

Grafting Knowledge - A Conceptual Model to Facilitate Local Development*

Monica MacKinnon

The paper describes the exchange of scientific and indigenous knowledge between a botanical garden and two local villages in the context of two assistance projects in Southwest China. Differences in the nature of these two knowledge systems are described and some practical examples of success and failure in knowledge transfer presented. Whilst from an academic point of view the documentation and field testing of new techniques contribute to an increase in higher level scientific knowledge, what happens on the ground during a development program is limited to the knowledge that can be placed in the hands of local farmers. This remains mostly indigenous knowledge with only some rudimentary new lessons learned from science. The findings are placed in a conceptual framework and an analogy is drawn with the technique of fruit tree grafting such that indigenous knowledge can be viewed as the native root stock and the scientific knowledge as the introduced superior scion.

INTRODUCTION

In recent years, the recognition of indigenous knowledge (IK) and its possible contribution in facilitating sustainable development has been gaining increasing attention (Roling and Engel 1989; Warren 1991; Rajasekaran, Martin, and Warren 1993; Colchester 1994; World Bank 1995; Liu, Xu, and Xu 2000). The value of the knowledge and experience of the local and indigenous communities in the use of the medicinal, agricultural and other useful properties of endemic flora and fauna has been gaining growing appreciation (Nijar 1996). In addition, there has been a growing interest in integrating IK into development planning and

resources management systems (Roling and Engel 1989, Sharland 1993, Campilan 1995, Subedi 1997, Grenier 1998, Xu et al. 2000).

IK is important; nevertheless it is not the only key. The development of these areas that are marked by unprecedented population density, loss of natural resources, or political change may require adaptation for which past local experience provides little guidance. It is a fact that poverty and hunger are no strangers in many areas where traditional agricultural practices still prevail. Therefore, in the development of the indigenous communities, particularly those

* Paper based on doctoral dissertation (Extension Education), U.P. Los Baños, 2004

located in places where livelihood and economic improvement of the local people depend on ever-decreasing natural resources, knowledge, both scientific and indigenous, is needed to cope with the ever-changing conditions of human dynamics and unstable environment.

Research into the knowledge systems has not only recognized the wide gap between science-based and indigenous knowledge (see Table 1) and the big challenge that intertwine them (Campilan 1994), but also sparked calls to search for a common ground for the productive engagement of farmers, scientists and extensionists (Scoones and Thompson 1993), and to establish suitable communication channels among stakeholders (Poffenberger 1997).

This paper explores the fusing of research knowledge with indigenous forms of cultural and environmental knowledge and innovations in order to develop a better alternative to environmental degradation and poverty, and steer toward integrating local development and achieve social sustainability in the conservation of the ever-decreasing natural resources. It is hoped that, by way of an alternative framework —grafting research knowledge on the base of the IK, the researcher is engaging development theorists and practitioners alike to rethink ways we had in the past and have now, and more or so, the possible ways of a transformed future. The researcher makes her case, based on a study of a practice of knowledge exchange in Xishuangbanna, Yunnan, China.

Table 1. Important Differences between Indigenous and Scientific Knowledge

Indigenous Knowledge	Scientific Knowledge
Transferred by word of mouth and personal experience	Transferred by documentation and publication, more second hand
Knowledge often closed (trade secrets)	Knowledge openly shared in journals
Imprecise	Precise
Tradition and superstition are strong elements, religion relevant	Tradition, superstition and religious elements absent
Low level of innovation	High level of innovation
More subjective	More objective
Founded on long-term but narrow experience with local plants and conditions	Founded on knowledge base of biology, ecology, agriculture over wide range of species and conditions
Poor knowledge of external markets, laws, policies and trends	Good knowledge of external factors

Development in Man'e and Manmo Village

From 1992 to 1998, Xishuangbanna Tropical Botanical Garden (XTBG) researchers, with the financial assistance from the MacArthur Foundation, implemented a project titled "Integrating Conservation and Sustainable Development Systems" (Project 1) to develop and demonstrate integrated development systems among communities in the tropical forest of south Yunnan. Two ethnic communities, Man'e (Dai) and Manmo (Hani), were selected as pioneer villages to develop and demonstrate the integrated development systems. Both villages are situated near XTBG and border the Menglun block of the Xishuangbanna Nature reserve (XNR). The project had three components: agroforestry, cash-crop development and eco-tourism.

A second project "Recovering Dai Ethnic Traditional Plant Culture: Holy Hills and Plants in Temple Garden" (Project 2), funded by the Ford Foundation started in 1993. Man'e Village was chosen again as one of the demonstration villages due to its holy hill and ancient Buddhist temple. The same group of researchers from XTBG who were involved in the project 1 implemented project 2. Project 2 was further extended from 1997 to 2000 with further financial assistance from the Ford Foundation.

The two projects have the same main principle – working towards sustainability of natural resources and rural economic development. This is due to the recognition by the XTBG

scientists, of the failure of the so-called "island effect theory" in conservation of natural resources. To conserve natural resources in a region, specifically in Xishuangbanna, one must see to it that the cycle of poverty and environmental degradation is broken.

As a result of the two projects, the two communities have greatly benefited economically and local people have gained much knowledge. The History of XTBG (Xu et al. 2000) recorded an increase of farmers' earnings by 52 percent in Man'e and 83 percent in Manmo. At the same time farmer's level of science and technology has improved, 1500 people having attended training. This provides a solid base for further economic development.

LOCALE OF STUDY

The entities involved include XTBG and two surrounding communities, Man'e Dai Village and Manmo Hani Village.

Xishuangbanna Prefecture has a total area of 19,220 km². Lowest altitude is 430 meters above sea level (m.a.s.l.) where the broad Lancang (Mekong) river leaves China and rises through a series of hills to the highest peak of over 2300m.

Much (94%) of the region consists of mountains and hilly terrain; river valleys make up the remaining area. Xishuangbanna lies mainly in both subtropical and tropical climate zones. Biological resources are plentiful due to the unique landforms and climate

conditions, this area is known as “the kingdom of wild floral and fauna” (Xu et al. 2000).

XTBG is situated in Menglun town at lat.21°41' N, long 101°25' E, and 570m altitude, with annual mean temperature of 24.4 °C, annual precipitation of 1556.8 mm and mean relative humidity of 83%.

Man'e Dai village is located on the plains of Mengkuang River, a branch of Lancang River. Geographic characteristics are similar to that of Menglun town, being only two kilometres away.

Hani people are by tradition a hill-dwelling group. Manmo Hani village is located attitudinally slightly higher than Man'e village, between 680-1000 m.a.s.l. It is only 7 km by road from Man'e.

METHODOLOGY

Two trips to China were made for the purpose of data collection. First trip was made in January 2003 and a second trip between October and November 2003. The following are some of the informants interviewed: local farmers, village leaders, monks in Man'e village, former director, deputy director and key researchers of XTBG, officials of Xishuangbanna Nature Reserve, tourism managers, prefectural tourism officials, tourists in botanic gardens and other sites.

The following methods were used in gathering both quantitative and qualitative data: in-depth interviews, key informant interviews, participant

observation, and review of secondary data.

RESULTS AND DISCUSSION

Regional context for development

Xishuangbanna Dai Autonomous Prefecture is located in the southern region of Yunnan province and shares borders with Laos and Myanmar. With unique geographic formations and climatic conditions, this region is blessed with rich flora and fauna of the tropical rainforest. To conserve the diversity of wildlife, Xishuangbanna Nature Reserve (XNR) was established in 1958 to protect the unique fauna and flora from further logging, hunting or farming. Adjacent to the nature reserve and surrounded by it, XTBG was established in 1959 to collect, study, and conserve the rich plant species. With more than forty years history, XTBG has become the biggest botanical garden in China and Southeast of Asia in terms of land area and richness of plant species. At the time of this research, XTBG has been an independent research institute directly managed by the Chinese Academy of Sciences.

Xishuangbanna is also home to many minority ethnic groups, including Dai, Hani, Lahu, Bulang, Jino, Bai, Yao, Miao, Hui, Zhuang, Wa and Yi communities. Dai constitutes the largest group (35%). These groups have strong cultural identities and maintain traditional beliefs and customs. For millennia, these groups have evolved careful ways of producing from the land while caring

for its integrity and thus sustaining production (Borrini-Feyerabend G. ed. 1997).

However, recent changes in Xishuangbanna in technology, population dynamics and the widespread shift from subsistence to market-oriented production have strained many of those relationships. In particular, during the Mao era all Chinese were dictated to adopt "the same nationally-determined, State-imposed culture" (S. J. Nepal 2000). Ethnic groups and communities were forced to abandon their beliefs and practices.

It was not until the overall reform entering into 1980s, that these ethnic groups slowly started to regain their rights over their traditional cultures and practices. With further political and economic reform, the diverse resources of flora and fauna together with the distinct ethnic cultures and practices, are finding huge potential in development. Within this context, integrated development with assistance from external agencies such as XTBG, started and thrived among these ethnic groups.

Environmental context of Xishuangbanna

An environmental context manifests the relationship between human beings and their surroundings within a period of time. Thus, an environmental context outlines not only the objective natural surroundings of a location, but also the human activities, the impact of such activities on the natural surroundings. It also

points out possible ways of ameliorating any conflict between human survival and the ecological sustainability of the location.

In Xishuangbanna, the environmental degradation has been unprecedented. For example, in 1950, about 70 percent of Xishuangbanna was covered with forest. Today the figure is only half of that. The speedy and continuous deforestation contributed to the environmental degradation of the region. The present environmental context can be attributed to both natural and anthropogenic causes. It is marked by the following aspects:

1. Shifting cultivation. Xishuangbanna has traditionally been farmed by slash and burn practices. As population has increased and forest area has shrunk, there is now insufficient space for the sustainable continuation of such shifting agriculture.
2. Population growth. Although population density in Xishuangbanna is well below the national average, the rate of increase is alarmingly high and this has already put great pressure on limited agricultural land. Population is high because the ethnic minority people are not limited by the "one child one family" policy applied to Han majority. In addition the region has been subjected to high levels of immigration from other parts of Yunnan and Sichuan, partly to develop the rubber industry but also to take advantage of the comparatively dynamic growth of the local economy.

3. Rubber industry. Since the 1960's Xishuangbanna was opened up for the development of Brazilian rubber. At first rubber could only be grown below 800m and much excellent forest was cleared to make way for the new crop. Since then Chinese scientists (centred largely at XTBG) have found improved management techniques including introducing second crops such as tea between rows of rubber. As a result of these researches, rubber survives the cool winters better, can grow up to higher elevations and can have better yields than in the first trials. Rubber has been promoted to small farmers as a way to stabilize shifting cultivation. Today, almost one quarter of the entire prefecture is under rubber cultivation.

Government response: Biodiversity conservation

The value and importance of the prefecture's rich biodiversity has long been recognized. Government has set up nature reserves in 1958 to protect the rich fauna and flora resources of this region with varying degrees of success. Also in response to the importance of local biodiversity a total ban on hunting with guns has been imposed on the prefecture.

XTBG involvement

In recent years, researchers realized, although XTBG has the biggest land area in China, a botanic garden is at its best, a fragmented ecosystem whose sustainability depends on a larger ecosystem. On its

own it cannot protect most species from danger and/or extinction in the long term. An improved regional environment is key for its biodiversity conservation. XTBG scientists have taken the view that conserving the richness of natural resources in Xishuangbanna region depends in large part on good economic prospects for the communities within the region. Therefore much of XTBG efforts and resources have been put into the research on methods and techniques of the integration of local economic development and biodiversity conservation specifically on knowledge exchange. Only this can lead to sustainability of the natural resources and resolve the vicious cycle of "poverty and environment degradation".

Comparison of characteristics of the two communities

Man'e and Manmo communities are situated in the same geographical location, and yet their different cultural background and traditions and their specific situation, give rise to differences in attitude and aptitude and have effects upon the knowledge construction and exchange process. (Table 2)

THE KNOWLEDGE EXCHANGE PROCESS

1. Funding and planning

In the case of the projects implemented in Man'e and Manmo village by XTBG, funding sources include international funding agencies, government agencies, and contribution

Table 2. Comparison of Main Features of Two Villages

	MAN'E DAI	MANMO HANI
History	900 years	40 years
Biophysical setting	River basin	Hillside
Agro-systems	Holy hill (burial ground and holy forest)- Buddhist temple - village - fuel - wood plantation - paddy rice fields	Forest (for water source and burial ground) - village - shifting cultivation (for dry rice and maize)
Religion and belief	Hinayana Buddhism with traces of earlier polytheistic beliefs	polytheistic beliefs and ancestor worship
Sources of income	Rubber 70-90% Other cash crops – Chinese cardamom and winter vegetables, irrigated paddy rice sufficient for home consumption and surplus for market; Ecotourism – little income	Rubber: 90% Others cash crops – Chinese cardamom, rice just enough to feed the community Ecotourism – little income
Relationship w/ outsiders	Long amicable relationship with XTBG, MNR, and other government agencies	Related to XTBG only during projects, normalized relationship with MNR, little contact with government agencies.
Women status	Women are respected and share equal rights with men, have independence in income, own properties and can make decisions	Women have no names, no rights over income or no place in family genealogy, no say in family or village affairs.
Education	Long history of written Dai language and temple school education for boys. Now with state schools (for boys and girls), and temple monastery school for boys to learn old Dai language and Buddhist canons.	Traditionally no Hani schools, no Hani written language nor literature. First school in Manmo village was established in 1995. Today, Manmo Hani people are very keen to see their children get educated in state schools.
Traditional knowledge	On plants and their taxonomy Astronomical knowledge Arts and Literature Knowledge on Architecture	On useful wild plants and animals
Knowledge transfer modality	Generation to generation within family, village or wider Dai society. Temple school and state school	Generation to generation within family, villagers and from village elders. School (new)
Form	Folk stories and legends, books, literature, manuals, and temple school lessons, state school lessons	Oral stories and legends, school lessons

from villagers. The funding sources and contributions include:

- MacArthur Foundation (project 1)
- Ford Foundation (project 2 and its extension).
- Man'e Dai villagers' donation to the restoration of village temple.
- Manmo Hani villagers' contribution to Manmo electricity facility.
- Local government contribution to Manmo electricity facility

The author considers the inclusion of some contribution from the villages themselves as an important component for success and commitment.

Prior to the implementation of the project, XTBG set a precondition for Manmo village — an agreement for the villagers not to cut trees from neighboring nature reserve or other village land, without conflict with other villages and Manmo will get the outside assistance, mainly from XTBG to prosper by themselves. This measure is planned, based on the XTBG scientists' awareness of worsening relationship between Manmo and its neighbouring nature reserve and neighbouring village, caused by the diminishing Manmo village forest.

2. Selection of technologies

The technologies, as summarized by the XTBG scientists, were: agroforestry, cash crop and eco-tourism development. The rationale behind the selection of technologies was to increase the income sources by diversifying the farmers' cropping

system, and establish sustainable agricultural development, thus to achieve conservation of the regional biodiversity.

Selection of the technologies was done by the XTBG scientists. It was based on the analysis of the communities in terms of social, economical conditions as well as their dependence on natural resources; extensive review of available literature on the region; and assessment on XTBG's own research and available technologies.

At a time when participation of the local people in decision-making seems to be paramount in the change process, one can easily criticize the seemingly top-down approach used in the technology selection. However, special situation would need special solutions. In the course of technology selection, participation is embedded in the interviews and field observation done by the XTBG researchers. Another point is that even Roling (1990) points out that the typical issue in natural resources management requires decision making at a system higher than the conventional farm level. At this higher level, networks (including XTBG, local communities, local government agencies and foreign funding agencies) and processes (interviewing local people, reviewing literature, access XTBG's own research, and soliciting other agencies) were required for generating locality-specific responses to diversity and complexity, taking into account the multiple perspectives and objectives of the actors involved.

The different features of the two communities, their respective indigenous knowledge systems were the bases for selection of technologies and approaches to disseminate them by XTBG. The selection was made by scientists well versed in local ways and preferences and any suggestion put forward by the scientists would anyway have to run the gauntlet of acceptance or rejection by the farmers at field trial level.

3. Experimentation and trials

Living among the rich natural resources of the Xishuangbanna forest, the people in Man'e and Manmo had never planted vegetables or fruits before, because they knew how to survive on the food from the forest (IK). However, as the forest shrinks and food resources decline, the IK in surviving on the land would not sustain them anymore and newer ways toward natural resource management would have to be found. This is where the research knowledge can come in to build on the base of the IK.

Among the selected technologies, some were readily available within XTBG (some agroforestry inter-cropping systems such as rubber with tea, Chinese cardamom and coffee etc.), and some were new. New technologies (cash crop varieties such as vegetables, fruits and medicinal plants) were first developed and tried on the experimentation plot in XTBG.

When the newly developed technologies became ready on XTBG's experimentation field, trials in the communities started. Man'e leaders

agreed to rent a piece of village land to XTBG as a field trial and demonstration plot. Farmers from both Man'e and Manmo were taken to see the experimental plots in XTBG and later in Man'e, and Menglun market to compare the prices and savour the taste of different varieties.

The experimentation, trial and demonstration of planting vegetables, fruits and medicinal plants on Man'e village land had immense effect on the farmers. Farmers from both communities witnessed and marvelled with their own eyes the whole cycle of the plants growth and production. A farmer from Man'e village, Mr. Bo, agreed to convert part of his home garden as a trial and demonstration plot for Man'e and Manmo farmers. Seedlings of vegetables, fruits and other cash crops were propagated in his home garden. Scientists and experts on vegetables and fruits came to train farmers and demonstrate new techniques in his garden. Mr. Bo and his wife, along with a few other progressive farmers had become unofficial proxy teachers in these techniques.

4. Facilitation of the technologies

The facilitation can be categorized as: interactive, participatory and mutually beneficial. Different approaches were used to facilitate the technologies in the two communities. Again these approaches had deep roots in the understanding of IK and indigenous people.

Having had long involvement with XTBG, Man'e Dai village farmers had trust in the XTBG scientists and the

initiation was easy. Manmo Hani village had little previous contact with XTBG, therefore, getting the trust of the farmers at this phase was the hardest among all other activities of the project, according to XTBG scientists.

A. Agroforestry and cash crops

Although Man'e people had for a long time maintained home gardens, the production from home gardens was mostly for home consumption. They had great potential to bring in more economic benefit if new varieties and newer technologies were introduced and selection of species improved. On the basis of traditional home gardens, XTBG scientists introduced to the farmers ways of grafting fruit trees and the use of the shaded space under larger plants to propagate seedlings. Introducing a new variety of pomelo was a big success.

Apart from the long-term fruit tree crops, XTBG scientists also introduced some short-term crops to generate faster income for farmers whilst waiting for the benefit from the fruit trees, which may take several years. The short-term crops included winter vegetables such as chillies on the resting rice fields. Consideration was also given to rationally use the space underneath the fruit trees, where other economic crop varieties, such as vanilla, were introduced to intercrop with the fruit trees.

Based on their analysis, XTBG scientists planned the improvement of the Manmo, similar to that of Man'e,

to increase diversity of useful plant species through improved agroforestry and introducing cash crops. Accordingly, the priority task for XTBG scientists was to make sure the Manmo farmers had enough food. To achieve this, they collaborated with Manmo farmers to improve the paddy field irrigation, opened more paddy rice fields, converted some original dry rice land into paddy rice fields, and introduced a higher yielding hybrid rice variety. In a period of two years, the grain production in Manmo increased and was able to meet the population needs.

However, rubber trees took at least 6-7 years to mature and to generate economic returns. Help was provided by XTBG to intercrop the trees with rice, pineapples, etc. which is an interim measure while the rubber trees were young. Meanwhile cultivation of Chinese cardamom under existing forest cover was further promoted.

Tropical fruits were introduced and old fruit trees were improved by grafting. Grafting Menglun pomelo on the existing old stem of pomelo trees was faster than planting other fruit trees, so this became the main task in the first phase of the agroforestry and cash crop introduction. Other cash crops and fruit trees were also introduced for the long-term economic and environmental benefits. A nursery was also set up with the assistance of XTBG scientists to produce seedlings of fruit trees. As a complementary measure to mitigate the firewood shortage during implementation of the projects, XTBG researchers had come up with the

training of the village people to build energy saving stoves as in Man'e Dai village. In addition, *Cassia* planting techniques were introduced to the Manmo people, so that firewood shortage will not be a long-term problem.

B. Ecotourism development

In Man'e Dai Village, ecotourism was a main part of planned economic development of both projects. On the basis of the village temple, holy hill, the traditional Dai style of life, and easy access to Menglun town, XTBG scientists planned the eco-tourism development in Man'e to manifest the traditional Dai village with its culture, religion, holy hill forest and paddy fields.

In Manmo Hani village, the remaining rainforests and the poorly known Hani culture formed the basis for ecotourism development. With the assistance of XTBG, an area of 60 hectares of tropical rain forest just north of the village residential area was transformed into an ecotourism area.

Despite the potential interests and the favourable location of the two villages beside a good road that serves as a major artery for visitors to the prefecture, the development of community level ecotourism has not been successful in either village.

The success of any type of tourism, particularly ecotourism depends on an intricate balance of many factors of the destination site and its wider context. These include social, cultural, economic, political, environmental and psychological factors.

The capacity or necessary knowledge on the part of the managers, operators and the destination site as a whole has not been given enough attention. This may well be part of the reason for the failure in the ecotourism development in these two communities — a lack of knowledge on the part of the farmer operator to continue to run the destination without the researchers' assistance.

CHANGES AS RESULTS OF THE PROJECTS

In the villages

Changes in attitudes are clear in the two communities as well as the XTBG researchers. In both Man'e and Manmo, the farmers now respect the XTBG researchers and their knowledge ever more than before. Man'e and Manmo people have become friends. Great self-esteem has been fostered among many farmers during the projects.

Building on the culture and religions of the local people, renovating the village temple and restoring the village holy hill in Man'e not only steered the renewed respect towards Buddhism, to the holy hill and ancestors, and to the community, but also added farmers knowledge on their culture, religion, and the significance of plants in their way of life.

Farmers now realize the important role temple garden plants and holy hill forest can play on the conservation of tropical vegetation, plant diversity and

local environment as well as an important part of the Dai traditional agro-ecosystem. Their traditional knowledge on plants has been further broadened to include knowledge on cultivated vegetables and fruits, such as chillies, passion fruits and raising seedlings and grafting. Due to the increase of knowledge and enhancement of the traditional knowledge, knowledge on their cultivated land has been improved and so did knowledge on the broader environment.

Agricultural practices in both communities have now shifted from earlier hunting gathering with some farming activities, to more diversified practices including vegetable and fruit planting. Changed practices also enable Manmo people to give up shifting-cultivation while now having more than sufficient food resources and cash income. This also enables men to reduce hunting – another positive change for the environment. Planting fuelwood and installing energy-saving stoves make fuelwood supply and need balanced thus conflicts with the nature reserve was mitigated. Tree cover increase and tree crops on former shifting cultivation areas have improved water flow and soil conservation.

In XTBG

The XTBG scientists have gained much knowledge from the local people both from the project communities and beyond. This rich knowledge has resulted in many beneficial outcomes, namely, (1) the knowledge they gained has contributed to their own botanical research work in XTBG, (2) publishing

reports and books benefit XTBG and the individual researchers for academic standings and promotion, which can help in application for new projects and research grants, (3) the knowledge the XTBG researchers gained from projects can bring economic benefits to the botanical garden and individual researchers.

The knowledge gained by the researchers from the local people has been widely used in the tourism development of XTBG. Although it is not easy to identify which knowledge shown in XTBG is used to attract tourists, in totality, XTBG's tourism development has been an on-going process of improving the learning of and showing of the diverse plants, the local knowledge, local culture and people, relationship between local people and their environment. Almost half a million visitors a year pay to enter the gardens. The attraction of XTBG has been increasingly dependent on learning from the local knowledge. The scenic beauty of the garden is built on the ethnic groups, particularly the Dai style. That such a plant collection from this region is available in XTBG is due in part to the ethnic groups' accumulated knowledge on plants and their protection. Special displays and facilities are all based on the ethnic styles, not to mention the ethnic minority people as the tourist guides, explaining ethnic ways of life in relation to plants; hotels and restaurants serve ethnic foods based on local knowledge on plants, and even the keeping of the green peacocks is a display of Dai ideology and symbolism.

In particular, the opening of the Ethnic Forest Culture Museum within XTBG is a direct resulting benefit from the two projects. Many of the cultural artifacts on display in the museum are from the people in these two communities. This suggests that the development of tourism in XTBG has benefited much from the local knowledge and local culture as well as the participation by local peoples.

CONCLUSION

Man'e Dai village, having settled in its present location for about 900 years, having distinct agro-ecosystems (paddy rice fields - home gardens - village centre - Buddhist temple - holy hill forest), having written language and both state school and temple school education, longer and better relationship with XTBG and other outside agencies, with wider range of indigenous knowledge, the learning of the XTBG scientific knowledge had been easier for the Man'e farmers and results were better sustained. In Man'e Dai Village, agroforestry practices such as intercropping rubber with other crops, maintaining the holy hill forest and temple garden plants are well sustained. Cash crops planting such as raising winter vegetables and high value fruits are also practiced.

In comparison, Manmo village with short (40 years) history in its present location, with distinct agro-ecosystems (forest - village residence - shifting cultivation), with no written language, having had limited contact with XTBG and outside agencies, with its indigenous knowledge more

focused (and perhaps understudied) on the forest and surviving in the forest, the persuasion for people to change had been more challenging. And the result of the learning from the scientific knowledge relatively less well sustained.

In both villages, ecotourism development has largely failed. External influences such as government taxation scheme, proximity to better run competing tourist facilities (including XTBG), and internal factors such as lack of management skills on the part of the villagers are responsible for the failure.

It is clear that the local farmers possess a great amount of valuable local indigenous knowledge. Much of their knowledge has evolved from the availability of natural resources, natural environment and their varied ways of coping with the nature and its changes. The local indigenous knowledge has provided strong base both for the livelihood betterment of the region and the scientific research of XTBG.

At the same time, the scientific research as carried out by XTBG is also fundamental in the local development in Xishuangbanna region where the environmental degradation has become severe. XTBG's scientific research into botany, ethnobotany, plant conservation and their contribution in conservation of both local plant diversity and local economic development are timely and necessary. However, yet without a strong base of local knowledge, including local cultures, local beliefs and locally

specific practices, the insertion of the scientific knowledge into the local development process would not stand much of a chance to succeed.

This case study demonstrates that development of the local villages depends upon an exchange of local indigenous knowledge and scientific knowledge. In the knowledge exchange process, the local indigenous knowledge has been transformed into scientific knowledge and scientific knowledge into local indigenous knowledge. New knowledge has been constructed during the course of exchange.

For both the local people and XTBG scientists alike, this is a process of continuous learning and knowing, trying to emulate what occurs in nature, trying to understand and construct necessary knowledge, needed for the right fit of human, culture and landscape. Thus knowledge, both indigenous and scientific, is embedded in a complex system of social, cultural, physical, temporal and other elements.

Facilitation of the local knowledge process by external intervening agents has been recognised as a potential key strategy for sustainable development (Roling and Brouwers, as cited by Campilan 1995). In the development of the two villages, XTBG's research provided higher-level solutions than the farm level or village level in the pursuance of the integration of wider environment conservation and local economic development. At this higher level, XTBG's research has been generating locality-specific knowledge to cope with local and regional

diversity and complexity, taking into account the multiple perspectives and objectives of the actors involved.

This process of knowledge exchange is similar to the process of fruit tree grafting. Scientific knowledge can be seen as the scion and local indigenous knowledge the understock. The purpose of inserting scientific knowledge into the bases of the local indigenous knowledge is to propel local development through a knowledge exchange process. In the fruit tree grafting, cambium is the essence for the growth of newer branches, which will bear fruits. In exchange of scientific and indigenous knowledge, a knowledge cambium is the quintessence for successful exchange and construction of new knowledge.

A knowledge cambium would need a good fit of knowledge and situation. Similar to the elements to be considered in fruit tree grafting, the dynamics (including who, what, where, when and how, not just knowledge per se) of knowledge cambium are very diverse and localized. A reliable formula, if it exists at all, needs painstakingly detailed study on the local indigenous knowledge, available scientific knowledge and the compatibility of the two.

Drawing from the grafting analogy, the author emphasizes the importance of the IK as the base for local development and recognition of the resulting mutual benefit. Thus, IK should serve as the foundation for the common ground (Scoones and Thompson 1993) and the new higher

ground (Chambers 1997). Only development founded on the strong base of IK will yield desired results and be sustained.

In realizing whose reality counts, Chambers (1997) calls for 'putting the first last', therefore, altruism and generosity on the part of the uppers. Here the author proposes the uppers, the outside intervening agencies, to take a step further, to foot development efforts on the base of IK and the IK bearers. This implies not only putting the first last, but last first; not only altruism and generosity, but

also consistency and persistence, in our efforts to change.

It is also hoped that with a firm footing on the IK, implications can be drawn on such contentious issues as who participates with whom, what stage and how to participate in the development process, access and rights to resources (including knowledge and information, both indigenous and scientific), etc.

REFERENCES

Borrini-Feyerabend, G. (ed.)

1997 "Beyond Fences: Seeking Social Sustainability in Conservation." http://www.bsponline.org/publications/asia/beyond_fences/bf_section1_2.html

Campilan, D.

1994 "Enhancing the User-oriented Diagnostic Framework through Knowledge Systems' Thinking." In *Taking Root*. Proceedings of the Third UPWARD Annual Conference. Los Baños, Laguna, Philippines: CIP-UPWARD.

1995 "Learning to Change, Change to Learn: Managing Natural Resources for Sustainable Agriculture in the Philippine Uplands." Ph.D. dissertation, Wageningen University and Research System.

Chambers, R.

1997 *Whose Reality Counts? Putting the First Last*. London, UK: International Technology Publications.

Colchester, M.

1994 The Social Impacts of Wilderness Preservation. *The Politics of Parks, Society, and Biodiversity. Salvaging Nature: Indigenous Peoples, Protected Areas and Biodiversity Conservation*. Discussion paper 55. United Nations Research Institute for Social Development. Geneva.

Grenier, L.

1998 *Working with Indigenous Knowledge. A Guide for Researchers.* Ottawa, Ontario, Canada: International Development Research Centre.

Liu, H. M., Z. F. Xu, and Y. K. Xu

2000 "The Role of the Traditional Beliefs in Conserving Plant Diversity: A Case Study in Xishuangbanna, Southwest China." In: J. C. Xu (ed.) *Links Between Cultures and Biodiversity.* Proceedings of the Cultures and Biodiversity Congress 2000. 20-30 July, Yunnan, PRO China. Yunnan Science and Technology Press.

Nepal, S. J.

2000 "Case Study 9: Xishuangbanna Nature Reserve, China." In J. Beltran (ed.) *Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies.* IUCN, Gland, Switzerland and Cambridge, United Kingdom and WWF International, Gland, Switzerland.

Nijar, G. S.

1996 *In Defence of Local Community Knowledge and Biodiversity – A Conceptual Framework and the Essential Elements of a Rights Regime.* Third World Network Paper 1.

Poffenberger, M. C.

1997 Local Knowledge in Conservation. In G. Borrini-Feyerabend (ed.) *Beyond Fences: Seeking Social Sustainability in Conservation.* http://www.bsponline.org/publications/asia/beyond_fences/bf_section1_2.html

Rajasekaran, M. and D. M. Warren

1993 "A Framework for Incorporating Indigenous Knowledge Systems into Agricultural Extension." *Indigenous Knowledge & Development Monitor* 1(3).

Roling, N. and P. Engel

1989 IKS and Knowledge Management: Utilising Indigenous Knowledge in Institutional Knowledge Systems. In D. M. Warren, L. J. Slikkerveer, and S. O. Titilola (eds.) *Indigenous Knowledge Systems: Implications for Agriculture and International Development.* Iowa State University Research Foundation, pp. 101-115.

Scoones, I. and J. Thompson

1993 *Challenging the Populist Perspective: Rural People's Knowledge, Agricultural Research and Extension Practice.* Discussion Paper 332. Institute of Development Studies.

Sharland, R.

1993 "Fusing Tradition and Science to Design a Better Granary." *LEISA Newsletter for Low External Input and Sustainable Agriculture* 9 (3), March.

Subedi

1997 "Farmer's Local Knowledge Agrees with Formal Experimental Results." *LEISA Newsletter for Low External Input and Sustainable Agriculture* 13 (3), October.

Warren, D. M.

1991 *Using Indigenous Knowledge in Agricultural Development*. Discussion Paper No. 127. World Bank.

The World Bank

1995 "The World Bank Operational Manual, Operational Directive (OD) 4.20: Indigenous Peoples." In S. H. Davis and K. Ebbe (eds.) *Traditional Knowledge and Sustainable Development*. Proceedings of a conference held at The World Bank, Washington, D. C. September 27-28, 1993. Environmentally Sustainable Development Proceedings Series No. 4, pp. 52-57.

Xishuangbanna Tropical Botanical Gardens. Chinese Academy of Sciences. Tropical Plant Research. Collected papers (selected issues).

Xu, Z. F. et al. (eds.)

2000 *History of Xishuangbanna Tropical Botanical Gardens (1959 - 1999)*. Unpublished monograph.

Contradictions and False Dichotomies in Ecogovernance: Shifting Cultivation as Agroforestry*

Daylinda Banzon-Cabanilla

This paper examines selected current issues in ecogovernance centered on shifting cultivation, by highlighting a specific contradiction and a false dichotomy embedded in rhetoric and practice. Insights are drawn from first-hand experiences in studying forest communities, supervising graduate students' research on indigenous agroforestry systems, handling a course on shifting cultivation, and reviewing relevant literature. The paper begins with an analysis of a major contradiction in ecogovernance discourses on the "goodness" of agroforestry and the "badness" of shifting cultivation. The paper then revisits the case of Tausug agroforestry systems to illustrate the false dichotomy of science versus indigenous knowledge. The paper concludes by indicating implications of the ideas presented for theory and practice in the forestry and environment sector.

INTRODUCTION

Ecogovernance is an alternative label for environment and natural resource management, which has been defined succinctly as "the new business of bringing our human enterprise into harmony with the natural world of which we are a part" (Speth 2005: 2). Ecogovernance has acquired prominence in development discourses. There is no longer any doubt that authentic development requires a serious consideration of environmental issues. Poverty reduction, which is today the all-encompassing goal of development initiatives, includes environmental

dimensions. Thus, the conventionally "social" realm of development has expanded to include the environment. On the other hand, the conventionally "biophysical" concerns for the environment are facing the challenge of incorporating various social dimensions and contexts.

The broad intention of this paper is to highlight a specific contradiction and a false dichotomy embedded in the rhetoric and practice of ecogovernance centered on shifting cultivation. I draw my insights from first-hand experiences in studying

*This is a revised version of the Francisco J. Nicolas Professorial Chair lecture presented on 13 January 2004 at the College of Forestry and Natural Resources, U.P. Los Baños.

forest communities, in supervising graduate students' research on indigenous agroforestry systems, handling a course on shifting cultivation (and related topics in other courses), and reviewing relevant literature.

The objectives of the paper are: 1) to analyze a major contradiction in ecogovernance discourses, i.e., the "goodness" of agroforestry and the "badness" of shifting cultivation; and 2) to revisit the case of Tausug indigenous agroforestry systems to illustrate the false dichotomy of science versus indigenous knowledge. I conclude the paper by indicating some implications of the ideas presented for theory and practice in the forestry and environment sector.

Plural publics and multiple realities in ecogovernance

The realization of the necessity for a more holistic and participatory approach in addressing issues in ecogovernance has produced plural publics or interest groups. Categories of these different groups include "outsiders and insiders," referring to external development agents and local communities; and sectoral groups of government agencies from national to local units, civil society organizations including nongovernment organizations (NGOs), peoples' organizations (POs), and private companies. Other groupings that represent functional clustering but may not be mutually exclusive consist of educational (academic), scientific or research, and development or assisting organizations.

The plural publics of ecogovernance can be viewed as actively, though oftentimes implicitly, constructing their own realities pertinent to ecogovernance. These realities are encoded in language. The different uses of language intersect with the ways in which power relationships are sustained by expressions that mobilize meaning in the social realm. Thus, the analysis of language is central to my arguments about contradictions and false dichotomies. However, in this paper, I do not dwell on the theoretical aspects of language-reality relationships (see Banzon-Cabanilla 1996).

Why focus on shifting cultivation? In recent years, shifting cultivation has begun to occupy a central space in ecogovernance discourses. Multiple publics are talking about it and anthropologists who were among the first to document various cases are revisiting and adding to these cases (Classic studies include Conklin 1961, Frake 1962, Geertz 1963, Spencer 1966, and Rappaport 1971). Even state and academic institutions that represent the more dominant western "scientific" view are in the forefront of advocacies upholding traditional systems. The number of conferences, workshops, networks and publications focused on aspects of shifting cultivation has increased in the last few years. There is considerable rethinking among groups that used to view shifting cultivation negatively. These indications are just the beginning, setting the trend in a more sustained and widespread concern for

reconsidering the old paradigms in ecogovernance.

Another reason for the focus on shifting cultivation is that the plural publics and multiple realities have contributed to making the issue of shifting cultivation an illustrative example of contradictions and false dichotomies in ecogovernance. To address this confusing situation, we are challenged to raise the level of our alertness, establish some precision in our terminologies, and clarify the messages of ecogovernance.

The terms “contradictions” and “false dichotomies”, like all words, have several meanings, thus it is necessary for me to specify their meaning in this paper. By contradictions, I mean inconsistencies with or oppositions to statements. Thus, one need only to contrast statements to identify inconsistencies. In this paper, I focus mainly on the internal contradiction of the statement, “Agroforestry is good but shifting cultivation is bad.” The statement is, of course, a gross generalization of the continuing debate about shifting cultivation but it serves the purpose of my paper.

I have found it much easier to surface contradictions than to label dichotomies “false”. Dichotomy is the state of being divided into two; in logic, it pertains to the division of a class into two mutually exclusive subclasses, one positive and the other negative, such as poor versus non-poor. In anthropology, particularly in structuralism, the bifurcation of phenomena is referred to as “binary

opposition” or “pairs of opposites” (Levi-Strauss 1967 is considered the model of this type of analysis). To label these dichotomies “false” is tricky. If by “false” we mean “contrary to truth or fact” then the burden of proof is in establishing the standard truth or fact. In this paper, I limit the meaning of “false” to “artificial” or “not real.” In this sense, all conceptual devices are “false” in the way they are synthetic tools that are not reality themselves but simply heuristic tools for understanding reality. This is debatable: do dichotomies actually exist in reality or are they only representations of reality? But, aren't representations of reality also real?

Thus, contradictions and false dichotomies are not necessarily negative phenomena that should be condemned. In fact, I am revealing my own contradictions and false dichotomies in this paper. In today's increasingly complex and variable world, individuals and groups find themselves located in phenomena and situations characterized by numerous contradictions and false dichotomies. This scenario is a healthy indicator of an era of vigorous debate and contestations that has resulted in a rich diversity of ideas and practices. A more disturbing and lamentable situation is when there is uniformity in thinking and a lack of critical thinking and action. Of course, an extreme situation would be where the contradictions and false dichotomies become counterproductive to both theory and practice.

Contradiction: Agroforestry is good but shifting cultivation is bad?

The success of the promotion of agroforestry as a strategy in sustainable forest governance is manifested worldwide by the number of academic and developmental programs and projects that focus on, or at least include aspects of, agroforestry. This section focuses on the internal contradiction of the proposition that agroforestry is desirable but shifting cultivation is undesirable. Why is this a contradiction? I argue that shifting cultivation is agroforestry and thus the identification of shifting cultivation as the problem and agroforestry as the solution is a contradiction. I see this major contradiction emerging from the fundamentals, that is, the definition, characterization and typologies of shifting cultivation.

Shifting cultivation is also called shifting agriculture, extensive cultivation, slash-and-burn, or swidden (from an old English dialect meaning “burned clearing”). Some experts (see Olofson 1981) prefer the latter term because it is perceived to be a “neutral” term that does not carry the derogatory meanings of the other terms. I use “shifting cultivation” in this paper simply because of its popular usage.

Terms for shifting cultivation in various local languages have been enumerated in different publications (see for example Conklin 1954). Of course, even these vernacular terms are generic because there are many other languages within a country that

have other terms for shifting cultivation. Are these terms synonyms? Do they refer to the same thing or do they specify particular kinds of shifting cultivation?

What is shifting cultivation? What are its features? What are its different varieties? The different answers to these basic questions (see Warner 1991) are at the heart of the contradictions between and within pronouncements by specific publics and across publics. The answers are crucial when we are passing judgment on shifting cultivation. A major concern of ecogovernance is forest loss and degradation, and shifting cultivation is usually cited by state forestry agencies and other organizations as a (if not the) major cause of deforestation. The assumption is that there is only one type of shifting cultivation, the destructive type, and consequently the sooner shifting cultivators learn to practice permanent agriculture the better.

Anthropologists, by disciplinary tradition, have pioneered the study of societies that practice shifting cultivation. Some of the classic definitions of shifting cultivation offered by the pioneer anthropologists are shown in Table 1.

This sampling of classic definitions identifies shifting cultivation basically as a farming technology (“agriculture”, “cultivation”). This is consistent with more recent definitions such as “any temporal and spatial cyclical agricultural, system that involves clearings of land —usually with the

Table 1. Definitions of Shifting Cultivation by Pioneer Anthropologists

Pioneer Anthropologist	Year of Publication	Definition of Shifting Cultivation
Watters	1960	an agricultural system with subsistence-level production and impermanent use of land.
Conklin	1961	a system of farming rainforest land in a "continuing agricultural system in which impermanent clearings are cropped for shorter periods in years than they are fallowed." It usually involves the two f's, fire and fallow, but variation is great and it does not always involve burning or slashing.
Frake	1962	"The tropical forest agriculturist must establish a controlled biotic community of sun-loving annuals and perennials in a climatic region whose natural climax community, the tropical rainforest, is radically most different in almost every respect from the community agricultural man seeks to foster. The swidden farmer meets this problem by periodically putting the forest through its successional paces. He modifies and operates on an existing ecosystem rather than permanently replacing it with an utterly different kind of biotic and edaphic world, such as that of the wet- rice paddy" (pp. 55-56).
Geertz	1963	He discusses similarities between swiddens and the forests from which they are carved, and contrasted the differences between swiddens and rice-paddies. The swiddens as "canny imitations" of the forest: swidden and forest are similar in their degree of generalization, as an ecosystem with high diversity. Both have a high ratio of nutrients in living biological forms to nutrients in the soil. Both have closed-over architectural structures. Contrast of swidden versus paddy: forest imitation vs. artificial aquarium; highly diversified, multicrop vs. highly specialized monocrop; closed-over architecture vs. open field; nutrients cycle between living forms rapidly and are provided to crops through ash vs. minerals are borne by paddy- water and nutrients also come from decaying stalks and fertilizers; dependence on rainfall without elaborate water control vs. reliance on man-made, capital intensive waterworks to channel rainwater; delicate equilibrium-over-population leads to habitat deterioration vs. stable equilibrium-over-population is merely absorbed by finer technique; dispersive and inelastic, allowing only low population densities vs. concentrative and inflatable; allows extremely high population densities.
Spencer	1966	"mobile techniques of crop growing which do not use systems of permanently sited fields under specified legal tenure." He would prefer to call it "jungle gardening" or "proto-agriculture" rather than "agriculture" (as in shifting agriculture) which, to him, is mechanized, but both involves disturbance of soil or "cultivation."
Rappaport	1971	one strategy where the farmer anticipates the return of the forest. It involves the establishment of "...temporary associations of plants directly useful to man on sites from which forest is removed and to encourage the return of forest to those sites after the useful plants have been harvested. The return of the forest makes it possible or at least much easier to establish again the associations of cultivated plants sometime in the future" (p128).

assistance of fire— followed by phases of cropping and fallow periods” (IFAD et al. 2001:24). However, although some recent definitions include the phrase, “closely linked with socio-cultural values that are central to the lives and livelihood of shifting cultivators and their communities” (IFAD et al. 2001:3), it is usually the anthropologists, through detailed ethnographies, who have gone beyond a compartmentalized view by showing the interconnections of technology, ideology, social relations, and environment in a holistic cultural

framework. No wonder those who define shifting cultivation merely as a technological problem also identify solutions that are merely technological.

We can see some of the convergences among the definitions of shifting cultivation in the anthropological typology of human cultures as adaptive strategies (Ember, Ember, and Peregrine 2002). Shifting cultivation is defined as a type of horticulture, which in turn is one of the three kinds of food production, which are compared in Table 2.

Table 2. General Features of Three Types of Food Producers (Adapted from Ember, Ember, & Peregrine 2002: 272)

	Horticulturists	Pastoralists	Intensive Agriculturists
Population Density	Low-moderate	Low	Highest
Maximum Community Size	Small-moderate	Small	Large (towns and cities)
Nomadism/ Performance of Settlements	More sedentary; communities may move after several years	Generally nomadic or seminomadic	Permanent communities
Food Shortages	Infrequent	Frequent	Frequent
Trade	Minimal	Very important	Very important
Full-time Craft Specialists	None or few	Some	Many (high degree of craft specialization)
Individual Differences in Wealth	Generally minimal	Moderate	Considerable
Political Leadership	Some part-time political officials	Part- and full-time political officials	Many full-time political officials

For anthropologists, horticulturists are those people who grow a variety of crops using relatively simple tools like the hoe and dibble stick. The shifting cultivator grows crops on land that is periodically fallowed or rested for long periods. Horticultural societies combine crop cultivation with hunting and fishing. Some are seasonally nomadic. Horticulturists produce more food in a given area than is available to food collectors (foragers or hunters and gatherers), and thus can support more people. Compared to foragers, they have a more sedentary life although groups may move to another plot to farm after several years. Among horticulturists there are indications of differentiations in society. There are a few craft specialists as well as some part-time political officials. Individual differences in wealth can be seen although generally minimal.

As I have mentioned, many foresters and other environment-concerned professionals condemn shifting cultivation as a major cause of forest destruction. But, is it really shifting cultivation and not some other form of agriculture that they are condemning? Here, the characteristics of shifting cultivation serve as basis for a checklist of features. The classic characterization of swidden farming by Pelzer (1953) includes the following features:

1. rotation of fields rather than of crops;
2. periods of cropping are short (1-3 years); whereas

3. fallow periods are long (from 6-8 up to 20 years or more);
4. the forest or bush is cleared by slashing and burning;
5. crops are planted by hoe or digging stick (the dibble), the plow being employed in rare cases only.

Spencer (1966) listed the following characteristics of swidden farming:

1. practiced by low-energy cultures of small total population; occasionally used by anyone to whom it appears expedient;
2. labor is chiefly human in nature with the use of a few hand tools;
3. cooperative labor patterns are frequent, with variation in structure of work group;
4. clearing of fields by felling, cutting, slashing, burning to dispose of debris that has been allowed to dry thoroughly. There are a few exceptions to the use of fire in wet areas;
5. frequent sequential shifting of cropped fields usually within a land area given by traditional law to the social group through right of usufruct;
6. many variations in planting systems, with both multiple and specialized crops;
7. use of annual and short-term food crops predominant, with the addition of long-term shrub and tree crops;
8. crops usually for subsistence; surplus or cash crops sometimes cultivated for sale;

9. use of permanent gardens in houseyard, or near the village or homestead, especially among groups using permanent or near-permanent settlement sites;
10. yields per acre and per man-hour compare favorably with permanent-field agriculture, when comparison can be properly made, and when both do not involve mechanically powered systems;
11. the area cropped per capita annually is small, but similar to non-powered sedentary systems;
12. vegetative cover is used as soil conditioner and source of plant nutrients;
13. when the system is efficient, soil erosion, soil depletion, and destruction of natural resources are no greater than in other efficient systems;
14. there is a great variation in details of farming practices due to physical environment and cultural tradition;
15. the shifting of residence is common but not universal, depending on cultural preference and harmonious adaptation to the environment; and
16. operative chiefly in regions where technologically complex systems are not yet economically feasible and where land is not appropriated by more powerful people.

In 1954, Conklin published a now-classic article that contested the commonly-held negative ideas about shifting cultivation. In agreement with his contestations, the narratives of

various indigenous peoples in Mindanao that I studied in 2000 affirmed the sustainability of traditional forms of shifting cultivation. These indigenous peoples were located in four provinces, namely, Davao del Norte, Davao del Sur, Bukidnon and Sarangani (see ADB 2000 for the demographic and income profiles of the provinces, municipalities and households considered for the Community-Based Forest Management Project in the Philippines). Some of them were holders of the Certificate of Ancestral Domain Claim (CADC) as shown in Table 3.

These indigenous peoples today vary in terms of degree of acculturation, but they have in common the general story of how their traditional cultures were forest-based, with the forests addressing practically everything (*tanan-tanan*) that they needed in these extensive ancestral domains. Food, medicine, and materials for clothing, housing, weapons, tools and containers for subsistence production were supplied by the forests. In addition, their beliefs and knowledge systems as well as social organization and social processes were also greatly influenced by the forests. The traditional farming system was shifting cultivation, which incorporated crop diversity, fallow periods, labor exchange, equitable sharing of benefits, and respect for nature. For generations, shifting cultivation provided sustainable lifeways. Only with the advent of deforestation caused by large-scale logging were the Indigenous Peoples unable to practice traditional shifting cultivation and thus were reduced to

Table 3. Holders of the Certificate of Ancestral Domain (CADC) among the Visited Indigenous Peoples, 2000

CADC No.	Recipient IP	Location	Area (hectares)
R-11-CADC-015	B'laan	Matanao, Davao del Sur	7,028
R-13-CADC-017	Tagakaolo	Malita, Davao del Sur	33,731
R-11-CADC-059	Tagakaolo/ Kalagan	Malungon, Sarangani	37,752
R-11-CADC-060	B'laan	Malungon, Sarangani	43,877
R-10-CADC-161	Bukidnon/ Higaonon	Malaybalay, Bukidnon	27,025
R-11-CADC-102	Talaingod, Langilan, Kaylawan, Ata-Manobo	Talaingod, Davao del Norte	65,000

belonging to one of the poorest and most marginalized sectors in the country (see Lamug and Banzon-Cabanilla 2001 for additional insights on poverty of these communities).

Shifting cultivation is practiced in a variety of forms depending on both the local environment and culture, as illustrated by the specific cases of the Indigenous Peoples earlier mentioned. The typologies of shifting cultivation (Conklin 1961, Watters 1960, Spencer 1966) show how complex the variation is among different types of shifting cultivation. If shifting cultivation destroys the forest, which type is being referred to? One thing is sure, shifting cultivation and foraging do not exist as pure types. Rather, they are found in various combinations, increasingly even with intensive agriculture.

From the definitions, characteristics, and typologies of shifting cultivation, it is not difficult to see that shifting cultivation is a kind of agroforestry because it combines trees and other woody perennials with agricultural crops and animals in spatial arrangements or temporal sequences. That shifting cultivation is agroforestry has received some degree of acceptance in recent materials. For example, in the recent volume published jointly by key organizations (IFAD et al. 2001) involved in agroforestry, several articles mention shifting cultivation as "the original form of agroforestry" (3); "All shifting cultivation systems are actually forms of agroforestry systems" (24); "Many of these agroforests have been created by swiddeners" (142).

However, despite the agreement that shifting cultivation is agroforestry, there are contradictions evident in recent materials. [My choice of materials is based only on ready accessibility; my citation of them here is only for the purposes of my paper and does not mean that I do not laud their significant initiatives.] Let us examine the language of the newest international organization focused on shifting cultivation. The Alternatives to Slash and Burn (ASB) Programme is part of the Consultative Group on International Agricultural Research, and ICRAF serves as its convening center. The “alternatives” mentioned in the program’s name are “agroforestry options and alternatives.” But isn’t slash-and-burn (shifting cultivation) an agroforestry system by definition? Even with the qualification of slash-and-burn as “unsustainable,” the need to clarify the seeming contradiction is not answered. The interpretation of a reader could be: slash-and-burn (shifting cultivation) is bad and agroforestry is good.

Reading the second issue (December 2002) of *Soil Fertility Matters*, A Newsletter on Soil Fertility and Fallow Management in the Upland Tropics, we can also detect contradictions. “The search for a creative linkage between indigenous knowledge systems and agroforestry is important to develop a culturally appropriate and sustainable agroforestry management system” (Suminguit, 11). “...(G)reen manures and cover crops ... and development of agroforestry systems are very interesting pathways of how shifting

cultivation may evolve..” (Magcale-Macandog, 12). These are just a few examples of statements that contain contradictions. It would seem that the “unspoken” typology of agroforestry systems consists of the indigenous systems practiced by traditional societies and the “experimental” type practiced by researchers trained in western science. While some authors write about the juxtaposition of existing local and the external intervention agroforestry, there is still a dominant thinking that the “experimental” agroforestry is good and the indigenous one is bad. Here we see that contradictions are related to false dichotomies.

False dichotomy: science versus indigenous knowledge

In this section, I limit my discussion on a major false dichotomy in ecogovernance namely, science versus indigenous knowledge, using the Tausug indigenous agroforestry systems as a case in point.

Today, more than ever, indigenous knowledge is romanticized. Everyone is in love with indigenous knowledge, and numerous studies, conferences and organizations have been produced because of the support of indigenous knowledge-friendly funding agencies. The international agreements that were formulated in the 1992 Earth Summit – the Rio Declaration of Principles, Agenda 21, the Convention on Biological Diversity, and the Statement of Forest Principles contain three aspects which are reiterated in several parts: 1) the recognition of the unique knowledge of indigenous

peoples, which defines their crucial role in sustainable development; 2) prescriptions to states to support and promote this unique knowledge, including identity, culture and interests; and 3) prescriptions to states to guarantee the effective participation of indigenous peoples. The key ideas involving indigenous peoples that the Earth Summit advanced provide a broad justification for action: 1) that the recognition of traditional knowledge of indigenous peoples is relevant and useful in the management of natural resources and in the pursuit of sustainable development; that this knowledge should be interfaced with the current natural resources management, as appropriate; and 3) that indigenous peoples should actively participate in decision-making, particularly with regards to lands, waters, and resources in which they have a traditional bond and interest (Cicin-Sain and Knecht 1995, UN Department of Public Information 1992).

In addition, national and local laws and policies, notably the Indigenous Peoples Rights Act of 1997, lay down the institutional support for indigenous knowledge. Thus, there is no need to argue for the recognition of indigenous knowledge. The indigenous knowledge of forest communities is manifested in their major farming technology, shifting cultivation. No wonder descriptions of the indigenous knowledge of these communities have mushroomed in the literature. However, only a few (and usually anthropologists) would refer to indigenous knowledge as science, or at least, ethnoscience.

In contrasting science from other forms of knowledge, dichotomies have always been employed: science versus religion, rational versus irrational, universal versus particular, theoretical versus practical. This style of invoking dichotomies has forced powerful categories unto popular imagination. A style that uses dichotomies serves to define what is included and excluded, and creates hierarchies privileging one type of knowledge over another (see Gutmann 1992). I do not intend in this paper to provide a history of the relatively recent ascendancy of western science. Rather, I ask the question: is indigenous knowledge not science? As Nader asks: "If knowledge is born of experience and reason, ... and if science is a phenomenon universally characterized (after the insight) by rationality, then are not indigenous systems of knowledge part of the scientific knowledge of mankind?" (1996).

Instead of belaboring my point that the science-indigenous knowledge dichotomy is false, I present a case where that dichotomy, along with such subsidiary dichotomies as nature versus culture, is non-existent. After all, the nature-culture dichotomy has been identified with western worldviews that have separated humans from nature, and the case that I present is on indigenous agroforestry systems.

I refer to one of the articles that I have co-authored with Salahuddin Kaing, my Tausug thesis advisee, where I re-analyzed his data on Tausug indigenous agroforestry systems (Banzon-Cabanilla and Kaing 1997).

The study was conducted in Tanduh, Luuk, Sulu with an estimated area of 751 hectares developed into six types of indigenous agroforestry systems, which are described in Table 4.

My interest here is not on the agroforestry systems per se but on how their sustainability is ensured by the moral order that underlies their practice. Tausug culture is the moral order that defines the people's standards of right and wrong, desirable and undesirable. Thus, it is not only the agroforestry systems but also the whole Tausug culture that is made sustainable. My interpretation of Kaing's data focuses on what I see as the central principles of this cultural morality (Banzon-Cabanilla and Kaing 1997):

- 1) The inseparability of "religious" and "secular" domains. The dominance of Islam as a major force in Tausug culture including the agroforestry system is very evident. Farming technologies and practices operate as part and parcel of, rather than separate from, religion and are therefore premised not only on biophysical but also sociocultural factors. Prayers asking for grace from Allah for a good harvest are recited in all phases of farming. *Jakat* (tithe)-giving is conceived as "savings and investment" for life after death.
- 2) The pervasive culturally constructed concept of shame. The Tausug concept of shame (*sipug*) is internalized by the Tausug, and guides social behavior. To die is better than to be put to shame. Hence, each one

is cautious about his thoughts and actions so as not to offend and be offended. Conflict is minimized, and cooperation, respect and harmony are promoted.

- 3) The concern for social equity that is built in the system. Tausug farmers are motivated to have good harvests so that they can give *jakat*, which is divided into three equal parts: the first part goes to the *pakil* (mosque leaders); the second part to the *masjid* (mosque); and the third part to the *tabid* (faith healers or herbal doctors), *panday* (local midwife), *balu balu* (widows and widowers incapable of working), *ilu-ilu* (orphans), and the *sula* (agricultural leader). A portion of the first two parts constitutes the *kuliling*, which is set aside for emergencies such as death, penalties, and weddings for the poor.
- 4) The traditional respect for the environment, which is incorporated in indigenous knowledge and practices. The Tausug have a deep awareness and understanding of their ecology as seen in their indigenous taxonomies for land, land use and other environmental aspects. Land is considered the best gift for the next generations because it is the source of water, air and life. The agroforestry practices are based on an elaborate traditional environmental ethnosience.
- 5) The wide recognition and acceptance of local leaders. The authority of the local leaders is widely accepted by the Tausug

Table 4. Six Types of Tausug Indigenous Agroforestry Systems

Type of Agroforestry System	Features
Intercropping agroforestry	2 sub-types: 1) randomly-mixed intercrop - left-over forest vegetation are used for nurse trees of shade-loving agricultural crops; and 2) trees-along-borders - <i>Gliricidia sepium</i> is used as live fence for farms to supplement split-bamboo fences. <i>Gliricidia</i> also provides green manure and firewood.
Coconut-based agroforestry	Combination of coconut with forest trees, annual crops, medium-term perennials and fruit trees. Coconuts are planted in definite rows and constitute 70% of total vegetation. The system is motivated by the market popularity of copra.
Fruit-tree based agroforestry	Combination of different species of fruit trees, bamboo, coffee, banana, coconut, and some forest trees. Crops have no definite pattern of arrangement but dominant vegetation consists of fruit trees like durian, baluno, huanni, and marang. First, fruit trees are planted. Then seeds of their fruits are scattered by the farmers or are dispersed by insects and mammals. In due time, a climax forest dominated by fruit trees is developed.
Modified swidden farming	Clearing and farming of old fruit-tree based agroforestry area resembling swiddening with fallow periods.
Agrisilvipasture	Livestock are either 1) tied and allowed to graze in pasture areas or under coconut-based and fruit-tree based agroforestry areas, or 2) left free to graze anywhere. Farms are well-fenced to prevent damage.
Random block agroforestry	Blocks of agricultural and forest crops are planted separately in same piece of land. Annual crops are interspersed with strips or patches of forest trees or fruit-tree based agroforestry so they appear to be planted in blocks.

despite changes in the leadership patterns from the sultanate to the present state governance. Decision-making is facilitated, followers are guided, and norms of behavior are explicit. This is exemplified by the *sula* (agricultural leader) who dictates the days of planting and spearheads the assessment of fines upon violators of their rules.

The Tausug case shows a reality that rejects the nature-culture dichotomy. In our contemporary western science, we reduce the whole into isolated parts: we have a conceptual box for culture (everything human-made) and separate box for nature (everything beyond culture). Thus, shifting cultivation is both culture and nature, both science and indigenous knowledge. Instead of

using dichotomies that are by definition mutually exclusive, should we think in terms of a continuum?

CONCLUSION: IMPLICATIONS FOR THEORY AND PRACTICE IN ECOGOVERNANCE

The central point of my paper is to reassert the presence of contradictions and false dichotomies in the language of ecogovernance. I have focused on only one major contradiction (“agroforestry is good but shifting cultivation is bad”) and one false dichotomy (indigenous knowledge versus science).

These contradictions and false dichotomies emerge from multiple publics who have their own interests and who construct their own realities encoded in language. In a positive sense, our raising of these contradictions and false dichotomies to a level of explicitness should lead to: 1) a heightened vigilance about such contradictions; 2) a commitment to establish more precision in our terminologies, which will provide better directions for theory and practice; and 3) a concerted effort to clarify the messages of ecogovernance.

This is in line with a renewed interest in language in the social sciences along with a revival of constructivist paradigms that provide alternatives to the more dominant positivist-empirical kind of science. The interpretive/hermeneutic and transformational epistemologies deserve more serious consideration,

especially in the case of indigenous systems (see Alejo 2000 as example).

Precision in language includes clarifying what “population pressure” means. It has been invoked in explanations of why shifting cultivation was “once good” but “now bad.” But “population” is more than just the demographic processes of fertility, mortality and migration. It is also about social structure and equity along class, gender and ethnic lines. Thus, “population” includes power relationships especially in terms of access to and control over resources at the local, national, and global levels.

Other implications of the ideas we have presented, particularly for academics in the forestry and environment sector include:

1. Recognizing the inadequacy and/or inappropriateness of “old” ecogovernance strategies. This includes developing modalities for interdisciplinary action-research on shifting cultivation.
2. Heightened concern for the erosion of cultural diversity and extinction of indigenous ethnoscience.
3. Deeper understanding of the philosophy of sustainability in indigenous agroforestry.
4. Equitable incorporation of ethnoscience in instruction and extension.

REFERENCES

Asian Development Bank

2000 "Final Report on the Community-Based Forest Resources Management Project in the Philippines." TA No. 3282-PHI.

Alejo, S.J., Albert E.

2000 *Generating Energies in Mount Apo. Cultural Politics in a Contested Environment.* Manila: Ateneo de Manila University Press.

Banzon-Cabanilla, Daylinda

1996 "Domain, Taxonomic and Componential Analyses of Folk Terms for Land and Land Use: Ethnographic Contributions to Social Forestry Practice." U.P. Endowment Fund Professorial Chair Lecture, U.P. Los Baños, 13 August.

Banzon-Cabanilla, Daylinda and Salahuddin A. Kaing

1997 "Indigenous Agroforestry Systems of the Tausug: Morality and Sustainability." *Indigenous Peoples of the Philippines: Knowledge, Power and Struggles.* Quezon City: UGAT.

Cicin-Sain, Biliana and Robert W. Knecht

1995 "Analysis of Earth Summit Prescriptions on Incorporating Traditional Knowledge in Natural Resources Management." *Property Rights and the Environment: Social and Ecological Issues.* Washington, D.C.: The Beijer International Institute of Ecological Economics and the World Bank.

Conklin, Harold C.

1954 "An Ethnoecological Approach to Shifting Agriculture." *Transactions of the New York Academy of Sciences* 17(2):133-42.

Conklin, Harold C.

1961 "Study of Shifting Cultivation." *Current Anthropology* 2:27-61.

Ember, Carol R., Melvin Ember, and Peter N. Peregrine

2002 *Anthropology.* 10th edition. New Jersey, U.S.A.: Prentice-Hall. Reprinted by Pearson Education Asia Pte Ltd.

Frake, Charles

1962 "Cultural Ecology and Ethnography." *American Anthropologist* 64: 53-59.

Geertz, Clifford

1963 *Agricultural Involution.* Berkeley, U.S.A.: University of California Press.

Gutmann, Matthew C.

1992 "Cross-Cultural Concepts — Science in China and the West." *Science as Culture* 3(2):208-239.

Harris, David R.

1972 "The Origins of Agriculture in the Tropics." *American Scientist* 60:180-193.

IFAD, IDRC, CIIFAD, ICRAF, & IIRR

2001 *Shifting Cultivation: Towards Sustainability and Resource Conservation in Asia*. IIRR.

Kaing, Salahuddin A.

1994 "Indigenous Agroforestry Systems of the Tausug in Western Mindanao." Master of Science in Forestry (Social Forestry) thesis, U.P. Los Baños.

Kaing, Salahuddin A. and Daylinda Banzon-Cabanilla

1997 "Indigenous Agroforestry Systems of the Tausug in Western Mindanao." *Developments in Agroforestry Research*. Book Series No. 160. Los Baños, Laguna: ICRAF, FAO/APAN and PCARRD/DOST.

Lamug, Corazon B. and Daylinda Banzon-Cabanilla

2001 "Poverty and Equity: Sociocultural Challenges for Action Research on Non-wood Forest Products in Mindanao, Philippines." Paper presented in the 4th South and East Asian Countries Non-Timber Forest Products Network (SEANN) Workshop, TREES-CFNR, U.P. Los Baños, 18 September.

Levi-Strauss, Claude

1967 *Structural Anthropology*. New York, U.S.A.: Doubleday.

Magcale-Macandog, Damasa

2002 "Practitioners Share Views on Soil Fertility and Fallow Management." *Soil Fertility Matters* 2 (December).

Nader, Laura

1996 *Naked Science. Anthropological Inquiry into Boundaries, Power, and Knowledge*. New York, U.S.A.: Routledge.

Olofson, Harold (ed.)

1981. *Adaptive Strategies and Change in Philippine Swidden-Based Societies*. Laguna, Philippines: FORI.

Pelzer, Karl

1958 "Land Utilization in the Humid Tropics: Agriculture." Proceedings of the Ninth Pacific Science Congress held in Bangkok, Thailand in 1957, Vol.20: 124-43.

Rappaport, Roy A.

1971 "The Flow of Energy in an Agricultural Society." *Scientific American* 225 (3): 116-132.

Spencer, J.E.

1966 *Shifting Cultivation in Southeastern Asia*. Berkeley: University of California Press.

Speth, Dean James Gustave

2005 "The Heart of the Matter." *Environment: Yale*. Journal of the Yale School of Forestry & Environmental Studies. New Haven, CT (Fall).

Sumingit, V.J.

2002 "Indigenous Knowledge in Northwestern Mindanao." *Soil Fertility Matters* 2 (December).

United Nations Department of Public Information

1992 Agenda 21. Rio Declaration, Forest Principles, *The Final Text of Agreements Negotiated by Governments at the UNCED*, Rio de Janeiro, Brazil, 3-14 June.

Warner, Katherine

1991 "Shifting Cultivators. Local Technical Knowledge and Natural Resource Management in the Humid Tropics." *Community Forestry Note* 8. Rome: FAO.

Watters, R.F.

1960 "The Nature of Shifting Cultivation." *Pacific View Point* 1 (1): 59-99.

Stakeholders' Absorptive Capacity for Development: The Case of Waras-lalo Watershed, Bicol Region

Cleofe S. Torres

This study aimed to assess the utility of operationalizing the sociological concepts of stakeholders and absorptive capacity for development planning using the Waras-Lalo Watershed in Bicol Region as the illustrative case. Stakeholders analysis was carried out using the importance-influence matrix developed by ODA (1995). Absorptive capacity or the capability of the stakeholders to acquire and utilize effectively the goods and services that the development project would generate for them was analyzed using five key criteria, namely: motivation to change, level of knowledge and skills, social and political environment, capabilities of community organizations, and other community resources (ADB 1994). Corresponding set of data indicators were identified, obtained, and analyzed for each criterion.

It was found that a systematic elaboration of the concepts of stakeholders and absorptive capacity can greatly enhance social analysis for development planning. Stakeholders analysis making use of the importance- influence matrix can more objectively identify, categorize, and prioritize stakeholders. It clarifies information quickly and helps draw out assumptions about the risks and factors concerning the viability of the project. Absorptive capacity, on the other hand, can describe more thoroughly the ability of the intended stakeholders or community to access and utilize the project's goods and services effectively, thus, avoiding imbalances and wastage of resources. Both concepts when operationalized can make development planning more strategic.

INTRODUCTION

Development planning requires the building up of information base for making decisions on what courses of actions need to be taken in order to attain certain objectives. Together with the state of the different biophysical resources, functions and processes in the ecosystem, the information base should include a clear description of the social conditions in the area. The task of identifying and incorporating the various facets of the social dimension into development planning is called social analysis (ADB 1994).

Social analysis includes the assessment of stakeholders who are expected to use and benefit from the goods and services that are to be provided by the development project, their problems/needs, demands, and their absorptive capacity. The first three sets of data are quite very popular among social researchers and the methods and tools for gathering them have so far been well established. But indicators and the corresponding data for absorptive capacity are perhaps something new for most social researchers and

development planners. Hence, this study is an attempt to apply and elaborate such concept and its corresponding indicators.

It should be emphasized, however, that data collected on the aspects of stakeholders and absorptive capacity are part and parcel of the bigger socio-economic profile of any community or social group under study. They make the socio-economic profile more comprehensive, thus, providing a better basis for determining the scope and content of the development project. Moreover, they provide a more concrete foundation for designing the appropriate implementation and institutional arrangements of the development project .

Objective

This study aimed to assess the utility of operationalizing the sociological concepts of stakeholders and absorptive capacity for development planning using the Waras-Lalo Watershed as the illustrative case. This was done using the Asian Development Bank's (1994) framework for social analysis.

Significance of the study

A clear definition and delineation of "stakeholders" as a concept is necessary as each development plan has its own bias in terms of the subgroups in the population it wants to serve. This becomes more important in watershed planning where there are multiple stakeholders with varying and oftentimes competing and conflicting interests. Hence,

determining who they are and their relative position in terms of prioritization can help development planners in identifying the more appropriate project design and components that would benefit the disadvantaged stakeholders the most.

In the same vein, typical project implementation usually emphasizes the delivery of services without thoroughly assessing the capability of the recipients to avail and utilize such services. This is the case of microfinance projects that eventually go bankrupt because of repayment failure, or of newly constructed communal water pumps that end up being dysfunctional because they have not been properly maintained by the users. This is because the stakeholders' demand for services does not always match their ability to establish self help initiatives or their knowledge and skills on how these services can be maintained and sustained.

Results of this study would serve as basis for focusing on priority group of stakeholders and for the identification of development goods and services in the watershed that should be made accessible to them. Findings will also help in the development of mechanisms and capability building interventions that would enable stakeholders to acquire and utilize the development services more effectively and in a sustainable manner. This would help assess the project's riskiness or viability before funds are committed.

Limitations of the study

Social analysis covers a broad range of social factors, starting from the simple socio-demographic characteristics to other concerns such as ethnicity, gender issues, institutional arrangements, potential impacts, and social safeguards. This study will focus only on the concepts of stakeholders and absorptive capacity. Data on these two variables should eventually be integrated into the socioeconomic profile as important components that will help make watershed development and management planning more strategic.

REVIEW OF RELATED LITERATURE

Most of the studies involving characterization of ecosystems made use of socioeconomic profiling more than social analysis. Thus, data gathered focused on very disaggregated data such as population, household size, occupation, income, education, attitude, social organization activities, access and utilization of credit, training undertaken, and women participation among others. No attempt to aggregate related data that will constitute a more comprehensive indicator of social capability was so far evident.

Walters et al. (1994) in their study on watershed restoration and protection in the Bais Bay Basin made use of participant interviews to gauge the level of local knowledge and experience that had existed prior to the project intervention. Participants were asked whether they knew how

to raise seedlings and if they had ever planted trees or made soil and water conservation improvements on their farm. This could have very well constitute the knowledge level component of absorptive capacity.

Similarly, the same study looked into community participation in terms of participants' direct participation in project activities and in terms of their efforts to educate and involve the other members of the community. This may be counted as other assets or resources in the community which is an indicator also of absorptive capacity.

In the earlier years of community-based resource management, rapid rural appraisal (RRA) and agroecosystem analysis were the dominant methods used for social analysis. RRA methods usually generate distinct sets of data on the biophysical environment, socio-economic profile, and cultural setting. Agroecosystem analysis, on the other hand, follows a distinct framework of characterizing a particular ecosystem using spatial analysis patterns, temporal analysis, flow analysis, and decision making analysis. Most of the data in both frameworks could actually be easily transformed to constitute the different data indicators for absorptive capacity.

RRA and agroecosystem analysis were applied by a group of social researchers in studying the Gran Cordillera Central in Ifugao, Mountain Province (Guy 1995). Data were generated on many categories of socio-economic and cultural aspects

of the upland area. These included demography, labor availability and distribution, transportation, markets and credit availability, channels of market information, land tenure, landholding/inheritance patterns, ethnicity and migration, leadership patterns, conflict resolution, education, health, and peace and order. While these data were indeed useful in the context of the two frameworks, they may be also used to indicate the absorptive capacity of the communities involved. This new perspective would be useful in anticipating the extent by which the people in the community would be able to respond to and absorb the project interventions as well as the additional capacity building efforts which the project needs to do in areas where the communities may still be weak.

In an area dominated by indigenous people in Surigao del Sur, an ITTO project did a socioeconomic survey and analysis as basis for developing the sustainable forest resource management plan in an area currently under a Timber License Agreement (TLA) with a private logging firm but which is due to expire in year 2010 (ITTO 2002). Using the typical socioeconomic profiling method of analyzing disaggregated data, a typical plan responding to what the baseline data indicated was formulated. While there was really nothing wrong to this method, it is believed that a more comprehensive and responsive plan could have been developed had the data been analyzed using the absorptive capacity framework.

An attempt to consolidate some of the social data, though not in terms of absorptive capacity, into a more meaningful indicator was carried out in Mt. Makiling Forest Reserve research and development programming (Rebugio et al. 1998). Related social data were put together to constitute a certain domain of human welfare which they address. In that exercise, data about sense of stewardship, peace, harmony with nature, myth, religion, and philosophy were analyzed as indicators of psychophysiological influences of the forest reserve.

A number of studies conducted by the author, singly and jointly with other researchers, in the past were aligned more with the conventional social profiling exercise. That was the time when the concept of stakeholders' absorptive capacity was not in the social analysis menu yet. These studies dealt on the people's organizations in the Mt. Makiling Forest Reserve (Torres and Mallion 1996); Census of Household Occupants in Mt. Makiling Forest Reserve (Torres and Rebugio 1991); and Stakes and Stakeholders in Mt. Makiling Forest Reserve (Torres and Sargento 1997). Definitely, results of social profiling would have been more meaningful and would have gained an added dimension had the social data been analyzed from the absorptive capacity perspective.

METHODOLOGY

The applicability and utility of the sociological concepts mentioned

earlier were tested in the Waras-Lalo Watershed management planning done in the Bicol Region last 2002-2003. Waras-Lalo Watershed is one of the major watersheds in the Bicol River Basin. The 34,000-hectare watershed is administratively located in the city of Iriga and the towns of Baa, Buhi and Nabua in Camarines Sur, Bicol Region.

Data on the stakeholders and their absorptive capacity were gathered using focus group discussions (FGDs). About 50 representatives from the communities, which may be a barangay or a group of adjacent barangays, were divided into groups to tackle three different tasks simultaneously: stakeholders' identification, problem tree analysis (perceived needs and problems), and vision/aspirations setting.

An FGD subgroup had 10-15 participants each. Respondents were purposively chosen to represent four types of communities assumed to be the most vulnerable to any development interventions in the area: (1) indigenous peoples (IPs) or the Agta, (2) upper class poor, (3) lower class poor, and (4) organized communities (with people's organization or PO). Upper class poor referred to those household workers who derive regular but very low income from tending small farms (1 hectare and below) or from working as hired labor. Lower class poor were defined as landless workers with no regular source of income and who from time to time are engaged in dead-end jobs.

The series of FGDs were capped by the conduct of multisectoral workshop among the various stakeholders of the Waras-Lalo River Watershed to identify the needs, issues, and concerns which they think the project should address. Invited stakeholders included representatives from the various sectors in the watershed namely: LGUs, POs, NGOs, business, media, police and military, women, youth, religious group and sectoral services covering education, health, social welfare, irrigation, disaster mitigation, local government, tourism, trade and industry, water supply, electric supply, agriculture, agrarian reform, and environment and natural resources.

Another two-day workshop was initiated by the Philippine Rural Reconstruction Movement (PRRM) with the Upland NGO Assistance Committee (UNAC) - Bicol Cluster among the representatives of civil society organizations (CSOs) and NGOs in the area. This was designed to tackle the problems, vision, strategies, and programs which they perceived to be relevant for program planning of the Waras-Lalo Watershed.

RESULTS AND DISCUSSION

Concept of stakeholders

A stakeholder is always tied up to a stake. Hence, elaboration of stakeholder as a concept necessitates also a discussion of stake.

The Webster Dictionary defines stake as "a share or interest in

something jointly owned or in something affecting many." This share or interest does not necessarily consist of physical items but of a perceived set of rights over those items. This set of rights indicates what one party can do and what another party cannot do over an item. A stake becomes part of an open access and common resource such as the watershed which the stakeholders control and manage as a private property. This gives rise to conflicts and competition in resource use.

A stake has always a positive value attached to it. The value may be economic (source of livelihood) or sociocultural (birthplace). Similarly, a stake represents only part of a whole, the whole being communally owned. Hence, social analysis involves identification and prioritization of multiple stakeholders.

The term *stakeholders* has been defined in so many ways. A run down of how it is used in literature shows that the term may refer to individuals, groups, institutions or organizations who:

- depend on the products and services of a resource (Mendoza 1994);
- have inputs into or is affected by the decision-making process pertaining to the resource (Abraham 1992, Lerner 1992, and Florece 1994);
- have values to achieve (Connolly et al. 1991);
- have interest in the problem or is directly influenced by actions that

others take to solve the problem (Gray 1989); and

- have vested interest in the project or program (Hough 1988, ODA 1995).

The above definitions imply that stakeholders are actually consumers of certain goods and services which they so choose to fulfill certain needs or objectives. These objectives are most of the time meant for their own good and benefit. Hence, all stakeholders have their vested interest for using a particular resource.

Given their stakes, stakeholders appropriate a portion of the common resource such as a watershed, making that portion unavailable to others. Whatever they extract from the resource becomes a private good which in a way limits the flow of benefits to the larger society (Sargento 1995). This is where conflict in resource use often arises.

Stakeholders analysis

Stakeholders analysis is the identification of a project's key stakeholders, an assessment of their interests, and the ways in which these interests affect project riskiness and viability (ODA 1995). Thus, it involves three basic steps: identification, prioritization, and profiling. In most studies, identification and profiling are easier and more uniform tasks to do. The task of prioritizing, however, differs among social researchers. Some put up categories to imply priorities. Hence, stakeholders may be primary, secondary or tertiary; direct or indirect; local or external; major or

minor. Key stakeholders are those who can significantly influence the success of the project. Stakeholders in a watershed could be so numerous that it becomes important that they be systematically sorted out so that planning can be made more strategic.

In the case of the Waras-Lalo Watershed, an initial stakeholders identification was carried out through a review of secondary data such as the municipal land use plans, municipal development plans, and project documents. Institutional over individual stakeholders were preferred to be covered by the project for efficiency and greater impact. A preliminary long listing of institutional stakeholders yielded the following:

1. LGUs (municipal and provincial levels)
2. National government agencies (NGA) /service offices (e.g., Department of Agriculture, Department of Environment and Natural Resources, Department of Social Welfare and Development, Department of Agrarian Reform, Department of Health, Department of Education, Philippine National Police)
3. Cooperatives
4. Peoples organizations or POs (fisherfolk, farmers, women, etc.)
5. Indigenous peoples (IPs)
6. Nongovernment organizations (NGOs: PRRM)
7. Traders and businessmen
8. Religious groups

9. Academe
10. Professional groups (association of medical doctors, engineers, accountants, media practitioners, etc.)
11. Civic organizations (such as Rotary Club)
12. New Peoples Army or NPA
13. Youth

Then the above list was subjected for verification and prioritization among the multisectoral stakeholders during a workshop. Systematic prioritization was carried out using the importance-influence matrix developed by ODA (1995). Here, "importance" refers to those stakeholders whose problems, needs, and interests are the priority focus of the development programs or projects. These important stakeholders need to be assisted at all cost for the programs or projects to succeed. Influence, on the other hand, is the extent to which the people, groups, or institutions are able to persuade or coerce others into making decisions or following certain courses of actions.

The matrix below indicates that the distribution of stakeholders varies in terms of importance-influence. For example, the POs, cooperatives, indigenous peoples, and youth have low influence but are of high importance in terms of the program's/project's success. Conversely, religious organizations and NPA appear in the matrix as having high degree of influence but whose interests are not primarily targeted by the project.

Stakeholders Importance-Influence Matrix

Low Importance-Low Influence	Low Importance-High Influence
Peace and order officials (police) Civic organizations Professional groups POs Cooperatives Indigenous peoples Youth	Religious organizations NPA LGUs Government service agencies (esp. DA, DOH, DENR, DAR, DSWD) NGOs Businessmen and traders Academe

Implications to development planning

The implications of the results depicted in a matrix are as follows (ODA 1995):

- Low importance-low influence stakeholders – these are of low priority and need not be the main subject of project activities.
- Low importance-high influence stakeholders – may be a source of threat to the project and they need careful monitoring.
- High importance-low influence stakeholders – will require special initiatives from the project if their interests are to be protected.
- High importance-high influence stakeholders –there is a need to establish good working relationship with them to insure an effective coalition of support for the project.

Hence, it can be said that stakeholders analysis becomes more meaningful if the researcher is able to systematically prioritize and distribute them in the various quadrants of the importance-influence matrix. This tool readily leads the development planner

into important decisions concerning actions to take. A mere listing and profiling of stakeholders do not, of course, accomplish this much.

The above matrix for prioritizing stakeholders proved to be useful. The stakeholders themselves confirmed that the picture presented by the matrix mirrored the real condition occurring in their watershed in terms of who the stakeholders are and their perceived importance and influence. The process of stakeholders analysis in itself drew out the interests of major stakeholders (i.e., LGUs and POs) on the task of watershed planning. It also helped pinpoint areas of conflicts between major stakeholders and thereby help identify the mechanisms by which these can be resolved. The identification of their allies and non-allies during the workshop further helped identify relations among stakeholders which can be built upon especially in establishing coalitions during project implementation.

Concept of absorptive capacity

Development projects primarily target the poor and the marginalized as the intended stakeholders. Oftentimes, development projects are packaged to provide instant relief from poverty without giving much thought on how much the concerned stakeholders can adequately utilize and manage given their limited experience and skills. This is similar to giving a person an opportunity to manage P100,000 at once when before he was only managing P100. The relatively enormous amount can indeed put the person into an unwieldy situation. It goes to say that there is a limit to the amount of development aid and resources that can be absorbed by any stakeholder's group. Anything more than what can be absorbed can create serious imbalances that can put the stakeholders in a situation worse than where they were before.

In the context of learning and as it relates to openness to change, absorptive capacity refers to the stakeholders' capacity to recognize the value of new ideas, external information, assimilate and apply them to their desired ends (Cohen and Levinthal 1990). It is a function of their prior knowledge, attitude, and practices.

With focus on development planning, absorptive capacity refers to the capability of the stakeholders to acquire and utilize effectively the goods and services that the development project would generate for them (ADB 1994). Its assessment

helps determine the most effective means for delivering project services to the beneficiary-stakeholders.

A number of factors influence the ability of the stakeholders to absorb inputs that will be provided by the project (ADB 1994). The more significant ones are as follows:

- **Motivation to change** as indicated by attitudes and aspirations toward change, recognition of need for change and evidence of participation/cooperation in self help activities;
- **Level of knowledge and skills** (including managerial, technical, financial and entrepreneurial), exposure to ideas from outside the community, and experience with similar projects;
- **Social and political environment** as indicated by social customs and traditions and support mechanisms within the community, the role of women, political support or interference, community discipline and incidence of crime;
- **Capabilities of community organizations** as indicated by the quality of leadership, degree of organizational and social cohesion, and capacity for building consensus and settlement of disputes; and
- **Other community resources** such as time, assets and liabilities of the individuals or groups (such as common facilities, equipment, etc.) and their health and nutritional status.

If the assessment indicates that the absorptive capacity of the priority stakeholders (those under high importance-low influence quadrant) is low, this suggests that some interventions such as social mobilization may be necessary to assist them to develop those capabilities that would enable them to acquire and use the services envisioned by the project. Community organizing may then become an important component of project design so that intended stakeholders become empowered in systematically and efficiently managing resources that they now have or will later acquire.

Assessing absorptive capacity is important because development would definitely entail a change in the way people do things. An increased level of resources that would be made available at the stakeholders' disposal would require certain values and management skills. Managing scarcity would entirely be different from managing abundance. And if the stakeholders have not been adequately prepared for this, some dissonance or imbalance is likely to occur that can cause disaster to the development project.

Assessing Absorptive Capacity

The concept of absorptive capacity has been elaborated and operationalized in this study using the development planning experience in the Waras-Lalo Watershed.

1. Motivation to change

The stakeholders' motivation to

change was inferred from their vision and aspirations.

a. Vision

Vision guides the people on what they need to do today. It is, therefore, a potent force for shaping the decisions and actions of individuals, the bigger community, and the government instrumentalities. Dreams and aspirations serve the same purpose and much more – they are the driving force that motivate people to hurdle whatever difficulties they encounter along the way. They also make people more open in adopting new ways of doing things. They provide meanings to the, otherwise, drab life of their daily toil. For planning purposes, they serve as gauge of people's values, attitude, and ability to pursue higher goals, which in turn reflect their absorptive capacity.

Part of the tasks during the consensus building workshop among the multisectoral stakeholders was the formulation of a vision for the Waras-Lalo River Watershed. Sans the rigid requirements of an academically sound vision, the exercise was meant more to draw out the stakeholders' perception of a desired future scenario for the watershed. The common vision finally agreed on was stated as follows:

A better quality of life for the empowered stakeholders of the Waras-Lalo River Watershed through an effective and sustainable environmental management and strong support system.

Key words in their vision that have implications on the management and development of the Waras-Lalo Watershed are:

- better quality of life
- empowered stakeholders
- effective and sustainable environmental management
- strong support system

The above implies that the stakeholders are all after a better quality of life, one that would surpass what they presently have. They wish to have control over that life by empowering themselves. By empowerment, they mean being able to identify their own needs and problems, the courses of action necessary to address these needs and problems, and harnessing the resources to implement such actions. They envision to acquire a better quality of life by carrying out an effective and sustainable environmental or watershed management properly provided with strong support system, preferably by government instrumentalities.

b. Aspirations

A probe on aspirations is useful in that they serve to challenge the stakeholders to take the necessary actions to turn these desires into reality. Aspirations dare them to adopt certain new behaviors to make things happen. They are reflective of the social problems themselves and are, thus, helpful in understanding the latter.

Tackled during the FGDs at the community level was the exercise on scenario building where the respondents were asked to enumerate and prioritize the aspirations for their communities. Results of the exercise for the Waras-Lalo River Watershed are enumerated in Table 1.

On the whole, the major stakeholders have numerous aspirations and all these appropriately address the needs and problems they cited earlier. They can be summarized into four categories, namely, economic stability, agricultural productivity, environmental protection, adequate social services and facilities

To insure economic stability, they desired to have sufficient capital for farming and functional or actively operating cooperatives. Related to economic stability was the stakeholders' aspiration for greater agricultural productivity through the provision of farm-to-market roads, and irrigation for farmlands. Complementing these economic-oriented aspirations was the dream to live in a healthy and protected environment by having abundant trees and plants; rip raps constructed where needed to prevent soil erosion; rehabilitated forest; controlled flooding; and proper sewage and garbage disposal system. And to achieve their envisioned better quality of life, adequate social services in terms of education, health, and water should be provided. Also cited were nonmaterial aspirations like unity, cooperation, and values formation. Hence, it can be said that aspirations of the communities are

Table 1. Aspirations of the Stakeholders in the Waras-Lalo Watershed

Aspiration	Indigenous People	Upper Class Poor	Lower Class Poor	With Organization
A. Economic Stability				
Financial security	X	X		
Livelihood opportunities for all	X	X	X	X
Sufficient capital for farming		X		
Functional cooperatives		X		
B. Agricultural Productivity				
Farm-to-market roads			X	
Irrigated farmlands		X		
Provision of additional corn sheller in the barangay		X		
C. Environmental Protection				
Abundant trees and plants	X			
Construction of rip raps	X			
Rehabilitated forests		X		
Controlled flooding		X		
Proper sewage, drainage and garbage disposal system				X
D. Adequate Social Services				
Sufficient water supply		X	X	X
Adequate medical supplies	X	X	X	
Provision of emergency vehicle	X			
Smaller average family size		X		
Healthy children				X
Botica in the barangay				X
Assistance for the disabled				X
Adequate school personnel, building, and facilities			X	
Availability of a special school for the Agta	X			
Expansion of electric lines		X	X	X
Good road condition	X	X		

multidimensional but very consistent with the common vision they cited earlier for the watershed.

Aspirations of the indigenous peoples or IPs were similar to the non-IP communities. What stood out was their desire to have a separate school just for their ethnic group. This was because even if they wish to be assimilated into the mainstream society, their color and physical looks already work to their disadvantage. As narrated, they were most of the time victims of discrimination in public places including the schools. Such unkind treatment has created dislike among their children to attend formal schooling with non-IPs. While a teacher has been assigned by the National Commission on Indigenous Peoples (NCIP, a government service agency attending to their welfare), to assist them in learning, this has not been a regular activity. This aspect, thus, merits special attention in the watershed development and management plan because the Agtas are major stakeholders who have already paid a high price of being displaced from their lands.

It should be noted that nowhere in the above list of the IPs was education mentioned explicitly as an aspiration. Respondents were seemingly more engrossed with livelihood concerns. Stakeholders need to recognize the value of having their very much needed capital which is education.

All the above indicate that the stakeholders strongly recognize the need for change and that they are willing and prepared to take on

additional work and activities to be able to pursue such changes. It can be safely assumed that the stakeholders have relatively high motivation to change.

2. Level of knowledge and skills

Stakeholders' level of knowledge and skills was gauged by reviewing their experience with development projects and their ability to come up with sound recommendations on how they would pursue their dreams and aspirations.

Based on the outputs produced, more strategies were articulated by the upper poor and those who were organized. The organized group was also more open in espousing for vigilance in the community. By virtue of their broader exposure and experience, the upper poor and the organized have strongly urged for the need to link up with proper authorities in pursuing their needs and aspirations. This means that they have higher absorptive capacity than the lower class poor and the unorganized because they are aware of the need to demand and negotiate for services they deserve from proper authorities. Similarly, they are properly equipped to do so in terms of knowledge and skills. All groups, though, have the tendency to ask for assistance and dole outs especially from the government.

A summary of the communities' proposed strategies to achieve their dreams and aspirations can be categorized into any of the following:

- policy formulation
- law enforcement
- adoption of technologies and prescribed practices
- capability building
- participation in community development activities
- linkage and networking with proper authorities and institutions
- soliciting funds, assistance/dole outs
- information, education and communication (IEC) including value orientation

a. Policy formulation

The group believed that policies are important in bringing about change. Barangay resolutions empower the local authority to regulate wrong doings which can cause damage to the locality, e.g. throwing of garbage, *jueteng* operation. Policies also compel people to become more careful and more disciplined as non-compliance can exact penalty or punishment.

But policies, according to them, are useless if not properly and strictly enforced. Hence, law enforcement should form part of the multifaceted strategy. They admitted, though, that this usually becomes the acid test because, in the Filipino culture, *pakikisama* still strongly prevails among local populace. This is where strong political will, they believe, should come in.

b. Adoption of technologies

As a way of coping with change, the groups also recommended to adopt

certain technologies, particularly in their farming. They put premium on technology as a way of accomplishing things better and faster. Of course, they were aware that these have cost, so they hope there will be benefactors who can provide them the needed technologies at much lower cost, or preferably for free.

c. Capability building

Capability building forms part of the suggested strategies. The communities believed that somehow they would need to acquire additional knowledge and skills through attendance in training or workshops to be truly empowered to decide and act for themselves. This also becomes most useful for expanding their livelihood opportunities. This is also where functional literacy becomes necessary.

d. Participation in community development

For their aspirations to materialize, the communities felt that it is their obligation to do their share by participating in development activities affecting their locale or barangay. This could come in the form of tree planting, barangay clean up, and attendance in community meetings. Most of the time, they alleged that it is apathy from those concerned that cause the projects to fail.

e. Linkage and networking

Establishing linkage with proper authorities was proposed in recognition of their need to seek out

proactively for assistance or demand for needs they know fall within the mandate of certain institutions, e.g. medicines from DOH, seedlings from DENR, free education from DepEd, farming technology from DA, or funds from LGU. There is, however, a very thin line that distinguishes this approach from the dole out system which they also proposed. In fact, having experienced several dole out programs in the past, the syndrome still forms a big part of the local community's behavior.

f. Information, education and communication

Finally, their strategies were anchored on the need to inform and educate their people. Creating awareness, developing the right attitude, and equipping themselves with the needed skills through training have been perceived as necessary catalysts for making the other strategies effectively work. After all, information and knowledge form the basis of their decisions and actions.

g. Means of alleviating poverty

Many of the stakeholders perceived themselves as poor, and this has been their thinking for so many years. So when asked, what they think are the ways of alleviating poverty, many mentioned the values of hard work and perseverance. For them, there is no other choice except to endure the deprivation brought about by poverty at the moment, and then to work harder to earn more. Along with this, many of the respondents felt that the government ought to provide

them the needed support such as land and capital. Again, this indicates the prevailing reliance on outside support such as the government to help bring them out of poverty.

Out perhaps of desperation, two FGD participants cited deception as a way out of poverty. But on a positive note, one mentioned prayer as a better alternative.

On the whole, it can be said that the stakeholders have considerable level of knowledge and skills necessary to work out and fulfill their dreams and aspirations. But their attitude towards dole out should be addressed by some value orientation.

3. Social and political environment

a. Insurgency

At both the LGU and community levels, the issue of insurgency or the presence of members of the National People's Army (NPA) in the area was not openly discussed. Though one out of the four groups in the FGD mentioned NPAs as big non-ally, no one seemed to be willing to discuss the issue at length. This was not also explicitly cited as one of the problems during the multisectoral workshop and other consultations.

Most of the mayors and LGU officials met during LGU courtesy visits admitted the presence of NPAs but they said that NPAs could be dealt with diplomatically. In fact, LGUs have apparently contacts with NPA leaders as they promised to provide the person who can safely guide and assist the project team in going to the

communities believed to be strongholds of NPA. If ever, the only targets of NPAs, according to LGU sources, are the pursuing military men and the notorious criminals in the community.

At the community level, there was apparent hesitation to discuss the issue as the barangay officials cautiously warned the project team that some members of the audience during community briefings could in fact be NPA members. This indicates the network that NPA has over the community, and the seeming attitude of both the LGUs and communities to co-exist peaceably with NPA group. After all, it has remained an unsolved problem through the years, and has become a reality that they have learned to live with.

b. Local politics

A study of local politics forms an important aspect of community development. Interventions would have to go through the local leadership for they are the “real” leaders by virtue of their authority, and perhaps of strong personality and followings large enough to put them in office.

A glimpse of the political dynamics in the watershed area was based on the formal and informal dealings with the LGU officials and their staff. Discussions with some of the barangay officials met during community briefings provided more flesh to some of the earlier observations.

Local politics in the watershed can be described as typical of what can

be observed in other communities in the country. Political leaders, at the provincial, municipal and barangay levels are aligned with one political party or another. This in turn affects how they participate in programs and how the one on top allocates resources down to their constituents at the lower level. For example, it was apparent during some consultations and meetings for mayors who were politically non-aligned with the governor to be absent. In a number of barangays visited, officials complained of nonallocation of budget to development projects in their areas because they belonged to a different political party from that of the mayor. Similarly, some noted the ongoing projects they have as being funded by the LGU mayor or congressman with whom they have political alliance. These show that, indeed, support of local leadership is a key to a successful project implementation.

From the local community’s perception, local leaders are icons of power, prestige, and leadership. They are regarded as the “elite” in the area in the sense that they initiate, direct or regulate the activities in the community. To them, these leaders sort of provide a father figure who they can go to for their needs and problems. They can also readily pick out who among the local officials are serving well and who are corrupt and opportunistic. Whether they are politically aligned or not with their leaders, the local community can sense the “good” from the “bad” egg and seems to be ready to change party as necessary.

There are two types of political leaders that can be observed in the watershed area: the traditional-political and the professional-entrepreneurial leaders. The first are usually products of political dynasty or clan whose tendency is to form strong alliance with the masses through granting of favors. They cater more consciously to the demands and wishes of the local residents, developing an extensive alliance network to consolidate their power. The second come from professionals and entrepreneurs from non-elite ancestry who enter the political arena. By virtue of their educational background and experience, they are more development action-oriented. They treat their position as one geared towards fulfilling the needs of the larger society.

Dealing with any or both of these types of local executives would inevitably mean contact with factionalism as was encountered during project orientations and briefings. Opposing factions tend to attack this project because it is being supported by their rivals, finding as many loopholes as they can to halt the project. It is important, however, to keep in mind that it is the local leadership and not the program that is being attacked. Somehow this reality also works for the better in the end. Because of this, there is seemingly a strong urge on the local leaders to make a project succeed, if only to prove their rivals wrong and keep face with their constituents.

The presence of NPA in the watershed and the party system local

politics somehow negatively affect the absorptive capacity of the stakeholders. If this persist, they can negate any investment in development efforts.

4. Capabilities of community organizations

Stakeholders identified several types of POs existing in their respective barangays. These POs were categorized based on the beneficiaries or clients served (e.g. farmers, fisher folk, youth, women, tribal group, etc.) or by sectors being served (e.g. health, community welfare, religious, peace and order, etc.) The most frequently mentioned type was that of the farmers cooperative/organization, followed by community service or "Rabus" which means bayanihan or cooperation (Table 2). This could be explained by the fact that most of the community members were into farming.

Notable were other POs catering to youth, families, women, senior citizens, and the IPs. Based on sectoral concerns, there were also POs for health, peace and order, religion, and irrigation. All barangays in the watershed have at least one PO.

POs have initiated projects meant to meet their group needs. Based on frequency of mention, projects dealing with the provision of social services topped their list (Table 3). The services pertain to granting scholarships, medical missions and assistance, construction of a tribal hall and waiting shed, provision of housing, and organizing sports activities. This was

Table 2. Types of POs in the watershed

Type	Total
• Farmers cooperative/organization	15
• Community service/Rabus	8
• Youth organization	5
• Family organization	4
• Parents-Teachers Association (PTA)	3
• Health organization	2
• Women’s organization	2
• Peace and order	2
• Religious group	2
• Irrigation	2
• Fisher folks organization	2
• Senior citizen	1
• Tribal organization	1
TOTAL	43

closely followed by provision of loans for farm inputs and as capital for small business like chairs and tables rental, trading, store, and furniture shop.

Since farming is a major economic activity in the watershed, several PO-initiated projects also dealt with enhancing agricultural production through animal dispersal, irrigation, post harvest facilities, provision of grass cutter, and conduct of seminars. Other projects dealt with barangay clean-up and beautification, forest conservation, religious activities, and bayanihan. FGD participants perceived most of the POs operating in their area as successful. But a higher rate of success is attributed to farmers cooperatives than in any other POs. Success was

attributed to the tangible benefits (e.g. loan) derived from the services, unity and good coordination within the organization, and the support of LGUs and NGOs.

The capabilities of community organizations can be assessed as relatively good based on the findings above.

5. Other community resources

Consistent with the indicators of absorptive capacity, this study considered the resources and opportunities that the LGUs can offer to incoming or potential development projects. Resources include their rich natural resource endowment, unique product or feature, track record or

Table 3. PO-initiated projects in the Waras-Lalo Watershed

Type	Total
Provision of social services (sports, scholarship, medical assistance, waters system, tribal hall construction, housing, waiting shed)	14
Loan/capital provision for farming and small business	13
Agricultural productivity enhancement	9
Barangay clean-up and beautification	6
Forest conservation (reforestation . social forestry)	2
Church development and activities	1
Bayanihan/Community service	1
TOTAL	46

performance. Table 4 summarizes the resources and opportunities found in each of the four LGUs covered by the Waras-Lalo Watershed.

In the context of a watershed development and management planning, these resources and opportunities can also serve as entry points and can be maximized in building up the strengths of the area. They can also lessen the cost of investment as things do not have to start from zero.

Summing up and implications to development planning

The overall absorptive capacity of the major stakeholders in the Waras-Lalo Watershed may be assessed using the five prescribed indicators and the arbitrary rating scale of 1-5 (with 1 as the lowest and 5 as the highest) as follows:

Indicators	Rating
Motivation to change	4
Level of knowledge and skills	4
Social and political environment	2
Capabilities of community organizations	3
Other community resources	3
Overall Rating	3.2

The overall rating, which is just slightly above the midpoint, implies that the absorptive capacity of the target stakeholders is slightly above average. They need not start from the base as they have some of the necessary starters to keep the development project, say in livelihood, going. This means lesser investment for development planners. Their current level of community organization suggests some good accomplishments in terms of

Table 4. Other Community Resources in the Waras-Lalo Watershed

Baao	Buhi	Iriga City	Nabua
Presence of Lake Baao – centermost portion of Bicol River Basin; proposed site of the Integrated Flood Control, Fishery and Irrigation Development Project	Rich natural resources; Lake Buhi is sanctuary of the smallest fish in the world	National Irrigation Administration and Bicol River Basin Development Project irrigation projects	Potential as tertiary urban growth center along Iriga-Naga-Legazpi-Daet growth corridor
Commercial quantity of potable water all over the area	Suitability to almost all types of agricultural activities		Consistent positive economic growth through the years
Egg basket of Bicol Region	Major trading center		
Biggest supplier of tilapia fingerlings	Within the tourism hub of the province Presence of light to medium enterprises		

community organizing and social mobilization, which are further indicative of their level of empowerment. Future projects can actually build upon this.

However, development projects may need to carry out major interventions in the area of political environment. Traditional politics need to be addressed by some innovative strategies in local governance that would transcend partisanship and patronage. Likewise, the unfavorable peace and order situation brought about by the presence of NPAs in the area has adversely affected investments which could have helped boost the local economy. This, in fact, has contributed to the watershed's

being one of the second poorest in the country. Definitely, this aspect can drastically pull down the watershed's absorptive capacity rating. More efforts need to be done on this aspect as no development would thrive in areas threatened by unstable peace and order.

CONCLUSIONS AND RECOMMENDATIONS

As demonstrated in the study, a systematic elaboration of the concepts of stakeholders and absorptive capacity can greatly enhance social analysis for development planning. Stakeholders analysis making use of the importance-influence matrix can

more objectively identify, categorize, and prioritize stakeholders. It clarifies information quickly and helps draw out assumptions about the risks and factors concerning the viability of the project. Absorptive capacity can describe more thoroughly the ability of the intended stakeholders or community to access and utilize the project's goods and services effectively, thus, avoiding imbalances and wastage of resources. Both concepts when operationalized can make development planning more strategic.

It is, however, recommended that further quantification of indicators for absorptive capacity be tried out. The rating system can be modified to come up with relative weight for each indicator depending on their relative importance. This may be standardized or varied based on the community or ecosystem being studied.

REFERENCES

Abraham, Emmanuel Rodantes G.

1992 "Policy Research on the Protection and Enhancement of the Natural Quality of Mt. Makiling Forest Reserve: Selected Stakeholders of Mt. Makiling Forest Reserve." Paper presented at the Policy Workshop on Development and Protection of Mt. Makiling. College of Forestry, U.P. Los Baños.

Asian Development Bank

1994 *Handbook for Incorporation of Social Dimensions in Projects*. Pasig, Metro Manila.

Cohen, Wesley M. and Daniel A. Levinthal

1990 *Absorptive Capacity: A New Perspective on Learning and Innovation*. ASQ 35:128-152.

Comprehensive Land Use Plan 2002-2004. Nabua, Camarines Sur.

Comprehensive Land Use Plan 2002-2004. Buhi, Camarines Sur.

Connolly, F.W., et al.

1991 "A Bill of Rights for Electronic Citizens." *EDUCOM Review* 26 (2):37-41.

Dy, Rolando T.

2000 *Private Investments in Agriculture: Trends, Constraints and Key Indicators*. Center for Food and Agribusiness, University of Asia and the Pacific, Ortigas, Pasig City.

Florece, P.M.

1994 "Developing Collaborative Structures and Processes in the Generation of Solutions to the Occupancy Problem of the Makiling Forest Reserve." MPA Action Project, Development Academy of the Philippines, Silang, Cavite.

Gray, B.

1989 *Collaborating: Finding Common Ground for Multiparty Problems*. San Francisco, U.S.A.: Jossey Bass Publishers.

Guy, Peter

1995 *Agroecosystem Analysis and Rapid Rural Appraisal of Selected Sites in the Central Cordillera, Ifugao, Philippines*. ERMP, IESAM, College, Laguna.

Hough, J.L.

1988 "Obstacles to Effective Management of Conflicts Between National Parks and Surrounding Human Communities in Developing Countries." *Environmental Conservation* 15 (2): 129-136.

International Tropical Timber Organization (ITTO)

2002 "Conservation and Maintenance of Biological Diversity in Tropical Forests Managed Primarily for Timber Production, Surigao del Sur, Philippines." Final Technical Report. Sustainable Ecosystem InternationalCorp., Quezon City.

Lerner, J.

1992 "Incentives and Disincentives for Community Participation in the Conservation of Makiling Forest Reserve: A Preliminary Examination." Research report prepared for the Environment and Resource Management Project. IESAM: UP Los Baños.

Mendoza, M.D.

1993 "A Strategic Intervention to Deal with Forest Encroachment: The Case of the Forest Migrants in the Makiling Forest Reserve." Master of Development research report, Asian Institute of Management.

Moser, Caroline

1997 *Household Responses to Poverty and Vulnerability*. Volume 1. Confronting Crisis in Cisne Dos, Guayaquil, Ecuador. World Bank, Washington DC.

Municipal Socioeconomic Profile 2001. Baao. Camarines Sur.

Municipal Socioeconomic and Physical Profile 2001. Iriga City.

Nolledo, Jose N.

1992 *Local Government Code of 1991*. 1st edition.

Overseas Development Administration (ODA)

1995 "Guidance Note on How to Do Stakeholder Analysis of Aid Projects and Programmes."

Porio, Emma

1990 "Partnership with the Poor: The LRM Approach to Rural Development." National Economic and Development Authority, Pasig City.

Porter, Gareth with Delfin J. Ganapin, Jr.

1988 *Resources, Population, and the Philippines Future*. World Resources Institute.

Ranes, Viviane Leah C.

2001 *Watershed Resources Management in Lake Buhí*. College of Forestry and Natural Resources, U.P. Los Baños, College, Laguna.

Rebugio, Lucrecio L., Cleofe S. Torres, Emmanuel R.G. Abraham, and Jose O. Sargento

1998 *Sustainable Mountain Ecosystems: Philippines' Challenge for the 21st Century*. College of Forestry and Natural Resources, U.P. Los Baños, College, Laguna.

Sargento, Jose O.

1995 "Participation of Major Stakeholders in the Conservation of the Makiling Forest Reserve." Ph.D. dissertation, U.P. Los Baños.

Socioeconomic and Physical Profile 2001. Camarines Sur.

Walters, Bradley B., Angelita M. Cadelina, Ariston Cardaño, and Eduardo Visitacion

1994 *Watershed Restoration and Protection in the Bais Basin, Philippines*. EMRP, IESAM. College. Laguna, Philippines.

Environmental Correlates of Community Attachment*

Corazon B. Lamug

The resurgence of interest in community development also stimulated conceptual and methodological elaboration of related concepts among which is community attachment.

The study developed indexes of community attachment and identified its environmental correlates using key informant interviews and social survey in barangays Bayugo and Pagkalinawan of Jala-jala, Rizal. Community attachment was measured using local indicators of the three dimensions of the concept, namely, interpersonal relations, community participation and community satisfaction. An index was constructed for each dimension: interpersonal relations measured degree of closeness to people they went to for help on important matters and to those they often socialized with; community participation consisted of both membership in formal organizations and participation in informal organizational activities in the barangay; community satisfaction reflected extent of satisfaction with the barangay, plan to change barangay of residence and trust that barangay leaders would perform roles effectively. The community attachment index was the composite of scores on the three individual component indexes. Index scores show differential levels of community attachment among the residents of the two barangays.

Three environmental factors were found to have significant relationships with the composite measure of community attachment. These are the physical features of the barangay, length of residence in the barangay and ownership and type of residential unit of respondents. The construction of a community attachment index contributes both to the conceptual elaboration of community attachment and to the methodological imperative for indicators that capture the specificities and particularities of the barangays studied. The study lays the ground work for further studies linking the concept of community attachment to community action and development.

INTRODUCTION

Community development has regained currency in recent years due in part to the recognition of the importance of local initiatives and participatory approaches to development. Effecting development at the community level requires an appreciation of the concept

of community as well as that of community structure and dynamics.

Community is one concept that has taken different meanings in different contexts. The usage of the term is not entirely consistent even

* Paper based on a study made possible through the support of the Southern Tagalog Studies Program of UPLB and with the assistance of Ms. Rhodora Aparante.

among sociologists. This situation is even compounded by the blurring traditional distinctions between rural and urban communities and the fast changes not only in the communities themselves but more so in the larger geopolitical contexts in which these are embedded.

Community like any sociological concept displays many different facets. It has been given different definitions most of which were for purposes of delineating manageable areas of research. Among the earliest definitions was the one given by Maclver (1917:107) where a community is "a social unity whose members recognize as common a sufficiency of interests to allow of the interactivities of common life."

Over the years the concept has undergone some subtle changes with emphasis on such aspects as co-occupancy of a given territory (Park 1929), sharing "a common culture, ... arranged in a social structure, and exhibit an awareness of their uniqueness and separate entity as a group" (Mercer 1956:27), effects of urbanization, industrialization, and bureaucratization leading to the "eclipse of community" (Stein 1960:107), non-utility of an areally bounded social entity in favor of a new form of "community without propinquity" (Webber 1963:23), interdependence of generalized activities in and through a set of institutions for its continuity as a social and economic entity (Schnore 1973), social relations characterized by personal intimacy, emotional depth, social coherence, and continuity in

time (Baltzell 1968, Nisbet 1969), a means of intervention and a process of participation in society (Steuart 1985).

Recent studies have focused on community attachment as a vital aspect of community development to deal with such issues as out-migration because of lack of jobs or other income opportunities and underutilization of available human capital. Some sociologists have argued that it is imperative for rural areas to build the "social infrastructure" in order to deal effectively with such issues. This can be done by stemming out-migration and mobilizing residents for community action (Flora and Flora 1990, Allen and Dillman 1994). As Wilkinson (1986:12) aptly puts it, "without community action, there is no community development." Assuming that community attachment fosters community action, then studies on the determinants of the attachment of residents to their local communities would lead to finding solutions to community problems and issues.

Thus, the elaboration of the concept community attachment has drawn the attention of researchers who have identified and empirically tested its dimensions and determinants. The earliest and most influential conceptualization was that by Kasarda and Janowitz (1974). Community attachment accordingly has three dimensions: (1) The interpersonal dimension refers to the degree to which ties to friends and relatives are concentrated in the local community and the extensiveness of

ties in the local community; (2) The participation dimension is the person's involvement in formal community organizations; (3) The sentiments dimension captures positive feelings toward the local community. The first two dimensions reflect local bonds while the third dimension reflects local sentiments.

A systemic model of community attachment was developed where the systemic factors that explain the strength of community attachment are three characteristics of residents, namely, length of residence, social position, and stage in life cycle. In applying the model to rural communities, for example, community attachment was significantly related to, among others, length of residence and stage in life cycle (Goudy 1990), broad economic factors (Brown 1993) and contextual local community factors (Sampson 1988, Stinner et al. 1990). A recent test of a refinement of the model was done by Beggs and

associates (1996) where they introduced operational refinements to the interpersonal and participation dimensions of the model and then tested the refined model with data from southwest Louisiana. Their results suggest that the operational refinements generally improved understanding of community attachment in a rural setting but further suggest that additional refinements are needed.

In addition to fostering community action, personal attachment to one's community serves to provide a person with a "... sense of belonging and purpose which gives meaning to his/her life" (Proshansky and associates 1995:90). This sense of belonging varies with the degree to which the important activities in a person's life are centered in and around the home (Buttimer 1980). Such personal attachment has been referred to as place identity (Proshansky and associates 1995). An analysis of six

Table 1. Selected Characteristics and Sample Sizes of the Two Study Sites

Particulars	Pagkalinawan	Bayugo
Land Area*	177 ha	577 ha
Total number of farms*	86	68
Residential area*	5 ha	27 ha
Total number of households	267	739
Number of survey respondents		
Part I of survey (<i>MBN</i>)	267	739
Part II of survey (Community Attachment)	267	280

Source: * Municipal Planning and Development Office, Jala-jala, Rizal, 2000

women's narratives demonstrated the utility of place identity in explaining different levels of attachment to their hometown, Bacolor, Pampanga (Lamug et al. 1999). All of the women had their homes devastated by lahar flows following the eruption of Mt. Pinatubo.

The objective of this study is to measure community attachment in migrant communities and identify its environmental correlates. It uses locally specific indicators for each of the three dimensions of community attachment used by Kasarda and Janowitz (1974). For the interpersonal dimension, local social networks (friends and kin) are used. The participation dimension employs participation in formal and informal community organizations. The sentiments dimension is measured using a scale of affect toward the local community. The composite measure of community attachment is then correlated with environmental factors to explain the variation in strength of community attachment to a rural community in Jala-jala, Rizal. This study departs from the established systemic model of community attachment by focusing on physical and social environmental correlates. In addition, the study is on two predominantly migrant communities unlike in previous studies of communities with low proportions of migrant residents.

METHODS USED

The study was conducted in Jala-jala, one of the towns of the province

of Rizal. The town is a peninsula along the shores of Laguna de Bay. The study sites were two of the 11 barangays of Jala-jala, namely, Pagkalinawan and Bayugo. These two towns were forested areas in the 1950s with an abundance of wildlife. Despite the private ownership of the land, it attracted several waves of migrants from different towns of Batangas province. Initially, the migration was circulatory in nature with migrants engaged in farming as tenants and some fished in the lake. The eruption of Taal volcano in the 1960s brought big waves of migrants to Jala-jala this time many became permanent residents.

The selection of the two study barangays was based on variation in population size, mix of livelihood sources of residents and environmental conditions. Table 1 shows that Bayugo has a larger total land area, larger residential area and bigger number of households than Pagkalinawan. The latter, however has a larger number of farms than the former; more households are engaged in farming in Pagkalinawan than in Bayugo where a large proportion of residents engage in fishing.

Key informant interviews and the social survey were employed in the study. The key informants were former and current chairs of the barangay council, some purok leaders and selected community members. The key informants validated the bases for site selection and gave suggestions for indicators of community attachment.

A social survey was conducted in each barangay. The survey consisted

of two parts. The first part was the standard questionnaire used by the Department of Social Welfare and Development (DSWD) for its Minimum Basic Needs (MBN) survey. This part was conducted immediately before the study for Bayugo. We volunteered to encode the questionnaires and provide the DSWD a diskette of the analyzed data for ease in data comparison in subsequent phases on their MBN study. No such survey was done for Pagkalinawan so the first part of the survey (MBN) was conducted together with the second part which consisted of items on community attachment and environmental variables.

For Pagkalinawan, the two part survey was a complete enumeration of all 267 households in the barangay. For Bayugo, only a sample (280) of the total number of households (739) took part in the community attachment part of the survey. Table 1 shows the number of survey respondents in both barangays.

RESULTS AND DISCUSSION

Description of households and survey respondents

Historically, both Pagkalinawan and Bayugo are migrant barangays. In the 1950s the first set of circulatory migrants from Batangas arrived setting up temporary houses and engaging in cultivation of rice and bananas. A decade after a big wave of migrants arrived following the eruption of Taal volcano. The land was privately owned and they were considered as tenants.

There were land related disputes between the land owner and the migrants. In the 1970s, the barangays were created, schools were constructed and development projects were initiated. In the 1980s, there were changes in land tenure as most farmers became agrarian reform beneficiaries or were awarded Certificates of Stewardship Contracts for their upland farms. Electricity and piped water were also introduced in the barangays. In the early 1990s, a road traversing the entire town of Jala-jala was constructed thereby increasing accessibility of the study barangays.

Most of the survey respondents were the head of the family or the spouse. In Pagkalinawan, about 94 percent of the heads of families were male while in Bayugo the male heads of household comprised 87 percent. Expectedly, most household heads were married (90 percent for Pagkalinawan and 85 percent for Bayugo). For both barangays, the modal educational attainment of the family heads was elementary education. The main sources of livelihood or occupation of the household heads were farming and charcoal-making in Pagkalinawan while in Bayugo these were fishing and farming. There were very few professionals among family heads in both barangays.

About three-fourths of household heads were members of formal organizations in Pagkalinawan. These were economic, sociocivic and political organizations. In Bayugo only 9 percent of household heads were

members of formal organizations. These organizations were sociocivic, economic and political in nature.

Most of the families in both barangays consisted of 4 to 6 members. Similarly, the modal age range of family members in both barangays was 26 to 40 followed by the range 18 to 25 years. A large proportion of family members were single and with some elementary education and many were still attending school. The occupations of the family members were reflections of the occupations of the household heads.

The modal monthly income of the study families was over P5,000 (22% for Pagkalinawan and 19% for Bayugo). The largest proportion of the family income was earned by the father although the mother and some children also contributed to the family income.

The modal materials for the building of houses in both barangays were wood and cement. Most houses in Pagkalinawan (83%) and in Bayugo (78%) were owned by the occupants. The modal type of toilet used is the one where water has to be poured (*de buhos*). Potable water was piped into the individual houses (Pagkalinawan, 79%; Bayugo, 86%).

Development of measures of community attachment

The three indicators of community attachment used were (1) interpersonal relations; (2) community participation; and (3) community

satisfaction. An index was constructed for each of the three indicators and an overall community attachment index was the composite of all three indicators. The construction of each component index and the composite index is described in turn.

The interpersonal relations index

This index consisted of two separate items on interpersonal relations. One measured the degree of closeness to people that the respondents often went to for help on important matters and the other item measured the degree of closeness to people that the respondents often socialized with.

On the first item each respondent was asked to give three to five names of people that they often go to for help on important matters in the last 6 months. For each name given four descriptors were provided. These were the nature of the relation to the respondents, location of residence, duration of relation and degree of closeness of relation. Each descriptor was measured on an ordinal scale showing variation in degree of relation to the respondent. A composite score from each of the names given in this item was the summation on the scale score of each of the descriptors. For example, a score on this item is high if the name given is a member of the family, residing in the barangay, and the relation characterized as longer than 6 years in duration and very strong compared to a low score if the name given is a mere acquaintance, residing in a different barangay or

town, and the relation characterized as less than a year in duration and not strong at all.

On the second item each respondent was asked to give three to five names of people they often socialized with in the last 6 months. Like in the first item, four descriptors were provided for each name given by the respondent. These were the nature of the relation to the respondent, location of residence, duration of relation and degree of closeness of the relation. The variations in the descriptors were reflected in the ordinal scale used to measure these. The scale scores for each of the names given were summed to form a composite score for the second item.

The individual scores on each of the two items were then assigned weights to reflect the relative importance of the first item (assigned weight of 2) compared to the second (assigned weight of 1). In other words, the interpersonal relations on assistance in important matters are deemed more important than those with whom one casually socializes. The interpersonal relations index was thus the summation of the two weighted items and then categorized into low, moderate and high. The interpersonal relations index in this study differed from that used in previous studies that conducted factor analyses of indicators of the local concentration of network ties and the strength of local ties.

The distribution of scores on the interpersonal relations index is shown in Table 2. For Pagkalinawan residents,

their interpersonal relations scores are almost evenly distributed among the low, moderate and high categories although those with high scores comprise the modal category (35%). Bayugo residents, in contrast, have moderate interpersonal relations scores as the modal category (38%). Thus, slightly more residents of Pagkalinawan than of Bayugo went to close relatives for help on important matters and often socialized with people from within their barangay on a sustained basis. In other words, Pagkalinawan residents had slightly stronger local ties and denser social networks than Bayugo residents. The difference between the two barangays in interpersonal relations could be attributed to the large land area and population size of Bayugo compared to Pagkalinawan. It could be that the smallness of the Pagkalinawan community made for more personal social relations and cohesive social networks which translated to higher interpersonal relations than in Bayugo.

The community participation index

This index was developed from two separate items. One was membership in formal organizations in the barangay and the other was participation in informal organizational activities in the barangay. Each question was answered by a 'yes' or 'no' response. The classification of answers to the two questions comprised the community participation index. This index differed from that used in previous studies in that the latter used participation only in formal organizations.

Table 2. Distribution of Index Scores on Interpersonal Relations, Community Participation, Community Satisfaction and Community Attachment

Index/Scores	Pagkalinawan		Bayugo		Total	
	Frequency	%	Frequency	%	Frequency	%
Interpersonal Relations						
Low	83	31.09	87	31.07	170	31.08
Moderate	90	33.71	107	38.21	197	36.01
High	94	35.21	86	30.71	180	32.91
Community Participation						
Low	4	1.50	20	7.14	24	4.39
Moderate	48	17.98	96	34.29	144	26.33
High	215	80.52	164	58.57	379	69.29
Community Satisfaction						
Low	10	3.75	67	23.93	77	14.08
Moderate	37	13.86	98	35.00	135	24.68
High	220	82.40	115	41.07	335	61.24
Community Attachment						
Low	35	13.11	92	32.86	127	23.22
Moderate	76	28.46	95	33.93	171	31.26
High	156	58.43	93	33.21	249	45.52
Total	267	100.00	280	100.00	547	100.00

The scores on the community participation index were classified into low, moderate and high based on score distribution (Table 2). Evidently, majority of the respondents had high community participation scores with Pagkalinawan residents having a larger proportion of residents participating in both formal and informal community organization (81%) than Bayugo residents (59%). It should be noted that membership in organizations was significantly different in the two barangays (75% in Pagkalinawan compared to 9% in Bayugo). The high community participation levels of Pagkalinawan residents compared to those of Bayugo reflect stronger local bonds among residents of the former barangay.

Community satisfaction index

This index was constructed from three separate items. One was on extent of satisfaction with the barangay of residence. This was measured on an ordinal scale from very dissatisfied to very satisfied. A second item was on whether or not the respondent plans to change barangay of residence. The third item was frequency with which respondent trusted that present barangay leadership can perform its roles effectively. This item was measured on an ordinal scale ranging from almost never to just about always.

The community satisfaction index was a composite of the scores on the three items. Thus, scores on all three

items were summed such that the higher the score, the greater the community satisfaction. The scores were categorized into low, moderate and high. This index followed closely the measures utilized by Beggs and associates (1996) in their operational refinement of the sentiments dimension of community attachment.

The distribution of scores on the community satisfaction index is shown in Table 2. Like in community participation, Pagkalinawan residents have more than four-fifths of residents who are satisfied with their barangay, have no plan of changing residence and more often trust that their barangay leaders would perform their roles effectively. In comparison, almost a quarter of Bayugo residents are low in community satisfaction and only 41 percent have high community satisfaction scores. Thus, while the modal score category for both barangays is high, Pagkalinawan residents have a much larger proportion of high scorers (82%) compared to Bayugo residents (41%). This means that Pagkalinawan residents have more positive sentiments about their barangay than residents of Bayugo.

Community attachment index

The measure of community attachment is a composite of the scores of the three individual component indicators. Thus, the index scores for interpersonal relations, community participation and community satisfaction were summed to comprise the community attachment index. The sums ranged

from 3 to 9. These scores were then categorized into low, moderate and high in community attachment.

Table 2 shows that there are no significant variations in community attachment of Bayugo residents. About one-third of residents are each distributed evenly in the low, moderate and high categories of community attachment. In contrast, only 13 percent are low scorers while 58 percent are high scorers on community attachment in Pagkalinawan. In other words, majority of residents of the latter barangay have high interpersonal relations, actively participate in community organizations and are highly satisfied with their barangay. The description by the key informants of community dynamics in the two barangays is consistent with the levels of community attachment as measured by the index. Thus, the local indicators of interpersonal relations, community participation, and community satisfaction lend themselves to a useful locally specific measure of community attachment in Jala-jala. This is consistent with the findings and suggestions of Sampson (1987), Stinner and associates (1990) and Beggs and associates (1996).

Environmental factors associated with community attachment

Community attachment as measured by the community attachment index was tested for association with specific environmental factors. Of the several factors screened for empirical testing of association only three emerged to have significant relationships. These

are the physical environment of the barangay, the length of residence in the barangay, and ownership and make of residential unit.

The physical environment of the barangay. The two study barangays were purposely chosen because these have different features of the physical environment. As described in the selection of study sites above, barangay Bayugo has a larger total land area, a larger residential area, and a bigger number of households than barangay Pagkalinawan. The latter however, has a larger number of farms. In other words, more households in Pagkalinawan engage in farming as a main source of livelihood compared to Bayugo where residents are engaged in a variety of enterprises including fishing and farming.

Table 3 shows that there is a significant relationship between the physical environment of the barangay and community attachment. As shown earlier, Pagkalinawan residents have a higher level of community attachment than the Bayugo residents. This could be attributed to the distinctive features of each barangay.

It seems that the relatively small size of the Pagkalinawan community and the larger proportion of farmers make for higher levels of community attachment. Small community size in rural areas is often associated with greater cohesiveness and hence the relatively greater tendency to help one another. This is clearly demonstrated in farming activities where most of the residents continue to practice labor sharing arrangements locally referred to as bayanihan. It could be that farming provides better opportunity for community participation like in informal organizations compared to other livelihood endeavors. Moreover, having a dominant source of livelihood like farming allows community leadership to focus community interventions on farming which would otherwise be diffused when there are multiple endeavors. These differences, notwithstanding, the two barangays have experienced major events and significant changes such as the increase in population size through migration, land tenure disputes, road construction and changes in land use.

Table 3. Environmental Factors Associated with Community Attachment

Environmental Factors	Statistical coefficient in relation with community attachment		
	Gamma	df	prob.
Physical environment of barangay	-0.452	2	$p \leq 0.001$
Length of residence in barangay	0.195	4	$p \leq 0.001$
Ownership and type of residential unit	0.183	2	$p \leq 0.05$

Length of residence in barangay.

When asked how long they have resided in the barangay, the respondents gave a wide range of responses from a low of 14 to a high of 41 years. It is evident from Table 3 that length of residence is directly associated with community attachment, a finding that is consistent with those of previous studies (Kasarda and Janowitz 1974, Sampson 1988, Goudy 1990, Beggs et al. 1996). It may be that residents who have resided for a long period of time in the barangay have relatively more extensive social networks, have institutionalized participation in community activities and stand to lose more if they decide to migrate to another place compared to those who have not quite grown their roots in the barangay. This is notable because residents of the two study barangays are mainly migrants.

However, the Lamug and associates study (1999) of Bacolor women showed that community attachment was a complex process that was not solely dependent on length of residence but also on other factors such as positive or negative past experiences in the community.

Ownership and type of residential unit. Two variables were fused into one; these were ownership of housing unit and type of house (i.e., the materials it is made of). The composite variable is found to be directly associated with community attachment (Table 3). Respondents whose residential units are owned and made of more permanent materials like concrete have significantly higher

levels of community attachment than those whose units are not owned and are made of less permanent materials. Recall that there are relatively more residents in Pagkalinawan (83%) than in Bayugo (78%) who owned their residential units.

It seems that residents with extensive social networks, greater community participation and are generally satisfied with their barangay have decided to stay permanently in the barangay and consequently invested in homes which they owned and built to be more stable. It goes without saying that socio-economic status is a confounding factor in linking ownership and make of residential unit with community attachment as empirically established in the Lamug and associates study (1999).

DISCUSSION AND SUMMARY

The study identified environmental correlates of community attachment. It tested specific indicators of the three dimensions of the concept, namely, interpersonal relations, community participation and community satisfaction. The research methods used were key informant interviews and social survey in two barangays of Jala-jala, namely, Bayugo and Pagkalinawan.

In constructing measures for community attachment three locally specific indexes were used. One was an interpersonal relations index that measured degree of closeness both to people they went to for help on important matters and to those they

often socialized with. A second index was on community participation which consisted of both membership in formal organizations and participation in informal organizational activities in the barangay. The third was a community satisfaction index reflecting extent of satisfaction with the barangay, plan to change barangay of residence and trust that barangay leaders would perform roles effectively. A community attachment index was the composite of scores on the three individual component indexes. Thus, the index scores on interpersonal relations, community participation and community satisfaction were summed to comprise the community attachment index.

Three environmental factors showed significant relationships with the composite measure of community attachment. One is the physical environment of the barangay. Pagkalinawan residents have a higher level of community attachment than Bayugo residents. The relatively small size of the Pagkalinawan community and the larger proportion of farmers there made for greater cohesiveness and tendency to help one another compared to Bayugo with a larger total land area and residential area, and larger proportion of households engaged in non-farming endeavors.

Length of residence in the barangay was also positively associated with community attachment. Residents who have resided for a long time in the barangay have relatively more extensive social networks, have institutionalized participation in community activities

and stand to lose more if they migrate to another place.

The third environmental factor associated with community attachment is ownership and make of residential unit. Respondents whose residential units were owned and made of permanent materials have significantly higher levels of community attachment than those whose units were not owned and were made of less permanent materials. It could be that residents with extensive social networks, greater community participation and were generally satisfied with their barangay have decided to stay permanently in the barangay and consequently invested in homes which they owned and built to be more stable.

It can be concluded that the concepts of community and community attachment have utility even among residents of migrant communities. It can be inferred that to the study respondents, the co-occupants of their barangay, together with their interactivities in various aspects of life comprise a community. Moreover, the traditional notion of growing one's roots in one's birthplace is challenged when migrants to a new place develop their own sense of attachment in the context of different physical, social and interpersonal changes happening in their respective communities. The utility of the concept for migrants is demonstrated by their differential levels of attachment as indicated by three dimensions of the concept used in the study. In addition, the identification of environmental correlates of

community attachment adds a different dimension to the established systemic model of community attachment. The environmental factors can contribute to a better understanding of the migrant residents' sense of community attachment.

Moreover, the study demonstrated the importance of using local indicators of the dimensions of community attachment that reflect the social dynamics obtaining in the study areas. Its methodological implications for conceptual elaboration and local validation cannot be overemphasized.

Having shown the utility of the concept of community attachment to migrants as well as its measurement using composite indexes, it is suggested that future studies test its external validity on other barangays and identify other environmental correlates of community attachment. In addition, the assumption that community attachment fosters community action and community development should be tested in future studies by showing the correlation of community attachment as measured in this study with local indicators of community action and development.

REFERENCES

Allen, John C. and D.A. Dillman

1994 *Against All Odds: Rural Community in the Information Age*. Westview Press.

Baltzell, E. Digby

1968 *The Search for Community in Modern America*. New York, U.S.A.: Harper and Row.

Beggs, John, J. Hurlbert, and V. Haines

1996 "Community Attachment in a Rural Setting: A Refinement and Empirical Test of the Systemic Model." *Rural Sociology* 61: 407-426.

Brown, Ralph

1993 "Rural Community Satisfaction and Attachment in Mass Consumer Society." *Rural Sociology* 58:387-403.

Buttimer, A.

1980 "Home, Reach and Sense of Place." *Landscape* 24:3-8.

Flora, Cornelia B. and J. L. Flora

1990 "Developing Entrepreneurial Rural Communities." *Sociological Practice* 8:197-207.

Goudy, Willis

1990 "Community Attachment in a Rural Region." *Rural Sociology* 55:178-198.

Kasarda, John and M. Janowitz

1974 "Community Attachment in Mass Society." *American Sociological Review* 39: 328-339.

Lamug, Corazon, K.S. Crittenden and G.L.M. Nelson

1999 "Place Identity of Women of Bacolor." *Philippine Sociological Review* 47:21-30.

Maclver, Robert M.

1917 *Community*. London: Macmillan.

Mercer, Blaine E.

1956 *The American Community*. New York, U.S.A.: Random House.

Nisbet, Robert A.

1969 *The Quest for Community*. New York, U.S.A.: Oxford University Press.

Park, Robert E.

1929 "Sociology, Community and Society." In W. Gee (ed.) *Research in the Social Sciences*. New York, U.S.A.: Macmillan.

Proshansky, H.M., A.K. Fabian, and R. Kaminoff

1995 "Place-Identity: Physical World Socialization of the Self." In L. Grant (ed) *Giving Places Meaning (Readings in Environmental Psychology)*. London: Academic Press.

Sampson, Robert

1988 "Local Leadership Ties and Community Attachment in Mass Society: A Multi-Level Systemic Model." *American Sociological Review* 53:766-779.

Schnore, Leo F.

1973 "Community: Theory and Research on Structure and Change." In N. Smelser (ed.) *Sociology: An Introduction*. 2nd edition. New York, U.S.A.: John Wiley and Sons.

Stein, Maurice R.

1960 *The Eclipse of Community*. New Jersey, U.S.A.: Princeton University Press.

Steuart, Guy

1985 "Social and Behavioral Change Strategies." In S. Keisler, J. Morgan, and V. Oppenheimer (eds.) *Social Change*. New York, U.S.A.: Academic Press.

Stinner, William et al.

1990 "Community Size, Individual Social Position, and Community Attachment." *Rural Sociology* 55:494-521.

Webber, Melvin M.

1963 "Order in Diversity: Community Without Propinquity." In L. Wingo, Jr. (ed.) *Cities and Space*. Baltimore, U.S.A.: Johns Hopkins Press.

Wilkinson, Kenneth P.

1986 "In Search of the Community in the Changing Countryside." *Rural Sociology* 51: 1-17.

Beyond the 'Mythic Community': Enhancing Collective Action in Community-Based Forest Management

Juan M. Pulhin and Maricel A. Tapia

This paper examines the characteristics of communities in Community-Based Forest Management (CBFM) and analyzes their attributes that promote collective actions. It presents a brief history of community, its emergence as the central figure in natural resource management and conservation, and how it evolved as a sociological concept which gave birth to the idea of the "mythic community". The paper also describes two categories of communities in CBFM, i.e., self-initiated and externally-initiated, based on classification generated from the literature. It concludes with theoretical and policy and practical implications of the findings on the practice of CBFM.

INTRODUCTION

The inadequacies and ineffectiveness of the state in managing natural resources have led to a major paradigm shift in forest policy and resources management (Ife 1999, Meinzen-Dick and Knox 2001). Breaking the old notion that considered communities as culprits of forest destruction, the new paradigm recognized the constructive role of community in forest resource conservation and development. In the Philippines, this shift marked the development of people-oriented forestry programs with families and communities taking the lead in resource management activities. These programs were later unified under one umbrella program called Community-Based Forest Management (CBFM) which embodied the paradigm change and devolution processes happening since the 70s.

CBFM founds itself on the belief that access rights and control over natural resources must be restored to

Philippines' indigenous and local communities. It became the national strategy for sustainable upland management which aims not only to arrest resource degradation and loss but also social justice in the uplands (Chiong-Javier 2001).

In the meantime, effective implementation of devolved programs requires collective action, or a conscious working together, on the part of the community or local users (Meinzen-Dick and Knox 2001). This collective action is not a problem to communities conceptualized as territorially fixed, small and homogeneous as "these characteristics supposedly foster the interaction among members that promote desirable collective decisions" (Agrawal and Gibson 1999). However, with the high level of mobility of many people and the globalization of their worlds, collective action for resource management

cannot be assumed to exist (McCay 1998, Meinzen-Dick and Knox 2001). Even “the very notion of a single, identifiable ‘community’ for ‘community-based resource management’ may be a fallacy where users are from diverse social backgrounds and economic position” (Agrawal 1997 in Meinzen-Dick and Knox 2001). Hence, the idea of a community as small, integrated groups using locally evolved norms to manage resources sustainably and equitably has, in many cases, become a myth (Agrawal and Gibson 1999).

In response to this changing nature of community, this paper examines certain characteristics of communities in CBFM and analyzes their attributes that promote collective actions. It argues that, notwithstanding the noted heterogeneity within communities, a sensible way to enhance collective action in CBFM is to capitalize on the ties that bind them without undermining the complexity and multiple realities of these communities.

The paper is organized into five major sections. The introduction is followed by a historical review of the notion of “community” as a sociological concept as well as the emergence of community as a central figure in contemporary natural resource conservation and management. This section provides the context from which the idea of a “mythic community” evolved. Section three briefly describes two categories of communities based on a classification made by a recent research on the assessment of CBFM in the Philippines

that involved the author. Using the wealth of information generated through this assessment and other empirical evidence from the literature, section four explores the attributes of CBFM communities that enhance collective action. The paper concludes by examining the policy and theoretical and practical implications of the findings that could enhance collective action in CBFM.

Community in history

Traditional writers view community as consisting of “persons in social interaction within a geographic area and having one or more additional common ties” (Hillery 1955). Such “common ties” include history, interest, norms and a sense of identity. This creates a vision of community that is unified and organic, which fits quite well with the characteristics of some indigenous or ancient communities (Borlagdan, Guiang, and Pulhin 2001). The three important elements highlighted in the definition, i.e., area, common ties and social interaction, also correspond to the three ways in which literature sees community: as a small spatial unit, as a homogenous social structure and as a set of shared norms. These three ideas form the basis of most of the advocacy for community (Hillery 1955, Agrawal and Gibson 1999).

However, the great transformations that happened in the late 19th and early 20th centuries (industrialization, urbanization, and modernization) has led to a fundamental change in human interaction. Tönnies described this phenomenon as a change from

Gemeinschaft to *Gesellschaft*, or from community to society. The *Gemeinschaft* society where “people interact with a relatively small number of people, whom they know well, in many different roles” became a *Gesellschaft* society where “one has interaction with many more people, but these interactions are limited to specific instrumental activities” (Agrawal and Gibson 1999, Ife 1999). This shift blurred the stereotyped idea of ‘community’ as homogeneous in the same way as human settlements became larger, diverse and heterogeneous (Uphoff 1998). It also dissolved the ties that anchored humans to their environment, in which they were said to have a harmonious relationship (Agrawal and Gibson 1999, Ife 1999).

With the rapid growth in population and the penetration of market forces, the community began to be viewed in an antagonistic way. Not only were their activities equated with exploitation but they themselves were also regarded as obstacles to efficient and “rational” forest use (Agrawal and Gibson 1999). Such verdict was anchored on the belief by many social scientists that the goals of conservation and the interests of local communities were in opposition. Hardin’s schematic representation even suggested that since conservation required protection of threatened resources and communities rely on these resources for their livelihood, people will tend to exploit resources without restraint (Agrawal and Gibson 1999).

The negative notion given to communities paved the way for policies and programs that regarded the local residents as hindrances to effective resource management and conservation (Uphoff 1998). As a result, the state took on its shoulders the tasks of managing and conserving the natural resources. This top-down approach, however, proved ineffective due to the limited capacity of the state to coerce their citizens into unpopular development and conservation programs. Faulty design, inefficient implementation, and corrupt organizations were also associated with the poor outcomes. This failure brought back the community at the forefront of the conservation scene. Empirical and historical works, as well as theoretic foundation on the role of community, have helped “resurrect community and local participation in conservation” (Uphoff 1998, Agrawal and Gibson 1999). Since then, sustained efforts were made to incorporate community involvement in resource management.

Meanwhile, the waves of societal evolution have given the concept of community a new look and meaning. Communities became characteristically diffuse, heterogeneous, diverse, and with multiple locations and social identities (Mehta et al. 1999). Despite these changes in characteristics of most communities, however, the designs of community-based programs and policies are still catered to the unusually isolated, forest-dependent, resource-conserving, “traditional” indigenous communities (Agrawal and Gibson 1999, Li 2002). This fallacy

of community-based approach to project implementation led to the conception of the idea of the 'mythic community'. This mythic community fails to attend to the differences within communities such as in terms of class, ethnic and gender inequities. It also ignores the realities of migration, mobility, marketization and globalization that promote multiple layers of interaction and diverse social identities. Such romantic myth of homogeneous community resulted to poor designs and ineffective implementation of community-based projects, hence, to failure (Cernea 1992, Agrawal and Gibson 1999, Li 2002, Cabanilla and Lamug 2002).

The poor outcomes of community-based conservation programs called for a reorientation and redefinition of social actors in community-based projects. Some authors argue that it is more important to determine the social organizations that can act as sustaining and enduring social structures for long-term conservation activities. "Such units of social organization, or social actors, can be (1) natural (existing) social units, such as the individual family household or a tightly knit kinship group or subgroup; (2) groups organized purposively to plant, protect, and cultivate trees; or (3) groups (or organizations) that were established for purposes other than forestry but are able to undertake forestry-related activities as well" (Cernea 1992).

In the case of CBFM, it is likely that the abovementioned social actors are by themselves highly heterogeneous, as the following

sections will indicate. This highlights the need to identify the ties that bind these groups together and capitalize on these ties to promote collective action.

"Communities" in community-based forest management

In the Philippines, existing CBFM schemes may be classified based on how they were originally organized. A recent research project initiated by the Ford Foundation, Incorporated, "Community-Based Natural Resource Management in the Philippines: A Preliminary Assessment", came up with three categories of CBFM in the country on the basis of this criterion (Borlagdan, Guiang, and Pulhin 2001). These are: self-initiated sites, locally assisted sites, and national programs. The study covered 29 CBFM sites: five (5) are classified as self initiated, ten (10) locally-supported, and fourteen (14) under national programs and projects. Other related studies are also cited to provide empirical support.

Communities in self-initiated CBFM

"Communities" in self-initiated CBFM belong to four indigenous cultural communities (ICCs) such as the Ifugaos in Banaue; the Bontocs in Bontoc and Sagada; Ikalahans in Nueva Vizcaya and the Higaonons in Misamis Oriental. Research interest on these communities stems from their notable indigenous forest management systems, which they managed to sustain until the present time. These are: (1) the *muyong* system of Ifugao; (2) the *tayan* of the Bontoc; (3) the *saguday* of the Sagada; (4) the

indigenous management practices of the Ikalahan; and (5) the *gaop* system of the Higaonon (Borlagdan, Guiang, and Pulhin 2001).

Recent literature continue to view indigenous communities (IPs) or ICCs to retain their organic characteristics, that is, a group of homogenous people, living in a common territory and sharing common interests and norms. This is reflected in Covo's (1986) report to the United Nations which describe ICCs as:

...those, which, having a historical continuity with pre-invasion and post-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems (Add 1-4).

However, as the five cases studied demonstrate, communities in self-initiated CBFM are complex and have great variations among and within them. The five cases belong to the three of the five basic types of ethnic social organizations identified by Jocano (2000) in his important study of the patterns, variations, and typologies of Filipino indigenous ethnic communities. Arranged in a continuum

of increasing complexity, these social organizations are characterized as follows (Borlagdan, Guiang, and Pulhin 2001):

1. *Puró* type. This includes the slash-and-burn (*kaingin*) farmers, such as the Ikalahan, who live in scattered semi-permanent settlements or neighborhoods called *puró*. Representing the kindred type of social organization, it is generally composed of related persons occupying a particular settlement and having close interaction with one another. The organizational focus is on the settlement, while group life centers on the family and the neighborhood. Among members of the Kalahan Educational Foundation (KEF), sharing and cooperation constitute the major theme of group life.
2. *Ili* type. Derived from the Bontoc name for "village," this type consists of groups of people living in villages of various sizes, called "hamlets," albeit predominantly large and compact. The hamlets are further subdivided into smaller politico-juridical units which function as the economic, political, and religious centers. This type of organization has been noted among the Ifugao, Bontoc, and Sagada. Elders and influential members of the community who comprise the council of elders assume sociopolitical leadership.
3. *Banwa* type. Represented by the Higaonon, the *banwa* is characterized as the most complex type of indigenous social organization. It is made up of

several villages organized in large communities or domains. Each village is composed of several related or unrelated families, held together by village alliances and a complex set of customary laws. As in the Higaonon of Minalwang, political leadership is vested in the head of the influential family (*datu*), who is assisted by the council of elders.

While clan, in most cases, is the dominant type of social organization responsible in CBFM, hence may be viewed in operational term as the "community", resource management decisions are based on complex social structure such as class and gender differentiation. In all cases, the decision of the elders/clan leaders dominates over that of the ordinary clan/tribal members. Gender differentiation is also distinct, especially in the *muyong* of Ifugao and the *tayan* of Bontoc, in which women are not allowed to participate in collective decision-making on forest-related concerns (Borlagdan, Guiang, and Pulhin 2001).

Increasing population, penetration of cash economy and globalization also continue to alter existing social structure that adds to the complexity and plurality to realities of communities in the self-initiated CBFM sites. For instance, with the booming tourist industry and other opportunities, a growing number of Ifugaos in Banaue have engaged in off-farm employment (permanent or seasonal) to augment their limited cash income from the farm. This has given rise to a new social class that imbibed lowland

culture and less interested in maintaining the *muyong*. Others, however, endeavor to divide their time in farm activities and part-time employment but also straddle in two types of culture – the traditional subsistence economy and the market economy introduced by the lowlanders.

It should be noted at this point that the self-initiated CBFM communities studied are not isolated cases in terms of their heterogeneous characteristics. Recent studies and field observations corroborate that distinction in status and well-being exists even among indigenous peoples. For instance, Cabanilla and Lamug (2002) noted that wide disparity exists among IPs participating in DENR reforestation project in the same region. Accordingly, the low assets of the Ata-Manobos of Talaingod in Davao del Norte were a stark contrast to the local leaders and crop buyers among the B'laan of Mindanao in Davao del Sur. Similarly, field visits to the Higaonon tribe in Claveria, Misamis Oriental indicate the wide economic disparity among its well-off *datus* and deprived members, yet project benefits continue to be captured by the former at the expense of the latter. The heterogeneous nature even of IP communities makes CBFM intervention more complex and hence not appropriate to central planning and control.

Communities in externally-initiated CBFM

Externally-initiated CBFM can be divided into two categories: locally

assisted initiatives such as those involving the local government units (LGUs), nongovernment organizations (NGOs), and the academe; and the national government programs or projects initiated by or in partnership with the Department of Environment and Natural Resources (DENR) (Borlagdan, Guiang and Pulhin 2001). These external actors serve as catalysts for the formation of groups that can be mobilized towards resource conservation and management. As such, they are faced with a big task of identifying (or establishing) a viable group capable of sustaining the process and the flow of benefits established through their programs (Cernea 1992).

“Communities” in externally-initiated CBFM have been largely associated with people’s organizations and small groups, which are organized to achieve specific project objectives. Subcategories within POs include the associations and cooperatives normally established to implement CBFM projects, and the bigger federations, which are made up of these two groups (Borlagdan, Guiang, and Pulhin 2001). On the other hand, the “small groups” category constitutes the farmer groups (e.g. Landcare in Claveria, in Claveria Misamis Oriental and Lantapan, Bukidnon; BEST Project in Malaybalay, Bukidnon; ISF/UDP in Upper Bala, Davao del Sur; and BLUDPP in Buhilalo, Camarines Sur). In some instances, the community is defined as a locality – a human settlement with a fixed and bounded territory such as *sitio* or *barangay* (e.g., Guba,

Bansalan, and Kabulanan, Mt. Kitanglad, and Don Victoriano).

These externally associated communities may belong to different ethnic origins, may actually identify themselves with several social groups, and may be new to the place. In general, they are more diverse than the communities in the self-initiated CBFM sites. Some community members maintain both upland and urban residences that provide them more social interaction and multiple social identities. Communities may also be highly stratified in terms of assets, religion and dialects. Moreover, they can be highly diverse in terms of their forest-related interests as well as the extent of their dependence on the forests. However, they may have limited shared norms in terms of promoting a more sustainable forest management.

The literature is replete with examples of negative outcomes associated with the inability of government and other external groups to take into account the complexity and multiple realities of rural communities in the design and implementation of CBFM projects. Fujisaka (1993) in his case study of a national CBFM project in Laguna analyzed how religious differences among community members had resulted to two warring groups that barred collective action preventing the achievement of project objectives. Similarly, Pulhin (1996) in his study of a Community Forestry project, in Claveria, Misamis Oriental, described how the NGO’s definition of the

community as a locality (i.e., barangay) had resulted to the marginalization of the IPs in favor of the elite sector in the area. Related studies conducted in other countries point to the same result (Cernea 1992).

Despite the noted negative outcomes, there are also indications that right form of economic incentives and benefits can mobilize communities towards collective action. These binding factors include the different forms of livelihood and employment opportunities provided by the projects. Aside from economics, some peripheral factors could also serve as ties that bind these externally-initiated communities. These include tenure system; environmental awareness; acquisition of additional knowledge through participation in training, cross-farm visits and related activities; and technical assistance. While these latter factors could act as 'community binders', experiences in various sites demonstrated that they are not sufficient to sustain the communities interest in collective action that promotes sustainable forestry management (Borlagdan, Guiang and Pulhin 2001).

A perfect example showing the successful combination of the above factors in forming an externally-initiated community was the experience of the Community-Based Coastal Resources Management (CB-CRM) Project in Bolinao, Pangasinan. In this particular case, the local residents were unified by their pursuit to hinder the establishment of a cement plant that would cause further

degradation of their water resources. Heightened environmental awareness, fueled by a vigorous program on public environmental education and the active involvement of LGUs, played a catalytic role in the community mobilization and formation of CRM-oriented people's organization (Talaue-Mcmanus et al. 1998).

Other examples of successful externally-initiated communities include: the Bukidnon Environment Small-Scale Tree Farm (BEST) Project initiated by the local government, the NGO/PO-initiated Kalahan Educational Foundation (KEF) and Mag-uugmad Foundation, Inc. (MFI), and other programs spearheaded and catalyzed by local/external institutions and/or individuals (Pulhin n.d.). However, already noted, not all externally-initiated communities have success stories. Some are divided by fragmented socioeconomic interests and composed of heterogeneous population clusters that inhibit a collective unified action (Cernea 1992).

Attributes of CBFM communities that enhance collective actions

More than large financial investments, CBFM programs require "some form of collective action to coordinate individuals' activities; develop rules for resource use; to monitor compliance with rules and sanctions violators; and to mobilize the necessary cash, labor or material resources" (Cernea 1992, Meinzen-Dick and Knox 2001). The following selection provides a closer look at some of the attributes that enhance

coordinated action and discusses how each has contributed in fostering collective action in some CBFM communities.

1. *Sociocultural factors* refer to history, genealogy, language, customs and beliefs, and other related factors. The commonalities of these factors have been proven to enable the community members to pursue collective action in resource management and conservation. These were also associated with psychological factors, like common identity and a sense of belongingness and obligation to community members. These characteristics are indigenous to the traditional communities, such as the Ifugaos, Bontocs, Ikalahans and Higaonons, mentioned earlier in the selection. Their social cohesiveness and the harmonious relationship with nature promoted by their culture have helped them in the sustainable management of their ancestral domains (Borlagdan, Guiang, and Pulhin 2001).

Not all communities, however, have a sociocultural composition similar to that of the mentioned indigenous peoples'. Externally-initiated communities, in particular, are composed of members coming from diverse socio-cultural backgrounds. As such, the effect of 'heterogeneity' in collective action has become a theoretical puzzle in community-based forest management. Many argue that differences in sociocultural backgrounds result in differences in interests among the users, and therefore, to conflicts in consensus-building and norm-enforcement.

These factors have been associated to problems of distrust and lack of mutual understanding (Varughese and Ostrom 2001, Ostrom 1998, Borlagdan, Guiang, and Pulhin 2001).

However, a study of Varughese and Ostrom (2001) in 18 forest user groups in Nepal revealed that heterogeneities "do not have a determinant impact on the likelihood or success of collective action" in a group. Although the research does not discount the possible negative effect of heterogeneity in coordinated action, it suggested that "heterogeneity is not a variable with a uniform effect." Another study by Theodori and Luloff (2001), on the other hand, revealed that community heterogeneity resulting from the process of urbanization did not lower the community attachment in urbanized areas. On the contrary, rural communities were found to exhibit statistically significant lower levels of community attachment than those of the most urban site. These suggested that while homogeneity has been usually equated with collective action and sense of belongingness, heterogeneity does not necessarily result to the opposite effects.

2. *Economic opportunities and benefits* are the major factors that bind people together, especially in locally assisted and national program sites. It is the presence of clear and secure profit opportunities, which may be in form of livelihood programs or employment activities, that drive the local residents towards responsible management of forest resources, both in terms of development and exploitation (Ascher

1995). Hence, collective action among community members is, most of the time, enhanced by economic factors.

However, evidences showed that collective action effected by economic factors is not only enhanced when there is high availability of resources or profit opportunities. For instance, in some areas of Nepal, resource scarcity also drives the forest users to act collectively. However, this depends on effective leadership, consensus on action to be taken, ability to enforce restriction, and confirmation from government that local organizational units are empowered to take such action (Hobley and Shah 1996).

On the other hand, economic self-interest among the members makes it crucial for the user groups to act collectively (Ascher 1995). While there are some studies suggesting that slightly unequal patterns of wealth distribution do not prevent “uniform interests” among the members, heterogeneity that is “tantamount to heterogeneity in economic interest” (Vedeld 1997 in Varughese and Ostrom 2001) can lead to conflict rather than collective action (Varughese and Ostrom 2001).

3. *Geographic factors* pertain to shared locality or territory, such as ancestral land, and attachment to “special places”, e.g., sacred groves or sacred mountains. It could also serve as a tie that binds community members and enforces collective action (Borlagdan, Guiang, and Pulhin 2001). Yet, this still depends on some geographic consideration like scale and boundary issues (McCay 1998).

In considering the effect of geographical scale in collective action, “small is (sometimes) beautiful:” small enough for easy monitoring by communities, but large enough to enable comprehensive management of resources. Geographic boundary, on the other hand, can be important for instilling a sense of ‘ownership’ and responsibility in people, enhancing local stewardship (McCay 1998).

In the case of the Ikalahans, securing the boundary of their ancestral land has been the main driving force for collective action that resulted to the issuance of the first forest lease agreement in the country and consequently, the sustainable management of the area.

Similarly, in Nepal, forest boundaries serve an important function to the users as these borders determine the users who will manage and use the forest resources. These boundaries must also be clearly demarcated and agreed by the users to avoid any conflict (Hobley and Shah 1996).

4. *Institutions* can be seen as sets of formal and informal rules that shape interactions of human with others and nature. In general, they are understood as both enabling (in terms of providing people with ways through which they can negotiate their way through the world) and constraining (in providing the rules for action). On the other hand, most mainstream institutional theories tend to view institutions as rules, regulations or conventions imposing constraints on human behavior to facilitate collective action (Agrawal and Gibson 1999, Mehta

et al. 1999). Several studies on community-based resource management suggested the evolution of institutions from mere rules to embodiments of social practice which are molded by social and power relations. In many respects, they have become synonymous with people's everyday life practices and ways of viewing the world (Mehta et al. 1999).

As demonstrated by the self-initiated CBFM, various forms of indigenous institutional arrangements facilitate collective action that promotes sustainable forest management. In the saguday, for instance, the council of elders appoints a *membantay* (administrator or caretaker) to ensure the enforcement of customary practices in relation to the cutting of trees as well as the maintenance and protection of the area (Cruz 2001). In the muyong, this same set of responsibilities is assigned to eldest child to ensure that the family or clan forest is managed according to locally defined and legitimized rules and regulations (Borlagdan, Guiang, and Pulhin 2001). Among the Ikalahans, the *tontongan* provides the mechanism for resolving forest-related conflicts such as illegal logging, forest fires, land grabbing and encroachment. They find this arrangement to be more efficient, democratic, and reliable, compared to the time-consuming and financially draining legal courts (Dolinen 1997).

Institutional arrangements are very helpful in promoting cooperation when social relations do not provide a common ground for such a condition

(Vira 1993). However, it is important that the different groups who will be affected by such institutions will have representatives in the formulation process. Members of these groups should also have opportunities to exercise a right to remove their representatives if the performance of the representatives is unsatisfactory as deemed by those affected by rules (Ribot 1996 in Agrawal and Gibson 1999).

Aside from the abovementioned attributes, there remain other factors that also foster collective action in community-based resource management. One of these is the issue on property rights, which is defined as "the capacity to call upon the collective to stand behind one's claim to a benefit stream" (Bromley 1991 in Meinzen-Dick and Knox 2001). It is important to address this issue because these rights: (1) offer incentives for management; (2) give necessary authorization and control over the resource; (3) reinforce collective action; and (4) demonstrates government commitment to devolution (Meinzen-Dick and Knox 2001). Moreover, property rights give the local users an assurance that they will be able to continue to use the forest in the future, hence, the people become more motivated to care for forests (Ascher 1995).

Threats to natural resource sustainability, environmental or problem awareness and encouraged participation of the local residents could also mobilize people towards a coordinated action (Uphoff 1998, Vira 1993, Talaue-McManus 1998).

CONCLUSION: FROM MYTHIC COMMUNITY TO COLLECTIVE ACTION

The continuous onslaught of tropical forests, coupled with mounting upland poverty and glaring inequity in resource access and distribution, had forced scholars, policymakers and practitioners to rethink the role of community in forest management. As a result, the community-based forest management was born. Departing from the traditional notion that regard communities as the main agent of forest destruction, the new paradigm highlights the potential of communities to engage in collective action that will advance a more sustainable and equitable forest resource management (Borlagdan, Guiang, and Pulhin 2001).

Until recently, the notion of a “mythic community” – a group of people living in small spatial unit with homogeneous social structure and bound by common interest and norms – has remained a universal icon in CBFM. This paper supports emerging literature on common property resources, which argues that in the face of a rapidly changing world, such an ideal community hardly exists even among indigenous cultural communities. Instead, CBFM communities on the ground, both in self-initiated and externally-supported initiatives, are increasingly becoming heterogeneous, diverse, and with multiple social identities, and hence are more complex than what most of scholars, policy makers and planners have originally conceived. Such misconception of the grounded

communities has barred collective action and contributed to the failure of some CBFM initiatives.

The present study points to a number of theoretical and practical implications. At the conceptual level, categorization of communities in CBFM into self-initiated, locally assisted, and national programs provides an alternative and hopefully a more useful framework to better analyze and understand the complex social relations in different CBFM sites. It departs from tendency of the State and most development practitioners to lump CBFM communities together assuming homogeneity rather than heterogeneity amongst community members and to downplay power struggles and heterogeneous outcomes within communities. This statist view of community perpetuates the elite’s control over and benefits from the forest resources and further marginalizes the upland poor.

Considering the different context by which the CBFM communities in this paper are categorized, the present typology may not be comparable to the more popular ones such as Tönnies’ notion of *Gemeinschaft* to *Gessellschaft*. However, it’s usefulness goes beyond forestry and may also apply in similar context such as the irrigation and coastal resources sectors. It should be pointed out though that typologies of communities are mere conceptual tools to better understand social realities. Consistent with the idea of “grounded community” the main message of this paper is not much in terms of which typology should be adopted but rather

ensuring that whatever category may be chosen, it should appropriately reflect the multiple and complex social realities on the ground.

On a more practical aspect, the notion of a mythic community as basis for collective action in CBFM should be abandoned. Instead, CBFM planners and practitioners should start with the communities on the ground. They should have an in-depth understanding and appreciation of the complex socioeconomic and political realities of each community and be able to identify and capitalize on the ties that bind community members as basis for identifying strategies for collective action. The implications of this on the policy and practice of CBFM are as follows:

1. Improving the policy process

CBFM policies should be anchored on ground realities. Thus, current policy process should be improved to include appropriate feedback mechanism from the field that would allow a more dynamic and responsive policy formulation process. Likewise, policies should be flexible to allow site-specific intervention that address identified needs of specific groups in the community.

As a valuable input to policy formulation, a community forum that would promote exchange of experiences and learnings from different CBFM sites should be instituted at the regional and national level. Such a forum should have some degree of independence from the DENR and should be organized by the

civil society but with legitimacy both from the government and the CBFM communities, themselves.

2. Strengthening the planning, monitoring and evaluation of CBFM projects

Considering the complexity and multiple realities of CBFM communities, the present standardized approach to planning would not work. Project design should be community-specific and specially designed to address the realities of grounded communities. In all cases, an in-depth participatory community analysis is required that goes beyond the current standardized practice of "community profiling". Such an analysis should go deeper into the social and political context of CBFM communities, the prevailing local power structure, the characteristics and interests of different groups/stakeholders, and the identification of the ties that bind community members.

Considering the complex power relations within communities, appropriate monitoring and evaluation mechanism should likewise be installed to ensure that those who benefit are really the intended beneficiaries of the project.

3. Focusing on community-building

In most, if not all, externally-initiated CBFM sites, POs are the de facto "community" managers. Consequently, most of them are faced with daunting community organizing challenges, especially those in large CBFM areas spanning several

barangays or municipalities, which are often characterized by high degree of sociocultural heterogeneity, diverse political and economic interests and varied resource management practices. Oftentimes, they lack the necessary organizational skills to steer different interests and voices toward a common goal. This points to the need for prior community building as contrasted with community mobilization. Thus, community organizers should focus to forging cohesive community in the same way as they need to focus on organizational capability building (Borlagdan, Guiang, and Pulhin 2001).

4. Continuing research support

A continuing research is needed to support CBFM implementation and realize its objectives. Participatory action-research and process documentation type of research should be vigorously pursued and should form part of the project design especially for well-funded projects. Such researches should highlight local community dynamics resulting from the socioeconomic and political diversity within communities. They should also explore deeper the ties that bind community members in varying situations and how these promote collective action in CBFM.

REFERENCES

- Agrawal, A. and C. C. Gibson
1999 "Enchantment and Disenchantment: The Role of Community in Natural Resource Conservation." *World Development* 27 (4):629-649.
- Ascher, W.
1995 *Communities and Sustainable Forestry in Developing Countries*. San Francisco, California: International Center for Self-Governance.
- Banzon-Cabanilla, Daylinda and Corazon B. Lamug
2002 "Grounded Versus Ideal-Type Communities in Designing Community-Based Forestation Projects in the Philippines." Paper presented at the National Symposium on Forestation Research and Practices, April 16-17. College of Forestry and Natural Resources, University of the Philippines Los Baños.
- Borlagdan, S. B., E. S. Guiang, and J. M. Pulhin
2001 *Community-Based Forest Management in the Philippines: A Preliminary Assessment*. Institute of Philippine Culture, Ateneo de Manila University.

Cernea, M. M.

- 1992 "A Sociological Framework: Policy, Environment and the Social Actors for Tree Planting." In N.P. Sharma (ed.) *Managing the World's Forests: Looking for Balance between Conservation and Development*. Iowa: Kendall/Hun Publishing Co., pp. 301-335.

Chiong-Javier, Ma. Elena

- 1993 Settlement and Social Forestry in the Philippines (revisited). Paper presented in the Fourth Annual IASCP Conference on "Common Property in Ecosystems Under Stress", Manila, Philippines, June 16-19

Hobley, M. and K. Shah

- 1996 "What Makes a Local Organisation Robust?: Evidence from India and Nepal." *Natural Resources Perspectives* Number 11.

Hillery, G. A., Jr.

- 1955 "Definitions of Community: Areas of Agreement." *Rural Sociology* 20 (2):111-123.

Ife, J.

- 1999 *Community Development: Creating Community Alternatives – Vision Analysis and Practice*. Melbourne: Addison Wesley Longman.

Jocano, F. Landa

- 2000 *Filipino Indigenous Ethnic Communities: Patterns, Variations and Typology. Anthropology of the Filipino People II*. Metro Manila: PUNLAD Research House, Inc.

Li, M. T.

- 2002 "Engaging Simplifications: Community-Based Resource Management, Market Processes and State Agendas in Upland Southeast Asia." *World Development* 30 (2):265-283.

McCay, B. J.

- 1998 "Co-Managing the Commons." Paper presented at the International CBNRM Workshop, Washington, D. C.

Meinzen-Dick, R. and A. Knox

- 2001 "Collective Action, Property Rights and Devolution of Natural Resource Management: A Conceptual Framework." Working Draft.

Mehta, L., M. Leach, P. Newell, I. Scoones, K. Sivaramakrishnan, and S. A. Way

- 1999 *Exploring Understandings of Institutions and Uncertainty: New Directions in Natural Resource Management*. IDS Discussion Paper 372. Brighton: University of Sussex.

Ostrom, E.

- 1998 "Self-Governance and Forest Resources." Paper presented at the International CBNRM Workshop, Washington, D. C.

Pulhin, Juan M.

- n.d. "Community Forestry Country Profile: Philippines." A country profile project report submitted to the International Network of Forests and Communities (INFC), University of Victoria, Victoria, Canada.
- 1996 "Community Forestry: Paradoxes and Perspectives in Development Practice". Ph.D. dissertation, The Australian National University, Canberra, Australia.
- 1997 "Community Forestry in the Philippines: Trends, Issues, and Challenges." In M. Victor, C. Lang, and J. Bornemeier (eds.) *Community Forestry at a Crossroads: Reflections and Future Directions in the Development of Community Forestry*. RECOFTC Report No. 16. Proceedings of an International Seminar, Bangkok, Thailand, 17-19 July 1997, Bangkok, Thailand: RECOFTC, pp. 201-215.

Talaue-McManus, L., A. C. Yambao, S. Salmo III, and P. Alino

- 1998 "Participatory Coastal Development Planning in Bolinao, Northern Philippines: A Potent Tool for Conflict Resolution." Paper presented at the International CBNRM Workshop, Washington, D. C.

Theodori, G. L. and A. E. Luloff

- 2000 "Urbanization and Community Attachment in Rural Areas." *Science and Natural Resources* 13:399-420.

Uphoff, N.

- 1998 "Community-Based Natural Resource Management: Connecting Micro and Macro Processes, and People with their Environment." Paper presented at the International CBNRM Workshop, Washington D.C.

Varughese, G. and E. Ostrom

- 2001 "The Contested Role of Heterogeneity in Collective Action: Some Evidence from Community Forestry in Nepal." *World Development* 29 (5):747-765.

Vira, B.

- 1993 "On Local Cooperation for the Care of Forests." An earlier version of this paper submitted as a dissertation to the Faculty of Economics and Politics, University of Cambridge.

Environmental Consequences of Lahars, Subsidence, and Human Behavior in Bacolor, Pampanga*

Kelvin S. Rodolfo and Kathleen S. Crittenden

Illustrious, centuries-old Bacolor was the town worst hit by lahars (flowing slurries of volcanic debris and water) following the 1991 Mt. Pinatubo eruption and lasting until 1995. Drawing on a 1996 community survey, official and unofficial censuses of town residents, extended field research in the town proper, and ongoing research on regional subsidence, and human responses to them have transformed Bacolor's physical and social environments, and the implications of these changes for the future of the town.

Most of the outlying *barangays* were totally destroyed and abandoned, and the national government decided to sacrifice the town by enclosing it in a debris basin with dikes in order to protect other communities. Several hundred families in the town proper ignored government orders to leave in 1992, 1994 and 1995, and raised their houses several times between lahar attacks that collectively left deposits more than 6 meters thick. In 1995, declaring the town unsafe, the national government denied it clearance for private reconstruction bank loans and public funds to rehabilitate infrastructure. With little outside help, the families that stayed, municipal government, the parish priest and civic institutions rebuilt the water system, an elementary school and two churches. The decision of the local technical college to remain open greatly helped the town to survive.

Ironically, the elevation of the Bacolor surface has reduced its vulnerability to lahars and increased the threat to the unaffected adjacent communities. Furthermore, Bacolor is now immune to flooding that is increasingly inundating neighboring towns. The worsening floods are caused primarily by over-consumption of groundwater for domestic use, agriculture, and aquaculture. Reduction of potential residential areas by flooding and the growing Pampanga population inevitably target Bacolor as a large residential town. However, pride in Bacolor's past, the desire to return it to pre-eruption conditions, a survival mentality, and lack of vision and resources may hinder realization of the town's maximum potential. Bacolor urgently the national government and philanthropic agencies to give financial and technical support for comprehensive, community-wide planning to reconstruct the town as a disaster-resistant community in harmony with its natural environment.

* An earlier version of this report was presented at the Cities on Volcanoes 3 Conference in Hilo, Hawaii, in July 2003.

INTRODUCTION

Mount Pinatubo is a volcano in Pampanga, Tarlac, and Zambales provinces on the Philippine island of Luzon (Fig. 1A). Its 1991 eruption, the world's most powerful in 89 years, left 5 to 7 cubic kilometers of loose debris on the volcano flanks. Huge amounts were remobilized into flowing slurries called lahars during strong monsoonal and typhoon rains in the following five years. Flowing down rivers to the plains, the lahars escaped from channels and buried towns in volcanic debris as thick as nine meters.

Bacolor, a municipality in Pampanga province, has suffered most from the lahars. Here, we describe how several years of recurrent lahars and human responses to them have transformed its physical and social environments, and the implications of these changes for the future of the town. We draw upon a 1996 community survey of women from Bacolor (Lamug et al. 1999a), official and unofficial censuses of town residents, interviews with town leaders, and other information gathered during extended annual stays in the town proper beginning in 1998 (Crittenden 2001, Crittenden and Rodolfo 2002). Another important source of information is the ongoing research of Siringan and Rodolfo (2003, Rodolfo et al. in press) on regional subsidence and worsening floods in the low-lying plains that border northern Manila Bay.

Physical setting

Bacolor is 65 km north-northwest of Manila and 36 km east-southeast

of the Pinatubo summit (Fig. 1A). Volcanic debris and lahar deposits of previous eruptions have left a gently sloping apron east and south of Mt. Pinatubo. Immediately downstream of Bacolor, the apron merges into the swamps at the head of Manila Bay. The volcano is quiescent for centuries between eruptions. The previous eruption occurred sometime between 500 and 800 years ago (Newhall et al. 1996), and so the people around the volcano had little or no knowledge of eruptions.

Bacolor is located along the east bank of the Pasig-Potrero river system, which begins on the Pinatubo flanks 800 meters above sea level, and flows down to the gentle slopes of the volcano apron and into a maze of shallow channels on the low-lying delta complex of the Pampanga and other rivers. Over many centuries, the swampy region has been greatly modified into rice paddies and fishponds, and since pre-Hispanic times has been a major producer of rice and cultured fish. This pre-Hispanic town developed and thrived primarily because its proximity to the river provided domestic and agricultural water, fish, and transport. It also stood slightly higher than the surrounding flats; the name Bacolor derives from *macabaculud*, meaning "high place surrounded by lowlands". The delta experiences severe floods during the rainy season that typically lasts from June through October. Despite Bacolor's small height above the flood-prone neighboring towns, it historically also has been subject to seasonal flooding. In the 1960s, dikes 13 kilometers long were built along the

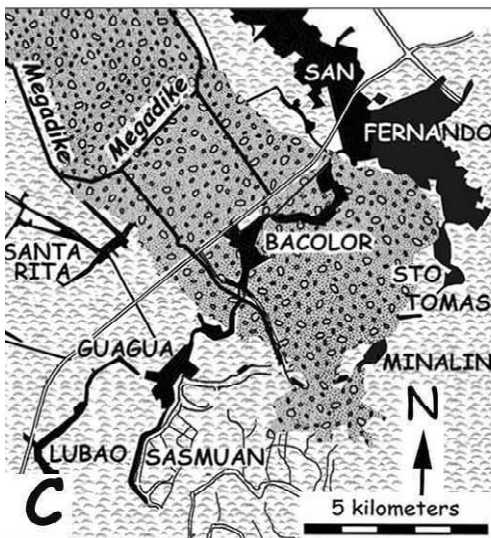
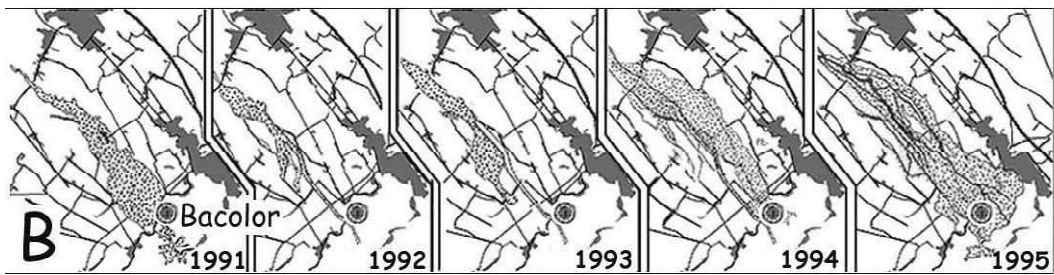
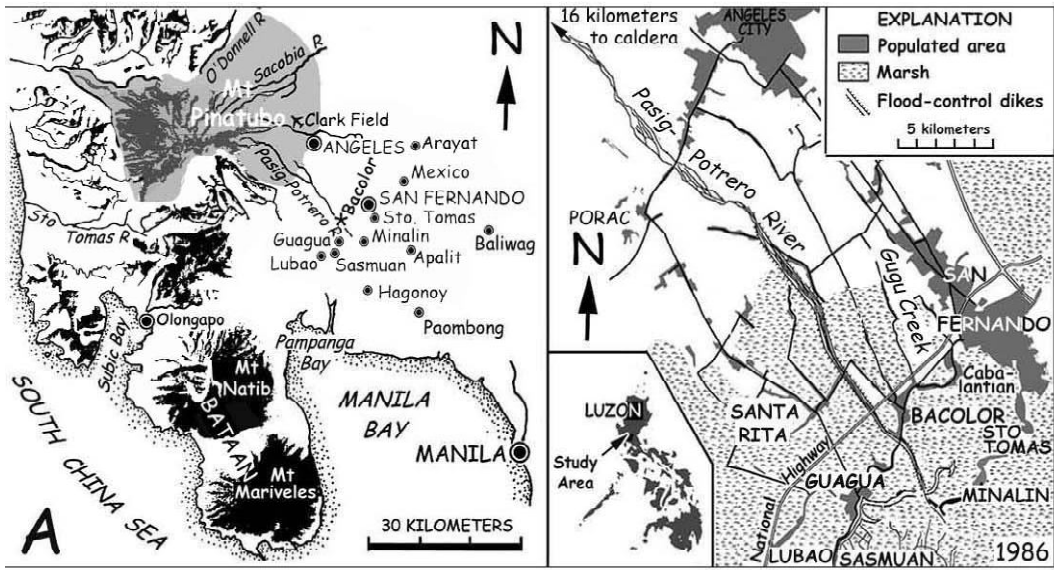


FIGURE 1.

A. Location maps of study area.

B. Lahar deposits (stipples) from 1991 to 1995.

C. Lahars that raised Bacolor have eliminated flooding there, but the adjacent towns of Guagua, Lubao, Sasmuan, Minalin, and large parts of San Fernando increasingly are flood-prone due to subsidence from overuse of groundwater.

The MacArthur Highway is parallel to and one half kilometers southwest of the GSO Highway between Bacolor and San Fernando, and connects Bacolor to Guagua.

Pasig-Potrero River to protect Bacolor and neighboring towns.

Bacolor is bordered to the north by Angeles City; to the east by the provincial capital city of San Fernando; to the south and west, by the municipalities of Minalin and Guagua, respectively (Fig. 1A). Running through the town is the national Gapan-San Fernando-Olongapo (GSO) highway to Subic Bay that serves as a vital link between Manila and points west, including western Pampanga and the provinces of Bataan and Zambales.

Pre-eruption history

Pampanga was the first province inaugurated by the Spanish in Luzon. Its name derives from *pangpang*, "river bank" in the language of its inhabitants, the *Capampangan*, "people of the river banks". Its first settlers are believed to have migrated by boat from the Malay Peninsula or Sumatra. The pre-eruption history of Bacolor is chronicled by Blair and Robertson (1904), Buenviaje (1968), Centro Catolico Officers (1980-81), Galende (1996), Henson (1955), Larkin (1993), and Tantingco (2003).

When Spanish conquistadors arrived in 1571, Bacolor was already a thriving settlement of Muslims engaged in rice farming and commerce. They were defeated by the Spaniards and Christianized by Augustinian missionaries, who corrupted the original name of the settlement to Vacolot or Bacolot, and eventually to Bacolor. In 1576 the Augustinian council designated Bacolor as San Guillermo convent,

named after the town patron San Guillermo Ermitaño. Juan de Medina, a seventeenth-century Augustinian, characterized Bacolor as:

... the best village not only of Pampanga but of all the islands.... It has the best meadow-land in the islands, and it also produces rice abundantly. It has a celebrated church with its crucifix which is entirely built of stone and brick. The inhabitants are the richest and best-clothed of all Pampanga... (Blair and Robertson 1904:245).

In 1746, Bacolor became the provincial capital, which it remained for 160 years. From 1762 to 1764, when English invaders drove the Spaniards out of Manila, it served as the temporary capital of the Philippines. In 1765, the Spanish king designated the town as "Villa de Bacolor", one of only three Philippine communities so honored.

By the end of the nineteenth century, Bacolor was a center of *ilustrados* — families whose land wealth, education, and broad social contacts made them preeminent beyond a single region (Larkin 1993). It was often called the "Athens of Pampanga". "At that time, more than any other town, it produced men of letters, congressmen, governors, composers and musicians (Henson 1955: 103)".

In addition to its elaborate, ancient church, Bacolor boasted the oldest vocational school in the country and many elegant nineteenth-century homes. At the beginning of the American colonial period in 1901,

Bacolor became the first capital of Pampanga province, and a townsman was appointed its first governor. In 1904, however, the capital was transferred to the larger town of San Fernando.

At the time of the eruption, Bacolor was a town of 67,000 people. It comprised 21 *barangays* (villages), four of which constituted the town proper (National Statistics Office 1990). Its residents were very attached to the town. A majority of respondents in the 1996 survey had been born in Bacolor and their families had resided in the same *barangay* for 21 years or more (Lamug et al. 1999a, 1999b).

Lahar of the eruption and its aftermath

Bacolor received only a dusting of ash during the climactic 1991 eruption because winds during the climactic explosions of 15 June were easterly, blanketing downwind areas to the west in decimeters of airfall debris. Shortly before the height of the eruption, a passing typhoon generated lahars that flowed down all major Pinatubo drainages, but those along the Pasig-Potrero River were small and were largely contained by the flood-control dikes. Over the ensuing five rainy seasons, however, Bacolor was to become the town most severely damaged by lahars.

Pinatubo lahars, often called “mudflows”, actually are flowing slurries of sand and coarser materials (Rodolfo 1995; 2000). The larger, most sediment-laden lahars can have

water contents as low as 10 percent — barely enough to mobilize the debris into “debris flows” called *lahar na malapot* in Pilipino. These most powerful and dangerous lahars can flow as fast as 35 kilometers per hour. Lahars containing less than 70 percent of solid material are called *lahar na malabnaw*. These more dilute lahars can bulk up into debris flows by eroding and incorporating additional material along their paths.

When a lahar overflows its channel banks, it is rarely more than several meters thick, and so any low hill or tall building can provide safe refuge. As it spreads, frictional resistance increases at its base, slowing it down; thus, it usually is not powerful enough to topple even fragile structures such as thatched huts, and merely flows around and into them.

In 1991, immediately following the eruption, Pasig-Potrero lahars damaged many of Bacolor’s outlying *barangays* (Fig. 1B). On 7 September, a lahar buried much of the town in debris 1 to 3 meters thick (Arboleda and Martinez 1996). In the town proper, flows less than a meter thick buried the outer walls of San Guillermo Church but did not flow into it. By the end of the rainy season, lahar deposits had buried 38 square kilometers of land along the Pasig-Potrero River, including the national highway at Bacolor, to an average depth of 1.3 meters.

In 1992 and 1993, upstream *barangays* received more lahars, but the town proper was spared. In 1994, however, lahars crossed the national

highway and buried large areas of central Bacolor in deposits several meters thick (Arboleda et al. 1995). Finally, several flows in 1995 again buried nearly the entire town. Worst hit was barangay Cabalantian, south of the highway and between the town proper and San Fernando, which a single six-hour event buried in deposits up to 9 meters thick. By the end of 1995, total deposition in the town proper averaged 6.5 meters (Crittenden 2001, Lamug et al. 1999a). Deposits were thickest in the upstream barangays north of the highway and, of course, in Cabalantian.

Human responses to the lahars

Although the precise timing of the previous eruption remains uncertain (Newhall et al. 1996), the modern residents of Bacolor clearly had neither written history nor an oral tradition of Pinatubo eruptions and lahars. The Philippines has many, much more active volcanoes, but even the national government had no familiarity with eruptions and lahars of such magnitude.

National government

The Philippines is an impoverished developing country with a large and rapidly growing population and more than its share of natural hazards, including typhoons, floods, earthquakes, landslides, and active volcanoes. The multi-year Pinatubo disaster overwhelmed the government's capacity to respond; furthermore, disaster policy decisions were made less on scientific

grounds, more on the basis of political considerations, available resources, and greed (Rodolfo 1995).

The National Police was supposed to monitor upstream channels and reports of PAGASA, the national weather bureau, and issue lahar warnings so that people in harm's way might seek high ground or go to temporary evacuation centers. At times, the warning system did not prevent significant loss of life, most notably during the Cabalantian tragedy in October 1995.

In 1992, the initial engineering countermeasures of the government's Department of Public Works and Highways (DPWH) primarily took the form of "sabo" (Japanese for "debris-retention dams") built across upstream lahar channels and dikes along their downstream stretches in 1992. These were quickly overwhelmed and obliterated by lahars. Additionally, from 1992 to 1996 DPWH elevated the national highway about 10 meters in a sometimes futile attempt to protect it from lahar damage. Initially, raising the highway also helped to protect central Bacolor.

In 1992 the national government decided to sacrifice Bacolor by enclosing it in a debris basin with dikes, in order to protect the yet-unaffected adjacent communities. DPWH instituted an annual program to build dikes out of low-density, porous lahar sand and gravel deposits. These structures, either lacking concrete armour or only thinly encased, were inadequate to contain lahars or even normal floodwaters and were breached every lahar season and

even enlarged the lahars that absorbed them. They also enhanced the danger by promoting a false sense of security. In 1995, Cabalantian residents were unprepared for lahars because they believed they were protected by the eastern portion of a dike complex along Gugu Creek, even though its western components had already been breached several times before the catastrophe.

It has been recognized for centuries that engineering measures to save one town from volcanic disaster often increase the risk to others. San Fernando, the provincial capital and a more populous commercial center, lobbied successfully for dikes, joined in this effort by Angeles City, Guagua, and Lubao. The ostensible intent was to restrict the lahar deposition to Bacolor land, but in fact the dikes were built atop deposits of the previous seasons (Rodolfo 1996, Rodolfo et al. 1996).

The dikes were inadequate to stand up to lahars or even floods. Each year when they failed, they were replaced with larger and more expensive, but still inadequate, structures, in no small part due to the notorious corruption of DPWH. The FVR Megadike, constructed in 1996 after the Cabalantian tragedy at a cost of P1.4 billion, has the undeserved reputation for effectively containing the lahars, thereby limiting the damage to Bacolor. Two weeks after it was dedicated, accumulated flood waters from two small typhoons were enough to breach its "transverse dike" component – actually a dam – simply by seeping underneath the structure

and undermining it. In fact, the only lahar event of any significance after the Megadike was built occurred in 1997; its flows were too dilute to wreak much damage. With or without the series of dikes built since 2002, the lahars would have been limited to Bacolor and small adjacent areas of Sta. Rita, Guagua, and San Fernando. Meanwhile, the unaffected areas surrounding Bacolor were becoming increasingly more flood-prone (Siringan and Rodolfo 2003).

In 1992 and again during the 1994 and 1995 lahar seasons, the national government ordered Bacolor's inhabitants to evacuate and resettle elsewhere. However, no government agency ever took responsibility for funding or enforcing the evacuation orders. By 1994 there already was a huge backlog of families awaiting resettlement, and the increasing cost of the dikes led each year to diversion of funds allocated for resettlement.

Communities were supposed to be resettled away from the lahar areas by a three-step process. First, victims or threatened residents were moved to schools and other evacuation centers that were supposed to be temporary; in practice, the evacuees stayed in them as long as six months. The second step was for residents to move to staging centers for a rehabilitation period, where they lived in bunkhouses of 10 or 12 small, single-family rooms. This step lasted from 18 months to two years. Finally, residents were supposed to move into "permanent" resettlement communities offering small houses and modest livelihood, such as making cement building

blocks. These resettlement villages improved the pre-eruption standard of living for the most economically marginal town residents. However, only families who could document ownership of their lots and their destroyed homes were eligible for the housing. For many eligible Bacolor homeowners, government resettlement represented reduced circumstances: overcrowding and limited access to education, commerce, services, and viable livelihood.

Pinatubo resettlement policy applied one lesson documented in the disaster research literature (e.g., Erickson 1976): As much as possible, whole neighborhoods of evacuees were resettled together so as not to needlessly exacerbate the social dislocation caused by the natural disaster. Resettlement communities were organized to cluster residents according to preexisting barangay structures, in order to maintain social bonds among neighbors. In many cases, relatives lived along the same street or in the same block. There were "Little Bacolor" communities in staging centers and resettlement communities across Pampanga.

After the catastrophic 1995 lahar season, the national government declared Bacolor an unsafe place; no government funds could be used for reconstruction of schools or other public facilities. The Philippine Institute of Volcanology and Seismology (PHIVOLCS) denied clearance for construction bank loans, and the national water-utilities administration abandoned the local water district. To make matters worse, the interim census of 1995 (National Statistics

Office 1995) was conducted in July, while 11 lahars flowing through the town hindered access and many citizens were in temporary evacuation centers. The severe undercount was to have drastic revenue consequences for the town at the time of its greatest need.

Given the diaspora and the fierce attachment of its members to Bacolor, in 1998 the Philippine Commission on Elections waived the legal residence requirements for voting and holding office in Bacolor. The scattered former residents returned in force to vote for mayor, vice-mayor, and eight municipal councilmen. Of those elected, only the mayor actually resided in Bacolor at that time. This electoral policy further encouraged the loyalty of the scattered populace to the town. At the same time, it multiplied the demands on the impoverished municipal government for services, and deprived the legitimate town residents of political representation.

Families and local government

In order to save the town, the municipal government, families who were determined to stay, the parish priest, and a few local institutions toiled energetically to restore essential services. They rebuilt one elementary school and two churches, all without help from the national government, although the school reconstruction was aided greatly by imposing an informal tax on lahar sand and gravel being quarried from the town in increasing amounts for construction in the region and Metro Manila. After

lahars destroyed the water system in 1995 and the national government refused to help, the local members of the Water District voluntarily reconstructed the system with the help of the mayor. The electric cooperative that serves Bacolor quickly restored power in inhabited parts of the town, and service has been interrupted only briefly by typhoons, lahars, and scheduled "brown-outs".

The Don Honorio Ventura College of Arts and Trades (DHVCAT), founded in 1861 by local philanthropists, runs the public high school for the town proper and also offers vocational and college curricula at very low tuition to students from all over the province. It was badly damaged by lahars in 1994 and 1995, when classes were suspended indefinitely. Many students transferred to other schools. The college president, faculty and staff decided not to give up on the college and the town. Classes resumed in December with little instructional equipment. Physical conditions were deplorable for years. Classes occasionally had to be suspended during the rainy seasons, when floods isolated the school. The low-lying campus was inundated for much of the year, necessitating footbridges between buildings. Beyond its academic services, DHVCAT brought many more people into the town daily than lived there. It was the primary employer in the town proper and indirectly provided additional livelihood through small cafeterias, transportation, and rented housing for students.

Bacolor could not have survived without DHVCAT.

By 1995, the half-buried, 350-year-old Spanish baroque San Guillermo parish church had become a famous visual symbol of the devastation wrought by Pinatubo lahars. Restoring the church was a high priority, not only to serve religious needs, but also to symbolize the continuing life of the town. The choir-loft window above the buried main doorway became the new entry. With lahar deposits exposing only the top few centimeters of the arched side windows, and huge chandeliers nearly reaching the ground, the church interior resembled a dark cave. In November of that year the parish expanded the annual religious festival of the *poblacion* to include the entire scattered populace of Bacolor. In 1997, with contributions from scattered townspeople and tourists, the parish began to remodel and restore the church. The massive masonry structure was much too heavy to lift, so the ceiling was removed to increase the height of the interior. The roof was fitted with large dormer windows to admit light, and lined with silvery, reflective insulation to block solar heat. In 1998, a room adjacent to the sanctuary was converted into a museum that attracted donations from increasing numbers of tourists. Restoration and remodeling continue as resources become available.

The smaller archdiocesan shrine had been buried under 5 meters of lahar deposits by 1995. A massive concrete structure, completely shortly

before the eruption, had to remain buried, but the older chapel was rehabilitated in two stages. First, a new main entrance was added above the original, and the interior redecorated, so that masses could resume early in 1996, contributing a sense of normalcy to the town. Then in 1997 the roof and cupola were lifted by 5 meters to accommodate a remodeled sanctuary constructed about 2 meters above the surrounding land.

In all barangays but two outlying ones, virtually all of the houses were destroyed by the end of 1995. No families remained in most barangays, but no single event had destroyed every house in the town proper. Many families were determined to stay and others, discouraged by resettlement conditions, had returned. The interim government census in 1995 listed only 229 people in the town proper. Unofficial but more accurate censuses counted 1488 sturdy souls in 1996 and 1755 in 1997 (Lacsamana 1996, Lacsamana and Crittenden 1997, as cited in Crittenden 2001), struggling to maintain their freehold and rebuild their town. The 1997 count in the town proper was only 11 percent of the pre-eruption population (National Statistics Office 1990).

Stilted houses are a traditional and very functional form of domicile in the Philippines. To recover and protect their homes from the repeated lahars, Bacolor families reverted to this form, developing their own unique building methods (Crittenden and Rodolfo 2002, Crittenden 2001). For several years, the practice was limited to small

houses of lightweight materials such as new or recycled wood or woven bamboo (*sawali*). To raise the salvageable part of a buried house, family members dug with shovels to a level just below the floor of the highest story, which they sawed off so they could lift it up from the portion that would remain buried. In late 1995, we observed a family raising their house with a single automobile jack, raising each corner in turn a few centimeters at a time until the house was high enough to install on concrete stilts. Once stilted, a house could always be raised again if necessary.

Almost half of the 353 families living in the town proper in 1997 had raised their house on stilts, and about 8 per cent had added rooms or new stories on top of stone or concrete houses too heavy to lift. Some families had raised or completely rebuilt their houses as many as four times during the period.

House-raising was not limited to families who stayed in the town. According to survey respondents from the town proper in 1996, many of the 'resettled' families also had valiantly resisted by raising their Bacolor homes, only to be defeated by the continuing dangers and exhaustion of their resources. Other families had moved more willingly, but elevated their houses for their eventual return or to protect their investment. A majority of those residing in permanent resettlement communities and half of those in temporary staging centers had raised their houses in Bacolor one or more times. Only among families who had resettled on their own to other

towns was it unusual (only 7 percent) to have raised their Bacolor houses.

In early 1996, six large hydraulic jacks donated by Capampangans living in the United States allowed the town to exhume and raise larger houses with a *Taas Bahay* program. For structurally-suitable houses, the municipal government designated a local contractor and contributed cement, forms for molding stilts and concrete beams, and the use of the jacks. Homeowners paid only the labor costs. Sixty houses were lifted in 1996 and 1997, drastically altering the landscape that was visible from the national highway. Additional families borrowed the jacks and forms, and over 250 houses eventually were raised in this manner.

Standing on concrete stilts at least 4 meters tall, a typical house in 1996 was constructed primarily of wood, with the bottoms of the walls cut irregularly and stained where they had been buried. The raised part of the house, entered by a wooden ladder or staircase, normally had running water and a functioning bathroom with a commode connected by a long plastic pipe to a buried septic tank. The lower level was left unfinished and open.

In 1997 and 1998, many large families made their stilted houses more comfortable. Some families enclosed the lower level with concrete blocks made of the omnipresent lahar sand; others raised the floor a meter or more with truckloads of lahar deposits, so as to provide a dry, sheltered area.

Beginning in 1999, returning families were building new, unstilted

homes. Typically these were multistory, concrete-block houses constructed atop the original buried ones, with a foundation raised 2 to 3 meters, on a lot already raised with lahar deposits at least a meter. New home construction has been accelerating, but almost always with a substantial foundation and a lot raised 1 to 2 meters higher than the lahar deposits.

Living in Bacolor was difficult. Lahars choked all existing drainages and were deposited unevenly, leaving an irregular surface with no integrated drainage. After each lahar episode, water channels began to be reestablished, only to be destroyed by the next onslaught. The GSO highway posed a special problem; it ponded water from the north and sent it through one or two culverts into the town proper, where it spread out and drained sluggishly through any lows in the terrain. Given the absence of an organized drainage system, the unpaved streets in the town proper were flooded and eroded whenever it rained, becoming difficult or impossible to traverse. No funds were available to repave the streets or build sewers. Ironically, the only organized drainage was created inadvertently, when the municipal government tried to smooth the streets by scraping them down. The next heavy downpour made the old MacArthur Highway, a major thoroughfare through the town proper, into a new tributary of the Pasig-Potrero River. This situation persisted for several years, eliminating vehicular traffic and requiring improvised foot bridges for crossing the "street". Stagnant water also posed serious

health hazards, including dengue and other insect-borne diseases and aquatic parasites. Athlete's foot was pandemic.

THE TURNING POINT

Late in 1998, DPWH proposed yet another hazard-containment structure to sacrifice Bacolor, this time a system of tail dikes enclosing the south end of the town to protect downstream communities from flooding and lahars. DPWH announced a public "focus group and community consultation meeting", one day before it was held on a weekday in virtually unpopulated Cabalantian. Word spread very quickly among the concerned citizenry. Consultants from the University of the Philippines at Los Baños charged with conducting an environmental impact assessment were faced with about 60 irate Bacoloreños and had to plead for "civility" during their presentation. The meeting was nevertheless very productive. The townspeople convinced the consultants that the goals of the project would be achieved equally well by raising the MacArthur highway in Bacolor, a project desperately needed to reestablish traffic through the town proper. Even if the raised highway trapped sediment on its north side, affected landowners would have accepted it because, given the local architecture that had evolved, they had no objection to having their land raised even more above the floods. DPWH agreed to this counter-proposal, but had to justify it officially not in terms of its benefits for the condemned town, but instead as an

"evacuation route" through it, should the main highway be damaged or blocked. Thus, despite the prohibition against public monies for Bacolor, national funding was expended on a project that greatly enhanced the rehabilitation of the town.

The final design elevated and paved the MacArthur highway and rebuilt the bridge across Gugu Creek between the town proper and Cabalantian, thus restoring the routes to San Fernando on the east and Guagua on the west. It also raised and paved the streets around the perimeter of the *poblacion* to connect the MacArthur with the national GSO highway. Drainage ditches alongside the raised, paved roads went a long way toward solving Bacolor's flooding problem.

It often is said that disaster can provide an opportunity to build for the future. DPWH plans for building the "evacuation route" included modest widening of the highway and streets. However, the project was stalled for some time by over 100 landowners reluctant to cede right-of-way. The deep distrust of the national government engendered in the beleaguered residents of the town proper had extended to the local officials. Despite the obvious benefits to the town and the seemingly equally obvious economic advantages to themselves, many owners of frontage property were quite reluctant to sell even a narrow strip of their land to widen the roads.

Eventually a compromise was reached. Construction began in 2000

and was completed in 2004. As soon as the MacArthur highway was opened, residents flooded back to rebuild in their beloved town. The municipal government encouraged the return through its *Balik Barangay* (return to the *barangay*) program that forgave land taxes for the land on which property owners resided. Opening the highway also brought back much-needed commercial establishments, the first a hardware store to service the construction boom. The municipal government used donations from candidates for provincial office to begin paving local streets and connecting them with the newly raised and paved "evacuation route". However, funds were short, and the local paved streets are narrow and substandard.

The Department of Environment and Natural Resources was required to return to municipalities the proceeds of quarrying of lahar deposits. In 2000, the "Lahar Shares" program returned to Bacolor a sum substantial enough to fund construction of a new municipal building. Together with the newly raised and paved streets, this new *municipio* was a striking sign that, despite the national prohibition, Bacolor could rebuild.

Finally, in 2004, PHIVOLCS lifted the designation of Bacolor as an unsafe place, thereby removing the prohibition against public funding. This action also made bank loans for construction possible.

As of this writing, the municipality is planning to reconstruct its long-buried public *palengke*, or market, with

funds promised by national politicians. When the *palengke* reopens, it will stimulate even more commercial and residential development, restoring a sense of normalcy as well as a tax base to support the needs of town residents. Bacolor will have come a long way toward reaching the end of its long ordeal.

REGIONAL FLOODING PROBLEMS

In coastal and deltaic Pampanga and adjacent areas, storm floods and tidal incursions have worsened since the 1991 Pinatubo eruption. This is especially the case in southwestern Pampanga, where stream channels have been choked by great amounts of eruption debris brought down by floods and lahars. Long before 1991, however, the region was already notoriously flood-prone, and floods were already increasing in frequency, magnitude and duration. Furthermore, coastal Bataan, Bulacan and Manila suburbs that received virtually no Pinatubo sediment are also suffering from aggravated flooding by storms and high tides. Clearly, factors independent of Pinatubo are important. The more widely recognized causes stem from urbanization: decreased infiltration and increased runoff due to expanding pavement; encroachment of channels by fishponds and informal settlers; and choking of streams by improper garbage disposal. Upland deforestation also contributes in a major way by increasing runoff, slope erosion, and channel filling (Siringan and Rodolfo 2001, 2003).

Studying why floods are worsening in low-lying Pampanga, Siringan and Rodolfo (2001) discovered that by far the most important cause is land subsidence, at rates of centimeters to more than a decimeter per year. The subsidence results primarily from overuse of groundwater for agriculture, aquaculture, and domestic use. Any deltaic area in the world where water is being pumped too quickly out of the ground subsides and suffers from exacerbated flooding (Rodolfo et al., in press).

In trying to understand the enhanced flooding and tidal incursion in the coastal region around northern Manila Bay, the Philippine public and its decision makers have only recently begun to recognize that global warming is causing a worldwide rise in sea level of about 2 millimeters per year (cf. Mimura and Harasawa 2000). They have yet to accept that the regional sea level rise from human-induced subsidence is more than ten times faster. As long as the government underestimates the effects of subsidence, its multi-billion-peso dredging and diking flood-mitigation projects probably are futile.

Serious, prolonged monsoonal flooding in Pampanga drew wide attention in 2002. From July 8 to 30, Guagua, Minalin, Sasmuan, Santo Tomas and large areas of the City of San Fernando (Fig. 1C) were seriously inundated, up to 2 meters deep in places. Ironically, the only community spared was Bacolor, because the lahar deposition has raised its surface several meters above its surroundings.

Owing to imperfect drainage, Bacolor did experience flooding during the heavy rains, but the waters left after only one or two days. By 2004, its drainage system had been greatly improved, and so flooding was essentially eliminated.

For as long as groundwater is the principal source of water for domestic use, agriculture and aquaculture, land subsidence and the consequent flooding from rains and tidal incursions will continue to worsen. The population of Pampanga continues to grow, requiring additional housing that would be impractical to build in the flood-prone communities. Indeed, many people of these towns will need to relocate. Bacolor is an obvious place for them to resettle, and for the burgeoning provincial population to live.

LOOKING TO THE FUTURE

Lahars

Are the lahars over? Since 1996, weather patterns have been dominated by El Niño episodes of the climatic southern oscillation, during which fewer typhoons approach the Philippines and monsoon rains are reduced. As a result, there have been no serious Pinatubo lahars, and many people believe that the risk of lahars is entirely over. But this is a temporary condition. Much of the debris on the volcano flanks has been exhausted, but great volumes of debris that the lahars have deposited on the volcano apron can be remobilized into new lahars. It is important to remember

that the lahars that buried Cabalantian in 1995 did not come directly from the volcano. They were remobilized from deposits of lahars that from 1991 to 1994 had buried the eastern barangays of Porac municipality, 18 kilometers up the apron from Bacolor. The period that followed the Cabalantian tragedy had relatively low rainfall, and only dilute lahars were generated that were deposited upstream of Bacolor. Future storms may remobilize this accumulation into large lahars. The lahar threat may last for years or decades before it becomes minimal and remains so for centuries until the next eruption.

It is important to note that the lateral dikes of the FVR Megadike complex have not yet been seriously tested by lahars. In 2002, however, relatively mild storms generated lahars that stripped the cement armor off a 100-meter-long portion of the eastern lateral Megadike. Had the rains lasted a day or so longer, the dike could well have been ruptured and sent lahars into San Fernando. The damaged portion was repaired much more strongly than it had originally been built, but the next lahars cannot be expected to attack only at that point along a 22.5 kilometer-long structure.

However, future lahars are not expected to affect Bacolor directly. The town proper has been elevated at least 6 meters by the lahars. Bacolor is now truly *macabaculud*, standing even higher above its surroundings than ever before, and any future lahars will probably skirt this high ground. The town also is protected by the raising of the GSO highway, and, to a

lesser extent, by the dikes intended to sacrifice it. The towns most at risk are Santa Rita to the northwest, Guagua to the southwest, and the City of San Fernando to the east.

Furthermore, residents of Bacolor's town proper have elevated almost all of their buildings well above the current ground level. Thus, Bacolor now is much less vulnerable to lahars than any of the towns around it. And unlike that of the national government, its approach to mitigation does not pass the threat to the future or onto other towns. Indeed, people of the low-lying communities around it could well benefit from the house-raising technology developed in Bacolor. Even if lahars do not reach them, they are suffering from ever deeper and longer-lasting floods from storms and high tides.

Flooding: "*Napakasuwerte naman ang mga taga-Bacolor!*"

"The people of Bacolor are so lucky!" we heard a citizen of the neighboring town of Minalin exclaim during a recent Pampanga flood. Not only has the elevation of Bacolor solved its lahar problem, but it no longer suffers from the flooding that is becoming increasingly severe in the lowlands of the province.

The lahar threat can only decline in the long term, but the problem of chronic flooding in Pampanga's coastal and estuarine areas continues to grow and reduce the quality of life. Population statistics may already be reflecting the environmental deterioration of this area, which grew

12.7 percent from 1995 to 2000, compared with 15.0 percent for the entire province (National Statistics Office 2002). Growth was much lower in the most flood-prone communities, for example, -1.5 percent in Minalin, 0.9 percent in Sasmuan, and 2.4 percent in Guagua. If land subsidence and flooding continue to worsen, we can expect more and more people to be displaced. High-and-dry Bacolor is an obvious place for them to resettle.

Building the Bacolor of the future

Residents have saved their town, but their building for the future has been severely handicapped by lack of coordination, resources, and support. Residential reconstruction has been *kanya-kanyahan* (each family for itself), with little attention paid to the overall layout and appearance of the town. The daunting task of rebuilding understandably dominates the attention and resources of Bacoloreños, leaving little time, thought, and funding for long-term planning.

A town with more *civic capital* — the social resources a community has for making decisions and getting things done — can respond more successfully to major changes in its environment (Orum 1998, Orum and Gramlich 1998). In order of frequency of presence, the types of resources are *alliances* among the leading economic, political and social sectors; a *commitment* to the place on the part of the citizenry; a *consensual vision* for the direction and future of the

town; and *bridges* that connect the leading sectors to the citizenry.

How does Bacolor's civic capital measure up to the monumental task of rebuilding?

Disasters often elicit a spirit of cooperation across community sectors. In the aftermath of the devastating 1994 and 1995 lahars, the leading sectors of the town formed an alliance to solve critical town problems, without the assistance or even the cooperation of the national government. This alliance was essential for the town to survive at all but, born of an emergency, it was transitory. Furthermore, having fled, the commercial sector did not participate.

Vision and long-term perspective are seriously limited in Bacolor by severe lack of resources and the habits developed in the fight for survival. Although disasters can occasion community development and planning for the future, in this case, the initial rebuilding activities were *ad hoc* for several years before initiation of comprehensive planning. Bacoloreños are justifiably proud of their town's illustrious past, and their planning and effort have focused primarily on restoring the routine amenities of a sleepy bedroom community and predominantly agricultural economy. Seemingly paralyzed by short-term thinking, they spend little effort in visualizing what Bacolor might be in the future. Thus, the current municipal plans include restoring farm-to-market roads without the wide frontage that could evolve into the

thoroughfares needed by the urban center of the future. The local government is considering placing its garbage disposal sites in more elevated areas north of the town proper. This would depreciate elevated areas well suited for housing, and contaminate the groundwater upon which the community relies so heavily.

Unplanned development is not unusual in the Philippines. However, the longer that Bacolor continues to rebuild in an uncoordinated, family-based manner, the more difficult and expensive it will be to achieve a comprehensive plan for the town infrastructure. What the town most urgently needs now is support from the national government and private philanthropy to launch a comprehensive, community-wide, participatory planning effort to reconstruct their town as an attractive, disaster-resistant community (Crittenden 2001).

Ironically, restoring Barangay Cabalantian from its total obliteration by the catastrophic lahars of 1995 seems to be a far easier task. In the post-disaster years, during which reconstruction was proscribed by the national government, the barangay and its leadership had ample time for coordinated planning. A new network of wide, well-drained roads with street lights was built so that the new houses could be erected as integrated neighborhoods.

Bridges between the leading sectors and the citizens are lacking in many municipalities. Residents of the town proper tend not to be joiners

(Lamug et al. 1999a). However, communication across all town sectors has been facilitated by their long acquaintance, and the adversity they have shared and transcended. The captain and council of some *barangays* are well connected to the residents, but such connections in other *barangays* are hindered by the dispersal of residents and elected officials alike.

CONCLUSION

The Pinatubo lahars of 1991 to 1995 devastated Bacolor. Struggling to recover life in their town without outside assistance, and learning from repeated lahar invasions, Bacoloreños learned to elevate their houses, rebuilding their environment to protect both houses and people from future lahars.

Disaster historically has presented an opportunity to build for the future, and Bacolor is a prime example. Ironically, the catastrophic flows raised the ground surface of Bacolor by several meters, thus exempting it not only from future lahars but also from the floods that are plaguing nearby towns that have been spared from lahars. Unlike the diminishing lahar threat, rain floods and tidal incursions promise to deepen, occur more frequently, and last longer. The primary cause is the excessive withdrawal of groundwater. As the number of people increases, so must groundwater usage, the subsidence it causes, and the resulting floods. The deteriorating quality of life in the flood-prone communities may be forcing

people to relocate. In addition, while the floods continue to diminish the areas in Pampanga that are suitable for housing, the population of the province is expected to double by 2025 (National Statistics Office 2002). Bacolor is an obvious place to develop into a large residential area. It needs to build with the future in mind, to realize its maximum potential as a pleasant community not only for itself, but for the entire region. Bacolor urgently needs the national government and any other pertinent agencies to provide financial and technical support for comprehensive, community-wide, participatory planning in order to reconstruct the town into a sustainable community in harmony with the natural forces of its environment.

ACKNOWLEDGEMENT

Our research was supported by the Center for Integrative and Development Studies and the National Institute of Geological Sciences of the University of the Philippines, the Philippine office of Oxfam Great Britain, the Bureau of Agricultural Research of the Philippine Department of Agriculture, and the College of Liberal Arts and Sciences of the University of Illinois at Chicago. Our colleagues in this research are Corazon Lamug, Gloria Nelson, Cristina Remotigue, Ramoncito Rivera, and Fernando Siringan. We dedicate this report to the people of Bacolor, in admiration for their courage and love for their town, and we are especially grateful to the late Rustico Lacsamana who suggested the research, and Nilo Caballa, Ananias Canlas, Jr., Romeo Dungca, Ernesto Nicdao, and Father Nestor Tayag for their invaluable assistance.

REFERENCES

- Arboleda, R.A., S.G. Catane, P.J. Delos Reyes, M.L. Martinez, H.T. Mirabueno, T.M. Regalado, B.S. Tubianosa, J.V. Umbal, R.S. Punongbayan, C.G. Newhall, and R.A. Alonso
- 1995 "Chronology of the 1994 Lahars at Pinatubo Volcano and Consequent Hazards and Risks." Unpublished report of the Philippine Institute of Volcanology and Seismology.
- Arboleda, R.A., and M.M.L. Martinez
- 1996 "1992 Lahars in the Pasig-Potrero River System." In C.G. Newhall and R.S. Punongbayan (eds.) *Fire and Mud: Eruption and Lahars of Mount Pinatubo, Philippines*. Seattle, U.S.A.: University of Washington Press, 1045-1054.

- Blair, Emma Helen and James Alexander Robertson (eds.)
 1904 *The Philippine Islands: 1493 -1898*. Volume XXIII. Cleveland, U.S.A.: Arthur H. Clark, 1629-1630.
- Buenviaje, Conrado B.
 1968 "Villa de Bacolor Non-plus Ultra: History of Bacolor and its Barrios." Unpublished manuscript.
- Centro Catolico Officers
 1981 Centro Catolico Souvenir Program (1980-81), Villa de Bacolor.
- Crittenden, Kathleen S.
 2001 "Can this Town Survive? Case Study of a Buried Philippine Town." *Natural Hazards Review* 2:72-79.
- Crittenden, K.S., and K. S. Rodolfo
 2002 "Bacolor Town and Pinatubo Volcano, Philippines: Coping with Recurrent Lahar Disaster." In R. Torrence and J. Grattan (eds.) *Natural Disasters and Cultural Change*. London: Routledge, 43-65.
- Erickson, Kai
 1976 *Everything In Its Path: Destruction of Community in the Buffalo Creek Flood*. New York, U.S.A.: Simon and Schuster.
- Galende, Pedro G.
 1996 *Angels in Stone: Augustinian Churches in the Philippines*. Manila: San Agustin Museum.
- Henson, Mariano A.
 1955 *The Province of Pampanga and Its Towns (A.D. 1300-1955)*. 2nd ed. Manila: Villanueva Book Store.
- Lacsamana, R.
 1996 Certified Updated Masterlist of Current Residents of Barangays Cabambangan [the poblacion], San. Vicente, Sta. Ines and Cabetican, Bacolor, Pampanga.
- Lacsamana, R., and Kathleen S. Crittenden
 1997 Unofficial census of current residents of the Barangays Cabambangan, San Vicente, Santa Ines and Cabetican, Bacolor, Pampanga, July, 1997. Town of Bacolor, Pampanga, Philippines.
- Lamug, Corazon B., Kathleen S. Crittenden, and Gloria L. M Nelson
 1999a *Processes through which Families in Bacolor (Pampanga) Respond to Natural Disaster with Emphasis on Relocation*. Manila: Center for Integrative and Development Studies, University of the Philippines.
 1999b "Place Identity of Women of Bacolor." *Philippine Sociological Review* 47:21-30.

Larkin, John A.

1993 *The Pampangans: Colonial Society in a Philippine Province*. (University of California, 1972). Quezon City: New Day Publishers.

Mimura, N. and H. Harasawa (eds.)

2000 *Data Book of Sea-Level Rise 2000*. Japan: Center for Global Environmental Research, National Institute for Environmental Studies, Environmental Agency of Japan.

National Statistics Office

1990 *Pampanga Census of Population and Housing*. Philippine Government, Manila, Philippines.

1995 *Central Luzon Census of Population 1995*. Philippine Government, Manila, Philippines.

2002 "Pampanga: Population to Double in 23 Years." <http://www.census.gov.ph/data/pressrelease/2002/pr02121tx.html>.

Newhall, C., A. Daag, F.D. Delfin Jr., R. Hoblitt, J. McGeehin, J. Pallister, M. Regalado, M. Rubin, B. Tubianosa Jr., J.V. Umbal

1996 "Eruptive History of Mount Pinatubo." In C. G. Newhall, R.S. Punongbayan (eds.) *Fire and Mud: Eruptions and Lahars of Mount Pinatubo*. University of Washington Press, Seattle, pp. 165-196.

Orum, A. M.

1998 "The Urban Imagination of Sociologists: The Centrality of Place." *The Sociological Quarterly* 39 (1), 1-10.

Orum, A. M., and J. Gramlich

1998 "Civic Capital and the Construction (and Reconstruction) of Cities." Presented at the annual meeting of the American Sociological Association, San Francisco, CA.

Rodolfo, Kelvin S.

1995 *Pinatubo and the Politics of Lahar: Eruption and Aftermath, 1991*: Quezon City, Philippines: University of the Philippines Press.

1996 "Mount Pinatubo Lahars: Scientific "Givens", and some Political and Socioeconomic Consequences." Proceedings of the International Symposium On Disasters and Health, Manila, pp. 325-332.

2000 The Hazard from Lahars and Jökulhlaups. *Encyclopedia of Volcanoes*. Philadelphia, U.S.A.: Academic Press, 973-995.

Rodolfo, K.S., R.A. Tamayo, C.T. Remotigue, and J.A. Cagas

1996 "Geological Reasons for Breaching of the "Transverse Dike," Pasig-Potrero "Megadike" System, Pampanga." *Proceedings of the 1996 Convention of the Geological Society of the Philippines*.

Rodolfo, K.S., F. P. Siringan, C. T. Remotigue, and C. B. Lamug

In press "Worsening Floods around Northern Manila Bay, Philippines: Research-based Analysis from Physical and Social Science Perspectives." *Philippine Sociological Review*.

Siringan, F. P. and Kelvin S. Rodolfo

2001 "Net Sea Level Changes in the Pampanga Delta Region: Causes and Consequences." Final report submitted to the Center for Integrative and Developmental Studies, University of the Philippines, pp. 1-5.

2003 "Relative Seas Level Changes and Worsening Floods in the Western Pampanga Delta: Causes and Some Possible Mitigation Measures." *Science Diliman* 15:1-12.

Tantingco, Robby (ed.)

2003 "Bacolor: One Brief Shining Moment." *Singsing* 2 (2). Angeles City, Philippines: The Juan D. Nepomuceno Center for Kapampangan Studies, Holy Angeles University.

Contributors

Daylinda Banzon-Cabanilla, Ph.D. (Anthropology), is an Associate Professor of the Department of Social Forestry and Forest Governance, College of Forestry and Natural Resources, U.P. Los Baños. Her research interests include social forestry, culture and the environment, and indigenous peoples, using qualitative social research methods.

Corazon B. Lamug, Ph.D. (Sociology) is Professor of Sociology at the Department of Social Sciences and current Dean of the College of Arts and Sciences, U.P. Los Baños. Her research interests include community studies in upland and coastal areas, gender relations and social psychological aspects of relocation and social development projects.

Kathleen S. Crittenden, Professor Emerita of Sociology at the University of Illinois at Chicago, is a social psychologist interested in community health. Currently she is working on an interactive, computerized map of the Bacolor poblacion to display visual images and data of the lahar burial and rebuilding process.

Kelvin S. Rodolfo is Professor Emeritus of Earth and Environmental Sciences at the University of Illinois at Chicago and Adjunct Professor of the National Institute of Geological Sciences at the University of the Philippines – Diliman. He has studied the eruptions and lahars of Mount Pinatubo since 1991, and the land subsidence and worsening floods caused by overuse of ground water in the areas around northern Manila Bay.

Cleofe S. Torres, Ph.D. (Extension Education), is Associate Professor and Dean of the College of Development Communication, U.P. Los Baños. Her research interests include social analysis, profiling, multistakeholder analysis and institutional arrangements for natural resource management projects.

Monica MacKinnon, Ph.D. (Extension Education), obtained her doctorate in U.P. Los Baños. The article is drawn from her dissertation. Her research interests include biodiversity conservation, natural resources management, and indigenous peoples. She is currently based in Canterbury, UK.

Juan M. Pulhin, Ph.D. (Geographical Sciences) is Associate Professor, College of Forestry and Natural Resources, U.P. Los Baños. His research interests include the policy and practice of community-based forest management, social forestry and forest governance and human dimension of environmental change.

Maricel A. Tapia was a former Research Associate of the Environmental Forestry Program, College of Forestry and Natural Resource, U.P. Los Baños. Her research interests include social aspects of forestry and the environment.

Guidelines for Contributors: Notes and References

Prospective contributors are requested to observe the following guidelines:

1. Standard length of papers is 6000 words (approximately 20 pages typed double spaced with generous margins at the top, bottom, and sides of the page), but shorter contributions are also welcomed.
2. Include a brief abstract of 100-200 words summarizing the findings and at most five key words on a separate sheet of paper (without author information).
3. Title, author's name, affiliation(s), full address (including telephone and email address) and a brief biographical note should be typed on a separate sheet.
4. *Notes* should contain more than a mere reference, although it is recommended to use notes only for substantive observation and to limit the length. They must be numbered serially and presented at the end of the article in a separate endnotes section that appears before the References.
5. All illustrations, diagrams, and tables to be referred to as "Figures" and "Tables" and numbered according to the sequence in the text. Figures should be referred to by number (Figure 1) rather than by placement (See Figure below). Each table and figure must include a descriptive title.
6. Please use the American Psychological Association (APA) citation style.
 - a) The following examples illustrate the format for referencing in the text:

(Banzon-Bautista, 1998, p. 21)

(Lynch & Makil, 1968)

Zialcita (2005)

For Filipinos, the "outside" world is "a place of power, wealth, cleanliness, beauty, glamour and enjoyment" (Cannell, 1995, p. 223).

Source: Saloma, 2001

"After all," he said, "*pinoy* can be seen along national lines."

Source: Saloma, 2001

- b) List two or more works by different authors who are cited within the same parentheses in alphabetical order by the first author's surname. Separate the citations with semicolons.

For example:

Scholars (Karaos, 1997; Porio, 1997; Tapales, 1996)

- c). All references cited in the text must be listed in the *References* section. The details should be listed in full, alphabetically by author. The following examples illustrate the format for references.

Journal or Magazine Article

Marcuse, P. (1989). Dual city: A muddy metaphor for a quartered city. *International journal of urban and regional research*, 13, 697-720.

Newspaper Article

Estopace, D. (2005, January 25). The business of poverty. *Today*, p. B3

Article from the Internet

Mershon, D. H. (1998, November-December). Star Trek on the brain: Alien minds, human minds. *American Scientist*, 86, 585. Retrieved July 29, 1999, from Expanded Academic ASAP database.

Cabrera, R. E. (2003) Renewable energy program for Mindanao. Retrieved July 26, 2003, from <http://www.amore.org.ph>

Book

Berner, E. (1997). *Defending a place in the city*. Quezon City: Ateneo de Manila University Press.

Book Article or Chapter

Racelis, M. (1988). Becoming an urbanite: The neighborhood as a learning environment." In J. Gugler (Ed), *The urbanization of the third world* (pp. 219-224). Oxford: Oxford University Press.

Conference paper

Sassen, S. (1994). Identity in the Global City: Economic and Cultural Encasements. Paper presented at the conference on The Geography of Identity. University of Michigan, 4-5 February.

Preface

The currency of environmental discourse is not recent and neither does it seem to be on the decline. Most arguments on both the causes of environmental degradation and the proposed courses of action or programs to stem or correct the degradation invoke social forces. The papers in this volume focus on different dimensions of the environmental discourse in such contexts as environmental conservation programs, indigenous production systems, watershed development projects, and different aspects of community development.

The first paper by **Monica MacKinnon** used the metaphor of fruit tree grafting to describe the exchange of scientific and indigenous knowledge between a botanical garden and two ethnic villages in Southwest China. The exchange was effected through projects involving scientists/researchers of the Xishuangbanna Tropical Botanical Garden, on the one hand, and farmers in two ethnic villages located close to the botanical garden, on the other. It consisted of the adoption of technologies on agroforestry and cash crops which built on the local agricultural practices of the farmers and the cultural significance of their temple garden plants and holy hill forests. The scientists gained knowledge from the local farmers which contributed to their research work and brought economic benefits to the botanical garden. Thus, the knowledge exchange contributed to the local development of the region specifically the use of agroforestry technologies to promote soil and water conservation as well as the increase in food production and cash income of farmers. It also expanded the scope and advocacy of the botanical garden.

Agroforestry in contrast to shifting cultivation is analyzed as a major contradiction and science versus indigenous knowledge as a false dichotomy in the paper of **Daydinda Banzon-Cabanilla**. In the ecogovernance discourse, agroforestry is considered desirable while shifting cultivation is undesirable. The paper argues that shifting cultivation is agroforestry and thus, the identification of shifting cultivation as the problem and agroforestry as the solution is a contradiction. To support this argument, definitions of shifting cultivation by pioneer anthropologists and review of more recent ones including that of the author's based on a study of indigenous peoples in Mindanao are presented. Moreover, the distinction between science and indigenous knowledge is discussed as a false dichotomy using a case study on Tausug indigenous agroforestry systems as illustration. The rejection of the dichotomy cites the central principles of Tausug cultural morality that ensure the sustainability of their different indigenous agroforestry systems. The implications of a heightened vigilance for contradictions are presented for the theory and practice of ecogovernance.

The concepts of stakeholders and absorptive capacity were elaborated on as tools for social analysis in development planning in the paper of **Cleofe S. Torres**. A watershed development project was used as test case to illustrate the utility of these concepts. Stakeholders were classified along the importance-influence dimensions to objectively identify, categorize and prioritize them. Absorptive capacity was operationalized on five dimensions, namely, motivation to change, level of knowledge and skills, social and political environment, capabilities of community organizations, and other community resources. Specific indicators of each dimension were used to measure the absorptive capacity of stakeholders. The paper argues that an assessment of absorptive capacity of stakeholders makes development planning more strategic and thereby leads to more effective access to and utilization of project goods and services by stakeholders.

My paper describes the development of indexes of three dimensions of the concept of community attachment: (1) the interpersonal relations index measured by degree of closeness to people they went to for help on important matters and to those they often socialized with; (2) community participation consisted of both membership in formal organizations and participation in informal organizational activities in the barangay; (3) community satisfaction as reflected in extent of satisfaction with the barangay, plan to change barangay of residence and trust that barangay leaders would perform their role effectively. The community attachment index was the composite of scores on the three individual component indexes. The development of the indexes of community attachment used key informants and social survey in two barangays of Jala-jala, Rizal. The study identified three environmental correlates of community attachment, namely, the physical features of the barangay, length of residence in the barangay, and ownership and type of residential unit of the respondents. The paper argues that the construction of a community attachment index contributes both to its conceptual elaboration and to the methodological imperative of using indicators that capture the specificities and particularities of the barangays studied and thereby lays the groundwork for linking community attachment to community action and development.

The concept of community has emerged as a central operational strategy in the management and conservation of natural resources, thus, the label Community Based Forest Management (CBFM). The paper by **Juan M. Pulhin and Maricel A. Tapia** analyzes the foundational concept of this strategy. It argues that the expectation of homogeneity and commonality of interests for successful collective action of communities is a myth. Data from an assessment of CBFM projects show the heterogeneity of the communities regardless of whether these are categorized as self-initiated or externally initiated. Rather than relying on these commonalities, the paper argues for promoting collective action in the face of heterogeneity invoking sociocultural factors, economic

opportunities and benefits, geographic factors and institutions. The paper concludes with some implications for policy and the practice of CBFM.

The once illustrious town of Bacolor in Pampanga was devastated by a series of lahar flows commencing in 1992 up to 1995. The paper by **Kelvin Rodolfo and Kathleen Crittenden** describes what happened to a town historically known to be a center of *illustrados* long before the eruption of Mount Pinatubo to the gradual transformation of its landscape as a consequence of periodic lahar deposits in the context of regional flooding attributable to land subsidence due to ground water extraction. The responses to the disastrous lahar flows are varied. At the national government level, a decision was made to sacrifice Bacolor by enclosing it in a debris basin with dikes, in order to protect the yet-unaaffected adjacent communities and declared the town an unsafe place. In contrast, the municipal government, families and a few local institutions worked to save the town. Despite the absence of resources from the national government, an elementary school and two churches were rebuilt, the water system was reconstructed and the Don Honorio Ventura College of Arts and Trades was made operational and continued to function. In addition, a local technology for raising buried houses was developed and houses made habitable by first raising these on stilts and then making them more permanent. The DPWH in 1998 elevated and paved the MacArthur highway; this facilitated the return of residents to their respective barangays. Ironically, the deposition of lahar on the town raised its elevation relative to adjacent towns making it less prone to flooding. The chronic flooding in Pampanga's coastal and estuarine areas is due to land subsidence as a consequence of extensive ground water extraction for domestic and agricultural uses. With Bacolor immune to flooding, the Pampanga population has targeted it as a residential town. However, a lack of vision and resources may hinder the realization of the town's maximum potential.

Corazon B. Lamug
Issue Editor

PHILIPPINE SOCIOLOGICAL SOCIETY

(2001-2002)

President

Emma E. Porio

Vice President

Ma. Elena C. Javier

Secretary

Emmanuel R. Fernandez

Treasurer

Jesusa M. Marco

Directors at Large

Clarence M. Batan

Cristita A. Mallari

Ana Maria Peralta

Stella P. Go

Corazon B. Lamug

Ma. Cynthia Rose B. Bautista

Corazon B. Lamug

Issue Editor

Editorial Assistants

Isagani A. Lachica

Karen B. Barrios

Monette L. Jimenez

The *Philippine Sociological Review* is the official journal of the Philippine Sociological Society, Inc.

Please address manuscripts, book reviews, research notes, comments, and advertisements to the Editor, *Philippine Sociological Review*, P.O. Box 205, U.P. Post Office, Diliman, Quezon City 1101 Philippines. Subscriptions (P600/US\$40.00 per year) should also be addressed to the Philippine Sociological Society, same address as above. This is a refereed journal and the editorial staff/reviewers reserve the right to publish or not publish articles sent for consideration.

Applications for permission to quote or reprint from the *Review* should be addressed to the Editor.

Copyright 2006 by the Philippine Sociological Society, Inc. The articles appearing in this PSR issue were prepared in 2006 but are being released as PSR 2002 issue owing to delays in journal publication.

ISSN 0031-7810

Official Journal of the Philippine Sociological Society

Philippine Sociological Review

Official Journal of the Philippine Sociological Society

Volume 50

January-December 2002

PREFACE	iii
ARTICLES	
Grafting Knowledge - A Conceptual Model to Facilitate Local Development <i>Monica MacKinnon</i>	1
Contradictions and False Dichotomies in Ecogovernance: Shifting Cultivation as Agroforestry <i>Daylinda Banzon-Cabanilla</i>	18
Stakeholders' Absorptive Capacity for Development: The Case of Waras-lalo Watershed, Bicol Region <i>Cleofe S. Torres</i>	35
Environmental Correlates of Community Attachment <i>Corazon B. Lamug</i>	58
Beyond the 'Mythic Community': Enhancing Collective Action in Community-Based Forest Management <i>Juan M. Pulhin and Maricel A. Tapia</i>	73
Environmental Consequences of Lahars, Subsidence, and Human Behavior in Bacolor, Pampanga <i>Kelvin S. Rodolfo and Kathleen S. Crittenden</i>	89
CONTRIBUTORS	110



Philippine Sociological Review

Volume 50

January-December 2002

Grafting Knowledge - A Conceptual Model to
Facilitate Local Development
Monica MacKinnon

Contradictions and False Dichotomies in Ecogovernance:
Shifting Cultivation as Agroforestry
Daylinda Banzon-Cabanilla

Stakeholders' Absorptive Capacity for Development:
The Case of Waras-lalo Watershed, Bicol Region
Cleofe S. Torres

Environmental Correlates of Community Attachment
Corazon B. Lamug

Beyond the 'Mythic Community': Enhancing Collective
Action in Community-Based Forest Management
Juan M. Pulhin and Maricel A. Tapia

Environmental Consequences of Lahars, Subsidence,
and Human Behavior in Bacolor, Pampanga
Kelvin S. Rodolfo and Kathleen S. Crittenden



Philippine Sociological Review

Volume 50

January-December 2002

**Grafting Knowledge - A Conceptual Model to
Facilitate Local Development**
Monica MacKinnon

**Contradictions and False Dichotomies in Ecogovernance:
Shifting Cultivation as Agroforestry**
Daylinda Banzon-Cabanilla

**Stakeholders' Absorptive Capacity for Development:
The Case of Waras-lalo Watershed, Bicol Region**
Cleofe S. Torres

Environmental Correlates of Community Attachment
Corazon B. Lamug

**Beyond the 'Mythic Community': Enhancing Collective
Action in Community-Based Forest Management**
Juan M. Pulhin and Maricel A. Tapia

**Environmental Consequences of Lahars, Subsidence,
and Human Behavior in Bacolor, Pampanga**
Kelvin S. Rodolfo and Kathleen S. Crittenden