gradually falling so that reliance on imports will steadily increase.

Buffering of the supply of staple foods is crucially important for the well-being of the people and for the political and social stability of the region. We only have to cast our minds back to the food shocks of 2008 to realise the importance of this.

The question arises of whether these rain fed farms are achieving the yields they could be. Various estimates suggest that the yields are typically only about a third of what they could reasonably be with the widely available modern varieties. Thus, increasing these yields by 50%, to half of what they could reasonably be, would seem to be an achievable target, which, if met, would substantially reduce the need for imports and provide a cushion against volatility in international prices.

Because yield improvement on rain fed farms has been very slow it may seem fantasy to think that one could increase the yields by 50% even over a decade or two. Nevertheless, there is a precedent of this happening. In Australia in 1985 wheat yields had not improved for thirty years, yet they almost doubled over the next fifteen. The main driving force for this change was that the farmers had been given a very simple way of estimating what their yields should be if limited only by water. This was a highly motivational paradigm shift.

All the farmers had to do estimate their potential wheat yield was to take the seasonal rainfall, subtract from it 100 millimetres to account for water lost by direct evaporation from the soil, and multiply what was left by 20 kg per hectare. Thus, to take an example, for a seasonal rainfall of 300 millimetres, the water limited yield would be 4 t per hectare [(300-100)*20kg], much greater than what they were typically achieving. Such estimates, though crude, motivated them to start looking for reasons if their low yields, that is, to search for constraints to yield other than water. With the help of agronomists, they uncovered a variety of constraints, many of which could be overcome, so that the yields started to increase rapidly. See: Passioura JB and Angus JF (2010) Improving productivity of crops in water-limited environments. Advances in Agronomy 106, 37-75

It may well be possible to repeat this success in many parts of NENA. There are three requirements for doing so:

The first is to expose the farmers to the simple technique for estimating the water-limited yield from the seasonal rainfall.

The second is to engage diagnostic agronomists to help farmers identify possible constraints if the actual yields are well below the estimated water-limited yield. Such unrecognised constraints are likely to be in the soil, for the farmers would surely be aware of constraints that they could see above ground.

And the third is to involve the farmers as full partners in exploring ways of overcoming these constraints.
The opportunity is there. I believe that this report would be much more effective if it strongly emphasised this opportunity and encouraged the application of modern agronomic techniques in dryland agriculture. For we will have to rely more and more on dryland agriculture as water for irrigation becomes inexorably scarcer.

73. Alberto Alonso-Fradejas, Instituto de Estudios Agrarios y Rurales de Guatemala (IDEAR), Guatemala

Estimadas compañeras y compañeros del equipo del HLPE,

Desde el Instituto de Estudios Agrarios y Rurales de Guatemala (IDEAR) queremos hacerles llegar nuestro entusiasmo por este trabajo sobre agua y seguridad alimentaria.

Compartimos plenamente los términos generales del reporte y especialmente su aproximación al agua como un derecho humano cuya satisfacción se encuentra delimitada por relaciones de poder. El estudio es muy oportuno considerando el contexto actual de presión corporativa sobre la tierra, el agua y los bosques que se vive en Guatemala y en otros países y regiones del sur y del norte global ricos en bienes naturales. Nos parece especialmente preocupante la enorme demanda de agua que acarrea la expansión de cultivos como la caña de azúcar y la palma de aceite. Una aproximación a los impactos socio-ecológicos de la expansión de la caña y la palma en Guatemala pueden conocerse en un informe que elaboramos en el IDEAR en 2011: "Plantaciones agro-industriales: Dominación y despojo indígena-campesino en la Guatemala del s.XXI", disponible en: http://www.congcoop.org.gt/images/stories/pdfs-congcoop/Plantaciones_y_despojo-Guatemala-sXXI.pdf (ver especialmente sobre el agua pps. 89-104). Así mismo, queda reflejado en los siguientes materiales audiovisuales

1- Documental Aj´R´al Ch´och (Hijas e Hijos de la Tierra). Subtítulos en inglés (Caracol Producciones e IDEAR, 2012). Disponible en: http://www.youtube.com/watch?v=rgpEvC94OM0&spfreload=10

2- Noticia Tele Sur: "Producción de palma africana contamina norte de Guatemala", en http://www.youtube.com/watch?v=j6BKO4OWyC0

Confiamos en que el presente estudio del HLPE sirva como base para la elaboración de unas Directrices sobre Acceso al Agua y Derecho a la Alimentación en el marco del Consejo de Seguridad Alimentaria Mundial (CSA). Consideramos muy oportuno replicar en el caso del agua la positiva experiencia de las Directrices sobre Tenencia de la Tierra, los Bosques y las Pesquerías en el Contexto de la Seguridad Alimentaria Nacional.

Fraternalmente,

Alberto Alonso-Fradejas.

74. Ernesto Jiménez Olin, Unión Popular Valle Gómez, A.C., Mexico

El tema de Seguridad Alimentaria y Agua debe considerar algunos aspectos que no se mencionan en el Borrador Cero. Uno es la consideración respecto a no diferenciar ya el campo de la ciudad, es decir, considerar el Territorio en sus distintos niveles como un sólo continuo que tiene diversas características tanto urbanas como rurales. Así el agua y la alimentación podrán verse como una unidad interrelacionada que se sirve la una de la otra. se complementan y no deben verse en lo individual.

Otra situación es tomar en cuenta las aportacionjes, conocimientos, tradiciones y experiencias de losm pueblos originarios de todo el mundo. Ellos tienen una concepción de la naturaleza como un todo y no diferencian entre los bienes (producidos) y los recursos (naturales). El agua y la alimentación son parte de la misma naturaleza y en corelación con el territorio lo ven como un sólo Hábitat, la Pacha Mamaen América del Sur, el Altépetl entre los mesoamericanos.

También, el Borrador Cero debería incluir la situación del Cambio Climático y cómo afecta la relación agua-comida. El Panel Intergubernamental de Expertos en Cambio Climático en su informe de principios de noviembre de 2014 señala algunos aspectos que podrían considerarse para el Informe.

75. Montserrat Núñez Pineda, Environmental Life Cycle Sustainability Assessment, France

El informe toma un enfoque incompleto y sesgado de las metodologías existentes para contabilizar la huella hídrica y los impactos ambientales debidos al consumo de agua de los productos agrarios. Un informe con firma de las Naciones Unidas, por sus implicaciones científicas y políticas, no debería mostrar estas carencias.
Concretamente, el informe se limita a comentar la aproximación de la Huella Hídrica de Hoekstra y colegas, mientras que olvida nombrar otras metodologías como la del Análisis de Ciclo de Vida (ACV) y estándares cruciales (ISO 14046 de la huella hídrica) que especifican principios, requisitos y guías para la realización de estudios de huella hídrica de productos y procesos.
El informe habla en numerosas ocasiones de los impactos ambientales debidos al uso del agua en agricultura. La aproximación del ACV proporciona una plataforma ideal para cuantificar estos impactos. Para ello, el ACV contabiliza, en una primera etapa, la cantidad de agua utilizada a lo largo del ciclo de vida de un producto agrícola, desde su producción a la gestión de los residuos que genera (i.e, m3 usados o consumidos). En una segunda etapa, el ACV transforma estos m3 de agua utilizada en indicadores de impacto ambiental, tomando en cuenta las especificidades geográficas y climáticas. El ACV permite comparar el impacto ambiental sobre la biodiversidad y sobre la salud humana de consumir un mismo litro de agua en varios lugares del mundo. El ACV tiene en cuenta no sólo que el agua se distribuye desigualmente en el planeta, dando lugar a zonas más áridas que otras, sino que también toma en cuenta la regionalización de la biodiversidad y de los medios socio-económicos que determinan el acceso al agua para regar o para beber.
EL ACV es una metodología respaldada por la ISO 14046 para realizar estudios de huella hídrica de productos. Por su relevancia en estudios presentes y futuros sobre los impactos ambientales del uso del agua, ni la ISO 14046 ni la metodología de ACV deberían quedar fuera del presente informe.

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76. Watershed Management and Mountains Team, FAO, Italy

HLPE e-consultation to set the track of the study on" water and food security"

Contribution from the Watershed Management and Mountains Team

Thank you for providing the opportunity to contribute to this important discussion.

One aspect which is not adequately reflected in the study outline is the need to protect the world's freshwater resources for which it is proposed to include a separate chapter at the beginning, before dealing with water use, governance and management aspects. Protection of increasingly scarce surface and ground water resources will be of vital importance if we are to cope with growing demands of a rising world population and new challenges stemming from climate change.

With a substantial increase in the demand for food and energy, mobilization of water resources for agriculture and food production will be critically important but there is a need to balance short-term productivity gains in agriculture with the long-term role that water flows provide for maintaining sustainable ecosystem services in landscapes and serving multiple benefits to human well-being. The quantity, timing and quality of water flows in landscapes must be sustained to meet the increasingly competing demands and to balance between a wide range of water uses and users.

Ecosystems such as mountains, forests and wetlands provide crucial water-related services, and the conservation and protection of these ecosystems is of global importance.

A high proportion of the fresh water required for domestic, agricultural, industrial and ecological purposes comes from forested areas in mountain areas. Mountains, covering 27% of the Earth's land area, provide on average 60-80% of the word's freshwater resources while this rate can rise up to 95 % in semi-arid and arid regions. In order to conserve and protect the increasingly scarce surface water resources, both in terms of quantity and quality, increased attention is required for the wise and integrated management of mountain areas.

Wetlands can store excess water during the wet season and release it slowly as water levels fall in the dry season. High altitude wetlands such as glacial lakes, marshes, wet grasslands and peat lands support unique ecosystems and services that sustain the livelihoods of people. They store large quantities of water from rain and glacial melt, feed aquifers, trap sediments and recycle nutrients, enhancing both the quantity and quality of water supplied throughout the year. In arid zones wetlands are vital sources of water in otherwise uninhabitable landscapes. As sources of water, food and fibre, they are critically important life-support systems for the survival of people. They help provide regular water supplies and fertile soils, improve water quality, recharge underground aquifers and lessen the impact of seasonal floods. Inland marshes and vernal pools store water in areas where there are no permanent rivers or streams.

Forests and forested watersheds are particularly important for the provision of freshwater resources. The role of trees and forests in the hydrological cycle by maintaining high water quality, influencing the amount of water available and regulating stream flow and groundwater recharge is more and more being recognized, ultimately contributing to food security and sustainable development.

More attention should be given to forest protection and forest management for the provision of clean water, and one way to achieve this is by increasing areas under forest cover specifically for the protection of soil and water. According to FRA 2010, only eight percent of the world's forests have soil and water conservation as their primary objective.

Watershed management can be a suitable approach to combine natural resources management, agricultural production and livelihoods improvement for the sustainable development of rural landscapes. Watershed management contributes to the regulation of surface water flows, the

reduction of sediment load in river systems and the maintenance of water quality, all indispensable characteristics of surface water systems for successful and sustainable food production.

The International Year of Family Farming 2014 presents an opportunity to focus attention on the merits and challenges of family farming including in mountain areas. The study could therefore make specific reference to the most vulnerable and food insecure small-scale producers who may depend on access to water for their survival and who could benefit tremendously from targeted investments in small-scale water harvesting and water storage as well as low-cost micro-irrigation systems. Fostering local level solutions including the safeguarding of indigenous knowledge and local agro-biodiversity may contribute significantly to a more rational water use and improved agricultural water productivity.

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www.wetlands.org

P. Wolter

Watershed Management and Mountains Team

FAO Forestry Department

12 Feb 2014

77. Forestry Department, FAO, Italy

Dear colleagues,

Many thanks for inviting FO to comment on this zero draft. Since the document is at an early stage of development FO would like to offer a generic feedback rather than detailed comments to the different sections of the text:

1. The draft focuses almost exclusively on “one side of the coin” - water productivity, water use, water governance, etc. Except for the short section on agro-ecology (2.4.4.) the draft hardly makes any reference to the sustainable management and conservation of the source / supply areas of water, e.g. mountains and watersheds. The document should make reference to the fact that 60-80% of the world’s freshwater resources for domestic, agricultural, industrial and ecological needs (in

both upstream and downstream areas) originate in upland and mountain areas and that, accordingly, particular attention should be paid to the sustainable management, development and conservation of these areas.

2. The draft takes a rather sectorial and narrow approach to the theme. The need to apply a landscape approach in the sustainable management of the water resources and to integrate the different landuse systems available within a landscape is almost completely missing. In this context, watershed management could be exemplified as a very appropriate approach: the landscape approach, which is followed by watershed management, is based on land suitability analysis and a multi-stakeholder planning process and accordingly allows for a maximum efficiency in the use of natural resources. In addition, watershed management creates local resilience against climate change as well as adaptation options.

3. The crucial role of forests and trees in the hydrological cycle and in ensuring food security is almost completely missing in the draft. The text should make reference to the fact that forests influence the amount of water available and regulate surface and groundwater flows while maintaining high water quality. Moreover, forests and trees contribute to the reduction of water-related risks such as landslides, local floods and droughts and help prevent desertification and salinization.

Please be informed that inputs were provided in February via the FSN Forum (see attached communication). You will see that this submission in February already raised the same concerns as listed above which means that FO's submission was somehow not considered in the formulation of the 0-draft. FO would like to ensure that this time our contribution does not go unheard. We are available for any further input which might be required in this matter.

We hope these comments are useful at this stage. We assume the proposed additions could most logically be reflected and incorporated in chapter 2 of the draft. We available for any clarification which may be required.

With best regards,

Office of the Assistant Director-General

Forestry Department

78. Pat (JS) Heslop-Harrison, University of Leicester, United Kingdom

Comments on HLPE Water and food security - zero-draft consultation paper from Professor J.S. (Pat) Heslop-Harrison, University of Leicester, LE1 7RH UK.
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I welcome the fact that the FAO Committee on World Food Security has requested the High Level Panel of Experts on Food Security and Nutrition (HLPE) to prepare a report on Water and Food Security. The draft report makes some science-based contribution to the facts and defining needs for water usage and its availability with respect to food security, but in many areas is off-topic and does not cover the ground in relation to the request of the UN Committee on Food Security. Therefore, I have significant reservations about the impact of the report in the present format. At a little over 100

pages, it is far from concise, and is poorly structured, so data, recommendations and the key messages are lost. Unfortunately, I think the draft report also misses key aspects where robust scientific advice is needed to inform political, policy and treaty decisions or recommendations. Although indicated in the Terms of Reference, the target audience and route to implementation of recommendations should be made explicit and the report needs focus. I think that many areas of the third chapter, 'Governing water for FSN', stray into political issues, when the purpose of this report (and the Terms of Reference) is to provide scientific underpinning for robust policy advice.

In particular, I think there are three critical recommendations required in terms of Water and Food Security.

First, a robust, global measurement framework to collect data a world-wide map with high spatial and temporal (seasonal) resolution is required for water availability, usage and quality, throughout the world. This will inform policy decisions and give a base-line for interventions.

Second, a major genetic research effort is required to understand the genetic variation available within current and candidate agricultural plants, and to an extent animals (including fish and insects), as related to the efficiency of water usage; and to study how this variation can be exploited in current and prospective socioeconomic and farming conditions.

Thirdly, education is critical to future agricultural sustainability, ecological management, capacity building and equality. This recommendation should cut across other issues, and is important at all levels from primary school through to post-graduate and farmers.

While I am critical of the excessive length of the report, with discourses on management of somewhat peripheral water-related issues, I believe it does not give enough emphasis to the significant successful (or unsuccessful, and including reactive interventions to water problems) examples where science-based policy changes and management, implemented by farmers and regional governments, have occurred with respect to water and food security (including sustainable usage) usage in many countries over the last century.

- The significant Australian successes are not well covered – they go far beyond the water reform legislation in 2007- 2008; water management has become central in every family farm in that country (many of thousands of hectares) in the last two decades.

- Going further back, the remediation of arguably the greatest human-caused environmental catastrophe, in the 1930s, of the dust-bowls of the Western US, was an example of successful agricultural and water management reacting to a major problem.

- Within this century, two significant new policies are already having major effects on agricultural water usage as well as current and future, The Kingdom of Saudi Arabia has implemented major structural and regulatory changes, away from the plan for high production of cereals (self-sufficiency, as initiated in the 1980s) because it became clear in the 2000s that it is too resource-intensive in terms of water: trade with countries with more water is more efficient and sustainable for cereals. In the Indian Punjab, region-wide changes in agriculture now mean double cropping of much land, but depletion of aquifers was becoming a major possibility; restrictions on irrigation dates are now implemented.

It is good that the report considers the entirety of the position of water in food security and socioeconomic context. However, it is grossly imbalanced: the term 'sanitation' is mentioned no less

than 133 times, more than twice 'drink'... or 'indust'…, or four times 'salin'…! This is but one example where peripheral issues have high prominence, and I think that major rebalancing is required to focus on key issues. As another example where key issues are buried, the global population change is mentioned multiple times (2050 and two billion more people and increase in meat and oil consumption), the global figure means little compared to the impact in individual countries. For example, on page 16, the graph should show population growth for Ethiopia as well as other lines: the progress from famine of 1984 to a reasonably fed population now, with growth from 40 million to 96 million in the same period, is remarkable.

With respect to my three aims set out above,

GLOBAL MEASUREMENT FRAMEWORK

I believe it is important that all countries have a rigorous measurement framework for the status of water with a national, high resolution grid, and finer resolution in the vicinity of open water or aquifers (coasts, lakes or major rivers). The appropriate grid scale and parameters must be defined in conjunction with timescales and resource implications, but my suggestion would be 10km over most areas and 1km in water-impacted regions. There should, though, be robust, evidence-based reasons regarding grid size and where a larger grid is appropriate, as it will be in landscapes with even geology, vegetation and unchanging features. The measurements should include water input, flows/extraction, evapotranspiration, groundwater, water tables, salinity, and BOD among other routine parameters. Page 9 notes "In water, data is very often a challenge for action. Data definition, quality and transparency, precision at lower geographical scales, disaggregation by users, and gaps are the biggest issues." but there is little mention later of the need for international data. Section 8 also has some relevant material.

How will this be implemented? The single mention of "remote sensing" on p79 is extremely weak: it is a key technology for assessment and monitoring of water amounts, distribution, quality and flow; policy definition, development and research on new water usage approaches, even for plant breeding selection approaches. Is it satellite, aircraft, ROV, in situ transponders/sondes? The one mention of remote sensing in the draft report is even in the context of "citizen science" – I would suggest data collection on water is a major duty of every government (as, indeed, it has been up to now) and remote sensing is undoubtably the way to improve the quality and granularity of water data for use by national governments, geographical regions, and international organizations.

As pointed out, water availability is highly variable across time and space and characterised by the complex interactions. Other key methods are isotope analysis with environmental isotopes to assess water resources, recharge of aquifers, nutrient flow and other aspects of monitoring of water and aquifers: training and standardization of these methods is required. There are problems with current published statistics including quality, granularity, comparison/standardization of types.

GENETICS RESEACH

It is remarkable that no mention of different crops and plant breeding opportunities except as "Seed multiplication/drought resistant seeds" and "Crop genetic improvement programme/Animal genetic resources/ Genetic improvements can lead to crops that required less water or are more drought resistant" as a vague reference in a table at the very end (p. 101). Such research is critical to the sustainable intensification of agriculture, and the increase of appropriate, rain-fed or ground-water based, agricultural production systems to feed people without overuse of water resources. Plant breeders and research scientists recognize not only that there are huge differences between

difference crop species in water use and water quality requirements, but there is also extensive genetic variation within existing crop species and their wild relatives. With more research, the genetics can be discovered and applied to ensuring productive agriculture while using less water.

There is also need to consider nutritional aims in the breeding context – of both the plants (beyond water requirements), with respect to nitrogen and other nutrients; and importantly with respect to the nutritional value of the crops, the major impactor on human health.

The genetic needs should be in the context of existing programmes but not exclude potential significant contributors: CGIAR Centres, the Joint IAEA/FAO Genetics and Plant Breeding programme, national agricultural research centers (NARs), Universities and the private sector.

EDUCATION

A key to 'Water and Food Security' is education. There is minimal mention in the report of this aspect beyond a phrase "how to provide small farmers in particular with the necessary information to improve productivity, access to markets etc. In this process, the use of open source software should be the basis of all developments in this field". Why the limitation to small farmers? Why open source? The private sector has an excellent track record in delivery of products to farmers and teaching them how to use them. Indeed, heavily protected technology such as mobile phones, internal combustion engines, personal computers, or even (unnecessary) soft and alcoholic drinks, have the widest market penetration even when 'open-source' equivalents exist. (In the context of open-ness, much more of a problem is that Governments keep publicly-funded data of water use and quality secret.)

The use of water for efficient agriculture starts with the farmer, and it is critical that farmers are given access to up-to-date research and demonstrations of best-practices in water-efficient agriculture. They are the people – female and male – who will make the difference to agricultural water usage and ensure food sustainability. Broader education occurs through early-adopters with demonstration technology, University and NAR outreach centres staffed with people trained to undergraduate or Masters-level. In much of South India for example, the benefits of large numbers of such people are clear in the disease-control and agronomy practices which are now universal. Involvement of communities at all levels, from use of questionnaires through to community partnerships or cooperatives, can deliver sustainable water usage.

Beyond the farmer-level, University research with appropriately trained biologists, agronomists, and geographers is critical to understand the role of water in the environment and food security. Political interference has no part in this science-based training, and there have been problems in implementing and establishing fundamental aspects of agricultural developments. The implementation requires high level governmental support with appropriate funding; international collaborations as the way to develop the new technologies required now and in the next 100 years.

CONCLUSIONS

Unfortunately, I feel that the current Draft report is too vague and does not address key issues. No doubt that major interventions are required to increase the sustainability of use of the world's water, with efficient usage and increased production from agriculture. This can be achieved by measuring water usage, improving the genetics of crops, and teaching people. The policy questions need to be well defined, and lead to high quality and robust scientific advice feeding into those policy questions.

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79. Filiberto Altobelli, INEA, Italy

Dear Collegues,

Firs of all, I would like to thanks FAO for inviting to comment on this paper.

In this draft V0, the topic of water and food security is very broad analized and has been well tackled. Also the nexus water-(food-enery-land) - security has been well observed. The paper is very innovative and stresses the importance of increasing knowledge about scientific issues relating to water in agriculture sector. In fact, they are often under-represented in rural development policies in different countries.

The paper addresses emerging topics like “water grabbing”, often included in the broader context of the global phenomenon of land acquisition, a topic at the centre of international debate, and that has attracted the attention of organizations. International governments, civil society and academic institutions worldwide. The renewed interest in agricultural land by different types of investors - private companies, public-private partnerships, local governments, investment funds has occurred since the 2000s, intensified considerably during the crisis in 2007-2008, through the rent - for a period generally between 50 and 99 years - of large tracts of agricultural land on which to install new business.

Finally, a very detailed analysis is then dedicated to the section of the paper relative to improved water management for improved FSN and important aspects like virtual water and water footprint have been well analysed.

80. IUF , Switzerland

IUF submission to the High Level Panel of Experts for Food Security and Nutrition (HLPE) consultation on water and food security

This comment to the HLPE is submitted by the IUF*, the global trade union federation representing workers in agriculture, food processing and in the hotel, restaurant and catering industries.

The IUF welcomes the decision of the CFS to ask the HLPE to conduct a study on Water and food security. The IUF also welcomes the recognition in the VO draft consultation paper of 1st October that the scope of the topic of water and food security is very broad and the request to identify important evidence or aspects that the present draft has failed to cover.

The IUF believes that the VO draft fails to address the specific situation of agricultural workers and their access to potable water and how this impacts on their food and water security. The 450 million women and men who labour as waged workers in plantations, farms, orchards, greenhouses and other forms of agriculture throughout the world are essential to global food security. They are also

essential to sustainable agriculture and rural development including water conservation and management. See the joint publication by the FAO, ILO and IUF Agricultural Workers and their contribution to sustainable agriculture and rural development.

Agriculture is the major user of the world's water supply yet many thousands of people who work in the sector have no access to potable water in their workplaces. There is no systematic collection of data concerning dehydration amongst agricultural workers but IUF affiliates have extensive evidence of serious health problems, including fatalities, resulting from dehydration caused by lack of access to drinking water in the fields for agricultural workers.

See this account of working in North Carolina's tobacco fields by the President of the IUF- affiliated Farm Labor Organizing Committee.

There is also evidence that the epidemic of chronic kidney disease affecting sugar works in Central America is related to heat stress and dehydration.

The FAO-ILO-IUF report points out that "Because many agricultural workers live where they work, their lives and occupations are inseparable. There is a close link between housing, worker well-being and productivity". The publication goes on to emphasize the connection between inadequate housing, non-potable drinking water and the spread of communicable diseases, citing poor sanitation and water provision documented by the ILO in Kenya, for example. Since the agricultural work environment makes no clear distinction between living and working, pesticide exposure poses particular risks to these workers as well as to the water they share with their families and the wider community.

Another vital link is illustrated by the recent findings against a major sugar corporation in Parbhani district in the state of Maharashtra, India, concerning the environmental and socio-economic impact of water pollution. Pollution of the Mannath reservoir caused by sugar mills led to a dramatic decline in fish stocks and a loss of livelihood for fisher folk dependent on the reservoir. Subsequent investigations showed that this water pollution also affected the health of livestock in the area as well negatively impacting agricultural crop yields, which in turn affected the livelihoods of agricultural workers employed on these farms. This impact on local food production, coupled with rising unemployment in the fishing and farming community, had a far-reaching impact on water and food security and nutrition.

We welcome the draft consultation paper's attention to the impact of climate change on food production and water provision for rural communities and producers, but would also like to highlight the connection between agriculture as itself a major generator of greenhouse gasses, deteriorating water quality and the impact on the agricultural workforce. The 2006 Stern Commission Report identified agriculture as a significant source of climate-changing emissions, stating inter alia that: "Fertilisers are the largest single source (38%) of emissions from agriculture. Agricultural emissions are expected to rise almost 30% in the period to 2020…Around half of the projected growth in emissions is expected to come from the use of fertiliser on agricultural soils". The nitrogen fertilizers which give rise to nitrous oxide – nearly 300 times more potent a greenhouse gas than carbon dioxide – are also the sources of water eutrophication and contamination which are a major contributor to growing water scarcity. Reversing the food system's overdependence on agrochemicals is essential to advancing the agroecological food systems the report identifies as playing an important role in protecting water resources and the right to water in both production and consumption. This reinforces the link between sustainable water management and food production, the living and working conditions of agricultural workers and the role of governments in

realizing the rights to food and to water. The IUF believes that existing human rights instruments – the Conventions and Recommendations of the United Nations' ILO – make this crucial link and need to be integrated into the CFS/HLPE work and all intergovernmental efforts on water security.

The International legal framework on agricultural workers' access to portable water.

The ILO Plantations Convention, 110, 1958, requires the establishment of minimum standards for plantation housing that cover water supply and sanitary facilities (Article 86).

Convention 184 on Safety and Health in Agriculture calls for the provision of adequate welfare facilities at no cost to the worker (Article 19).

The Safety and Health in Agriculture Recommendation 192, 2001, which, in giving guidance on how to implement Convention 184, sets out the obligation for employers to put in place "appropriate measures to protect persons present at an agricultural site, the population in the vicinity of it and the general environment, from risks which may arise from the agricultural activity concerned, such as those due to agrochemical waste, livestock waste, soil and water contamination, soil depletion and topographic changes" (paragraph 5 (e).

Paragraph 10 (a) of ILO Recommendation 192 calls for employers to provide "an adequate supply of safe drinking water".

The ILO's Code of Practice on Safety and Health in Agriculture (2011) contains important recommendations on the provision of safe water and sanitary facilities and makes the link between accessible potable water, dehydration and productivity:

18.1.1 Dehydration quickly reduces physical and mental ability, thus reducing productivity and increasing the risk of accidents. For this reason, the employer must provide an adequate supply of potable water placed in locations readily accessible to workers. The water should be provided in sufficient amounts to meet the needs of all workers at the worksite, taking into account the air temperature, humidity and the nature of the work performed. [p.259]

Further reading on the general situation of plantation workers and how their working conditions, including lack of access to potable water, lead to widespread violations of the right to food can be found in Harvesting Hunger – a joint publication by FIAN, Misereor and the IUF.

The IUF therefore calls on the HLPE to ensure that the next draft of its report on Water and food security addresses the issue of lack potable water for agricultural workers and proposes measures to address the issue of lack of potable water in agricultural workplaces.

These measures should include:

A call to Governments to ensure that (in line with ILO Convention 110 and Recommendation 192) agricultural workers have access to potable water and that labour inspectors assess and report on both the quantity and quality of potable water available to agricultural workers in their workplaces;
A call to governments to ratify ILO Convention 184 on safety and health in agriculture;
A call to governments to promote use of the ILO Code of Practice on safety and health in agriculture.
Ron Oswald

General Secretary

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*The International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations (IUF) is an international federation of trade unions representing workers employed in agriculture and plantations; the preparation and manufacture of food and beverages; hotels, restaurants and catering services; all stages of tobacco processing. The IUF is composed of 390 affiliated organizations in 125 countries representing a combined membership of around 2,6 million.

Annex 1: potable water "systems" for sugar cane cutters in Kenya.

a) Workers bring their own water in recycled containers;

b) Employers organise water distribution in the fields – usually one person goes to where the workers are to fill their containers or give them a cup of water

c) Employers park a water tank at the edge of the fields and workers have to walk back and forth to the tank whenever they need to fill their containers with water

Liquid intake under the strenuous working conditions of cane cutters should be 12 litres of liquid while in the fields. The IUF has never seen such amounts of water available to cane cutters.

There is no information available on the quality of the water available to these sugar workers.

Source: IUF

81. Emily Mattheisen, Habitat International Coalition - Housing and Land Rights Network, Egypt

Thank you to the HLPE for the opportunity to comment on this report.Water and food security is a broad topic and the report does a good job in highlighting many important aspects, however we have suggestions in filling some critical gaps. The below comments also cover the other questions.

Crises/conflict

There is a lack of real analysis/engagement with water as it relates to food insecurity and nutrition in situations of conflict, occupation and war, where water issues are critical and in some cases can prolong or exacerbate conflict, as well as affect all sectors from agriculture, WaSH, food security and nutrition. The issue of protracted crises has been on the CFS agenda for the past 2 years, and it is important that this report reflect that process. We suggest that the HLPE add a section on these issues, including the international legal obligations associated with water insecurity or denial of water resources in conflict, and there are several examples to be used as case studies.

In Palestine, and especially the Gaza Strip, the Israeli government systematically denies water access to Palestinians. One such example that HIC-HLRN documented is the situation Bedouin communities living in the "unrecognized villages" face in the Negev desert; this information can be found in the HIC-HLRN publication "The Goldberg Opportunity", found here: http://www.hic-

net.org/document.php?pid=3832, as well as the over-extraction affecting water levels in the dead sea: http://landtimes.landpedia.org/newsdes.php?id=q3A=&catid=ow==&edition=pg== . It is also critical to examine the case of Gaza, which faces extreme denial of access to water, having devastating effects of food security and nutrition, sanitation and health. A simple search reveals a plethora of information, including the destruction of water infrastructure during the war on Gaza that took place over the summer. Palestine is an area we work closely with, but it is not the only territory affected- there are many other situations that could and should also be studied and highlighted.

Urban/slums/etc

The report touches on issues of urban access to water outside of urban agriculture, but does not provide enough analysis on the real global challenge of water access for vulnerable urban populations, particularly in slums. This challenge goes beyond general public health issues, into real consequences for food and nutrition security, as briefly mentioned in the present report, however it is imperative that we also analyze all challenges and best practices dealing with urban challenges. For this issue it is important to look at local government and authorities role in managing public resources and service delivery. In the Greater Cairo Area many informal areas and communities are unrecognized by governments and thus are denied access to public water services- Batn al-Baqara in Cairo is one such community (of many), and some information can be found here: http://landtimes.landpedia.org/newsdes.php?id=pGxs&catid=ow==&edition=qw==

Urban areas continue to grow, and will continue to do, with related growth and expansion of informal settlements and slums, and as the “urban poor” increases as do the consequent health, food and nutritional challenges. It is important the barriers to access are fully addressed in the report for urban populations. These challenges continue to persist as water infrastructure is increasingly privatized and prices increase for access.

Privatization/commons/management

We are happy to see the inclusion of the negative effects resulting from the privatization of water, and water infrastructure, especially the resulting power imbalance, including the section on “water grabbing”. This is a real threat to real sustainable development and the realization of human rights for many persons, from urban poor to small scale food producers and indigenous communities. Water, including watersheds, are a part of the commons. This report should reflect this viewpoint more strongly, and present more in-depth the policy/governance best practices and the challenges for managing water as part of the commons. In terms of governance, we urge the HLPE to examine also the benefits of public-popular partnerships for water management, which integrate national and local government with communities directly in planning processes, as an alternative to the public-private partnerships touted by the world bank, which often have damaging outcomes for vulnerable populations. The “Reclaiming Public Water” publication has many good examples of alternative water management systems to be included in this report.

Human Rights and the right to Water, and land

We fully support the inclusion of section 3.6 on the right to water; as a UN mechanism, the CFS is bound by a human rights mandate, and should promote a normative framework in all policy recommendations. The right to water and the right to food are integrally linked, and it is necessary to expand this to cover water for agriculture, fisheries, etc.- without rights to water, the right to food

cannot be fully realized. The right to water should also include productive uses to water and the right to water for ecosystems.

The core components of realizing the right to water for the purpose of drinking/hygiene and productive uses should be addressed in the same framework looking at availability, accessibility, and quality. Water is required to produce food, and the rights to water must reflect this connection. The UN CESCR General Comment 15 on the right to water states that "Attention should be given to ensuring that disadvantaged and marginalized farmers, including women farmers, have equitable access to water and water management systems, including sustainable rain harvesting and irrigation technology… States parties should ensure that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous peoples." This report takes a good step in pushing for a more comprehensive understanding of the right to water.

By expanding the right to water, including the mandate of the Special Rapporteur on the right to water and sanitation, food and water, along with land can be treated more coherently at the global and local policy levels. As mentioned previously, water should be treated as part of the commons. The sustainable use of water for agriculture, and other productive uses must be regulated in this lens, especially the overuse/misuse by large corporations. Access to the productive (and safe) water resources should be prioritized for small scale food producers, including livestock and pastoralists. Expanding this mandate, also including extra-territorial obligations, will better underpin the transboundary implications of water resources (and water grabbing), and increase the obligations and safeguards for investment projects, specifically on TNCs.

We are happy to see that report contains good analysis of the problems associated with "de-coupling" water from land, and generally the lack of coherent governance between land and water. Land and water cannot be treated as separate sectors, and must have a balanced and complimentary rights-based approach in governance and policy at all levels.

Better policy coherence also aligns with agroecology, which the report strongly support, as it offers an alternative, more resource conscious method of food production, and also acknowledges indigenous methods of production. We could welcome more specific information on the benefits of the agroecological approach in managing water resources, especially in areas that are not water rich.

82. Stephan Pfister, ETH Zurich, Switzerland

To whom it may concern

The report is quite an impressive work. However, I agree with previous comments, that it is trying to cover everything at the expense of covering the details as well as providing a consistent report.

I will focus my comments on the environmental assessment and footprint of water consumption for ensuring food security.

Especially the chapter 2.5.1 is very biased and does not account for international consensus finding and discussions around the water footprint concept. For instance the new ISO norm on water footprint is in contradiction to the concepts described here (ISO 14046). This reflects the discussion in scientific community that provide more insights into water footprint assessment, that are relevant for assessing environmental issues of water consumption. Some studies are:

Pfister S, Ridoutt BG (2013) Water Footprint: Pitfalls on Common Ground. Environmental Science & Technology 48:4-4 doi:10.1021/es405340a

Pfister, S. and Hellweg, S. (2009). The water "shoesize" vs. footprint of bioenergy (Letter). Proceedings of the National Academy of Sciences of the USA, 106:E93-E94; doi:10.1073/pnas.0908069106
Ridoutt, BG. and Pfister, S. (2010). A revised approach to water footprinting to make transparent the impacts of consumption and production on global freshwater scarcity. Global Environmental Change, 2010, 20(1), 113–120
Pfister, S.; Bayer, P.; Koehler, A.; Hellweg, S. (2011). Environmental impacts of water use in global crop production: hotspots and trade-offs with land use. Environmental Science and Technology, 2011, 45(13), 5761–5768
These papers discuss the relevance of the location of water use, since water used in arid places is more relevant than that used in water-abundant places. Furthermore, combination of green and blue water is not making sense from a water resource perspective, but rather within the virtual water concept (showing how much water can be saved by imports). However, Water footprint tries to account for impacts.

Furthermore the combination with grey water is very strange, since dilution volumes without physical meaning are combined with water volumes. This text should be revised to account for the shortcomings of the presented method and provide solutions to this provided in scientific literature.

Furthermore, the temporal timing of water consumption is a key issue too, which has been accounted for by Mekonnen and Hoekstra 2011 in the blue water scarcity index and further elaborated in Pfister and Bayer 2013 (monthly water stress).

Due to the above mentioned critical issues, the presented numbers for water footprint are not indicating the pressure on water resources. Beef produced in Swiss alpine grassland is almost free of any water (could be ~100 liter per kg) consumption and therefore of much lower water footprint than protein from irrigated crops! The presented numbers must be put in context and also the uncertainty and spatial variability must be mentioned (compare above references).

Beyond this, more holistic approaches such as LCA, combining different environmental aspects might be added to avoid trade-offs between water consumption and pollution with more advanced methods for pollution assessment.

Kind regards

Dr. Stephan Pfister
Senior Research Associate
ETH Zurich, Switzerland

83. Alan Nicol

Dear Sir,

Allow me to present the following brief comments on the report:

1. The Report provides a comprehensive examination of a range of issues related to the complexity of water and food security interrelationships. Many of these are captured in Fig.1. It is an important and critical contribution to global policy debates.

2. In general, I don't think the report provides sufficient examination of the food-non-food production relationships in agriculture, which are critical to income and (therefore) non-own production relationships and food security. There is a need to break down agriculture as described in the report per types of crop, animal husbandry and other outputs.

3. The report explicitly focuses on farming, but in reality provides little exploration of farmers -- they tend to be regarded as a homogenised group, undifferentiated in scale, scope, gender and geographical variation. Breaking down the complexity of this global community is essential to understanding the management challenge for the 70% or more of water that passes through farmers' fields, crops and range of technologies.

4. Virtual water is mentioned, as is water footprinting, but there is little examination of the 'missing middle', i.e. local, regional and global trade in food, global demand and supply shifts and the roles of key governments and corporations.

5. The concluding recommendations are on the whole sound. If the right to sufficient water to meet the FSN requirements of the poor is to be developed further, very clear guidance will be needed on thresholds of water need per different agro-ecologies, as well as specific metrics on understanding the local complexities of defining 'water efficiency' in different types of agriculture. These are not insurmountable challenges.

Kindest Regards,

Dr Alan Nicol

84. Sylvia Kay, Transnational Institute, Netherlands

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

The report is the first within the CFS context to bring together the topics of water and food security and as such makes an important contribution to policy debates and fields of action. The scope is broad and the report comprehensive as it needs to be in order to cover the terrain.

An aspect which deserves further attention is the impact of different agricultural models on water resources. This is given only a cursory examination. Yet food crop monocultures use up to ten times more water than biodiverse agricultural systems. The water intensity and pollution associated with industrial agriculture and the increasing use of agro-chemicals should be recognised as problems demanding policy re-evaluation. Conversely, more emphasis should be given to water practices rooted in diversified, agro-ecological farming approaches as true leaders in sustainability.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

The report is fairly evenhanded in its diversity of approaches and methodological issues. The report correctly highlights the pressing issue of water stress and water scarcity and provides various figures to underline the urgent need for action and planning. Although it does mention that water scarcity has been induced by policy failures in addition to a number of other factors, this is an area that deserves further attention.

The engineering of scarcity through ecological irrational decision making such as the growing of water intensive biofuel crops in fragile ecosystems like the Tana River Delta in Kenya, the planting of industrial tree plantations which require high volumes of water, and the pollution and degradation of water through the push for Green Revolution style packages of agro-chemical inputs, all need to be brought in here.

But policy failures occur even before this as well through the human destruction of local environments e.g. through deforestation and the constant over-use of water resources, all of which reduce the water retentive ability of soils and vegetative cover. In extreme cases, this can affect entire river basins and lead to processes of desertification.

A more thorough examination of some of these issues could lead to some interesting conclusions and point towards other interventions such as reducing water demand and increasing water conservation and recycling efforts.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interact with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

The report brings in the concepts of the virtual trade in water and the water footprint as useful tools which illuminate the water embedded in products that form part of increasingly globalised supply chains. While this is to be welcomed, there are some concerns in the way these concepts are then used in the report.

The trade in virtual water should not be used to suggest an unproblematic exchange between water abundance and water shortage guided by the theory of comparative advantage. Rather, the complex linkages between meeting water demand in one region and the creation of water pressure and scarcity in another should be highlighted.

The trade in virtual water is rapidly transforming and transnationalising the waterscapes upon which local lives and livelihoods depend, especially as countries are increasingly seeking not only to trade in virtual water but also to ‘lock in’ access to water reserves by acquiring productive land with good access to water abroad. The case of Saudi Arabian investments in Africa has been well documented. While these lock ins and offshoring of production may help capital rich, water deficit countries to resolve their own water and food constraints, the impacts on local livelihoods and ecologies have often not been positive.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

The recommendation of the report to expand the scope of the Right to Water to include also productive uses is most welcome. Water is essential for food production and the realisation of the right to adequate food and the achievement of a decent standard of living. Based on the indivisibility of human rights and the clear way in which water is already deeply intertwined in the daily lives and decision making processes of food producers (both small and large), an expanded approach tot the right to water is most logical.

As the report notes, this recommendation does bring with it many practical and policy challenges. Foremost among them, is how to determine priorities among competing uses of water between different sectors and different actors. Clearly these priorities and contestations are not easy to determine and resolve. In the human rights field, priority is given to the most vulnerable and marginalised. As elaborated in General Comment No. 15 of the Committee on Economic, Social and Cultural Rights, in ensuring sustainable access to water resources for agriculture to realise the right to adequate food, states shall give attention "to ensuring that disadvantaged and marginalised farmers, including women farmers, have equitable access to water and water management systems".

Some countries have taken up this issue of prioritising water use and allocation according to human rights based criteria. Ecuador's new constitution of 2009 for example affords priority to human consumption and to uses that guarantee food sovereignty and natural processes. Article 318 of the constitution stipulates that water resources shall be destined first to human consumption, then to irrigation to secure food sovereignty, then to ensure environmentally adequate levels of flow in the country's rivers, and finally to other productive activities.

A second and related challenge is how to effectively link land tenure and water governance regimes through a consistent human rights based approach to these issues. The report could take a clearer position in this respect on the link between land grabbing and water grabbing. Water is a critical factor in land grabbing - both as a driver and as a target. It is determinant in shaping which lands are attractive for investment and which are not and often an investors' control over land comes with a corresponding control over water. If prior and independent impact assessments are not carried out and local people's water uses, management systems, and future needs are not adequately recognised, the danger exists that these land investments may negatively appropriate water resources, particularly in contexts marked by significant power inequalities. The need for careful land use planning, rigorous assessments of the impacts of land use changes and the transfer of user rights, and the application of human rights based principles such as non-discrimination, participation, and transparency are paramount.

Following on from this, an important expansion of the mandate of the Special Rapporteur on the Right to Water - as recommended in the report - is to track violations to the right to water. Developing qualified and reliable monitoring tools to track violations and impacts on the most vulnerable when their rights are under threat could be very powerful.

Finally, given the many challenges presented by this and other issues raised in the report and the lack of a global governance instrument on water, a very sound recommendation that the report makes is for the CFS to initiate an inclusive and participatory multi-stakeholder process to formulate International Guidelines on Water Management.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

What is needed above all is a just, democratic and human rights based approach to issues of water governance, management and use for food security.

The report correctly identifies the legal pluralism and the complexity across waterscapes and tenure regimes when it comes to governing for water for food security, noting that this legal pluralism can be both enabling and disabling but that in most instances it is difficult for local users to defend their claims. A key action to be taken, as recommended in the report, is thus to make the 'invisible' users of land and water (referring to indigenous peoples, fishers, pastoralists and small-scale food producers who largely lack formal access or titles to land and water) more visible in policy processes and programmes. Recognition and strengthening of customary, collective and informal systems of water management is therefore essential.

To illustrate the point on the vital contribution that a democratic and people rather than profit-centred models of water governance can make to food security:

While governments (both local and central) are still the main actors to provide water services and are the principal duty bearer to ensure access to water for all citizens, the absence of the government in the vast peri-urban and rural communities is the de facto reality in many countries, especially in Asia, Africa and Latin America.

Very often unofficial, autonomous community water systems have filled this gap to organise, run and provide water to community members. Such water systems are not only critical for subsistence and public health but also to sustain livelihoods including food production. There is a rich diversity among community systems, taking on different forms e.g. cooperatives and different names e.g. water committee in Bolivia and community aqueduct in Colombia. Their defining features is their autonomy, having their own norms and mandates to manage public goods.

In Columbia, there are 12,000 community aqueducts and 26% of the population is served by such community autonomous systems. Community aqueducts tend to be isolated (geographically and politically) and not-acknowledged or treated with hostility by local authorities and as a result often have little access to public financing. But the community aqueduct in La Sirena, the peri-urban and rural areas of the department of Valle del Cauca (outside of the city of Cali) is an empowering example of how a community aqueduct can contribute directly to the right to water and the creation of sustainable livelihoods. The aqueduct in La Sirena has built a partnership with the water workers' union SINTRACUAVALLE (the public water company ACUAVALLE operating in the Valle del Cauca). Voluntary workers have provided technical support to the community aqueducts in La Sirena under the horizontal partnership agreement. Technical support includes knowledge on administrative management, water quality control and preserving water resources in the community where the water comes from. Keeping its autonomous character, the aqueduct in La Sirena has enhanced its capacity to extend and improve its services to the community. Importantly, the aqueduct has built its own water systems (infrastructure) with contributions (labor and finance) from community members and has built a democratic form of governance to sustain the system. La Sirena illustrates how a community aqueduct can contribute to the community's livelihood (water and food production) especially when they receive appropriate external support. (Find more details at: http://www.municipalservicesproject.org/publication/labour-and-community-reinventing-public-water-colombia).

Similar positive examples exist elsewhere. In Tameis and Girardota in Colombia, local authorities have acknowledged community water systems (ACUATAMESIS and GIRAGUAS respectively) as water providers and supported them through the the allocation of public finance to upscale their water

systems. This arrangement can be called public-community partnerships. In Bolivia, collaborations between water committees (community water operator) are emerging. San Miguel Km 4 Water committee and Habitat for Women in the Auxilidadora Community from one of the poorest neighbourhoods areas of Cochabamba have made a partnership to help each other and enhance their capacity. Now the women's organisation is providing water to Auxilidadora community. (For more information, see the video at: http://www.tni.org/multimedia/all-one-and-one-all?context=599)

Community water systems are thus a key actor to tackle water and food insecurity in rural and peri urban areas which point the way for just, democratic and sustainable systems of water use and management.

85. Brian O'Riordan, International Collective in Support of Fishworkers (ICSF), Belgium

Submission by Brian O'Riordan, Belgium (Liaison) Office Secretary, International Collective in Support of Fishworkers. Contact e mail briano@scarlet.be

The International Collective in Support of Fishworkers (ICSF), an international network with a Secretariat based in Chennai, India and a liaison office in Belgium, would like to submit the following comments to the consultation on the VO draft of the HLPE report on Water and Food Security, as regards the fishery and aquaculture related aspects.

2.4.1 Improving water and land productivities

Page 39, para 2 lines 8 and 9. The statement "better integration of fisheries and aquaculture with water management systems can also improve water productivity" needs considerable qualification.

Intensification of large scale aquaculture, especially export oriented production, goes hand in hand with more intensive use of external inputs – including industrially produced feeds, antibiotics, pesticides, and a variety of chemicals. This generates considerable pollution with high levels of solid and liquid organic wastes. Pollution of waters by intensive feed based aquaculture reduces downstream water quality, due to eutrophication processes in the water column and on the seabed, and productivity with implications for public health and aquatic biodiversity.

Escapes from fish farms, especially of carnivorous and exotic species, have implications for biodiversity and ecosystems by displacement and elimination of local species including through spread of disease. These impacts have major implications for local food security when such large scale aquaculture operations impact on small scale fisheries, shell fish collectors, and aquaculture. For example in Chile, South America (notably the Chiloe archipelago), intensive salmon farming has caused toxic "red tides", causing the closure of local shellfish farming and fishery activities. The escape of salmon into the local environment has impacted on local artisanal fisheries. In tropical Asian and Latin American countries intensive aquaculture of shrimp has had similar impacts, with the clearance of mangrove areas, pollution of groundwater, displacement of communities, closure of fishing grounds and violence against local communities.

Better integration of fisheries and aquaculture with water management systems to improve water quality as well as food security and nutrition should focus on:

a) developing extensive, low input, labour intensive, small-scale activities, mainly oriented to local markets, and in the case aquaculture focussed on species low in the food chain, and based on indigenous species.

b) fisheries enhancement through "culture based capture fisheries", optimizing the potential of reservoirs and other water bodies for sustainable and equitable fishery production.

c) protecting the land tenure, fishery access and user rights of communities that have traditionally depended on extraction of living aquatic resources.

d) Ensuring the siting/construction of intensive and large scale aquaculture projects away from sensitive coastal ecosystems like mangroves and the river mouths.

e) Establishing a proper process of consultation, assuring the rights of affected communities and civil society to access information as part of environmental and social impact evaluations.

f) Establishing control and monitoring processes that are participative and transparent during the implementation of aquaculture projects.

2.4.5. Diversifying with Fisheries and Aquaculture

Page 45, lines 11 to 33.

Lines 12 to 14 rightly refer to the recent HLPE report on Sustainable Fisheries and Aquaculture for Food Security and Nutrition. Mention should also be made of the recommendations to the CFS 41 drafted by the rapporteur of the Round Table on Sustainable Fisheries and Aquaculture for Food Security and Nutrition. Reference should also be made to the considerable body of work undertaken by the FAO Department of Fisheries and Aquaculture over many years to increase understanding of and to document evidence of the linkages between fisheries and food security and nutrition.

Line 16 of the report notes that "high technology cage fisheries can produce 18 up to 100 kg of fish for each cubic meter of water". However, this overlooks the downstream impacts of the pollution caused by the solid organic wastes produced by such cage operations (dead fish, uneaten food, faeces, and so on), or the pollution by the use of antibiotics, pesticides and other chemical treatment of fungal, parasitic, bacterial and viral diseases, which have implications for small-scale capture fishery operations and other small-scale productive activities in the area.

Lines 18 to 21. It is not correct to say that "fisheries are mostly run by small farmers". Although in many countries, notably South East Asia, certain kinds of small scale aquaculture practices are integrated into the farming systems, and fish farming activities may be run by small farmers, this is not the overall rule. Fishing operations – i.e. the catching of fish - are generally carried out by men who often don't engage in other productive activities. On the other hand women are engaged in productive, economic and social and cultural activities throughout the fisheries value chain, in fishing as well as in upstream and downstream pre- and post-harvest activities. Hence the "vital gender" dimension referred to, a dimension that often goes unrecognized and unrewarded. But the role of small farmers in fisheries is limited to certain kinds of fish farming operations that are integrated into farming systems (such as the case with mixed rice and fish cultivation, or in the case of farming waste and by products being recycled in fish farming).

Lines 22 to 27. It would be important to mention the significance of the recently approved FAO Voluntary Guidelines for Securing Sustainable Small Scale Fisheries in the context of food security and poverty eradication (SSF Guidelines) and the role these have to play in contributing to the food security and nutritional needs of poor rural communities in many areas, as well as of the world at large. The SSF Guidelines have been developed over a 7 year period (from 2007 to 2014), with a high level of inclusion and participation. The implementation of the SSF Guidelines will be very important for improving food security and nutrition, especially for marginalized and vulnerable groups. The SSF Guidelines support responsible fisheries and sustainable social and economic development for the benefit of current and future generations, with an emphasis on small-scale fishers and fish workers and related activities and including vulnerable and marginalized people promoting a human rights-based approach.

Lines 26 and 27. Increasing competition for access to and use of coastal and aquatic resources and other commons (coastal areas and fresh waters sources), is also leading to privatization of these resources and the access/ user rights to them, to the detriment of the food security and nutrition of the people who have traditionally depended on accessing these resources. The aquatic equivalent of "land grabs" - "water grabs" - are also a growing concern, with mass tourism projects, energy generation projects, expansion of port infrastructure, industrial aquaculture, and conservation projects displacing fishing communities with implications for food security and nutrition at all levels.

Box 21 page 68 could usefully include a section on Voluntary Guidelines that have been adopted. These include:

Voluntary Guidelines to support the progressive realization of the right to adequate food in the context of national food security http://www.fao.org/docrep/009/y7937e/y7937e00.htm

Voluntary Guidelines Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security http://www.fao.org/fileadmin/user_upload/nr/land_tenure/pdf/VG_Final_May_2012.pdf

Volunary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication.

Draft Recommendations – 10 Water Governance:

Page 81, lines 11 to 18:

Please include:

States and Civil Society should promote the implementation of the VGGT and SSF Guidelines.

86. ActionAid, USA

Dear High Level Panel of Experts:

ActionAid USA appreciates the opportunity to comment on the Committee on World Food Security's (CFS) High Level Panel of Experts (HLPE) V0 draft report on Water and Food Security. ActionAid is an international organization, working in 45 countries to further human rights for all and defeat poverty. Our comments focus on the impacts of biofuels production on water quality and quantity, an

important issue that report touches on but, in our view, could expand upon greatly. Biofuels have arisen as an issue affecting not only food security but also water quality and quantity, and challenges will only worsen as global biofuels mandates increase over the coming decade. As the draft report states, "biofuels consume significant quantities of water" and are just one of many industries putting pressure on water supplies around the world. The report draft rightly acknowledges important issues related to increased biofuels production on water availability, water quality, and other socioeconomic impacts, such as increased use of irrigation, loss of land tenure due to international land grabs to grow biofuels feedstocks, and the likelihood that biofuels production fails to benefit smallholder farmers in water scarce contexts.

In addition to these important issues, ActionAid also recommends that the final report include discussions of the following concerns surrounding biofuels' impacts on water and food security:

(1) The quantity of water used directly in the production of biofuels at ethanol and biodiesel facilities, in addition to biofuels feedstocks such as sugarcane, soy, and corn.

(2) How this demand for water may increase in the future as biofuels mandates are expanded worldwide, for both feedstocks and the production of biofuels at ethanol and biodiesel facilities. The Organization for Economic Co-operation and Development (OECD) and the Food and Agriculture Organizations of the United Nations (FAO) estimate biofuels production to increase 50 to 60 percent over the coming decade; other international estimates, such as those from the International Energy Agency (IEA) predict even greater expansion of global biofuels production over the same time period.i The corresponding increase in water demand and effects on water quality will be immense as first-generation biofuels, produced primarily from food crops, continue to dominate the biofuels market and require large amounts of fertilizer, herbicides, and pesticides. The production of potentially less water- and input-intensive second generation biofuels such as cellulosic ethanol derived from perennial grasses or agricultural wastes has yet to reach commercial production. As the National Academy of Sciences predicted in a 2011 report, companies attempting to produce cellulosic biofuels will continue to struggle with technological and economic challenges, while first-generation biofuels largely produced from food crops continue to degrade water quality and require more water than gasoline in their production process.ii

(3) How water quality issues are exacerbated by biofuels production, particularly in areas growing input-intensive biofuels feedstocks and refining biofuels (such as the American Midwest). Over half of all US waters are impaired or threatened, many the result of agricultural fertilizer and chemical runoff from large-scale farms growing corn and soybeans.iii ActionAid Brazil released a report in Oct. 2014 detailing how smallholder farmers and local communities are no longer able to grow food for their families or local markets due to the degradation of water supplies and the application of harmful herbicides and pesticides on nearby sugar and soybean fields.iv

(4) How increased water usage for biofuels feedstock production and biofuels production affects food security, both at a local and international level. Currently, approximately 65% of EU vegetable oil, 40% of the US corn crop, and 50% of Brazilian sugarcane are used for biofuels.v Biofuels crops such as corn and soybeans are some of the most water- intensive crops grown around the world. With increased production of food-based, water- intensive biofuels in the coming years, pressure on commodity and food prices will increase as greater percentages of crops are used for biofuels and as price increases encourage large-scale farms to grow fuel instead of food crops. The UN CFS's expert panel report on biofuels in 2013 noted that "biofuels and more generally bioenergy compete for land and water with food production." A 2011 report, commissioned by G20 agricultural ministers, recommended that countries "remove provisions of current national policies that subsidize (or

mandate) biofuels production or consumption," acknowledging that biofuels production was a significant factor in increased food price and food price volatility. Other experts have estimated that biofuels production was responsible for 10-15% of food price increases and up to 30% of grain price increases since 2007.vi Impacts will only worsen if food-based and land-intensive biofuels mandates and other subsidies continue on auto-pilot.

(5) How women in particular are affected by the loss of access to adequate, clean water supplies and affordable and nutritious food since they bear the burden of providing food, water, and fuel for their families in many parts of the world. As the report acknowledges, there are "trade-offs between water uses/users [which should be tackled] in an equitable, gender just and deliberative manner."

The HLPE also welcomed "examples on how the role of water for food security and nutrition is accounted for in land governance and management and land-use, including links between land tenure and water rights." The land rush for biofuels and other agricultural production has resulted in vast tracts of land being sold or leased to commercial interests, many of which are large multinational biofuels companies or agribusinesses aiming to export biofuels to the EU, US, and other countries with large biofuels mandates. Local communities lose land previously used for farming, animal grazing, fishing and gathering wild foods, as well as for wood and water collection, when land deals prioritize investors and outside interests over local livelihoods.

Biofuel-related land deals displacing local communities have been documented in countries ranging from Cambodia to Tanzania.vii

Finally, we believe there is a typo in the last sentence at end of page 63: the text should indicate that some companies have received water rights even without sufficient water available for such operations, but the word "without" is absent from the sentence.

Thanks again for the opportunity to comment on this draft report as we work towards increasing food security, access to clean water, and land tenure rights for the most vulnerable populations around the world. If you have any questions, please contact me at Kristin.sundell [at] actionaid.org.

Sincerely, Kristin Sundell

i http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Oilcrops/Documents/OECD_Repor ts/biofuels_chapter.pdf
ii http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=13105 , http://www.nap.edu/openbook.php?record_id=12039&page=45
iii http://iaspub.epa.gov/waters10/attains_nation_cy.control
iv http://www.actionaid.org/sites/files/actionaid/biofuels_energy_hunger.pdf
v http://www.fao.org/fileadmin/templates/est/COMM_MARKETS_MONITORING/Oilcrops/Documents/OECD_Repor ts/biofuels_chapter.pdf
vi http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/100xx/doc10057/04-08-ethanol.pdf , http://www.ifpri.org/sites/default/files/publications/vonbraun20080612.pdf
vii http://www.actionaid.org/sites/files/actionaid/the_great_land_heist.pdf

87. Carlos Gonzalez, Fischer Compassion in World Farming, United Kingdom

We welcome this report, as water is essential for agriculture and critical for the maintenance of human life on earth. We also welcome the recognition of the increase in the consumption of livestock products as one of the main factors behind the increased demand for water.

The report does mention the differences in water consumption between animal products that come from different species, and it also mentions the differences between products from different systems (e.g. grass-based vs grain-fed for ruminants). However, we think that is important to analyse the interaction between both factors.

In that sense, we believe that more emphasis should be given to the distinction between the different components of the water footprint (i.e. green, blue and grey). While we recognize the difficulties in measuring water footprints ad specially, their individual components (blue, green and grey water), it is critical to evaluate the differences between these components in the local context (e.g. in areas with high rainfall, green water use is of lesser concern), to properly evaluate the differences between production systems: beef might have a larger water footprint than pork or chicken, but if we are talking about grass-fed beef, most of that water would probably be rainwater (green) and its usage would have far less impact, whereas in the case of pork and chicken (especially in industrial production systems), a larger proportion of that water would be blue and grey and thus, more relevant. We are attaching a copy of a report that provides further clarification on these issues, as well as figures to support these claims.

The report also points out that livestock production is becoming more and more functionally segregated from crops production, and we'd ad that there is also a geographical segregation, that's present at the farm, regional, country and even continental level.

Considering that 40% of the cereals and the vast majority of soybean produced globally are directed to feeding livestock, and that those animals are usually reared in different regions to the one where the crops are originated, grain-dependant livestock farming represents a huge part of the virtual water trade that's mentioned in the report. Furthermore, this practice also favours nutrient accumulation in the areas dedicated to livestock production (mostly via manure accumulation) which further increases grey water footprint in the destination (as well as nutrient depletion in the regions where the crops are grown).

Grain feeding of ruminants also increases the water footprint of ruminant meat, as grain and other concentrated feedstuffs have a much higher water footprint than grass and roughages (and a less favourable distribution between the 3 components of water footprints), as shown in our attached report.

Taking all of the above in consideration, it becomes clear that the increase in production of livestock products has direct as well as indirect effects on water use. Increased production of a water demanding product (e.g. meat) increases water use. Furthermore, the increasing demand for meat can only be met by industrial systems that present serious risks, not just for water, but for every limited resource we depend on this planet.

Once we accept that the increase in the demand for animal products is a big cause of the increase water use, we must accept that besides working on increase the water use efficiency of livestock production (and doing it without increasing its footprints for other impacts), we should be thinking

about regulating the demand, to make sure to keep it at the levels that can be achieve by sustainable production.

We welcome the inclusion of the "Addressing changing diets" category among the policy recommendations. However, due to all that was expressed here, we believe that there is the need for a stronger call to address consumption patterns, to move away from water demanding products (including, but not limited to meat). This is mainly the role of the states (as well as the consumers), and we'd like to see an explicit mention in the recommendations to the shift away from water demanding products (and production methods). In the recommendation for the private sector, we would like to see some clarification that the improvements on water efficiency shouldn't be made at the expenses of other equally valuable resources and the call for a holistic view of sustainability (i.e. not focusing on one metric at the time).

We would also like to see recommendation regarding the different production systems (as illustrated in this commentary around grain vs grass based systems for ruminants, but the argument also extends to other systems).

Finally, we would encourage the consideration of recommendation to reduce food waste, which can be also seen as a virtual water waste (in the same lines of the virtual water trade).

88. Markus Berger, Technische Universität Berlin, Germany

Dear Sir or Madame,

first of all I would like to congratulate you to this very comprehensive report on a very relevant aspect. While reading it, I noticed that you focus entirely on the water footprint according to Hoekstra and colleagues when it comes to assessing the amount of water consumed in food production.

While this approach developed by the Water Footprint Network is well known, easy to understand, and well established, I would like to draw your attention to the limitations and drawbacks of such a volumetric method. Simply aggregating volumes of blue, green, and gray water fails to a address the much more relevant dimension of water use: the local impacts resulting from it. Obviously 1 m^3 of rain water consumption in Brazilian soy bean production does not compare to 1 m^3 of ground water consumption in Spanish tomato production. Consequently, these volumetric figures can be drastically misleading, as products with smaller volumetric footprints in water scarce regions can actually cause more severe consequences than product which consume more water in water abundant areas.

The understanding of the scientific community (including the Water Footprint Network) is that the determination of water consumption volumes is the first step only. Subsequently, the volume of water consumed needs to be interpreted based on parameters like local scarcity, sensitivity of ecosystems, ability of the population to compensate water stress, etc. Attached you can find a position paper of the UNEP/SETAC Life Cycle Initiative's working group on water use in LCA (WULCA) regarding the consideration of water use and associated impacts along product's life cycle.

Further, I would like to mention that an ISO standard (ISO 14046: http://www.iso.org/iso/catalogue_detail?csnumber=43263) has been launched this year, which represents the international consensus on how water should be assessed along product life cycles.

According to this standard a water footprint is a "metric(s) that quantifies the potential environmental impacts related to water". Hence, a purely volumetric analysis of the amount of water used or consumed can be termed a water inventory but not a water footprint. This is in conflict with statement in you draft, which states: "The water footprint of a product is defined as the total volume of fresh water that is used directly or indirectly to produce the product" (Page 47, Line 11)

By assessing impact resulting from water use, the water footprint has developed from an inventory to an impact oriented indicator. In that way it is consistent with the carbon footprint, in which various greenhouse gas emissions are weighted according to their environmental relevance. In the same way that GHG emissions can be multiplied by a factor denoting the specific global warming potential, water consumption in different regions can be multiplied by a factor denoting the regional scarcity and sensitivity.

I my opinion your report, that will be of high relevance, should reflect the scientific development which has taken place during the last years. These new aspects can also be integrated quite easily into the existing version I think. If it can be of help, I can also assist you in this respects and make a few proposals.

Kind regards from Berlin,

Markus Berger

89. Graciela Romero, War on Want , United Kingdom

Many thanks for your open invitation for comments on the Water and Food Security zero-draft consultation paper.

I would like to provide brief insights in order to draw attention on the need to explore stronger arguments about the power of transnational capital and the threat that it represents when seeking systemic actions to attain water and food security.

The rise of development strategies focusing on economic growth at all cost and dismantling the role of the state poses a challenge for the implementation of the human rights approach. Therefore, it would be useful to contextualise the human rights approach with broader development strategies that gives prevalence to the private sector, concentration of capital and commodification of nature.

So long as development strategies are geared towards resource extraction and export oriented production under free market regimes, there will be an inherent conflict of interest for states to protect natural resources and subsequently to ensure food security. There are many documented cases within the extractive industry that provide testimony of this. A landmark case is the devastating impact of the oil extraction in the Ogoniland-Nigeria over a period of 50 years affecting millions of people. (Environmental Assessment of Ogoniland, United Nations Environment Programme, 2011). The unregulated environment for corporations and the voluntary nature of their corporate social responsibility programmes are inconsistent with national legal frameworks and human rights covenants.

Development strategies pursued through public-private partnerships, where public money has been shifted towards promoting corporate led initiatives such the New Alliance for food Security and

Nutrition and Agricultural Corridors in Africa, have been widely contested by civil society, as they are expanding corporate control on natural resources and destruction of livelihoods.

The institutional, political and legal apparatus that protects transnational capital through free trade agreements and direct foreign investment needs to be deconstructed in order to bring back the functionality of the human rights approach. Investment treaties and free trade agreements offer few instructions as to how such agreements should be reconciled with human rights obligations of the state. Governments might pursue policies and measures in furtherance of human rights obligations, only to encounter allegations that such initiatives run afoul of parallel international obligations to protect foreign investors and their activities. (Luke Eric Peterson, 2009).

The report would benefit by arguing a stronger case for:

1. Recommending the food sovereignty framework alongside the agroecology as a viable strategy to build food regimes that ensure water governance, management and use for food security at local and global levels.

2. Exposing the conflict of interest between corporate social responsibility and its unsuitability to protect the public interest.

3. Recommending binding regulations that give power to the state to hold corporations accountable.

4. Exposing cases where state is confronted with protecting foreign direct investment and human rights protection, in order to reject the World Bank's International Centre for Settlement of Investment Disputes.

Best regards

Graciela Romero

International Programmes Director

War on Want

90. David Groenfeldt, Water-Culture Institute, United States of America

As many others have commented, the report lacks a coherent structure, a weakness that ripples through all the sections. At the same time, there is a tremendous amount of valuable material in the report. My comments are intended to offer a structure, which I am relabeling as a "frame" within which the major elements of the current draft might be more constructively arranged, and the need for new elements will become more clearly apparent.

The Frame: Regenerative Water Management for Food Security

In my view the report needs more than a better structure; it needs to be framed around a central argument, and that argument will necessarily espouse certain values and ethical positions. These should be expressed deliberately and clearly so that the values being championed (e.g., promoting

social equity or protecting freshwater biodiversity) can be distinguished from the technical prescriptions intended to support those values. This transparency of values can help in the processes of evaluating among alternative solutions.

The frame which I am suggesting would incorporate "strong sustainability", or sustainability with an eye to environmental regeneration and resilience. Our goal should be to identify water management strategies which will not only sustain food production, but will actively enhance the resilience of freshwater ecosystems (rivers, lakes, aquifers, wetlands, and estuaries) and the food systems (physical, technical, and socio-cultural) which rely on those waters. This frame would be fundamentally environmental. The underlying argument is that enhancing the health of water ecosystems and agricultural ecosystems (including soils, agro-biodiversity, and adjacent lands) is a necessary condition for food security. A further justification of this "environmental fundamentalism" comes from the well accepted definition of sustainability from the 1987 Brundtland Report, "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." as well as Aldo Leopold's maxim from his 1949 essay on The Land Ethic: "A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community. It is wrong when it tends otherwise."

From Principles to Prescriptions

Establishing the principle that healthy water and land ecosystems comprise the sine qua non of food security provides an orientation for developing strategies for water management and agricultural production. But environmentally-friendly production is only the foundation, not the goal. We need to bring additional values into the frame to identify those strategies which meet all our values at once, or as many of them as possible.

Where can we go to find a set of values which have some legitimacy and are not merely the creation of the report's authors? The past several decades have provided us with a rich legacy of broadly agreed ethical standards for both water management and agricultural management, many of which are discussed in the current V0 Draft. The 1992 Dublin Conference not only labeled water as an inherently economic good, but also call called for participatory management at the lowest possible level, underscored the special role of women in water provision and use, and highlighted the priority of protection of natural ecosystems. Subsequent declarations and UN declarations and resolutions have established a very detailed right to food, as well as a right to water (nicely presented in the V0 Draft, pp 69-71).

The already agreed-upon principles of sustainable water management and parallel principles of sustainable agriculture provide the basis for articulating a systematic set of principles (values) which both water management and agricultural practices should comply with, to meet the challenge of food security. These principles include the following:

- In water allocations, priority should go to reasonable food crops grown with reasonable water efficiencies (Much depends on the local details);
- water ecosystems should be kept in good condition (borrowed from EU Water Framework);
- promote social equity and opportunity (including through affirmative action for disadvantaged groups);
- promote health and nutrition through agricultural practices and food choices
- integrate climate-mitigation aims into Ag practices (e.g., carbon sequestration in soil);
- respect social and cultural value of traditional foods/practices;
- promote participatory, decentralized governance of water, watersheds, and rivers;
- favor local food production as food security strategy (localism)

• use global food trade as water security strategy (e.g., importing virtual water)
• etc.

Once the principles/values have been carefully crafted, a set of operational prescriptions can be developed around them. These prescriptions would serve as guidance for selecting among alternative strategies for water management, soil management, crop production, livestock practices, etc. What's the best agricultural strategy, in terms of food security, for a particular farm, watershed, or landscape? Should policies favor industrial capital- and chemical-intensive practices, or agro-ecology integrated systems? If the values to be honored have been comprehensively articulated, the process of evaluating the relative merits of alternative strategies and policies will rest on a consideration the values that will be promoted through the policies, rather than on the policies themselves.

The Recommendations section of the report would be tightened and strengthened through rewriting the recommendations as policy prescriptions, which can advance the values which have already been agreed upon through decades of international meetings. Even in the case of values which are newer and less firmly agreed upon (e.g., how high a priority should be given to carbon sequestration in soil management), the report could take a position about the importance of this practice, and then incorporate that value into a policy prescription (e.g., Policies should favor agro-ecological approaches which maximize soil carbon), so long as the development of this position is transparent.

Specific Comments on the Report

> Multifunctional Agriculture is mentioned only once (p. 29) but deserves to be cited as an approach to conceptualizing the links between water/Ag sustainability and food security. The basic logic is that keeping food systems viable requires attention to the whole set of multifunctional interactions, including cultural heritage and identity, secure employment, social standing in the community, etc.. [Reference: Groenfeldt 2006, Multifunctionality of Agricultural Water: Looking Beyond Food Production and Ecosystem Services. Irrigation and Drainage 55:1-11]

> Discussion of integrated farming systems (pp 37-38) and agroecology (p. 44) should be greatly expanded [as others have pointed out]

> Human waste and compost as a source of fertilizer (p.46). The potential for capturing human waste (in both rural and urban settings) and processing into fertilizer has strong food security implications which the report should discuss. In rural settings waste recovery is tied to sanitation, so there is a double benefit of fertilizer and improved sanitation. In urban settings there is also a double benefit of expanding wastewater treatment (and avoiding a major source of water pollution) and a source of fertilizer. Capturing urban compost also has health benefits (minimizing rats) and fertilizer benefits.

> Water Governance (p 51) discussion should also include the ethics underlying governance aims. See Groenfeldt and Schmidt (2013), Ethics and water governance. Ecology and Society 18(1):14 [http://www.ecologyandsociety.org/vol18/iss1/art14/]. See also Groenfeldt (2013), Water Ethics: A Values Approach to Solving the Water Crisis, Routledge.

> Water rights (pp 51-53) - The discussion about prior appropriation is not directly relevant to developing countries. Instead, the discussion should focus on the water markets as an emerging trend with implications for water security for the poor. [These markets are based on the ethic of prior appropriation, but it confuses the issue to talk about this specifically American practice.]

> Decentralization of water management (p.58) - This discussion paints too gloomy a picture of WUAs being coopted by the wealthy. The potential of community capacity-building through small farmers' participation in water user associations remains promising, if too often unrealized. The decentralization discussion should also discuss how watershed associations and river basin organizations can be opportunities for rural poor and small farmers to voice their interests.

91. Sofia Monsalve, FIAN International, Germany

FIAN International would like to thank the HLPE for the opportunity to comment on the V0 draft of the report "Water and Food Security" and commends the HLPE Project Team for this comprehensive draft.

FIAN International strongly supports the recommendation of this draft report to apply human rights to water and food security. In the following comments, we would like to focus on what kind of challenges this would bring.

The development of the human right to water has been indeed largely focused so far on safe drinking water and sanitation. The UN CESCR's General Comment N° 15 (GC 15) on the right to water though has already identified other aspects of the right to water which have remained under-explored and under-developed. We refer to:

- The clear recognition in the GC that "water is required for a range of different purposes, besides personal and domestic uses, to realize many of the Covenant rights. For instance, water is necessary to produce food (right to adequate food) and ensure environmental hygiene (right to health). Water is essential for securing livelihoods (right to gain a living by work) and enjoying certain cultural practices (right to take part in cultural life)" (GC 15, paragraph 6).
- The inextricable linkages of the right to water to the right to the highest attainable standard of health and the rights to adequate housing and adequate food; and the holistic understanding of the right to water as the GC calls to see it in conjunction with other rights enshrined in the International Bill of Human Rights, foremost amongst them the right to life and human dignity (GC 15, paragraph 3); and the rights enshrined in the Convention on the Elimination of All Forms of Discrimination Against Women and in the Convention on the Rights of the Child (GC 15, paragraph 4).

- The development of criteria to give priority in the allocation of water resources to the right to water for personal and domestic uses; and to the right to water in connection with the right to food and health to prevent starvation and disease as well as to meet the core obligations of each of the Covenant rights (GC 15, paragraph 6).

- The importance of ensuring sustainable access to water resources for agriculture to realize the right to adequate food giving particular attention "to ensuring that disadvantaged and marginalized farmers, including women farmers, have equitable access to water and water management systems, including sustainable rain harvesting and irrigation technology. Taking note of the duty in article 1(2), paragraph 2, of the Covenant, which provides that a "people may not "be deprived of its means of

subsistence", States parties should ensure that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous peoples." (GC 15, paragraph 7).

- The importance of protecting natural water resources from contamination by harmful substances and pathogenic microbes; and the need to taking steps on a non-discriminatory basis to prevent threats to health from unsafe and toxic water conditions (GC 15, paragraph 8).

In our view, strengthening the interpretation and understanding of these aspects of the right to water and of its inter-linkages with other rights is at the order of the day for all the reasons laid down in the draft report, in particular to address power imbalances, competing demands and increasing water conflicts, as well as to make the management and governance of water for food security more democratic, sustainable and just. We recommend the HLPE team to further develop its recommendations building on these aspects spelled out in GC 15.

Following the example of the Right to Food Guidelines, we believe that the CFS could play again a catalytic role in several ways:

- It could contribute to deepening the interpretation of GC 15 by developing guidelines on the right to water in food security and nutrition with the aim to provide practical guidance about how to integrate water in national food security and nutrition strategies 1) reaffirming the importance of safe drinking water and sanitation for all people while paying attention to particular situations such as the case of access to safe drinking water of children, of plantation workers and people facing natural disasters and protracted crisis; 2) giving particular attention to ensuring adequate access to water for small-scale food producers and for securing the livelihoods of indigenous peoples, fishing and pastoralists communities; 3) increasing coherence and coordination among national authorities dealing with water, agriculture, environment, fisheries, livestock, nutrition, health; and among water and food security national strategies as well.
- It could request the Special Rapporteurs on the Right to Water, the Right to Food, the Right to Health, the Rights of Indigenous Peoples and the Independent Expert on Human Rights and the Environment to address the issues mentioned above in their work and to report back to the CFS providing recommendations. They could specifically be requested to provide guidance on how to apply the Maastricht Principles on Extra-Territorial Obligations of States on Economic, Social and Cultural Rights to, inter alia, trans-boundary water issues, water trade and the adequate regulation of transnational corporations and other businesses in the context of water and food security.
- It could acknowledge the resolution A/HRC/27/7 of September 2014 of the Human Rights Council and call the Council to continue strengthening the right to water and sanitation by supporting the development of other aspects of the right to water as contained in GC 15 in all its ongoing relevant processes, such as for instance, in the Open-ended Working Group on the rights of peasants and people living in rural areas.

Further remarks:

- The link between water, sanitation and reproductive and maternal health (including infant and young child feeding) is not sufficiently addressed – for example, water-related health complications during pregnancy or due to exposure to chemicals through breast milk (and their long-term impacts on the nutritional status of children) are not mentioned.
- Regarding the recommendation 3 on addressing water quality: As we have already stated in our previous submission, pollution of water sources and destruction of water bodies has been identified in our case work as one of the major obstacles to the realization of the right to food in conjunction with the right to water. Besides the recommendations contained in the report, it would be useful to look into the developments of environmental law when it comes to prosecute and sanction environmental crimes related to water pollution as one important measure to protect natural water resources from contamination by harmful substances and pathogenic microbes. Moreover, it would be useful to provide guidance on best practices about how states should support local communities in restoring and rehabilitating degraded eco-systems.
- The recommendation 10 on water governance should be strengthened by calling to apply a human rights approach to water governance. The recommendations to states, civil society, the private sector, international donors and the CFS should be revised accordingly. The Right to Food Guidelines and the Guidelines on Responsible Governance of Tenure of Land, Fisheries and Forests provide references how this could be done. The preface of the Tenure Guidelines in fact invites States to take into account the governance of water in the implementation of the Tenure Guidelines. Particularly important in this context is the recognition and protection of customary land systems and the commons; and of the rights of indigenous peoples to land and territory and to Free Prior and Informed Consent.

92. Barbara Van Koppen, IWMI , South Africa

An inspirational piece! Please, see my comments in the attachment [*comments provided diretly in the V0 draft in PDF, Ed*].

Kind regards

Barbara van Koppen

http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/HLPE-Water-and-Food-Security_V0-Draft-BvK_1.pdf

93. Patrick Binns, United States of America

Dear HLPE Project Team and Steering Committee,

Thank you for the opportunity to provide input and comments to the draft consultation paper, “Water and Food Security” that is being prepared for the UN Committee on World Food Security. The subject is of critical importance to humanity’s prospects for sustainably producing nourishing food for current and future generations; and to do so in balance with our planet’s resource constraints and dynamically changing climatic and environmental conditions.

Clearly, 'Water and Food Security' is a complex, multi-dimensional relationship that embraces global and regional hydrologic cycles; disparate agronomic practices; watershed and landscape ecosystem dynamics; and social, cultural and economic factors that all contribute to our prospects for achieving healthy, prosperous and equitable societies. Given these complexities, I appreciate the project team's efforts to describe, document and recommend a set of strategies that could be adopted in farmers' fields; in technology research and development; in governance of water rights and usage; in public policies that shape private sector practices and investments; and in other disciplines. Your draft paper has made an admirable effort to articulate these important challenges and opportunities for action.

However, I am concerned that the present draft does not present a sufficiently coherent and forceful assessment of the challenges, conflicting forces and most promising strategies for implementing local, regional and global water and food security. In my view, despite being nearly 100 pages in length, the paper fails to draw attention to the most important issues and actions that are needed to promote and improve more productive and water efficient agricultural practices and to advocate for the public and private sector frameworks that are needed to accomplish these objectives.

This consultative paper is far too general in its statements and findings of facts and recommendations of best ways forward. While it provides many relevant comments and examples; much of what is written is difficult to comprehend. While only a draft, the paper needs thorough editing for clarity; and to more effectively present its key messages. The paper should also employ a more narrative organizational format and structure for its findings that provide greater granularity of 'subject headers' (e.g. bold font designations) that clearly focus the reader's attention to the important points being made. The paper would be significantly improved with the inclusion of an executive summary at the beginning that concisely defines the challenges, issues and recommendations for high priority actions.

As an example, I fully agree with the statement on page 29 (lines 9-12) that "… soil moisture retention and micro-climate management are crucial strategies…agro-ecological approaches are particularly suitable for building healthy soils with higher water retention capacity…" However, this critical finding is obscured in the dense text of several paragraphs. I would encourage the paper to format key points of information or action with more easily recognized subhead titles such as: "Soil Fertility and Soil Moisture Retention Are Critical Factors for Water and Food Productivity."

Similarly, "The Critical Role of Agro-ecological Practices in Building Healthy Soils" could be an excellent subhead title for a discussion of the importance of returning nutrients and organic carbon to soils; adopting multiple crop rotations; providing cover crops and crop residues to reduce evaporation and soil erosion; etc. These practices are widely recognized as being essential for the restoration and maintenance of fertile soils and more efficiently capturing and using water. Although the draft often mentions these actions; the points are usually hidden by verbiage and a lack of methodically presenting the argument for what actions are needed.

"Excessive Nutrient Runoff Leads to Eutrophication of Surface and Coastal Waters" would be a clear way to highlight a discussion of how poorly managed applications of chemical or organic fertilizers or livestock manure are contributing factors to water pollution; the reduction of fisheries productivity; and increased human health problems. This issue is briefly mentioned in the draft, but deserves a more thoughtful description of its negative impacts and the means by which farmers (or food processors) could change their current practices and operations to more efficiently and effectively manage and recover these unused nutrients for productive purposes.

"Soil Nutrient Mining and Poor Recycling of Post-harvest Nutrients Impair Water/Soil Productivity" is another topic that is briefly noted in the paper. However, the factors contributing to soil nutrient depletion (e.g. smallholders' lack of access to fertilizers; limited use of micro-dosing and other precision input methods; limited reuse of crop residues and composts; limited reliance on crop rotations and N-fixing crop varieties; negligible use of mycorrhizal fungi and biofertilizers; etc.) deserve much greater attention and consideration. Furthermore, enhanced recovery and reuse of organic nutrients in food processing wastes; livestock operations; municipal wastes; etc. should also be discussed to address the need to 'close the farm-to-table nutrient cycle' in order to replenish soil nutrients. Given that soil fertility exhaustion is a significant limiting productivity factor even when water supplies are adequate; proper soil stewardship will be absolutely essential for farming in a water constrained future.

"Improper Irrigation Practices Can Lead to Soil Salinity" would be a useful subtitle header that precedes a discussion of the negative impact of the buildup of salts in soils that are continuously irrigated. In view of changing precipitation patterns and lengthening drought periods; irrigating what are now rainfed arable lands is certain to become a more widespread adaptation strategy. However, if such practices lead to soil salinization, the productivity of such farming regions cannot be sustained in the long term. This is an important challenge and warrants more consideration and examples of best practices that can minimize and manage such environmental degradations.

"Local Watershed and Groundwater Management Practices for Maintaining Water Tables" should be specifically discussed and prioritized in the paper. While there is some mention of such measures; this subject deserves far greater emphasis than has been presented in the draft. There are many examples of successful farmer and rural community interventions (e.g. building check dams; retaining riparian vegetative buffer areas; maintaining local rainwater harvest storage reservoirs; integration of agroforestry and crop cultivation practices; etc.) that should be noted. With a better appreciation of these measures, hopefully decision-makers would be more interested in creating conditions that enable and support rural development efforts to build and maintain such water resilience infrastructures.

"Breeding and Distributing Drought and Salinity Resistant Crops for Improved Water Use Efficiencies" is an important element of a comprehensive water and food security strategy. Surprisingly, this entire topic was barely mentioned in the paper. This oversight must be remedied with the inclusion of a discussion of various means by which public and private research collaborations; region-wide farmer cooperatives and community seed banks; increased crop diversification across staple cereals and horticultural crops; and other methods that can strengthen the vitality and resilience of crops that must adapt to changing climatic and other abiotic and biotic stresses. The same attention to breeding for improved adaptation capabilities should also be applied to livestock husbandry as well.

"Human Capacity Building for Access to Training, Technology, Capital and Governance Processes" would be an important section to include in the paper in order to address the many institutional issues and challenges that impact and constrain agriculture's abilities and prospects for improving water and food security. The critical need to identify the 'best agronomic practices' for achieving higher Water Use Efficiencies (WUE); such as crop diversification, soil nutrient and watershed management, etc. must be complemented with facilitating the means by which farmers could improve their practices. This means better informed and more effective agricultural extension services; developing the next generation of agricultural and ecological systems scientists; more distributed and productive value-added capabilities in rural areas; and much more. Attention to these institutional and social-economic factors should be given as much consideration as the more field-focused practices that are covered in the paper.

I will conclude with a final comment that this paper clearly strives to introduce important information and perspectives to contribute to the Committee on World Food Security's cogent and hopefully productive deliberations and actions. This is a very good beginning draft. I wish you well in sharpening the paper's discussions and recommendations to advance this critical cause.

With best regards,

Patrick Binns

Seattle, WA USA

94. Zenón Porfidio Gomel Apaza, ASAP, Peru

Saludos a todos y todas desde el Altiplano peruano sobre los 3850 msnm.

El tema central del V0 es la relación agua y seguridad alimentaria, y en caso mío planteado desde un contexto geográfico, cultural específicos. Según el mapa de cuencas hidrográficas del Perú, elaborada por la Autoridad Nacional del Agua (2012) la cuenca del Titicaca representa 0.5 % de agua disponible del Perú, en el mismo espacio viven el 4 % de la población nacional (total habitantes Perú 30 millones). Siguiendo la serie histórica de precipitación pluvial acumulada anual durante los últimos 30 años hay un promedio de 700 mm, cuya distribución en los últimos tiempos en errático, además de la variación climática que vive en la zona con fuertes heladas, granizadas y veranillos que afectan las actividades de producción agrícola. También es importante mencionar que el servicio de saneamiento de agua, en forma de agua potable o agua entubada, está tratando de cubrir a toda la población, en el sector rural en mas del 50 %, con el agravante en el sector rural que el agua se ausenta en los sistemas de tubería de agosto a diciembre, por lo que es acceso de agua para consumo humano se hace de otras fuentes alejadas y con riesgo de contaminación.

Este cuadro configura un escenario donde la relación de agua con la producción agrícola y el consumo humano es deficitario, peor aún si se trata de agua para la nutrición. Cerca del 90 % de los cultivos del Altiplano dependen de la lluvia y el agua que consume la población rural solo es agua entubada.

Una de las alternativas que ya impulsa el estado es la cosecha de agua superficial a través de grandes y costosos proyectos de almacenamiento de agua para irrigación de algunas partes bajas. Sin embargo las laderas donde también existe agricultura están totalmente excluidas. Entonces se hace necesario el fomento de proyectos de siembra y cosecha de agua en las cabeceras de cuencas para atender otras áreas donde ocurre agricultura y para el consumo humano. También está pendiente el tratamiento de aguas entubadas para hacerlas potable y mejorar la salud y la nutrición de quienes los consumen.

Muchas gracias colegas.

95. David Hall, University of Greenwich, United Kingdom

Comment on HLPE Water and food security V0 DRAFT October 2014

by David Hall, Visiting professor, PSIRU, University of Greenwich. www.psiru.org

1. Comment 1: on right to water for productive uses (Q4)

In my view there are strong political, economic and environmental reasons for not creating rights for production purposes:

(a) Assigning political rights to water for production could not be done without allowing corporations to acquire such right, which would constrain democratic decision-making e.g. at village level, and grant undemocratic political power to corporations.
(b) allowing political rights to water for production processes risks creating economic inefficiency; not because it interferes with markets, but because it would create obstacles to democratic decision-making reflecting (changing) social and economic contexts , by creating an indirect market in such rights, sold by people who have more than they need to businesses in other sectors – as has happened in some Latin American countries.
(c) environmental issues e.g. food processing is polluting, so there should be a requirement for total recycling – not on rights to flows, nor the 'polluter pays' principle (which effectively =buying rights to pollute). See below, and more generally http://www.psiru.org/sites/default/files/2012-03-W-Resources-noannexe.docx

2. Comment 2: on food processing etc (Qb)

The problem of commercial use is not just about abstraction, but about priorities, so the level of use in ALL sectors is highly relevant for human security, including food security. So there needs to be regulation to reduce commercial use (to reduce pressure on the human RTW) and reduce commercial wastewater (to reduce pollution) . So there is a need to e.g. curb wasteful use by mines, and by food and other manufacturing. Two possible approaches.

(a) Access to water tied to treatment and recycling Eg Cordoba dealing with yeast plant pollution (see Watertime http://www.watertime.net/docs/WP2/D17_Cordoba.doc); also mining companies in Andalucia allocated fixed volumes of water , to be recycled, not rights to flows. This approach also stimulates further development of cleaning and recycling technology.
(b) Taxation of water for commercial uses; i.e. NOT general tax on water abstractions, but specifically on commercial use – so does not impact at all on household consumption, or livelihood consumption. Wastewater treatment tax is similar (see Vallés-Giménez and Marco. 2013. 'Environmental Taxation and Industrial Water Use in Spain'. Investigaciones Regionales, no. 25: 133–64 http://dialnet.unirioja.es/servlet/articulo?codigo=4226402 .

3. Further consideration of financial aspectss (Q1)

The report could benefit from extended discussion of financial aspects. Some of these are touched on eg the problem of trading of water rights, and, briefly, the limitations of decentralisation. But there is a need for a more explicit consideration of the issue. Linking water to food security should not lead to the assumption that human food security is NOT identical with the security of food production companies. Commercial food producers as economic firms are strictly indifferent to the human right to water or the actual extent of provision of clean water supply, except insofar as it affects their production processes or the level of effective demand for their products. There is no general reason to expect them to make any investments or changes to their political activity or production processes simply in order to advance the HRW. The use of public finance is therefore

central to this debate, either through taxation, or public spending on direct services, or subsidies, or some combination (see http://www.psiru.org/sites/default/files/2012-03-W-finance.docx)

96. Itamar Nadav, Netafim , Israel

Dear all,

My name is Dr. Itamar Nadav and I'm an agronomist At Netafim- the world leader in drip irrigation. I appreciate your work on the global water status but I have few suggestions to achieve some of the goals.

Regarding dealing with saline water for irrigation, in continue to line 22 on p. 30 I would add: further conventional irrigation with saline water can, in long term, rule this soil out from being feasible for agriculture uses. Adequate irrigation practice such as drip irrigation along with drainage cam maintain the salinity level at the root zone beneath the critical salinity damaging for not salt durable crops. Drip irrigation keeps the root zone constantly wet due to the low discharge rate and the daily irrigation. In those conditions the salinity level can be constrained with less crop yield reduction and sustained soil salinity for long term.

Regarding the section dealing with ground water in p.31 I would like to add that the reduction of available ground water and the depletion in ground water level requires higher energy inputs and costs. Irrigating with old fashion methods requires large amounts of water and as a consequence high pumping costs. Irrigating with micro irrigation methods requires significantly less water and reduced flow rates which leads to reduced pumping cost and cheaper pumps. Furthermore, long term of flood irrigation along with fertilizers application may cause ground water contamination by leached nutrients, while micro irrigation methods uses less fertilizers that are located in the wetted root zone and hardly leached from there

97. Barbara Van Koppen, IWMI, South Africa

In support of an expansion of the current right to water for domestic uses to also encompass a right to water for food, the five points below trace implications for the state as duty bearer.

1. Statutory water law should respect and protect any water directly used by people to meet their human right to food. Currently, the most widespread statutory law, permit systems, entail the opposite. First, micro-users exempted from the obligation to apply for a permit, are categorically relegated to a status of second-class entitlement. Second, small-scale users, especially women, who are obliged to apply for a permit are discriminated by the administrative structure. The revisions of the permit systems to these ends should be well communicated in local language.

2. The state has the following obligation to fulfil the right to water for domestic uses and food when investing in public infrastructure. The contents of the human right to water should at least be 50 lpcd. This is because a significant proportion of clients of water supplies that were designed for domestic uses only, already use those supplies for productive purposes as well, even at levels that are commonly seen as basic domestic uses (Hall 2013; Van Koppen et al 2009). These productive uses should be respected and protected instead of being declared illegal. Hence, in order to reach the

recommendations for absolute minimum for domestic uses of 25 lpcd, higher service levels are needed.

3. Irrigation projects should also respect and protect the already existing human right to water for domestic uses, in case such domestic needs are not met as yet otherwise. There is no justification why irrigation professionals can ignore that right. Thus, new irrigation schemes should be designed to also meet the human right to water for domestic uses. In existing schemes, as a minimum, no one should be prohibited to use the scheme for domestic purposes. Instead, such domestic uses should be encouraged and enabled. A minimum volume of 5 lpcd should be safe for drinking and cooking.
4. People's own investments in infrastructure for water for multiple uses that contribute to meeting the human right to water for domestic uses and for food should be fully respected and protected , also as the starting point of planning any new public water scheme.

5. Future users of a new scheme or a rehabilitation, women and men, should have a strong say in the planning of the scheme that affects their lives, especially in the technology choice.

98. Ian Hextall, University of London

Bottled Water

Within the body of this excellent report there is little discussion of the place of bottled water in relation to water and food security. Undoubtedly in relation to disaster relief bottled water has an important role to play. However, in more general terms it can play little part in the development of a secure and sustainable potable water scenario. In ecological terms it is wasteful of resources both for bottling and containers and in relation to transportation and recycling. In economic terms it is also much more expensive than sources of municipal water and plays an increasingly significant role in diverting scarce resources from the public to the private sectors. In 2013 the global bottled water market was estimated as worth £25bn and in the UK £2bn. In both cases these figures are on an upward trajectory.

(Source:
http://www.ccwater.org.uk/waterissues/currentkeywaterissues/drinkingwaterquality/#sthash.mbdMtyIm.dpuf)

There is considerable debate about the relative qualities of tap water and bottled water. In repeated controlled tests it is shown that people find it very difficult to differentiate the taste and quality of bottled and tap water. Within this ambivalence there remains uncertainty about the macro-biological security of bottled water over long periods of storage and in regard of the leakage of contaminants from the bottles or rigid storage containers.

There are also national, regional and global concerns over the regulatory procedures surrounding bottled water. Whilst public water is very meticulously tested and regulated the procedures concerning bottled water are much more 'light touch' and largely rely on the commercial providers to undertake testing and to make returns.

Finally, in areas of low resources and high water insecurity water harvesting by private companies can make significant inroads into supplies of ground water. This can generate situations of water capture and the reallocation of water resources on commercial grounds.

For all of these reasons it would seem warranted to spend a little time within this HLPE report exploring the commercial, regulatory and governance contexts of the bottled water industry.

Ian Hextall (WaterAid Volunteer) (Research Fellow Goldsmiths', University of London)

99. ActionAid Netherlands , Netherlands

Feedback ActionAid Netherlands to Zero Draft

ActionAid Netherlands welcomes the HLPE report on water and food security and the opportunity to contribute. We feel the draft contains a very strong and human right-based analysis and recommendations on the importance of better understanding ánd addressing the role and challenges of water in food security and achieving the right to water (3.6). We would particularly like to highlight the strong connection between land and water and the particular gendered dimensions this has, as well as the importance of empowerment and a rights-based approach to providing an enabling environment and support to (women) small-scale food producers, to access and provide water and food to themselves and their societies.

- From our work on sustainable agriculture (climate resilient sustainable agriculture) it shows that supporting smallscale (women) farmers in building agroecological approaches and mitigating as well adapting to water challenges is urgent and promising to food security and biodiversity.

o See experiences with agroecology and sustainable ánd inclusive water management in for example Kenya here.

o Water in innovative integrated smallholder farming systems, involving (rainwater) harvesting, small scale irrigation, crop and animal diversity, fish farming etc.

- From our work and research on land rights, large-scale land investments and land grabs specifically it becomes very clear that:

o Land grabs often constitute water grabs as well, especially because high potential areas for irrigation are targeted (e.g. near lakes).

o Climate change, large-scale aquaculture and agriculture as well as mineral-extraction and other mega-development projects reduce fishing and farming communities' access to land, security of land tenure, and the availability and quality of water for drinking, sanitation and for small-scale food production, as documented by the Polaris Institute and ActionAid.

§ See also specific cases such as the impacts of biofuel investment in Tanzania (Fuel for Thought, ActionAid 2012; and country study by Sulle, 2009) or extractives.

§ Also many other export commodities such as flowers have major impact on local water ánd food supply. The link between industrial monoculture and catchment (watershed) land degradation in large African catchment resulting in more severe erosion and more severe flooding etc is often not sufficiently acknowledged and addressed.

§ There are also direct health dimensions, e.g. risks of waterborne diseases around large irrigation schemes, etc.

o Women are particularly affected by both pressures on land as well as water due to lack of protection of their rights as well as the roles they play including producing and providing food, water collection etc. This shows from various case studies as well as our analysis on 'Gendered Dimensions of Landgrabs' (From Under Their Feet, ActionAid 2012) and the research under the Women and Mining Project (Womin), such as the impacts of extractives on women's access to food and water. Women smallholders require access to water for drinking and food production, yet their rights and opportunities are systematically denied, often for the simple reason of being women. Moreover, policies often disregard smallholders contributions to food production, climate resilience, and biodiversity regeneration, among others.

o Where we support women to claim their land rights, this is only effective if this land is fertile and they have access to water and additional resources to improve their (food) production. When these conditions are met, this approach of empowerment and jointly addressing the right to food, water and land is very successful. (See work with REFLECT circles for example and findings from evaluations of ActionAid programmes, such as published in the report 'From Marginalisation to Empowerment' – ActionAid 2013).

§ Many, including the World Bank now acknowledge the important role women play in food production and cooperating with them in the defence and expansion of access to land, water and support for farming can significantly contribute to both women's rights and food security.

- Acknowledging the strong interconnected nature of these resources and challenges we feel a more holistic approach to land and water (or in fact natural resource) management starting from the right to food and water is key to achieving food security. In practice there is often little cross-over between people working on water for production, water for consumption and those working on land rights and gender equality. Acknowledging the food-water-land nexus and its gendered dimensions more strongly in research ánd policy making would be a major step forward.

- It is important that to understand and address the the impact of global/EU/OECD consumption (especially of water intensive crops such as soy, sugar; flowers) on local water availability in for example Africa. One approach is to start measuring and addressing the water footprint, as the Dutch Landscape Agency has started to explore for the Netherlands. This could be done in conjunction with land and other resource footprints, followed by action.

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100. ActionAid Pakistan. , Pakistan

I think it is a comprehensive report covering almost all the aspects. Please find suggestions on the report.

- There is a need to emphasis more focus on the efficient and wise use of water for the crop production in the introduction.
- Water harvesting and its linkages crop production
- Trans boundary water issues and its nexus with livelihood, agriculture, crop production women role needs to be emphasized.
- I think there is a need to include latest food insecurity, water scarcity data in the introduction
- There is a need to analyze role on MNCs engaged in the water business like Nestle and its link with the water scarcity and water rights
- More emphasis required for the industrial waste, its linkages with water use for crop production especially vegetables(mainly women job)
- Water harvesting especially in the water scarcity regions.
- Need to include water insecure regions
- Monitoring water rights
- Need to demand promoting crops which needs less crops,
- Promote/advocate livelihood diversification including staple food/crops
- Information need to be added on impact of climate change on the decreased yield and its nexus with food security
- Need to include role of agriculture/water research institutes
- Need to emphasize on promoting food crops instead of cash crops
- Propose budget allocation
- Need more focus on the water conservation local methods, water erosion control etc
- Need to critical look into water privatization(based on the experience in south Africa, argentine etc)
- I think in the introduction a paragraph on the international commitments on right to water is required

101. Italian Committee for the World Water Contract , Italy

1. Introduction and General Considerations

The Italian Committee for World Water Contract (CICMA) is an organization committed over 15 years, in international, European and national level, to promote the human right to water and its preservation as a “common good”. We appreciated this initiative taken by HLPE of Committee on World Food Security (CFS) to stimulate reflection about the links between the right to water and the right to food and setting the problem with reference to means of legal recognition and in terms of governance.

The defence of the right to water, land, food, is the priorities requested by rural communities and farmers as evidenced by the resolution adopted in Dakar. While in Rome take place in FAO the working of the CFS in Dakar, in the same days, in the African Social Forum social movements discuss land and water grabbing.

Over 30 organisation engaged in land, food an water have signed a political platform of request to the Institution asking the implementation of international legal instruments for the realization of these rights and the State's engagement for the implementation of these right in the new agenda of sustainable development goals post-2015 (Annex 1)

CICMA consider the proposal "Draft-zero" a first significant contribution. For the first time "water and food" is highlighted the connection and was recognised that "can be no access to the food-right" if is not possible to guarantee the right to water and consequently to the access to land.

With reference to sections of the draft devoted to " water" we would like to point out that it is necessary to supplement this section with the latest documents; in particular :

- references in terms of water-right, violations, recommendations are just contained in the reports of the Water-right Rappoteuer and the pronouncements of the Human Rights Council;
- the examples reported in the box, in terms of countries experiences are "dated", and can be replaced with more recent experiences of application of the human right to water .
- at level of legislative frameworks for the recognition of "human water right" we can refer to the experience of Ecuador that entered into the Constitution the water-right and the right of land and adopted them at national laws . Other examples at national level on the cases of Uruguay, Bolivia.

2. Contribution to the questions

Referring to questions proposed in page 2 of draft, we present the contributions of CICMA (Italian

Committee for the World Water Contract)

1. The scope of the topic of water and food security is very broad. Do you think That the draft V0 Has it adequately charted the diversity of the linkages between water and food security and nutrition? Is there evidence or important aspects the present draft That Has Failed to cover?

Consideration.

Relationship between "right to water and right to food.

It is good that in these draft of HLPE/CFS is recognized and introduced the connections between water and food right, in the context of human rights. But human rights are principles which are recognized only at the level of soft law and so are not guaranteed by the States.

It would be appropriate to recall the principle that "water is life" and that without water there is not any "life" (in all its forms). Without water you can not produce food. Without food you do not live.

Any can live without water and food. These statements may strengthen the connection between the two rights and the urgent need to ensure accessibility.

Proposal:

1. CICMA suggest to explain this relationship and consequently to affirm in the draft that in the absence of a recognition of the water-right, in term of access to a minimum level (guaranteed by the States and International community) is unrealistic can ensure the right to food and nutrition. The recognition of the right to food is subject to the realization of water-right at national level, but it is necessary to remember that water-right is just recognized at specific and autonomous human right by the UN and up now there are not at similar level of recognition of "food-right".

2. CICMA suggests not approaching the right to food in terms of right of poor groups or as priority for the most vulnerable the categories. This approach is not in harmony with the universal level of "human rights". The right to water and to food is universal and must be guaranteed to everyone, not just only to the most vulnerable people.

Our proposal is to confirm, in the draft, the universality of "human rights" linked to human dignity. The human rights must be recognized and guaranteed by all the States. It is time to assert the universal, inalienable, supra-national, inter-religious level of "human rights" and promote the States' commitment to recognize the "rights of nature/land" (ecosystems).

2. Has the report revealed adequately covered the diversity of approaches and methodological issues, in Particular Concerning metrics and data for water and food security? Which metrics do you find Particularly useful and Which not?

Consideration.

Referring to the parameters of "quantification" to ensure food and water in terms of "security", the document suggests some parameters proposed by UN Agency for the minimum quantity of access to water. On the basis of the experience and assistance provided by FAO, it is possible to propose in the draft a minimum quantify of water necessary to produce food for basic nutrition in rural areas?

Proposal

CICMA proposes that the draft would formalize some proposals regards the minimum quantity of water for drinking and sanitation in terms of "human water right". In order to realise and implement the UN resolution is necessary to quantify the minimum guaranteed as a "human right" and at the same time to identify an instrument of international law that ensures this " water right".

CICMA propose that the document adopt of certain parameters in terms of the right to water for human use and for food production.

The parameters to introduce as a benchmark are as follows:

1. Universal human water-right

The right to water: minimum quantity of between 50 and 100 litres per day per person taken in charge by the State;

The right to individual and collective welfare: between 100 and 250 litres day/peers access is guaranteed through a progressive tariff system in respect of good state of eco-systems;
The right of water (sustainability of ecosystems): the domestic use in excess of 250 litres/day/p is prohibited.

2. Universal right to access to water for food production and uses

- Right to collective water use: up to 1700 m3 year for all purposes, cost taken in charge by to local community;
- Right to collective water use: uses ranging from 1.700 m3 /y/p at to 2500 m3/y/p , access is guaranteed through a progressive tariff system
- Uses of water for intensive production from 3500 m3 /y/p are prohibited if unendurable for the ecosystems.

3. Food security Involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently-for-food importing countries, food exporting countries, scarce water versus water rich countries. Do you think the draft V0 Has appropriately covered the matter?

Consideration.

Referring to the concept of “food security” it should be noted that not all the rural communities and farmers recognize the priority of these approaches, because food security do not defend their rights, but those who

have the ability to access the food market and to purchase it.

Access to food, the right to food and nutrition, can not be addressed only as " availability of a food", possibly to access at low-cost or an affordable price, and at if possible with a low water footprint.

The growth of national income of the countries through export of agricultural products with virtual trade water, does not the guaranties to transfer these incomes to the peasants and the opportunity to ensure the

food. The vision of “food security” in terms of production and access to food does not guarantee the right to

food and basic nutrition for all, in particular for the poor community.

The right to food, the access to food can not be assuring providing to the rural community the money to buy the food on the market or giving food-free .

To adopt the “virtual trade water” as a parameter to select or to orient local agricultural and food production improve the necessity to realize a national “market price of water”. This approach support the prevailing view, imposed by the water companies and many national policy, that “water is a commodity” and not a human right.

Proposal

CICMA suggest introducing in the document the concept of “food and water sovereignty” as a way to real ensure food security, in terms of the right to access to water and food.

The paradigms of “food sovereignty” and “water sovereignty” are used to strengthen the claim of the right to food, to water, to land of communities and to manage production and agriculture processes, may be realized in respect of human and environmental rights.

A vision of the right to food and water based on "sovereignty", namely in terms of self-determination of the

farmers, rural communities and peoples engaged to the rights to water, to the environment and the sustainable use of common resources (water, land , seeds, biodiversity) is preferable to a model of agricultural production oriented only to respect “water footprint” or national food security through the importation of technology, seeds and economic standards for agricultural production.

CICMA suggest preventing in the document the approach of “virtual water consumption”, witch strengthening the vision of “water is a commodity”, a resource with economic value in the market.

4. In this report, we considered the potential for an expansion of the right to water to encompass productive uses. What kind of practical and policy challenges would this bring?

The approach of "extension" of the right to water raised by the report is good but requires the positions defined on the legal basis on which the claim can be set.

Consideration

The approach of the report to consider the potential for an expansion of the right to water to encompass productive uses is good approach. We suggest, however, that this approach should be strengthened by clarifying the legal framework and the bases of reference.

Thanks to the mobilization of the water movements, ad international et national level, “water” is characterized today from a very advanced international legal framework in terms of recognition as “human right to water and sanitation”. The recognition of this right is secured by a specific UN resolution and supported by States and subsequently by the Human Rights Council.

This can proceed fire by introducing an international legal instruments concretely realising the resolutions and conventions already ratified by the States and sanctioning j the violations.

The legal framework currently existing for right to food and nutrition as human right is only at the level of reference in the Declaration of Human Rights (article 25) and of principles in terms of economic, cultural and social rights. There is no specific resolutions at human right.

Proposal

Cicma suggest that to explore the hypothesise that water and food rights must be associated, with the support of experts. A legal basis such as a Treaty or Protocol specific for human as a human right, adopted by the States and international community defining obligations of States, in terms of quantities, methods and sanction against of the violations of universal right to water.

Only through the adoption of this framework and the procedures for guarantying the human righty to water we think it will be possible to introduce principles in relation to the right for water and food of vulnerable groups.

With reference to other productive uses of water, it is proposed that this international legal framework confirms that the human right to water and sanitation should prevail of other productive uses, and that access to water for all other uses is subject to the balance of available water resources in that territory. Access to water for agricultural production and other purposes, must be based on a progressive tariff system for levels of consumption. The uses incompatible with the water balance of an area (resources of ecosystem or basins) should be prohibited.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

Consideration.

The document highlights the importance of water governance and identifies three level and models, but does not identify what is the most relevant to ensuring the right to food and food security. The reflection on the most appropriate models of "governance" brings us back to the concept of the management model in terms of "food security", "water security".

Proposal.

1.Cicma suggest the opportunity to activate a process of analysis, with debate and consultation in CFS respect to the food security production, as model to access to right-food and to promote individual welfare of the poor, the farmer, and the rural community .

We think that the approach of "food sovereignty" linked to the rights of communities and rural producers, is a and responsible model of agricultural production with a more respectful cycle, combining individual rights, and more respect of the environment right's (use of soil, land, water etc)

Referring to the management-governance of common goods, particularly of water, the governance must be conceived in terms of the sovereignty at global level (humanity, peoples) with the involvement of local people and communities, and not in terms of local, national security for access to food, water, and environment.

The concepts of "food security" and "water security" are linked to a concept of "national sovereignty" (State / Country) of naturals resources (water, soil, food) and therefore are associated to national security and defence policies. In order to defend the access to national goods it's allowed and tolerated the use of military security in the name of "sovereignty" (see water wars, land wars (grabbing), wars for food / bread),

To avoid these conflicts and ensure the "security of access to resources" for all, current trends' tend to build models of "governance" that give the power to "definition of rules and legal bases" to stakeholders, reducing State's sovereignty. We suggested to avoid in the "draft zero" supporting this model of governance only practiced and supported by European Commission and the principal corporations for "water management and governance" (refer to policy's of World Water Council, CEO, UNwater, Blue print of EC,TTIP negotiations USA-UE)

2. With respect to governance models, we believe it urgent to promote a reflection on designing new models. The most appropriate model to ensure news governance for the rights of the commons goods is to create instruments of international law and supranational structures of law with legislative and sanctioning powers, about of the national sovereignty of States. One hypothesis, at international level, proposed by CICMA and other Movements is to promote a World Water Authority and an International Court for Water and the commons goods.

At the regional level it is necessary to propose and to adopt models of governance based on local communities. These models may be recognized by legal frameworks, by protocols or by treaties that introduce management at a local areas, particularly transboundary basins of water. Basin management committees should be composed by representatives of local governments and citizens who live on the land and use the water resources, in particular citizens, farmers, stakeholders.

3. With reference to the principles, the appropriate model of governance must ensure the rights of the citizens living in the territories. Necessary to guarantee: the right to information on the quality of water and on sources used by public or private actors; the right to the participation for civil sociality ; the sanctions of the right to violations; the respect of the human-right water also in the wars the respect for the rights of the environment (soil, climate) .

Part 2 : Recommendations

Point. 12 - The right to water and food

Consideration

On the basis of the above considerations, for CICMA suggest

- Binding human right to water and the right to food, referring only to the common belonging as “human rights” recognized byn the Declaration of the United Nations, is a wach approach
- difficulties are even greater for the proposal to associate the right to food to recognition of the rights of nature and ecosystems. The failure of the Climate conferences’ that the States are not willing to give up their sovereignty over natural resources managed in terms of security

The recognition of the human right to water and sanitation, as established by resolution of the United

Nations, does not make an explicit reference he right to food ; it is difficult to sustain that it be automatically extended in terms of food right, especially as a right to access to food for the poor.

Maybe it ’s possible to introduce the right to water for food and extension of the human right to water and the right to a dignified life (right for the life).

The recognition of the right to water may be promoted and pursued:

- At the level international, through a Treaty or International Protocol

- At the level of individual countries, through national legislative frameworks

The definition of the human right to water, the regulation of the substantive issues that need to be guaranteed by the States at the substantive and the procedural level, through an international Treaty adopted by the United Nations Assembly, could increase the possibility of obtaining a specific recognition for the right to water for food production, particularly for the most vulnerable groups.

At international level, CICMA is engaged to promote a proposal for a Second Optional Protocol to the

International Covenant on Economic, Social and Cultural rights, on the right to water and sanitation

(PIDESC) ; in this draft there are definitions of water-right in terms of “drinking water and sanitation”, and “drinking water” is inclusive of water use by human for drinking, cooking, food preparation, personal hygiene and health or similar purposes.

At national level, it is necessary that States adopt national law ensuring that “everyone has access to safe water” and adopt roll propose by the Optional Protocol for water an sanitation .

We here remind that the most advanced model of water-right is implemented in Ecuador : after having inserted of the right to water and right of nature in its Constitution, the Government passed a national law to regulating the different uses and recognizing the right to water to communities for food self-production.

Proposals

The Italian World Water Contract proposes to the drafting group to introduce in the “draft-zero” the following proposal :

1. to request to the Human Rights Council to propose to the States to adopt an instrument of international law, a Treaty or Protocol, in order to ensure the human right, autonomous, specific to water and sanitation, the obligations of States on the substantive and procedural terms.

2. to request to the Human Rights Council to adopt a resolution formally declaring the connection between the human water-right, food-right” and right of water ecosystems. Such resolution should recognized the local community as the subject who has the right to manage plans for protection and use of water, land and food.

3. to request to FAO to identify the appropriate channels, at the level of United Nations, supporting the proposal for a Second Optional Protocol to the International Covenant on Economic, Social and Cultural Rights (PIDESC) and at the same time promoting, among the objectives of sustainable development of the UN Agenda post-2015, the formalisation of the right to water, food, land as State’s commitments.

4. the request to FAO to give immediate effect to "voluntary guidelines" on land and resources management, by identifying the legal means for effectively implementation the protection of rights by the States.

102. Ruben Olmedo, National University of Cordoba, Argentina

Good morning, it is very exciting to participate as a consultant to FAO documents. From my point of view it is an activity that has to be filled with pride to all participants.

Comments and inputs on the following important aspects:

1) The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

The report is comprehensive and covers many important topics and story to the problematic of water and food securitya and I think the link between water management, food security and nutrition is demonstrated. As a matter of high importance to cover: the teaching of proper water management education as well also in terms of food security related to drinking water and higinizarse.

2) Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

The report is very explanatory in terms of approaches and methodology used to demonstrate metric parameters of the water.The most useful parameter is indicating how related is between the amount of water per capita and the amount of water that is in condition to be used in the feeding and sanitation to be food secure. As in the case of countries that have a high average rainfall but water infrastructure issues can not be exploited and that is used does not have adequate conditions for safe use.

3) Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

Okay addressed the issue of issues related to food trade (in its various forms such as grain, meat, etc) and food security. Anyway there most food production is related to the private sector which is not presented in its most respect for water use. In many developing countries it is difficult to control by the state over the private sector mainly due to problems related to bribery, inefficiency in the management of water or lack of interest on water management. This is seen a lot when they are corporations that comercilizan food produced in other countries and not in the country of origin of the food. A controversy was raised in Argentina with the theme of soybean monoculture industrializing little to consumption in Argentina and one of the issues that were raised to consider is water loss suffered by Argentina which is built into the seed and not it also takes into account the wear and extraction of minerals from the soil. Also in international trade by large ships and make port in freshwater rivers, has lately proved that they are filling their ballast tanks with fresh water marketed in countries where the load carrying grain and sell this water sweet crude for them to be potabilizadas. This has been observed in the basin of the Rio de la Plata-Parana where is the port city of Rosario which is the largest grain agribusiness hub Argentina. These practices Trading are not regulated and may affect property rights of countries own their natural resources which through special taxes or charges may allocate those revenues to improve infrastructure for uptake of water for use in the food chain and to improve structure safe water in poor areas.

4) In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

The right to water, to food, to health and to education should be inherent in every human being. As for the right to water for the production should be considered two aspect that may be related to conflicting ethical-legal-political kind. If the right to produce is referenced to the generation of food and if those foods to be marketed elsewhere in the world, we must take into account that production will not be available for residents of the region where it is realized production and also for such production water that may be in need of the citizens in their daily lives is removed. In such circumstance is this privileging people in other areas who have money to buy these foods rather than privileging locals production which compete for water supply. As the people have the right to water and feed is necessary to generate food but if the food is produced in a developing country with water issues and are sold in developed countries with high aquisitivo power, situation or problematic generates me in developing country? The production is entitled to water but also the people have the right to water and what produccido in that region and the surplus can be traded but can not remove the right to water to the inhabitants to produce food that will be marketed in other areas because we would be increasing the money power generating monetary inequality and inequity and lead to pay more for the right to water.

5) Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

From my point of view the approach may be more effective water management and food security should be the politico-social with a focus in the awareness of water management. In developing countries water management, unless there escazes no interest in the agenda of states and are not worried about pollution or increasing desertification. Governments in many of these countries are more concerned in the following year in the coming decades. It is the state approach that can enable increased infrastructure for the uptake of rainwater and can be ensured by controls pollution of aquifers not. Reports and recommendations will not be effective but become one of the most important issues on the agenda of governments. Without an international protocol to regulate and to consider a challenge to water management by all the countries the individual actions of each country will be governed according to the convenience of each country according to the problems that are identified on the fly and not are going to be working on real long-term solutions. Like for example I live in the city of Cordoba in Argentina. We are very close to a lake called Lago San Roque which provides us with water to the city of 1,250,000 inhabitants. This lake has been filled for decades by the growing mud generated in hilly areas due to deforestation that can not attract and retain water. The lake's capacity to retain water has led us to begin to suffer water shortages Alerts. The government policy was not only clean up the lake shore and increase the height of buildings leading to increased eutrophication of water and a minor amount of water to dissolve the contaminants. Do not plan on water management but governments often think of other government actions regardless of water management.

In addition to the issues and queries also wanted to make a contribution regarding the editing of the report which is not justified paragraphs, there are figures that are not mentioned in the text and no mention in the text of figures that are not included or has the name changed. In addition there are figures that are far removed from the text where they are mentioned and are displaced for several pages back or forward. Some figures to be extracted from other bibliographic materials or reports lack some information or axes which explains that seen in the figure which could be remedied with a footnote at the bottom of the figure. It would also be good to include a list of all abbreviations used

for a more comprehensive document management. Give certain impression that the times were very short and could not make a review about the edition of the paper to reduce such errors.

Anyway it is a very good outreach and effort devoted to collecting and searching for solutions to water management shows.

I would like to thank for the opportunity to be working albeit with opinions or suggestions that maybe are not available to the excellence that is in the report but all views add to the plurarilad in water management and food security . I would have liked to do some stress upon the management of water purification to be consumed and possible technological alternatives who are within reach of at risk populations and poverty.

Also highly motivating and mobilizing of reviewers would be if there was the possibility of reward by an electronic certificate which has participated and collaborated in that FAO is an umbrella organization that to me proud and professional responsibility for the work and reports that perform and to have a certificate of collaborating is really pleasing. They are wont as a suggestion.

Greetings and at your disposal.

Ph.D. Professor Ruben Olmedo
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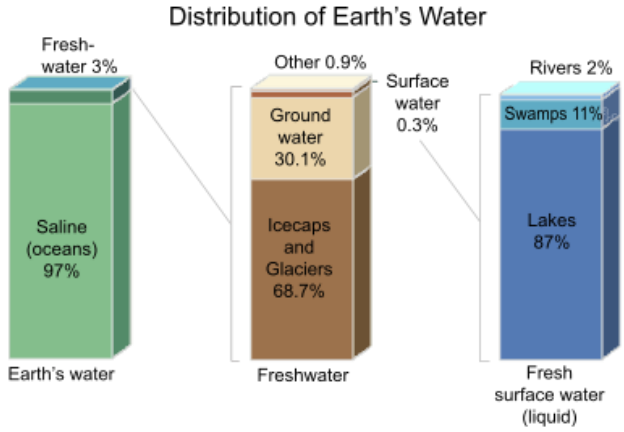
103. Oxafm Intermon WaSH , Spain

Comments from Oxafm Intermon WaSH. Any question please free to contact mmiret@oxfamintermon.org

Page 13. Suggested Box
WaSH with Nutrition approach allows to take advantage of evidenced efficient Public Health Promotion (PHP) methodologies used in WaSH. These methodologies enhance behavior change and community based approaches that address malnutrion causes underlying (based on 1997 UNICEF malnutrion causes framework).
Source, Oxfam Intermon

Page 17. Suggested figure
It is suggested to mention % of fresh groundwater sources compared to % of fresh surface water in the world, since groundwater represent 30.1% of freshwater and surface water only 0.3%



Source, Wikipedia

Page 27. Suggested box in Chapter 2

In 2012 food security crisis in Sahel, WaSH Food Security integrated approach programs allowed to optimize use of water resources for both safe water and livelihoods. For example, a rehabilitated well was used for accessing safe water for drinking and hygiene. At the same time the well drainage was adapted by radial connections to allow access for livestock to drink and for vegetable garden watering.

Source, Oxfam Intermon (Mauritania, 2012).

Page 35. Line 18. Water re-use

Suggested: mention how technologies already used in developed countries, as Manged Aquifer Recharge (MAR), could be used to "treat" waste water for future use in irrigation, livestock, etc. (links: http://www.kompetenz-wasser.de/fileadmin/user_upload/pdf/veranstaltungen/kongress/Jekel_NASRI_Overview.PDF , http://www.epa.vic.gov.au/~/media/Publications/1290.pdf)

Page 35. Line 27

Attention when mentioning using brackish water in agriculture. Overexploitation of brackish aquifers might increase saline intrusion (special in coastal areas) and deteriorate groundwater quality.

Page 36. Line 10. Desalination

There are experiences of desalination with renewable energies which are more sustainable and economic feasible compared to non renewable energies (links:

http://water.worldbank.org/node/84110 ,
http://www.irena.org/DocumentDownloads/Publications/IRENA-ETSAP%20Tech%20Brief%20I12%20Water-Desalination.pdf)

Page 47. Line 10. Water footprint
Suggested: link to the new ISO 14046:2014 which will specially affect to companies of developed countries (http://www.iso.org/iso/catalogue_detail?csnumber=43263)

Page 79. Line 29. Research

Undertake further research on technical/scientific solutions for prone flood and arid zones in water drainage and water access consequently.

104. World Vision International

Greetings,

We are appreciative of this opportunity to provide some feedback on V0 of the report on water and food security. Our comments on this topic are less extensive than on some of the previous ones, for two reasons, the second being the most significant reason:

- we have had less time to look it over and provide feedback, but more importantly
- it is an excellent piece of work as it is and, in our opinion, there are no major gaps in the work -- nor is it going down the wrong track

Additionally, we appreciated:

- the very important dual emphasis on management and governance -- the second aspect being too often given short shrift in the WASH sector -- and
- the very important mention of soil and water conservation/management practices in agriculture and the role they play in water management for FS.

Wishing you all the best as you revise in response to the feedback you have received. Please do not hesitate do get in touch if you wish to follow up on any of the points we raise.

All the best.

Doug

Water and Food Security

Comments on V0 Draft

Douglas R. Brown, Christopher Shore, Angeline Munzara, Kirsty Nowlan and Pamela Ebanyat

World Vision International

General Comments

- We have reviewed this report and find it, on the whole, to be a very useful and comprehensive survey of thinking about the current situation, a thorough analysis of the data and a clear statement of issues that need to be considered for the future, especially in relation to food security, including the impact of inadequate access to water on children.

- In terms of water management, we really appreciated the focus on:
  - soil and water conservation and soil management
  - supplemental irrigation
  - water harvesting and storage
  - integrated water resources management
  - attention to the gender dimensions of water and food security
  - links between healthy ecosystems (including water) and dietary diversity
  - the importance of an agroecological approach

- At the same time, we feel that there could be greater emphasis on:
  - community-based watershed management
  - landscapes and water
  - the important role that climate smart agricultural practices play in management and recharge of groundwater as well as their linkage to food security and resilience
  - a more explicit mention of the role of management of soil carbon in water management

- In addition to this, we really appreciated the very strong and comprehensive focus on the various governance issues related to water:
  - Access to water
  - Local level as well as national level institutions, both formal and non-formal

- We are largely in agreement with the conclusions of the report. With respect to some of the specific recommendations we would note:
  - Recommendation 1: Water and sanitation deserve a central position in food security and nutrition strategies and there needs to be more joined up thinking and action around water / sanitation and food security and nutrition:
    - It seems to us that there is a disconnect between the analysis of the report, which acknowledges the particular impact of inadequate access to water on children, with the recommendations, where children are entirely absent. This could be corrected by specifically naming children as a cohort alongside vulnerable women and men in Recommendation 2. For example, the introduction on page 76, line 21 could be reworded as:
      - "Problems and solutions around water for FSN are often conceptualized and framed in ways that neglect the needs and interests of poor, food insecure and marginalized women and men, including and especially children. Thus,

poor women's and men's capabilities and entitlements to water and food are neglected, together with their ability to ensure the needs of their children for water and food are met."

- The report rightly states that the current The Voluntary guidelines on the 'Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security adopted by CFS do not address the link with water. Given that access to land and water are interlinked, it would seem appropriate to consider how the CFS might amend or revise the Voluntary Guidelines to include water – or consider whether one might develop separate guidelines for sustainable water management. In most African states, just as land is vested in the State, so is water. Land and water are the most critical resources for agricultural production.

- Recommendation 4: Ensuring sustainable use of ground water:
  - States should recognize the key role that ecosystems play in maintaining water quantity and quality and support actions within respective national boundaries to protect and sustainably manage these ecosystems.
- Recommendation 6: Fostering sustainable investment, innovation and technologies to improve agricultural water management productivity:
  - National governments, international finance organisations, NGOs and international cooperating partners should accelerate the provision of technical and financial assistance to countries in preparing nationally owned integrated water resources management and water-efficiency plans tailored to country-specific needs, paying particular attention to economic development, social and environmental needs as well as to the development of innovative and locally adapted institutional arrangements to enable their effective management.
- Recommendation 7: Locally appropriate solutions:
  - States should also involve all stakeholders, including women and men, youth and local communities, in integrated planning and management of land and water resources; developing preventive and preparedness measures, as well as risk mitigation and disaster reduction, including early warning systems and facilitate information exchange and knowledge-sharing, including indigenous and local knowledge.

- Finally, it me be worthwhile discussing the sort of programming options that might help assure that the linkages between water and the various dimensions of food security are optimized:

Food security dimension		Water		Activities		Indicators
Availability		Water for increased crop & animal production		Irrigation, dams, rain water harvest		Households with year round access to sustainable sources of water
Access		Water for Increased incomes		Water for sale, water for value addition, Advocacy with the		Households with improved standards of living as a result of water sale as a source of income

Food security dimension		Water		Activities		Indicators
				government		
Utilisation		Water for better nutrition		Water for food preparation, safe drinking water, Water for WASH, water for health		Households accessing safe water, households with improved standards of sanitation and hygiene
Stability		Environmental Water control, preservation and maintenance (Management)		Drought & flood management, adoption of water preservation Agriculture approaches like Conservation agriculture, solar pumped water, rain water harvest irrigation		Increase in household resilience to climatic effects

105. Bjorn Marten, Sweden

Summary

Landgrabbing and monocultures are violating food sovereignty and create a tremendous threat upon water and food security. The main reasons are the increasing meat consumption and biofuel targets for drop in fuels, like bio diesel and bio ethanol.

Cold plasma technology for small scale production of syntethic diesel . (SD) has however given a sustainable alternative, since it can be introduced easily without any engine modifications . The production cost per liter same as for 1000 times larger Fischer Tropsch diesel plants . The potential is giant since the synthetic diesel can be produced directly from biogas or by thermal gasification of any substrate with carbon like by example tires and waste from households. Introduction of biogas technology will also open up the possiblity for reclaim of denuded land that will contribute to rescuing of the rainforests, our rain cloud factories, thus securing one of our most important rainwater water supplies

Maintenance of soil fertility is a key challenge for humanity to create food security. Use of chemical fertilizer and linear flows of nutrients will never be sustainable since rock phosphate is a limited resource.

Recycling of organic waste is thus a key issue. There are two ways of recycling - composting and production of bio manure from anaerobic digestion in a biogas plant.

Composting is frequently used but has some limitations especially in metropolitan areas. It also creates huge losses of energy (heat) and nitrogen. Anaerobic digestion however can be adapted to any situation from family digesters to municipality digesters with several thousands m3 of reactor volume. During fermentation in the digester, around 50 % of the raw material is transformed into bio methane a flexible bio fuel with the highest exergy and energy content of all bio fuels.

At the same time bio manure is produced that can be spread directly in growing crops, since nutrients are mineralized during fermentation and can be taken up directly by the plants without losses.

Thus the use of bio manure from biogas plants will be a possibility for organic farmers to increase the crop yields compared to conventional farming.

Biogas technology is like introducing an industrial cow that produces fertilizer. In Sweden initially cattle where kept for producing manure and feedstock for fermented milk products. But when chemical fertilizer was introduced and electricity became available, milk and meat production became key issues for farmers and a disaster for humanity. They are now the biggest contributors to the global warming and declining health in the world.

However biogas technology offers an excellent solution. By switching from the real cow to the industrial cow, meat and milk producing farmers can get a sustainable alternative since the industrial cow feeds very well on grass and any organic waste including black water. In Sweden 4 out 5 fishes are used as feedstock for cattle. Thus declining fish populations can be restored by switching the cows.

Raw vegan food will lower the demand for cooking fuel and thus prevent deforestation and soil degradation. .The only cooking fuel you need is for making safe water for soaking beans and cereals.

A family digester feed by household waste and black water will produce around 1 m3 of biogas per day which will be more than enough for the raw vegan family.

On a global level 240 Mha of arable land is used for producing cattle feed. If we lowered our meat consumption with 80% we would be able to release 200 Mha of arable land for growing grass and energy crops that together with any carbon waste can support all our vehicles with bio methane. and synthetic diesel.

Monoculture crop production for Biodiesel and bio ethanol can be abandoned once and for all. Further on biogas technology will make it possible to reclaim denuded land that makes it possible for exploiters of the rain forest to operate outside the rainforest. Rescuing of the rain forest is the most important issue right now since the rain forest is a rain cloud factory that distributes rain to surrounding countries. Clearing rain forests is like stealing rain from your neighbor and without rain there will be no food.

Time is ripe for introduction of biogas technology in combination with cold plasma technology paving the way for introduction of 100% organic farming and 100% renewable vehicle fuel, biomethane and synthetic diesel.

Bjorn Marten, independent sustainable system designer

Sweden

106. Meredith A. Giordano, Sri Lanka

Section 2.4 Improving land and water productivities

The section provides a nice overview of the literature and related issues. Some thoughts that came to mind while reading the section (and related recommendations) are as follows:

1. Improvements in water productivity can support broader development outcomes but the nuances (and synergies) that allow this to happen are not yet well articulated in the document. For example, page 38 lists several examples to improve water productivity but scale, re-use of water, and role of institutions are not introduced until later on in the text, which are important factors to consider when reviewing options for and impacts (positive and negative) from improvements in water productivity. These nuances need to come out more clearly in the document.
2. These nuances are particularly important when it comes to recommending specific interventions (p. 78). For example, what are the basin scale impacts (environmental, equity) & risk implications (e.g., to the farmer) from the adoption of water conserving technologies such as deficit irrigation? What are there potential food security issues from shifting cropping patterns? The answers to these and other related questions depend on the context. There are a number of examples from the Middle East but adding a few more examples from other regions with different biophysical, institutional (including legal), and socio-economic contexts would help to highlight the importance of context.
3. The relationship between water productivity and other development objectives is complex. I think that needs to be stated somewhere in the chapter. I think it is important to also acknowledge the range of factors apart from water that can influence water productivity and the potential outcomes.
4. As general note, I agree with one of the commenters that it reads more like an in-depth literature review and would benefit from a synthesis (to bring out the nexus issues) and from that provide concrete suggestions on how to explore these issues in research (not only topically but also methodologically) and address the issues in action (policy and practice).
5. As a small note, I think it would be helpful to include a box with some definitions to help the reader better understand the different terms and differences between the terms that are used (e.g., water productivity, irrigation efficiency, water use efficiency, application efficiency).

107. Scott G. Hutchins, U.S. Department of Energy, United States of America

To Whom It May Concern,

As the lead for the U.S. Department of Energy's Water Energy Tech Team (WETT) Outreach and Stakeholder Engagement working group, I would like to provide the following recommendation for an addition to the HLPE Report Draft v0.

Page 21, Section 1.3.4, I recommend you add the following introductory paragraph:

“Present day water and energy systems are tightly intertwined. Water is used in all phases of energy production and electricity generation. Energy is required to extract, convey, and deliver water of appropriate quality for diverse human uses, and then again to treat waste waters prior to their return to the environment. Historically, interactions between energy and water have been considered on a regional or technology-by-technology basis. At the national and international levels, energy and water systems have been developed, managed, and regulated independently. As the largest single consumer of water, agriculture competes directly with the energy sector for water resources. However, agriculture also contributes indirectly to the energy sector via production of biofuels. Both connections will be strained by increasing concerns over water availability and quality. (DOE 2014).”

Reference: DOE (U.S. Department of Energy), 2014. The Water-Energy Nexus: Challenges and Opportunities. (Page v. and vi.)

http://www.energy.gov/sites/prod/files/2014/07/f17/Water%20Energy%20Nexus%20Full%20Report%20July%202014.pdf

Justification: Section 1.3.4 elucidates the "water for energy" and "energy for water" aspects of the nexus, but they aren't actually called out. This also provides an opportunity to share the U.S. Department of Energy report on the nexus.

Perhaps of additional interest, pages x. and xi. of the report explain and illustrates: “The connection of water and energy to land is particularly important (Figure ES.4), as are the connections to global and regional climate, technology options and strategies, and broader aspects of socioeconomic development.”

Thank you, and please let me know if there are questions. Also, if you desire a more detailed conversation, including a briefing on our report, please feel free to contact me.

Scott.

108. Redmanglar Internacional, Guatemala

-Redmanglar Internacional es un movimiento que agrupa a más de 260 organizaciones y comunidades en doce países de América Latina y que trabaja por la defensa de los territorios costero marinos.-

“En las zonas costero marinas el agua es elemento fundamental, íntimamente ligado a la soberanía alimentaria de los pueblos costeros. “

Debido a lo corto de los tiempos que hemos tenido para la revisión, basamos nuestras opiniones al Borrador Cero, respecto a temas vinculados con el agua y los territorios costeros marinos.

En general:

Los temas relacionados con la acuicultura, en particular la acuicultura industrial de camarones deben ser considerados y abordados con mayor detalle en este borrador. Para un informe sobre el tema del agua y la soberanía alimentaria este debe ser un aspecto de gran importancia, por sus diversas implicaciones e impactos ambientales y sociales.

A pesar de que se hace referencia a no repetir en este borrador las conclusiones del informe: "Sustainable fisheries and aquaculture for food security and nutrition" Siendo la acuicultura industrial de camarones una de las actividades a nivel mundial mayormente responsable de la pérdida y degradación de ecosistemas costeros, humedales y fuentes de agua, ese informe tampoco aborda con suficiente profundidad diversos temas que a continuación compartimos y que representan nuestros puntos de vistas.

La acuicultura industrial, limita y viola el derecho a la soberanía alimentaria de los pueblos

La producción industrial de camarones, desde la instalación de piscinas y el sistema de producción genera graves impactos en las aguas, afectando la salud y los medios de vida de las comunidades. La acuicultura industrial profundiza la injusticia socio-ambiental. El desarrollo intensivo de la acuicultura de camarones implica la externalización, o transferencia a la sociedad y al medio ambiente, de los costes de la degradación ambiental. Así pues, mientras que una minoría logra cuantiosos beneficios económicos, el resto de la comunidad sufre las consecuencias del aumento de la pobreza, hambre, enfermedades, contaminación y vulneración de los derechos humanos fundamentales. Se privatizan las ganancias y se socializan los impactos ambientales y sociales.

Uno de estos impactos, directamente relacionado con las aguas y la soberanía alimentaria, es el uso de productos químicos y tóxicos en los procesos de cultivo de los camarones y de conservación del producto. Amenaza la salud de los trabajadores y consumidores, genera a la vez graves efectos en otros organismos marinos, también con efectos posteriores en la salud humana.

El metabisulfito de sodio, aunque se considera un agente químico de insalubridad máxima en numerosos países, es un conservante químico ampliamente usado por esta industria. Este compuesto, al reaccionar con agua libera dióxido de azufre (SO2), gas que causa irritación en la piel, ojos, laringe y tráquea, y cuyos efectos pueden provocar, según numerosos estudios científicos, graves enfermedades a las personas expuestas. Además, el metabisulfito de sodio también se utiliza como conservante durante el transporte, por lo que el consumo de estos productos tampoco resulta recomendable para la salud, especialmente para personas alérgicas o asmáticas. Otros estudios constatan niveles elevados de PCB (conocido tóxico y cancerígeno) en los langostinos cultivados, así como otros compuestos contaminantes. A todo esto, se debe sumar las grandes cantidades de antibióticos que se subministran a los langostinos cultivados, para prevenir la propagación de bacterias y virus, cuyos efectos tienen graves consecuencias sobre el medio ambiente, pero que también pueden tener efectos nocivos sobre el consumidor.

Amenaza la integridad de los ecosistemas costeros.

El vertiginoso crecimiento de la acuicultura de camarones -cuya producción se centra el 99% en países del trópico en vías de desarrollo-, ha ido acompañado por una huella de explotación de los recursos naturales cada vez mayor, causando la destrucción generalizada de los ecosistemas costeros tales como deltas, estuarios, marismas, humedales y manglares, siendo éste último uno de los ecosistemas más afectados en el mundo. En zonas tropicales y subtropicales del planeta, el 38% del área del manglar ha sido destruida para la producción de langostinos destinados a la exportación, siendo esta actividad reconocida globalmente como la mayor amenaza al ecosistema manglar.

La camaronicultura y acuicultura industrial en las zonas tropicales y subtropicales afecta y hace más vulnerables a las sociedades y poblaciones costeras ante los impactos del cambio climático, tomando en cuenta la salud actual y el estado de conservación de estos ecosistemas costeros, como los manglares y otro tipo de humedales; en general los impactos de la degradación y destrucción de los ecosistemas costeros por actividades industriales acuícolas y otras, disminuye su capacidad natural de adaptación, así como la resiliencia de las poblaciones humanas ante el cambio climático. Los impactos de la destrucción del ecosistema manglar inciden directamente en la disminución de las pesquerías con efectos locales, regionales y globales, aún poco investigados y documentados.

La acuicultura industrial impacta recursos hídricos y veda el derecho humano al agua a los pueblos costeros:

Al destruir, acaparar, transformar e invadir los ecosistemas costeros, las empresas camaroneras realizan en el proceso inicial para la producción, el ingreso de aguas saladas o salobres a las piscinas camaroneras. Propiciando el proceso de salinización de las fuentes de aguas frescas subterráneas. Esto ha ocurrido en muchos lugares donde la acuicultura del camarón se ha instalado. A manera de ejemplo, las comunidades de Tecojate e Isla Chicales en el Pacífico de Guatemala, padecen ya la salinización de sus fuentes de agua por la empresa camarones Oro del Pacífico. También la Sociedad Sueca para la Protección de la Naturaleza ha documentado en su informe Aguas Turbias (2011) testimonios y casos de estos procesos de salinización en comunidades de Bangladesh.

La salinización de las fuentes de aguas dulces es un serio problema que debe ser abordado en el Borrador Cero. La acuicultura industrial de camarones es uno de los principales responsables, pero también se suman: la industria de producción de sal a gran escala, y proyectos y mega proyectos de infraestructura que destruyen ecosistemas costeros estratégicos que funcionan como amortiguadores naturales, ante este efecto. La falta de aguas frescas debido a procesos de salinización es una realidad en muchas localidades, un problema concreto que veda el acceso al agua de buena calidad para el consumo. Las mujeres son uno de los grupos más afectados y vulnerables, en la búsqueda de agua no salinizada, deben recorrer largas distancias generando otros problemas sociales. La agricultura familiar también se ve afectada, al salinizare las parcelas, estas quedan imposibilitadas para su uso, generando perdida de territorios, migraciones y afectando la producción y las economías familiares.

La contaminación por el vertió de aguas de desecho sin tratamiento es otro factor altamente preocupante. Antibióticos y otros productos químicos utilizados por las empresas acuicultoras así como los mismos desechos de los camarones, son vertidos a esteros y humedales con pocos o sin ningún tratamiento, generando la contaminación de las aguas. Se afecta y daña a los pescadores locales, debido a la disminución de la pesca, o al correr peligro su salud al consumir pescado u otros productos contaminados.

Los desechos de las salinas o salineras, “desechos amargos” también contaminan las aguas, debido a que al aumentar las concentraciones de sal se presenta toxicidad para diversas especies en los ecosistemas. La contaminación y degradación de las aguas por estas industrias, se da bajo un esquema de escasos o nulos controles por parte de las instituciones de gobierno en donde operan, y de violaciones a las normativas más elementales de protección ambiental.

Acaparamiento de las aguas en los territorios costeros:

El acaparamiento de las aguas y de las tierras, es otro asunto que debe ser abordado con mayor profundidad. Las agroindustrias como la caña de azúcar o la palma africana, utilizan grandes cantidades de agua, generalmente como una práctica común acaparan y desvían los ríos y otras fuentes de aguas, vedando el acceso a las comunidades locales al recurso.

Limitan el acceso al agua para consumo y para la agricultura familiar. Con la contaminación de las aguas también se ve afectada la pesca a pequeña escala, los altos niveles de contaminación propician la muerte de peces y otras especies utilizadas para el consumo o la venta afectando también la economía familiar. Impactan también ecosistemas naturales y la biodiversidad.

El uso de agrotóxicos, como: madurativos, fertilizantes y otros productos químicos como pesticidas contaminan las fuentes de agua, ocasionando graves problemas ambientales y de salud para las poblaciones humanas. Afectaciones a la biodiversidad, poblaciones de especies y organismos tanto terrestres como acuáticos.

Los emprendimientos hoteleros y otras infraestructuras en zonas costeras que impactan el recurso hídrico: la industria hotelera demanda grandes recursos, como el agua, que es utilizada para el mantenimiento de zonas verdes, canchas de golf y para los servicios básicos para las habitaciones de los hoteles. Los hoteles utilizan el agua abriendo pozos y cada vez más disminuyendo los mantos de agua subterránea, tan importantes y delicados en una zona con gran influencia salina. Al disminuir el acuífero subterráneo, prácticamente se pierde un equilibrio entre las aguas, y la cuña salina puede ingresar y contaminar las aguas frescas o dulces.

Deben ser planteadas y consideradas de manera urgente sanciones a los agronegocios, por su responsabilidad en vedar y limitar el acceso al agua, acaparándola, contaminándola y degradándola, por ser éstos, factores que generan racismo ambiental. También deberían ser consideradas y exploradas obligaciones de las agroindustrias e industrias en sufragar los costos que genera la contaminación de las aguas y sistemas naturales, con el fin de restituir el entorno y el acceso al agua para las comunidades y poblaciones afectadas.

Para Redmanglar Internacional, el agua es un derecho humano fundamental, no debe ser bajo ninguna circunstancia privatizada ni sometida a ningún esquema que pretenda o plantee su mercantilización. La soberanía alimentaria es un derecho de los pueblos.

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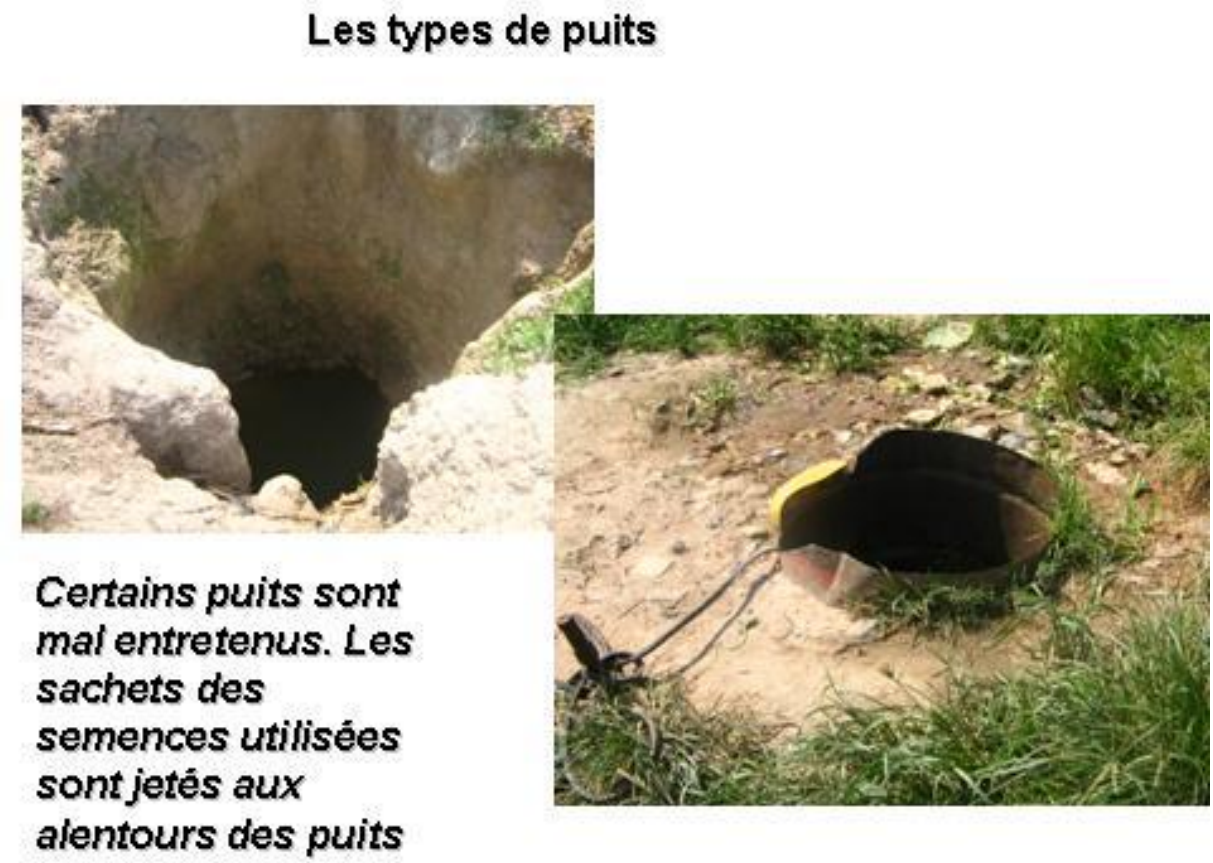
109. Adèle Irénée Grembombo, France

Bonjour

Ma contribution concerne la qualité de l'eau au maraîchage. je vous l'envoie en fichier attaché.

Qualité de l'eau et la sécurité alimentaire et la nutrition

Il est vraie que les pratiques d'hygiène sont des nécessités de base, nécessaires pour assurer le développement humain et de permettre à l'activité humaine de se développer.
Je voudrais attirer votre attention sur la qualité de l'eau utilisée pour les jardins potagers. Nul doute que certains légumes sont consommés crues. En saison sèche, certains puits sont mal entretenus. Les déchets sont jetés aux alentours de ces puits.
Il serait opportun de prendre en compte ce fait pour la sécurité sanitaire des légumes que nous consommons en Afrique. Prévoir la construction des meilleurs forages pour le maraîchage.
Je vous montre légumes des photos de puits utilisés pour l'arrosage des légumes en Centrafrique.



Adèle Irénée GREMBOMBO

Ingénieur Agronome, spécialisée en Nutrition et Sciences Alimentaires
MSc en Nutrition Humaine et Santé Publique

110. UNSCN Secretariat

The UN System Standing Committee on Nutrition welcomes this public consultation and would like to give the following feedback on the Zero Draft of the Report on Water and Food Security

General comments:

Terminology in the title: Title should mention nutrition, and not imply that this is adequately included in the term food security

Without water there are no crops. To alleviate hunger, people must first have access to ample supplies of water in order to grow crops year round for food security. Additionally, diarrheal diseases, common in people who are forced to drink contaminated water, diminish the nutritional benefits of the food they actually eat. According to UNICEF, malnourishment affects a child's ability to learn and actively participate in school. Food deprivation provides a daily stress on children and stunts both their emotional and physical development (FAO).

Specific comments on:
1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

We appreciate the comprehensiveness of the report addressing water in terms of drinking water, resource for sustainable food and livestock production, and water as essential element of the ecosystem.

Regarding the linkage of water with nutrition security, the bi-directional linkage between water and sanitation with nutrition should be highlighted:
On one side increased access to safe water at household and community level leads to reduction of stunting in children under five years: In calculating the relative contribution of various factors to the progressive decline in child stunting between 1970 and 2010, Smith and Haddad (2014) estimated that increased access to safe water accounted for 25 % of the change. For example, 2010, Lim et al. (2012) attributed roughly 8 million DALYs to unimproved water globally. The risks to nutrition derive from water-borne diseases, microbial contaminants that provoke enteric disfunction, diarrhoea, and a lack of cleanliness that itself increases food safety risks and lack of hygiene-related nutritional compromise. Separately, Smith and Haddad (2014) calculated that roughly 14% of the total fall in stunting between 1970 and 2010 resulted from improved sanitation.

On the other side, improved nutritional status of the household members and populations, leads indirectly to improved water and sanitation through increased demand. As all forms of nutrition improve, which leads to the associated benefits of demand for higher food quality, education, preventative health-seeking behaviours, and a voice in development, there is greater household exposure to, and practice of, appropriate hand-washing practices, food and personal hygiene, and sanitation. This results in demand for clean water and effective personalized sanitation. As poverty falls, consumers (urban and rural) understand and afford the benefits of private access to hygienic resources and facilities. (UNSCN 2014)
http://www.unscn.org/files/Publications/Briefs_on_Nutrition/Final_Nutrition%20and_the_SDGs.pdf

We recommend referring to the WHO stunting reduction policy brief, http://www.who.int/nutrition/topics/globaltargets_stunting_policybrief.pdf ,
which also contains additional case studies on the relationship between water and sanitation and stunting reduction.
We also like to refer to the WHA Global nutrition targets, http://www.who.int/nutrition/topics/nutrition_globaltargets2025/en/
and in particular to the stunting reduction target which can only be achieve through a Multisectoral approach of nutrition-sensitive actions. These include adequate access to and use of clean water and sanitation.-

Therefore, we fully support the Recommendation 1, and have the following additional comments on this recommendation 1:

In order to adequately recognize the role of clean water and sanitation in reducing malnutrition and enhancing human well-being, this recommendation should include, under the responsibilities of States, international donors, UN and NGOs, one bullet point on monitoring. Such as

- Monitor the proportion of population with access to and use of safely managed drinking water services, as well as the proportion of population using safely managed sanitation services, in a gender and other inequalities disaggregated manner. These two indicators are supported by the UN agencies and will be presented to the WHO EB to complement the 6 global nutrition targets.

Improved nutrition outcome like reduction in childhood stunting is an important indicator for successful improvement in water and sanitation. Therefore, we recommend

- including stunting reduction as outcome indicator to the monitoring of access to and use of clean drinking water and sanitation services, in alignment with the WHA recommended global target on stunting reduction.

In addition, we would like to see reference not only to the poor, but also to other vulnerable population groups such as elder persons, displaced populations etc.

2. Water use in food processing and Recommendation 5

The importance of water quality in the preparation of food for infant and young child needs to be highlighted.

Poor sanitation poses more of a risk to those who are particularly vulnerable, such as the non-breastfed infant and young child. Complementary foods and breast milk substitutes are more likely to be contaminated in areas where water supply, sanitation, and hygiene are lacking. Furthermore, families living under these conditions often have fewer economic resources and thus are less apt to prepare foods freshly for each meal, adequately reheat previously prepared foods, or store foods under refrigeration. Consequently, mixed-fed and weaned infants living in poor sanitary conditions face considerably higher exposure to foodborne pathogens than similarly fed infants in less contaminated environments. Exclusive breastfeeding during the first 6 months of live as recommended by the WHO, provides protection to infants and is particularly important for those living in highly contaminated environments.

With this regard we would like to emphasise the importance of the International Code of Marketing of Breast-milk Substitutes (http://whqlibdoc.who.int/publications/9241541601.pdf?ua=1)

The aim of the code is to contribute to ensure the proper use of breast-milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution. The environmental factors like access to and use of clean water is an essential element. There is a role for Governments, UN agencies, NGOs, consumer groups and industry. We would like to emphasize, considering that manufacturers and distributors of breast-milk substitutes have an important and constructive role to play in relation to infant feeding, and in the promotion of the aim

of this Code and its proposer implementation. We propose to add this to the recommendation 5, under the private sector.

With kind regards

UNSCN Secretariat Team

111. Germany

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

- The Zero Draft captures the relevant issues around the linkage between water and food and nutrition security. Highly appreciated is the consideration of the rights-based approach.
To be consistent with the text, we recommend to include "nutrition" as essential part of food security in the title.

- We take note that the draft focuses on water as a natural resource for agriculture and food security. We are much aware that this is only a partial analysis since water serves for many other means and sectors as well. We would like to point out that cross-sectoral linkages could be better balanced, in particular with regard to safe drinking water and sanitation.

- The recommendations (p. 75-82) do not consider strong regional differences in the availability of water. For many regions in the world the statement "water is a resource under stress" (see p.75) does not apply (see figure 8, figure 2). The conclusion "growing demand […] will increase tension over water accessibility" does not apply in general but depends on the region in which the growing demand for water exists. Although in recommendation 7 this subject is covered other sections do not distinguish sufficiently between regions with different water availability. If regional differences are not prioritized in global water governance policy recommendations may not be efficient. I.e. in regions without water shortages policies to reduce water consumption can be ineffective or even counterproductive due to higher health risks and higher energy consumption for water treatment.

- A close relationship between nutritional problems and access to water in general needs to be questioned (see recommendation 1, p.76). Many regions of Africa have high precipitation - even if considering the high evapotranspiration because of high temperatures.
And still in countries like Tanzania and Kenia crop yields are low. This is mainly caused by inappropriate crop cultivation, the use of old varieties and insufficient fertilization. An increase in irrigation would not improve the situation.

- The draft does not mention the consequences of firewood use to boil water. Especially in developing countries firewood is used to boil and sterilize water. According to the FAO World Food Report 2014 this is common practice for about 764 million people or 11% of the population. Hence water quality and removal of woods from forests are directly connected. Especially because "sustainable forestry for food security and nutrition" is planned as topic for CFS 2017 possible conflicts between quality of drinking water for poor households and sustainable forest use could also be discussed in this report.

- We kindly ask to check if the statement that "water is increasingly transferred from agriculture (see p.75, line 10) to other sectors" is valid on a global basis or more on a local or national basis. Accounting for 70-90% of water resources, the agricultural sector still has high efficiency potentials. The household use of 10% and industry use of 20% of water resources reflects competing user interests. This calls for fair solutions.
- The report should also focus on the potential of agriculture to preserve water resources by enhancing efficiency of water usage or by reusing treated waste water (p. 78).
- With regard to recommendation 4 (p.77, line 33) we would welcome a statement to be included that groundwater usage should not exceed its recovery rate.
- With regard to recommendation 5 concerning "Changing diets" (p.77) the potential of reducing food waste should be included.
- We believe that improved agricultural water management productivity (recommendation 6, p.78) should lead to increased water efficiency in agriculture. We noted that the reuse of untreated wastewater is not mentioned although nutrients could be saved/restored/recovered.
- Regarding water governance the advantage of cross-sectoral coordination could be illuminated.
- When dealing with collective rights such as the right to food (or water) of the community it could be examined if it was more appropriate to speak of collectively practiced rights of individuals.
- After having read the study it is not clear where the problem is: Is it a not completely implemented right to water or is it the lack of precision of the current wording of the right to water?
- The difference between the "capabilities"-approach of Amartya Sen and the human rights approach sometime does not become clear. It could be a possibility to leave out Sen´s "capabilities"-approach and instead emphasize the possibilities and limits of the human rights approach.
- p. 69, line 16: "Amartya Sen..." –the capabilities approach might not be adequately summarized here: capabilities are freedoms. These freedoms serve to achieve something that the individual values, i.e. "functionings" that he or she values ("functionings" being the states and activities that make up ones existence, such as having a job, but also being healthy and safe, etc).
In essence, it conceptualizes a new multi-dimensional approach to poverty: not just in terms of economic poverty (i.e. resource-based approach), but in terms of what the individual can achieve within his or her outside parameters (as in: what choices does he or she have, based on their personal abilities and outside parameters, and up to which point can he / she exercise them).
Summary by Sen: "For this reason, while the combination of a person's functionings represents their actual achievements, their capability set represents their opportunity freedom — their freedom to choose between alternative functioning combinations" (Amartya Sen, Development as Freedom, 2001)

In this context we would like to remark that the human rights approach and the capabilities approach are not synonymous. Rights may be seen as entitlements to certain capabilities (not to all – there's no "right to the dream job" or "right to travel the world", even though these would be functionings).

- p. 69, line 31: the "respect, protect and fulfill" approach is common to all human rights.
- p. 69, line 43: We suggest to replace "collective rights" with "collective exercise of these rights".
- p. 69, line 52: We suggest to replace "them" with "persons belonging to them".
- p. 70, line 28: Please add "2010" after September and "in resolution 15/9" after "the UN Human Rights Council".
- p. 70, line 34: We suggest to replace "as elaborated..." with "Based on General Comment 15 and the work of the Special Rapporteur, the Human Rights Council has recognized in Resolution 24/18 of 27 September 2013 that the human right to safe drinking water and sanitation "entitles everyone to without discrimination, to have access to sufficient, safe, acceptable, physically

accessible and affordable water for personal and domestic use and to have physical and affordable access to sanitation, in all spheres of life, that is safe, hygienic, secure, socially and culturally acceptable and that provides privacy and ensures dignity,"

- p. 71, line 25: Capabilities and human rights are not synonymous; however, human rights definitely accounts for "livelihoods and subsistence needs".
- Chapter 1.1.1:

P. 12, line 34 and P. 13 Box 1: Besides diarrhea the text should mention intestinal worm infections (being highly prevalent in developing countries and relevant to nutrition, incl. link to anaemia)
P. 12, line 51: lack of latrines and open defecation also pose a risk for sexual harassment and violence towards young girls and women (also mentioned on page 20, line 12).

- Chapter 1.1.3:

P. 21, line 8: hygiene practices, especially hand washing

- Chapter 1.1.4:

P. 24, line 32/33: Water scarcity also implies limited quantities for consumption and good hygiene practices (potentially leading to negative health outcomes and malnutrition)
2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

- We would appreciate if in recommendation 8 about research and development (p. 79) research for better storage of irrigation water surplus was mentioned.

- Given the regional differences in water scarcity the concept of the water footprint does not offer any advantages without taking into account climate and market conditions of production (food consumption requirements in relation to availability of land and water). Since for example Brazil is not affected by water scarcity and irrigation is not needed it does not seem reasonable to indicate the exact amount of water used to produce one kilogram of Brazilian sugar cane. Water availability in Brazil or global water scarcity would not be influenced if sugar cane was not grown in Brazil anymore.

- The draft does not mention that there is a lack of data about water pollution ("grey water"). "Grey water" is defined as the (hypothetical) amount of fresh water needed to dilute water pollutants from fertilization or production processes to a concentration which is environmentally compatible. Data about grey water in agriculture only incorporates nitrate from nitrogen fertilization. Recent studies also include phosphate in their data but these are not applicable yet.

- In many regions households are supplied with drinking water by their water suppliers. Therefore internationally coordinated guidelines for the use of installation products should be developed. In the same way as there are guidelines for packaging of drinking water the contamination of water by installation products should be considered. For food packaging positive lists have proofed to be most effective in giving advice about the use of different materials.
- We would recommend to check if the unit in table 2 (p. 34) is correct. Possibly it rather is "liters per kilogram of product" instead of "liters per ton of product".

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

- Recommendation 6 (p. 78) implies the import of food in countries facing chronic water scarcity. We would like to point out that this would rather refer to staple foods than to food in general such as wheat in northern Africa. In countries with water scarcity the scarce resources could

be used for products of high value such as fruits and vegetables, if appropriate for the given agriculture. We recommend to also include that in such regions an adaptation of farming systems is needed. As an example we refer to the widespread practice to plow fields. This is a technique which maximizes water losses in those regions. Aimed target should rather be to practice water-saving and water-efficient soil cultivation methods such as preserving methods or no-till.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

- Recommendation 2 (p.76) gives the advice to revisit subsidy and policy regimes with regard to rich producers and farmers wasting or degrading water resources. In our opinion the waste or degradation of water resources is not only caused by rich producers or farmers but can be also caused by smallholders if they have access to water for a comparable small price.
- Ensuring responsible food consumption by using regulation and incentives (see recommendation 5, p. 77) seems plausible but we have sincere doubts that this approach can be successful. The problem is with which measures shall governments initiate and implement a modification of consumption patterns of its population. Effectiveness and efficiency of such measures are highly questioned.

Comments on Recommendations:

- P. 75, line 5: Please add: water for consumption, preparation and processing of food
- P. 75, suggestion for title of recommendation 1: More Joined up thinking and action around WASH and food and nutrition security
- P. 75, line 47: Please add: locally adapted, affordable and accepted solutions
- P. 65, line 38: Please add: the role of water, sanitation and hygiene in reducing malnutrition
- P. 78, line 29: recommendation of importing food implies risks linked to price volatility and dependency on markets potentially the situation for poor, food insecure households – import is depending on the context an option, but not a key FNS strategy. Focus should rather be on restriction of water-intense exports.
- P. 80, line 21: Please add: time for child care
- P. 80: Please add: promote gender equality through the reduction of work load for women, e.g. through time-saving technologies around food production and WASH

112. International Federation of Organic Agriculture Movements (IFOAM), Germany

First of all we would like to congratulate you for the “Water and Food Security” draft.

IFOAM appreciates that the inputs and suggestions sent by us were taken into consideration. In fact, the draft includes data, scientific evidences and case studies on the water efficiency in organic farming systems (as for example Hepperly et al 2007, Pimentel et al 2005, Pelletier et al 2008, Scialabba and Muller-Lindenlauf 2010, Verbruggen et al 2010), as well as in other agroeological models (as for example Holt-Gimenez 2002 and Fraser et al 2011).

But we are surprised that the recommendations refer only on "Investing on Agroecology" without any mention on organic agriculture although the references cited. We suggest to change the subtitle to "Investing on agroecological models" and to include into the text also organic definition.

Organic agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved. (IFOAM General Assembly 2008).

Kind regards,

Cristina Grandi
Chief Food Security Campaigner

113. Normita G. Ignacio, SEARICE, Philippines

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

The draft needs to consider seed issues or issues related to plant genetic resources for food and agriculture, relating to water and food security. Only Line 53 in page 44 of the draft report under the discussion 2.4.4 "Investing in Agroecology" was the protection of seed varieties mentioned in passing. The importance of PGRFA in relation to water and food rights need to be emphasized. PGRFA depends greatly on water and is the basic unit of all food. On the other hand, food security is greatly dependent on PGRFA. The interlinkages between PGRFA, water, and food security needs to be emphasized in the report due to the interdependencies of these three.
One of the seed issues related to water and food rights is the increasing production of patented seeds that often use up huge amounts of water, as compared to traditional varieties. The draft comprehensively emphasized the scenario of dwindling water supply. In the face of this reality, there should be a moratorium of the production by giant agrochemical companies of patented seeds that uselessly and needlessly require voluminous amounts of water. This is only proper in the light of the unarguable fact that GMOs and other patented seeds, since their introduction in the 1990s have not been successful in combatting world hunger.
The "water footprint" of patented seeds vis-à-vis traditional and farm-saved seeds need to be part of the analysis.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

It is humbly suggested that there should be additional quantitative data on how smallholder farmers minimize water use when practicing agroecological farming as compared to industrial farming. A recommendation to adopt the practices and methods of smallholder farmers towards the end of minimizing water use, such as the practice of System of Rice Intensification (SRI) in rice cultivation will be appropriate.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

No, there is need to furthermore discuss water and food trade between countries, and the impact of regional or international bilateral trade agreements such as the GATT, on water and food rights.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

The expansion of the right to water to also include productive uses will highlight the interconnectedness of the various human rights such as the right to food, right to livelihood, and right to environmental hygiene. It will not limit the right to water to its priority and limitation, which is for personal and domestic purposes only, and hence within the sphere of health. It encompasses a broader context and embraces the multiple uses of water, beyond the personal and private sphere and more into water as a common resource that is vital in realizing the very basic right to food, subsistence and thus to life.
Considering the expansion of the definition of the right to water, to include the use of water for productive use,

1. The quantity and quality of water for food production can be properly factored in. Considering that food is one of the most basic human needs for existence, the interlinkages between water and food security can be highlighted.
2. WHO and other health organizations will need to reconsider and rethink the analyses of water needs on a per capita basis only. The quantification of water and food production and use on a collective scale will be challenging.
3. Emphasis will be made to formulate and implement policies that acknowledge and prioritize water for productive uses.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

Using the human rights approach in addressing water, land and food rights is believed to be an ideal step forward. The interconnectedness of these rights and other human rights show the complexity and at the same time the importance in addressing these rights.
In relation to the draft recommendations, there is need to recommend resort to the practices and methods of smallholder farmers in optimizing water use. There should be sufficient discussion on smallholder farmers and water and food security, since smallholder farmers are at the core of water and food rights. The draft provided discussion on the rights of women and girls to water and food security, it should likewise present a similar or more than extensive discussion on the rights of smallholder farmers to water and food security. The draft's discussion on agroecology generally pertain to approaches but not specifically to the role of smallholder farmers in advancing and promoting water and food rights.

114. Government of the United States of America

USG Comment 1:

- Question 1 (areas that the draft has failed to cover): One omission we noted was a discussion of climate change and snow/glaciers. A significant amount of "storage" of water, particularly for irrigation, is in the form of snow pack and glaciers. Climate change potentially reduces this capacity by melting glaciers and causing earlier snow melts that are beyond the capacity of existing surface water storage systems. This is a particular concern in areas of Asia with water supplies fed by Himalayan glaciers.

- Question 1: In addition, the draft fails to mention the promise of innovative agricultural technologies (such as biotechnology) in reducing water requirements, for instance through the development of drought-resistant and flood-resistant crop varieties.

- Question 4 (changes in water rights): For countries with national water plans this will be an easier topic to address. The key feature of the U.S. is that most allocation decisions and changes in water rights occur at the state level. That difference between the U.S. and other countries is important to note.

- Section 2.4.4 ("Investing in Agroecology"): We believe that it is inappropriate to highlight one particular agricultural approach as preferable to others, particularly as there is no agreed international definition for "agroecology." Moreover, as described in the draft report, agroecology includes political and ideological undertones that are inappropriate for this document. Many of the claims made for agroecology are unproven (e.g., the preferability of "traditional" techniques.") Finally, many of the purported benefits of agroecology as described in the draft (e.g., fewer inputs) are not peculiar to agroecology.

- Recommendation 5 ("Addressing Changing Diets"): "Responsible food consumption" is a concept that would be difficult to define, much less to implement.

- Recommendation 6 ("Fostering Sustainable Investment"): The recommendations in this section inappropriately focus on "agroecological approaches." However, there is no mention of innovative agricultural technologies and techniques, including biotechnology.

- Recommendation 11 ("Trade as an Option"): While the paper appropriately recognizes the importance of trade in the face of variability in water supplies, trade should be considered an integral part of promoting global food security, rather than as an "option." Moreover, the first point highlights imports as a "strategy" to be used whenever natural resources are insufficient to meet local demand. We suggest that the focus of this point should be shifted to recognize the importance of the global trading system to food security as a general matter, since a strategy of only permitting imports when natural resources are insufficient to meet local needs is inconsistent with an open trading system, and will undermine global food security.

USG Comment 2:

Page 19, line 18 and the figures are from JMP 2012, but they published an update in 2014, so would be great to have the latest MDG numbers in this document. http://apps.who.int/iris/bitstream/10665/112727/1/9789241507240_eng.pdf?ua=1

page 19 lines 25-29 I think it would also be useful to note that even though the MDG is met, over 700 million people still do not have access, since the goal was only to reduce by half those unserved from the baseline to 2015. And there is also data on the problems with using a type of technology

(improved vs unimproved) as a proxy for the goal of safe drinking water, particularly for microbiological safety - see http://www.who.int/water_sanitation_health/publications/2012/rapid_assessment/en/. Basically piped water is pretty safe, and protected shallow wells isn't, which you could guess, but it is a reminder that the goal needs to be piped water under pressure 24/7 to really protect public health. There are other critiques of this indicator that they hope to address in the SDGs, including that unofficial settlements are often overlooked in the urban data collection so the coverage is overstated.

page 20 line 4, again, would be great to reference most recent JMP data (2014) for this document. Your issue #4 in the cover letter is a huge challenge. In the WASH sector, our position has been that water is free, but that there is a real cost to delivering water services. Different water service providers have used different ways of cross subsidies and grants to extend service to poor neighborhoods, but even then there are major definitional issues about how much water is enough water as a basic right for domestic use, much less productive.

USG Comment 3:

I recommend updating Box 12 to reflect the research presented on the situation in Syria to speak in the past tense. I think situation has changed on the ground, but no one knows. ICARDA, probably produced that report and may be able to update Box 12.

In general, throughout the report, there is a reliance on data and research that is old and may not reflect the situation on the ground. Not great for credibility.

USG Comment 4:

Thank you for the opportunity to review. The document presents a review of multifaceted food and water challenges very well, substantiated with appropriate references.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition?

Yes.

Is there important evidence or aspects that the present draft has failed to cover?

No additional comment.

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

Suggest recognizing how water use can be incorporated into the total factor productivity (TFP) metric.

3. Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing

countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?

Yes.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

One facet of a systematic approach: Recognize the links between groundwater and surface water withdrawals, and manage allocations accordingly.

USG Comment 4:

I suggest changes to Section 1.1.2 Water quality and food security and nutrition, the last paragraph of the section, which ends:

On the other hand food production and processing as well as human waste (such as urine and faeces) impact water quality. Nitrogen and phosphorus are key water pollutants stemming from agricultural production. Both livestock and aquaculture production, when done on industrial scale, are associated with significant wastewater discharge along their value chains with potential adverse impacts on human and animal health and the environment (Delgado et al., 1999; Naylor et al., 2000). Appropriate reuse of wastewater, however, can reduce the cost of fertilizer applications, particularly phosphorus and nitrogen (Drechsel et al, 2010).

I suggest replacing that 7-line paragraph with the text below, and also adding the references cited:

On the other hand food production and processing as well as human waste (such as urine and faeces) impact water quality. Nitrogen, phosphorus, and a variety of pesticides are key water pollutants stemming from agricultural production. Both livestock and aquaculture production, when done on industrial scale, are associated with significant wastewater discharge along their value chains with potential adverse impacts on human and animal health and the environment (Delgado et al., 1999; Naylor et al., 2000). Appropriate reuse of wastewater, however, can reduce the cost of fertilizer applications, particularly phosphorus and nitrogen (Drechsel et al, 2010). Studies are also available that link long-term pollution of surface water, groundwater, and near-shore marine waters to nonpoint agricultural sources; namely, the application of fertilizer and pesticides to crop fields (Dubrovsky and Hamilton, 2010; Dubrovsky et al, 2010; Gilliom and Hamilton, 2010; Gilliom et al., 2010; Preston et al., 2011; Puckett et al., 2011; Sprague et al., 2011; Stone et al., 2014).

Additional REFERENCES CITED

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Dubrovsky, N.M., and Hamilton, P.A., 2010, Nutrients in the nation's streams and groundwater--National findings and implications: U.S. Geological Survey Fact Sheet

USG Comment 5:

Broadly, we would like to avoid any language that subverts trade agreements to rights.

The assumptions about meat production and food processing should not be highlighted the way they are in here. There are alternative studies on meat production with different results. The focus on food processing and not other sector processing that affects water is also an issue.

There are more lines throughout which are detailed below.

Page 7, Lines 1-11: Suggest deleting references to changing consumption patterns as a problem. While this may be a factor, we recommend not taking the view that we need to produce less meat. Market prices should be allowed to drive consumer decisions.

Page 8, Lines 9-12: It is unclear from this statement whether irrigation will continue to dominate total water demands or if the competing factors listed will reduce the water available for irrigation in the future.

Page 9, Line 1: Please delete entitlement

Page 9, Line 49: Tools developed for water management should be optimized for local or national regions rather than standardized internationally as a one-size-fits all solution.

Page 11: Line 11: Note that production of food includes processed foods so the extra language is redundant; please consider removing "including processed foods"

Page 18, Line 17: Please delete “towards more livestock products.”

Page 19, Line 6-7: Drawing this linkage to a more "sustainable" system is problematic since the most efficient means are not widely agreed upon.

Page 19, reference 7: Delete final sentence, “The authors further suggest that increased water use per capita due to continued dietary changes might well overtake population growth as the main driver of growth in water use” as it is not required to make the point.

Page 29, Lines 31-35 and Lines 39-42: There are other studies that indicate the opposite. We would like to see a better representation of the results of those studies or deleting this section.

Page 33, Lines 35-36: Based on this USGS paper, all industries should be examined for impact on water, not just food processing, recommend revising or removing to be more accurate.

Pages 38-39, Lines 28-30 and Lines 1-7: Relying on one source may result in oversimplifying this issues. Recommend presenting a more balanced view by showing how veterinary drugs improve efficiency, and reduce feed use. Also, feedlots use less lands, reduce land degradation, and are more efficient ways to increase size of cattle.

Page 44, Line 26-27: While this may be true, it is unlikely to meet the food demands of the future.

Page 64, Lines 40-43: Suggest not encouraging governments to subsidize the price of water - in this manner; it goes against international trade obligations.

Page 73, Lines 13-14: Delete

Page 73, Line 19: Delete “with increasing globalization.”

Page 73: Lines 32-47: Delete this entire paragraph. We do not agree to subvert international agreement on trade and investment issues to human rights treaties.
Page 81, Lines 42-43: Trade should be described as an option no matter what - it is not based on whether a country can't grow enough food.

Page 81, Line 46: Replace integrate with "Maintain open, rules-based trading system to meet the goals of national food and nutrition security through markets"

Page 81, Lines 49-51: Suggest "Ensure that trading systems use internationally-accepted standards to allow the flow of safe food."

Page 82, Lines 2-3: Replace with, "Affirm that countries follow obligations of international rules based trading systems to keep markets open, which may help mitigate crises due to lack of food and water."

USG Comment 6:

Below, in the order in which they appear in the 104 page report, are those sections of the report that highlight positions therein that are either contrary to the USG's view on Customary International Law of water and/or contrary to our understanding of USG policy/legal positions on water resources.

INTRODUCTION – "The underlying issue is: who should get what access to which water when, for how long and for what 25 purposes? Answering this question is complicated and often controversial enough within a single 26 country. Yet this is clearly not enough. While it is often observed that "water flows to power", it is also 27 clear that, because of the existence of transboundary basins, water is a resource that "ignores" 28 administrative boundaries (be in infra or supra national), thus complicating the challenge of sharing 29 water and of water governance."

"In this report, two fundamental lenses are used to examine the issue of water and FSN. The first is the 7 human rights framework, particularly the rights to food and water, and how these two rights intersect 8 and support each other. In particular, we are interested in exploring whether the right to water can be 9 expanded to encompass uses of water that are directed towards the realization of the right to food. 10 The second is a lens that looks at the possibility of reframing the challenge in order to reframe the 11 solution – looking at issues of redistribution and equity, reduction of waste, and changes in agricultural 12 and dietary practices in order to ensure water for FSN."

"1.2 Water resources 8
When we look at agriculture and food security, all forms of availability of water have to be considered: 9 rainfall, runoff and groundwater. Water basins are the pertinent geographic entity to appraise/measure 10 water resources (rainfall, runoff or ground water)."

"3 GOVERNING WATER FOR FSN
* * *Governance is polycentric and 7 located across a range of institutional arrangements from local to global, requiring constant negotiations across domains of power.

In this chapter we highlight that: 10

* * * *

2) The nature of water resources almost always span across infra-national or supra-national 14 geographical boundaries and areas (surface and groundwater but also upstream, downstream and 15 transboundary) as well as jurisdictional and administrative boundaries, complicating issues of water 16 governance.

"3.5 The emergence of a global water governance regime? 1
As discussed in this chapter, the allocation and use of water are not technical matters, but often driven 2 by political and economic interests. Taking this view, an analysis of the key players and the power 3 relations at the global level becomes a useful tool in understanding the water and FSN debate. While 4 most solutions to water challenges or exploitation of water-based opportunities take place at the local, 5 national or regional level, there is a complex network of players at the global level that inform the 6 dominant policy discourse in the water arena. Contemporary water governance at the international 7 level is an arena characterized by a high degree of political contestation, competing regulatory actors 8 and processes, and therefore a great deal of institutional ambiguity with few agreed rules or 9 procedures regarding decision-making (Franco et al., 2013)"

"3.6 A rights-based approach to water and food security implies that people's access to water and food is 2 protected by law and legal mechanisms."

"3.6.2. The Right to Water 3.6.218
The now globally endorsed human right to water has been the result of intense global struggles since 19 decades and is a relative new-comer. Unlike the right to food, it was not explicitly acknowledged in the 20 1948 Universal Declaration of Human Rights.

"3.6.3. Unresolved matters concerning the right to water 3.6.313
While the right to water now enjoys global recognition, it still remains conceptually ambiguous (Sultana 14 and Loftus, 2011). There have been many debates regarding whether or not it is compatible with water 15 privatization (Box 22)."

"3.6.6. Growing calls to expand the right to water or have a separate right 3.6.61 to water, sanitation and water for the realization of right to food?
There have been growing calls to elaborate a human rights perspective to land and to water that is 3 both more interconnected, more social justice oriented and encompasses productive uses of water 4 (Franco et al., 2013)."

"RECOMMENDATION 12. Rights to water and food"

USG Comment 7:

Section 3.6. The right to water and the right to food

- Comment 1: References to "right to water," "right to sanitation," "right to health," and "right to food." The Panel may wish to consider changing references to these rights to "rights related to [water]/[food]/[health]/[sanitation]." Because the formulations of these rights vary between international instruments and documents, it would be more broadly applicable and more technically correct to refer to them in this way.

• Comment 2: References to ICESCR and UDHR. The Panel may wish to consider reviewing citations to language from ICESCR or the UDHR, to ensure that they are cited in full for accuracy and completeness. For instance, the UDHR states that "everyone has the right to a standard of living adequate for the health and well-being of himself and his family, including food," whereas ICESCR states that "the States Parties to the Covenant recognize the right of everyone to an adequate standard of living for himself and his family, including adequate food." These formulations, and the legal character of the two documents, are different and the Panel may wish to consider distinguishing them accordingly.

• Comment 3: Use of General Comments of the CESCR. When the Panel uses language from a CESCR General Comment or report, it may want to consider making clear that these are the opinions of the Committee on Economic, Social, and Cultural Rights, and not interpretations or language that have been agreed by States in any international instrument. The Panel may also wish to consider clarifying this when quoting from other non-legally binding sources.

• Comment 4: References to Voluntary Guidelines. The Panel may wish to consider using the full and correct title of the Voluntary Guidelines ("Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security") to avoid confusion or mischaracterization. It also may wish to review any paraphrasing of the Voluntary Guidelines to ensure accuracy, and to consider quoting from the document to ensure that language and intent are accurately captured. For instance, the Voluntary Guidelines do not "call on States to develop strategies to realize the right to food." Instead, they say that "States, as appropriate and in consultation with relevant stakeholders and pursuant to their national laws, should consider adopting a national human rights-based strategy for the progressive realization of the right to adequate food in the context of national food security as part of an overarching national development strategy, including poverty reduction strategies, where they exist." The Panel may wish to review statements paraphrasing content of other documents as well, to ensure accuracy and to replace paraphrasing with quotes to ensure accuracy.

• Comment 4: Characterization of "right to water". The Panel may wish to review statements about rights related to water to ensure that they fully capture the status of those rights. For instance, on page 70, lines 19-21, the paragraph states that the human right to water is now "globally endorsed," and on page 71, line 14, it states that "the right to water now enjoys global recognition." This is not completely accurate as written, as there are no legally-binding international instruments that recognize or define any such right. Additionally, the Panel may wish to consider bearing this in mind in its discussion of the Special Rapporteur on the Right to Water and its recommendations regarding expansion of her mandate, as well as in its recommendation on voluntary guidelines to implement the right to water.

• Comment 5: Status of UNGA and UNHRC resolutions. The Panel should consider reviewing its references to UNGA and UNHRC resolutions, to ensure that their content and status is accurately captured. For instance, UNGA Resolution 64/292 (referenced on page 70, lines 26-27) states that it recognizes the right to safe and clean drinking water and sanitation as a human right that is essential for the full enjoyment of life and all human rights, but does not reference "access." Additionally, this resolution was controversial and ultimately put to a vote, with the United States abstaining, and was not passed by consensus. Indeed, at the time, the United States expressed the opinion that "there is no 'right to water and sanitation' in an international legal sense as described by this resolution." Additionally, when describing the UNHRC resolution from September 2014, the panel indicates that the right to an adequate standard of living is contained in several international human rights treaties and that it is both justiciable and enforceable. The Panel may wish to consider clarifying that the

right would be justiciable and enforceable only for States that have undertaken such obligations, and would not legally bind States that have not done so.

- Comment 6: Section 3.6.4. "Convergence and Conflicts". The Panel may wish to reconsider this section, including its discussion of "prioritization" of rights related to water and food in the context of Article 2(1) of the ICESCR. This article states that "Each State Party to the present Covenant undertakes to take steps […] with a view to achieving progressively the full realization of the rights recognized in the present Covenant" – because States have recognized that economic, social, and cultural rights are to be realized progressively, using available resources, this may be a useful lens through which to view this issue.

- Comment 7: Section 3.6.5 "Rights under Threat". The Panel may wish to offer a more inclusive statement of the potential effects of trade on the enjoyment of human rights, including the potential for positive impacts. The Panel may also wish to consider the views of States on the question of extraterritorial application of human rights obligations, rather than exclusively the views of the ETO Consortium.

- Comment 8: Individual nature of human rights. The Panel may wish to clarify that human rights generally belong to individuals, rather than groups, in its discussions of water and food.

- Comment 9: Mandate and Role of the CFS, UNHRC, and other bodies: The Panel may wish to consider the mandate and role of the CFS and the UNHRC in drafting its recommendations, to ensure that the recommendations do not encourage actions that exceed their scope of authority.

115. Private Sector Mechanism

1. Overview

We thank you for giving us the opportunity to study the zero draft of this consultation paper on this very important question. Water and food are essential to life, and so the topic demands insightful inquiry.

While there is much in the report to commend it, we regret that we find its strategic intent to be overly general. In order to remedy this, the introduction should contain a clearly stated set of strategic issues/themes linking water and food security and nutrition, and better references to the topic. In general, more should be done to increase the cohesion of narrative themes and to follow-through on ideas in order to arrive at a recommended strategy.

In general the report is confusingly structured and difficult to follow. It would benefit from revisions that re-organize ideas in order to present them in logical succession.

Increased balance and objectivity is required. Unfortunately, the current draft seems to be a mix of interesting material and facts with unsubstantiated and ideologically motivated assertions. The water/food security issue concerns the entire planet, including both developed and developing countries, and therefore measures should take global needs into consideration. Greater clarity is needed in separating conjecture from facts.

Whilst we recognise that this is very much a work in progress, we do believe that it requires a significant effort in re-drafting to improve its structure and ensure its readability, balance and credibility for decision-makers. At present, in some sections it reads more as a lobby document for

a particular point of view rather than balanced analysis and advice. We hope that this is unintentional and that it can be corrected by providing a more balanced view in subsequent drafts.

2. Generic questions

In light of the above we attempt to give broad and constructive answers to the five key questions that you pose.

1. The scope of the topic of water and food security is very broad. Do you think that the V0 draft has adequately charted the diversity of the linkages between water and food security and nutrition? Is there important evidence or aspects that the present draft has failed to cover?

We find that the authors have attempted to introduce too many subjects that are not strictly related to the mandate given. This makes it extremely difficult for the reader to identify and comprehend the linkages in a meaningful way. At the same time, some issues that have very great importance in the real world (water energy linkages, competition for water between varied human needs, the management of diffuse pollution, economic issues including financing and pricing etc.) are underplayed. The report must acknowledge that complex trade-offs are often necessary.

The impact and dependencies of agriculture on water should be highlighted at the watershed level. Agriculture accounts for the majority of global water withdrawal. It is therefore an integral part of any global or national water strategy. In this context the role of: farmers, as land and water stewards, and agri-business companies, as solutions and resources providers, should be explained in the report. In addition, it should be acknowledged that rain-fed agriculture accounts for the vast of majority of production, and should be considered very differently from irrigated agriculture.

Some of the ways in which access to water unlocks value for farmers in developing countries are not addressed in the report. These include:

(2) increasing a farmer's access to seasonal and operational finance.

(3) reducing the risk of crop failure/loss due to drought, thus making crop insurance more economically feasible.

(4) helping poor farmers build tangible assets (with proper land titles) that can appreciate in value and can be sold/transferred to create wealth for farm enterprises. (e.g. un-irrigated, untitled land can be worth less than $100 per hectare; irrigated, titled land can be worth $10,000+ per hectare)

2. Has the report adequately covered the diversity of approaches and methodological issues, in particular concerning metrics and data for water and food security? Which metrics do you find particularly useful and which not?

On a general level, the metrics and data dimensions of the paper could be developed further to underline the water and food security challenges. At the heart of this is the question of how to grow enough food using no more water than that which is available today. In this regard, we believe the scenarios developed by the OECD in its work

associated with the production of the *Environmental Outlook to 2050: the Consequences of Inaction*, offer an interesting example and useful data.

There is also no mention of any initiatives to close research and data gaps, including for groundwater resources.

A geographical map of the world-wide distribution of irrigated farmland, specifying land that is irrigated and the type of irrigation used, would be a useful piece of information in the report.

With regards to p.16 Comments on the poor predictive ability of current rainfall prediction models within the climate change realm (see e.g. the Berg River Catchment area in South Africa which is cited) could be elaborated on and studies accordingly encouraged. This is crucial for expectation scenarios and managing them on a national, regional and local level.

With regards to p. 39, lines 1-2*: "On average 1 kg of animal product uses from 3000 to 15000 m3 of water depending on management and animal efficiency in converting feed to products."* The numbers cited appear quite high and should be further explained. Compared with carbon footprinting, the science of water footprinting is less well developed. Early attempts at quantifying the water footprints of dairy products, (e.g., 1,000 L/L of milk, 5,000 L/kg of cheese; http://www.waterfootprint.org), building on the concept of virtual water, have reported volumes only. Such volumetric water footprints are potentially misleading and confusing because they fail to take into consideration the type of water being used and the local water scarcity where processes occur. For example, the potential harm associated with consumption of so-called green water, derived from natural rainfall over agricultural lands, is not equivalent to so-called blue water withdrawn from surface and groundwater resources. A more detailed analysis using life cycle assessment-based methodology, taking into account local water stress where operations occur, reported normalized water footprints of 14.4 L/kg of total milk solids in whole milk at farm gate and 15.8 L/kg of total milk solids in skim milk powder delivered to export destination (Ridoutt et al. 2010, J. Dairy Sci. 93:5114). In general terms, description of livestock products as "water intensive" can be misleading. Rainfed livestock grazing systems can be more water effective than irrigated crop production.

3. *Food security involves trade of agricultural produce, and a virtual trade of water. Agricultural trade interacts with water and food security in various ways, and differently for food importing countries, food exporting countries, water scarce versus water rich countries. Do you think the V0 draft has appropriately covered the matter?*

As the report's general philosophy appears to be weighted against the economic dimension of sustainable development, in favour of the ecological and social dimensions, its contribution to this discussion appears less fertile than it could be.

In addition, increased economic efficiency due to water transport is an important element of the water-food-energy-trade nexus not touched upon in this report. Bulk and cold chain transportation by water costs a fraction (per km, per kg) of road transport and should be included as an important "food security" variable. Improved water transport will unlock value in four ways: it can reduce COGS (cost of goods sold), it can reduce post-harvest losses, it can reduce the cost of food for consumers, and it can increase farmer incomes.

4. In this report, we considered the potential for an expansion of the right to water to also encompass productive uses. What kind of practical and policy challenges would this bring?

We find that the report is insufficiently clear with regards to the expansion of the right to water, and perhaps takes the logic of human rights too far. Mixing the water needs of people with those of irrigation and ecosystems in this report is more likely to add confusion than to provide solutions. This would not help decision-makers and is likely to devalue much of the rest of the content of the report. We suggest that the recommendation on extending the existing human right to access to safe drinking water and sanitation beyond its current well-defined scope be removed from section 3.

5. Which systemic actions/solutions/approaches would be the most effective to enhance water governance, management and use for food security?

In general, the role of technology, best practices and innovation is under-represented in the report. Solutions like drip irrigation, drought-tolerant crops, and grey water use deserve more attention, as does innovation in allocation management systems.

We believe that it would be much more constructive for the report to focus on concrete policies, technologies, and programs to provide farmers with access to water.

We would suggest the report place more emphasis on the processes of water stewardship as a practical way to enhance water governance, to allocate resources, and improve water management to ensure food security in ways that are consistent with the need to meet other securities. In our experience, water stewardship is a more practical and operational approach to mitigating water security issues than the water footprint approach. The water footprint approach is good for awareness raising, but does little to provide real guidance for concrete action. We therefore suggest you add a section on water stewardship.

We also suggest that a more in-depth discussion of how states can develop national policies and priorities to improve water productivity in both rain fed and irrigated agriculture would be beneficial.

It is also difficult to see how this question can be answered satisfactorily without a much more serious consideration of the economic dimensions of the challenge, including the questions of costs, price and value. Without this, the capital and operating investments necessary cannot be assessed and nor can the value of the benefits to be generated.

The document would also benefit from more structure when discussing the value chain for food production – including post-harvest losses. This would be a useful framework to use in framing the objectives of this report as well as the risks/opportunities involved.

3. General comments on content

Given that this is an early draft, we do not believe it is of much value to make very specific comments on detailed drafting. Nevertheless there are a number of points that we believe it would be useful to highlight. Please do not consider this an exhaustive list.

a. Allocation and reallocation

One of the most difficult challenges that decision-makers will have to face in the coming years is the need to prioritise the competing interests and trade-offs of different parties (this includes both individual and collective interests). At the heart of this will be the need to ensure the water, food, energy, land and other securities of individuals, communities, both state owned and private corporations, the environment, states, regions and global systems. The geographic scale and temporal constraints of these are likely to become less and less well aligned.

Much of this is implied in the draft report, but obscured by the lens through which the report has chosen to examine this complex subject. Decision-makers at many levels of government will be called on to both allocate limited resources, such as water, and, much more difficult, reallocate them, which may mean removing or restricting an allocation that someone already has for the good of everybody else. Some such decisions have to be permanent and others temporary to respond to a drought or similar event. Aligning individual rights with collective interests presents real, practical challenges. Whilst the report rightly draws attention to the need to include all stakeholders, including those with a weak or no voice, the report appears to champion these latter stakeholders without helping policy makers develop policies that satisfy all water demands simultaneously, including those that underpin jobs, production, and overall stability.

b. Section 1.3.5

Section 1.3.5 is titled "Increased interest for water resources by big corporate actors: "water grabbing"?" We recommend replacing this with a section that inventories and assesses corporate interests and investments in water, particularly from a corporate citizenship/sustainability perspective. There are also significant risk management and productivity objectives of corporations that would be synergistic with efforts to manage water and food security and nutrition. This document misses the opportunity to include an organizing principle around which they could rally private sector support and engagement.

We note the CFS specifically chose not to use inflammatory language and undefined terms (e.g. "land and water grabbing") during consultations on the Voluntary Guidelines on the Responsible Governance of Tenure. We suggest that the HLPE follow suit.

c. Dealing with land salinization

With regards to page 30, lines 22-27: further conventional irrigation with saline water can, in the long term, rule soil out from being feasible for agricultural uses. Adequate irrigation practices such as drip irrigation along with drainage can maintain the salinity level at the root zone beneath the critical salinity damaging for non salt durable crops. Drip irrigation keeps the root zone constantly wet due to the low discharge rate and the daily irrigation. In these conditions the salinity level can be constrained with less crop yield reduction and sustained soil salinity, for a longer period of time.

d. Pollution prevention, protecting water quality, water reuse and resources recovery

The questions of preventing pollution, catching and removing polluting substances from used or polluted water so the water can be reused safely, and of recovering the resources thus removed for beneficial use are becoming widely recognised globally. These questions apply to agricultural as well as urban, and industrial activities, and to energy production. They are partially mentioned in the report. In our view however, they need to be emphasized much more strongly.

In many cases, agricultural activities are the cause of very significant amounts of both "point source" and "diffuse" pollution. Poor agricultural practices, including uncontrolled discharges, polluted run-off, and erosion are some of the most serious causes of damage to the aquatic environment worldwide. They pose a real threat to water security at all levels. At the same time, they reduce the amount of water available and lead to expensive wastes of other resources. Recent and ongoing work by the OECD could be referred to in this context.

Governments, farmers, food processors and consumers all need appropriate information, incentives, regulations and penalties, designed to overcome these pollution related issues. Action needs to be taken that is in line with the 3R's approach: Restrict pollution at source, Remove pollution from water after use and Reuse the water and other resources beneficially. We believe that there is considerable scope for the report to be reinforced to highlight this as a very important way of improving the water-food-energy-land security nexus.

We have several concerns with regards to the treatment of the relationship between fertilizers and water quality in the report. For example, in Page 14, lines 2-3, it is suggested that Nitrogen and Phosphorus are "key water pollutants stemming from agricultural production", without adequate discourse on the use of best practices and varied sources. Page 22, line 16, Suggests using point source wastewater on agricultural fields to reduce cost of fertilizer application. Page 46, lines 7-9, promotes the "underutilized resource" of human urine and feces as fertilizer as an "untapped resource". We suggest that these sections be reconsidered, taking into account food safety and human health considerations, and acknowledging that sewage, whether human or animal, is capable of polluting and spreading disease. The concluding point of the policy recommendations on p. 49 – line 6, should have the words "water reuse and recycling, nutrient recovery and reuse" added after the words "urban agriculture".

It should also be recognised that the reuse of urban wastewater is growing steadily throughout the world as a means of mitigating water scarcity. It would be useful to add a paragraph to section 2.3.1 explaining that to mitigate potential health difficulties, WHO has produced guidelines that are periodically reviewed and improved2.

More emphasis should also be put on the recycling of water and sourcing from other places such as desalination of seawater. As noted earlier, innovation is under-represented as an aspect of this project.

e. Increasing water use productivity in Agricultural production

As indicated by the OECD in the Environmental Outlook to 20503, there will be little scope for increasing water for irrigation. This point should be introduced more clearly and developed further in the report. It is very important to understand this as a global constraint and quantitative limit to water available for agricultural production.

Improved input-use efficiency through better technology and related productivity increases is the most economically viable solution to closing the water gap in agriculture dominated economies, as

2 http://www.who.int/water_sanitation_health/wastewater/gsuww/en/

3 OECD Environmental Outlook to 2050 : OECD 2012, http://www.oecd.org/env/indicators-modelling-outlooks/waterchapteroftheoecdenvironmentaloutlookto2050theconsequencesofinaction.htm

highlighted in the "*Charting Our Water Future*" report of the Water Resources Group. Water harvesting, and techniques such as conservation tillage, should be explored. The report should also emphasize how productivity gains in agriculture will lead to long-term improvements in water use efficiency. The following measures could be considered, as they are deemed to be important in this context:

a. Sustainable Intensive Agriculture - *Grow More from Less* – we have to use water wisely and efficiently to grow more food and to reduce water wastage and loss throughout a product's value chain.4 Produce more crops per drop of water, per hectare of land, per hour of labor, per application of crop protection products.
b. We agree with the statement in the report that "*the challenge for irrigated agriculture in this century is to improve equity, reduce environmental damage, strengthen ecosystem functions, and enhance water and land productivity in existing and new irrigated systems.*" (page 30, line 28-30). However, this could be tackled by focusing on maintaining and improving the agricultural water demand and supply balance within a watershed, through for instance:
    i. *Altering traditional crop selection criteria* – to promote consideration of water supply (not water availability) in the crop selection process. For example, substitute water intensive crops for less water intensive crops or imports, in water scarce regions. There is extensive work underway on dry-land techniques
    ii. *Maintaining and improving soil structure* - to enhance soil water holding capacity and reduce soil based evaporation. This is mentioned at places in the report, but the benefits of sustainable soil management and use, or good water / irrigation management practices in controlling soil erosion and water contamination, are not emphasized. (land productivity section)
    iii. *Advancing water application systems in crop production* – to encourage adoption of water efficient irrigation techniques: sprinkler or drip irrigation; combined water, fertilizers, and chemical inputs application techniques.
    iv. *Trans-boundary cooperation* - to maintain and improve water demand and supply balance. For instance, there was not much mention in the report of the groundwater boom in Asia. Again, the role of innovation must be emphasized.

Building a virtuous circle of improved water productivity, primarily in irrigated agriculture, but also in rain-fed production, reduced waste of water, energy and other related inputs and reduced damage to water resources, needs to be given more emphasis. Could the potential for upscaling the approach outlined in section 2.4.4 to cover a wider range of producers than small scale subsistence farmers alone not also be considered?

f. Section 3.2.1 From Delhi to Dublin

The way the report sets the fourth Dublin principle apart from the other three appears to be very unhelpful. Our understanding is that all four Dublin principles were intended to act together and

4 Approximately, 70 billion dollars' worth of crops is wasted every year. Additionally, some 15-35% of all crop irrigation is considered unsustainable and underground aquifers are overexploited. This can be seen around the world, such as the River Rio Grande failing to reach the Gulf of Mexico for the first time in 2001.

inseparably. Water is a social good and an environmental and an economic good, and it is also a common good and a private good. It is all of these things at the same time, with the relative importance of one dimension varying relative to another only in degree depending on circumstances. By isolating the fourth principle from the rest and apparently opposing the economic approach, the report perpetuates an outdated and unconstructive view.

g. Section 3.3

Section 3.3.1 "valuing and pricing water" could be made into a constructive and helpful discussion by developing the statement made in the first sentence "*Water pricing policies can improve efficiency and sustainability when combined with appropriate supporting policies*" (page 59, lines 5-6). For example, the OECD highlights water pricing as a useful policy option for creating incentives for water efficiency. "*Water pricing can be used to signal scarcity and to create incentives for efficient water use in all sectors (e.g. agriculture industry, domestic). Social consequences are best addressed through well-designed tariff structures or targeted measures. In combination with regulations, standards and public support to innovation, water pricing will curb water demand and make alternative water sources (such as reusing untreated wastewater) competitive*."5

There is little in section 3.3. of real use for policy makers. Statements such as "*water pricing may conflict with the idea that the provision of water services is a basic right to all individuals if water prices rise to a level that low income households cannot afford*" (page 59, lines 7-9), which is not based on the position of the human right to safe water and sanitation, are misleading and very far from the water for food topic of the report. Other statements have nothing to do with the context being discussed, for example, "*and past and controversial attempts at water privatisation*"; "*The role of the World Bank has been particularly controversial around both the hydropower and privatisation debates*" (page 66, lines 1-2). They should be removed to avoid devaluing the report.

Section 3.3.3 provides a very distorted view of the activities of the private sector and does nothing to recognise the constructive contribution made by many different firms and business organisations from different industrial sectors to improving the understanding of water issues, including the water-food-energy nexus. Private companies also provide know-how, processes and technologies, and investment, as well as implementing cooperative water management processes with governments and other stakeholders.

The first three pages of this section deal exclusively with the provision of public drinking water and sanitation services, which is a long way from the topic of the report. In addition the section implies that private water operators do not see water as a public good to be provided at affordable rates for everybody. This material should be deleted.

h. Section 3.6

Section 3.6 appears to stray further and further from the subject of the report and as a result becomes less and less helpful. It appears to be designed to put pressure on human rights specialists to accept a particular perspective rather than to provide operational advice to those working in the field of food and nutritional security.

5 OECD pamphlet supporting the Environmental Outlook to 2050: the consequences of inaction - key findings on water - OECD March 2012 – p4. http://www.oecd.org/env/indicators-modelling-outlooks/waterchapteroftheoecdenvironmentaloutlookto2050theconsequencesofinaction.htm

The introductory paragraph concludes with the statement "*the right to determine and set one's own priorities and strategies*" (page 69, lines 20-21). There is a trap in this, because there have to be limits to what the individual can do when this affects the rights of other individuals or the community as a whole. This dilemma appears to be recognised in some of the comments in the rest of this section, but no helpful advice is offered..

Section 3.6.3 appears to be designed to exacerbate the supposed controversies rather than to resolve them. Much of this section has nothing to do with the subject, particularly box 22, which should be removed since it has no linkage with food security..

i. Gender equality

The section on gender equality in the water management and use sector could be strengthened, showcasing the benefits of achieving such equality. (we recommend referring to "*Effective gender mainstreaming in water management for sustainable livelihoods: From guidelines to practice*" by Dr. Margreet Zwarteveen, Irrigation and Water Engineering, Wageningen University.)

3.

4. Draft recommendations

The recommendations should focus on more constructive suggestions not only on **what** should be done, but on **how** to do it.

Expanding the existing right to safe drinking water to include "*water for ecosystem reserves and water for subsistence production*" would be detrimental to the billions of people who are still waiting to have their human right to access to drinking water that is really safe. For this reason, we suggest that recommendation 12 is removed and replaced by a recommendation that focuses on water for food production only.

The report should include a recommendation that the use of water in agriculture be optimized, and water optimization be prioritized in agricultural policies. Policy frameworks which recognize the interdependence of energy, food, water, and health should be promoted. In addition practical, feasible, and time bound water policy targets should be set for the achievement of a sustainable level of water efficiency in the agricultural sector.

The aim of agri-policies should be to get a higher yield from every drop of water in the most sustainable manner, if we are to manage this scare resource more wisely. The importance of innovation, research and development in this area is key, including drip irrigation and drought resistant technologies. These policies should be supported by productivity based indicators/metrics, which recognize the interdependence of water with other issues, particularly energy and food, as well as climate. For instance, water metrics based on food calories per unit of irrigated water could be considered.

4.

Policies to support the resilience of farmers, particularly smallholders are essential and should align with work like that done by ICARDA and CCAFS.

The report should include recommendations to Improve the targeting of policies in areas where water wastage and pollution is most acute. They could involve:

- *Integrated planning and management across competing uses of water* - to ensure that everyone gets a fair share of water. For instance, there is no mention of water user associations/farmer associations – they can be very effective in managing water use in developing countries.
- *Establishing and strengthening legal and governance frameworks for water* – to facilitate correct mapping and accounting of water scarce regions. For instance,
  - formalization of the water sector to facilitate water valuation and establish water rights;
  - building the capacity and knowledge of policy makers and decision takers to help them design, implement and understand the impacts of policies in advance, as well as to monitor and track on-the-ground progress of enacted policies;
  - setting-up information systems for dynamic mapping of water sources in order to support farmers, water managers, and policy makers;
  - supporting training and educational institutes to build capacities at local level to better manage water resources; and financial institutes that benefit rural poor and resource constraint growers to adopt better means of water resource management,
- *Promoting public-private partnerships – to* enhance water use efficiency and to garner support for inter-basin transfer infrastructure.
- *Identifying and promoting technologies that develop and protect water resources* – to enhance agricultural productivity and simultaneously support mechanisms that help in the diffusion and dissemination of these technologies to the ones that need them most.

The report should include a recommendation that Businesses be encouraged to drive sustainable solutions at scale while linking development goals to core business interests, identifying and managing their impacts and collaborating with governments and civil society. They could include:

- Incentives for efficient irrigation systems tied to productivity improvements, or even to amount of calories produced.
- Simple and pragmatic water accounting and reporting tools developed to measure agriculture water intensity (off-rain water).

116. Groupe Interministériel français sur la sécurité alimentaire (GISA), France

Le document préparé par le HLPE est globalement satisfaisant : très documenté (nombreuses références), bien structuré, il présente l'état des lieux en abordant les questions de sécurité alimentaire et de nutrition dans le contexte du changement climatique. La distinction entre agriculture pluviale et agriculture irriguée est posée, les interactions entre agriculture et élevage sont abordées, l'agroécologie est mentionnée. Les questions de gouvernance de l'eau (conflits d'usage, politiques, droit à l'eau) sont bien abordées. Le rapport propose des recommandations s'adressant aux diverses parties prenantes.

Dans ces conditions, les remarques du GISA relèvent de l'amélioration :

- il serait utile de mentionner l'importance de lutter contre les pertes et gaspillages de produits agricoles et alimentaires, car cela participe à favoriser une meilleure utilisation des ressources naturelles (terre et eau) ;

- l'organisation sociale de l'eau mériterait d'être davantage considérée dans le rapport. L'eau n'est pas seulement un intrant et un facteur de production, mais un bien commun qui présente la caractéristique d'être un flux partagé entre l'amont et l'aval. Cette solidarité entre l'amont et l'aval, entre les territoires ruraux et les territoires urbains est un élément structurant de l'espace où les organisations sociales jouent un rôle clé. C'est pourquoi tous les aspects liés aux aspects sociaux et sociétaux devraient être encore plus documentés et mis en exergue (multi-usages de l'eau). Le rapport pourrait mentionner l'existence d'associations d'usagers de l'eau ou de propriétaires (associations telles que les ASA en France).

- au-delà du droit à l'eau abordé dans la partie "recommandations", le droit légitime sur l'usage de l'eau pourrait être développé, car la compétition dans les usages de l'eau est réelle et il est crucial que les droits légitimes soient reconnus. Une gouvernance de l'eau efficace passe par une meilleure reconnaissance de l'ensemble du faisceau de droits coutumiers ou réglementaires sur l'eau. Cette approche permettra notamment d'atteindre, comme le recommande le rapport, une meilleure connexion avec les régimes de gouvernance alimentaire et de gouvernance du foncier.

- Sur les questions liées aux investissements dans le secteur de l'eau, le rapport pourrait faire le point sur la législation internationale dans ce domaine.

- sur la gestion de l'eau, le paragraphe p. 27, lignes 25-34 insiste sur la tarification comme outil de gestion de la demande en eau. D'autre approches existent cependant et devraient être citées : connaissance, réglementation (autorisations de prélèvement, suivi volumétrique des prélèvements, imposition de quotas, économies d'eau), accords collectifs, réduction de l'impact environnemental de l'offre avec une démarche de substitution des ressources (stockage de l'eau en période de hautes eaux).

- concernant l'eau pour l'agriculture (p. 28 et suivantes), il faudrait expliquer dès l'introduction de la partie 2.1 quels sont les différents systèmes de « agricultural water management » au lieu de se focaliser sur la dichotomie pluvial/irrigué : le paragraphe d'introduction pourrait expliquer qu'un continuum existe depuis l'agriculture pluviale jusqu'aux systèmes irrigués, en passant par soil moisture / rainwater harvesting / supplemental irrigation (ces systèmes sont bien mentionnés dans la partie 2.4.2, p. 39 et suivantes).

- la partie sur l'agriculture pluviale pourrait être développée pour mettre en avant les bonnes pratiques permettant d'optimiser l'utilisation de l'eau de pluie. Des exemples pourraient faire l'objet d'un encadré : le SRI (système de riziculture intensive) à Madagascar, la technique culturale du zaï dans les pays sahéliens. Les recommandations 6, 7 et 8 devraient tenir compte des gains de productivité que l'on peut attendre de l'agriculture pluviale.

- La qualité de l'eau est essentielle mais la question mériterait d'être développée dans le rapport, qui l'aborde surtout sous l'angle des pollutions d'origine animale et omet l'impact d'autres activités. Les recommandations relatives à la qualité de l'eau ne peuvent être comprises que si elles sont précisées par d'autres arguments dans le rapport.
Concernant spécifiquement la recommandation sur l'application du principe pollueur-payeur, ce principe important peut néanmoins présenter certaines limites en terme d'impact sur la réduction de

la pollution ; on constate ainsi en France une certaine inélasticité entre le prix des intrants et leur usage. D'autre part, il peut être pertinent d'utiliser les revenus générés par l'application du principe pollueur-payeur pour financer des pratiques agricoles bénéfiques pour l'environnement (en complément de la restauration des ressources en eau). C'est pourquoi la recommandation (p. 77) pourrait être nuancée ("increase application of the polluter-pays principle, which helps to reduce pollution and provides revenue for promoting environmentally-friendly agricultural practices and rehabilitating polluted water resources").
Dans cette même partie, il pourrait être recommandé de développer l'intérêt des paiements pour services environnementaux.

- p. 32, box 9, ligne 10, l'approche française pour *'formalized groundwater management*' pourrait être citée également, aux cotés de la Californie. L'approche française est réglementaire et repose sur la concertation avec les parties prenantes ; les prélèvements font l'objet d'une procédure administrative, un volume prélevable maximal est affecté, les volumes étant contrôlés par l'État ; en cas de déséquilibre sur la ressource, des études sont menées afin d'estimer la réduction nécessaire des prélèvements et une réduction est imposée aux préleveurs en conséquence, après concertation avec toutes les parties prenantes.

- Le paragraphe traitant de la gestion intégrée des ressources en eau (§ 3.2.2) devrait être développé, notamment en ce qui concerne la gestion transfrontalière, en faisant notamment référence aux conventions de New York (1997) et d'Helsinski (1992). Les recommandations devraient par conséquent évoquer la GIRE, notamment la gestion transfrontalière de l'eau.

- La question de la gestion des eaux souterraines n'est pas évoquée. En particulier, le rapport mériterait d'évoquer la surexploitation des aquifères dans certaines régions (comme la rive sud de la Méditerranée).

- au point 3.5, p. 66, ligne 10, la référence au Forum mondial de l'eau est inexacte ; le Conseil mondial de l'eau organise le Forum mondial de l'eau tous les trois ans mais ne l'héberge pas.

- le rôle du secteur privé évoqué en pp. 61 et 66 ne reflète pas la notion de gestion déléguée. L'État peut en effet déléguer une mission de service public au secteur privé sans qu'il y ait appropriation de la ressource. C'est le service (garantir la fourniture aux usagers d'une eau potable pendant la durée du contrat) et non la ressource en eau qui est privatisé. Il serait intéressant de mentionner les travaux de Bernard Barraqué sur le sujet, qui montrent que l'implication du secteur privé dans le domaine de l'eau peut reposer sur des arrangements et des partages de responsabilité très divers et que les problématiques de gouvernance de l'eau dépassent la dichotomie public / privé (voir les références par exemple *Urban Water Conflicts: UNESCO-IHP ; Return of drinking water supply in Paris to public control*).

- concernant l'efficacité de l'eau, (empreinte eau, eau virtuelle), le rapport gagnerait à faire référence à l'ouvrage de Daniel Zimmer (*L'empreinte eau – Les faces cachées d'une ressource vitale*, 2013)

- pp. 47 et 48, le paragraphe consacré à l'eau virtuelle souffre d'une approche trop neutre. Les implications des choix politiques (importations de produits agricoles, donc d'eau virtuelle *versus* maintien d'une activité agricole) ne sont pas évoquées, alors qu'ils relèvent des orientations en termes de souveraineté alimentaire. Ainsi, dans les recommandations, la question du commerce comme option pour assurer la sécurité alimentaire (paragraphe 11) devrait être pondérée en prenant en compte les conséquences des choix politiques sur le niveau d'indépendance alimentaire et les éventuelles conséquences sociales qui pourraient en découler.

- p. 59, en ce qui concerne le stockage de l'eau, on ne précise pas les impacts potentiels des barrages en fonction de leur taille, notamment sur les écosystèmes aquatiques et les populations locales.

- réf. lien accaparement terre et eau : Mehta *et al.*(2012), Water grabbing ? Focus on the (re)appropriation of finite water resources

117. World Food Programme, Italy

"First of all, WFP very much welcomes the report of the HLPE. The nexus on water, food security and nutrition is very relevant and pertinent.

Secondly, WFP supports a broad range of water-related activities related to water for nutrition and health, soil and water resources conservation, water for food production and hazard protection. Between 2002 and 2009, 275 out of 732 WFP projects, or 38 percent, involved water-related activities. These activities took place in 69 countries.
In 2010/2011, of 341 projects supported by WFP globally, 113 (33 percent) included water activities. Projects which contained a water management component were identified and classified under four main categories: i) nutrition and health; ii) soil and water conservation; iii) food production; and iv) hazard protection. According to this 2010-2011 analysis, among WFP projects with a water-related component, 61 percent aimed at addressing drought impacts and 46 percent flood impacts. 19 percent dealt with internal and cross-border conflict, 12 percent with increased food prices, 5 percent with storms, and 14 percent with other natural hazards (earthquakes, crop infestations and environmental degradation). Interventions were implemented as response measures or as risk-reduction measures depending on the country and operational context.
In the context of WFP's work in this area, partnerships with host governments (central and local) and other partners in this area are key, both for domestic uses (e.g. with UNICEF and WHO on WASH related activities), agriculture (e.g. FAO and others) and protection of infrastructure.

Third, the gender dimension is also very important for WFP as water quantity and quality relates not only to food consumption and nutrition, reduction of diarrhoea, but also to the reduction of hardships on women and girls tasked to fetch water from increasingly distant locations, especially in deteriorated ecosystems where most of WFP beneficiaries reside. By fetching water from distant locations, women and girls expose themselves to the risk of rape and other forms of violence. This protection issue might benefit from some more elaboration in the current draft.

Fourth, attached is a document (http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/CFS%20Recommendations%20in%20draft%20HLPE%20Water%20report.docx) that contains all the recommendations that the HLPE made to the CFS in this zero draft report, some of these might benefit from some more reflection (we provided two comments already)"

118. Jennie Dey de Pryck, Italy

Dear Colleagues,

Sorry I didn't contribute before. I'm now attaching a recent publication I prepared for FAO on Gender Inequalities in Fish Value Chains (http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/resources/Jennie%20PubGenderInequalitiesFishValueChainsFinal.pdf) .

The relevant points in this publication on Fish VCs for this HLPE paper on water are:

1. Pollution: agro-chemical pollution that gets into the rivers/fish ponds and kills fish or makes them unsafe to eat (see, for example, Box 3 and section 1.2 first para), industrial pollution damaging coastal and inland water for fish (section 1.2 para 7) and pollution from aquaculture that gets into the water table, affects/contaminates agriculture, and health/safety (section 2.2.2)

2. Women's poor access rights to ponds for aquaculture (section 2.2.1)

3. Women's time poverty (including their need to provision the household (plus animals etc) in water - often at long distance - and often not clean/safe either. The time they spend fetching water reduces their time/energy for productive activities, child care (with negative impacts on child nutrition, health, well being) etc.

Best wishes,

Jennie

Jennie Dey de Pryck Ph.D.

Senior Gender Adviser
Global Forum on Agricultural Research (GFAR)
Gender in Agriculture Partnership (GAP)

119. Food and Agriculture Organization , Italy

Introduction

The Food and Agriculture Organization appreciates the opportunity to provide comments on the Zero Draft of the Report on water and food security being prepared by the High Level Panel of Experts on Food Security and Nutrition (HLPE), and to be presented at its 42nd Session in October 2015. In view of the cross-sectoral nature of the subject, which has linkages with the global goals of the Organization (eradication of hunger, food insecurity and malnutrition; elimination of poverty through economic and social progress for all; and sustainable management and utilization of natural resources), the Zero draft has been widely circulated within FAO technical units.

We present here a synthesis as FAO's corporate response to the Zero Draft, alongside more specific comments provided from thematic or regional perspectives.

[*FAO comments in track changes mode on the Zero Draft document* http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/files/Water/FAO-comments-draft-zero-in-the-text.docx]

General comments

Structure and style of the report

We appreciate the work that has gone into this very extensive report and congratulate the authors on pulling together a huge amount of information and developing a set of key issues to be considered by CFS. The HLPE draft report of water and food security analyses main water-related challenges for food security in multiple dimensions and is intended to serve as a useful reference on policy implications of the water and food security nexus.

We acknowledge the complexity of the issue to be treated and the difficulties in putting together a comprehensive and authoritative document in support to the work of the CFS. We also appreciate that, as indicated by the authors, 'this V0 draft may be thoroughly corrected, modified, expanded and revised after the present consultation'. We therefore ask that our comments below be considered as part of a constructive process aimed at obtaining the best possible guidance to CFS.

The report is very rich in information about water, agriculture and food security and provides a good conceptual frame for analysis. Figure 1 is a commendable attempt to capture the different dimensions of the water-food security linkages. Unfortunately, it is not exploited sufficiently in the organization of the report and the linkages between water and food security are not treated in a systematic way. Our earlier suggestion (on the scoping document) to organize the report according to the different dimensions of food security has not been considered so far.

As it stands now, the organization of the report is quite confusing, the rationale behind its overall structure is difficult to understand, and the reader is very likely to have difficulties in capturing the main ideas. The report touches upon very many good and interesting issues, but a lot more work is needed for their analysis and to address them more systematically and more thoroughly. The number and extent of the issues touched upon also triggers the question of focus, which gives the impression of a moving target and as such makes the breadth greater than necessary, sometimes to the expense of the depth in issues and topics that are more key than others. Several issues are discussed several times in different sections of the report (sometimes in an inconsistent way), further increasing the level of confusion. A number of issues are being discussed with no clear conclusion on which to base specific recommendations.

We appreciate that recommendations, a critical part of the report, are still very much work in progress. We are concerned, however, by the relatively large number of recommendations, and note that they are not systematically supported by the main text. We would expect that the main text build the case for these recommendations.

We appreciate the wealth of collective knowledge that has been put in the document. We note, however, that several sections are written like research papers, in a style that may not be the most effective when addressing a target audience like the members of the CFS where policy advice is expected. This nature also makes it very difficult for the reader to see a flow of ideas, building up to a case to be made.

We are concerned that some statements are relatively free interpretation of stated facts, and that several statements are not scientifically substantiated. These points are discussed below. We believe that the highest level of scientific rigor is needed in order to ensure the overall credibility of the report and its consequent authoritative value. Without this, there is a serious risk that the report sees itself discredited and its recommendations easily dismissed by the members of the CFS.

An effort is needed to clarify the concepts and definitions used in the report. This is particularly true for issues like water productivity, water efficiency, water consumption and agricultural water

management productivity. A clear definition of these terminologies is needed to avoid misunderstandings.

Tables and Figures are powerful tools to illustrate important points. Yet, we feel that the report would benefit from a more strategic selection of these illustrations. Figure 4 is difficult to understand; the data from Figure 5, showing major increase in industrial water use in developed countries and not in developing countries seems counter-intuitive; Figures 6 and 7 may not be a priority for a report on water and food security; Figure 8 could easily be replaced by a more recent map of water scarcity; Tables 2, 3 and 4 offer information of little relevance for the reader. We also note that notwithstanding the wealth of data, information and maps it offers, FAO's AQUASTAT database, considered the most comprehensive and authoritative database on water and agriculture, has been practically ignored. Success stories and lessons learned, presented in boxes, would be valuable additions to illustrate specific points.

Substance of the report

The report provides a wide diversity of ideas, approaches and methods, yet it does seem limited by a set of underlying assumptions that modern technologies, policies, legislations and markets will be bad for smallholders that is problematic and we suggest some clearer discussion on this issue as modern agricultural technologies are likely to play an important role in water security.

Indeed, the report seems to convey the idea that traditional agricultural techniques could feed today's population of 7 billion. Such an idea is not only wrong, it is also dangerous. Current levels of productivity could never have been achieved without the advances in agricultural research and development, and in the future increases in productivity will be needed to feed another 2 billion people, serve a growing demand for agricultural and other products and contain encroachment on the natural resources base. While there is no doubt that new, more ecosystem-based models of development are needed, there is no way that traditional approaches alone can satisfy today and tomorrow's demand, nor can ecosystem approaches be imposed without considering farmers' livelihoods and local economies.

The same applies to institutions and legislations. The report seems to suggest that traditional institutions are more equitable than the modern ones, and that that modern water rights and interventions are at the origin of gender inequity, while traditional norms are not questioned on this ground. Yet, there is abundant literature on how many traditional systems are intrinsically inequitable.

Also, there's somewhat of a suggestion all through the report that traditional institutions are likely to be more efficient than any new or introduced ones and this is something that needs to be examined carefully. Most institutions were developed under very different conditions (population densities, cultural settings, climate, competition for resources, markets, etc.) and there's good reason to reassess the capacity of traditional institutions to cope with these new conditions. The challenge to combine traditional and modern institutions and develop new institutional arrangements is an important topic which may need to be further developed with clearer indications on their effect on the water/food security linkages.

Throughout the report, there seems to be also a suggestion that some groups are inherently good and other fundamentally bad, that subsistence agriculture is good and commercial agriculture is bad. In particular, systematically blaming large commercial farms and foreign investors for problems, while small subsistence farmers as seen only as victims of inequities is probably reflective of a romantic perspective but it might not be productive. Clearly, there are large power imbalances to take into account, and governance mechanisms must be put in place to ensure equitable and transparent access to resources and markets, but pointing the finger at different categories may not be the most productive approach. Furthermore, many sections of the report seem to associate

smallholder farming with subsistence agriculture while the great majority of small-scale producers are linked to markets in a way or another and there are very few purely subsistence farmers.

The text seems to have confusion about public and private goods generated from agriculture – and the policy approaches to managing them. Several sections call for changes in farming practices, in particular in relation to more sustainable practices, but they do not indicate who should bear the cost for these changes in practices (higher risk, lower return, higher labour costs, etc.). We suggest that the report needs to better address the farm level returns issues and the potential public/private tradeoffs that may arise in adopting new approaches in order to have a more realistic appraisal of the challenges being faced.

Moreover, it is not possible anymore to base analyses on a generic grouping into developed and developing countries. The report should differentiate its discussions between low-income countries, transition economies at different stages of economic development, and developed economies, as well as different levels of water scarcity.

While issues of water supply and sanitation are important, in particular in connection with hygiene, health and nutrition and through the possible linkage between water supply and income generating activities, there is an excessive focus on the subject compared to other issues. In particular, the report does not sufficiently address the linkage between water and rural livelihoods and proposes a very 'static' view of agriculture, farming and poverty. The needs of poor people must be addressed, but there is nothing in the report about how water can contribute to lift them out of poverty. The analysis on links between poverty, food and nutrition security and water is equally missing.

The focus on issues of equity and rights resulting in recommendations to explicitly ensure representation of the most vulnerable and of their interests is very welcome, and much needed. The report provides a series of new avenues to strengthen a right-based approach to the issues of access to food and nutrition and access to water, and provides interesting bridges between domestic water supply, nutrition and poverty alleviation. However, some of the recommendations themselves are questionable. In particular, the report tries to establish a direct link or correspondence between access to food and access to water as a basis for food and nutrition security and associates small scale farming with subsistence agriculture. As a result, the default path on access to food seems to be by own production, which is rarely the case.

While there is ample space in the report for discussions on right-based approaches, the broad question of the implication of increased water scarcity and inter-sectoral competition for water on food production, supply and security and implications in terms of national and international policies, including trade, is treated too lightly. Yet, the CFS, in its request to HLPE to prepare a report on water and food security, indicated that *'this topic should be seen in the wider context of the nexus between water, soil, energy and food security which is recognized as a pillar of inclusive growth and sustainable development'*. Ignoring growing linkages between development sectors, and branding (and dismissing the possible use) of nexus as a *'new approach imposed from the top'* without entering into the merit of the discussion is not sufficient. A serious, substantive discussion of future trade-offs and co-benefits as well as the implications of water scarcity for food security is needed.

Likewise, the question of water accounting is treated too lightly in the report. With growing pressure on water resources, it becomes increasingly important to carefully assess the increasingly complex implication of water management choices. Any water conservation measure, for instance (water harvesting, supplementary irrigation, soil moisture conservation, or even tree plantation) has potential impact on water availability further downstream and therefore needs careful attention to avoid that changes in practices translate into unexpected re-allocation of water from one user category to another. The question of improved water use efficiency in irrigated schemes needs to be treated carefully and analysed through a water accounting lens.

Virtual water is presented as a way to increase water productivity but it is not reviewed critically enough. While a virtual trade of water is a useful concept for illustrating linkages between agricultural trade, food security and water, it has so far failed to translate into practical policy applications. The recommendation on using trade as a means of achieving water security is quite reasonable, but the report would have benefitted from a more substantive analysis of this issue. The use of imports to compensate for structural deficit in water scarce countries (already a reality for many countries) is treated too lightly, and its international dimension is not discussed. Yet, it is a subject of increasing concern for many governments and deserves a much more elaborated discussion: interestingly enough, the implications that those who cannot afford virtual water trade are the poor is not discussed at all. Looking at the issue at global, regional and national levels and how to address the challenge at these different levels would probably be helpful.

Discussions and guidance on investments are missing other than a short argument about large-scale irrigation seen as a subtitle of improving water management. The lack of investment into infrastructure and institutional and implementing capacities would have deserved its ow section. Discussion about development assistance is also non-existent. Yet, it would be interesting to read about current trends in investment and funding for water, the focus of most water aid on water supply and sanitation and its implications for the productive uses of water which is rarely directly targeted.

The report fails to recognize and analyze the role of economics and falls short of covering markets, consumer behavior and incentives/disincentives other than generic references.

Finally, we believe that the report must have covered much more in the perspective of the post-2015 development agenda and that linkages to SDGs are inadequate and detached from the subject matter. An example is Box 20, which is only about a possible goal on water in the SDG suite with no mention of the proposed goal on food security and sustainable agriculture, let alone an analysis of the linkages between the two. Likewise, possible linkages and trade-offs between relevant goals are non-existent.

Suggestions for restructuring the report

Some additional efforts should be put in refining the very interesting conceptual model presented in Figure 1. The question of water scarcity and trade-offs between different development and environmental goals must be made more explicit, through a visual representation of the different linkages. WASH and drinking water should be merged. The figure could then be used as a basis to establish the overall structure of the report.

In order to reduce confusion and provide users with a clearer understanding of the issues at stake and possible responses, we suggest that the authors identify a few major issues which they believe require CFS attention, and organize the report along these issues. For each of these issues, evidence should be presented and analyzed in an unbiased way, and recommendations should be drawn on the basis of the analysis. Adopting such an organizational principle would offer a much more coherent structure for the report, avoid repetitions, and ensure that the text is much better linked to the report's recommendations. Recommendations would probably be less numerous than the current, generous figure of12. An executive summary would capture the main findings and open to the recommendations, while the introduction could be reduced. Such an approach would, hopefully, ensure that clearer, more straightforward messages would be sent to national and international institutions, and be, to some account, linked to some type of 'voluntary accountability'.

The report needs to be much more balanced and factual than it is now, avoid offering biased interpretations of facts and statements and build its credibility, and therefore its authority on a meticulous research of objectivity in the way it presents its analysis. This does not in any way mean that complex or controversial issues should not be discussed. To the contrary, if considered

important to the subject matter, they deserve a clear, concise and objective analysis on the basis of which CFS members could base their decisions.

Comments on specific topics

Rights to water and right to food, and linkage with poverty reduction

The report must be commended for presenting an interesting and detailed discussion on the human right to food and the human right to water. The question of linkage between the right to food and the right to the water to produce food is a difficult subject. In a world dominated by subsistence agriculture, the linkage between food security and the capacity to produce would be straightforward, and access to the means of production of food would therefore become a logical extension of a right to food. Yet, in today's world, the number of people producing their own food is a very small minority, and most farmers are connected in a way or another to markets. The *extrapolation* proposed in page 69, indicating that the State Parties have the obligation to protect the water resources from being diverted for other purposes so that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous people seems quite hazardous. Yet, the question of access to water for productive activities for millions of rural people in general is indeed important. Issues of tenure security, livelihoods, and the capacity to use water for productive purposes are indeed important and need to be addressed. It might be risky to address the issue through a strict and relatively radical 'human right' approach to the problem which could probably be easily dismissed.

In addition, while the right to drinking and domestic water seems indeed straightforward, this right implies relatively minor volumes of water, the production of which does not pose problems in the vast majority of the cases. In many countries, extending a right to water to food production would simply not be feasible in view of the limited availability of water resources.

We suggest to link access to water for productive purposes with issues of livelihoods and livelihood assets and equity in access to the resources, in line with the philosophy of the voluntary guidelines of for the governance of tenure of land, forests and fisheries.

Water and poverty linkage could be better addressed in the report. Specifically, the links between investments in small scale water developments, climate resilience of local livelihoods and rural poverty reduction could be better spelled out in the report and given larger attention in the policy recommendations.

On water supply and sanitation

While the linkage between water supply and sanitation and food and nutrition security is important, the report focusses too much on this argument. The discussion on water supply and sanitation should focus mainly on the linkage with food security, the relation between domestic use of water and food security, productive use of domestic water and multiple uses systems, and implications for water supply programmes.

On gender

Gender inequality issues are mentioned throughout the paper, but not in a systematic way, making it difficult for the reader to understand why gender matters in the access, allocation and management of water resources; how gender inequality issues affect water management and productivity in the context of food and nutrition security; and how water resources should be managed in order to ensure social sustainability and gender equality. Gender is a key social dimension to answer the main

guiding question of the report: "who should get access to which water, when, for how long and for what purposes?" It is therefore recommended to address it more thoroughly and systematically. We suggest creating a separate paragraph analyzing the gender implications of water and food security in each of three chapters, in relation to: challenges, water management and water governance.

The paper tends to emphasize women's role in the collection and use of water for domestic purposes, sanitation and hygiene (WASH). Although this is crucial, we recommend better highlighting the productive role of women in the agriculture sector, and their needs in relation to water as a productive resource. This concept, in fact, is mentioned only at the very end of the report, in one of its final recommendations (page 80). Women's limited access to productive resources is a crucial factor of the underperformance of the agriculture sector in developing countries, with huge implications on water use and management, and should not be overlooked in this paper.

Any reference to the "sustainable" management of water resources should include the social dimension in addition to the environmental and economic one. Please, refer to the recent work of FAO on "Sustainable food and agriculture: Vision, principles and approaches" (see link to the document in the email).

In Paragraph 2.4.3 "Investing in irrigation" (Increasing irrigation efficiency; Modernizing irrigation systems; Reducing demand through pricing), the report states that investment in irrigation must become more strategic. This implies also considering women's differentiated needs, capacities and priorities in the sector. Technology per se is not sufficient to improve irrigation efficiency, if it is not made accessible to all the stakeholders involved in the sector. It is well documented that women have less access to technology as well as to extension and advisory services, which are key to ensure the success of the modernizing efforts. Furthermore, the report just superficially mentions the need to invest in gender-sensitive technologies, including those that specifically aim to reduce women's work burden.

In paragraph 2.6, the report states that "everywhere enabling humans and institutions to deal with changes is required". We suggest being more specific about the need to create an enabling environment for the promotion of gender equality and women's empowerment. The policy recommendations listed in this paragraph should include the support to the formulation, implementation and monitoring of gender-responsive water policies and programmes in the context of food and nutrition security.

As often mentioned by the report, access to water is determined by socio-economic dimensions, including gender. It is therefore essential to include in Chapter 3 a deeper analysis of gender inequality issues in water governance. It would be interesting to examine:

whether and how existing governance mechanisms consider women and men's different entitlements to water resources;

at what level (global, national and local) women's rights have been more successfully targeted and protected;

what has been done and what could be done to strengthen institutional capacities to protect women's rights to water and ensure their participation in decision-making processes related to water allocation and distribution. Water user associations, for example, play a major role in managing water at local level, but often women are not adequately represented or have very limited decision-making power within them. What can be their role in the current water reform processes? How can national policies and institutions support local user associations?

An analysis of the gender dimensions of the three key allocation mechanisms (page 51) and the shifts in the nature of water rights (page 53) is also recommended.

In paragraph 3.4 on "National policies and processes that affect water for food security", none of the policies presented explicitly address the gender inequality dimension of water and food security. It would be very helpful to include an example of a gender-responsive water policy. For more information on criteria to define a gender-responsive policy, please refer to the FAO E-learning course on Gender in Food and Nutrition Security, available at: www.fao.org/elearning

With reference to the Draft recommendations (Chapter 4):

Recommendation 2: Please consider also the following aspects:

Women's equal access to resources should not be limited to water and land entitlements and technologies, but to all productive assets, resources and services that will allow them to participate equally to the benefits of social and economic development.

Support inclusive and equitable governance mechanisms, which are able to represent and be accountable to local, often "invisible" users, including rural or indigenous women.

Strengthen rural women's participation and representation at all level of water governance (water users associations, ministries and other national institutions, regional platforms, etc.) to ensure that their perspective is taken into consideration in policy-making and reform processes.

These points apply also to Recommendation 7 and 10.

Recommendation 4: The "sustainable" use of groundwater should encompass not only the environmental, but also the social dimension, including gender equality. As mentioned above, please refer to FAO's vision of sustainability recently developed in the context of Strategic Objective 2.

Recommendation 6: Investment, innovation and technologies to improve agricultural water management and productivity should be gender-sensitive. Increasing water productivity should not be at the expenses of rural women and girls' time, as they are overwhelmed by water collection and water management responsibilities. On the opposite, innovation and technologies should aim at reducing women's drudgery and address the issues of time poverty.

Recommendation 8: In relation to monitoring, it is important to support the collection of sex-disaggregated data and the identification of gender-sensitive indicators, in order to monitor and evaluate the impact of water and food security policies on the well-being of the most vulnerable men and women.

Recommendation 9: Please consider also the following aspects:

Women and girls' needs and priorities should not be limited to WASH. Rural women need to be represented and targeted in their productive roles pertaining to water and food security, i.e. as farmers, managers of natural resources, agri-food value chain laborers, etc.

State and international donors should therefore invest more in institutional strengthening and gender awareness rising as well as in women's targeted interventions.

Useful resources:

Passport to mainstream gender into water programmes, developed by FAO in collaboration with Gender and Water Alliance and Gewamed in 2013

FAO Integrated Guidelines on Improving Gender Equality in Territorial Issues (IGETI) Sustainable food and agriculture: Vision, principles and approaches, FAO 2013.

SEAGA Irrigation Sector Guide, FAO 2001

UN WWAP UNESCO gender-sensitive indicators, reviewed by FAO

Governance

Water governance: this section can have a clearer focus. The initial definition seems vague, talks about what water governance includes, implies, etc. but not what the authors think it is! Subsequently, the following sections allude to series of issues that are all more or less to what one assumes is 'included' under governance: access and allocation, water rights, institutional arrangements, water re-allocation and conflicts, water reform processes, decentralization, water pricing, water policies etc. There it touches on very important and relevant issues some of which are taken up in the recommendations (e.g. the need to 'connect water, food and land governance regimes'… In the initial analytical paragraphs the important political economy dimension is not treated in-depth, but it is then taken on more pronouncedly at the beginning of Section 10.

The following definition of water governance by the FAO Governance Team might be useful to consider:

"The concept of governance embraces the formal and informal rules, organizations, and processes through which public and private actors articulate their interests; frame and prioritize issues; and make, implement, monitor, and enforce decisions. Its scope includes the special constitutive processes through which these rules, organizations and policy processes are formed, adapted, revised and dismantled. Essential governance activities include agenda-setting, prioritizing, norm-, rule- and policy-making, measurement, monitoring, enforcement and adjustment.

Governance issues arise, and governance takes place, in many different settings, both public and private, from local communities, farms and cooperatives, to business organizations and large-scale enterprises, and in a wide variety of local, regional, national and international contexts. A robust concept of governance takes a whole-of-society perspective, recognizing that improving governance involves strengthening and empowering non-state as well as state actors.

To improve the governance capacities of societies and of social actors is to enable effective and efficient collective problem-solving in ways that are regarded as legitimate by the stakeholders who are involved.

The term "governance", or "good governance", is sometimes used in ways that imply a uniform set of criteria to be applied universally as a precondition to policy success. The FAO approach is not premised on such assumptions, but seeks to incorporate in its framework sensitivity to widely shared principles that can be incorporated in different ways within and across societies to enhance legitimacy and effectiveness, and to make governance, among other things, a widely shared, mutual learning process. These key principles for enhancing effective governance include: participation, transparency, accountability, legitimacy, equality and fairness, efficiency and effectiveness, and rule of law".

Investments

The report contains Section 6 on "Fostering sustainable investments, innovation and technologies to improve agricultural water management productivity". However the main recommendations on investments are very general and refer to "upgrading rainfed agriculture". It may be useful to extend/clarify the investment-related recommendations, specifying that investments are required in both infrastructure and institutions. The importance of small scale infrastructure could be emphasized including the role of small storage options to complement irrigation investments. The need to invest in sound water managements institutions should be an important priority for national policies and investment strategies.

Adoption of better farming practices (including agroecology)

The section on improving water management and uses in agriculture and food systems calls for use of agro-ecology approaches, no or limited use of inputs sourced external to the locality of production, and heavy reliance on traditional knowledge. For example page 44 line 26 states the

following: Traditional farming techniques with fewer inputs protect water from degradation due to chemical pesticides (Altieri et al., 2012a), and agroecological methods maximise the productivity of available resources through context-specific soil, water and biodiversity management regimes informed by traditional knowledge (Altieri et al., 2012b).

From a farmer's point of view, maximizing the productivity of available resources may not be the highest priority – instead maximizing the return to the farm operation – including through the use of labor saving or yield enhancing technologies may be a higher priority. We have seen that in many cases systems that use these type of external inputs do have higher returns – but of course they also cause environmental damage.

Simply advocating that all farmers should integrate environmental costs into their production decisions without taking adequate consideration of the costs to the farmer of adopting such practices, as well as the public good values they would be generating without compensation – is essentially socially unjust – and also not likely to be very effective. Recent work on barriers to adoption of sustainable land management practices suggest there are considerable costs involved – not just at the farm level, but at the local institutional level to ensure that enabling environments are in place. Knowledge systems, input supply systems that support efficient and informed use, land and water tenure systems – there is a need for substantial investments in this area in order for broad scale farm level sustainable agriculture adoption to be feasible. We suggest that the report needs to better address the farm level returns issues and the potential public/private tradeoffs that may arise in adopting agro-ecological/sustainability approaches in order to have a more realistic appraisal of the challenges being faced here. On page 39 lines 38-47 the analysis of low adoption rates for improved rainfed crop management and the solution proposed as increased access to markets, credit, inputs – is too simplistic. Credit needs to be designed to support long term transitions, input supply to support efficient use etc.

The inconsistency of treatment of public and private goods comes up again in on Page 77 with the recommendation that the state should: Implement the polluter-pays principle as a tool to reduce pollution and to provide revenue for rehabilitation of polluted water resources. Does this recommendation make sense when the polluters are smallholder and food insecure farmers at the top of watershed that are causing erosion into downstream waterways and urban consumers? Some recognition of the potential for paying the polluter (e.g. payment for environmental services) depending on equity issues – as well as efficiency is needed here.

Improved water management and crops

We regret to note that Section 2, on improved water management, does not seem to offer much innovation with respect to what is presented as the main issues. On rainfed agriculture, the focus is on soil moisture conservation, while the main problems of rainfed agriculture probably lie in large part out of the water 'box', in overall agronomic practices, climate risk management, markets and risk sharing mechanisms like social protection and index based insurance schemes. Practices like supplementary irrigation and water harvesting are promoted but with now clear understanding of the constraints to their adoption and their overall impact at the level of the basin. On irrigated agriculture, the classical solutions that include drip kits and water pricing, strengthening of water users associations are discussed in a disconnected and largely inconclusive way, with no clear linkage with the question of food security.

Page 39 lines 30-31 has the following quote: According to Rosegrant et al. (2002), more than 80% of the cereal harvested area in developed countries remains rainfed, and is highly productive with average yields equal to irrigated cereal yields in developing 31 countries. This is difficult to believe – We suggest checking those figures and perhaps using more updated estimates.

The scope of the treatment of water use in crop production could be broadened to include considerations of plant biology and genetics. Input use efficiency is a recognized adaptive mechanism of crop production systems to stresses. In water limiting production systems, which is expected under climate change scenarios, it would be necessary to grow crops and their varieties that would produce even more yields with fewer inputs, including water. For water deficit systems therefore, hardy crop varieties that require less water – and therefore less affected by drought – would be needed in vulnerable regions and production systems. Also, crop varieties that are early maturing – and therefore can 'escape' the dry periods of the year – would also be needed in rainfed systems, especially in instances of lengthening periods of dry spells. The paper could therefore devote some space to the role of plant breeding and genetics in developing these varieties and to effective seed systems for getting the high quality seeds and planting materials of such crops and their varieties to the farmers who need them. Ample resources on this theme are available from the CGIAR, especially the International Center for Agricultural Research in the Dry Areas (ICARDA; http://www.icarda.cgiar.org/); and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT; http://www.icrisat.org/index.htm).

Food chains

Food losses and waste in the context of use of water use and applications throughout the food system needs to be highlighted. Specifically due to the level of waste and losses and the bound up investments of valuable and scarce water resources in the generation and provision of this food, this aspect needs to be highlighted in this report. CFS (2014) has provided strong endorsement for action by a variety of partners (public and private) on this issue and it would appear logical to establish a strong link between the two reports.

On p33, a few more examples on use of water in the food industry would be useful – hopefully these will emerge through the public consultations. Engagement with the private sector will be essential for obtaining up-to-date data. It may be interesting to also see the usage levels in different scales of industries and perhaps staple foods. The reference to data on water use for whiskey appears misplaced and might be removed.

Water use in energy related to food might also be a useful element to consider.

Linkage with food safety

We think it would be important to include something in the document about water quality implications to food safety. Looking at the zero draft, we thought that this could be done right upfront in the section 1.1.2 Water quality and food security and nutrition. We therefore suggest to add the following text on page 13 line 19.

Many, if not most, foodborne illnesses can be related back to poor water quality used in food production and/or postharvest processing. Water can in fact be the vehicle for both pathogens and chemical contaminants to be transferred from the environment into the food chain, thus impacting on Food Safety and Public Health. Water quality implications should be carefully considered not just from an environmental and agricultural perspective, but also taken into account to integrate Water Management, Public Health and Food Safety into joint policies and decision making. Furthermore, the growing demand for quality water accompanied by the increasing water scarcity and pollution, calls for a more systematic and at the same time safe approach to water re-use.

Fisheries and aquaculture

General observation

Overall, the scope of the topic seems primarily – but not exclusively – about fresh water and food security, but that is not the title of the report. If the report is only about fresh water, this should be explicitly mentioned in the title.

On several occasions, the report confuses capture fisheries and aquaculture/fish farming. We hopefully caught all the mixed meanings (see attached file, in track changes), but attention needs to be paid to this in future drafts. Comments not included in tracked changes:

Importance of Inland Fisheries to Food Security

Although the document is referring to fisheries several times, the first and second chapter give the impression that the authors are not appropriately appreciating the importance of inland fisheries, and therefore freshwater ecosystems, for Food Security and Nutrition for many people in the poorer segments of the poorest countries.

Freshwater ecosystems are increasingly under threat by several challenges impacting the goods and services they provide. Fisheries production is one of those impacted services, which has as a consequence a direct impact for many poor and food-insecure countries, as fish is a key source of protein and micro-nutrients for in many cases the poorest segments of society. For millions of people in low-income countries, adequate nutrition, health, and income are directly tied to ecological functioning of freshwater.

Inland/freshwater fisheries have a yearly catch of around 14 million tons, valuing around USD 9 billion, without any waste due to discards; however this estimate does not include subsistence fishers, who may harvest many millions of tons. 61 million people are employed in inland fisheries worldwide, of which 60 million in the developing world. 65% of the reported catch from inland fisheries is caught in low-income food-deficit countries. Over 200 million of Africa's 1 billion people regularly consume fish and nearly half of this comes from inland fisheries (UNEP 2010). Whereas fish consumption is increasing in most of the world, in many parts of Africa per capita consumption of inland fish is decreasing due to over-fishing and habitat degradation.

Freshwater capture fisheries will continue to be a key component for Food Security and Nutrition, particularly for poor and landless people, because small, wild-caught fish are generally more accessible, cheaper and have higher nutritional value.

Inclusion of fisheries governing water

Having made our statement above with respect to the importance of inland fisheries for Food Security and Nutrition, we would like to express our appreciation with respect to the Chapter concerning Governing Water for FSN. The chapter draws attention to often forgotten peoples (including fishers) when water rights, or water user rights are managed. The text is truly inclusive, for which the authors are congratulated.

Specific comments per chapter:

Agriculture water demand (1.3.2)

On page 19 (line 1) a statement is made which is not a correct reflection of the statement made in the article referred to. "It is widely accepted that animal food products require much larger quantities of water per unit of nutritional energy compared to foods of plant origin (Gerbens-Leenes et al, 2013)" We would like to clarify that the article referred to is dealing with poultry, pork and beef, not with fish. We propose therefore to improve the sentence to: "It is widely accepted that

poultry, pork and beef require much larger quantities of water per unit of nutritional energy compared to foods of plant origin (Gerbens-Leenes et al, 2013)"

We would also like to point out that inland capture fisheries and aquaculture are compatible with other uses of fresh water, however the water must be managed appropriately. Withdrawals for and effluents from agriculture can have adverse impacts on fisheries whereas managing water for fisheries may restrict its use for other purposes. None-the-less, inland capture fisheries do not degrade water quality and do allow for multiple uses.

Water and Energy linkages (1.3.4)

The part dealing with water and energy linkages does not cover the potential disruptive effect(s) dams can have on biodiversity in the catchment area where they are placed, as they might be blocking essential migration routes of fish to their spawning grounds and vice versa. This might result in the significant depletion of concerned stocks, with its obvious effects on fish production downstream. Through dams, water flows might become regulated, reducing inundation periods and intensity, reducing the associated fisheries production. These effects need to be considered and mitigated when investigating and operating dams for irrigation and hydropower.

Rainfed agriculture systems (2.1.1)

On page 29 line 28, we would like to see fish added to livestock so that the sentence would read: "Livestock and aquaculture are an important part of multi-functional agriculture, providing milk, meat, eggs, fish, cash income, farm power and manure that can"….. Especially in Asia aquaculture is an integral part of households systems, being an efficient addition to rural livelihoods.

Diversifying with fisheries and aquaculture (2.4.5)

We agree with the statement made that findings of the HLPE report on sustainable fisheries and aquaculture should not be repeated in the present report, and that it would be inappropriate not to note the importance of fisheries and aquaculture in the context of food security and nutrition. However, from line 16 onwards there seems to be a misconception or misunderstanding by the authors on the differences between aquaculture and inland fisheries. The authors mention fish and aquaculture, but do not mention capture fisheries or are mixing the two concepts; aquaculture is the farming of fish, inland fisheries is the hunting or trapping of fish. It is therefore incorrect to state that "fisheries are mostly run by small farmers with wide participation at all levels and scales including farming, processing and marketing". The sentence should read: Aquaculture operations are frequently run by small farmers with…

It would be good to expand the sentence (starting at line 20) that inland fisheries often being critical to local food security etc. lack of understanding of this importance by people outside the sector is what often causes non-inclusion or non-consideration of fisheries in basin water management, investment plans, etc

Line 22, here there is again the omission of fisheries and fish and aquaculture is mentioned. The sentence should read: "When considering the issue of water for food security and nutrition it is critical that the role of fisheries and aquaculture in meeting the nutritional needs of poor rural communities in many areas, but also of the world at large, are considered in water policy and practice."

Starting at line 24: The sentence should read: Several species of fish are seriously overexploited. Causes for this include environmental pressures such as low water quality and habitat destruction.

Line 26: As competition for water resources increases fish and fisheries and aquaculture suffer most as the priorities for water allocation are usually focused on other sectors

Line 31: This will require building partnerships between fishers, aquaculturists and other interest groups concerned with more efficient ways to increase the overall benefits of water productivity to food security and poverty reduction as well as achieve higher level of integration in agricultural systems.

2.5.1 Water footprint

It is disappointing to see that fish from inland capture fisheries is not mentioned in this chapter, as this is one of the products with the lowest water footprint. Clearly authors use the concept for comparison of land-based products, but it would be good to include capture fisheries in this, so that the benefits/importance of the sector is truly appreciated.

2.6 Policy implications

Page 48, Line 38: we assume that the term agriculture includes capture fisheries and aquaculture

3.1 Multiple ways to allocate and access water

Page 52, line 13: We would like to propose the change the term cultivators into users, and add fishers, so that the sentence would read: "It is also important to note that many small-holder users, most women, fishers and pastoralists have use rights in customary arrangements that are largely invisible to policy makers and these play a critical role in ensuring their food and livelihood security"

3.3.2 Hydropower

We appreciate the chapter on hydropower, and the reflection of the discussions around the issue. The example given on the Mekong river is very important. Box 19 is appreciated.

Page 68, Box 21. We would like to suggest to include in the Box two Voluntary guidelines:

Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security http://www.fao.org/docrep/016/i2801e/i2801e.pdf , and

Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (FAO. 2014)

3.6.3 Unresolved matters

Page 72, line 1: We appreciate the reports mentioning of expanding the scope to address the importance of adequate water for ecosystem sustenance and subsistence agriculture

Recommendations on fisheries

We would like to see a recommendation drawing (States) attention to the Specific importance of the inland fisheries sector (providing animal protein and micronutrients with limited alternatives) to food security and nutrition for often poorest segments of society. Before taking water management actions with potential impacts on inland fishery production and biodiversity, States should include the inland fisheries sector in their impact assessments. (fishers are mentioned in some recommendations, but without a link to the importance of the production of the sector to nutritional status of people. When fishers are mentioned it is more in the context of their rights)

Page 75, line 34: we would like to see fishers added to the text: "Water and land tenure and use right systems are seldom coordinated, which can lead to sub-optimal outcomes on the ground, especially for small or marginalised farmers, fishers, and other food producers"

Forests

Since the document is at an early stage of development we offer a generic feedback rather than detailed comments to the different sections of the text:

The draft focuses almost exclusively on “one side of the coin” - water productivity, water use, water governance, etc. Except for the short section on agro-ecology (2.4.4.) the draft hardly makes any reference to the sustainable management and conservation of the source / supply areas of water, e.g. mountains and watersheds. The document should make reference to the fact that 60-80% of the world’s freshwater resources for domestic, agricultural, industrial and ecological needs (in both upstream and downstream areas) originate in upland and mountain areas and that, accordingly, particular attention should be paid to the sustainable management, development and conservation of these areas.

The draft takes a rather sectorial and narrow approach to the theme. The need to apply a landscape approach in the sustainable management of the water resources and to integrate the different landuse systems available within a landscape is almost completely missing. In this context, watershed management could be exemplified as a very appropriate approach: the landscape approach, which is followed by watershed management, is based on land suitability analysis and a multi-stakeholder planning process and accordingly allows for a maximum efficiency in the use of natural resources. In addition, watershed management creates local resilience against climate change as well as adaptation options.

The crucial role of forests and trees in the hydrological cycle and in ensuring food security is almost completely missing in the draft. The text should make reference to the fact that forests influence the amount of water available and regulate surface and groundwater flows while maintaining high water quality. Moreover, forests and trees contribute to the reduction of water-related risks such as landslides, local floods and droughts and help prevent desertification and salinization.

Please be informed that inputs on Forestry were provided in February via the FSN Forum. You will see that this submission in February already raised the same concerns as listed above which means that FO’s submission was somehow not considered in the formulation of the 0-draft. FO would like to ensure that this time our contribution does not go unheard. We are available for any further input which might be required in this matter.

We hope these comments are useful at this stage. We assume the proposed additions could most logically be reflected and incorporated in chapter 2 of the draft.

Mountains (note: these comments were also published separately)

One aspect which is not adequately reflected in the study outline is the need to protect the world’s freshwater resources for which it is proposed to include a separate chapter at the beginning, before dealing with water use, governance and management aspects. Protection of increasingly scarce surface and ground water resources will be of vital importance if we are to cope with growing demands of a rising world population and new challenges stemming from climate change.

With a substantial increase in the demand for food and energy, mobilization of water resources for agriculture and food production will be critically important but there is a need to balance short-term productivity gains in agriculture with the long-term role that water flows provide for maintaining sustainable ecosystem services in landscapes and serving multiple benefits to human well-being. The quantity, timing and quality of water flows in landscapes must be sustained to meet the increasingly competing demands and to balance between a wide range of water uses and users.

Ecosystems such as mountains, forests and wetlands provide crucial water-related services, and the conservation and protection of these ecosystems is of global importance.

A high proportion of the fresh water required for domestic, agricultural, industrial and ecological purposes comes from forested areas in mountain areas. Mountains, covering 27% of the Earth’s land area, provide on average 60-80% of the word’s freshwater resources while this rate can rise up to 95 % in semi-arid and arid regions. In order to conserve and protect the increasingly scarce surface

water resources, both in terms of quantity and quality, increased attention is required for the wise and integrated management of mountain areas.

Wetlands can store excess water during the wet season and release it slowly as water levels fall in the dry season. High altitude wetlands such as glacial lakes, marshes, wet grasslands and peat lands support unique ecosystems and services that sustain the livelihoods of people. They store large quantities of water from rain and glacial melt, feed aquifers, trap sediments and recycle nutrients, enhancing both the quantity and quality of water supplied throughout the year. In arid zones wetlands are vital sources of water in otherwise uninhabitable landscapes. As sources of water, food and fibre, they are critically important life-support systems for the survival of people. They help provide regular water supplies and fertile soils, improve water quality, recharge underground aquifers and lessen the impact of seasonal floods. Inland marshes and vernal pools store water in areas where there are no permanent rivers or streams.

Forests and forested watersheds are particularly important for the provision of freshwater resources. The role of trees and forests in the hydrological cycle by maintaining high water quality, influencing the amount of water available and regulating stream flow and groundwater recharge is more and more being recognized, ultimately contributing to food security and sustainable development.

More attention should be given to forest protection and forest management for the provision of clean water, and one way to achieve this is by increasing areas under forest cover specifically for the protection of soil and water. According to FRA 2010, only eight percent of the world's forests have soil and water conservation as their primary objective.

Watershed management can be a suitable approach to combine natural resources management, agricultural production and livelihoods improvement for the sustainable development of rural landscapes. Watershed management contributes to the regulation of surface water flows, the reduction of sediment load in river systems and the maintenance of water quality, all indispensable characteristics of surface water systems for successful and sustainable food production.

The International Year of Family Farming 2014 presents an opportunity to focus attention on the merits and challenges of family farming including in mountain areas. The study could therefore make specific reference to the most vulnerable and food insecure small-scale producers who may depend on access to water for their survival and who could benefit tremendously from targeted investments in small-scale water harvesting and water storage as well as low-cost micro-irrigation systems. Fostering local level solutions including the safeguarding of indigenous knowledge and local agro-biodiversity may contribute significantly to a more rational water use and improved agricultural water productivity.

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FAO (2006) The new generation of watershed management programmes and projects. FAO Forestry Paper No. 150. Rome

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www.wetlands.org

Regional perspectives

FAO's decentralized structure offers the opportunity to appreciate a given issue from different perspectives, in line with the local priorities. This section presents the comments received from several decentralized offices. Some of these comments have also been used in the drafting of the general comments.

From Europe and Central Asia

As far as the regional perspective is concerned, pressure on available water resources varies considerably in the region. The northern parts of Europe and Central Asia are generally well-endowed with freshwater resources. The Russian Federation has abundant resources of water, at 31.534 m3 per capita per year. But the picture can vary widely from country to country as availability diminishes significantly in the southern parts of the continent. For instance, water availability moderately decreased in almost all of the EU countries between 1990 and 2010 – mostly as a result of population pressure and economic development. Moreover, the heaviest relative water users in Central Asia, Turkmenistan and Uzbekistan, are each withdrawing over 100 percent of their renewable freshwater resources annually.

Specific comments on scoping topic: 10. Water governance

The report may consider incorporating an example of nexus approach application, conducted in South-Eastern Europe. Specifically, FAO has joined the task force established by UNECE to conduct a series of trans-boundary Water-Energy-Food-Ecosystem Nexus assessments, including in the Sava river basin.

In the context of trans-boundary basins, water provides a useful point of entry to a nexus analysis. Water resources are used by almost all economic sectors and the society for different purposes and by different users. As such, the nexus approach can be seen as a subsequent (or even parallel) step to Integrated Water Resource Management (IWRM). In regards to water-food-energy interrelations the nexus approach is currently being applied for Sava river basin and aims to enhance water, energy and food security by increasing efficiency, reducing trade-offs, building synergies and improving governance across sectors.

The nexus assessment workshop on the basin was organized jointly with the Sava river basin Commission (ISRBC) from 4 to 6 March 2014 in Zagreb. The findings highlighted the growing need for irrigation as well as for investments in the energy sector. At the same time, extreme weather events pose risks and might damage infrastructure. More investments should be made in new land reclamation strategies. The assessment made clear the inter-linkages and trade-offs between different development strategies in the basin. For example, it might difficult to reconcile plans for increased irrigation for agriculture with the energy production capacity of planned and existing hydropower plants in the basin. Furthermore, these plans need to be in accordance with current work on the rehabilitation and modernization of the Sava river waterway, which has important economic implications for the riparian countries.

In the Sava Basin, the assessment exercise is contributing to further integration of water policy with other policies and further dialogue with the key sectoral stakeholders, as specific objectives in river basin management defined in the Strategy on Implementation of the Framework Agreement on the Sava River Basin.

The selected linkages will be investigated in more detail to identify integrated approaches that will take advantage of synergies and cooperation

From Africa

Comparative water performance (productivity and resilience) for food security and nutrition of different farming systems, and food systems, in different contexts

In sub-Saharan Africa access to food is still a challenge; while many countries' economies are growing, the poverty rates remain high and rural infrastructure limited. In vulnerable, arid and semi arid areas of Africa where food security is linked to rainfall and the seasonal production of food - meaning that households can experience hunger between 5 to 8 months a year - innovative water and soil moisture conservation practices have contributed to improved food production. These practices are often linked to techniques that enhance soil fertility and curb down natural resources degradation. As a result of these practices, yields have increased, leading to improved food security and reducing vulnerability. In general, the investments required to achieve such an impact are minimal and require the active involvement of targeted beneficiaries in adopting these practices, which are sometimes part of their indigenous inheritance.

Water for food and nutrition security in urban and peri-urban contexts

In Africa, several initiatives have demonstrated the potential of urban and peri urban horticulture to improve food and nutrition security, through direct food production or income generation. The role of water has been central to this success. Yet, in several instances, the source of water is unsafe waste water produced by households without (adequate) hygiene and sanitation infrastructure. While this source of water is abundant and rich in organic matters, thus enabling high yields, it is at same time contaminated with bacteria and sometimes heavy metals which make the food produced unsafe for consumption.

It is imperative to plan for bold actions that will deal with the food supply chain, hygiene and sanitation challenges of fast growing cities, so as to reduce and eliminate the threat of use unsafe waste water to nutritious and healthy foods.

From Asia and the Pacific

The focus on issues of equity resulting in recommendations on governance to explicitly ensure representation of the most vulnerable and of their interests is very welcome. However the recommendations themselves unfortunately are questionable and very debatable and seem to result from biases or gaps in analysis made very explicitly at the very beginning of the report, which carry all the way into the conclusions.

In short, from the very beginning, the report tries to establish a direct link or correspondence between access to food and access to water as a basis for food and nutrition security and affirms that small scale farming or small scale production are subsistence agriculture. As a result, while in Graph 1 we do have an arrow from economic development to access in the food security box, for food producers and rural populations, the only path on access to food seems to be by own production.

The problem with this is that, in our region, subsistence agriculture is residual compared with commercial agriculture, and the combination of both types of purely agricultural livelihoods is already less than livelihoods based on pluri-activity, while rural livelihoods based on labour and migration are increasing. Some of this is due to dispossession of land or water or indebtedness, but a big part of it is also due to positive choices of moving towards much better economic and social opportunities, particularly for those who are educated.

Unfortunately, in this report, data on rural and agricultural livelihoods are missing. Likewise, a serious analysis and data on the changing shape of agriculture are also missing. Instead, we have plenty of data on water supply and sanitation. In fact, we do not have even a cursory analysis or mapping of where and who the food insecure are.

The analysis on links between poverty and food and nutrition security, and with water, is equally missing. In the region, we have done this analysis of rapidly changing rural livelihoods under our IFAD project. This is because, in our estimate, understanding the dynamics of rapidly changing rural economies and livelihoods is essential to assessing water options for rural livelihoods. The publication is available and would provide good reading for the HLPE. (http://www.fao.org/3/a-i3705e.pdf). Evidently, the HLPE should have done the same.

Unfortunately, sections in Chapter 2 dealing with irrigation and agriculture do not have an adequate framework for discussing the social or economic adoptability of the various technical pathways to improving productivity. For instance, while agroecology is promoted, as it rightly should, none of the impacts/benefits mentioned are directly related to incomes or substantial increases in incomes. What we would like to know in practice is what type or characteristics of agroecology can be adopted to reduce the very significant rural/urban social and economic inequities, or would be sufficiently attractive for farmers to adopt.

While the report bemoans at the beginning the absence of proper definitions, unfortunately, the whole report and technical sections are riddled with inconsistent or poorly defined concepts. While water productivity is defined (but insufficiently, what is the water consumed?), what does water efficiency mean? The use of consumption or consumed is not consistent? What does water-use efficient mean? What does agricultural water management productivity mean?

Likewise, there is an inconsistent use of water accounting. The discussion on irrigation efficiency is welcome (although the sometimes very good reasons to improve it are not mentioned). Reducing runoff by water harvesting to reduce inflows to salt sinks is fine but what about the ecosystems on the way to those sinks and in those sinks (say marshlands, estuaries, etc.). The report certainly rightly emphasizes improvements to rainfed agriculture, supplementary agriculture, etc. quoting Rockstrom among others. Yet, when water re-allocation is discussed, articles and papers from Rockstrom and Falkenmark that explicitly describe the focus on rainfed agriculture and blue water as water re-allocation is not mentioned. Literature on decreasing flow rates downstream as a result is not cited. In practice, improved consumption upstream implies a re-allocation of water from downstream to upstream. This may be very good for equity and overall water productivity but this has to be addressed nevertheless.

Groundwater resources are misunderstood. They are only considered as stocks replenished by recharge. But groundwater resources are also flows. Stabilizing abstraction to equate recharge does not mean that downstream impacts can be forgotten in the discussion of sustainability.

Likewise, water re-allocation towards carbon sequestration (forestry) is not mentioned.

The impact on marginal groups of re-allocation towards ecosystem services seems to be readily accepted. Why?

Commercial agriculture seems to be only by large farmers and foreign investors. The discussion of big commercial (the bad guys) against small subsistence (the good guys) falls rather flat when one considers that the great majority of small-scale producers are commercial producers. For them, is water a social good or an economic good?

The report repeats statements that are frequently made. This does not make them true. for instance, farmers have no incentives to save water or invest in technology if they do not feel the scarcity value through prices. This has been debunked by literature a long time ago and it is not clear why these statements persist. Farmers experience directly the scarcity of water .They invest in so-called water saving technology for profit, for growing cash crops or for saving labor or inputs or energy.

Fisheries are certainly very important and aquaculture is very productive. Rice-fish and similar options are certainly to be promoted. However, aquaculture consumes much more water per ha

than crops, often benefits outsider investors while creating jobs for a labor force which is also imported while farmers lose their water. This creates serious conflicts. This also needs to be addressed and not all pro-fisheries arguments by fisheries specialists should be taken for granted.

Water pricing is clearly favoured be the authors of the report. The benefits of water pricing (confused with cost recovery) are supposed to be the object of a consensus. They are not. In fact, critical literature (Perry, others) is cited. The report advocates democratic water governance but invokes political difficulties in getting water pricing introduced. In practice, water pricing is not favoured by voting citizens.

Virtual water is not reviewed critically. In fact, authors such as Wichelns who have criticized this concept are quoted, in the following paragraphs, but on other topics.

The focus on economic water productivity is criticized as reflecting vested interests, a the national or international levels. There is obviously much truth to this. Nevertheless, the report mentions that an effect of drought is failure of governments to improve the purchasing power to affected populations to purchase food. We would thus expect some recommendation to focus on economic water productivity as quite critical to counter water scarcity and drought risk management. But the reasoning is not pursued. Why not re-allocate water away from agriculture instead of just promoting it within agriculture from staples towards cash crops? Because of the new nature of rural economies and livelihoods, in any case, a serious discussion is warranted, not just "us vs them". How can states bet on trading and not be interested in developing the economy so that states can actually procure food from markets?

As mentioned before, the discussion on water and food security is flawed from the onset. The report jumps too fast, and contrary to facts, from discussing "water" and "food and nutrition security" to "water and food" security. Sometimes, the report mentions water and food security and nutrition. The discussion on the right to water is being extended to right for productive activities. But the report in these sections only addresses food production for own consumption. Unfortunately, the discussion on legal aspects is not very rigorous. Many extrapolations and convergences appear to be forced, or the result of a play on words.

The report advocates prioritizing access of agriculture to water everywhere and at all scales. It mentions that this implies conflicts with a serious of other rights. It suggests that it might be interesting to discuss whether there is sufficient water for all this. It proposes that there should be some research involving legal and human rights experts. Curiously, the need to include water resources specialists or economists is not felt to be needed.

The report mentions Sen and capabilities. Curiously, the report does not quote Sen on education. Education is only mentioned in the context of gender and water supply. The report therefore fails to mention investment in education as a key to improving access to food, including by being able to access employment opportunities, outside of agriculture. Authors such as Molle explicitly conclude that Governments should invest on education preferably to irrigation in closing river basins. This is due to limiting water and food security to subsistence and lack of strategic an integrated thinking in this report, which the report nevertheless advocates, but limiting it to water, land, food and energy. It is really curious that the report only focuses on production for subsistence options. Our region, and our rural populations, are increasingly making different choices. Obviously they must be wrong, according to the report.

The report seems to mention that modern water rights and interventions are at the origin of gender inequity. Cultural norms do not seem to have many biases. Some cultural biases seem to acceptable in general, and some seem to be more acceptable than others to the authors of the report. For instance, caste is mentioned in traditional water governance, but is excluded from the topics that

FAO is asked to investigate. Yet, this is abundant literature on how the caste system perpetuates inequity or subverts intended equity in the warabundi system in India.

The report has a number of internal contradictions, too numerous to mention in these comments. For instance, the introduction says that the potential for dams is now marginal. Then is goes on quoting pro-dam literature, then ends up stating that the hydraulic mission in Africa has barely started.

It is an oversimplification to opposed juts developed and developing countries. The report should differentiate its discussions between low-income food deficit, countries, transition economies at different stages of economic development, and developed economies.

The report fails to address head-on the issue of food prices. Cheap food seems to be always good in all cases. But is it not a reason for economic disparities? In addition, why would countries with abundant water supplies invest in irrigation for food production? Transition economies in Asia that export rice are seriously discussing whether they should continue to focus on exports, considering their other water needs and the fiscal costs of supporting the incomes or rice prices for small-scale farmers who are poor almost by definition. Likewise, the report does not discuss social safety net options. Is it because it was discussed by another HLPE? As a result, the report inevitably falls back on water access issues at the exclusion of all others.

In conclusion, the report focuses on important questions of inequity, but arrives at strong and apparently simple conclusions simply by throwing reality out of the window. This does not mean that a number of recommendations related to equity should be thrown at the window however. This means that the discussion is more complex that we are led to believe. Technical recommendations would gain from a stable framework of definitions and water accounting. Some basics of water accounting should also be used to have a preliminary discussion for the feasibility of proposed water rights and their implications following. Just promoting those rights and reserving the discussion on their implications or feasibility later is not very serious. This is also because feasibility objections very easily come to mind, that have to be addressed even preemptively in the report; otherwise these recommendations will be very easily dismissed.

120. French High Council for Food, Agriculture, and Rural Areas (CGAAER)

[*English translation of the comment available here, Ed.*]

Introduction et résumé du commentaire du CGAAER

Le HLPE.a lancé une consultation électronique sur le « Draft zéro » de son futur rapport « *Eau et sécurité alimentaire* ».

La France, en tant qu'initiateur du « G20 agricole » et de co-organisateur du 6ème Forum mondial de l'eau (Marseille, 2012) et de la prochaine « COP 21 » sur le climat (Paris, décembre 2015), a consacré et développe un effort important à la réflexion sur la problématique de l'eau et de la sécurité alimentaire dans le contexte du changement climatique. Elle a notamment :
mis en place un groupe de travail multi-acteurs « eau et sécurité alimentaire » (*ministères, agences de développement, ONG, organisations agricoles, scientifiques)* dans le cadre du

Partenariat Français pour l'Eau (PFE) ; groupe présidé par le CGAAER (Conseil général de l'alimentation, de l'agriculture et des espaces ruraux)
documenté *40 exemples de solutions* dans une quinzaine de pays et produit le rapport « *L'eau et la sécurité alimentaire : défis et solutions, contribution au débat international* », préfacé par la FAO *(CGAAER 2012).*
pris l'initiative, conjointement avec le Conseil Général du Développement Agricole du Maroc (CGDA), d'initier une plate-forme de réflexion stratégique régionale sur l'eau et la sécurité alimentaire en Méditerranée (*séminaires SESAME de 2013 et 2014*)
produit un rapport sur « les contribution possibles de l'agriculture et de la forêt à la lutte contre le changement climatique » (*CGAAER, Octobre, 2014*).

Le CGAAER a, par suite, lu avec la plus grande attention le « **Water and Food Security V0 Draft** » soumis à consultation par le High Level Panel Expert (HLPE) du Comité de la sécurité alimentaire mondiale, a mobilisé la contribution de plusieurs membres du groupe « sécurité alimentaire » du PFE et produit la présente note de commentaires.

Il tient à souligner d'abord la grande qualité du « V0 Draft » et à en féliciter les auteurs. Les points forts du document sont notamment à ses yeux les suivants :
L'analyse développée pp 9-10 et 69-74 et qui conduit à recommander d'étendre le droit universel d'accès à l'eau potable / assainissement pour prendre également en compte les usages liés à l'accomplissement du droit à l'alimentation. Ce point d'importance stratégique soulève cependant plusieurs questions.
L'excellente analyse critique faite sur la « *rareté* » de l'eau. La pénurie d'eau ne se mesure pas en effet seulement en termes de volumes théoriquement accessibles par habitant, mais très souvent et d'abord en termes d'accessibilité à la ressource en eau, une accessibilité conditionnée, pour une grande part, par l'environnement social, politique et culturel.
Les développements proposés sur la « *productivité de l'eau et de la terre* » et les accents portés sur l'« *agro-écologie* » même si la définition proposée pour celle-ci nous paraît restrictive.
Les analyses critiques portées sur les notions d' « *efficience* », d' « *empreinte eau* », d' « *eau virtuelle* », et sur les traductions qui ont pu être faites, à tort, du concept de « *gestion intégrée des ressources en eau* » (GIRE/IWRM) qui sont également pertinentes et salutaires ; même si l'analyse sur la notion d'efficience mérite sans doute d'être nuancée.
L'accent porté sur le caractère insoutenable de la surexploitation des nappes et des ressources non renouvelables ; sur la nécessité incontournable, pour la production agricole, d'une disponibilité suffisante d'eau et sur le besoin d'investir dans l'hydro-agricole, même en culture pluviale,
La mise en évidence du défaut de cohérence des politiques publiques, notamment au niveau gouvernemental.

Le rapport pourrait cependant être encore amélioré significativement car, au regard de la commande initiale, telle que formulée par le Comité de la Sécurité Alimentaire, à savoir :
un rapport sur « *l'eau et la sécurité alimentaire* », centré d'abord sur « *la question de l'eau en tant que*
« ressource des productions agricole et agro-alimentaire » ainsi que sur la question de la « *durabilité des systèmes productifs* ». des recommandations portant sur le comment « *améliorer les politiques de l'eau et de la sécurité alimentaire ainsi que les coordinations entre secteurs et acteurs à tous les niveaux et dans une perspective de long terme* » ?,
et qui nous paraît pleinement justifiée, le Draft zéro, à notre avis :
propose une vision **insuffisamment dynamique et proactive** de la problématique nécessite des **améliorations sur 5 points importants**.

Il s'agit d'éviter que le rapport, qui s'est élargi aux questions nutritionnelles et d'accès à l'eau potable et à l'assainissement, soit trop en décalage avec la commande du CSA, et que ses recommandations permettent bien d'inviter au nécessaire changement en matière de : i) gestion de l'eau en tant que ressource de la production, ii) passage à des systèmes de production durables et iii) amélioration des politiques ; la priorité devant être d'**assurer l'accès de tous à l'alimentation, la stabilité et la disponibilité, dans une perspective de long terme.**

Ces 5 points sont
les suivants :

1. **La nécessité de mieux prendre en compte les enseignements du dernier rapport du GIEC** :
   - la montée constatée et annoncée des problèmes,
   - le rôle de l'eau agricole pour la réussite de l'atténuation et de l'adaptation,
   - l'importance stratégique nouvelle du stockage et de l'irrigation,
   - l'évolution de la demande en eau agricole.

2. **Le besoin d'une vision sans exclusive**, **mobilisatrice de tous les acteurs pour produire plus, mieux et plus équitablement ; les questions posées par le concept de droit à l'eau agricole**

3. **L'importance relative des « eaux vertes »** et des problèmes d'érosion hydrique, d'envasement des retenues des barrages **et de pertes et gaspillages de terres agricoles équipées pour l'irrigation** ; la nécessité de préciser les données utilisées

4. **La nécessité d'affirmer plus fortement les différences de situation entre les régions riches et pauvres en ressources, la montée des interdépendances (commerce, environnement, migrations) et des risques** et les conséquences différenciées en matière de gestion de l'eau

5. **Le lien nécessaire entre politiques de l'eau et de l'alimentation, la nécessité de visions et stratégies « eau et agriculture », de la recherche de solutions concertées aux niveaux des territoires pertinents**, et **d'un changement de paradigme**

1. Mieux prendre en compte les enseignements du dernier rapport du GIEC

La question de la relation entre eau et sécurité alimentaire, dans une perspective de long terme, demande à être regardée, en dynamique, dans son inter-relation avec celle du **changement climatique**.

Si le draft zéro y fait mention, il ne tire pas à notre avis suffisamment parti des enseignements du dernier rapport du GIEC, si bien que l'importance stratégique de la problématique et la nécessité de nouvelles visions et politiques de l'eau et de la sécurité alimentaire n'apparaissent pas assez.

1.1 La montée annoncée des problèmes

Le rapport 2014 du GIEC montre que les 6 grands risques futurs identifiés pour l'humanité (avec une
« confiance élevée ») sont les suivants :

« *la mise en péril des moyens d'existence dans les zones côtières basses,*
la mise en péril des moyens d'existence des urbains suite à des phénomènes d'inondations dans les zones intérieures,
la mise en péril des moyens d'existence du fait des ruptures des systèmes alimentaires résultant des sécheresses et de la variabilité des pluies,
des pertes de moyens d'existence et de revenus ruraux suite à un accès insuffisant à l'eau d'irrigation et à la baisse de productivité agricole, voire, dans certains cas, à la perte d'accès à l'eau potable,
les conséquences pour les communautés de pêcheurs de la perte de services écosystémiques, les risques systémiques des évènements climatiques extrêmes ».

L'analyse du GIEC sur l'agriculture et sur la sécurité alimentaire alerte notamment sur :
les problèmes d'eau : quantité (répartition), qualité, évènements extrêmes,
le risque d'une variabilité accrue et d'un recul grave des rendements en cas de défaut d'adaptation. Une augmentation de température de seulement 1°C peut induire une baisse de rendement de 1% par décade alors que le besoin d'une planète qui va gagner 1 milliard d'habitants en 15 ans, 2 milliards d'ici 2050, est de + 14%/décade.
Le risque de forte montée des prix alimentaires mondiaux, aux dépens des ménages et pays vulnérables. Des modèles montrent que le seul effet « eau et T° » (effet CO_2 non compris) pourrait amener à une hausse des prix jusqu'à + 80% d'ici 2030.
Le fait que tous les aspects de la sécurité alimentaire (quantité, accès, stabilité, nutrition) sont concernés.

Le GIEC conclut qu'on peut malheureusement s'attendre à :
« *des impacts tout au long du siècle en termes de sécurité alimentaire, de pauvreté, et de croissance économique,*
la multiplication de « trappes à pauvreté » dans les zones vulnérables,
une montée des prix mondiaux qui affectera de plein fouet les ménages pauvres, des migrations subies, des conflits, et des risques pour l'intégrité de certains Etats ».

Le GIEC montre donc de façon très claire que **la question croisée de l'eau et de la sécurité alimentaire est centrale/vitale pour notre avenir commun**. Le rapport du HLPE devrait s'en faire davantage l'écho.

1.2 Le rôle de l'eau agricole pour la réussite de l'atténuation et de l'adaptation

La sécurité alimentaire au niveau local, régional et mondial ne pourra pas être atteinte sans réussite à la fois de l'adaptation au changement climatique et de l'atténuation (réduction de émissions de GES).

Dans ce double défi, le « secteur des terres » (agriculture, forêt et sols) est en première ligne car le rapport du GIEC a montré que :

- l'agriculture et la forêt sont particulièrement menacées par le changement climatique,
- le secteur des terres, y compris par la production de bioénergies et la réduction des pertes et gaspillages, peut contribuer à hauteur de 20 à 60% du potentiel d'atténuation d'ici 2030.

Il s'agit donc à la fois de réussir l'adaptation, de réduire les pertes et gaspillages et de produire beaucoup plus et mieux, pas seulement pour satisfaire les besoins alimentaires croissants mais aussi pour stocker davantage de carbone dans les sols et pour substituer autant que possible des produits bio-sourcés à des produits « miniers » très émissifs (pétrole, acier,…) parfois en voie rapide d'épuisement.

L'adaptation au changement climatique et l'intensification durable de l'agriculture sont donc des clefs de notre sécurité alimentaire future, y compris par leur capacité à éviter une trop forte déforestation qui, si elle avait lieu, aurait pour effet une forte croissance des émissions de GES.

Or, la bonne gestion des eaux agricoles (vertes et bleues) est une condition majeure de cette double réussite
(*CGAAER, 2014*).
En effet :

- il n'y a pas de production agricole sans eau (en pluvial comme en irrigué),
- l'agriculture, pour pouvoir jouer son rôle d'atténuation, doit pouvoir s'adapter,
- les agriculteurs sont naturellement rétifs aux risques, mais le nécessaire changement de pratiques et de systèmes suppose une prise de risques
- la bonne gestion de l'eau permet de réduire les risques : elle est une condition majeure de la réussite de l'adaptation en agriculture, de la résilience des systèmes, donc aussi de la réussite de la transition vers une agriculture « climato-intelligente » et de l'atténuation.

On notera qu'une des actions de premier rang au niveau mondial pour la réussite de l'atténuation dans le « secteur des terres » est la restauration des terres pastorales ou des sols cultivées dégradés, ce qui passe notamment par la réussite de la transition agro-écologique ; par une évolution vers des agricultures et par un pastoralisme assurant la bonne conservation des eaux et des sols et améliorant la productivité de l'eau, et donc aussi par de nouvelles formes de gouvernance collective.

1.3 L'importance stratégique nouvelle du stockage de l'eau et de l'irrigation

Le changement climatique et la nécessité de réussir l'adaptation et l'atténuation et de satisfaire les besoins alimentaires imposent d'affirmer clairement la nouvelle importance stratégique du stockage et de l'irrigation.

En effet :

- Le rapport 2014 du GIEC chiffre à **225 milliards de $ des E.U. les investissements nécessaires d'ici 2030 pour la construction de nouvelles réserves en eau et la satisfaction de nouveaux besoins d'irrigation**[1]. Le rapport devrait y faire référence.
- Dans un contexte climatique et hydrologique qui devient de plus en plus erratique, et face à la réduction déjà constatée et annoncée des manteaux neigeux dans de nombreux massifs de montagne (et donc du stockage naturel de l'eau), la politique de stockage de l'eau est appelée à reprendre de l'importance. Le stockage a vocation à être reconnu comme un **outil de gestion des risques**, un outil clef pour le maintien de la **stabilité**, une des 4 dimensions fondamentales de la sécurité alimentaire.
- Le changement climatique va modifier la **géographie agricole**. Des zones qui jusqu'alors n'avaient pas besoin de recourir à l'irrigation devront, par obligation, y faire appel demain. C'est

le cas par exemple en Europe, continent dont une partie importante est en voie rapide de « méditerranéisation ».

- Le changement climatique, par ses impacts sur l'agriculture, l'eau et la sécurité alimentaire, peut mettre en péril l'avenir même du **continent africain**. Le très faible taux d'irrigation observé en Afrique sub-
saharienne, qui, comme le rappelle le rapport (p 59), ne résulte pas d'un manque de ressources hydriques,

[1] "Calculating the global cost of adaptation in the water sector is a difficult task and results are highly uncertain. Globally, to maintain water services at non-climate change levels to the year 2030 in more than 200 countries, total adaptation costs for additional infrastructure were estimated as US$531 billion, with US$451 billion (85%) required in
developing countries, mainly in Asia and Africa (Kirshen, 2007). Including two further costs, for reservoir construction since the best locations have already been taken, and for unmet irrigation demands, total water-sector adaptation costs were estimated as US$225 billion, or US$11 billion per year (UNFCCC, 2007; GIEC 2014 Rapport 2, Chapter 3.6.3).est une cause majeure de vulnérabilité au changement climatique, et donc d'insécurité alimentaire. Le renforcement du stockage et de l'irrigation est donc un impératif même si l'intensification durable de l'agriculture pluviale, notamment par la réussite de la transition agro-écologique, est une priorité première. Ces 2 progrès nécessaires sont à notre avis inter-reliés car le progrès de l'irrigation, parce qu'il permet de produire beaucoup d'emplois et de nourriture, peut permettre de réduire les pressions sur les terres pluviales et donc de faciliter la transition agro-écologique.

- Plusieurs chapitres régionaux du rapport 2014 du GIEC soulignent la nécessité d'une politique beaucoup plus dynamique de mobilisation et de stockage de la ressource en eau. Ainsi, par exemple, le rapport sur
l'**Europe** considère que la question de l'eau pour l'agriculture constitue, avec la question des inondations et
des canicules, l'un des 3 risques importants à prendre en compte dans les stratégies d'adaptation. Le rapport alerte à la fois sur : i) la réduction de l'aptitude de l'agriculture européenne à la production en pluvial, et
donc la forte croissance de la demande en irrigation, ii) la forte baisse de la teneur en eau des sols avec des
baisses de recharge en eau des aquifères et de niveau des nappes et donc la forte croissance des besoins en eau des plantes en pluvial comme en irrigué[2] et iii) la nécessité dans les stratégies d'adaptation de pouvoir répondre aux nouveaux besoins en eau et de prévenir les conflits d'usages. Le rapport conclut sur la nécessité de faire évoluer les pratiques agricoles (ex : semis précoces, sélection de nouvelles variétés, promotion de l'agriculture de « conservation »…) mais aussi de créer de nouvelles infrastructures hydrauliques (stockage, transferts) dans certaines régions ; tout en alertant sur les risques d'obstacles qui pourraient être économiques mais aussi réglementaires. De nombreuses politiques de l'eau en effet ne font pas de la sécurité alimentaire un objectif ou une priorité et n'intègrent pas les effets annoncés du changement climatique ni la nécessité absolue de promouvoir une agriculture climato-intelligente.
  - De très nombreux exemples sur le terrain (*voir notamment CGAAER 2012, exemples de solutions 9, 10, 11,*
12 et 13) montrent l'importance déterminante pour la sécurité alimentaire d'une meilleure mobilisation de l'eau.
- Le stockage de l'eau est aussi le moyen de soutenir les étiages et donc, dans bien des cas, de maintenir ou d'atteindre un bon état écologique.

La partie du rapport relative au stockage et à l'irrigation nécessiterait par conséquent d'être renforcée et le chapitre final (« draft recommandations ») corrigé. Le rapport pourrait aussi reprendre à son compte et promouvoir la nouvelle vision du stockage citée p 60 et qui nous paraît pertinente : celle d'un « continuum » pouvant faire appel à différentes options incluant : grands et petits barrages réservoirs, retenues et citernes, recharge artificielle dans les nappes, stockage d'eau dans les sols (agro-écologie) et stockage par bonne préservation, création et gestion des zones humides.

1.4 L'évolution de la demande en eau agricole

La croissance démographique et l'évolution des modes de consommation et de production ne sont pas les seuls déterminants de l'évolution de la demande ou de la consommation en eau par l'agriculture comme plusieurs passages du draft zéro le laissent penser. En effet, le changement climatique par la croissance de l'évapo- transpiration, et donc des besoins en eau des plantes (en pluvial comme en irrigué), et par les changements de géographie agricole, est un autre facteur à prendre en compte. Le draft zéro y fait d'ailleurs référence page 16 puisqu'il rappelle que « *selon le GIEC, les changements climatiques conduiront probablement à une croissance de la demande en eau agricole, la demande en irrigation pouvant s'accroître de 40% dans certaines régions, non compris les besoins additionnels pour satisfaire les besoins de sécurité alimentaire d'une population croissante* » (Jimenez et al., 2014). Il conviendrait par conséquent de corriger les passages du rapport qui peuvent prêter à mauvaise interprétation.

[2] Il est intéressant à cet égard de faire ressortir le lien direct entres eaux vertes et eaux bleues : la croissance de l'évapotranspiration de la végétation pluviale aura en effet pour conséquence une forte réduction des écoulements et des débits d'étiage (jusqu'à 40% par exemple en France). **2. Le besoin d'une vision mobilisatrice de tous les acteurs pour produire plus, mieux, et plus équitablement ; les questions posées autour de la proposition sur le droit à l'eau agricole**

2.1 Un défi vital pour l'équilibre de la société tout entière

Le rapport met fortement l'accent, à juste raison, sur la condition féminine et sur l'inégalité croissante dans l'accès aux ressources et, par suite, sur le nécessaire renforcement des droits à l'eau agricole des populations rurales défavorisées, sa principale recommandation. Ce faisant, il risque de donner l'impression que l'insécurité alimentaire ne touche et ne touchera que les pauvres et les femmes. Or, la crise alimentaire de 2007-2008, les analyses développées lors du 6ème Forum mondial de l'eau (*CGAAER, 2012)* et le dernier rapport du GIEC montrent que la question croisée de l'eau et de la sécurité alimentaire est en fait **un défi vital pour l'équilibre de la société tout entière.**

En renforçant les droits, on arrivera peut-être, en milieu rural et péri-urbain, à mieux assurer la subsistance de la
« petite agriculture » mais comment pourra-t-on nourrir des villes appelées à agglomérer la grande majorité des populations et dont une part importante de la population souffre également de pauvreté ? Relever de tels défis
nécessitera que l'ensemble des ressources en eau, vertes (agriculture pluviale) et bleues (eau circulante dont une
partie est prélevée pour les cultures irriguées), soient mieux gérées et valorisées et donc que l'ensemble des acteurs prennent conscience de la forte montée annoncée des risques et puissent apporter leur contribution :

- la petite agriculture familiale, dont on souhaite qu'elle puisse progresser et pas seulement rester « de subsistance », mais aussi les autres formes d'agriculture, familiales ou non, les grands systèmes hydro- agricoles et l'ensemble des entreprises impliquées dans le processus de production et de distribution ;
- les villes et les urbains qui devraient d'urgence prendre conscience de leur vulnérabilité alimentaire, de la montée des interdépendances et des risques, et donc aussi de la nécessité de produire davantage ; ce qui supposerait d'abord d'arrêter de faire de l'agriculture une simple « variable d'ajustement » du développement urbain et des politiques d'environnement ou de commerce extérieur ;
- les acteurs des politiques publiques à tous les niveaux.

Il s'agit par conséquent de refuser toute exclusive et de reconnaître le **principe de responsabilité partagée et de complémentarité**. Ceci signifie également qu'il faut éviter les faux problèmes et les exigences arbitraires de tel ou tel usage ou/et découlant de certaines visions lorsqu'elles peuvent déséquilibrer indûment les arbitrages dans l'allocation de l'eau, aux dépens de la sécurité alimentaire, locale ou plus globale.

2.2 L'équité dans l'accès à l'eau agricole par la bonne gouvernance territoriale de la ressource

Le partage équitable de la ressource en eau agricole ne passe pas que par la création d'un nouveau droit universel à l'accès à l'eau agricole pour les plus vulnérables. D'autres moyens, dont les résultats peuvent être appréciables et à effets rapides, peuvent être mobilisés.

Les exemples documentés par les acteurs français pour le 6ème Forum mondial de l'eau (*CGAAER 2012 ; ex de solutions 16, 17, 18, 19, 20, 23*) montrent notamment :

- que ce qui est en cause, c'est d'abord bien souvent des visions faussées de politiques publiques (ex : privatisation, politique d'investissements) qui ignorent les réalités et avantages de la gestion communautaire de l'eau ou les conséquences négatives possibles de ces visions sur la sécurité alimentaire, voire sur la sécurité hydrique ;
- qu'il suffit souvent d'un peu d'**intermédiation de qualité entre acteurs** (entre petits agriculteurs et autres acteurs) pour modifier les choses positivement sur le terrain ; avec des conséquences parfois remarquables au niveau national. Les coopérations et partenariats Nord/Sud capables de mobiliser ensemble ONG et OPA du Sud et du Nord, et/ou des institutions qui savent organiser le dialogue entre acteurs (Agences de l'eau…) ont montré leur efficacité en bien des cas.

D'autres exemples (*CGAAER 2012 ; exemples de solutions 3, 4, 5, 6 ; CGAAER et collectif 2013*) montrent la possibilité effective de garantir une répartition équitable de la ressource en eau entre agriculteurs irrigants et de la gérer de façon efficace pour produire plus de biens et de services, y compris par exemple pour réduire les pollutions diffuses (*CGAAER 2012, ex de solutions 29 et 30*), protéger les milieux naturels et la biodiversité (*CGAAER 2012, ex de solution n° 25, 32 et 13)* ou pour conforter la sécurité globale d'approvisionnement en eau de l'ensemble des acteurs dans la perspective du changement climatique et ce, à un coût réduit (*CGAAER 2012, ex de solution n° 3 et 7*).

Ces exemples montrent notamment l'importance :

- d'une **gouvernance locale de l'eau agricole à la bonne échelle territoriale**, souvent très locale (bassins déversants), **avec des règles solides donnant aux associations d'usagers d'eau agricoles (AUEA) de vrais pouvoirs de gestion et garantissant l'équité dans l'accès à la ressource**. C'est le cas par exemple de nombreux territoires en Espagne ou en France méditerranéenne ; depuis parfois plus de 1000 ans. Ce peut l'être dans les pays du Sud (*CGAAER 2012, cf ex du projet Preynup au Cambodge*), et ce devrait l'être bien davantage, ce qui suppose à la fois des actions de renforcement des capacités et une évolution du droit. On notera que les projets de coopération peuvent permettre de construire sur le terrain des institutions efficaces et démocratique de gestion de l'eau agricole mais doivent aussi savoir évoluer (*cf notamment CGAAER 2012 exemples n° 4 et 5).*

- donc de **lois nationales** reconnaissant les communautés d'irrigants comme des corporations de droit public pouvant regrouper tous les propriétaires d'une zone irrigable et jouissant d'une indépendance, de droits et de responsabilités importants. L'expérience espagnole confirme le rôle fondamental de ces corporations pour une exploitation équitable de l'eau, et celui de leur fédération nationale pour transmettre les besoins du secteur irrigué et défendre ses intérêts vis à vis de l'administration *(CGAAER et collectif, 2013).*

- de **systèmes de gouvernance et de gestion de l'eau à des échelles supérieures de territoires**, les AUEA ne pouvant assurer un partage équitable de la ressource au delà de leurs territoires ou mettre en œuvre des investissements d'envergure régionale. Ceci a conduit certains pays à mettre en place des commissions ou agences de l'eau ou/et des « **sociétés d'aménagement régional** » (ex : société du canal de Provence en France) et autres offices régionaux de gestion multi-usages des ressources en eau et en particulier d'irrigation ou de mise en valeur agricole.

Un rééquilibrage du projet de rapport du HLPE sur ces questions d'accès équitable à la ressource, de droits, de responsabilités des acteurs et de moyens, institutions et politiques à mobiliser pour des progrès rapides nous paraît donc nécessaire.

2.3 La productivité de l'eau et de la terre par la valorisation des « ressources rurales » : une affaire aussi d'organisation collective, de capital social et de valorisation des savoir-faire locaux

Le draft zéro montre bien que la question de la productivité de l'eau et de la terre, considérée sous l'angle élargi proposé et que nous approuvons (« produire plus de nourriture, plus de revenus, plus de bien-être et plus de bénéfices environnementaux à un coût social et environnemental le plus faible possible par unité d'eau utilisée »), est la question centrale de la problématique croisée de l'eau et de la sécurité alimentaire. Comme le dit l'IWMI, gérer l'eau pour répondre aux besoins alimentaires, c'est fondamentalement « *réussir une nouvelle alliance entre les écosystèmes et la productivité* ».

L'objectif devrait donc être partout de réussir le passage à des systèmes de production agricole plus durables et plus productifs et de renforcer l'équité et la solidarité dans l'accès aux ressources et entre acteurs et territoires, donc de **réussir une « intensification durable » dans le cadre d'un développement inclusif et équitable**. Les chapitres 2.4.1 à 2.4.5 sont à cet égard particulièrement importants et, à notre avis, parmi les meilleurs du document proposé à la consultation. Les gains possibles de productivité de l'eau sont effectivement très importants, y compris dans les pays en pénurie croissante (cf résultats du séminaire SESAME 1 Collectif, 2013).

Cependant, les exemples documentés pour le 6ème Forum mondial de l'eau (*CGAAER 2012 ; exemples de solutions n° 3, 4, 5, 6, 9, 10, 11, 12, 13…)* ont montré que les progrès d'intensification durable ne sont pas seulement une question d'innovation technologique/agronomique et d'investissement mais aussi, souvent, d'abord et principalement, une question d'**organisation collective**, d'émergence d'un **leadership** local, de renforcement du **capital social.** L'**innovation sociale**, la **formation** et l'**intermédiation/ingénierie du développement rural durable** sont donc des facteurs clefs d'une mise en mouvement réussie. La « draft recommandation » actuellement proposée sur les questions de productivité de l'eau ne devrait donc pas donner le sentiment, dans son titre, que c'est ici une affaire seulement d'investissements et de technologie.

La croissance de la productivité de l'eau pour la sécurité alimentaire devrait ainsi conduire, à notre avis, à raisonner l'articulation eau/sécurité alimentaire en termes de « **ressources rurales** », dans une acception large. Il s'agit en effet, pour les territoires, de pouvoir mieux **conserver, mobiliser et valoriser une diversité de ressources naturelles** (l'eau et la terre), **humaines (**les hommes et les femmes) **et culturelles** (les savoir-faire liés à la gestion de l'eau agricole ; les organisations collectives..) **pour produire davantage de biens et services.** Les échelles de territoires à prendre en compte sont multiples mais l'objectif ultime devrait être un progrès de productivité à l'échelle de l'ensemble du « paysage » ou du « bassin versant » en prenant en compte et en valorisant les interactions positives possibles entre eaux « bleues » et « vertes » et la possibilité de mobiliser de nouvelles ressources (stockage, transferts et irrigation)**.**

Dans cette vision élargie et « territorialisée » de la « productivité de l'eau », on pourrait tout à fait intégrer des objectifs de **réduction des pertes et gaspillages**, pertes et gaspillages alimentaires et d'eau dans toute la chaîne alimentaire, et pertes et gaspillage de terres, notamment équipées pour l'irrigation ; ainsi que les progrès rendus possible par l' « économie circulaire » (recyclage). Toutes ces pertes représentent en effet des gaspillages d'eau et des pertes de productivité globale ; avec des conséquences directes et indirectes (ex déforestation tropicale) très négatives pour le climat et la sécurité alimentaire. Le HLPE, dans ses recommandations, pourrait donc mettre en avant cette vision moderne et systémique de la productivité et des ressources en soulignant l'importance d'en donner une traduction concrète dans les futures politiques de l'eau et de l'agriculture.

Enfin, si le draft met beaucoup l'accent, à juste titre, sur l'irrigation d'appoint, sur le recueil des eaux pluviales, et sur l'agro-écologie ; il pourrait aussi souligner, au passage, les bénéfices possibles des **agricultures dites de « précision », de « conservation » et « écologiquement intensives »**, ou élargir en conséquence la définition donnée à l'agro-écologie. Le développement de ces 3 types d'agricultures est en effet important pour réduire l'érosion des sols et/ou les pollutions de l'eau en aval et pour accroître la productivité de façon durable.

2.4 L'efficience de l'eau : un propos à nuancer

Le V0 Draft a tout à fait raison de mettre l'accent principalement sur la productivité de l'eau et de la terre et de relativiser l'intérêt et la portée du concept d'« efficience ». Cependant, l'affirmation p 43 que l'amélioration de l'efficience des systèmes collectifs d'irrigation ne crée pas de ressources additionnelles, valable sans doute pour la partie de l'Egypte où l'eau du Nil est réutilisée en cascade ou pour les oasis traditionnelles du Draa et du Tafilalet au Maroc, n'est pas pour autant une règle générale.

Par exemple en Provence, les prélèvements unitaires des systèmes traditionnels sont 10 fois supérieurs à ceux des systèmes modernes, et ils conduisent parfois à un transfert de l'eau en dehors du bassin versant, donc à un non-retour à la rivière. Il en résulte une gestion tendue des réserves qui pourraient être beaucoup moins sollicitées par une gestion plus efficiente, laquelle permettrait d'accroître sensiblement la sécurité d'approvisionnement en période déficitaire. La mauvaise efficience des utilisations de l'eau conduit aussi, bien souvent, à sur-dimensionner les ouvrages de stockage, prélèvements et transports. Enfin, l'accès à l'eau agricole pourrait dans bien des cas être amélioré si l'efficience de l'utilisation de l'eau par les autres secteurs se voyait améliorée et, vice-versa (CGAAER 2012, ex de solutions 3, 7 et 8).

Dans les zones sèches (arides et semi-arides), l'amélioration de l'efficience des systèmes de l'eau, quand elle ne vise pas d'abord directement à augmenter les ressources disponibles, peut cependant contribuer à réduire les gaspillages et les infiltrations profondes de l'eau qui risquent de créer des remontées d'eau salée et de provoquer en conséquence la salinisation et l'hydromorphie des sols dans les zones irriguées. Dans certains cas, les réutilisations en cascade à l'échelle du bassin versant risquent de ne pas être durables à long terme car les eaux déversées en aval d'un périmètre irrigué et remises en circulation dans le cours d'eau sont chargées de sel et perdent au fur et à mesure leur capacité productive, en plus de la pollution de la ressource par les produits chimiques. Enfin, toute économie d'eau dans les systèmes modernes de ces régions est avant tout une économie sur les charges d'eau et notamment de l'énergie. Les gains d'efficience permettent donc, dans bien des cas dans ces régions, de maintenir la capacité des systèmes d'eau et donc la qualité de services rendus aux irrigants (Hamdane, 2014).

Inversement, dans certains cas (ex de la nappe de la Crau en Provence), c'est la faible efficience des systèmes irrigués qui permet d'alimenter la nappe au bénéfice de l'accès des habitants à l'eau potable. Dans le cas présent, il est intéressant de noter que c'est la disparition accélérée de l'agriculture irriguée (irrigation d'appoint) en Crau (et de la production de foin associée), du fait de l'étalement urbain non maîtrisé, qui conduit à mettre en péril à la fois : i) la nappe de la Crau et donc l'accès à l'eau potable d'une population très importante, et ii) l'élevage en montagne et les services qu'il rend en termes de consolidation du cycle de l'eau en aval et de biodiversité.

C'est donc cas par cas, que la question de l'efficience doit être interrogée.

2.5 Extension du droit à l'eau au droit à l'eau agricole : questions posées ?

L'extension du droit d'accès universel à l'eau potable au droit d'accès à l'eau agricole comme condition du respect du droit d'accès universel à l'alimentation constitue un des points forts du V0 Draft.

Cependant, il peut soulever plusieurs problèmes et au moins trois questions mériteraient sans doute d'être discutées / approfondies.

a) Le problème de l'application du droit à l'eau agricole dans les zones sèches (arides et semi-arides) en situation de pénurie croissante.

Dans les régions marquées par la rareté de la ressource et confrontées à la croissance démographique, à la raréfaction de la ressource du fait du changement climatique et à

l'augmentation des besoins en eau, la situation est celle de pénuries d'eau croissantes. Dans ce contexte, la part en eau allouée à l'agriculture irriguée, qu'on le veuille ou non, risque, dans bien des cas, de se voir réduite avec le temps et, faute de gains majeurs de productivité des eaux agricoles (bleues et vertes), la sécurité alimentaire est donc assurée de façon croissante par les importations (eau virtuelle). C'est d'ailleurs le cas depuis une trentaine d'années dans la région Afrique du Nord- Moyen Orient. Dans ce contexte, la mise en place du droit à l'eau agricole, si elle pourrait avoir le mérite de garantir un partage plus équitable de la ressource au bénéfice de l'agriculture familiale et des communautés rurales, ne devrait pas être comprise comme la garantie du maintien d'un quota d'eau dans le temps à ces acteurs, puisque celui-ci ne pourra, de fait, être assuré.

b) **La question de savoir si il doit s'agir d'un droit collectif ou d'un droit individuel**.

Le « V0 Draft » en parlant de « water for the self provision of food for the poor", de "the importance of of adequate water for … subsistance agriculture" et plus encore en citant Brooks, p 74 " everybody should have a right to a sufficent quantity of water of decent quality to enable the growing of enough nutritionus food for a healthy life", donne l'impression que ce droit devrait être un droit "individuel" comme le droit d'accès à l'eau potable et à l'assainissement.

Pourtant, on pourrait développer plusieurs arguments en faveur d'un droit de type d'abord collectif. En effet :

- un droit de type collectif permettrait de mieux reconnaître la réalité et l'efficience des usages communautaires et d'attribuer des droits formels à ces communautés ou à des collectifs agricoles en
s'assurant que les règles qu'ils adoptent garantissent bien un partage équitable de la ressource.
- assurer durablement notre sécurité alimentaire suppose un progrès global de bonne gestion des eaux pluviales et irriguées à l'échelle du « paysage » et du « bassin versant », et donc une gestion concertée et de
type collectif de la ressource, pouvant et devant mobiliser de nombreux acteurs.

- faire prévaloir ses droits d'accès à l'eau agricole dans les arbitrages sur l'allocation de la ressource entre secteurs nécessite une capacité pour les acteurs de l'agriculture à se défendre et à agir d'une façon groupée.

Il nous semble donc que ce droit à l'eau agricole devrait être de dimension au moins autant collective qu'individuelle.

c) Celle de savoir si le droit à l'accès à l'eau agricole ne doit pas se coupler avec un devoir de bonne gestion de la ressource (productivité, durabilité, équité).

Relever le défi du développement durable, c'est en effet affirmer des droits mais aussi des devoirs. Ce devrait être le cas notamment des droits d'accès aux ressources productives comme l'eau agricole, puisque la bonne gestion de ces ressources est une condition pour tous, urbains et ruraux, du respect du droit universel à l'alimentation. Il ne s'agit par exemple certainement pas de maintenir l'agriculture de subsistance dans sa situation actuelle de pauvreté et de faible productivité mais bien au contraire, en consolidant ses droits d'accès à l'eau agricole, de l'inviter à mieux gérer et valoriser cette ressource afin, non seulement, d'accroître ses revenus, mais aussi de contribuer à la disponibilité globale, à la stabilité et à améliorer l'accès de tous à l'alimentation. Et ceci vaut pour tous les acteurs et entreprises impliqués dans le processus de la production, de l'amont à l'aval.

3. L'importance relative des eaux vertes et des pertes de capital productif par érosion hydrique, comblement des retenues des barrages et consommation des terres agricoles

3.1 Eaux vertes, eaux bleues, écosystèmes et agro-écosystèmes, eau prélevée et consommée

L'introduction, le chapitre 1 « Water for food security ; charting the multiple linkages » et la conclusion ne mettent pas bien en évidence :
l'importance relative, pourtant essentielle pour la sécurité alimentaire, des eaux « vertes », qui permettent l'agriculture pluviale, et qui sont complétées, dans les cultures irriguées, par les eaux bleues, **les interdépendances amont-aval,**
le fait que les écosystèmes sont aussi pour une bonne part des « **agro-écosystèmes** » et que l'agriculture, si elle peut altérer la ressource en eau, peut aussi **produire des services environnementaux** importants pour la consolidation du cycle de l'eau,
le fait que l'eau n'est donc pas qu'un « input » pour la production mais, plus fondamentalement, **la composante des agro-écosystèmes qui en permet la vie et donc la production**.

Il serait également bon de s'attacher à distinguer clairement ce qui est « prélevé » et « consommé ». Plusieurs chiffres cités au long du rapport ne précisent pas en effet si il est question de prélèvements ou de consommations ou si ils concernent l'eau bleue, l'eau verte ou l'addition des deux : ils peuvent donc conduire à des confusions ou à de mauvaises interprétations. Il serait également bon de préciser ce que l'on entend par
« consommation » en faisant référence au cycle de l'eau et au fait que l'eau « consommée » (évapo-transpirée), si elle peut faire défaut en aval aux dépens d'autres usages, ne disparaît pas pour autant et revient par les pluies
aux territoires.

3.2 Non durabilité des systèmes productifs : érosion hydrique, envasement des retenues des barrages, déprise et pertes de terres équipées pour l'irrigation, pauvreté rurale dans les arrière-pays

Le draft zéro met bien l'accent sur les questions de vulnérabilité aux sécheresses, de pollutions des ressources en eau, de salinisation et de surexploitation des aquifères. Cependant, rien ou presque n'est dit sur les problèmes d'**érosion** hydrique, de désertification, d'**envasement accéléré des retenues des barrages, de pauvreté rurale dans les arrière-pays (« châteaux d'eau »)** et de **pertes de capital productif par artificialisation des sols ou déprise**.

Pourtant, ces problèmes de non durabilité sont très graves pour la sécurité alimentaire dans de nombreuses régions du monde :

- En Méditerranée du Sud par exemple, la vitesse actuelle d'envasement des retenues des barrages annonce leur comblement avant la fin du siècle (à quelques exceptions près dont Assouan) alors qu'il n y a pas d'autres sites disponibles. C'est donc à la fois les systèmes pluviaux d'amont et les systèmes irrigués d'aval qui sont menacés, et avec eux, la sécurité alimentaire dans ses 4 dimensions (disponibilité, accès à l'alimentation, qualité, stabilité).
- En France, 300.000 ha de terres équipées pour l'irrigation ont été perdus en seulement 10 années du fait notamment d'un développement urbain non maîtrisé et de la déprise. Des phénomènes d'une ampleur
comparable sont constatés dans beaucoup d'autres pays, y compris du Sud comme le Liban ou l'Egypte où
ils représentent une perte importante de ressources et une menace pour la sécurité alimentaire. En outre, de nombreux systèmes productifs, dans les zones marginales, notamment des

systèmes de culture sur terrasses en montagne, sont perdus par déprise et, avec eux, les services rendus en termes de production alimentaire et de bonne infiltration de l'eau.

- La pauvreté rurale se concentre dans les territoires intérieurs (les « châteaux d'eau » des pays), ce qui conduit à des « cercles vicieux » et explique à la fois pour une bonne part les problèmes d'érosion hydrique,
de désertification et de déprise
(figures).

• **Taux de pauvreté en Tunisie**

La **bonne gestion des territoires de montagnes** avec passage à des systèmes agro-sylvo-pastoraux durables, permettant de conserver l'eau et les sols, d'améliorer l'infiltration de l'eau et donc de « produire » de l'eau au bénéfice de l'aval ; ainsi que la nécessité de **protéger les terres équipées pour l'irrigation et/ou de compenser les pertes** de ce qui devrait être considéré comme le capital productif le plus précieux pour notre planète (1 ha irrigué produit en moyenne 3 fois plus que 1 ha en pluvial) sont donc aussi, à notre avis, des questions clefs de la relation entre eau et sécurité alimentaire.

Ce qui est en cause au fond, c'est notre capacité collective à assurer un **développement plus équilibré et durable des territoires, de l'amont (les châteaux d'eau) à l'aval (les régions côtières).**

4. Différences de situations et montée des interdépendances entre régions riches et pauvres en eau : quels risques et quelles conséquences en matière de gestion de l'eau ?

Si le draft zéro montre bien qu'il y a des régions riches et pauvres en eau, **il ne le dit pas assez fort**, et il tend, dans ses introductions et conclusions, à donner une visions simplificatrice et quelque peu faussée de la problématique. Le document proposé ne tire pas toutes les conclusions nécessaires de l'analyse de la diversité régionale en termes de montée des interdépendances (commerce, environnement, migration) et des risques, et, par suite, d'évolutions nécessaires dans la gestion de l'eau et dans les politiques agricoles et de sécurité alimentaire.

4.1. Le rapport ne montre pas assez nettement les différences de situations entre régions pauvres/riches en eau et leurs conséquences en termes de gestion de l'eau. Sa conclusion peut prêter à confusion

Le draft zéro pourrait laisser croire, dans son introduction et dans sa conclusion, que i) l'eau est partout une ressource limitée en quantité et sous stress croissant et que ii) la demande, partout, tend à augmenter, réduisant partout la part allouable à l'agriculture. Or ceci est inexact car, dans de nombreuses régions du monde :

- l'eau est une ressource abondante, encore très peu
stockée et mobilisée,
- la demande en eau se réduit de façon significative depuis
plusieurs décennies.

Si dans les pays riches en eau, l'eau peut cependant faire défaut en période sèche, c'est souvent d'abord parce que les capacités de stockage sont limitées.

Le rapport doit donc être corrigé sur ce point et éviter d'ajouter à la désinformation collective sur la rareté de la ressource en montrant mieux les différences de situations entre pays riches et pauvres en eau et leurs conséquences sur la ressource en eau et sa gestion.

Par exemple,

- en France, dans les bassins les plus sollicités du Sud-Ouest, on ne mobilise qu'environ 3% des écoulements de surface pour l'irrigation contre 15% dans le bassin de l'Ebre (Espagne) et 70% dans le bassin de l'Oum
er Rbia (Maroc). Et les capacités de stockage en place par rapport aux écoulements moyens sont
respectivement de 2,5%, 50% et 200%. (*CGAAER, 2013*). Le potentiel hydrique français est donc considérable.
- Si l'on compare la Méditerranée du Sud (du Maroc à la Syrie) et la Méditerranée du Nord (du Portugal à la Turquie), on constate que le total de la demande en eau dans les ays de la rive Nord (138 km3/an dont une très grande part n'est pas « consommée ») ne représente que 13% des ressources conventionnelles
potentielles, alors que la demande au Sud (116 km3, essentiellement agricole) représente 116% des
ressources conventionnelles potentielles.

Ces différences n'ont pas seulement pour conséquences une politique de mobilisation de l'eau (y compris par recours aux eaux non conventionnelles) beaucoup plus active dans les pays pauvres en eau : elles contribuent aussi à expliquer à la fois à la fois la forte croissance des importations alimentaires et la part importante d'eau exploitée de façon non durable. Au Maghreb, l'eau mobilisée par exploitation des nappes fossiles et par surexploitation des aquifères, c'est-à-dire « l'eau non durable » représente 30% du total de l'eau mobilisée.

4.2. Le rapport ne montre pas assez les causes des pénuries croissantes en eau au Sud et l'ampleur des changements annoncés

Un des plus grands paradoxes au niveau mondial est ce constat d'une croissance démographique en moyenne double dans les pays et territoires de climat aride et semi-aride (zones sèches) que dans les pays et territoires à ressources en eau abondantes (*Margat, Watarid, 2013 ; CGAAER 2012*). Ceci devrait être dit clairement par le rapport, chiffres à l'appui.

Comme la population dans ces régions continue à croître au même rythme alors que les ressources et les systèmes productifs sont déjà, dans plusieurs territoires, surexploités ou fortement dégradés, ceci signifie que les dépendances alimentaires de ces régions et le commerce international alimentaire **vont s'accroître de façon considérable ainsi que les risques de non durabilité (ex : surexploitation des ressources…).**

Les scénarios « *Agrimonde 2050* » (INRA, CIRAD, 2009), qui s'appuient sur les nombreuses prospectives agricoles et alimentaires disponibles et sur les hypothèses de croissance de rendements qu'on peut en tirer, ont le grand mérite de chiffrer, par grandes régions, les évolutions annoncées des échanges alimentaires (tableau).

Source : CGAAER 2012 à partir de
INRA/CIRAD 2007

Ils montrent en effet qu'à l'horizon 2050, les importations nettes des régions importatrices (Asie, MENA, Afrique sub-saharienne) depuis les régions exportatrices riches en ressources (Amérique latine, OCDE, Russie- Ukraine), mesurée en calories (bilans régionaux ressources/emplois), devraient plus que quadrupler.

De tels chiffres montrent l'**extrême fragilité et menace qui pèse sur notre sécurité alimentaire future,** annoncent des risques sérieux de migrations ou mortalités à grande échelle et démontrent bien la nécessité d'un véritable « changement de paradigme » dans nos visions et stratégies. Encore ces chiffres ne prennent sans doute pas assez en compte les impacts annoncés du changement climatique sur la ressource en eau et sur l'agriculture. Inversement, ils ne prennent pas non plus probablement suffisamment en compte les ressources en eau encore mobilisables (cas de l'Afrique sub-saharienne) ni les gains très importants possibles en termes de « productivité de l'eau » si on gérait mieux cette ressource.

4.3. Interroger les conséquences possibles des évolutions annoncées sur les politiques de l'eau et de l'agriculture/sécurité alimentaires

Les évolutions critiques annoncées devraient conduire à passer à des politiques de l'eau et de l'agriculture beaucoup plus proactives, ce que le rapport se devrait de souligner.

- Dans les **pays à ressources rares et surexploitées**, la croissance de la démographie et des besoins non alimentaires pourrait conduire effectivement, comme le dit le rapport (ex de la Jordanie), à réduire la part d'eau allouée à l'agriculture. Le recours accru aux eaux non conventionnelles (réutilisations, désalinisation), la recharge artificielle des nappes, la gestion de la demande en eau (gains d'efficience), la restauration des systèmes dégradés et **l'intensification durable de l'agriculture pluviale et des parcours,** où des gains de productivité de l'eau très importants sont possibles devrait devenir une priorité (cf ex de la Tunisie ; *Hamdane, 2014*) sont des priorités de premier rang. Des gains importants de productivité de l'eau sont aussi possibles en irrigué (*cf SESAME 1, notamment M Sohl, ICARDA*).
- En **Afrique sub-saharienne** où la ressource en eau est encore largement sous-exploitée, la rareté est économique et non physique. La priorité devrait être la mobilisation du potentiel en même temps que la restauration des systèmes/intensification durable de l'agriculture pluviale et l'accélération de la transition démographique. La demande en eau agricole pourrait ici s'accroître au lieu de diminuer.
- Dans les **pays riches en ressources** (Amérique du sud, pays OCDE, Russie, Ukraine..), la demande en eau agricole pourrait aussi augmenter significativement pour à la fois réussir l'adaptation au changement climatique et produire et exporter suffisamment si l'on veut prévenir des migrations massives depuis les pays pauvres en ressources.

Le risque n'est pas seulement celui du « water grabbing » mis en évidence par le V0 Draft ; ce pourrait être aussi celui :

- de la tentation égoïste dans les pays riches en ressources du repli sur soi et donc de la non mobilisation des ressources pour la réussite de l'intensification durable, l'agriculture restant une variable d'ajustement des évolutions urbaines et des politiques environnementales,
- d'une forte déforestation dans d'autres pays pour compenser le défaut d'intensification durable dans les terres déjà cultivées.

Le rapport devrait donc mieux expliciter et mettre en exergue :

- le risque que fait courir à la communauté internationale et à l'environnement mondial (climat, biodiversité) la tentation du repli sur soi des pays assez riches en eau, en terres et en économie pour

pouvoir pallier les insuffisances et les risques exceptionnels des pays déficitaires

- et, par suite, le **devoir de complémentarité et de vraie solidarité**,

Les prospectives mondiales sur l'eau disponibles, lesquelles intègrent encore très insuffisamment les impacts possibles du changement climatique et les impératifs de la sécurité alimentaire nous semblent donc devoir être interprétées avec la plus grande précaution et probablement ré-interrogées et revues. Inversement, les prospectives alimentaires du type « Agrimonde » mériteraient aussi d'être ré-interrogées en prenant mieux en compte les aspects « eau » et « climat ».

Dans tous les cas, la réduction des perte et gaspillages (terres, nourriture et eau tout au long de la chaîne alimentaire), le passage partout à des systèmes de production plus durable et la croissance de la productivité de l'eau et de la terre apparaissent comme des impératifs d'autant plus nécessaires que pour faire face au problème de raréfaction des ressources fossiles et pour que le secteur des terres puisse apporter sa contribution à la réduction des émissions de gaz à effet de serre, l'agriculture va devoir produire beaucoup plus que seulement des produits alimentaires. Parallèlement, les pays en pénurie croissante de ressources/dépendance alimentaire croissante, devaient s'engager à accélérer leur transition démographique (baisse de la fécondité).

Ce sont donc toutes nos visions et politiques de l'eau et de l'agriculture qui vont devoir être ré-interrogées.

5. Le lien nécessaire entre politiques de l'eau et de l'alimentation ; pour des visions, stratégies « eau et agriculture » et des solutions concertées aux niveaux des territoires pertinents

Le « V0 Draft » met bien l'accent sur les **défauts de cohérence et de coordination des politiques sectorielles, notamment au niveau gouvernemental** (p 75).

Cependant, il n'approfondit pas assez les évolutions nécessaires et possibles en termes de politiques publiques. L'analyse conduite pour le Forum mondial de l'eau (CGAAER, 2012) et lors des séminaires SESAME 1 et 2 nous conduit à proposer de mettre l'accent sur 3 points qui nous paraissent particulièrement importants :

- la nécessité de faire émerger des visions et solutions concertées à des niveaux de territoires infra- national,
- la nécessité d'une évolution des politiques agricoles, y compris par introduction de systèmes de « paiements pour services environnementaux »
- la nécessité d'une évolution parallèle des politiques de l'eau.

5.1 Des visions, stratégies et solutions concertées « eau et agriculture » à des échelles infra-nationales

La réflexion conduite à l'occasion de la préparation du 6ème Forum mondial de l'eau a d'abord montré l'importance de pouvoir produire des **exercices de prospective** et de monter des **plans d'action** ou des dispositifs de gestion **à des échelles de territoires pertinentes, c'est-à-dire de niveau « infra-national »** (et parfois supra-national : cas des bassins transfrontières) et pas seulement national (*CGAAER 2012 ; ex de solutions 37 et 38 ; ex de la prospective Garonne 2050).*

Ce sont par exemple :

- les scénarios produits par l'Agence de bassin du Souss Massa (Maroc) qui ont permis la nécessaire prise de conscience des impasses des trajectoires actuelles (surexploitation des aquifères avec toutes ses conséquences en termes de coûts et de risques), puis de conduire le conseil régional Souss Massa Draa à mobiliser les différents acteurs (Ministères de l'eau et de l'agriculture, office d'irrigation et agence de l'eau, coopératives agricoles…) pour prévenir le drame annoncé. Une convention cadre, un plan d'action combinant mesures de gestion de la demande et mesures de politiques d'offre (transferts) puis un « contrat de nappe » en ont résulté.
- les scénarios « *Garonne 2050* » de l'agence de l'eau Adour Garonne (France) qui ont montré la nécessité d'une politique active de stockage de l'eau si l'on veut à la fois préserver la production agricole et
énergétique et pouvoir maintenir un bon état écologique (soutien du débit d'étiage). Il est intéressant à cet
égard de souligner que les prospectives nationales sur l'eau réalisées par le Ministère de l'environnement avaient bien montré les risques d'impasses mais sans envisager de scénario de stockage, l'actuel plan
national d'adaptation s'étant limité à une approche de type « gestion de la demande » avec seulement des
possibilités très limitées de retenues de substitution.
- l'élaboration du PRAD (*Projet régional d'agriculture durable*) du Languedoc Roussillon (France méditerranéenne) qui a montré la nécessité absolue d'une prise en compte des impacts du changement
climatique et des spécificités du climat méditerranéen ; lesquels justifient notamment le stockage d'une
partie des excédents de pluviométrie hivernale et leur report au printemps pour une utilisation agricole. Ceci a conduit les services régionaux en charge de l'agriculture et de l'environnement à signer un protocole
d'accord, et donc à rapprocher des visions qui tendaient à s'opposer.
- la réflexion collective menée sur la nappe de la Beauce (France) qui a permis d'aboutir à un accord négocié avec les agriculteurs et à leur organisation collective pour la gestion durable de l'aquifère (gestion volumétrique avec compteurs et quotas).

La multiplication en grand nombre d'**exercices de prospective eau et agriculture/sécurité alimentaire aux bonnes échelles de territoires sous-nationales (bassins, nappes, régions de niveau NUTS 2 : landers, provinces, régions…**) ou/et transnationales (bassins transfrontières), et certainement pas que nationales, nous paraît donc un point prioritaire à intégrer dans le rapport du HLPE, y compris dans ses recommandations finales (sujet actuellement non couvert par le draft zéro).

Les exemples documentés montrent aussi la possibilité et la nécessité de se donner de nouvelles visions et **projets à des échelles plus locales, celle de la gestion de l'eau et du développement local** (nombreuses études de cas documentées dont par exemple celui de la réserve du Juanon en Provence : *CGAAER 2012, ex de solution n° 13*). Les réflexions interministérielles sur la gestion quantitative et qualitative de l'eau, par exemple en
France, ont ainsi conduit à mettre en avant le **principe de subsidiarité** et la nécessité de pouvoir monter au niveau local des « **projets de territoire** » (*cf rapport pour le Premier Ministre du député Philippe Martin sur la gestion quantitative de l'eau en agriculture*).

L'émergence de « **projets de territoires** » est aussi, plus globalement, une condition du passage réussi de systèmes de production non durables à des systèmes durables. Ces projets peuvent, selon chaque contexte, comprendre une grande diversité de mesures dont par

exemple la création d'ouvrages de stockage et mobilisation de l'eau, la revégétalisation des pentes, l'aménagement fin du terroir pour la conservation de l'eau et l'innovation agro-écologique (*cf CGAAER 2012, ex de solution n° 23 ; cf aussi ex de solution n° 22*).

La réussite de ces projets « sur mesure » de transformation des systèmes suppose en général : i) la reconnaissance ou l'émergence de **« collectifs » agricoles**, ii) de la formation/action avec un important **appui d'intermédiation** (animateurs ruraux formés aux approches participatives, à la gestion des ressources naturelles et à l'agro-écologie) et de la recherche agronomique, iii) du temps suffisant pour établir avec les communautés un diagnostic et des projets de qualité et iv) une **contractualisation** entre les autorités administratives et groupes d'agriculteurs pour préciser les objectifs, moyens (financements, appuis d'ingénierie et de la recherche) et responsabilités respectifs ainsi que les conditions de mise en œuvre du projet et de la gestion des ressources naturelles.C'est aussi à ces échelles locales que des solutions concertées et des plans d'action « multi-acteurs » peuvent être mis en place de façon efficace par exemple pour restaurer la qualité des eaux de captage (ex des accords villes-agriculture en Allemagne) ou prévenir la surexploitation des nappes.

C'est donc d'abord à ces **échelles infra-nationales** qui sont de 2 niveaux : celle de la « **planification** » (régions NUTS 2, bassin, grande nappe) et celle de l'**action locale** (la commune ou le groupe de communes, le bassin déversant, la nappe locale, le collectif agricole), c'est-à-dire « l'échelle de l'action », que :

- des solutions concertées peuvent être trouvées,
- le défaut de cohérence et de coordination des politiques, constaté au niveau gouvernemental, peut être dépassé,
- les coordinations entre secteurs et acteurs dans une perspective de long terme peut donc être fortement améliorées.

5.2 La nécessaire évolution des politiques agricoles et de développement : transition agro-écologique, agriculture climato-intelligente et mise en mouvement de toutes les agricultures et de tous les territoires

Les politiques agricoles et d'aménagement du territoire/développement régional, depuis 50 ans, ont, dans de nombreux pays, mis l'accent principalement sur les grands aménagements hydro-agricoles avec souvent à la clef, des progrès décisifs dans les 4 dimensions de la sécurité alimentaire (croissance de la production,- disponibilité, réduction de la pauvreté-amélioration de l'accès, amélioration de la qualité nutritionnelle et de la « stabilité »).

Cependant :

- la politique d'offre n'a, bien souvent, pas été assez accompagnée d'une politique de demande permettant de bien former les acteurs et de renforcer la gouvernance collective de la ressource de façon
  à bien valoriser les infrastructures,
- faute de politique de développement rural à la hauteur des enjeux, l'agriculture pluviale et l'élevage pastoral ont été trop délaissés et les déséquilibres territoriaux se sont fortement aggravés aux dépens de l'amont des grands périmètres irrigués (montagnes, zones d'agriculture pluviale)
- la productivité globale des eaux, vertes et bleues, est restée limitée et de nombreuses fragilités et non durabilités, de l'amont à l'aval, (pauvreté rurale, érosion hydrique des sols, envasement des retenues des
  barrages, surexploitation des aquifères, déprise et exode rural, artificialisation des sols agricoles…) se sont creusées.

Face à ce constat et à la nécessité de relever le triple défi de l'eau, du climat et de la sécurité alimentaire, des évolutions importantes s'avèrent nécessaires dans les politiques agricoles et d'aménagement du territoire/développement régional. Il s'agit notamment de :

- faire de la **productivité de l'eau et des terres**, au sens donné par le « draft zéro », élargi comme proposé plus haut, une nouvelle priorité des politiques agricoles/alimentaires.
- s'attacher à **réduire les pertes et gaspillages de terres**, et de nourriture et d'eau dans toute la chaîne alimentaire,
- réussir la **« mise en mouvement » de l'ensemble des acteurs et des territoires**. L'objectif doit notamment être d'améliorer l'accès des agriculteurs à tout ce qui fait défaut et est déterminant du développement (information, crédit, foncier et eau, marchés, responsabilité collective,….). Le leadership local, le renforcement du capital social, le développement articulé des filières et des territoires et la diversification de l'économie rurale sont d'autres conditions d'une transition réussie.
- promouvoir partout des **systèmes d'agriculture durable**, ce qui suppose notamment de i) réussir la transition agro-écologique et le passage à des agricultures climato-intelligentes, ii) sortir des cercles vicieux (pauvreté, dégradation des ressources et des systèmes notamment par le surpâturage) du mal développement rural à des cercles vertueux de développement « durable », iii) favoriser l'innovation, renforcer la recherche agronomique et sa bonne articulation avec l'action sur le terrain (rencontre es savoirs formels et locaux)
- prendre en compte dans les politiques agricoles la **diversité des situations**, les impacts possibles du changement climatique et les nouveaux besoins en eau. Cette nécessité de politiques pro-actives devrait conduire à élaborer et mettre en place, aux bonnes échelles géographiques (infra-nationales), des plans d'agriculture durable/stratégies d'adaptation en évaluant les nouveaux besoins en eau de l'agriculture ; à se donner des capacités d'ingénierie, à défendre les besoins en eau de l'agriculture dans les arbitrages sur les allocations et à disposer de financements en termes d'hydraulique agricole.
- Appliquer le **principe de subsidiarité** et mettre en place des agences de développement rural, des sociétés d'aménagement régional et des services de vulgarisation responsables et efficaces.

Il s'agit par conséquent et en priorité de mettre en place des **politiques « pro agricultures familiales »** et d'aménagement du territoire adaptées à ces nouveaux défis (*Cf CGAAER et CGDA 2014 et notamment l'exemple du Maroc : Plan Maroc Vert, politique de crédit agricole/Tamwil el Fellah, Stratégies de la région Sous Massa Draa et stratégie des oasis et de l'arganeraie*).

Dans ces nouvelles politiques, encore largement à construire, la mise en place de **paiements pour services environnementaux (PSE)** au bénéfice conjoint de ces populations très vulnérables, de la gestion durable de l'eau et des bénéficiaires situés en aval, pourrait s'avérer comme un des moyens d'avenir les plus importants pour la réussite de la transition. Elle pourrait effet contribuer à la fois à : i) réduire la pauvreté rurale, ii) mieux gérer l'eau et les sols et redonner une durabilité économique et environnementale aux systèmes productifs autant d'amont que d'aval et iii) prévenir des exodes ruraux et donc maintenir les équilibres urbain/rural et la stabilité sociale et politique.

Ceci supposerait de faire financer ces services soit par le marché (développement des produits d'indication géographique à haute valeur ajoutée avec des cahiers des charges garantissant la bonne gestion des ressources naturelles) ou par les bénéficiaires situés en aval lorsque c'est possible, soit par les Etats, en redonnant une responsabilité claire aux communautés rurales pour la gestion durable de leurs « terroirs » et en accompagnant le changement des pratiques et des systèmes par des « projets » de territoires négociés avec ces communautés.

Le V0 Draft du HLPE, n'ayant pas encore abordé la question des PSE et insuffisamment la nécessaire évolution
globale des politiques agricoles et de développement régional pourrait donc être nettement amélioré.

5.3 La nécessité d'évolution des politiques de l'eau

Les politiques de l'eau, comme les politiques de l'agriculture et du développement régional, vont devoir aussi évoluer pour relever le défi croisé du climat et de la sécurité alimentaire.

La première priorité serait sans doute de raisonner « besoins à satisfaire » pour relever le défi climatique et alimentaire et de **faire de la sécurité alimentaire, dans ses dimensions locales, nationale, régionale et mondiale, une de leur priorité**. Il conviendrait donc de sortir des visions réductrices inadaptées du « tout offre » ou « tout gestion de la demande » pour passer à des **politiques conjuguant offre** (stockage, transferts, ressources non conventionnelles) **et gestion de la demande** (efficience dans les utilisations, arbitrages dans les allocations..).

Ces politiques se devraient notamment de reconnaître, face au défi climatique et alimentaire, l'importance stratégique nouvelle du stockage de l'eau (dans son sens de « continuum »), y compris pour le soutien d'étiage / atteinte du bon équilibre écologique, ainsi que celle de l'irrigation, et faire de la GIRE/IWRM un outil pour contribuer à relever le défi de la sécurité alimentaire / accroître la productivité de l'eau et des terres à l'échelle du bassin versant.

Les politiques de l'eau devrait aussi davantage reconnaître et appliquer le **principe de subsidiarité** pour une gestion vertueuse, productrice et pro-active de la ressource en :

- impulsant dans les bassins versants ou à l'échelle des nappes des exercices de prospective sur l'eau
intégrant les enjeux du climat et de la sécurité alimentaire,
- renforçant, le cas échéant, les capacités des agences de l'eau et comités de bassins et la place donnée, dans ces institutions, au monde agricole et notamment aux communautés rurales, élaborant et mettant en place aux niveaux de territoires appropriés des plans d'aménagement et d'investissements pour une mobilisation bien raisonnée de la ressource ; soutenant et finançant le cas échéant des « projets de territoires » par les acteurs locaux en veillant à ce que ces projets soient compatibles avec les impératifs d'équité amont-aval et de durabilité ;
- soutenir les autorités locales prêtes à mettre en place des plans agricoles de territoire contractualisés avec les agriculteurs pour, par exemple, restaurer la qualité des eaux, prévenir leur dégradation et ainsi
« produire » de l'eau potable à moindre coût, préserver les terres agricoles de l'étalement urbain ou encore ralentir et infiltrer l'eau et contribuer ainsi à réduire les risques d'inondations. Contribuer à
financer l'intermédiation et les services environnementaux produits ou à produire par les agriculteurs.

- reconnaissant l'existence, la pertinence et l'efficience des systèmes de gestion communautaire de la ressource en eau et mettant en place des partenariats multi-acteurs valorisant les capacités de ces communautés rurales pour l'amélioration globale du service de l'eau

Elles devraient enfin s'attacher à responsabiliser davantage les utilisateurs en les sensibilisant, par la **tarification**, sur la réalité des coûts d'accès à l'eau parallèlement à l'effort d'aménagement pour encourager une gestion plus efficiente de la ressource et assurer le recouvrement des coûts de gestion.

Parallèlement, elles devraient élargir le principe « pollueur-payeur » pour y intégrer le principe de **financement des services environnementaux** à produire par l'agriculture.

C'est bien entendu à chaque pays d'inventer son propre modèle de politique publique / institutions (agriculture, eau….), un modèle qui doit être adapté à ses propres potentiels/enjeux démographiques, économiques, emplois, et de transition politique (gouvernance). Les pays ont besoin de se forger une vision 'macro' de leur développement économique et social et de stratégies et politiques de l'agriculture et de l'eau qui s'inscrivent dans un « projet de société » en tenant compte de la transition démographique, sociale et économique et des nouveaux défis à relever en termes de sécurité alimentaire et de changement climatique.

5.4 Conclusion : un nécessaire changement de paradigme ; agir de façon concomitante dans plusieurs grandes directions

Les travaux préparatoires au 6ème Forum mondial de l'eau (CGAAER, 2012) et leurs suites (séminaires SESAME 1 et 2), le V0 Draft et les remarques développées dans la présente note nous conduisent à mettre l'accent en conclusion sur la nécessité d'un véritable « changement de paradigme » dans nos visions collectives, dans nos comportements, nos modes de gestion des ressources rurales et dans no politiques publiques de l'eau et de l'alimentation.

En termes de **visions collectives et de droits/responsabilités**, le changement de paradigme devrait conduire notamment à :

- Replacer l'homme, les populations et la question des besoins vitaux, des droits et des responsabilités au cœur des préoccupations et des débats. *Ceci pourrait se traduire notamment par une extension du droit à l'eau au droit à l'eau agricole en le liant à un devoir de responsabilité.*
- Prendre conscience de la montée des risques et des rôles multiples de l'agriculture. *Ceci signifie notamment que la société doit prendre conscience de l'importance stratégique nouvelle de l'eau (y compris du stockage de l'eau et de l'irrigation), de l'agriculture et de la sécurité alimentaire dans ses dimensions à la fois locale, nationale, régionale et mondiale ; et reconnaître et soutenir le rôle d' « agent de développement durable » des agriculteurs.*
- Prendre en compte les interdépendances fortement croissantes (pays riches et pauvres en eau, villes/campagnes, amont/aval, environnement local et global) et le fait que nous sommes tous dans un même bateau et que nous nous devons par conséquent de bâtir de nouvelles solidarités. *Ceci signifie notamment que dans le monde interconnecté qui est aujourd'hui le notre, les problèmes auxquels nous sommes confrontés ne peuvent pas être résolus par un pays ;*

on doit donc comprendre les interconnections entre pays en termes de solutions et pas seulement de problèmes. Ceci signifie encore que les villes doivent rapidement reprendre conscience de leur vulnérabilité et dépendance aux campagnes ou que l'aval ne peut durablement se développer si l'amont ne peut pas bien préserver, valoriser et gérer ses ressources. Ceci signifie également qu'il nous faut savoir dépasser des visionsenvironnementales, urbaines et économiques/commerciales à courte vue et qui tendent à faire de l'agriculture une simple variable d'ajustement ou à accroître les inégalités aux dépens du monde rural et des biens publics globaux que sont le climat et la sécurité alimentaire.

En termes d'**action**, le changement de paradigme devrait conduire à se donner l'ambition d'agir de façon concomitante dans 5 grandes directions :

1. **L'intensification durable/productivité de l'eau et de la terre**

2. **L'accroissement du stockage et la mobilisation de nouvelles ressources (yc non conventionnelles)**

3. **L'appui à l'agriculture familiale** et aux territoires ruraux pour valoriser les eaux agricoles et pastorales, permettre un accès équitable aux ressources et garantir l'application du droit à l'alimentation et un développement inclusif et durable ; et réussir la mie en mouvement, soutenir les territoires vulnérables.

4. **La réduction des gaspillages et mauvaises utilisations** (terres, nourriture, eau)

5. **La révision des politiques de l'eau et de l'alimentation, et la mise en place de visions, stratégies et solutions concertées « eau et agriculture » à des échelles infra-nationales ; y compris pour la résolution des problèmes de gestion des « sites critiques »** (nappes surexploitées…)

Ceci demande la **mobilisation de l'ensemble des acteurs, sans exclusive**, et beaucoup d'**innovations** dans tous les domaines (technologie/agronomie, social, gouvernance, droit d'accès à l'eau agricole…).

Il est essentiel d'agir de façon concomitante en mobilisant tous les leviers à la fois.

Les conclusions et « drafts recommandations » du VO Draft mériteraient donc à notre avis d'être revisitées.

Annexe

Documents du CGAAER et/ou du CGDA (Conseil Général du Développeent agricole ; Maroc), cités au fil de la présente note

L'eau et la sécurité alimentaire : défis et solutions, contribution au débat international. CGAAER 2012. *Ce rapport, préfacé par la FAO, est le fruit du groupe de travail multi-acteurs (Ministères, agences de développement, ONG, organisations agricoles, scientifiques) « eau et sécurité alimentaire » du Partenariat Français pour l'Eau (PFE), présidé par le CGAAER. Le rapport, réalisé en vue du 6ème Forum mondial de l'eau (Marseille, 2012), fait le point sur la problématique et il documente 40 exemples de solutions dans une quinzaine de pays.*

L'eau et la sécurité alimentaire : le défi vital de la Méditerranée, CGAAER et collectif, 2013. *Cette note courte est une synthèse des résultats du « Séminaire Eau et Sécurité Alimentaire en MéditerranéE » (SESAME), tenu à Montpellier en février 2013*.

La France et ses campagnes 2025-2050, regards croisés filières et territoires, CGAAER Septembre 2013

L'agriculture durable : du concept à l'action, CGDA, 2014. *Il s'agit du rapport du 11ème séminaire institutionnel du CGDA (Maroc).*

L'agriculture familiale en Méditerranée et en Afrique de l'Ouest : de nouvelles dynamiques entrepreneuriales et territoriales, CGDA et CGAAER, Octobre 2014. *Il s'agit du rapport du séminaire SESAME 2 organisé à Meknès en avril 2014*

Les contributions possibles de l'agriculture et de la forêt au changement climatique, CGAAER, Octobre 2014

121. HLPE Steering Committee and Project Team

Dear all

On behalf of the HLPE Steering Committee and Project Team, we would like to thank all of you for your contributions in reviewing the V0 draft of the report, and your proposals and for the very useful and detailed comments received.

The HLPE Steering Committee and Project Team are now extensively considering the contributions made towards the finalization of the report.

Thank you for the time and interest taken and your contribution to this important dialogue.

Best regards

For the HLPE Steering Committee, Michel Pimbert, Steering Committee member, Convener of the Steering Committee oversight for the report.

For the HLPE Project Team, Lyla Mehta , Project Team leader.