Sustainable Agriculture and Natural Resource Management
Collaborative Research Support Program

SANREM CRSP Newsletter, January 2008

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

Contents

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Director's message

Since the previous newsletter in August 2007, the SANREM CRSP has been extremely busy updating annual reports and work plans by the long-term research awardees; preparing the FY2007 SANREM CRSP Annual Report; planning for the External Evaluation Panel's Year 4 review of the SANREM CRSP and the Year 4 Administrative Management Review, whose reports will be used in deciding whether SANREM is renewed for another five years; presenting a full-day policy seminar on payments for environmental services; planning the upcoming 21st Century Watershed Technology: Improving Water Quality and the Environment conference in Concepción, Chile, co-sponsored by SANREM; planning the SANREM annual meeting in May; and awarding additional funds to long-term projects to support cross-cutting SANREM research themes and 10 additional host-country graduate students.

I am particularly excited about the new cross-cutting initiatives, which will support comparative research related to soil metagenomics as an indicator of soil quality, gender and market access, linking knowledge to action, assessing and managing soil quality, and watershed modeling and assessment. More details are provided below. This newsletter also highlights SANREM's LTRA-2: Developing a Participatory Socioeconomic Model for Food Security, Improved Rural Livelihoods, Watershed Management, and Biodiversity Conservation in Southern Africa, led by Alex Travis of Cornell University.

In the previous newsletter, I discussed the upcoming External Evaluation Panel (EEP) report and Administrative Management Review (AMR) of the SANREM CRSP and their roles in determining whether SANREM will be renewed for another five years. The EEP review is nearly complete and will be available on the SANREM CRSP website by the end of January. Initial feedback from the EEP indicates that SANREM is achieving its goals and objectives. With respect to the AMR, SANREM has provided the review team with copies of all requested documents. The AMR team will visit Virginia Tech Feb. 26- 28, then travel to several SANREM LTRA sites over the following two weeks. The final report from the AMR team is due to USAID on April 30, so we hope to receive USAID's decision on the continuation of SANREM before our annual meeting May 26- 28 in the Philippines

Theo Dillaha, SANREM CRSP program director
dillaha@vt.edu

Research spotlight

LTRA-2: Developing a Participatory Socioeconomic Model for Food Security, Improved Rural Livelihoods, Watershed Management, and Biodiversity Conservation in Southern Africa

PIs: Alex Travis and Alfonso Torres, Cornell University; and Dale Lewis, Wildlife Conservation Society

Due to unsustainable practices in agriculture and natural resource management, rural residents of southern Africa face food insecurity and limited livelihood opportunities. Those practices also have diminished the region's biodiversity, a source of income from tourists and safari hunters.

In Zambia, LTRA-2 in partnership with COMACO – Community Markets for Conservation – is seeking to conserve biodiversity while improving food security and rural livelihoods. Founded five years ago by the Wildlife Conservation Society, COMACO has established community trading centers and food-processing facilities in Zambia's Luangwa Valley.

The SANREM CRSP research team led by Alex Travis, assistant professor of reproductive biology at Cornell University, has four objectives:

- to determine the extent to which the COMACO model can be economically self-sustaining and the effectiveness of the different COMACO model components
- to integrate new technologies into the COMACO model by applying food, soil, and veterinary sciences
- to determine the extent to which the COMACO model provides self-sustaining social institutions and meaningful roles for COMACO participants, and
- to determine the extent to which the COMACO model improves biodiversity and watershed conservation.

SANREM researchers are working to expand COMACO trade centers' potential for sale of rice, peanuts, soybeans, and other crops in the national and export markets. With new technologies, COMACO's food-processing facilities in Lundazi and Mfuwe also could make products such as high-energy protein supplement (HEPS), a soy product for the undernourished and HIV/AIDS patients. HEPS is now imported through relief agencies at high cost. Such profitable products could give farmers an incentive to grow more soybeans, which add nutrients to the soil, decreasing the need to clear more trees for crops. Besides providing habitat for wildlife and bees, trees improve soil retention, an important factor in decreasing erosion. Runoff appears to contribute to valley flooding and silt buildup, which in turn adversely affect habitat for hippos, crocodiles, and fish in the Luangwa River.

Using historical and current financial data, SANREM researchers drew up COMACO's first business model. The team led training for COMACO's Zambian staff on safe, hygienic food-processing practices essential to extend products' shelf life and earn export certification – a key

to higher profits. Researchers also are training villagers in poultry production, which rose 50 percent in the first year of the project; and how to raise goats for consumption and for sale. Gains in crop, poultry, and goat production should improve rural families' incomes and nutrition.

Surveys of families facing food insecurity found that 42 percent illegally kill wild animals to barter game meat for produce. This directly affects the safari and tourism markets, a major source of income for communities, and the federal and regional governments. SANREM researchers using aerial and satellite imagery found very little wildlife remaining in the Lukusuzi National Park, though it has escaped widespread deforestation. COMACO data show that many commercial poachers live immediately adjacent to the park, suggesting a link to the loss of animals. COMACO's Poacher Transformation Project, which teaches alternative livelihoods such as honey production and profitable farming, could make the area a good candidate for reintroduction of species.

By studying the links among agriculture, natural resources, and human factors – sustainable production methods lead to wiser use of natural resources, less deforestation leads to improved soil retention and less downstream flooding – SANREM researchers in Zambia are taking a holistic approach to effect positive economic, social, and environmental changes.

COMACO's products are processed and packaged under the brand name "It's Wild!" To learn more about the products, the program's adventure bush camps, and its line of jewelry made from confiscated snare wire, go to COMACO's homepage, http://www.itswild.org/home Click here to read more about the project's hygiene and food-safety workshops: http://www.oired.vt.edu/sanremcrsp/News%20archives/WashHands.php

News, notes, milestones

New SANREM funding will support cross-cutting research

SANREM's Management Entity (ME) learned in August that the program would be fully funded in fiscal 2008, and additional funds were provided to make up for budget shortfalls in Years 1-3. With the additional core funds from USAID's Bureau for Economic Growth, Agriculture, and Trade (EGAT), SANREM initiated five cross-cutting activities that promote cooperative research across the long-term projects. The new initiatives are described below.

Assessing and Managing Soil Quality for Sustainable Agricultural Systems. Principal investigator (PI): Peter Motavalli, University of Missouri. This project involves LTRAs 2, 3, 4, and 5. Key research objectives are: 1) to assess community perceptions and indicators of soil quality, including differences in perceptions of soil quality due to gender, environment, and socioeconomic factors; 2) to determine the efficacy of spectroscopic-based analytical methods to evaluate soil organic matter fractions and soil quality in degraded and non-degraded soils in a wide range of environments represented by the SANREM CRSP projects; and 3) to collaborate on evaluation of soil metagenomic methods as an indicator of soil degradation.

Biotechnology: Soil Metagenomics to Construct Indicators of Soil Degradation. PI: Karen Garrett, Kansas State University. This project, which involves LTRAs 2, 3, and 4, meets USAID biotechnology attribution requirements. Specific objectives are: 1) to characterize soil microbial communities from soils representing a range of levels of degradation; 2) to identify microbial taxa that are indicators for levels of degradation, especially those that may indicate the process of degradation has begun but is still reversible; and 3) to link soil community structure to both the general soil biophysical context and the social science context to understand human impacts and drivers of human decision-making for soil management.

Gendered Access to Markets: Gendered Networks and Livelihood Alternatives. PI: Maria Elisa Christie, Virginia Tech. This project involves LTRAs 2, 3, 4, and 5. Key research questions are: 1) How is access to markets for sustainable agriculture or natural resource products gendered? 2) How are the financial gains from market participation (through effective networks) translated into tangible social gains within the household, and how does the process of resource allocation differ between men and women as well as among women in different contexts? 3) How do women negotiate obstacles to market access? 4) What factors affect women's choices of crops grown, natural resources managed, or practices adopted?

Linking Knowledge and Action: Meeting NRM Challenges in SANREM. PI: Esther Mwangi, Indiana University. This project involves LTRAs 1, 3, 4, and 5. Key research questions are: 1) What strategies have the projects used to try and link their research to policymakers and resource users? Have those strategies been effective? Why or why not? 2) How do participants in the research-action arena think about research? Do they value research? If so, for what purposes? How do they envisage that it may help or hinder them in their daily work? 3) What factors influence learning by participants in the resource-action arena? What constraints do they face? What factors influence their actions and priorities? 4) What kinds of knowledge systems lead to more action and policy responses? Under what conditions can successful knowledge-action efforts be promoted? 5) What can be done to improve the knowledge-action link? Specifically, what kinds of insights can the SANREM experience provide to researchers regarding elements of sequencing, timing, and delivery of their knowledge to action strategies that ensure maximum impact?

Watershed Modeling and Assessment. PI: Conrad Heatwole, Virginia Tech. This project involves LTRAs 2, 3, 4, and 5. Key research objectives are: 1) to support natural resource management at a watershed and policy analysis scale by documenting landscape conditions, quantifying natural resources, and defining land-cover and land-use change using geospatial imagery and analysis; 2) to assess impacts of land-use practices and climate change on agricultural sustainability and natural resource management at a watershed scale; and 3) to design and implement low-cost, community-based watershed monitoring programs.

Philippines will be the site for SANREM's annual meeting

The SANREM CRSP 2008 Annual Meeting will be May 26-28 in the Philippines, preceded by a field trip to SANREM's Songco site, active since 1992.

The annual meeting's theme will be scientific results from the program's five Long-Term Research Activities (LTRAs). The timetable, beginning with the optional field trip, is:

May 23	Arrive in Cagayan de Oro, Mindanao, for transport to Malaybalay City, Bukidnon, Mindanao
May 24	Visit Philippine field sites, Lantapan, Bukidnon
May 25	Depart Cagayan de Oro for Manila
May 26-28	SANREM CRSP 2008 Annual Meeting
May 26	SANREM progress reports and planning
May 27	SANREM scientific conference
May 28 a.m.	SANREM business meeting
May 28 p.m.	SANREM Technical Committee meeting

Watershed conference is set for March 31 in Chile

A broad range of watershed management issues will be the focus of the 21st Century Watershed Technology: Improving Water Quality and the Environment. The international conference, organized by the American Society of Agricultural and Biological Engineers and co-sponsored by SANREM CRSP and the Texas Institute for Applied Environmental Engineering at Tarleton State University, will be at the University of Concepción, Chile, from March 31 to April 2. The conference will feature hands-on workshops, poster sessions, and a number of technical and cultural tours for conference participants and their families. The registration deadline for a discounted rate is Jan. 31.

The conference is intended for engineers, researchers, politicians, and practitioners in agriculture and environmental science. Subjects will include watershed management in developing countries, water quality standards, agricultural best-management practices (BMP), political and economic implications of water quality and quantity, and the impact of extreme weather conditions.

SANREM scientists presenting at the conference are Program Director Dillaha; Brian Benham, co-PI in LTRA-3; Researchers Conrad Heatwole and Heather Weeks; Victor Barrera of Instituto Nacional de Investigaciones Agropecuarias (INIAP), a SANREM partner in Ecuador; and Ruben Botello of Fundación PROINPA, a SANREM partner in Bolivia.

More information, the preliminary program, and registration information are online at: http://www.asabe.org/meetings/water2008/index.htm

Madagascar forest is mending, scientists report

A Madagascar forest damaged by illegal logging is recovering, writes the SANREM scientific team who visited the site in 2005 and again in May 2007. "The forest is recovering through natural regeneration," the team wrote in a comprehensive report released in September. "At this point, there do not seem to be major incursions of invasive species." A logging road has been

rendered impassable to vehicles due to erosion, gullying, landslides, and bridge washouts: "This is an excellent development, which works against further exploitation of the area. The road should not be repaired or maintained."

Led by Sarah Karpanty, assistant professor of fisheries and wildlife sciences at Virginia Tech, the team included SANREM Program Director Dillaha and Charles Welch, a research scientist at Duke University's Lemur Center. The three visited Madagascar at the request of USAID to study restoration activities and progress in the Ambohilero Forest. Among partners in the site assessment were USAID's MIARO program, Conservation International, and the World Wildlife Fund.

Before being shut down in 2004, a logging company built a 17 kilometer road through the formerly pristine Didy reserve, then harvested the timber along the road. Scientists feared that the swath would disrupt migration of lemurs, which typically travel through tree canopies. May's follow-up visit focused on restoration sites where trees had been planted, natural regeneration in previously established plots, and results of erosion control practices.

"Ambohilero is an unusual opportunity to observe and study passive restoration in Madagascar," the scientists wrote in their report. "The logging operations in this region have impaired ecosystem function in ways very similar to forest conversion to agriculture. … Lessons learned at this site can be translated to multiple other similar situations." Among the team's recommendations are that "national protocols are needed for construction of roads in forested and other natural areas. Revegetation and erosion-control activities should occur simultaneously with road construction, and provisions must be made to include natural corridors or bridges across the road for wildlife movement. … Capacity-building for ecological restoration is a priority."

In summarizing the expedition, Karpanty said, "We were pleasantly surprised at the level of natural regeneration that we observed. While it will still be many decades before the gaps in the forest begin to close enough for some threatened lemurs to cross the road, we hope that, if we can continue to minimize human incursions into this region, the forest will recover and serve as a model for the potential of natural regeneration. The government of Madagascar and major donors such as USAID are committed to this project, which is greatly facilitating progress on site."

Summer environmental program seeks scholars

The Beahrs Environmental Leadership Program is seeking applicants for the 2008 summer certificate course in Sustainable Environmental Management, a three-week certificate course at University of California-Berkeley. The course is scheduled for June 27 through July 19 on the Berkeley campus. The deadline for applications if Feb. 1.

Established in 2000, the Beahrs ELP is a learning opportunity for midcareer environmental professionals and decision-makers to gain expertise, enhance skills, and broaden perspectives on environmental and natural resource management and leadership. The program links local

and global environmental challenges with interdisciplinary perspectives. Course graduates become members of the Berkeley ELP Alumni Network, which supports ongoing learning, peer exchange, and collaborative research and policy projects. Each summer, the program accepts 40 participants from international organizations, academia, government, non-governmental organizations, and the private sector. A limited number of partial scholarships are available. Since the program's inception, 268 people from more than 60 countries have participated, among them agronomists, foresters, environmental lawyers and journalists, social and biological scientists, and development practitioners. SANREM LTRA-5 sent four participants to the 2007 session. LTRA-5 researchers Victoria Espaldon and Agnes Rola also are ELP alumni.

More information is available on the Beahrs website, http://nature.berkeley.edu/BeahrsELP or by e-mailing BeahrsELP@nature.berkeley.edu

SANREM researchers' articles win accolades

The Philippines' International Conference on Research in Higher Education has recognized the work of two researchers with SANREM's LTRA-5: Agro-forestry and Sustainable Vegetable Production in Southeast Asian Watersheds. At a conference Oct. 24-27 in Cebu City, Victor B. Ella was a winner in the natural sciences publications category, cited for "Simulating shallow tubewell drawdown in the Philippines using a three-dimensional finite difference groundwater model," published in *International Agricultural Engineering Journal*. Agnes C. Rola was recognized a co-author of "Farmers' knowledge and adoption of sustainable land-use management system in Matalom, Leyte, Philippines," winner in the social sciences category.

LTRA-5 now has a project website at http://tmpegs.org/index.html. The site features news, publications, and an online gallery of photos from its research sites, meetings, and training sessions.

SANREM PI, colleagues publish special section for science journal

SANREM PI Elinor Ostrom (LTRA-1: Decentralization Reforms and Property Rights: Potentials and Puzzles for Forest Sustainability and Livelihoods) and two associates organized and wrote for a special feature section in the Sept. 25 issue of *Proceedings of the National Academy of Sciences* (*PNAS*). Titled "Going Beyond Panaceas," the special feature comprised nine articles cautioning against the tendency among scholars to suppose that all problems of resource governance can be represented by a small set of simple models. The articles were subsequently reprinted separately.

In a letter introducing the issue, Ostrom, professor of public and environmental affairs at Indiana University, and colleagues John M. Anderies and Marco A. Janssen, both assistant professors at Arizona State University, write that their aim is "to provide theoretical analyses and empirical evidence to caution against the tendency, when confronted with pervasive uncertainty, to believe that scholars can generate simple models of linked social-ecological systems and deduce general solutions to the overuse of resources."

The articles, written by Ostrom, Anderies, Janssen, and 11 other scientists, present cases in which panaceas fail and give an overview of why they fail. The articles address how scholars and public officials can increase the prospects for future sustainable resource use.

PNAS is a multidisciplinary journal spanning the biological, physical, and social sciences. Established in 1914, it publishes research reports, commentaries, reviews, perspectives, colloquium papers, and actions of the National Academy of Sciences of the United States of America. *PNAS* is published weekly in print and daily online at http://www.pnas.org

Seminars explore payments for ecosystem services

"Pro-Poor Payment for Ecosystem Services" was the topic for an Oct. 4 policy seminar, the second in a series sponsored by SANREM CRSP and USAID for the agency's staff and guests. Payment for environmental services (PES) is a new economic instrument being used to promote development and reduce poverty. Key speakers for the daylong session were John Kerr and Rohit Jindal, Department of Community, Agriculture, Recreation and Resource Studies, Michigan State University; Theo Dillaha, SANREM CRSP program director; Paul Ferraro, Department of Economics, Andrew Young School of Policy Studies, Georgia State University; and Sven Wunder, senior economist with the Center for International Forestry Research (CIFOR), a SANREM partner based in Belem, Brazil.

The full-day seminar, co-sponsored by the BASIS CRSP, was held at Virginia Tech's Northern Virginia Center in Falls Church. It followed a July 13 midday session featuring presentations by economist Wunder and Bruce Byers of ARD Inc.

Presentations from the July and October sessions are available online at http://www.oired.vt.edu/sanremcrsp/menu_research/PES.PolicySeminar.Oct.2007.php
The *USAID PES Sourcebook*, case studies of successful PES programs in Africa, Asia, and Latin America, and a users guide for the PES knowledgebase on the SANREM website also are available online: http://www.oired.vt.edu/sanremcrsp/PES.php

New on the SANREM website

The website was redesigned in October with a homepage centerpiece each month focusing on an achievement, innovation, or breakthrough from one of the LTRAs. The news archives page has added a list of stories by headline. The *USAID PES Sourcebook* is available from the SANREM website, and the SANREM Knowledgebase (SKB) has an updated and improved online user guide for readers and contributors.

To post upcoming events on the website and to report activities, achievements, and opportunities, e-mail the information to SANREM Editor Deanne Estrada, destrada@vt.edu

Long-term research progress reports

LTRA-1: Decentralization Reforms and Property Rights: Potentials and Puzzles for Forest Sustainability and Livelihoods.

PI: Elinor Ostrom, Indiana University

In Kenya, community members were trained in details of the new Forest Act and their role in decision-making and general forest governance. In Uganda, researchers wrote articles for newspapers and television to discourage the government from converting the Mabira forest to sugarcane production, emphasizing the community's dependence on the forest. As a result of SANREM's work in Uganda, officials have proposed offering land to Makerere University to set up a model to demonstrate forest and agro-forestry technologies. Researchers developed a household survey database and trained 75 community members and local officials in Uganda, Kenya, Mexico, and Bolivia in research methods.

LTRA-2: Developing a Participatory Socioeconomic Model for Food Security, Improved Rural Livelihoods, Watershed Management, and Biodiversity Conservation in Southern Africa.

PIs: Alex Travis and Alfonso Torres, Cornell University; and Dale Lewis, Wildlife Conservation Society

SANREM helped the COMACO staff design comprehensive five-year business plans. New sanitation measures and production line practices were implemented at food processing centers to improve product safety and shelf life. Soil samples from 600 experimental sites were collected for analysis of physical and chemical properties. A manual on poultry production was written to be used in training more than 500 villagers. Data from the Zambian Wildlife Authority documenting poaching arrests, length of incarceration and associated costs, and mapping of arrest locations and poacher homes showed areas where pressures on wildlife are greatest.

LTRA-3: Watershed-based Natural Resource Management in Small-scale Agriculture: Sloped Areas of the Andean Region

PI: Jeffrey Alwang, Virginia Tech

In Ecuador, research showed that high-altitude soils of Alto Guanujo are resistant to erosion and can tolerate intensified land use, but the older soils of Chillanes on steep slopes are degraded and should not be disturbed. Priorities for Ecuador's Chimbo watershed are to diversify income on and off the farm, improve capacity to manage water and forest resources, and protect biodiversity. Local leaders are beginning to appreciate the use of science-based management techniques. In Bolivia, the Tiraque municipality is learning to use SANREM geographic information system (GIS) and watershed modeling tools for land-use planning, increasing the efficiency of the planning process.

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

PIs: Corinne Valdivia and Jere Giles, University of Missouri

Researchers implemented an integrated approach to livelihoods, capital, and biodiversity in 30 communities of Peru and 20 of Bolivia, broadening analysis by using a standardized approach. Geo-referenced maps were developed with collaborators to capture perceptions of change in natural resources, land use, cropping areas, and natural hazards and vulnerabilities of 10 communities in the Altiplano of Bolivia. Because local warming has affected high-protein crops such as quinoa, the project is helping farmers to experiment with short-season varieties. Farmers are being trained on technical issues of soil and pasture management.

LTRA-5: Agro-forestry and Sustainable Vegetable Production in Southeast Asian Watersheds

PI: Manual Reyes, North Carolina A&T State University

Preliminary results in Vietnam showed that several varieties of cacao are growing very well when planted between cashew trees. Cacao, ranked as one of the nation's top commodities, also improves soil quality. In Indonesia, farmers and traders were encouraged to improve efficiency of profit centers in a market value chain. For example, selling bananas based on retailers' specifications resulted in better prices. In the Philippines, officials in Lantapan expressed strong interest in developing incentives for vegetable agro-forestry, and local funding was earmarked to initiate such policies.

Calendar

2008

Jan. 15	Final report due from SANREM EEP
Feb. 1	Application deadline for Beahrs ELP (http://beahrselp.berkeley.edu/)
Feb. 26-28	AMR visit to SANREM ME at Virginia Tech
March 14	Application deadline for Borlaug LEAP Collaborative Research Support Program fellowships (http://leap.ucdavis.edu)
March 31-April 2	"21st Century Watershed Technology: Improving Water Quality and Environment" international conference in Concepción, Chile
April 15	LTRA semiannual reports due
May 26-28	SANREM CRSP 2008 Annual Meeting, Philippines

2009

Jan. 5-8	Soil and Water Assessment Tool-Southeast Asia workshop and conference, Chiang Mai, Thailand (http://www2.mcc.cmu.ac.th/swat/)

How to reach us

SANREM CRSP's managers and staff are at Virginia Tech's Office of International Research, Education, and Development, 526 Prices Fork Road, Blacksburg, Va. 24061.
Phone: 540-231-6338. Fax: 540-231-2439. E-mail: sanrem@vt.edu

SANREM CRSP Management Entity directory

Bertelsen, Michael
Economic Impact Assessment Coordinator
(540) 231-9665. bertel@vt.edu

Christie, Maria Elisa
Gender Equity Coordinator
(540) 231-4297. mechristie@vt.edu

De Datta, S.K.
Administrative PI
(540) 231-9853. dedatta@vt.edu

Dillaha, Theo
Program Director
(540) 231-6813. dillaha@vt.edu

Estrada, Deanne
Editor and Communications Coordinator
(540) 231-1218. destrada@vt.edu

Lawson, Peggy
Project Coordination Assistant
(540) 231-0916. lawsonp@vt.edu

Lee, Jane
Project Coordination Assistant
(540) 231-1228. janelee@vt.edu

Moore, Keith M.
Associate Program Director
(540) 231-2009. keithm@vt.edu