

## **Thailand Submission to the Subsidiary Body for Scientific and Technological Advice Views on Climate Change Adaptation for Agriculture**

- 1 In response to the Subsidiary Body for Scientific and Technological Advice (SBSTA) at its' Thirty–eighth Session inviting Parties and admitted observer organizations to submit to the secretariat, by 2 September 2013, the views on the current state of scientific knowledge on how to enhance the adaptation of agriculture to climate change impacts while promoting rural development, sustainable development and productivity of agricultural systems and food security in all countries, particularly in developing countries, Thailand herein submits its views as follows:
  
- 2 Thailand reaffirms the principles and provisions of the Convention, in particular the principle of common but differentiated responsibility as stated in the Preamble and the commitments in Article 4 of the Convention. Ways and means to enhance the adaptation of agriculture to climate change impacts should comply with these principles and provisions.
  
- 3 Thailand today faces a number of challenges affected by climate change such as, flood, drought, land-slide, rising sea level, biodiversity loss, and health risk. Agriculture, which is a fundamental part of the Thai economy and plays a significant role in food security, poverty reduction, and sustainable development, is at risk. Due to the lag in technology, the weakness in infrastructure, and the low adaptive capacity, agriculture becomes one of the most vulnerable sectors. Thailand recognizes that agricultural adaptation to climate change impacts is an instant need and the priority. Thailand recognizes the need to improve agricultural practices and technology and promote the adoption of the technology that will help to strengthen farmers' capacity and build resilience and sustainable agriculture.
  
- 4 In the past few years, Thailand has formulated several plan to respond to climate change impacts and prepare for agricultural adaptation. Among the most important plans that frame the works of adaptation in Thailand are Long-term Climate Change Master Plan, the 11th National Economic and Social Development Plan (2012-2016), and the Agriculture Strategic Plan on Climate Change (2013-1016). Key adaptation strategies includes building capacity of stakeholders, such as farmers, agricultural extension officers, policy makers, and scientists to better understand and appropriately respond to climate change, raising awareness and promoting public participation, supporting research and development on technology and practices, information collection, data analysis, and modeling, as well as supporting international cooperation to accomplish the common goal of climate change adaptation and sustainable development.

## 5 Priority Adaptation Technology Needs in Agriculture

### (1) Forecasting and Early Warning Systems

Increasing the forecast ability of the weather and pest or disease outbreaks is the first target for technology transfer and diffusion of the forecasting and early warning systems. This group of technology could reduce the risk of farm damage and increase crop yields by allowing farmers to select more appropriate planting times and crop cycles.

Forecasting and early warning systems are being used to monitor and predict weather patterns. The software supporting these systems is typically imported. Furthermore, the use of simulation models to predict pest/disease patterns is still rare, with several research institutes only beginning the preliminary development work, therefore requiring technology and knowledge transfer from more technologically advanced countries.

It is noted that long term forecasting technique is also needed.

### (2) Crop Improvement Technologies

This group is the technology that reduces the risk of yield loss while improving the efficiency of resource consumption for sustainable agriculture development. Crop improvement strategies under climatic variability may include (2.1) increasing the resilience of agricultural ecology to changing climates, (2.2) improving tolerance to abiotic stress such as drought, flash flooding, stagnant flooding, salinity, and temperature variation, (2.3) increasing photosynthetic efficiency, (2.4) increasing water-use and nitrogen-use efficiency, (2.5) decreasing non-photoperiod sensitivity, and (2.6) improving pest and disease resistance.

Technical development and training programs for plant breeders are needed, especially those in crop improvement programs for adapting to climate change, molecular breeders, physiologists, plant pathologists and entomologists. Enhanced capacity in the field of physiology is urgently needed. Advanced technologies needed for research in crop improvement technologies are costly and require the help of the government and international support.

### (3) Precision Farming Technologies

Precision farming in Thailand is at an initial stage of development. Even though some technologies such as drip irrigation system, customized fertilizer and closed system for aquaculture have already been transferred to pioneer farmers, the number of technology recipients is quite limited. Most projects and initiatives are still at a pilot/prototype-building stage.

This group of technology is to enable farmers to make informed decisions concerning their farming operations as well as to reduce inputs while maintaining maximum productivity and minimizing the effects on the environment. To apply this technology, a number of data are required, for instance, regional data on soil conditions, available water, wind, temperature and sunshine levels, local pests and diseases, and

biological data of animals, plants, pest and diseases. Therefore, suitability of imported technologies (especially sensor technologies) is needed.

(4) Water Resource Management

Water resource management barriers mostly are, for example, the lack of funding for the initial project investment and program maintenance, the lack of know-how in the design of a reservoir network and the lack of an essential database such as geographic data. Adaptation technology prioritization is as follows:

- (4.1) Networking (via pipes or canals) and Management of Infrastructure under the operation of water infrastructure technology.
- (4.2) Seasonal Climate Prediction under the weather and hydrological modeling technology
- (4.3) Sensor Web using observation and/or modeling data under the early warning technology

(5) Modeling Sector

The modeling sector is working at the interfaces between climate change and other affected sectors, including the agricultural sector and water resource management sector. It provides adaptive tools for coping with undesired consequences of climate change. Modeling tools are recognized as needed technology for both the agricultural and water resource management sectors. Priority technology needs are as follows:

- (5.1) National Data Center (containing an essential hardware and a large collection of data from various relevant and creditable sources)
- (5.2) National Data Transfer/Management
- (5.3) Integrated Modeling using the Weather Forecasting Technology

6. To enhance the adaptation of agriculture to climate change impacts as well as to ensure world food security and sustainable development, Thailand welcomes ways and means to support adaptation and adaptation co-benefits in the above-mentioned sectors/areas as follows:

- (1) Information and Best Practices Sharing/Exchange
- (2) Technology Development and Transfer
- (3) Expert Exchange/Assistance
- (4) Collaboration on R&D
- (5) Capacity Building (training, workshop)
- (6) Finance (including the Adaptation Fund)/ Grant/Scholarship
- (7) Building Network of Researchers/ Practitioners/ Experts in Related Fields.