Training course on the Application of Remote Sensing and GIS in Crop Production (APEC)

Summary Report

Agricultural Technical Cooperation Working Group

November 2013

Contents

Acronyms used in this report

ATCWG- Agricultural Technical Cooperation Working Group

GIS- Geographic Information System

IT- Information Technology

RS-Remote Sensing

1. INTRODUCTION

New technology, such as remote sensing and GIS is shaping economic activity, especially agricultural production. Remote sensing, GIS technology and its application greatly affect food security and it has been popular in calculating and predicting crop acreage and production. In addition, as an extension of the APEC funded workshop - "the Workshop on the Application of Remote Sensing and GIS on Crops Productivity among APEC Economies" held in Beijing in July, 2012, the effectiveness of sharing expertise from last workshop should be tested and discussed. Moreover, the remaining problems from last workshop, such as data integration and modelling, decision-support methods need to be addressed.

The APEC "Training Course on the Application of Remote Sensing and GIS Technology in Crop Production" was held in Beijing, August 27th-30th, 2013 against this background and in recognition of the need to provide a platform for sharing information and technological expertise on the issues related to the application of geographic information system (GIS) and remote sensing technology in crop production among APEC economies and for around the globe.

There were three key objectives of the training course: 1) to respond to the output of "the Workshop on the Application of Remote Sensing and GIS on Crops Productivity among APEC Economies" held in Beijing in July, 2012; 2) to increase capacity building for APEC economies, especially for developing economies; 3) to help technical extension of the application of remote sensing and GIS in agriculture among APEC economies.

Co-sponsored by Thailand, Chinese Taipei, and supervised by the Chinese Ministry of Agriculture, P. R. China, this training course was organized by the Institute of Agricultural Resources and Regional Planning (IARRP), Chinese Academy of Agricultural Sciences (CAAS). Delegates from 12 APEC economies attended the workshop, including Australia, Chile, Indonesia, Malaysia, Mexico, Peru, Philippines, Chinese Taipei, Thailand, USA, Viet Nam and the host China and invited Hungary. Nearly 110 people in total participated in the workshop.

2. TRAINING COURSE DESCRIPTION

At the opening ceremony, Dr. XU Minggang, Deputy Director of Institute of Agricultural Resources and Regional Planning, hosted the opening ceremony and welcomed all participants and introduced other dignitaries on the platform: Delivering the welcome address were Dr. TANG Huajun, Vice president of CAAS and ATCWG Lead Shepard, also expressing his appreciation at being present and for the support of delegates for this training course on behalf of the host. Mr. Huang Minjie, Deputy Director of Administrative Regulations Department, Ministry of Finance and Ms. WANG Weiqin, Director of International Cooperation Department, Chinese Ministry of Agriculture also address the training course.

The training course was divided into eight sections where experts from their respect economies and organizations presented their research outputs and strategies related to the application of remote sensing and GIS technology during this three-day training course. Participants were actively involved in the training course discussions. The delegates presented a total of 34 ppts.

3. KEY OUTPUTS

Through the three-day presentations and discussions, participants agreed to summarize the key points raised during the training course. Dr. HE Yingbin was commissioned to wrap up discussion by addressing key themes, response to major objectives, limitations and challenges, and highlighting important undertakings associated with capacity building activities in the future.

Key themes

- Crop monitoring activities

    Prof. Chi-Farn Chen (Chinese Taipei case studies)

    Dr. Dr. Rizatus Shofiyati (Indonesia case study)

    Dr. Nguyen Thi Hong Anh (Vietnam case study)

    Mr. Márton DEÁK(Hungary case study)

- Accurate crop acreage, yields, and mapping assessment and prediction

    Dr. Andrew James Robson (Australia case study)

Prof. Huang Shuchuan (Chinese Taipei case studies)

Dr. Jiang Zhiwei (China case study)

Dr. Kasper Johansen (Australia case study)

Dr. Syed Hakim Syed majid (Malaysia case study)

Dr. Huang Qing (China case study)

Dr. Ren Jianqiang (China case study)

Dr. Yu Shikai (China case study)

Dr. Eduardo Jimmy P.Quilang (Philippines case study)

Dr. Karika Kunta (Thailand case study)

Dr. Pornpun Hensawang (Thailand case study)

- Natural disaster monitoring in this fields

    Dr. Eugenio González Aguiló (Chile case study)

    Mr. Fan Jinlong(China case study)

    Mr. Henry Saul Juarez Soto(Peru case study)

    Dr. Xerxees R. Remorozo(Philippines case study)

    Dr. Huang Wenjiang(China case study)

- New instruments used in this field

    Dr. Noemí López González (Mexico case study)

- Other aspects based on remote sensing (crop evapotranspiration, GM crops risk analysis, snow coverage, land surface temperature retrieval, land use analysis, etc.)

    Dr. Sun Liang (China case study)

    Dr. Jorge Alcantara Delgado (Peru case study)

    Dr. Wu Shengli (China case study)

    Dr. Gao maofang (China case study)

    Dr. Li Zhibin (China case study)

- Other extensions (global change, quantitative remote sensing, soil Organic Matter, crop evapotranspiration, soil carbon sequestration, etc.)

    Prof. Li Zengyuan (China case study)

    Dr. Wu Wenbin (China case study)

    Dr. Yang Guijun (China case study)

    Mr. Cao Qiwen (China case study)

    Dr. Li Man (China case study)

    Dr. Ye Liming (China case study)

    Dr. Bai Linyan (China case study)

4. RESPONSES TO MAJOR OBJECTIVES

- This training course is an extension of the APEC funded workshop 2012 — "the Workshop on the Application of Remote Sensing and GIS on Crops Productivity among APEC Economies", in which remote sensing methods, data integration and decision-support methods were identified as the key challenges. These issues have been well addressed in this training course.

- Project outputs increased capacity building of applying GIS and remote sensing technology to monitor crops acreage, predict crops growth situation and production, and assessed crops growth suitability for APEC economies.

- Participants were actively involved in sharing applicable and universal method and model in the related field. Presentations and discussions were closely connected with the application of the remote sensing and GIS technology. It much facilitated technological cooperation and advance public awareness in this field and it will benefit for ensuring food security.

5. OVERALL LESSONS LEARNED

In terms of experiences of holding this training course, we believe that we should have continuous communication and issue tracking after the meeting. What's more, apart from the presentation, a filed observation made a profound impression on

participants in the training course this year. The combination of these two approaches and any others if possible can highly increase efficiency.

At present, the technical cooperation is still very limited among APEC members, which is not conducive to rapid progress in this field.

As for the limitation and challenges, in terms of the direction of modelling, we have following problems at present: the data's price and the range of application; the share of the data and model among APEC economies and the model is not sensitive enough to data. All these technical problems need continuous hard work.

6. CONCLUSIONS AND NEXT STEPS

In general, the project went very well. Participants were activity involved in training course deliberation. During and after the meeting, the participants highly praised the training course and put forward some suggestions.

Suggestions

(1) Establish a consortium, which consists of APEC economies, namely APEC Consortium on Remote Sensing in Agricultural Crop Monitoring. The Consortium aims to cooperate, discuss, and exchange experiences between members. This group can also conduct research cooperation between members. Communication can be done in several ways, i.e. teleconference, mailing lists, and even a seminar held annually alternately in economy member.

(2) The training course has built up the bridge and linking among APEC economies, hoping that the ATCWG can continue to support this activity in the future. This training course demonstrates the different techniques and concepts in applying GIS in various fields. All techniques are very useful. In addition, APEC should organize a project to set up the cooperation among APEC economies to transfer knowledge and enhance capacity building in the developing Economies. It should be elevated to the APEC Secretariat some cooperative research/ projects which will be identified by the training/ workshop. This will hasten a stronger technical cooperation from the APEC members. The group can develop a proposal that can be submitted to APEC or other International Agencies for funding. We can have cross-learning visits to other countries. Sharing of satellite

images by countries with own satellites to those countries which have no satellites are suggested. Consistent person as participants in so the group can further develop camaraderie and friendship.

(3) There could be a concrete resolution and agreement signed by the participating economies. It could indicate the specific parameters on data sharing and integration. If possible, there should be consensus from the group on what considerations and/or templates will be used in the modelling particularly in crop prediction and acreage monitoring.

(4) In the course training program, Bigger event venue with more participants and parallel sessions (Specific sessions about one topic), if possible, could be available. The participants may be grouped randomly or according to their expertise/interests. In terms of training design, it would be better if there will be an actual "hands-on" instead of a lecture/Q&A type of training. The most senior participants, particularly those from the academe, may be asked to be the in-depth resource speakers for a particular topic. At the end of the training, these groups or clusters will be asked to present a prospective project based on their learning from the lectures. The group could also identify which among the presentations are feasible for scaling-up or for extension to the grass-roots/ farm level. The complaint of most policy-makers is that some of these IT researches are not being felt by the primary stakeholders of the agriculture and fishery sectors, particularly the farmers and fisher folks. It may not be as detailed as a project proposal; a conceptual framework or paper may do. It could be presented at the end of the training program by the designated resource speaker from the group.

Next Steps

With the environmental problem becoming more and more serious, the application of RS and GIS technologies is becoming wildly and highlighted. Meanwhile, in response to the suggestions above, we will try our best to cooperate with other APEC economies to further develop RS and GIS technology.