



**Asia-Pacific
Economic Cooperation**

**Summary Report
of
APEC International Conference on
Natural Resources and Infrastructure Management
for Agriculture**

6-8 August 2012, Bangkok, Thailand

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1. The APEC International Conference on Natural Resources and Infrastructure Management for Agriculture was held on 6 - 8 August 2012 in Bangkok, Thailand. The Conference was attended by 150 participants from 16 member economies: Australia, Brunei Darussalam, Canada, Chile, China, Indonesia, Japan, Korea, Malaysia, Papua New Guinea, Peru, Philippines, Chinese Taipei, Thailand, United States, and Viet Nam.

2. **H.E. Mr. Theera Wongsamut**, Minister of Agriculture and Cooperatives of Thailand, delivered the opening and welcome address. The Minister stressed the importance of food security in the APEC region which can be confirmed by the initiation of the First APEC Ministerial Meeting in Niigata, Japan in 2010 and the continuation of the Second APEC Ministerial Meeting in Kazan, Russia in 2012. In Niigata, the Ministers endorsed the Niigata Declaration on APEC Food Security attached with the APEC Action Plan on Food Security. Since then all member economies have made their effort to implement activities under the Action Plan. The APEC International Conference on Natural Resources and Infrastructure Management for Agriculture is one of activities under the mentioned Action Plan. The Conference aimed to contribute to the Shared Goal 1: Sustainable Development of the Agricultural Sector of the Niigata Declaration. He highlighted the main objectives of the conference are to exchange policies, research, and best practices, outline the policy challenges, and develop recommendations on policy adjustment and revision on natural resources and infrastructure management for agriculture to pursue sustainable food production and food security. He stressed that Thailand as an agricultural economy has given high priority concern to natural resources and infrastructure management for agriculture, especially, soil and water management as key resources for agriculture. At the end, the Minister expressed his confident for the successful discussion in this Conference in order to enhance food security in APEC region.

3. **Mr. Thanawat Sirikul**, Program Director of the Agricultural Technical Cooperation Working Group from the APEC Secretariat, stressed food security as an APEC priority and the daunting challenge posed by agricultural resources degradation. He indicated that this Conference signals the collective intention and action of APEC members to contribute sustainable development and food security.

4. The Conference divided into four sessions. Session One was on the topic of Perspective on Enhancing Food Security through Natural Resources and Infrastructure Management for Agriculture chaired by Mr. Apichart Jongskul, Secretary-General, Office of Agricultural Economics, Ministry of Agriculture and Cooperatives of Thailand. The topic of Session Two was Water and Irrigation Management and Soil Management and was chaired by Mr. Chalit Damrongsak, Deputy Permanent Secretary, Ministry of Agriculture and Cooperatives of Thailand. Session Three and Four were chaired by Mr. Pinit Korsieporn, Regional Programme Coordinator from Food and Agriculture Organization (FAO). Economies reported the current and future policies on Natural Resources and Infrastructure Management for Agriculture in Session Three. Members also endorsed the future policy recommendations included in this Summary Report during Session Four.

5. **Mr. Hiroyuki Konuma**, Assistant Director-General and FAO Regional Representative for Asia and the Pacific (RAP), Food and Agriculture Organization, explained that the world has been producing enough food for everyone, however, not everyone has accessed to adequate, safe and nutritious food. He highlighted that global hunger is declining but it is still unacceptably high. It has been documented that 925 million of world population (7 billion people) were undernourished in 2010. Micronutrient malnutrition is affecting additional two billion people world-wide, whereas 1 billion people are suffering from overweight, diabetes, and non-communicable diseases. The new factor influencing hunger is food price volatility and the growing world population in cities. This implies rapid decline of agricultural labour force and change in dietary habit. He concluded that resources may be sufficient to produce food, huge investment on agricultural research and infrastructure is required to increase productivity, reduce post-harvest losses and waste. Natural resource base must be sustained and its management needs to be improved substantially to counteract competition. He also pointed out that crude oil price hike, food price volatility, bio-fuel development, emergence of trans-boundary diseases and climate changes are major sources of uncertainty. He recommended that using mineral fertilizers and organic materials to maintain soil fertility, conserving the use of indigenous, promoting agricultural research and technology for adaptation and mitigation to climate changes, promoting climate smart agriculture, water management efficiency and water saving technology, enhancing participatory natural resource management, promoting irrigation expansion and rehabilitation, combined with irrigation modernization.

6. **Dr. Katinka Weinberger**, Director, Centre for the Alleviation of Poverty through Sustainable Agriculture (CAPSA), ESCAP, defined the concept of green economy as an economic system compatible with the natural environment while being socially just. This can be equated to the 3 pillars of sustainable development; society, environment and economy. Agriculture is an integral component of the green economy, because it is a source of livelihood for millions of poor farmers and a source of food and food security. However, it is also a major source of greenhouse gas releases and unsustainable production practices contribute to high environmental cost. She highlighted five areas to facilitate green growth; promote green products and services, allow prices to reflect real cost of production and consumption, refocus from quantity to quality, of growth invest in development of mitigation strategies, and provide infrastructure. Six messages needed for further consideration are facilitating urban agriculture, focusing on transport systems, improving energy efficiency, addressing water scarcity, reducing post harvest loss, and enhancing capacity building and South-South Cooperation.

7. **Dr. Pisoot Vijarnsorn**, Senior Soil Specialist, the Chaipattana Foundation, Thailand, addressed soil situation in Asia and Pacific will worsen due to soil degradation and its negative impact on crop production. He highlighted population pressure, land scarcity and increasing of crop production in marginal land causing problem on deforestation low productivity and soil degradation in Asia Pacific. He provided example of Thailand on land use impact as all of the arable lands have been utilized for crop production and soil constraints for sustainable agriculture. There are various programs on soil and land management to minimize processes leading to land degradation conducting by many international agencies such as LADA (FAO), UN (UNCCD), GLADSOD, ASSOD, but there are some limitations that remain unresolved. Some recommendations related to soil management focusing on the adoption and the use of new cost-saving technologies and integrated planning of the land resources while at the same time minimizing environment damage. He stressed that the capacity development and the knowledge based contributed by

the proposed international institute should constitute the basic data-base for policy-making at the national and international levels. Five guidelines on soil management researches are still needed to ensure sufficient crop production : the research should clearly address the major problems of soil constraints and land degradation, should be in the line with priority of the governments and the communities, should be aimed at increasing soil productivity by means of sustainable agriculture development, should be a cost-effective technology appropriate to the condition of small holders which occupy most farms in Asia and Pacific and should be multidisciplinary and with the cooperation of a soil scientist, and agronomist, and agricultural economist, a sociologist and agricultural engineer.

8. **Dr. Cai Dianxiong**, Department Director of Soil and Water Resources Utilization, Chinese Academy of Agricultural Science presented the research result on the topic of “Nutrient management adaptation for dry land maize yields and water use efficiency to long-term rainfall variability in China”. The study explored both the impact of long-term rainfall variability and the long-term effects of various combinations of maize stover, cattle manure and mineral fertilizer (NP) applications of maize yields and water use efficiency (WUE) under reduce tillage practice. The result has shown that balance combination of stover (3,000-6,000 kg/ha), manure (1,500-6,000 kg/ha) and N fertilizer (105 kg/ha) provided the highest yield and water use efficiency.

9. **Mr. Mohammad Husni**, Directoriat General of Agriculture Infrastructure and Facilities, Indonesia, he stressed that the pressure on land resource in Indonesia has happened due to the population growth, industrialization and housing, agricultural land degradation and growing demand of healthy or organic foods. In case of water resource, it is more limited and expensive because of the increase of competition between industrial and domestic use and also the increase of water pollution. Therefore, the great Indonesian agriculture challenge is to produce more rice with limited water and land. In 2011, the President of Indonesia declared to increase rice production and in 2014, it should be surplus of 10 million tons of rice production. To achieve this target, one of policies through a newly developed paddy field extension is required with the objectives to establish new food production central as an economic driven to the region, to increase rice production in the region, to improve farmers’ welfare and to create new jobs for the local people. From 2006 to 2011, newly paddy fields extension had been developed for 124,661 ha while in 2012, Ministry of Agriculture has been targeted of newly developed paddy field extension of 100,000 ha and from 2013-2014, the target of new paddy field extension is 200,000 ha. Agricultural development to improve the paddy field contributing to national food security strategy could be carried out by building public awareness of the importance of sustainable rice development and phenomenon of food crisis, building policy at national and regional levels, developing of farm estate based on holistic re-identification, using lesson learned from the implementation of programs, projects and policies earlier, and utilizing the indigenous resources and integrate it with innovation.

10. **Dr. Seong-Soo Kang**, Soil Scientist, Rural Development Administration, Korea, introduced soil and nutrient management using Soil Information System. The overall objectives are to provide information on soil characteristics at a field, regional, and national level for farmers, researchers, and decision makers. Soil information has been provided in many forms such as GIS map service which included morphological and physical properties map, land use map, soil classification map, crop suitability map, and chemical properties map. He indicated that Korea also provides Mobile Web Version to access soil information

easily for both general users and specific users. Soil information has been published such as crop suitability service, fertilizer recommendation check, and crop nutrient diagnosis.

11. **Dr. Pitayakorn Limthong**, Land Development Department of Thailand presented about the introduction of soil in different parts in Thailand, natural resource situation, production of major agriculture goods, zoning of economic crops and soil management for sustainable agriculture. It is crucial to preserve the natural resource in the same time with economic development, as Thailand is a developing country. In order to utilize soil resource in sustainable way and to promote food security, zoning of economic crops including rice, cassava, para rubber, maize, had been done by the Ministry of Agriculture and Cooperatives. Also, soil management for sustainable agriculture has been widely applied throughout Thailand which it supports the sufficient economic in the mountainous area. He emphasized that all activities and facilities of Land Development Department are promoted to develop basic infrastructure on land development, soil improvement and soil rehabilitation to increase agricultural productivity and sustainable land use. These activities can be completed through the officers and the soil doctor volunteers across the country.

12. **Dr. Somkiat Prajamwong**, Director, Bureau of Project Management, Royal Irrigation Department, Thailand, indicated that Thailand has experienced with various forms of disasters. Flooding was one of important natural disasters which caused widely affected to both agriculture and non-agricultural activities. Approaches for water and flood management including at upstream, middle, and downstream as well as supportive measures such as adjustment of cropping calendar has been presented.

13. **Dr. Panut Manoonvoravong**, Geologist, Department of Water Resources, Thailand presented about preparedness of Thailand to confront with climate change. He indicated that Thailand has been supported by World Bank to develop model as a policy tool for adaptation to climate change impacts on water and natural resources which is called “Hydrologic-Agronomic-Economic” or “HAE Model”. Process of model construction and its beneficiary has been presented. The future climate change, using IPCC scenarios A2 and B2, was developed into this HAE model to anticipate the impact of climate change on the hydrologic regime, water usage, agricultural production and socio-economic conditions. The pilot area was selected in Kong-Chi-Mun basins. Bias adjusted climate scenario data, the future climate scenario data, were applied in both hydrological and crop models to create the scenarios of these fields under the conditions of A2 and B2. Then economic model was used to evaluate the benefit cost ratios of adaptation and mitigation measures in these components.

14. **Brunei Darussalam** presented the program on increasing rice production in response towards food security issues. Brunei depends on importing rice for domestic consumption around 97% in 2009. It is targeted to increase the domestic production by 60% in 2015. However, there are 3 critical success factors include opening new area, upgrading farm infrastructure and introducing new “High Yielding Variety”. The on-going plan of action to achieve the targeted production in 2015 include improvement of irrigation system and infrastructure, re-infrastructure of mechanisations, introduction of new high yielding variety, collaboration with other country, promoting and capacity building by introduction of farmer’s school.

15. **Chile** introduced its variety of agriculture productions from different geography and climate along the North through the South – dessert, arid, Mediterranean, mildly cold, and rainy and tundra – so that, exporting productions were quite assorted. Chile has become an

open economy, as a result of unilateral tariff reduction and several trade agreements, with the aim to diversify agricultural exports. Since 1984, import tariff have been lowering to 6% as the non-preferential tariff and as low as 1.8% on average under trade agreements. Chile has signed 22 trade agreements with 58 countries which covered 86% of the world's GDP and 63% of total population. Its agricultural trade balance has been surplus and shown positive impact after signing FTAs with China, United States, and EU. The country has been the major exporter of agricultural products of the southern Hemisphere. In detail, Chile is the world's first exporter of blueberry (33%), of grapes (22%), of plums (18%). Regarding water management policies, Chile has 22% of irrigated areas with 29 dams, and is planning to construct 17 more dams for irrigation. Infrastructure and technology have still been demanded. Soil management policies have focused on both erosion prevention and recovery of eroded soil, since 23% of agriculture land is facing erosion problem. So, Soil Recovery Programme has been implementing as one of the main policies since 1996. They are planning to benefit 18,000 farmers and 170,000 hectares annually for the next years.

16. **Malaysia** experiences in the threats of land degradation caused by excessive amounts of seasonal rain. Potential areas of degraded lands in Malaysia comprise of steep land and mountainous areas, peat land, land with acid sulfate soils and the impoverished sandy beach BRIS (Beach Ridges Interspersed with Swales) soils, mined land and areas under shifting agriculture. Preventive measures in forms of policies, legislations, guidelines and awareness campaigns are implemented in order to mitigate land degradation. Malaysia is considered successful in the rehabilitation of the severely degraded ex-tin mining land for productive and economic use as well as optimized suitable peat land into agriculture or other commercial use. Policy guidelines are in place to guide the land use planning and management on sustainable basis. Technical guidelines for various types of development have also been drawn to ensure the use of environment-friendly on-site operations. Legislation has been enacted as a deterrent against land mismanagement and abuses.

17. **Peru** briefed on water resource and irrigation policies and general facts about water use. Water is not adequately managed, irrigation efficiency is low, and water fees do not cover real costs. Agricultural sector is the highest water consumes which account about 85.7% of total water available and water conflict among sectors are appeared. Because of low precipitation and irregular rain fall, as this result, irrigation plays vital role in increasing agricultural productions and food security in Peru. The irrigation policies have been set to improve profitability and competitiveness of irrigated agriculture by intensive and sustainable use land and increase water use efficiency. Achievements of implementation in the irrigation area are also presented.

18. **Philippines** expressed concerns on domestic food security; therefore, the government promoted self-sufficiency policy by launching the Food Staple Self-sufficiency Program (FSSP). The government set the target domestic milled rice supply to be 18.19 million mt. by the year 2016. The supply and demand of milled rice was expected to be matched by 2014. The status of Irrigation Intervention under the FSSP included four elements: 1) targeting rice self-sufficiency 2) achieving irrigation quota 3) optimizing irrigation benefits 4) expediting project execution and 5) enhancing irrigation performance. The accomplishment of the project includes rolled-out irrigation area and incremental harvested area and crop production.

19. **Chinese Taipei** presented the management of water and Land resources for agriculture. Due to the uneven distribution of precipitation and increase of frequency and severity of

droughts and floods particularly in 2009 that typhoon MORAKOT struck the southern Chinese Taipei and it resulted to dead and missing of people, loss of agricultural land and failure of hydraulic facility, therefore, to improve the farm production environment and water logged soil, the practice of farm land consolidation is implemented. RS and GIS technologies have been used for planning the special crop production and marketing areas. Since the uneven feature is predicted to be more significant according to the trend of climate change, therefore, policy for climate change adaptation and agricultural food security are implemented. In terms of climate change adaptation, policy consists of strengthening of multi-functional irrigation infrastructure, improving basic environment for agricultural production, carrying forward productive, ecological and living functions of agricultural water resources, building up national Geographic Information System for irrigation, upgrading of irrigation management efficiencies, and utilizing the resources of Irrigation Associations to develop water resources related industry. For food security the policy rely on raising food self-sufficiency rate and increasing domestic food production and consumption and safeguarding water and soil resources required for agricultural product to ensure food security.

20. **Thailand** presented soil and water management for agriculture to ensure food security in 3 main topics. First; current situation of soil and water management, about 47% of total land area is used for agriculture, of which only 19.3% are under irrigated condition. Thailand has faced many challenges is soil and water management including soil erosion, soil degradation, soil salinity, water scarcity and competitive use between sectors, flood and drought. Second; to ensure food security, natural resources management policies has been put in the 11th National Agriculture and Cooperative Development Plan under the concept of “Efficiency, Balance, and Sustainability” and preparedness for climate change adaptation and participatory approach. Third; successful soil and water implementation cases including use Vetiver grass for soil and water conservation, selected salt tolerant crops growing to solve soil salinity problem, and participatory approach in irrigation management has presented.

21. **Vietnam** presented the new context on food security. Focusing on food availability, its rice production has shown significantly increase to 20 million – much enough to serve decreasing domestic demand and to export as high as 7 million tons in 2011. Increasing income growth reduced its poverty rate in both rural and urban areas from 18.1% in 2004 to 12.6% in 2011; therefore, it improved food accessibility and nutrition patterns, shifting from carbohydrate to protein products and fruits, while undernourishment still occurs. Also, there are such factors as fluctuated food prices, natural disaster, and crop competition challenging its food stability. Food security towards 2030 has been expected to face new challenges such as climate change, competitive use of resources, fossil fuel scarcity, and growing food demand. To ensure long-term food supply, Vietnam issued land policies to protect and maintain natural resources and to enhance the infrastructure for agricultural production which mainly focused on ensuring the proper use and management of paddy land, promoting land exchanges and accumulation, and supporting policies to protect and enlarge paddy land. Besides, policies on water resources have been issued to set out the comprehensive measures regarding protection, exploitation, use, and development of water resources for agriculture production. Agricultural infrastructure policies including irrigation, storage, scientific researches, and trading have also been issued.

22. **Closing Session:** Closing remarks by Mr. Apichart Jongskul, Secretary-General, Office of Agricultural Economics.

Future Policy Recommendations

1. We, APEC member economies, recognized the crucial role of natural resources (soil and water) and infrastructure management toward sustainable agriculture development and food security, and agreed to endorse the continuation of activities on the improvement of natural resources and infrastructure management for agriculture.
 2. Looking forward to the potential of green production, since water and soil management are closely linked to climate change, APEC member economies agreed to promote and invest more in the cooperation on researches including consultations among member economies on natural resources and infrastructure management for agriculture.
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