



Sustainable Agriculture and Natural Resource Management
Collaborative Research Support Program

SANREM CRSP Newsletter

December 2008

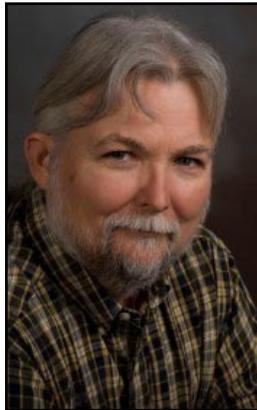
Promoting stakeholder empowerment and improved livelihoods
through knowledge-based sustainable agriculture and natural resource
management systems

Director’s message	2
Research spotlight	2
LTRA-4: Adapting to Change in the Andes: Practices and Strategies to Address Climate Change and Market Risks in Vulnerable Agro-ecosystems	2
News	3
Southern Sudan Associate Award focuses on higher education.....	3
Gender workshop concentrates on community, conflict, stereotypes	4
More than 300 researchers to attend January’s SWAT-SEA conference.....	4
Surveys contribute to planning for SANREM CRSP Phase IV.....	5
Fighting poverty in the Andes with potatoes and paintings	5
Report from National Academies sets priorities for 2 developing regions.....	6
Notes	7
Kudos	7
2009 Calendar	8

This newsletter is published by the SANREM CRSP Management Entity and Virginia Tech’s Office of International Research, Education, and Development, 526 Prices Fork Road (0378), Blacksburg, VA 24061. SANREM CRSP is made possible by the United States Agency for International Development and the generous support of the American people through USAID Cooperative Agreement No. EPP-A-00-04-00013-00.



Director's message



The SANREM CRSP is entering the final year of Phase III, and our five long-term research activities (LTRAs) are showing measurable scientific and practical results in sustainable agriculture and natural resource management. This newsletter highlights LTRA-4, Adapting to Change in the Andes, led by Corinne Valdivia of the University of Missouri-Columbia. Details of all five LTRAs' achievements will be in the *SANREM CRSP Annual*

Report 2008, to be published later this year.

Among our recent products were two workshops organized in Bolivia by Gender Equity Coordinator Maria Elisa Christie; results of partner surveys on research priorities for SANREM Phase IV; and news that USAID has awarded SANREM an Associate Award to assess higher education curricula needs in agriculture and environmental sciences in the southern Sudan. A SANREM team led by Michael Bertelsen, SANREM's economic assessment impact coordinator, visited the southern Sudan in mid-November and met with officials of the government of southern Sudan and representatives of southern Sudan universities to begin developing curricula for proposed degree programs in agriculture and environmental sciences. The team will be returning to the southern Sudan in March to complete the project.

Planning continues for the 2009 Soil and Water Assessment Tool - Southeast Asia (SWAT-SEA) Conference in Chiang Mai, Thailand. Organized by Manuel Reyes, principal investigator (PI) for LTRA-5, and cosponsored by SANREM, the Jan. 5-8 conference will highlight the use of the SWAT model for watershed management in Southeast Asia. The conference is expected to draw more than 300 scientists and development specialists from around the world. More information on the conference is available at <http://www2.mcc.cmu.ac.th/swat/>

SANREM is still awaiting formal renewal from USAID for SANREM Phase IV, which will begin in October 2009. We were notified orally that we would be renewed as a result of our positive External Evaluation Panel and Administrative Management reviews and USAID's decision to extend SANREM, but we are still awaiting USAID's written request for an application for extension and details of the extension. We had expected formal notification in July and had planned to issue requests for applications for Phase IV research activities after the first of the year and to initiate new long-term Phase IV research activities in October 2009, but this is

looking exceedingly unlikely due to USAID's delay in issuing the required extension documents.

As we approach the end of the calendar year, the SANREM Management Entity (ME) sends best wishes to all of you, our partners and associates around the globe, for a happy holiday season and a prosperous new year.

Theo Dillaha
SANREM CRSP program director

Research spotlight

LTRA-4: Adapting to Change in the Andes: Practices and Strategies to Address Climate Change and Market Risks in Vulnerable Agro-ecosystems

PIs: Corinne Valdivia, lead; Peter Motavalli and Jere Gilles, University of Missouri

Karen Garrett, Kansas State University

Anji Seth, University of Connecticut

Cornelia Flora and Jan Flora, Iowa State University

Jorge Cusicanqui and Magali García, Universidad Mayor de San Andrés, Bolivia

Elizabeth Jiménez, Universidad de la Cordillera, Bolivia

Miguel Angel Gonzales and Javier Aguilera, PROINPA, Bolivia

Edith Fernández Baca, Cecilia Turín, and Silvana Vargas, Universidad Nacional Agraria La Molina, Perú

Roberto Quiroz and Greg Forbes, International Potato Center (CIP), Lima, Peru

Host countries: Bolivia, Peru

Overview: Amid climate, economic, and social changes in the Andean regions of Bolivia and Peru, small landholders are increasingly vulnerable to environmental and market shocks and stresses. This project works with farmers to explore ways of adapting to change and building resilient livelihood systems. The goal is to achieve food security and biodiversity by teaching rural communities how to conduct research and develop production alternatives.

Research indicates that, by mid-century, the region can expect fewer days of frost, longer heat waves, a shorter but more intense rainy season, and more consecutive dry days. Farmers perceive that climate risks and shocks are increasing, citing as examples the droughts of the 1980s, followed by frosts, hail, and floods that have become stronger.

To help communities respond to these changes, the SANREM team is testing strategies and technologies to mitigate weather-related risks, enhance soil organic matter,



preserve cultivars and native plants, and find new markets for long-established crops. Scientists are seeking to improve farm productivity with conventional and alternative organic fertilizers such as compost and peat moss, and to determine how soil quality is affected by changes in fallow length and cropping systems. In collaboration with CIP, researchers are studying pest dynamics and diseases in the production of potatoes, particularly management of white moth, Andean potato weevil, and late blight outbreaks in changing climatic conditions. PROINPA Foundation, which preserves and promotes native Andean crops, is working with SANREM in Bolivia to make the region's products more commercially competitive.

Few small farmers in the region have access to credit through conventional financial institutions like banks, relying instead on savings, sale of livestock, or off-the-farm jobs to survive crop loss and other setbacks. To increase farmers' negotiating power in the marketplace, SANREM researchers are using an advocacy coalitions approach to strengthen social and political capital and to improve access to financial capital and market outlets.

Networking is an integral part of this project's mission to build and transfer new knowledge. Workshops and field days offer practical technologies and strategies that farmers can learn and use effectively. SANREM researchers earlier this year shared climate-change projections and ongoing research on adaptation for the Altiplano with Bolivia's National Program on Climate Change. With the McKnight Foundation, CIP, and the SANREM team, PI Corinne Valdivia organized a workshop in Lima on climate change and Andean agriculture production. SANREM partnered with Peru's Universidad Nacional Agraria La Molina to lead workshops for farmers on animal health and pest control.

In partnership with PROINPA, Universidad de la Cordillera, and Universidad Mayor de San Andrés in Bolivia, seminars and short courses have been offered on a wide range of topics, from handling agricultural chemicals to conducting

household surveys. The project also is supporting graduate students in soil science, eco-agriculture, agricultural economics, and social sciences. By collaborating with rural communities in the Altiplano of Bolivia and Peru, as well as with universities, non-governmental organizations, and U.S. institutions, the SANREM team is developing knowledge, practices, and strategies capable of building resilient livelihoods and ecosystems across the region.

On the Web. LTRA-4 launched its website this year, providing links

to details of the project's objectives, partners, publications, and reports. Each page features a photo of SANREM team members at various research sites and in meetings and workshops with local farmers. See: <http://sanrem.missouri.edu>

News

Southern Sudan Associate Award focuses on higher education

The SANREM CRSP has received an Associate Award from USAID's Sudan Mission to assess higher education needs in agriculture and natural resource management in the southern Sudan, a region largely in ruins after more than 50 years of civil war. Because the region's higher education system collapsed during the war, few well-trained Sudanese are available to deal with agriculture and natural resource issues. SANREM's goal is to evaluate education and human resource needs in the southern Sudan and to develop higher education curricula to meet these needs.

Subsistence farming and grazing form the economic base of southern Sudan. They employ the vast majority of its people, 90 percent of whom earn less than \$1 a day. Since a peace agreement was signed in 2005, refugees have begun returning to find an almost complete lack of services such as health care, schools, roads, and markets. For the region to develop into a modern, market-driven economy with food security, basic agricultural services such as education, extension, and research must be reestablished. Together with local and international experts, the SANREM team will begin by reviewing national and global models of higher education in agriculture, and gathering data to identify needs that can be addressed through new curricula to enhance farm production and ecosystem services.

The Associate Award is being led by Michael Bertelsen, SANREM's economic assessment impact coordinator and

associate director of Virginia Tech's Office of International Research, Education, and Development. Co-PIs are Program Director Dillaha and Father Michael Schultheis, acting vice chancellor for the Catholic University of the Sudan. "As the government of the southern Sudan works to restore basic services, assistance from agencies like USAID is essential to promote stability and peace in the region," Bertelsen said. After a preliminary review of the situation, Bertelsen traveled to Juba in November with Dillaha; Tom Broyles, assistant professor of agricultural and extension education at Virginia Tech; Peter Wyeth, agricultural economist in international programs at Washington State University; and Alice Pell, vice provost for international relations at Cornell University. The team interviewed policymakers and potential employers and led a symposium with Sudanese and regional university and government partners to assess higher education needs in agriculture and to develop a final work plan for the project.

The program will develop curricula to promote ecosystem protection for the region's degraded natural resource base, including shrub lands, savanna and grasslands, water and soil resources, and wildlife. "The region's natural resources have deteriorated rapidly," Dillaha said. "Action is critical now, not only to restore the environment but also to break the poverty cycle of the people whose livelihoods depend on these resources."



Gender workshop concentrates on community, conflict, stereotypes

Gender Equity Specialist Maria Elisa Christie organized a gender and participative methodologies workshop in October for SANREM researchers from Ecuador, Peru, and

Bolivia. The event was hosted by Universidad de la Cordillera and the graduate program in development sciences at Universidad Mayor de San Andrés in La Paz. The facilitator was Susan V. Poats of the non-governmental organization Grupo Randi Randi. An anthropologist and gender expert, Poats specializes in natural resource management and community conservation in the Andean region.

Among topics that Poats covered in the daylong workshop were definitions of community and how the concept can be used to exclude people as well include them; conflict as a factor in development work; different frameworks for gender analysis; and ways to break stereotypical gender roles. A key goal of the workshop was to make training, including materials, available in Spanish for host country institutions whose gender researchers do not speak English. Attending were 18 women and 13 men, most of them young professionals in agricultural and social sciences.

"The workshop went very well," Christie said. "We had more participants than expected, and they brought diverse backgrounds and experiences to the discussion. There was great interest in more training of this type within the SANREM program. The session laid the groundwork for future collaboration."

In a follow-up meeting at Universidad de la Cordillera in La Paz, 10 participants discussed differences between control and access of natural resources, focus groups and group interviews, and specifics on interview techniques for culturally sensitive topics. Jere Gilles, a SANREM research partner and director of rural sociology graduate studies at the University of Missouri-Columbia, spoke to the group about social networks and effective research methodologies. The group proposed organizing a seminar with SANREM sponsorship to share gender research.

Bolivia, where three of SANREM's LTRAs have activities, has been of particular concern in recent months. Demands by the nation's wealthier states for autonomy have triggered clashes, some violent, with the central government. Land ownership and control of petroleum and natural gas reserves are also politically divisive issues. Bolivians will vote Jan. 25 on a new constitution.

More than 300 researchers to attend January's SWAT-SEA conference

SANREM Program Director Dillaha and Victor Ella of the University of the Philippines-Los Baños, an LTRA-5 partner, will be keynote speakers at Southeast Asia's first SWAT conference Jan. 5-9 in Chiang Mai, Thailand. More than 300 researchers from a dozen countries are expected to attend, including representatives of academia, government, non-governmental organizations, and private industry. Chiang Mai University and North Carolina A&T State University are lead organizers for the conference, with SANREM CRSP

among more than two dozen co-sponsors. Manuel Reyes, associate professor of natural resources and environmental design at NCA&T and lead PI for SANREM's LTRA- 5, is organizing the conference and will give welcoming remarks. SWAT – Soil and Water Assessment Tool – is a river basin scale watershed management model. It can simulate hydrology and water quality to predict the effects of land management on watershed hydrology. SWAT is widely used for water quality impact assessment, including the movement and concentrations of pollutants and the potential impact of climate change on stream flow.

Among topics to be covered are watershed modeling in developing countries; calibration and validation techniques; SWAT applications for sustainable agriculture, climate change, and biofuel scenarios; land-use scenario evaluation; water quality management; and SWAT application at the large river basin scale. See:

<http://www2.mcc.cmu.ac.th/swat/>

SWAT is a public-domain model supported by the U.S. Department of Agriculture. See:

<http://www.brc.tamus.edu/swat/index.html>.

Research priorities from USAID interviews	
By research area	Frequency
Biofuels	21%
Ecosystem services	13%
Food security	13%
Policy	11%
Biodiversity	7%
Forestry	7%
Soil quality/fertility	7%
Water productivity	7%
Climate change	6%
Conservation farming systems	4%
Capacity building	3%
Soil and water conservation	1%

Surveys contribute to planning for SANREM CRSP Phase IV

Conservation farming systems, water management, and food security are top research priorities for SANREM Phase IV, according to an online survey of SANREM partners. A separate survey of USAID personnel found biofuels, ecosystem services, and food security to be the main concerns. Responses indicated that Africa is the region considered to have top priority, followed by Asia and Latin America.

Survey results will be among factors considered in designing the next five-year phase of SANREM, to begin in October 2009. "We are grateful to everyone who took the time to respond," Program Director Dillaha said. "The information will be useful as we set our research priorities for the next phase of our program."

The online survey, e-mailed to more than 500 people, drew 65 responses, about 12 percent. A separate survey comprised 15 personal interviews with USAID offices and bureaus in Washington and at Missions visited by the SANREM ME.

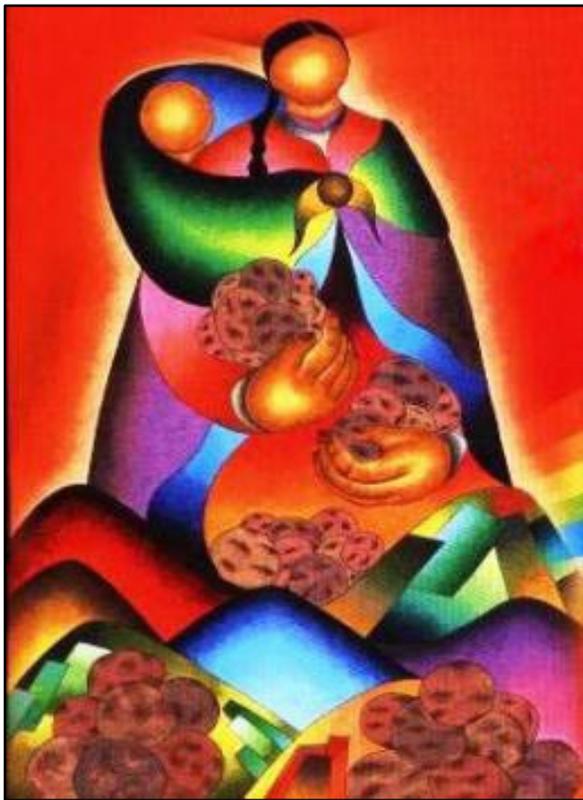
Research priorities from on-line survey	
By research area	Frequency
Conservation farming systems	11%
Water management/productivity	10%
Food security	9%
Climate change	9%
Soil quality	5%
Agroforestry	4%
Livestock	4%
Soil and water conservation	4%
Natural resource management	3%
Agricultural systems	2%
Biofuels	2%
Cropping systems	2%
Ecosystem services	2%
Energy	2%
Forest governance	2%
Forestry	2%
Governance	2%
Irrigation	2%
Rainfed agriculture	2%
Water quality	2%
By region	Frequency
Africa	48%
Asia	32%
Latin America, Caribbean	20%

Fighting poverty in the Andes with potatoes and paintings

Potatoes are the world's most important tuber, a food staple for more than a billion people. Recognizing how many people in developing countries depend on this prolific crop for their very survival, the United Nations declared 2008 the International Year of the Potato.

In the Andean region of Peru and Bolivia, where the potato was first cultivated more than 7,000 years ago, a SANREM CRSP partner is promoting academic and cultural activities showing the significance of this highly nutritious food. Within this framework, renowned Bolivian artist Roberto Mamani Mamani has joined Fundación PROINPA – Foundation for Research and Promotion of Andean Products – in the celebration with a series of paintings titled, "Potato: An Andean treasure."

Dedicated to the cultural, historic, and economic value of the potato, the paintings pay homage to the men and women who conserve and cultivate this invaluable crop. All



proceeds from sale of the paintings will be used for conservation of native potato genetic diversity. See: <http://proinpa.org/potato2008/>

“Preserving the amazing diversity of Andean crops, especially the potato, is critical to guarantee food security and livelihoods in Bolivia and Peru,” said Jeffrey Alwang, professor of agricultural and applied economics at Virginia Tech and PI for SANREM’s LTRA-3. “Sale of these paintings will help PROINPA with its mission of sustaining the region’s biodiversity.”

The potato is easy to cultivate, adapting to marginal environments such as poor soil and a short growing season. CIP near Lima, Peru, a partner in LTRA-3 and LTRA-4 in South America, reports that potatoes produce more food on less land faster than any other crop: One hectare of potatoes can yield the nutritional value of 2 to 4 hectares of grain and twice as much protein as wheat. A medium-size potato contains half the daily adult requirement of vitamin C, more protein than corn, and nearly twice the calcium. Potato is also low in fat. All of these traits make the potato a valuable source of nutrition and income.

There are thousands of potato varieties with a fantastic range of tastes, sizes, shapes, and colors from pure white to deep purple. The genes of many potato varieties contain natural resistance to disease and drought. Because just a

few are grown commercially, however, many varieties are disappearing. There is a danger that today’s cultivated varieties, repeatedly reproduced from previous tubers, may become weak and prone to disease. Yet the potato’s genetic diversity provides the variation needed to develop new types that can resist emerging threats from disease, pests, social and environmental stresses.

PROINPA and SANREM researchers are helping farmers by promoting technological innovation, food security, and the conservation and sustainable use of the Andes’ genetic resources. One of the goals is to teach farmers new agricultural technology such as tilling methods, crop rotation, and proper use of pesticides and fertilizers. Both programs also include women in their research and education. Though women are active in growing and selling produce, they are not always considered in training and policymaking.

PI Valdivia of LTRA-4 said women’s contribution is especially important in potato cultivation because a large number of varieties are grown for home consumption only. When SANREM and PROINPA researchers held a competition recently in Aroma La Paz, 400 people participated, bringing in 114 less-common varieties that researchers are now cultivating. Local farmers are partners in the project, sharing what they know about each type: which soil and climate it prefers, what it can withstand.

“On the one hand, we are identifying which varieties are still being grown,” Valdivia said. “And with PROINPA and the International Potato Center, we are also identifying niche markets where the beauty of these potatoes – their diversity of colors, shapes, and textures – is valued by consumers.”

Report from National Academies sets priorities for 2 developing regions

Soil and water management techniques, climate and weather prediction, and crop genomics – all areas of SANREM research – are among the highest priorities for development in sub-Saharan Africa and South Asia, according to a study by the National Research Council of the National Academies. Completed this year with a grant from the Bill & Melinda Gates Foundation, the study identifies new knowledge and technologies that could transform production capabilities of small farmers in the two regions.

The study’s top-priority technologies for development and exploration are management of the natural resource base supporting agriculture; application of genetic diversity to improve the production characteristics of crops and animals; reduction or elimination of biotic constraints (disease, pests, and weeds) that reduce yields of crops, meat, and milk; and availability of affordable, renewable energy for farmers.

Two of the report's recommendations coincide with SANREM precepts: a system-wide approach to problem solving, and integration of local expertise and participation into research and development activities. Agricultural technologies developed in industrial countries may not work in sub-Saharan Africa and South Asia, the study states in its summary. Agricultural innovation in those regions need not be "low" technology, however; innovations such as state-of-the-art biofuels might be more suitable there than in the developed world. Attention to implications of climate change is also critical, especially water scarcity. The report is available at: <http://www.nap.edu/catalog/12455/html>.

Notes

- A group of LTRA-1 partners gathered in July at the University of Gloucestershire, England, to present research findings at two conferences. Krister Andersson, Jacqueline Bauer, Forrest Fleischmann, Gustavo Garcia Lopez, Pamela Jagger, Elinor Ostrom, William Gombya Ssembajjwe, Ruth Meinzen-Dick, Leticia Merino, Esther Mwangi, Jephine Mogoi, Emily Obonyo, Paul Ongugo, and Patricia Uberhuaga gave reports at a meeting of the International Forestry Resources and Institutions Research Network and a conference of the International Association for the Study of the Commons.
- An article titled "Commons sense: Why it still pays to study medieval English landholding and Sahelian nomadism" was published in the July 31 edition of *The Economist*. The article cites *Governing the Commons*, Elinor Ostrom's 1990 book in which she describes rules and conventions for use of common resources. Ostrom is a professor of political science at Indiana University and PI for SANREM's LTRA-1. See: http://www.economist.com/finance/displaystory.cfm?story_id=11848182
- Associate Program Director Keith Moore participated in a Virginia Tech study in Liberia in July to evaluate community forestry training needs. After meeting residents, forestry officials and their staffs, government and non-government representatives, the team conducted a one-day workshop in Monrovia to give feedback on its findings. The team recommended a short-term training program to provide forest dwellers with knowledge and skills in non-timber products, improved agroforestry and agricultural practices, conflict and project management, enterprise and community development, and extension techniques.
- Program Director Dillaha traveled to Africa in August to investigate the potential for collaboration in SANREM Phase IV with the German project GLOWA-Volta (<http://www.glowa-volta.de/>), which is assessing the affects of climate change on water resources in Ghana and Burkina Faso. Dillaha met with John Mullenax,

Kudos

COMACO, LTRA-2's partner agency in Zambia, is one of 25 winners of the 2008 Equator Prize. In awarding the prize, the Equator Initiative said families participating in COMACO have seen a 15 percent increase in food security and a doubling of incomes, while the area has experienced a corresponding resurgence in lion and elephant populations. See: www.equatorinitiative.org

USAID's advisor on the Presidential Initiative to End Hunger in Africa; and with potential Ghanaian and Burkina partners. In his trip report, he stated that the newly established Volta River Basin Authority, the GLOWA-Volta project, the International Water Management Institute, the Ghana University for Development Studies, Kwame Nkrumah University of Science and Technology, and the various units of the Ghana Council for Scientific and Industrial Research are promising potential partners for SANREM Phase IV activities. See:

http://www.glowa.org/eng/volta_eng/volta_eng.php

- The upcoming book by SANREM partners on adaptive management of sustainable agriculture and natural resources is nearing completion. Associate Program Director Moore, editor for the book, is seeking reviewers for the final draft before it goes to press. Contact him, keithm@vt.edu, to be a reviewer for *Innovating for Sustainable Agriculture and Natural Resource Management: The Science and Art behind Adaptive Management*.
- The September issue of *Science* features a policy brief by the Nature Conservancy on how poverty alleviation and economic development can be compatible with environmental protection and biodiversity conservation, both SANREM priorities. The authors' research found that "World Bank projects with biodiversity goals were as successful in all development objectives, including poverty reduction and private sector development, as those that focused solely on development." See: <http://www.scienceonline.org/cgi/reprint/321/5896/1638.pdf>
- SANREM Partners Gerald Shively and David Midmore were interviewed on ABC Radio Australia about the impact of falling coffee prices on poor farmers across Southeast Asia. The segment aired Oct. 15 on the network's current affairs program "Connect Asia." Shively is associate head of Purdue University's agricultural economics department; Midmore is director of Central Queensland University's Centre for Plant

and Water Science. See:
<http://www.radioaustralia.net.au/programguide/stories/200810/s2394011.htm>

- Program Director Dillaha was a panelist at the Society of Environmental Journalists' 18th Annual Conference, hosted by Virginia Tech Oct. 15-19 in Roanoke, Va. Dillaha took part in a session on the effects of climate change on food production around the world. The annual conference brings together environmental

policymakers ,activists, and journalists. See:
<http://www.sej.org/confer/index1.htm>

- Sponsored by the World Bank's Environmental Department, SANREM PI Valdivia and other researchers published a paper titled "Transitioning to Climate Resilient Development: Perspectives from Communities in Peru." The paper includes policy recommendations for specific areas of the Altiplano. See:
<http://go.worldbank.org/Q3NBFHQND0>

2009 Calendar

Jan. 5-8	SWAT-SEA 2009 Conference, Chiang Mai, Thailand
May 27-29	LTRA-5 TMPEGS-Philippines meeting, Lantapan, Mindanao
June 3-5	LTRA-5 TMPEGS-Vietnam meeting, Nong Lam University and Nghia Trung village
June 10-12	LTRA-5 TMPEGS-Indonesia meeting, Nanggung