

# Sanrem CRSP-Southeast Asia: Accomplishments and Impacts, 1998-2003

Ian Coxhead, Sanrem-SEA Program Manager

Gladys Buenavista, Sanrem SEA Research Manager

Rogelio Serrano, Sanrem-SEA co-Program Manager

1. Introduction to the Sanrem CRSP-Southeast Asia project .....	1
2. Highlights of accomplishments.....	3
Tools for sustainable agriculture and NRM policy planning and implementation.....	3
Capacity for NRM planning and policy analysis.....	5
Research to support policy advocacy at local and national levels. ....	5
Information exchange at various scales. ....	6
External linkages through environmental research grants .....	7
3. Impacts.....	7
Improved human and organizational capacity. ....	8
Diversified land management practices and increased incomes.....	8
Better policy environment.....	9
4. Dissemination.....	9
5. Training and institutional strengthening .....	10
Contributions to human capacity development.....	10
Institutional strengthening. ....	11
6. Complementarity with bilateral programs, and benefits to the U.S.....	11
7. Collaborative relationships .....	12
Research administration and management.....	12
8. Leveraged funding external to USAID .....	12
Table 1 Sanrem SEA Partner Institutions .....	14
Appendix 1 Sanrem SEA work plans 1998-2003.....	15
Appendix 2 Sanrem-funded graduate students .....	16

## **1. Introduction to the Sanrem CRSP-Southeast Asia project**

In Phase II, the Sanrem Southeast Asia project set itself the ambitious goal of “enabling better natural resource management decisions by upland communities”. This was to be achieved through collaborative partnerships among researchers, government organizations and civil society in research, information dissemination, capacity-building and policy advocacy as means to support natural resource management for sustainable development by communities, local administrations, agencies of national government.

Within rural areas of Southeast Asia, concerns about unsustainable development are keenest “at the margin” — that is, in areas close to the cultivated frontier, where poor households farm sloping lands that are frequently poorly suited to intensive cultivation. The “margin” thus represents a constellation of ecological, economic and political conditions in which stress is endemic and the security of human welfare, soil and water resources, and biological diversity is under constant threat.

In the recent past, settlement and cultivation at the frontier was driven primarily by demographic change—rapid population growth and internal migration—in poor agrarian economies. Upland populations relied almost exclusively on agricultural production and gathering of forest products, and were largely subsistence-oriented. The influences of government and markets were relatively weak and indirect. Deforestation, land use decisions, and agricultural technology were, therefore, largely driven by local demographic, economic and biophysical conditions.

In very many areas of Southeast Asia these conditions have changed fundamentally within just two decades. The region as a whole is experiencing economic growth at an unprecedented pace. In addition to raising average income, growth has been accompanied by improvement and expansion of infrastructure, financial systems, educational opportunities, and the power of government. Internal and international labor mobility is increasing. ‘Globalization’, or the opening to international trade and capital flows, is transforming the structure of production and consumption, and the valuation of domestic endowments of labor, land and natural resources.

In the course of this change, upland communities find themselves increasingly closely integrated into rapidly expanding and developing national and global markets, through which resource managers receive signals that play major roles in determining land use, technology adoption, and investment. Markets thus exert a powerful influence over long-term environmental health and economic welfare. In Southeast Asia, deforestation and land use change is now driven much more by globalization and the transformation of domestic governance systems than by ‘traditional’ influences, namely population growth and poverty.

Unfortunately, economic growth alone does not resolve the problem of unsustainable upland land management practices in developing countries. The new forms of agricultural development place relatively fragile upland ecosystems under great stress. Land-degrading patterns of agricultural growth are promoted by adverse economic incentives and institutional failures. Tenure insecurity and failures of property rights are primary among these problems, and introduce an incentive bias in favor of short-term land uses. Rates of return to long-term investments in perennial crops and soil-conserving structures are also reduced by high capital costs in ‘thin’ local credit markets. For these and related reasons, farmers in steeply sloping upland areas are frequently observed to engage in land-degrading agricultural practices, even when they are clearly aware of the long-term consequences of their actions.

The expansion and intensification of upland agriculture also has important policy 'drivers'. Most Southeast Asian governments support domestic cereal production by special policy measures, and the expansion of temperate climate vegetable crops in steep lands is similarly stimulated by import restrictions, input subsidies and special R&D allocations (all of these policies are especially prominent in the Philippines). Accumulated evidence suggests that while overall economic growth rates are important predictors of declines in poverty-related migration and land degradation, crop-specific and sector-specific policies (or policy failures) exert substantial influence over land resource allocation and soil management, even in apparently remote upland areas.

Importantly, the policy aspect of environmental degradation is not limited to those agencies of government with direct responsibility for the management of agriculture or natural resources. In 'globalized' economies, trade and investment policies in particular are important determinants of the input and output prices that influence land use decisions. And increasingly, the devolution of fiscal and administrative responsibilities to local governments, rendering them simultaneously dependent on transfers from central government and on the participation of communities, is introducing new complexities to environmental policy-making and implementation. Thus every economic policy or administrative regulation that affects resource allocation in the uplands, whether directly or not, is a *de facto* environmental policy, and the creation of a supportive policy environment for sustainable development requires engagement and collaboration with *all* agencies whose actions have such effects.

Sanrem's main Southeast Asia research site is the municipality of Lantapan, located in the province of Bukidnon in the southern Philippines. Our continuous presence in Lantapan since the inception of the project in 1993 has enabled researchers to make long term observations on the dynamic interaction of economy, environment and policy, to accumulate a vast amount of information, and to establish and develop partnerships with community-based groups, local government, and other key actors in environmental and natural resource management. With Lantapan as our 'laboratory' we have been able to scale up and out to other municipalities and provinces in the Philippines, and to comparable research sites in Vietnam, thereby extending the research base and potential impacts of the project far beyond the boundaries of our initial research site. Similarities with Lantapan are defined not merely by common geographic characteristics, but the fact that economies in the region share certain experiences that are instrumental in shaping the direction of resource use and the logic of local natural resource management strategies. These experiences include dynamic economic growth, which tends to slow the rate of net migration to upland areas; expansion of commercial opportunities for local upland farmers, including intensive vegetable cultivation for urban markets; increased presence of highly capitalized agribusiness ventures in previously remote rural areas; and above all, rapid devolution of powers to sub-national jurisdictions.

In Phase II, we designed a project that brought together local and outside experts to combine community-level data gathering and analysis and local government capacity-building with the search for policies, at local as well as national level, that would achieve environmental targets through incentive-compatible means rather than through the application of regulatory formulae; through participation rather than command-and-control; and through local design rather than 'one size fits all' central plans. The methods adopted, and models developed, took account of the prevailing economic, social and institutional context, in particular on-going rapid economic growth, the presence of economic policies affecting agriculture, and the

decentralization of administrative and some policy responsibilities from central to local government.

Our outputs included decision support tools (methodologies, technologies, research findings and simulation models) to enable the formulation and answering of questions that link economic and social development goals with the long-term viability of the environment and natural resource base. We helped build analytical and decision-making capacity at local levels; and to promote structured discussion of NRM and sustainable development through information exchange and policy advocacy across levels (local, sub-national and national) and among institutions at each level. Capacity building activities supported our research by helping ensure that decision support tools could be used efficiently in NRM planning by communities, provincial and national governments and other local organizations. Information exchange and policy advocacy activities followed through on Sanrem research with the aim that research findings and their implications should reach the right influence makers and decision-makers, take appropriate forms for different audiences, and ultimately contribute to broader debates on the question of sustainable development.

## 2. Highlights of accomplishments

The project has enjoyed substantial success in meeting its Phase II objectives. Our own quantitative self-assessments have indicated tangible links from the projects to community-level and household-level changes in environmental awareness, attitudes and actions.<sup>1</sup> And an external review in 1999 described the project as “one of the few research programs with a rich base of data and experience ... [it] mobilizes information, research and participatory processes to achieve well-conceived and implementable plans that contribute to economic development as well as natural resource conservation”<sup>2</sup>.

The following are some of our accomplishment highlights, selected to emphasize the range as well as the depth of Sanrem activities. More complete documentation of our activities is available from <http://www.aae.wisc.edu/sanrem-sea>.

### *Tools for sustainable agriculture and NRM policy planning and implementation*

The project's partners have developed and adapted a suite of tools for NRM. These range from data intensive economic and environmental models, to participatory monitoring of environmental quality and methodologies for the design and implementation of NRM strategies, to on-farm technologies produced through collaborative research at the project site (24, 25, 34, 42, 44<sup>3</sup>). The successful development of these tools supports our goal of enabling better natural resource management decisions by upland communities. By making these tools available to a wide range of users, we steer away from making decisions *for* natural resource managers. Instead we work with them to develop and test an array of options to evaluate choices, develop a plan to conserve community resources, monitor the health of the environment, and select agricultural livelihood and NRM technologies which best fit their needs and capacity.

---

<sup>1</sup> Buenavista, Gladys; Ian Coxhead, and Kwansoo Kim (2001). "Assessing SANREM's impacts in Lantapan: results of a survey". Ch. 12 in Coxhead, Ian and Gladys Buenavista (eds). *Seeking Sustainability: Challenges of Natural Resource Management in a Philippine Watershed* (Los Baños, Philippine Council on Agricultural Research, Natural Resources and Development), pp. 232-257.

<sup>2</sup> Scherr, Sara (1999). "Report of the EEP visit to Sanrem-Southeast Asia", November 1999 (<http://www.aae.wisc.edu/sanrem-sea/DocumentArchive/EEP99.doc>).

<sup>3</sup> These numbers refer to the project's component work plans as listed in Appendix 1.

Our achievements in economy-environment modeling include the following. (A) Insights about the operation of markets, and about farmers' land use responses to prices and policies, based on monitoring of farm decisions and market trends in the site since 1994. This information contributes to a deeper and more detailed understanding of the dynamics of the upland economy. (B) The 'Manupali model', a user-friendly, intuitive, flexible, and highly portable computer-based tool for understanding the important linkages between economic policies, agricultural resource use decisions, and environmental outcomes. This computer model is based on data gathered at the research site and collaborative research with host country university researchers, host country NARS, and IARCs. To date, the Manupali model has been 'road-tested' with local government, agencies of the national government, representatives of NGOs, and university research groups. It has gone through several stages of development and has been presented at international research conferences in the Philippines and Thailand, and at offices of the Department of Agriculture and the Department of Environment and Natural Resources of the Philippines. The Manupali model is a substantive improvement over existing watershed model in that it incorporates a realistic representation of farmer decision-making in response to economic and environmental information. It is being now adapted for further use in Sanrem Phase III, both at the Lantapan site and in Vietnam, and is guiding methodological work on watershed modeling in the US. The model has been widely disseminated on CD-ROM and the world-wide-web at <http://www.agecon.purdue.edu/staff/shively/manupali>.

Participatory environmental monitoring is spearheaded by our collaboration on water quality monitoring with the *Tigbantay Wahig*, a local NGO in whose formation the project was a catalytic force. The TW undertakes water quality and quantity monitoring in Lantapan, and its documentation of environmental trends over six years of continuous monitoring has generated a comprehensive and unique database. This is a unique accomplishment also in that the data have been collected (and increasingly analyzed) by a community-based group with minimal supervision foreign or external scientists; and that the activity is a collaboration between US and Philippine universities, an international NGO, and a community-based organization. The rich information from water monitoring has enabled us to draw connections on the effects of population and economy on the environment and to study the role of local organizations and institutions in sustainable natural resource management. The TW, meanwhile, are increasing the list of their own accomplishments by providing training and advisory services to other community-based water quality monitoring efforts in several locations in the southern Philippines.

Another important 'process' accomplishment has been the development and application of methodologies for participatory natural resource management (NRM) planning. There have been several of these in the project, differing slightly in approach and outcome. The ICRAF-led NRM planning process worked with municipal level governments to articulate their environmental visions and develop action plans. In a separate activity, SEARCA led a collaboration with CMU-BIDANI working directly with village level (*barangay*) governments in NRM and sustainable land use planning. Both approaches involved capacity building, used local level data generated by community members themselves (or in collaboration with other groups) and required stakeholders, especially municipal and village governments, to commit time, human and financial resources to support the planning process.

Finally, our accomplishments in the area of agronomic research and experimentation have been significant, whether measured by conventional indicators such as academic output, or by influence on local practices. Our vegetable and agroforestry research initiatives test and

evaluate alternative land management options; the agroforestry initiatives in particular have led to the formation of a financially and organizationally strong local tree seed producers' group. Data from the field experiments have also been incorporated into the watershed modeling efforts described above.

*Capacity for NRM planning and policy analysis.*

Building capacity for analysis, action and evaluation is an essential component of any effort to promote better natural resource management decisions in upland communities . The project has been very active in this area, and our accomplishments extend from training and analysis for farmers and natural resource managers to communities, local policymakers, community based organizations, and researchers. All are aimed at building capacity to analyze NRM challenges and opportunities, the conduct of policy analysis, and the use of specialized information to support policy action and advocacy (23, 24, 25, 32, 34, 42, 44). It is significant that our capacity building activities, initially aimed at supporting the implementation of specific research activities, led to the establishment of viable community organizations, such as the *Tigbantay Wahig*, the Agroforestry Tree Seeds Association of Lantapan (ATSAL), and Landcare groups, all at the community level. These groups are increasingly recognized in mainstream local and national environmental forums and by development-oriented projects. In some municipalities in the Philippines, parallel organizations have been formed locally to undertake similar activities.

Strengthened capacity for NRM planning and policy analysis is a key component in the Philippine transition to decentralized environmental and natural resource management. As such we focused our efforts not only on strengthening capacity within civil society, but more importantly enhanced local government NRM capacity through the acquisition of skills in NRM planning and policy analysis (23, 34, 42). This has been a major thrust of the project, and has paid off in diverse ways: in facilitating civil society participation with local government, inter-agency collaboration, appreciation for the value of research, and recognition of local initiatives. These improvements in the policymaking environment are notable in the Municipality of Lantapan, where many have achieved concrete expression in the project-supported municipal Natural Resource and Development Plan.

*Research to support policy advocacy at local and national levels.*

Local and national policies have been shown to exert significant influence over natural resource management decisions in upland areas. Projects aiming to achieve sustainable development in such areas must not only provide support for building local policy making capacity, but also engage in policy analysis and advocacy to maximize their chances of success. Policy studies and advisory activities have been conducted by the project to assist the local government address emerging NRM issues in the municipality (23). As an example, we conducted a study to evaluate residents' willingness to pay for clean water, as an input to future legislation aimed at preventing further degradation of local water resources. Assistance was provided to the local government in preparing several ordinances, including a ban of aerial spraying by banana plantations, and the setting of user charges for water used by agro-based industries. The first of these has been approved, the second is awaiting further evaluation by the local officials of the provisions of the Water Code of the Philippines. Advocacy activities at the local level have also been conducted by other work plans and have produced concrete results such as the creation of Lantapan Water Task Force, legislation supporting NRM planning and implementation and ordinance for adoption of sustainable farming practices. Furthermore, the local government has

provided financial resources to fully implement these legislations. In other municipalities where the project sponsored capacity building activities for NRM planning, legislation was passed to support both the planning process and implementation.

Our policy advocacy activity has also reached the national level. In previous years, this was done through attendance of researchers in national level forums. More recently, we strategically included the Philippine Institute of Development Studies (PIDS) as an institutional partner to enable us to reach national level policymakers (53). PIDS leads in the preparation and dissemination of policy briefs and research notes, featuring results of our research in the Manupali watershed. These documents are distributed in key policymaking branches and agencies of national government. PIDS also heads the organization of a national level policy forum on watershed and water management. This forum, which will be held in August 2002, will feature research papers by national leaders in their fields on competing uses of water, environmental governance and water resource management, watershed development programs and policies, and the role of grassroots organizations in water resource and watershed management. National level policymakers and their advisors are expected to attend this activity.

#### *Information exchange at various scales.*

Information exchange has been facilitated at the local level through site visits, training programs and workshops as well as a wide range of less formal programs. At the national and international level the exchange of information has been achieved through participation by Sanrem researchers in a range of conferences and workshops. We have also sponsored an international workshop on NRM (in Chiang Mai, Thailand, in 1999, and an international conference on Sustaining Upland Development in Southeast Asia. Held in Manila in May 2001, the latter conference showcased the breadth and depth of Sanrem activities, established the project as one with Southeast Asia-wide relevance and cemented its position as a key resource of research and policy advice on the management of natural resources in the upland agricultural areas of the Philippines.

Three publications released at the conference provide further documentation of Sanrem-SEA progress. These are the research monograph *Seeking Sustainability* edited by I. Coxhead and G. Buenavista and published by PCARRD; the Sanrem-SEA multimedia CD-ROM; and a Sanrem-sponsored IIRR publication, *Enhancing Participation in Local Governance: Experiences from the Philippines*.

Through an institutional relationship with the Philippine Institute for Development Studies, a national government economic think-tank, Sanrem researchers now contribute to the publication and dissemination of policy-relevant research tools and findings on environment and natural resource management. We are also poised, in late 2002, to embark on a similar venture with a counterpart national agency in Vietnam, the Information Center for Agricultural and Rural Development in the Ministry of Agriculture.

Complementing our information dissemination strategy, we maintain and regularly update a web site containing research activities, publications, and other pertinent documents. The site is linked into by leading Southeast Asian NRM research networks, such as Mekonginfo ([www.mekonginfo.org](http://www.mekonginfo.org)). In the final 12 months of the project we will be drawing on the expertise of communication specialists to assist in translating research papers into popular media for wider dissemination of research outputs beyond the Philippine scientific community. At the site level, PCARRD in collaboration with the local government provides leadership in the organization of a technical working group to coordinate research and outreach activities implemented by various projects (other than Sanrem) in the Municipality of Lantapan.

### *External linkages through environmental research grants*

Beginning our fourth year, we implemented a competition for small research projects designed to address issues related to promoting sustainable agriculture and natural resource management in the region (50). Funded research in 2001-2002 include activities testing environmental models at the Manupali watershed, institutional analysis, testing of the Lantapan watershed model in Vietnam, and enhancing research and policy linkages in Vietnam. For the current year (2002-2003), we have provided funds through the environmental grant scheme to translate research outputs in popular format; review research on the linkages between forest resources and poverty alleviation in Vietnam; and examine the role of social capital and natural resource management in Bukidnon. Also in Year 4, the project added a GIS research activity to update site maps that were generated during Phase I and to use related outputs for integrated watershed analysis (52).

Our work in Philippines and Vietnam clearly shows the transferability of the tools we have developed in the Manupali Watershed to other areas undergoing similar economic transformations. As an example of the strong research contributions being made by Sanrem researchers, Dr. Gerald Shively, a member of the Sanrem SE Asia team, recently won a three-year NSF grant to continue his research on economy-environment interactions in the Philippines. His research uses household survey data to study how technical change in agriculture affects rates of tropical deforestation. This theme has been an important one for Sanrem researchers in the Philippines, and Shively's research provides an opportunity to study the direct and indirect effects of irrigation development on agricultural production and labor allocation, while controlling for a number of agronomic features of the sample farms and important social factors such as tenure security. His results will provide an empirical foundation for assessing competing theories regarding poverty and the environment, and will also inform broader debates regarding the distributional effects of growth and development and their implications for important aspects of household behavior. Results should have implications for a range of social and environmental outcomes including economic development, poverty reduction, biodiversity protection and carbon sequestration.

### **3. Impacts**

Sanrem is a research project, and as such its impacts are considerably more difficult to identify than is the case with projects having explicit development or technology transfer components. Moreover, because we lack a laboratory 'control', it is very difficult to draw precise causal links from project initiatives to impacts. In addition, the impacts of a research project of this kind are often frustratingly intangible, consisting in the main of changes in awareness and attitudes, perhaps leading to changes in actions, whose *physical* effects (in terms of environmental indicators) may not be observable for years or even decades. Nevertheless, our sustained presence in the Lantapan site has helped generate a number of local impacts that we feel confident in claiming to have caused. These in turn are generating increasing momentum for impacts at national and even regional (Southeast Asian) levels.

### *Sustained NRM planning and implementation and strengthened institutional capacity.*

Sanrem's NRM planning activity in Lantapan has altered governance in the municipality, with environmental concerns now high on the legislative agenda, and consultation with the community an accepted procedural mode, as demonstrated by the project-sponsored natural resource management and development (NRMD) planning process.



The same process has since been implemented successfully in four more of the municipalities bordering the Mt. Kitanglad Range Nature Park. There, local governments have sustained NRM planning activities over a year after its initiation, even with no direct technical assistance from Sanrem. A follow up survey conducted by project researchers in 2002 revealed five critical elements key to ensuring the NRM plans are put into action: the presence of local champions, continued budgetary allocations, a balance of power and responsibility, integration of the NRM plan with municipal environment and economic development plans, and a cohesive NRM council. The spread of NRMD planning has clearly led to immediate impacts in local governance. Local governments have become responsive in providing support to environment related projects in the community, such as those pertaining to soil conservation and protection of water resources. In the long-term, we expect that sustained NRM planning and implementation will lead to a better managed natural resource base in Bukidnon province.

*Improved human and organizational capacity.*

Our research and capacity-building activities have undoubtedly enriched local skills in the application of tools for natural resource management. The community groups that have become partners of the project have no less become advocates, trainers, and resource persons. The spread of their work is notable nationally and even internationally. Increased awareness and knowledge of local environmental issues have inspired these community groups to advocate for sound environmental projects and to participate in local policy dialogues. This also comes with their ability and ease to use information based on research. The *Tigbantay Wahig* members, for example, used data that they themselves collected to warn municipal officials of the gradual degradation of the river systems.

Improved human capacity has led to the creation or strengthening of local organizations and institutions. In the case of Lantapan and other municipalities in the country, members involved in water quality monitoring, agroforestry research and other NRM related activities have organized themselves as formal groups. We have observed the institutionalization of Sanrem methodologies (by which we mean adoption of tools and principles as part of an organization's regular activities) among the various local organizations and institutions with which the project works. The BIDANI group at Central Mindanao University, for example, has incorporated NRM as part of its research and extension agenda in promoting integrated development at the village level. Local governments in and around the project site have established multi-stakeholder natural resource management councils in their respective municipalities to ensure the continuation of NRM planning activities.

*Diversified land management practices and increased incomes.*

The introduction, through the project, of alternative land management practices in Lantapan, including low-cost conservation structures and integrated vegetable and agroforestry systems, has resulted in agricultural diversification and the conservation of soil resources. In Lantapan, for example, one can now observe greater diversity of tree species across the landscape than a decade ago. With the guidance and support of agroforestry experts, there has been a shift away from plantation-type establishments using single tree species, as introduced by previous projects. Diversifying tree species provides farmers with a hedge against disease and price risks associated with monoculture, and enables them to respond to market demands for specific species. There is now widespread appreciation for tree farming as an income-generating activity. Information obtained from the agroforestry association (an organization created with Sanrem assistance)

revealed that members made substantial additional earnings from sale of tree seeds. Income opportunities of local farmers could be enhanced even further with better knowledge of the timber and tree seed market.

#### *Better policy environment.*

Increased capacity for policy analysis among municipal officials has improved the environment for local policy analysis, design and implementation. This is demonstrated by increased consultation and transparency in decision-making (especially as policy formulation depends increasingly on data from community-based research), adoption of consultative processes, and the increased reliance on relatively formal tools for evaluating and deciding on policy alternatives.

At the national level, inputs to policy debates by Sanrem researchers through our partnership with the Philippine Institute for Development Studies are paying early dividends. Our policy briefs distributed through PIDS have been documented to be the catalysts for a review of policies and procedures at the National Water Resources Board (and we expect more progress following the August 2002 national water policy forum). Also through PIDS, Sanrem research is now reaching legislators in the national parliament through the PIDS' legislative monitoring data base, which provides lawmakers and their staff with information (including background research) pertaining to current legislative initiatives.

Finally, Sanrem has also helped national researchers to package and present research results for policymakers. In the Philippines, this has been an important impact of our partnership with PIDS. In Vietnam, the same process has just begun, with two workshops in 2001-2002 bringing researchers together with communications experts and senior officials of the Ministry of Agriculture and Rural Development for the purpose of refining and targeting the policy implications of academic research.

#### **4. Dissemination**

Sanrem is first and foremost a research project, and the primary means for dissemination of findings are the standard outlets for such research: peer-reviewed journal articles, books, acceptance of papers for presentation at national and international conferences, and publication of findings in numerous less formal and more popular outlets. Our achievements in these areas are documented in our annual reports and on the project web site.

The project has also made good on its promise to feed back research results to the Lantapan community. Numerous informal gatherings, called *kapihan* ('coffee meetings') and *pulong-pulong* (dialogues), have been organized to facilitate local level reporting and sharing of research results and to provide a venue for researchers to interact with a municipal level audience, including many participants not directly involved in project activities. The *kapihan* were also held at the provincial level, bringing in a geographically and politically broader audience, such as municipal planners and other provincial and in some cases regional (sub-national) level policymakers. Sanrem researchers, including community members, have also participated in government-sponsored conferences and technical working groups addressing provincial environmental issues. These face-to-face strategies for information dissemination and exchange not only facilitated understanding on the project's mission, but more importantly have helped create awareness on pressing local environmental issues. The successful spread of Sanrem research outputs are documented in an impact study conducted at the research site, in

which Lantapan local government officials ranked Sanrem as primary source of information on environmental and natural resource issues.<sup>4</sup>

Clear and systematic presentation of research outputs at the community level has made it easier for the Lantapan government and Sanrem to define environmental issues affecting the municipality. This paved the way for the proactive utilization of research-based information in the formulation of the municipal natural resource management plan – a concrete policy action undertaken by the local government.

Policy advocacy at the national level is led by national level institutions such as the ISPPS, the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), and the Philippine Institute of Development Studies (PIDS)— each of which has its own established networks within the central government. Activities include dissemination of policy briefs to the executive and legislative branches, and presentation of research results in national level dialogues. To cite an example, a recent Sanrem policy brief on water management has been forwarded to the National Economic Development Authority (NEDA) to be used as an input for the forthcoming national water summit. Recommendations presented in this policy brief are also being used as input in a paper prepared by NEDA for the president of the Philippines. A more direct approach undertaken by the project through PIDS and ISPPS is the organization of a water policy forum, which brings together key policy research experts in water and watershed management. Participants to the forum will include representatives from national line agencies and policymakers.

The strategies that we have employed help ensure that our findings and their implications reach the right audience, in particular influence-makers and decision-makers, and provide opportunities for replication of Sanrem-like activities in other parts of the country and region.

## **5. Training and institutional strengthening**

### *Contributions to human capacity development.*

Our capacity building activities cover a wide range of topics, but have one thematic focus: to enable better natural resource management decision in upland communities in Southeast Asia. Topics include application of integrated watershed model for policy simulations, water quality monitoring, natural resource management planning, land use planning, policy analysis, agroforestry management practices and participatory landscape/lifescape appraisal. The project site office has also hosted study tours for groups from as far away as Ethiopia, and with the provincial government has jointly sponsored a regional watershed workshop and symposium. Capacity building has been provided to community-based organizations on group strengthening, and organizational administration and management.

The project also sponsored researchers and staff to participate in national and international conferences, training programs, and workshops. These activities present opportunities for the participants to share project experiences, research methodologies and findings as well as to learn from other researchers.

A number of graduate students in the U.S. and the Philippines were also funded by Sanrem through research/project assistant ships. Inclusive of graduate students in the U.S. funded in Phase I, they now occupy research and teaching positions in U.S. universities or are employed in the private sector. Those in the teaching and research position in the U.S. are still

---

<sup>4</sup> Buenavista et al., op. cit.

involved in Sanrem research and have published widely the results of their research. A sample profile of former U.S. based students is presented in Appendix 2.

Two Philippine-based students are actively involved in Sanrem research and pursuing their doctoral degree at the University of the Philippines in Los Banos.

#### *Institutional strengthening.*

Our institutional strengthening efforts have been focused on enabling local governments undertake their devolved functions in environment and natural resource management. Governmental units both at municipality and provincial levels comprise our main capacity building clients.

### **6. Complementarity with bilateral programs, and benefits to the U.S.**

The work of Sanrem CRSP-Southeast Asia addresses the strategic objectives of USAID's bilateral program in the Philippines, and also has benefits to the US directly.

The goals and methods of the project over the past 5 years have address strategic objectives of the Manila USAID mission on governance, natural resource management, trade liberalization and food security, as well as some of its specific programs such as the recently completed Growth with Equity in Mindanao (GEM) project (for the mission's current Sos, visit their site at <http://www.usaid-ph.gov/>).

- The core of SANREM's Philippine activities in Phase II was a partnership with municipal and provincial governments to engage in natural resource management (NRM) planning. This was carried out in a way that deliberately integrated NRM planning into the broader strategy of building local government capacity for fiscal and development policy formation in the wake of the devolution mandated by the revised Local Government Code of 1992.
- The integration of environmental and economic-social analysis in Phase II directly addressed both growth and equity for a key province in Northern Mindanao. Our work with commercial corn and vegetable growers complements the small-business orientation of GEM.
- The project's close research attention to NRM and biodiversity conservation issues at the margin of agricultural cultivation in the buffer zone of the Mt. Kitanglad Range National Park addresses crucial problems raised by continuing economic and demographic pressures for the conversion of forested lands to commercial agricultural production.
- SANREM research has demonstrated and quantified the linkages between Philippine agricultural trade policies and the use of natural resources in upland agriculture. These operate both directly— through import restrictions on corn and certain temperate-climate vegetable crops'— and indirectly, through the effects of trade and exchange rate policies on overall economic growth, rural poverty and the generation of non-agricultural employment.
- Finally, it hardly needs to be emphasized that our research on the NRM activities of a relatively poor upland population in control of a fragile resource base has direct implications for the understanding of food security issues, both at the local level and— through the distillation of local and national policy implications— for the broader Philippine agricultural economy. SANREM's Philippine counterparts include nationally prominent researchers and policy advisors concerned with the integration of environmental policies and economic development strategies.

Sanrem's work in Southeast Asia also continues to strengthen links between U.S. research institutions and their counterparts and clients in the region. This benefits the U.S. institutions

through student training, faculty involvement in international experiences and opportunities for policy-relevant applied research. The research site serves as a research laboratory for U.S. based graduate students to gain experience in environment and natural resource management. Graduate students conduct on-site research or work on research activities led by U.S. and Philippine-based researchers affiliated with the project. They gain valuable knowledge and skills in addressing environmental issues in the U.S. and abroad through the development of innovative research methodologies.

In addition to graduate training, we have enhanced capacity for conducting multidisciplinary research using the landscape as a unit of analysis. The dynamic simulation modeling method, for example, is applicable to a wide range of topics.

U.S. based project researchers have served as resource persons in various international research and development courses and programs.

We keep track of our progress and impacts through our annual reporting process and mid-year meetings conducted on site. These meetings offer researchers the opportunity to interact and share research outcomes and outputs. We also use these meetings to address management issues. Towards the end of Phase I, the project conducted an impact evaluation. A similar activity will be conducted before the conclusion of Phase II.

## **7. Collaborative relationships**

### *Research administration and management.*

At the University of Wisconsin, Ian Coxhead, John Rowe and Gladys Buenavista (postdoctoral) take charge of research administration and management. Both Buenavista and Coxhead also have research responsibilities. Our counterpart host institution in the Philippines is represented by the PCARRD. PCARRD is responsible for administration and site coordination. PCARRD-based staff includes Dr. Rogelio Serrano (Sanrem SEA Co-Principal Investigator). A staff of three assists him. Dr. Vel Suminguit is our Site Coordinator and is assisted by a staff of two (one is site-based and also serves as research assistant for the policy analysis work plan). The Site Coordination Office is located in Malaybalay, Bukidnon. The Philippine Agriculture and Resources Research Foundation, Inc. (PARFFI) handling our financial administration. PARFFI is housed at PCARRD.

Our partner institutions and their corresponding roles in the project are shown in Table 1.

## **8. Leveraged funding external to USAID**

Leveraged funding as a result of SANREM programming in Southeast Asia continued to grow during Years 4 and 5 of the project. The funds are estimated at \$151,596 and \$182,660 for Years 4 and 5, respectively. Specifically, the funding came from the following sources and is being used for the reported purposes.

- PCARRD contributes approximately \$10,000 per year in staff salaries, transportation and other in-kind benefits in support of the SANREM administration in Southeast Asia.
- The International Fund for Agricultural Development (IFAD) is providing complementary support to work plan SEA 34 by implementing a countywide case study on the eleven Local Government Units that have introduced NRM plans. Estimated leveraged funds equal \$10,000.

- For work plan SEA 42, the BIDANI Institute has a MOA for this project with the city of Valencia and Municipality of Lantapan. BIDANI and Central Mindanao University have provided approximately \$11,000 over the two years for capability building, micro-finance and community based enterprise activities in these localities.
- ICRAF continues to build the Landcare program in the Lantapan and Calveria municipalities. Total support from ICRAF, the Australian Center for International Agricultural Research (ACIAR) and the Agencia Española de Cooperacion Internacional (AECI) now totals approximately \$50,000 per year.
- The Swedish International Development Cooperation Agency (SIDA) is funding a study through the Southeast Asian Network for Agorofrestry Education (SEANAFE) and ICRAF-Philippines Agroforestry Thesis Research Support Program for the Philippines at the cost of approximately \$15,000.
- Gerald Shively received a \$40,000 grant from the National Science Foundation to support a post-doctoral students research on Southeast Asian natural resource management issues.
- The Australian National University has supported Ian Coxhead's SANREM activities while he has been there on sabbatical (\$5,600). The UW-Madison Graduate School has also provided Coxhead a grant of \$18,500 to work on decentralization and natural resource management ideas arising from SANREM research.
- Heifer Project International continues its strong support of the water quality monitoring work in Lantapan and other municipalities at the rate of approximately \$12,000 per year.
- Victoria Espaldon and Agnes Rola received grants of \$7,000 each to attend the Sustainable Environmental Management course at UC-Berkeley. Espaldon also received a grant of \$2,500 to attend the International Human Dimension Program In Brazil.
- University of Philippines-Los Baños, SEARCA, Central Queensland University, Auburn University, Purdue University and UW-Madison contribute leveraged funds each year in support of the SANREM researchers based on their campuses. The annual value of this support for 2001-2002 is estimated as follows: UPLB (\$2,500), SEARCA (\$4,960), Central Queensland University (\$5,000), Auburn University (\$7,500), Purdue University (\$1,500), and UW-Madison (\$27,600).

**Table 1 Sanrem SEA Partner Institutions**

<b>Type of Institution</b>	<b>Institution Name</b>	<b>Role</b>
<i>Academic/University</i>	University of Wisconsin	Research, research management and administration
	Institute for Strategic Planning and Policy Studies (ISPPS), University of the Philippines at Los Banos	Research and advocacy
	Central Mindanao University (CMU)	Outreach, capacity building, research
	Auburn University	Research and outreach
	Purdue University	Research
	University of Agriculture and Forestry, Vietnam	Research
	Central Queensland University	Research
<i>Government Research Institutions</i>	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)	Research administration and coordination
	Philippine Institute for Development Studies (PIDS)	Policy research and advocacy (national level)
<i>Governmental Units</i>	Municipal Government of Lantapan	Policy analysis and advocacy
	Provincial Government of Bukidnon	Policy analysis and advocacy
<i>International Research Organizations</i>	Southeast Asian Ministers of Education Organization (SEAMEO) Regional Center for Graduate Study and Research in Agriculture (SEARCA)	Research and capacity building (Philippines and Vietnam)
	International Centre for Research in Agroforestry (ICRAF)	Research and capacity building
<i>Non-Governmental/Community-Based Organizations</i>	Heifer International	Research, capacity building and advocacy
	Tigbantay Wahig	Research, capacity building and advocacy
	Agroforestry Tree Seeds Association of Lantapan (ATSAL)	Research and capacity building

### Appendix 1 Sanrem SEA work plans 1998-2003

Work Plan	Title	Lead Institutions
SEA 01	Administration and Research Management	University of Wisconsin
SEA 02	Administration and Coordination	PCARRD
SEA 22 <sup>5</sup>	Weather Monitoring Using Automatic Weather Stations	Central Mindanao University
SEA 23	Policy Analysis for Environmental Management Planning	University of Wisconsin, ISPPS-UPLB, Municipal Government of Lantapan, Provincial Government of Bukidnon
SEA 24 <sup>6</sup>	Integrated Watershed Modeling for Decision Support and Policy Planning	Purdue University, Central Queensland Univ.
SEA 25	Water Resources Management and Education	Auburn University, Heifer International, <i>Tigbantay Wahig</i> , Central Mindanao University
SEA 32	Adapting and Transferring Lessons Learned from the Manupali Watershed to other Critical Watersheds in Southeast Asia: Focus on Vietnam	SEARCA, University of Agriculture and Forestry, Vietnam
SEA 34	Replicating Models of Institutional Innovation for Devolved, Participatory Watershed Management	ICRAF, Provincial Government of Bukidnon
SEA 42	Capability Building for Natural Resource Management at the Local Level	SEARCA, CMU
SEA 44	Technical and Institutional Innovations to Evolve Agroforestry Systems for Sustainable Agriculture and the Management of Protected Ecosystems in the Framework of a Watershed Model	ICRAF, ATSAL, Landcare
SEA 50 <sup>7</sup>	Environmental Research Grants Project	University of Wisconsin, PCARRD
SEA 51 <sup>8</sup>	Synthesis Activity: From Research to Policy in NRM: Insights from the Sanrem CRSP Experience	University of Wisconsin Madison, Provincial Government of Bukidnon, UPLB
SEA 52	Development of a Spatial Information Management System	University of Wisconsin, PCARRD
SEA 53	Water Policy Research and National Policy Advocacy	University of Wisconsin, Philippine Institute of Development Studies, ISPPS-UPLB

<sup>5</sup> Combined with SEA 02 beginning Year 3 and undertaken in collaboration with the Philippine Atmospheric, Geophysical and Astronomical Services Administration.

<sup>6</sup> Sub-work plan activity led by David Midmore on bio-economic modeling was merged with SEA24 beginning Year 3.

<sup>7</sup> SEA 50, 52, and 53 added beginning Year 4.

<sup>8</sup> Funded only in Year 4 by Sanrem global project.



## **Appendix 2 Sanrem-funded graduate students**

Name: Durga Dutta Poudel

Degree: Ph.D., University of Georgia

Accomplishments: Has published (authored or co-authored) 14 refereed journal articles, 5 national or international conference proceedings articles, 6 refereed conference abstracts, and three non-refereed publications. Worked as Research Manager for the Sustainable Agriculture Farming Systems Project at UC Davis after Ph.D. from UGA. I joined the University of Louisiana at Lafayette in Fall 2000 as Assistant Professor of Soil Science and Director of Ag. Auxiliary Units. As a Principal Investigator, received 5 different projects funded for \$554,000.00 over the last two years at the University of Louisiana at Lafayette. Two of these projects relate to non-point source pollution and Total Daily Maximum Loads, one to Organic Farming, one to Wetland Filter Strips, and one Scientific Equipment. Teaches several courses including soil science, water quality monitoring, soil and water conservation, wetland soils, and soil genesis and classification. President of Phi Beta Delta International Honor Society UL Lafayette Chapter for 2002-2003.

Name: Todd Nissen

Degree: Ph.D., University of Georgia

Accomplishments: Post-doctoral associate in the Dept. of Natural Resources and Environmental Sciences, University of Illinois, conducting research on soil quality and the development of perennial biofuels, in addition to maintaining research in Lantapan. Papers from the Lantapan research have appeared in Agricultural Systems, Agroforestry Systems, and the Philippine Journal of Development (pending--do you have any info on this?). Also the lead author on chapter "Soil Quality and Water Quality" in upcoming Encyclopedia of Soil Science from Marcel Dekker.

Name: Luc Boerboom

Degree: Ph.D., University of Georgia

Accomplishments: Expertise that gained on spatial decision support systems in Sanrem has enabled me to teach at the International Institute for Geo-information Science and Earth Observation, in the Social Sciences Division (Netherlands). Teaches spatial planning and decision support systems and their application to spatial conflict analysis and management to students from developing countries (6 to 8 three-week courses in a year on different topics), where experience gained in Sanrem. not only contributes to courses on natural resources management, but also urban planning and disaster management. Over the past three years, some 200 students have received training. Collaborates in various research programs.

Name: Xiaobing Shuai

Degree: Ph.D., University of Wisconsin

Accomplishments: Co-authored journal publications with Ian Coxhead, Gerald Shively and Agnes Rola. Currently financial analyst for Capital Financial Corporation.

Name: Haidy Ear-Dupuy

Degree: Ph.D., University of Wisconsin (dissertation in progress)

Accomplishments: Policy Advisor, Sustainable Livelihoods, Oxfam America, Washington D.C.

Name: Purisima G. Bayacag

Degree: Ph. D Ag econ (UPLB).

Dr. Bayacag is now an associate professor at the University of SOuthern Mindanao; and is actively doing research in agricultural production economics. Her dissertation is entitled "Economic and Environmental Impacts of Market Incentives Among Upland Corn Farmers of the Manupali Subwatershed in Bukidnon, Philippines (Ph.D dissertation, University of the Philippines at Los Banos, June, 2001).

Name: Celia Tabien

Degree: Masters in Management, major in Development Management.

Her field study is entitled, Local government response to the potential environmental impacts of commercial farms on the water resources of Lantapan, Bukidnon (Master's thesis, University of the Philippines Los Baños, 2000).

Name: Charles Zelek

Degree: Ph.D., Purdue University (expected completion 10/02)

Accomplishments: Co-authored journal publications with Gerald Shively.