Sustainability of World Nutrition

U. Ruth Charrondiere, PhD
FAO, Rome

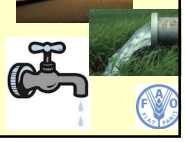
Where we are today (1)

World Population is increasing. Today we have 7 billion people. In many countries increasing % of elderly

Environment is deteriorating. Erosion. Climate change is continuing (in 2010 increase of CO_2 emission of 6%)

Limited **natural resources**. Water is becoming scare and ground water is becoming salivated in some regions. Energy is limited and oil and gas reserves are finishing

Agricultural production has to increase but land is limited and can only be expanded through e.g. deforestation. Loss of soil fertility because of pesticide use (esp. where pesticide-resistant GMO foods are grown such as soy). 70% of water is used in agriculture – increase difficult. Climate change threatens agriculture

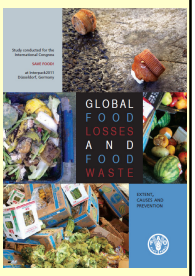


Where we are today (2)

Food Waste: 30% of the produced food is lost or wasted (1.3 billion tons per year) = waste of inputs and unnecessary increase of CO_2

Subsidies are rarely on fruits and vegetables but often on soy, wheat, sugar, soya oil (in a olive oil producing country) = enhances wrong food choice

Fat Tax to lower fat intake since 2011 in Denmark



Where we are today (3)

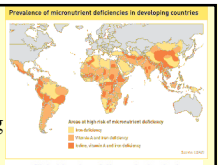
Double burden of malnutrition. Obesity endemic has reached developing countries. Non-communicable diseases are increasing worldwide. Undernutrition and micronutrient deficiencies are persisting

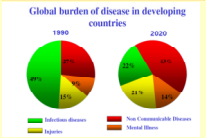
Medicalised approach is favored instead of food-based for nutrition: fortification and supplementation

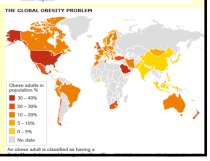
Simplification of diets and shift towards westernized diets

Increased consumption of animal products in e.g. China and India

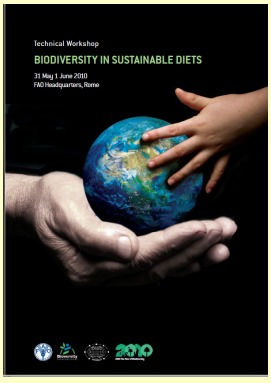
Food security is threatened in many countries, worsened through increased **food prices** and financial crisis

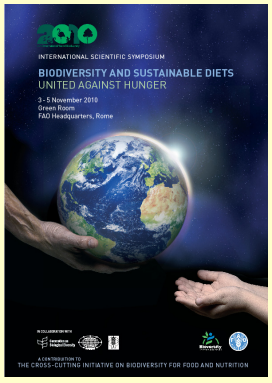






Solutions are needed in all sectors





Definition of Sustainable Diets

Sustainable Diets are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.

PLATFORM FOR ACTION

1. The participants of the Symposium recommend that FAO, Bioversity International and the CBD Secretariat, in collaboration with other relevant organizations and institutions at international /regional/ national/local level should **establish a Task Force** to promote and advance the concept of sustainable diets and the role of biodiversity within it, in the context of the CBD Cross-cutting Initiative on Biodiversity for Food

2. FAO and Bioversity International should encourage the UN System, Governments, International Organizations, International Food Security and Nutrition Initiatives and other relevant bodies to **finance and support research and development projects and programmes on biodiversity and sustainable diets**.

3. Decision-makers should **give priority to and promote sustainable diet concepts in policies and programmes** in the agriculture, food, environment, trade, education and health sectors. Nutrition should be given more emphasis by plant and animal breeders and research on nutrient content of **food biodiversity** should be encouraged. **Food composition** data should be compiled by FAO in the INFOODS databases and by regional and national institutions.

4. New projects and case studies should be encouraged to demonstrate the synergies between biodiversity, nutrition and socio-economic, cultural and environment sustainability as well as to **gather evidence about the potential of greater use of biodiversity for better nutrition and health** and for poverty alleviation and improved livelihoods. The evidence gathered from these research efforts should be compiled by FAO and Bioversity International and made available on an open access web-based platform.

5. Food based dietary guidelines and policies **should give due consideration to sustainability when setting goals aimed at healthy nutrition**. A guidance document on how to develop such guidelines and policies at national level could be elaborated by FAO, in collaboration with Bioversity International and other partners.

6. Governments, UN Agencies, Civil Society, Research Organizations and the Private Sector should collaborate in the development of programme activities and policies to promote sustainable diets in order to **achieve sustainable food production, processing and consumption, and to minimize environmental degradation and biodiversity loss**.

7. The development of a **Code of Conduct** for Sustainable Diets is strongly recommended.

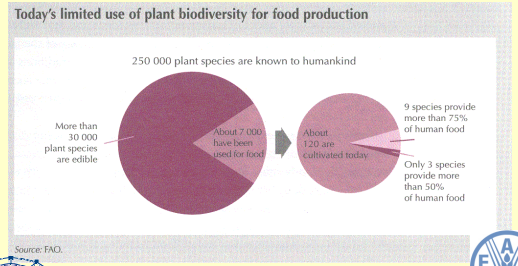
Biodiversity and nutrition

- Dietary energy supply *can* be satisfied without diversity
- Micronutrient supply *cannot* be satisfied without diversity

"Agricultural biodiversity is a matter of life and death for us.... We cannot separate agrobiodiversity from food security."

—Zambian delegate to the Conference of Parties, Convention on Biological Diversity, May 1998

Biodiversity=Dietary Diversity =Improved Nutrition



Extent of genetic uniformity in rice

Country	Number of varieties grown		
	Past	Present	Remark
Bangladesh	5,000	23	
Japan	1,302	-	>70% of area cultivated under three varieties
Rep. of Korea	4,227	12	
Philippines	-	13	
Sri Lanka	2,000	100	
Taiwan Province of China	1,679	50	> 82% of area cultivated under three varieties
Thailand	16,185	37	50% of area cultivated under two varieties

Source: Paroda, 1999

International Rice Commission

- **Rice has a key role in global food security**
- **Different varieties have statistically different nutrient contents**
- Nutrient content needs to be among criteria in cultivar promotion
- Golden Rice may help in the fight against vitamin A deficiencies, since commonly cultivated varieties contain virtually no β-carotene
- Existing rice biodiversity may also help
- Acquiring nutrient data for rice varieties is essential in order to understand the impact of biodiversity on food security

International Rice Commission

The Commission recommended that:

- Existing biodiversity of rice varieties and their nutritional composition need to be explored *before* engaging in transgenics.
- Nutrient content needs to be among the criteria in cultivar promotion.
- Cultivar-specific nutrient analysis and data dissemination should be systematically undertaken.

FAO (2002). Report of the International Rice Commission 20th Session (23-26 July 2002, Bangkok). FAO, Rome.

Differences in food composition

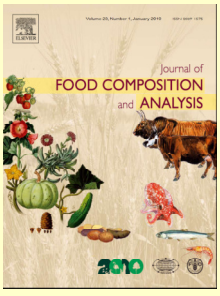
	Protein g	Fibre g	Iron mg	Vitamin C mg	Beta-Carotenes mcg
Rice	5.6 - 14.6		0.7 - 6.4		
Cassava	0.7-6.4	0.9-1.5	0.9-2.5	25-34	*<5-790*
Potato	1.4-2.9	1-2.23	0.3-2.7	6.4-36.9	1-7.7
Sweet potato	1.3-2.1	0.7-3.9	0.6-14	2.4-35	100-23100
Taro	1.1-3	2.1-3.8	0.6-3.6	0-15	5-2040
Eggplant		9 - 19		50 - 129	
Mango	0.3 - 1.0	1.3-3.8	0.4-2.8	22-110	20 – 4320
GAC					6180 – 13720
Apricot	0.8-1.4	1.7-2.5	0.3-0.9	3.5-16.5	200-6939 (beta carotene equivalent)
Banana			0.1-1.6	2.5-17.5	<1 – 8500

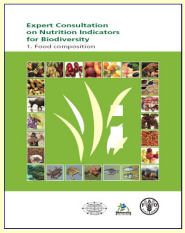
Impact of food biodiversity on dietary adequacy

Protein content	Protein content (g/100 g)	Cassava intake in Congo g/d/p	Part of the RDI for protein covered by cassava intake, in %
Average	3.24	286	20.6
Minimum	0.95	286	6.0
Maximum	6.42	286	40.8

Banana	β-carotene content in mcg/100 g	Banana intake in Philippines in g/d/p	Vitamin A intake through banana in mcg RE/d/p	RDI for vitamin A covered by banana intake, in %
USDA	26	93	4	0.7
Lacatan	360	93	56	9.3
Utin Iap	8508	93	1318.7	219.8

Improving the Evidence





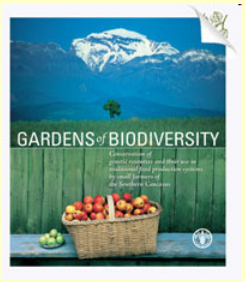
Training

- Since 1992, about 600 professionals were trained in over 20 courses, most of them did not include biodiversity
- FAO/INFOODS Food Composition Study Guide includes one module on biodiversity

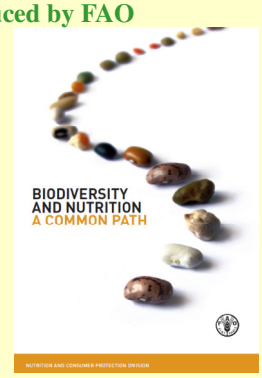
Food Composition Database on Biodiversity

- contains **only analytical** data for 182 components (macronutrients, vitamins, minerals and heavy metals, phytoestrogenes, FA, AA)
- Launched in December 2010 with 2400 foods: 1514 entries on potatoes (over 700 varieties), 27 on other roots and tubers, 444 on milk (from 14 species with 5 to 54 breeds per species), 316 on fruits, 30 on cereals, 24 on legumes, 30 on nuts and seeds, and 32 on vegetables.
- in December 2011 second edition with expected 5000 foods: more on fish, vegetables, fruits
- Download free-of-charge from INFOODS website http://www.fao.org/infoods/biodiversity/index_en.stm

Advocacy material produced by FAO



http://www.fao.org/agriculture/gardens_of_biodiversity/en/



http://www.fao.org/infoods/biodiversity/index_en.stm

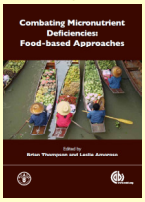
Vitamin A deficiency in Micronesia

- Traditionally, vitamin A deficiency was not know
- With shift to westernized diets (e.g. white rice and mutton tails) vitamin A deficiencies arrived
- Nutrition programme developed based on green leafy vegetables did not work as considered 'pig foods'
- Exploration of traditional diets showed that local varieties of bananas and taro were very rich in carotenoides –> current programme re-introduces the traditional diet seems to work. See http://www.islandfood.org



Prevention of vitamin A deficiency

1. **Food-based approach -> increased evidence that it works**
- Food biodiversity including wild and underutilized foods
- Traditional foods revival
- Nutrition education
- Change in agriculture production and homegardening



2. **Medicalised approach:** Fortification and/or supplementation -> **increase doubts**: read the commentary of Michael Latham 'The Great vitamin A Fiasco' at http://www.wphna.org/wn_commentary.asp)

The Great Vitamin A Fiasco (M. Latham)

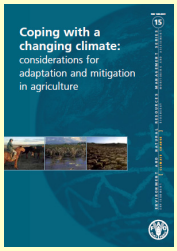
- "Vitamin A (capsule) programmes are ineffective. They use up precious human and material resources. Most of all, they impede other approaches to the prevention of vitamin A deficiency [...]. These include breastfeeding, and the protection and development of healthy, affordable and **appropriate food systems and supplies**. Such approaches also protect against other diseases, are sustainable, enhance well-being, and have social, cultural, economic and environmental benefits."
- "**capsules do not have a significant effect on mortality**" but de-worming and measles vaccination are effective
- "exceedingly rich sources of carotene such as palm and other fruits, tend to be overlooked [...], one reason being that they often grow wild, and even when cultivated do **not feature in international or national food composition tables** "

Policies/governments

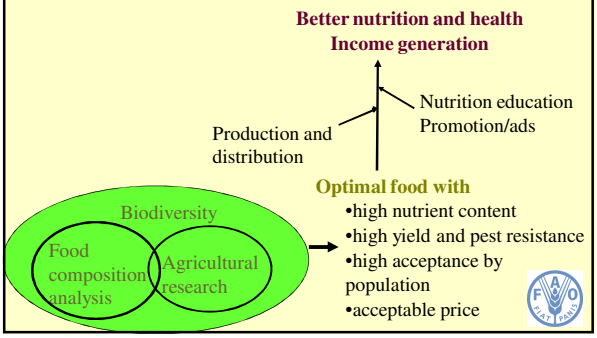
- change subsidy policies
- more countries to follow the example of Denmark in Fat Taxes?
- include more nutritious foods in food baskets for low income groups, e.g. less polished rice, more fruits and vegetables high in vitamin A and other micronutrients
- reconsider fortification and supplementation programmes – evaluate them for efficiency and impact on mortality and morbidity

Agriculture

- change food production including less inputs (energy, fertilizers, pesticides)
- explore existing biodiversity, including its compositional data
- include criteria on compositional data to develop and produce more nutrient-rich foods on large scale
- decrease food losses and waste



Food-based approach with biodiversity vs. supplementation/fortification



Nutritionists

- shift to food-based approaches
- explore regional and cultural habits and food biodiversity
- increase diversity of diets, including valuing traditional and wild foods
- promote the decrease of meat consumption where high
- include biodiversity in our work
- talk about biodiversity and sustainable diets widely (conferences, meetings...)
- get more professionals and consumers convinced about the importance of food biodiversity and sustainable diets
- send data on food composition and consumption on food biodiversity to FAO

Institutionalized kitchens (hospitals, schools, etc)

- buy locally if possible and cook freshly
- use foods varieties with high nutritional values
- propose more vegetarian foods which are tasty
- propose more fruits and vegetables
- organize events to develop the taste of kids
- use less fat, salt and sugar in preparations (gradually)

Biodiversity & Nutrition

For food composition database compilers:

- Sample and generate nutrient data for wild foods and individual cultivars, also by ecosystem
- Compile these data comprehensively, systematically and centrally, and disseminate widely

For food consumption surveys

- Include biodiversity questions and/or prompts in food consumption surveys
- Report food consumption also by ecosystem and/or ethnic group
- Communicate to food composition database compilers the need for compositional data for these specific foods

For nutrition education

- Investigate traditional foods and varieties
- Promote the most nutritious among them
- Promote home gardening
- Integrated programmes with agricultural production

Food Industry

- less packaging material
- use more renewable energy, less water and reuse 'waste' to produce foods
- decrease food loss
- use more varieties with high nutrient content to naturally "fortify" foods (biodiversity)
- use less salt and sugar (gradually)

Consumers

- use less water (e.g. less showers, economic toilet flashing), less energy (e.g. less aircon, less car)
- eat less meat, fatty snacks and soda
- eat more vegetables and fruits
- decrease food loss
- decrease obesity and over-weight
- buy locally if possible and choose varieties with good nutritional profile
- select products with less fat, sugar and salt (read label) and produced with renewable energy
- educate children to eat a diversity of foods and let them appreciate the different tastes

=> consumers are powerful – they decide to buy one product or another

Conclusions

Food composition data are fundamental for nutrition, health and agriculture and need more recognition and funding

Biodiversity can make the difference between nutritional adequacy and inadequacy and professionals and consumers need to know more about it

Biodiversity and food-based approaches are sustainable alternatives to fortification and supplementation (M. Latham: "Time to end quick fixes")

Sustainable diets are essential to feed future generations

➔ Basis to improve nutrition, health and food security based on FOODS

➔Contribute to preparedness to effects of climate change

➔Contribute to conserving and valuing our food biodiversity and our planet for our children and grandchildren

More information on the **INFOODS** webpage on biodiversity and sustainable diets

http://www.fao.org/infoods/biodiversity/index_en.stm

Obrigado

ruth.charrondiere@fao.org