



**FAO/OECD Expert Meeting on Greening the Economy with Agriculture (GEA)
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Comments by Shuhao Tan: Food system stability and green economy

Good afternoon, everybody. I would like to thank the organizers, FAO and OECD, to provide this opportunity for me to be here. With regard to the main topic of this afternoon, the stability of food system, I have several points to share with you.

First of all, I fully agree addressing the stability of food is very important. Simply keeping food quantity within a certain period does not make too much sense if it is distributed unevenly among different years (generations), or different areas. This may encourage people to utilize the natural resources with high discount rate and keep high productivity in their time but leave bad consequence to future.

Secondly, I would like to clarify what stability we are talking about, food stability, stability of food security or stability of food system. The three terms can be found somewhere in the document. It is a bit confused. I think it is necessary to clarify it. In my opinion, food stability is too vague, it can be understood as food availability, food access (those have been talked in our meeting yesterday and this morning), and the state of them, namely the availability and access of food are in an unstable way or in a stable way. Therefore, food stability should not be what we want to discuss here now.

Food security by definition itself contains meaning of stability of food access overtime. According to the commonly used definition from FAO, food security “exists when all

people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”. Another popularly cited definition from USDA, also confirms this. It says that “food security for a household means access by all members at all times to enough food for an active, healthy life”.

I therefore think that the stability we are talking about should be “the stability of food system”. Food system can be distinguished into four phases: food producing, food processing, food marketing and food consuming. The stability of food system can therefore be further distinguished into “the stability of food production system”, “the stability of food processing system”, “the stability of food marketing system” and “the stability of food consuming system”. This allows us to analyze the impacts of socio-economic factors like finance crisis and food price volatility, etc. and natural shocks like drought, flooding and insect disasters, etc. on the stability of each phase, and thus enables us to examine the mechanisms of impacts of socio-economic factors and natural shocks on the stability of food system.

Thirdly, considering my background which combines soil sciences with land management and agricultural economics, I prefer to say more about the stability of food production system. I think food production system is the basis of the whole food system. If we hope to maintain food security, maintaining a productive and stable food production system is most important. What is a productive and stable production system? First of all, it should have an appropriate structure, namely, different land use type like farming, grazing, forestry, and fishery, etc. should be optimized in terms of the land suitability. Structure of a system determines its function. What is the function of food production system? What to produce, how to produce and how much to produce, given a production system? This depends on what we are concerning about. In starvation prevailing areas, producing enough food to feed their people is the first choice.

In China, for instance, fulfilling 95% food self-sufficiency is an important objective of our agricultural policies. In doing so, China has to improve its productivity by 1% each year. With the rapid urbanization and industrialization during the past 3 decades, however, cultivated land has been greatly converted into non-agricultural purposes. Improved technologies, higher external input use, and increased cultivated land from

wetlands, forest lands and grazing lands has been becoming into new sources of food production. As a result, the original ecosystems in good conditions have been degraded. According to our observation, during the past several decades, the grain production gravity center of China has been shifted from South to North, from East to West, causing higher pressure to ecological fragile areas. For example, millions ha of grazing areas have been converted into cultivated land in some western areas of China. The best grazing land becomes into the worst cultivated land, and finally the ecosystem has been deteriorated. Numerous cases like this can be found in China and in some other developing countries which intend to keep food security and generate more income. In order to maintain the temporary growth of food production, groundwater has been used in high discount rate. This will cause instability of production system and threaten the food security in future. In addition, Chinese agriculture is characterized by high external inputs. During the past two decades (since 1990 to 2009), grain production has been increased by 25%, however, the fertilizer use has been more than doubled. Land use has been greatly intensified, causing high negative externalities to environment. It is said that more than 50% of the total population in China is produced by agriculture. This will threat the stability of the food production system.

In the countries which are still in poverty, improving income is most desirable to enable the family to afford education, health care and housing, etc. To generate higher income by producing more value-added crops is important when food security is not a problem for them. In an arid area of Inner Mongolia, it is said that the groundwater can be used for 17 years at the current speed. However, in order to promote economy development, the local government has introduced some foreign investments in vegetable plant, and exported the produced vegetables to Canada. This greatly depleted the groundwater in that area, resulting instability of the production system there.

In countries where food security and poverty are no longer problems, what to produce can have new answer. Yesterday, we heard the term of new agriculture, which mainly produces ecosystem service value. I think this is suitable for such countries, however, new agriculture to the above-mentioned two groups just like some luxury goods. They have to struggle for food and income, not environmental amenity.

During the last week, I had been in Zurich for the EAAE congress, which set a panel session for Swiss agriculture and organized a summer excursion for participants to Alp. Yesterday, Mr. Francois also introduced their agriculture. Putting all the information together, the Swiss agriculture becomes very impressive for me. I have been thinking about why Swiss agriculture can contribute to safe food supply for its population as well as to preserve the nature basis in a sustainable and market-oriented way, leading to a win-win for everybody. But for the countries with the above two situations, it is difficult for them to do so.

However, it is definite that new agriculture will be our direction in future, even for the countries with food scarcity and low income. They have to balance between now and future. Of course, only depending on them may not get out of the so-called vicious cycle, global governance is therefore needed on how to co-manage the production system of the world. This is the scope of political economics, concerning the gains and losses of many kinds of stakeholders. One stakeholder I would like to address is the pastoralists from grazing areas. In China, grassland covers 41% of its total land area, it is a very important food production system which is now most threatened by many other economic activities like farming, mining and constructing, etc. As shown in the figure we've seen from the presentation, pastoralists living in grazing areas have lowest resilience capacity. They and the production systems they are living on need more global attention.

Back to how to trade off between now and the future, yesterday, Mr. Hoffmann talked about a cost-effective way of cooling down the earth by building up the soil organic matter, etc. It sounds reasonable. However, under the current land use tenure, farmlands were allocated into numerous individual households, each household operates a small farm with several fragmented plots. Building up soil organic matter is very time-consuming for them, especially with the increase of the labor opportunity cost, farmers are more and more reluctant to do this, they prefer to apply chemicals to substitute their labor. In this case, the environmental friendly agricultural practices are not cost-effective way for them to sustain the ecosystem while maintain productivity. This is one of the reasons why there are many existing sustainable farming systems in China, but only few can be adopted by few farmers. Technically, sustainable farming is feasible, but economically it is infeasible.

Lastly, I would like to focus on the document. I have 3 comments on it: firstly, I would like to suggest the author to keep the stability concept consistent for the whole document; secondly, in the policy and institutions part, I would like to add local policy except for the national level and international level policies. The local policies can vary from community level to provincial level. According to Ostrom, for example, community-based approach maybe more effective to manage the natural resource with high externalities and difficult to be divided like wetland, forest land and grassland. The policies from different local levels may be more flexible in managing the local food production systems than the national level one. Thirdly, I would like to suggest the author to merge the last two parts, namely the solutions and measures. The potential solutions and measures for strengthening the stability of food system are already here, but they are overlapped each other. My suggestion is to reorganize these two parts in terms of technological, economic and institutional ways, or any other line.

That's what I want to say. Thank you for your attention!