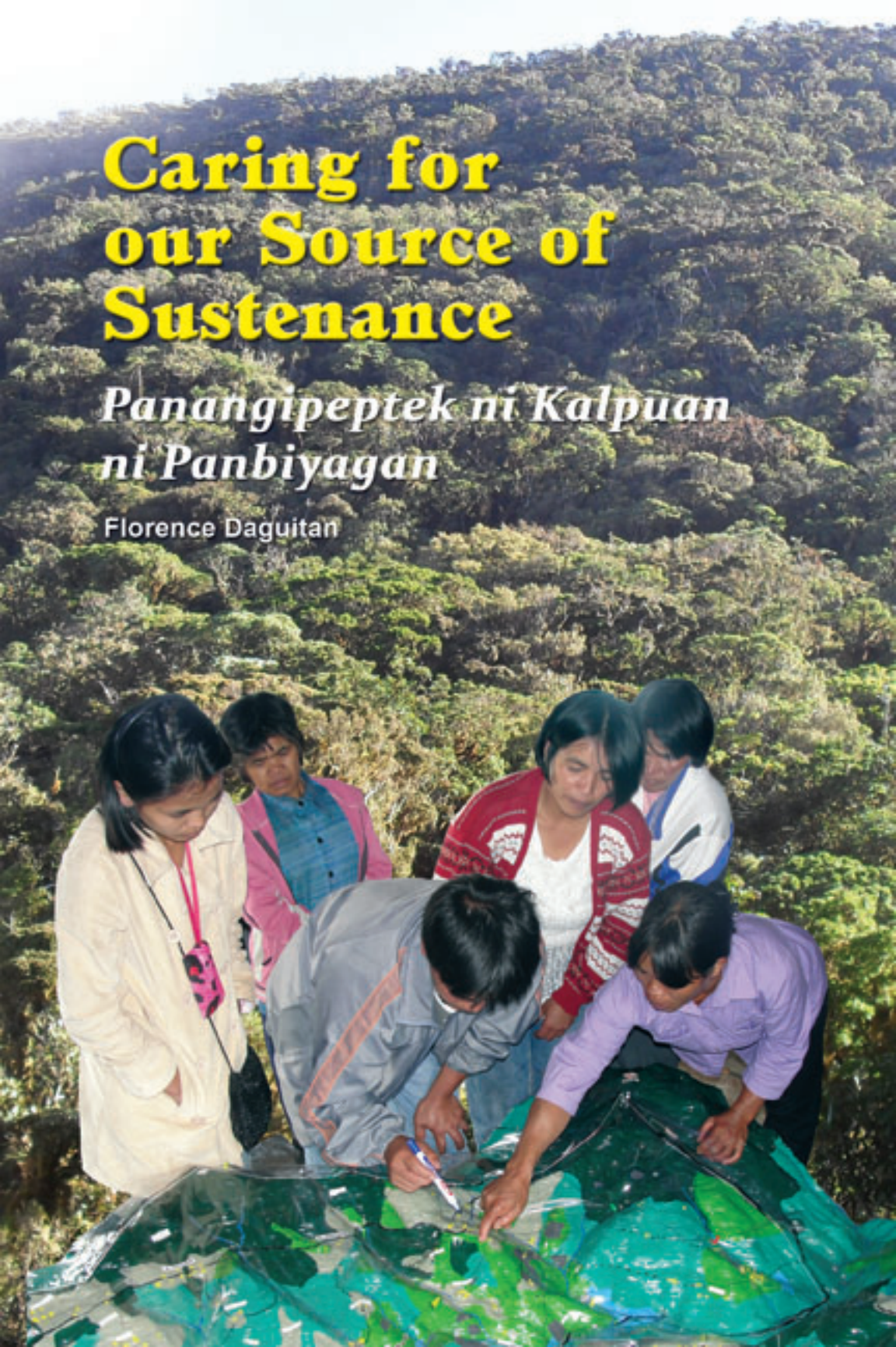
Caring for our Source of Sustenance

Panangipeptek ni Kalpuan ni Panbiyagan

Florence Daguitan



THE KALANGUYA'S TERRITORIAL MANAGEMENT

Caring for our Source of Sustenance

Panangipeptek ni Kalpuan ni Panbiyagan

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Panangipeptek ni Kalpuan ni Panbiyagan
Caring for our Source of Sustenance
Tebtebba Foundation

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May this documentation of how we care for our land inspire us to do more for Mother Earth especially in this time of climate crisis.

Haggiyo!

Florence Mayocyoc-Daguitan

Acronyms

ADSDPP	Ancestral Domain Sustainable Development Protection Plan
CBD	Convention on Biological Diversity
CBMS	Community-Based Monitoring System
CPA	Cordillera Peoples Alliance
DENR	Department of Environment and Natural Resources
DSWD	Department of Social Welfare and Development
FPP	Forest Peoples Program
GATT	General Agreement on Tariffs and Trade
IEC	Information, Education and Campaign
IPRA	Indigenous Peoples Rights Act
LGU	Local Government Unit
MA	Millennium Ecosystem Assessment (MA)
MARIS	Magat River Irrigation System
MASL	Meters Above Sea Level
MPDO	Municipal Planning and Development Office
MRDC	Montañosa Research and Development Center
NCIP	National Commission on Indigenous Peoples
NPA	New Peoples Army
NSCB	National Statistical Coordination Board
PAFID	Philippine Association for Intercultural Development
PNP	Philippine National Police
RDD	Research and Documentation
UNDRIP	UN Declaration on the Rights of Indigenous Peoples

Introduction

It has taken millions of years of evolution for nature to cover planet Earth with its amazing diversity of life forms and to create the conditions necessary for the appearance and survival of humankind. But in a span of mere decades, man has been able to reverse much of that.[1]

The importance of biological diversity for evolution and for maintaining life sustaining systems of the biosphere cannot be overstated enough. Thus in December 1993 the United Nations, affirming that conservation of biological diversity is a common concern of humankind, put into force the Convention on Biological Diversity (CBD). The Philippines was one of the first signatories to this Convention.[2]

The CBD pursues three objectives: 1) conservation of biological diversity, 2) sustainable use of its components and 3) equitable sharing of the benefits arising out of the utilization of genetic resources.[3] To realize these objectives, the CBD Conference of the Parties in 1995 adopted the Ecosystems Approach as the primary framework of action. This was also to respond to declining biodiversity caused by human action and unsustainable development strategies that adversely affect the capacity of ecosystems to serve people's wellbeing.

The implementation of the ecosystems approach however faces a major challenge in the midst of the current climate crisis where ecological degradation is to a great extent the result of "economic, social, and political inadequacies" but also "a principal cause of poverty."[4] Yet at the same time this approach is deemed a promising solution as "...reform and development efforts will not achieve their aims if they are not suffused with an ecological ethics that recognizes the conjugal bond between humankind and the natural world from which there can be no divorce."[5]

Partnership

Recognizing this, Tebtebba (Indigenous Peoples' International Centre for Policy Research and Education) in June 2008 forged a partnership with the Montañosa Research and Development Center (MRDC) to pilot the implementation of the CBD ecosystems approach in the Cordillera region in the Philippines. The partnership brings together a developmental nongovernment organization that works directly with indigenous peoples' organizations and one that works and has gained recognition in promoting indigenous peoples' rights in the international arena.

Tebtebba was established in 1996 to address the need for heightened advocacy to have the rights of indigenous peoples recognized, respected and protected worldwide. It seeks to promote a better understanding of the world's indigenous peoples, and their worldviews, issues and concerns. In this effort, it strives to bring indigenous peoples together to take the lead in policy advocacy and campaigns on all issues affecting them.[6]

The MRDC on the other hand was born at the height of the Cordillera indigenous peoples' struggle against the Marcos regime's development aggression that threatened to displace communities from their ancestral lands in favor of dams and commercial logging. Now in its 32nd year, MRDC believes that people's constant interaction with their biophysical en-

vironment imbues them with most of the scientific knowledge and skills they need to propel their own development. It places indigenous knowledge as the foundation for community development. Its task is to assist communities to systematize and augment their indigenous knowledge and traditional skills to meet the challenges posed by complex changes. [7]

The MRDC-Tebtebba partnership is referred to as "partnership" in this report.

Content of Report

This report shares the results of the project, "Support for Community Development within the Framework of Indigenous Peoples' Rights and the Ecosystems Approach," piloted in Tinoc, Ifugao province.

The report has three sections. The first is an account of the MRDC-Tebtebba's experience in carrying out the project, particularly the 1) strategies and activities undertaken, 2) goals achieved, and 3) lessons learned in the process of work.

The second part discusses the results of the research and documentation, one of the strategies used in implementing the ecosystems approach. It describes traditional land use management in project sites, land tenure arrangements, knowledge systems on customary sustainable resource use, biodiversity conservation practices and traditional occupations.

The third section illustrates the case of a village, which embraced the market economy when it adopted commercial vegetable production as a main source of livelihood. It highlights the importance of biodiversity and its link to people's wellbeing, the effects of changes on the community, and the challenges they face in the context of changes.

The last section presents the project outcomes and recommendations.

The report's scope is limited to the period of project commencement in June 2008 to November 30, 2010. Initially set to end in 2010, the project timeframe has been adjusted to June 2011.

PART 1

Engaging the Kalanguya in Piloting the Ecosystems-Based Approach

Conceptual Framework

Since the Convention on Biological Diversity (CBD) adopted the ecosystems approach as a framework of action in 1995, it has formulated concepts and theories including principles, operational guidelines, priority focus of implementation and requirements to make it an effective tool for indigenous peoples.

These were in place when the Montañosa Research and Development Center and Tebtebba started the project, "Support for Community Development within the Framework of Indigenous Peoples Rights and the Ecosystems Approach" in Tinoc, Ifugao province in the Cordillera region. Of the many formulations, three key concepts guided the work: 1) definition of ecosystems approach; 2) relationship of ecosystems services and wellbeing; and 3) the three dimensional perspectives of the ecosystems approach.

The CBD defines ecosystems approach as a strategy to manage land, water and living resources that promotes conservation and sustainable use in an equitable way, where sustainable livelihoods are practiced while maintaining the balance

of the different parts of the environment, thereby ensuring continued ecosystems services for people's wellbeing.[8]

Earlier studies reveal that the ecosystems approach is part of the traditional knowledge on customary sustainable use of the indigenous peoples in the Cordillera region. Conklin (1980) identified eight land use and management systems among the Ifugao people. They distinguish hundreds of terrain variations relating not only to forms of combinations of rock, soil, water and vegetation, but also to agronomic activity. Many of these refer to special qualities, aspects, or components of the environment rather than to contrasting general types.[9] Among the Kalinga, Pagusara noted that "the `ili' (ancestral domain) is an integral vibrant whole that illustrates the man-land-nature relationship manifesting six aspects of land use in efficient and intense complementation."[10] She called the ili "an admirable econiche."

The CBD ecosystems approach calls for a paradigm shift:

- from top level to broad-based decision making that includes communities and different stakeholders;
- from narrow commodity-based perspective of natural resources to a broad multi-objective perspective;
- from a management system that tries to eliminate uncertainty to one that incorporates it;
- from political and administrative boundaries to identifying and working with realistic ecological boundaries;
- from reductionist toward a holistic perspective on the world and its resources;
- from reactive to proactive management and identifying problems before they become huge and unworkable.

Moreover the approach calls for long-term thinking to supplement typical short-term views and to stop trying to simplify resource management and admit and embrace its complex and multifaceted nature. It also takes into account a precautionary approach because knowledge of ecological and social systems is incomplete.[11]

In sum, the ecosystems approach addresses the following concerns as shown in the following table:

Task 1: How do you involve all members of society in decisions associated with the management of land, water and living resources?

Task 2: How do you ensure management is decentralized to the lowest appropriate level?

Task 3: How do you ensure the effects of management actions (potential or actual) on adjacent and other ecosystems are taken into account?

Task 4: How can the economic context be understood so that market distortions that affect biological diversity are reduced, incentives are developed to promote biodiversity and sustainable use, and ecosystem costs and benefits are externalized?

Task 5: What measures could be used to conserve ecosystem structure and functioning so as to maintain ecosystem services?

Task 6: What measures can be taken to ensure ecosystems are managed within the limits of their functioning?

Task 7: What actions can be taken so that the problem(s) is (are) addressed at the appropriate temporal and spatial scales?

Task 8: How can varying temporal scales and lag-effects be taken into account when considering the sustainable use of ecosystems?

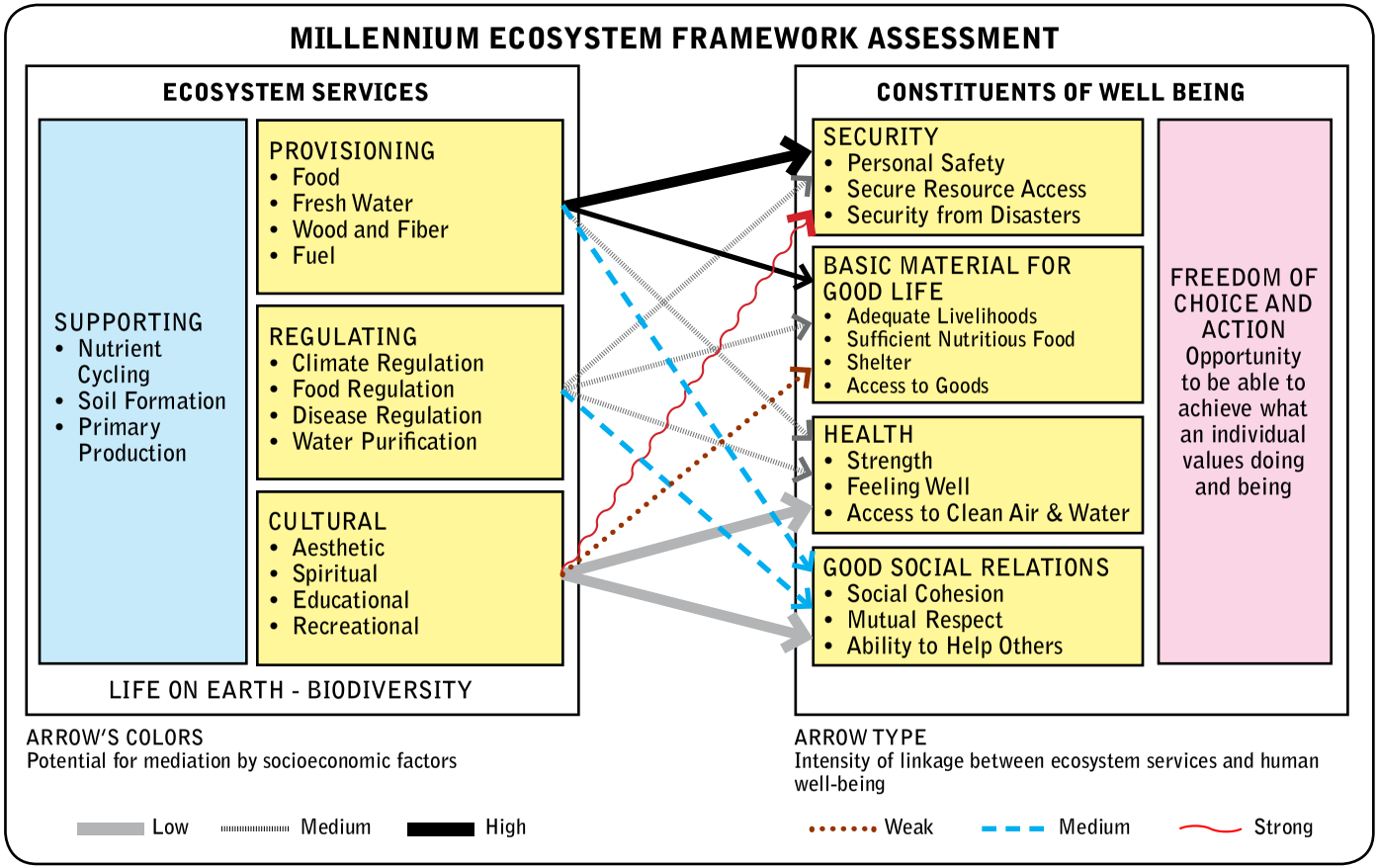
Task 9: How can adaptive management be used to address the problem(s) identified?

Task 10: How can an appropriate balance be sought between, and integration of, conservation and use of biological diversity?

Task 11: How do you ensure all forms of relevant knowledge including scientific, indigenous and local knowledge, innovations and practices are included?

Task 12: What measures can be taken to facilitate the involvement of all stakeholders including all sectors of society and scientific discipline?

Figure 1. Ecosystems Services linked to Wellbeing

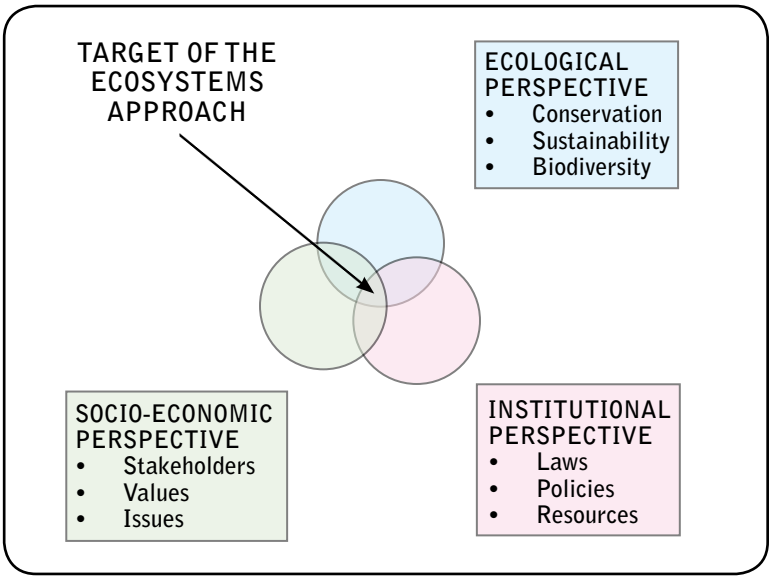


Source: Millennium Ecosystem Assessment 2005[12]

Another key concept in the ecosystems approach is the influence of environmental services on wellbeing. The UN Millennium Ecosystem Assessment (MA) describes ecosystems services as supporting, provisioning, regulating and cultural services, all of which are linked in varying intensity to people's wellbeing. This assessment defines human wellbeing as having "multiple constituents," among these, basic material for good life (adequate livelihood, access to goods, shelter), health (clean air and water, strength, feeling well), good social relations (social cohesion, mutual respect, ability to help others) and security (personal safety, secure resource access, security from disaster), hence being able to have freedom of choice and action. Figure 1 illustrates the association between ecosystems services and wellbeing.

And finally, the ecosystems approach targets three dimensional perspectives: 1) ecological perspective including conservation, sustainability and biodiversity; 2) institutional perspective including laws, policies and resources; and (3) community and socio-economic perspectives including stakeholders, values and issues. This is shown in Figure 2.

Figure 2: Target of Ecosystems Approach



Objectives of Project

From the above concepts and the knowledge on Cordillera indigenous communities, Tebtebba and MRDC defined the project's objectives.

Overall, the project aimed to promote, innovate and adopt indigenous natural resource management strategies and practices to improve people's wellbeing through ecosystems development and good governance. Specifically, it intended to:

1. Increase appreciation of indigenous knowledge systems and practices on natural resource management;
2. Promote development/innovations of traditional livelihood occupations towards poverty alleviation;
3. Form/strengthen appropriate groups in the community to spearhead planning, resource generation and implementation of community development plans;
4. Enable communities to advocate and influence policies of concerned government bodies and development agencies towards supporting the general objective of the project on the municipal and provincial level; and
5. Maximize the project outcomes for national and international policy advocacy.

Defining Strategies

To implement the project, four development strategies were drawn up, but in many stages of the work the partnership had to find the correct balance or combination of two or three of these and at other times, to focus on just one. These strategies are research and documentation, organizing and capacity building, advocacy and networking, and socioeconomic work.

Research and Documentation

Believing in the adage "Start where the people are," research and documentation (RDD) played a major role in the project inception and remained a major activity all throughout the project duration. The participatory research approach was adopted, engendering a process where both the researchers and the community learned from each other to understand not only *what is* but *what ought to be* done now and for the future.[13]

The research aimed to:

1. Enable communities to identify and characterize the land use and management of their territories, i.e., composition, structure and function with respect to: a) human interaction, needs and values including cultural aspects; b) conservation and management of biodiversity; and c) environmental quality;
2. Identify changes on the above subject matter and make their own assessment; and
3. Put forward recommendations pertinent to their assessment.

Focus group discussions, key informant interviews, surveys, workshops and secondary data were used to collect information, and data interpretation was arrived at through group and community discussions convened for the purpose.

Organizing and capacity building

Since 1986 peoples' organizations have cropped up in the Cordillera region as a requisite of projects undertaken by government or nongovernment agencies. But more often than not, these folded up when the project ended or died a natural death after initial enthusiasm dissipated. Hence the ecosystems pilot project prepared to form and/or strengthen appropriate groups in the community to spearhead plan-

ning, resource generation and implementation of community development plans. This included organizational and leaders development to advocate and influence policies towards adoption of the ecosystems approach. In the latter stage, capacity building included skills training on traditional technology/knowledge innovations and strengthening inter-village cooperation for collective action on common issues and concerns.

Advocacy and networking

As neoliberal policies favoring big business interests largely influence development programs in the Philippines, the project strongly promoted pro-people, pro-environment development. This was done through advocacy and networking among government development planners and service providers and NGOs working in the area towards increased appreciation of indigenous knowledge systems and practices on sustainable resource management and of the ecosystems-based approach.

The advocacy and networking component aimed to:

1. Facilitate information exchange and learning sessions among and between community holders of traditional knowledge, authorities of customary law and service providers/duty bearers towards formulating development plans within the ecosystems approach;
2. Promote adoption of the ecosystems-based approach at different levels of development planning and implementation;
3. Draw lessons at appropriate times from the piloting experience and transmit these to policy makers and strengthen implementation of the ecosystems-based approach, consistent with the rights and customary resource management and sustainable use practices of indigenous peoples.

Socioeconomic work

While the project did not define any particular objective for the socioeconomic component as this would be done by the communities, it was clear that it would support initiatives to enhance livelihoods linked to biodiversity and ecosystems services.

Processes Undertaken

Area Selection

Anticipating some difficulties in actualizing the theories, the partnership chose the northern Philippines' Cordillera Administrative Region to pilot the project due to some favorable conditions. The Cordillera forms a contiguous land mass peopled mainly by indigenous peoples (comprising more than 85% of total population) who more than once have come together in regionwide unity to defend their lands, rights and resources. Tebtebba and MRDC zeroed in on the province of Ifugao, also for several considerations. Ifugao is a UN-declared heritage site, forms the watershed of the 360-mw Magat Dam, yet is part of the original Philippines Club 20 or the 20 poorest of 81 provinces in the country.

We decided on a nested ecosystems within a river system on a scale that would enable us to 1) focus yet 2) be able to show interrelations and 3) to target the broadest participation possible. As such, we identified five clustered barangays (lowest political administrative unit) of Tinoc, Ifugao with a perspective of involving the whole town and eventually the two neighboring municipalities of Hungduan and Asipulo, which also serve as major headwaters of the Magat River.

Magat River runs through almost all of Ifugao's towns before it drains into the Magat Dam that supplies the Magat River

Irrigation System (MARIS). The MARIS services the neighboring provinces of Nueva Vizcaya, Quirino, Apayao and Isabela. Thus, while it focuses on five barangays, the project has a provincial and inter-provincial scale.

The project was piloted in the five barangays of Ahin, Binablayan, Tulludan, Wangwang and Tukucan, with the first four constituting part of lower Tinoc; and the last, of upper Tinoc.

Introducing the Project

We first presented the project in courtesy calls to concerned provincial and municipal offices, among these, the Governor's Office, Tinoc Mayor's Office, National Commission on Indigenous Peoples (NCIP) and Social Action Concerns of the Roman Catholic Lagawe-Bontoc Vicariate. Through these meetings, we learned of their own work in Tinoc and their expectations for future collaborative efforts. While these agencies agreed on Tinoc's great development potential given its natural resources, they acknowledged big development challenges. One of these is the difficulty and, admittedly for some, failed efforts at preventing farm encroachment into watersheds, rampant use of chemical pesticides, and attendant dangers of soil erosion and river siltation.

The next step was getting the consent of target communities to implement the project in their areas and linking with other stakeholders. Since the project was a pro-active initiative of the partnership, we had to introduce and explain it to the different stakeholders, especially the pilot communities, and to get to know the key people among the stakeholder groups. This entailed 10 consultation meetings where we presented the project: two in four pilot sites, an inter-barangay workshop involving all target areas, and a roundtable discussion held by the Ifugao Governor with representatives of 12 barangays and government line agencies with local programs.

Two meetings were conducted at the community/barangay level: the first, with barangay councils, other elected officials

and recognized community leaders; and the second, with household representatives in a general assembly. Except for Binablayan, all pilot areas chose to convene a barangay assembly to decide on approval of the project.

At the cluster workshop in lower Tinoc hosted by barangay Wangwang, two of the four target barangays each sent 10 representatives as earlier agreed on, one sent seven and Wangwang had 25 although only the official delegates signed on as participants. The concept, objectives and targets of the project were presented, after which each barangay delegation discussed in a workshop the project's relevance to their respective areas as well as the trends and challenges they face in managing their natural resources. The cluster workshop also served as an opportunity by the partnership to share the results of a series of climate change dialogues that had then just been completed in Ifugao.

By September 2008 the project had concluded all preparatory activities and received the consent of four of the five pilot barangays to implement the project. In Binablayan, the partnership was unable to present the project to a barangay assembly as agreed on with the barangay captain (officially elected barangay head) to let the people decide whether or not to enter into partnership and implement the project. The assembly was not held, and the barangay captain later decided they would first observe the project. He raised apprehensions of possible military repression as suffered by his community in the past if they would once again work with NGOs. Despite this we continued to invite them to our municipal forums, seminars and workshops to which they sent representatives and to involve them in the research activity. In October 2010, Binablayan welcomed the project to their barangay.

Research and Documentation

After getting the communities' consent, project implementation immediately started. The work proved to be much harder than anticipated due to two reasons. First was a prevailing "research fatigue" engendered by various researches

implemented in Tinoc since 2004 including a) formulation of an Ancestral Domain Sustainable Development Plan in 2006 and enhanced in mid-2008 to April 2009 under NCIP, b) situational assessment for a poverty alleviation program by the Department of Social Welfare and Development (DSWD) in 2004 and again in 2008, and c) Community-based Monitoring Systems under the Municipal Planning and Development Office (MPDO).

Second was discrimination against traditional lifeways and practice of rituals which, the informants said, some Christian fundamentalist groups have portrayed as works of Satan. In addition, commercial chemical-based farming and the attendant culture that measures success in terms of cash generation have relegated subsistence production systems as "backward." Hence, at first, most people did not like to be informants on traditional knowledge.

An additional factor was the language barrier and some of the project staff were new recruits. These conditions did not favor the implementation of structured research methodologies and significantly slowed down the process. More often than not, we received the following responses: "We already provided such information to (that) office." or "We no longer practice our traditions, we are now Christians."

Awareness raising on indigenous knowledge systems

These difficulties prompted a strategy shift from a more focused research to more awareness raising on traditional knowledge through formal and informal sharing sessions. In numerous sessions, we emphasized the distinct features of indigenous knowledge on sustainable use and resource conservation and the cultural practices that strengthen community cohesion and solidarity. These also served as a venue to learn and generate data on traditional resource management practices, production systems and changes through time. Data gathered from these sessions were substantiated in key informant interviews.

By the 10th month, although we had collected substantial information, more was needed. By this time the project decided to use 3-D mapping as a tool for data gathering. Agreeing to become training sites, barangays Ahin and Tukucan had their territories mapped through on-the-job training with technical support from the NGO, Philippine Association for Intercultural Development (PAFID).

It took about 10 months of quality community integration and sharing before we made a major breakthrough in the research work. The community people realized that the partnership was not like other groups that criticize traditional knowledge and beliefs but rather supports and works to promote indigenous ways of life.

Among the feedback we received were:

> *To revive our traditional knowledge is the best idea that I have heard for a long time.*
>
> Florentina Dulnuan, President
> Wangwang Women's Association

> *"Most of the time, we have to do our rituals in secret for fear of critics. But while we have to hide, no one in his right mind would say that the prayer given in thanksgiving for winning the barangay election is bad. It says: `Almighty One, grant (name) the wisdom to rule, the courage to discern what is right and what is wrong and act on these. Make him an instrument for the community to have a bountiful harvest and for the people and animals to have good health.'"*
>
> Tessie Gayaho, Ahin

> *"While we have adopted Christian teachings, we feel inadequate in terms of discipline, unity and capacity to nurture our farmlands and environment unlike our ancestors."*
>
> James Tiway, Tukucan elder

As we gained the trust of the local people, the work hastened as more of them became interested in the research work, enabling us to do structured research, such as focus group discussions, surveys and workshops.

It was in the following September that the project was able to

gather substantial data showing the contrasting situations of Ahin, a subsistence village, and Tukucan, which has adopted commercial chemical-based vegetable production. The data presented a sophisticated knowledge system of sustainable land use management in Ahin, most of which has been passed on to the present generation. On the other hand, Tukucan since 1996 has gradually converted most of its agricultural land to vegetable farms, which has caused deforestation.

Constructing a 3-D map is meticulous and hard work but with PAFID's expertise and community cooperation, the three maps were finished with relative ease. Recording past and present land uses was also not difficult, but deciding on what needed to be done had to take a process. A comprehensive land use plan has yet to be drawn up in Tinoc after elders and other concerned groups deliberate on the guidelines.

The data were further validated through workshops and group discussions in Ahin and Tukucan from November 2009 to February 2010. While information came from all five target sites, focus was given to these two barangays, which served as case study areas. Highlights of the findings were then presented to the stakeholders at the First *I-tinek* Land Summit held in January 2010.

The summit helped reveal data gaps, among which is a climate change perspective. In June 2010, a climate change component to enhance the research took off under three local researchers.

Workshop group on traditional land use during the First *I-tinek* Land Summit, January 13-14, 2010.

Networking and Advocacy

Our first attempt to build linkages was through the courtesy calls made to government and private agencies. This was also done for the purpose of transparency to give the military no reason to raise suspicions on the project. In the second networking effort, we wanted to avoid duplication of data already collected from the pilot communities by different line agencies, i.e., the Departments of Agriculture, Health, Social Work and Development and the Municipal Planning and Development Office (MPDO) did not have the information or this was yet to be processed at the time of our visit. Nonetheless, it afforded us a chance to discuss the research work with department heads.

The first breakthrough in networking and advocacy came when we presented to the Tinoc Municipal Council, an elected legislative body, the MPDO and line agency heads the research results on Kalanguya traditional knowledge systems and current threats to conservation and sustainable resource use. Tukucan readily agreed for us to share the findings in their area on the effects of converting lands to commercial vegetable farms, showing the stark difference with the Kalanguya's rich traditional practice of keeping the ecological balance of different land uses through customary law on resource use. This forum also sparked interest in 3-D mapping for research and planning, which prompted the Municipal Council and the partnership to collaborate on a municipal 3-D map and upscale land use and resource scanning to a municipal level.

The Municipal Council allocated part of the needed funds for the making of a municipal 3-D map and for a workshop to formulate a comprehensive land use plan. From September 13-29, the municipal 3-D map was constructed.

As a result of the partnership's awareness-raising and advocacy work, women in two of the pilot areas started recovering traditional rice varieties and to do seed exchange. Several individuals also campaigned to revive traditional synchronized cropping in rice production, and by end 2009 Ahin to a certain extent adopted this practice once again.

Noteworthy to mention is that while initially the MPDO Coordinator was a mere observer, he later became an active focal person in involving LGUs and other line agencies in the project. He convened three inter-agency consultations: a roundtable discussion with the Municipal Council on mapping as a research and planning tool, and presentation of initial findings to two groups, first to line agency representatives and the Tinoc mayor; and second, to the then newly elected municipal councilors to orient them on the project status and the previous administration's commitments to it.

While progress in networking was similarly slow, the Land Summit in January 2010 succeeded in uniting stakeholders on a municipal level on current challenges they face and in producing a covenant on actions to take. While the summit highlighted the Kalanguya's profound knowledge in managing territories and sustaining and improving biodiversity, it also sounded the alarm on its state of erosion. In some areas of origin like Tinoc, indigenous knowledge is disappearing as people succumb to "modernity" in response to discrimination even as the international community is increasingly promoting it to remedy global ecological ills. The summit underscored the present challenges of a degraded environment resulting from chemical monocrop farming, decreased land security due to privatization of communal lands, and waning authority on customary law especially on resource use.

From their collective learning the participants came to some conclusions:

> "We may not be able to convert privatized bel-ew (watershed) back to 'communal' land but 'owners' must agree to convert and maintain it as part of the watershed and community protected area."
>
> "We need to strengthen our customary laws and further develop our indigenous knowledge systems on sustainable use."

The summit also presented a conceptual framework on comprehensive land use planning and other potential arenas of engagement through discussions on the UN Declaration on the Rights of Indigenous Peoples and the Indigenous Peoples Rights Act.

The covenant, signed by 63 leader representatives of all 12 barangays of Tinoc, called for action to "arrest environmental degradation and promote people's wellbeing." To carry this out, they identified socioeconomic projects their villages can undertake to (1) halt environmental deterioration (e.g., reforestation and delineation of community protected areas) and (2) increase food security through sustainable food production systems, renewable energy development and, where feasible, reviving and promoting innovations/development of traditional occupations (e.g., permaculture in rotational agricultural areas).

Some participants also recommended a popular version of the convenant for broader use and, should communities agree, for it to be used in municipal land use planning, in conjunction with the Ancestral Domain Sustainable Development Protection Plan and the Barangay Development Plan. The National Commission on Indigenous Peoples was tasked to lead an information and education campaign on the ADSDPP while the partnership volunteered to be a member of the secretariat for it.

The project then convened a forum to finalize the proceedings of the summit and to discuss implementation of identified socioeconomic projects, some of which the partnership committed to support. An information, education and campaign (IEC) and popularization of the Land Summit results and covenant were to go hand in hand with IEC on the ADSDPP, but the latter failed to be conducted as planned. Thus in August the partnership consulted community elders in pilot sites on whether they wanted to spearhead the IEC on the summit results and covenant.

On October 29, 2010 the Man-ili Leaders' Forum of the Lower Tinoc cluster was convened in barangay Tulludan. The forum gathered elders and leaders of the *man-ili*, a traditional mutual aid organization in a community. They discussed collectively the role of the Man-ili in planning and implementing concrete steps and programs to stop environmental degradation and promote people's wellbeing as called for by the covenant. Specifically the forum aimed to:

1. Share with and update the participants on the results of the First I-tinek Land Summit;
2. Deepen their understanding of international and national laws and conventions on indigenous peoples' rights;
3. Provide a venue for them to decide on the adoption of the covenant;
4. Enable them to initially assess the status of Man-ili and its capacity to spearhead the promotion and subsequent planning for implementation of the covenant.

The Man-ili Leaders' Forum was a turning point for the project. Where before it was the partnership that articulated issues and concerns based on the research findings, at the Man-ili forum community leaders themselves defined the problems that need to be addressed. Among these are the potential of their traditional knowledge and culture to solve environmental ills, weakening unity of communities, and cultural erosion due to religion. They also raised the need for the entire Tinoc municipality to unify on current land and resource issues to be able to resolve them based on a common understanding. Finally the Man-ili forum committed to incorporate the covenant in the plans of all farmers' associations in Lower Tinoc, with their implementation to be overseen by their leaders and elders.

Capacity Building

Through actual observations and processes of learning together, the project identified the following interventions for capacity building:

1. One is community organizing for people's empowerment to counter a widespread dependence on government. Many of the community people expressed a desire to do things for themselves. While seen as an immediate concern, it was only after a year that this

was seriously addressed but it was again disrupted by the May 2010 national election. Organizing gained headway by the third quarter of the year when four farmers' organizations were formed and elders' organizing was launched in the pilot barangays.

2. From the start, seminars and trainings towards a better understanding of traditional knowledge on sustainable resource use took center stage. This was intended to address the prevailing sentiment that the villagers no longer practice many of their traditional ways as they have embraced Christianity and modern farming methods. The trainings focused on the sound ecological bases of indigenous knowledge to check the declining confidence in traditional lifeways. These were largely successful as in three of the five pilot sites, the people immediately started revitalizing traditional farm practices, e.g., seed exchanges among women to retrieve traditional rice varieties, synchronizing activities in paddy cultivation, strengthening the *ubbo* system (labor exchange networks among different sectors for farm activities). The project further engaged four of the five communities in *in-situ* innovations in enhancing soil fertility by using indigenous micro-organisms and fermenting plants for foliar fertilizers.

3. The organizational and management aspect of the socioeconomic work was an on-the-job-training for leaders and members as they formulated their basis of unity and implemented small scale projects.

4. Training on advocacy and networking outside the community are continuing in informal fora. A more comprehensive seminar on it will be given as part of the planned land use planning activity.

Socioeconomic Work

To date, the partnership has implemented three projects. The first was the construction of the Wangwang Footbridge in July-December 2009. This project is the first of its kind in the community on four counts: best in quality and durability in the municipality, designed through collective discussion, implemented through an ubbo group and done through a collaborative effort of the people's organization and the barangay council.

The second project set up a blacksmith training center through the newly formed Tinoc Panday Group in collaboration with the local government unit. Blacksmithing is one of the traditional occupations in the area, but in the entire central Tinoc only one living blacksmith continues to practice it. As 53-year-old Daniel Binay-an declared,

> *It gives me great pleasure to be a trainor in blacksmithing. I thought I would not be able to transmit the skills I have. The project now gives me the opportunity to lead a more meaningful life, I can transfer my skills to others. As such, I will die a happy man.*

According to the Tinoc municipal government, people have continuously streamed into the blacksmith training center to have their tools repaired since it opened in August 2010. This also manifests the tradition of *kailala* in which people are wont not to waste but to optimize the use of every resource.

A third project was the establishment of the Inum-an Development Project launched on November 23. The *inum-an* is the rotational agricultural area or where shifting cultivation is practiced. Since time immemoria**l,** the inum-an has contributed much of the people's sustenance. Before rice terraces were built, these areas supplied rice, *camote* (sweet potato), legumes and vegetables. Up to this time, these continue to supplement rice farming, contributing more than 50 percent of the food needs of the village. However, inum-an management has to contend with 1) shorter fallow periods, thus decreased soil fertility and reduced productivity; 2) need for better soil erosion control as the environment becomes more

fragile; 3) growing population and limited land; 4) decreasing labor force and 5) the need for cash.

With the Inum-an Development Project, innovations for sustainable food systems can be showcased and food security enhanced. Specifically, the project aims to:

1. Support interested ubbo groups, with members of organized groups as a priority, willing to integrate innovations in their inum-an;
2. Provide learning venues for other members of communities for innovative technologies;
3. Increase productivity of the inum-an;
4. Contribute to increasing food security of project beneficiaries; and
5. Contribute to organizational funds to promote and develop sustainable food systems.

In closing remarks at the project launching, Tinoc Vice Mayor Agustin Calyaen declared,

> *I have been with NGOs and am knowledgeable on how they work, but with the very short time I sat down with you, I can already see notable aspects of the project we have just launched. One, in the educational portion, this project started talking about our very own traditional knowledge on inum-an management before it tackled new concepts and models of modern day sloping agricultural land technologies. Second, the project did not only provide the venue for learning but also the needed support for it to take off.*

Challenges on the Ground

While outsiders, we were confident that we would be able to adjust well, having a good grasp of the situation of indigenous communities; and being indigenous persons ourselves, knowledgeable on their dynamic culture. However, it took some time and a lot of effort on our part to be accepted and to establish rapport with the community people, mainly due to language and cultural differences. This slowed down the process in conducting the research but we were able to adjust and hurdle the gaps before the end of the first year. From then on, the project gradually but steadily gained momentum.

The challenges became clear as we familiarized ourselves with the dynamics in the area and deepened our research. In the process we became more confident in linking the local to the global context and in linking solutions to the development of traditional knowledge and lifeways. Government line agencies and more people became interested in the partnership's work. And the project's capacity to spread its sphere from the five pilot sites to the whole of Tinoc grew promising, especially when the Municipal Council proposed to upscale land use planning to a municipal level.

There was much optimism for the project until a military-induced disruption on November 13, 2009. On that day, four members of the insurgent New Peoples Army (NPA) were captured in Gumhang, Tinoc by a Philippine National Police contingent. While no exchange of fire occurred between the rebels and PNP, shots fired by the latter triggered the evacuation of about 300 people from Gumhang and Binablayan to Poblacion Tinoc. Many were accommodated by their relatives in Poblacion but a big number had to stay in the open gym. The partnership facilitated the entry of relief and medical missions on November 17-18 and November 27-28 respectively.

Our involvement in those missions was the start of a persistent military disinformation campaign. The partnership was accused of being an NPA front; and the project, a venue to recruit NPA members. As a result, some key personalities in the pilot barangays and in the municipality became wary

of the project. This affected the participation of community people in succeeding project activities. The Land Summit in January 2010 and the follow-up activity in March, while well attended, did little to dissipate apprehensions.

This problem became increasingly felt as the project progressed. At the Land Summit, the anticipated broad municipal participation beyond the four pilot barangays did not materialize. Prior to January 2010, our activities often had from 85 percent to more than 100 percent participation, but from January to July, lower numbers were noted. During this period, barely half of target participants attended two major activities, although community people had been enthusiastic in their planning and even requested for larger participation. The activities were a planning session for implementation of the land covenant and training on sustainable agriculture technologies. Moreover only 25 percent of invited people attended the Fifth Cross Visit of the Philippine Traditional Knowledge Network.

Igorot Peoples and Military Repression

The Igorots figured prominently in the struggle against development aggression during the Marcos administration in the late 70s to early 80s. The government then planned to build four megadams along the Chico River that would inundate several Bontok and Kalinga villages in Mountain Province and Kalinga. It also gave a logging concession to the Cellophill Resource Corporation covering 200,000 hectares, again in indigenous territories in Mountain Province and Kalinga as well as Abra. Threatened with displacement from their lands and traditional livelihood sources, the people waged a relentless protest until they were able to stop the operation of the logging firm and construction of the dam. This was recorded as the first successful protest by indigenous peoples against a World Bank project in the entire world.

While not as well known, the Kalanguya of Tinoc, Ifugao were also able to halt the logging operations of Heald Lumber Company in barangay Ahin. Awareness raising and organizing by the people's movement also contributed significantly to bringing an end to the rule of two political dynasties in the province.

These experiences and the need to address continuing development aggression, including the green revolution, became an inspiration to progressive individuals and groups, giving birth to peoples organizations, the biggest of which is the Cordillera Peoples Alliance for the Defense of Land, Life and Resources and for Self Determination. It further led to the establishment of non-government organizations in the search for mechanisms and strategies for pro-people based development.

Progressive and quick to critique and act against anti-people state policies, laws and programs, these NGOs and POs were identified with leftist radicals and targeted for red baiting. Military harassment intensified with *OPLAN Bantay Laya*, a military anti-insurgency campaign that led to extrajudicial killings and enforced disappearances of NGO and PO members.

Some barangays of Tinoc similarly experienced military repression during the Marcos dictatorship. Tukucan was hamletted, forcing some villagers to migrate to other barangays, while some residents of Binablayan were illegally detained and tortured by the military not only once but thrice during this period.

The low participation was initially attributed to election fever but in-depth discussions revealed that military members based in Tinoc had sought an audience with local government officials, especially at municipal peace council meetings where they spread disinformation about the project. Specifically they declared the project a front for recruitment by the New Peoples Army and project staff including local researchers as NPA members. These deceptions apparently affected participation by community people in project activities.

Weaknesses and Limitations

The project has identified certain weaknesses that brought about and may even have magnified some of the problems encountered. Also, several planned activities have yet to be implemented.

1. The partnership failed to clarify to concerned government line agencies from the start that being a signatory to the UN Convention on Biological Diversity, the Philippine government is obliged to implement CBD programs and to accomplish its 2010 biodiversity targets. Had this been made clear, perhaps the LGUs and line agencies would have stood up for the project, and the red scare avoided.

2. Even after noting that the National Commission on Indigenous Peoples failed to take the lead in unification processes, the project waited too long to act on this concern. The first initiative was convening an interagency body (church sector, line agencies, legislative body, other NGOs) to follow up recommendations of the Land Summit, but a meeting was never held. It was only in July that the partnership took decisive steps; it consulted elders in lower Tinoc, and in October the Man-ili leaders forum was convened which adopted and committed to implement the Land Summit Covenant.

3. At the start, the partnership worked with regular NGO facilitators rather than with local researchers. Thus it took longer to resolve language and communication difficulties and to build rapport with the community. In June 2010 it started working directly with community people. Proper orientation, clear instructions and close supervision were provided to the local researchers, and the pace of data gathering hastened. Moreover, they were better able to gather different views and feedback from different sectors in their communities which they reported back to the project staff. These helped improve methods and clarify immediate concerns to be acted on.

Summary

Being indigenous peoples ourselves, we were eager to get the work off the ground and to complete the project development phase in the first six months. We were granted community consent to undertake the project through a very democratic process on the fourth month but it was only on the 10th month that we made a breakthrough in getting the people's trust and cooperation. This was after they were able to discern that unlike other groups who look down on traditional knowledge, the project has a high level of appreciation and strong support for indigenous peoples, their knowledge systems and lifeways. The work continued to be slow but we were able to accomplish the following:

1. Facilitated discussions to show correctness and soundness of many of the traditional knowledge and lifeways. These resulted in people becoming more confident in their traditional knowledge and a revival of their agricultural practice of seed exchange and synchronous activities in rice production. Awareness raising for traditional knowledge appreciation has led to a campaign for cultural renewal and knowledge revival not only in the pilot sites but to a certain extent throughout the municipality;

2. Documentation of the Kalanguya's traditional knowledge, custom law and ecosystems approach;

3. Capacity building among leaders for promotion and innovations/development of traditional knowledge;

4. Recognition and action by communities to strengthen indigenous political systems partly through elders' organizing;

5. Commitment of support by barangay councils, government line agencies and the Tinoc Municipal Council to the project in terms of resource sharing in activities.

PART 2

Traditional Knowledge on Ecosystems-based Approach of the Kalanguya of Tinoc

Tinoc: Land and People

The Kalanguya are one of seven major ethnolinguistic groups who occupy the Cordillera administrative region. They trace their origin to *Tinek* (now Tinoc) in Ifugao province. Ifugao and the provinces of Apayao, Benguet, Kalinga, Abra and Mountain Province make up the Cordillera region, and together have 1,152 villages distributed in 78 towns.

The Kalanguya were largely an anonymous group to ethnologists, census surveyors and anthropologists who made the first inventories and studies of Filipino ethnic groups during the Spanish (1521-1898) and American (1898-1946) colonial periods (cf Resurreccion, 1999). They generally identify themselves as *Igorot* (from the mountains), a term referring to the upland peoples in the Cordillera region who live in scattered settlements mostly found between 500 and 2000 meters above sea level (MASL).[14] The Igorots resisted Spanish rule, thus preserving their cultural autonomy that marked their difference from lowland, hispanized Filipinos. Through more than 350 years of colonization, they persisted in their indigenous social organization, decision making, dispute settlement institutions and cultural practices. In comparison the majority of Filipinos were effectively colonized,

abandoning much of their indigenous culture and adopting those of the Spanish and later American colonizers.

Genealogically the Kalanguya are closest to the Ibaloi and Kankana-ey, the indigenous groups living in most of Benguet province (Lewis, 1992). They are called by these Benguet groups I-kadasan or people living in the *kalasan* (oak forest) or sometimes as Ikalahan, a name made more popular in the last 20 years by an American missionary.[15]

The original territory of the Kalanguya is Ahin, now one of 12 barangays of Tinoc municipality. Tinoc was originally called *Tinek* which conforms to the Kalanguya language that puts a stress on the second syllable. Tinek denotes the past tense of *tenek*, which means scooping water with a dipper or water container. In Ifugao folklore, tinek was the collective action the people took to try to save *Bugan*, the wife of legendary leader *Balitok*, who drowned in a pond paddy. Tinek was adopted as the name of the place to honor her and her generosity. Bugan is remembered for always giving much more than what was due to people who worked in her fields.

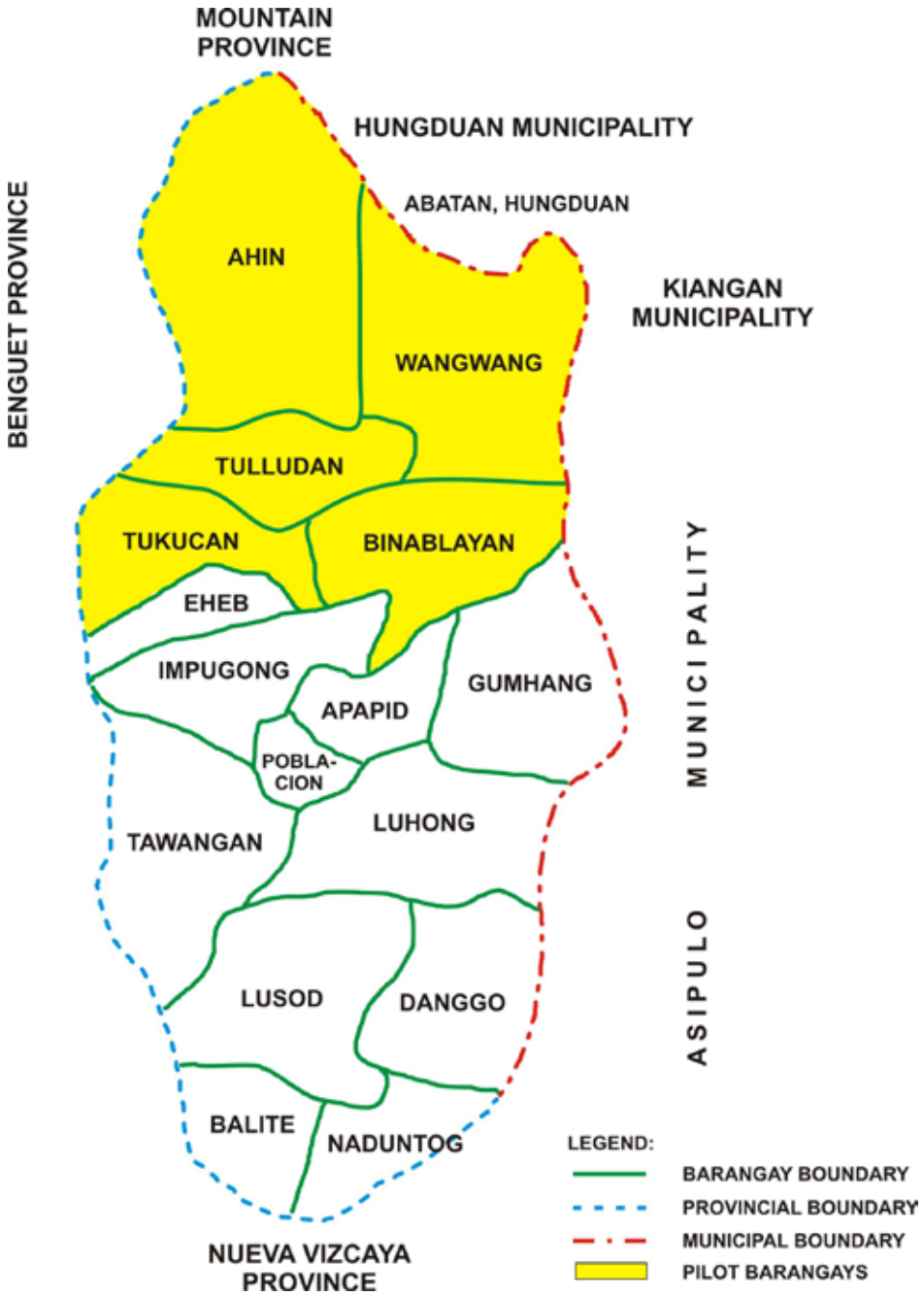
Among the three major indigenous groups in Ifugao, the Kalanguya are known as the most peace loving. They form the dominant group in Tinoc and have several sub-groups or tribes. These are the *Ipulyang* from present-day barangay Binablayan; *Ihaggud* from Wangwang; *Itabuy* from Luhong and Danggo; *Itinek* from Poblacion; *Ibangtinen* from Eheb; *Ikanawalan* from Lusod; and *Inangabulan* from Impugong and Tawangan. A few come from other tribes.

Formation of Communities

Most Tinoc communities were in existence before the Spaniards arrived in the 16th century as the Ahin rice terraces were already built by then.

The first Kalanguya settlements were set up along the River Ahin. These are Amun Pagey, Amkalew and Duntogto. From there, settlements expanded to Kalaban, Pulyang, Baliwangwang, Tabo, Pan-iblayan, Tumakguing, Ahin, Bayembeng, Tabuy and Tukucan.

MUNICIPALITY OF TINOC



Source: ADSDPP Tinoc

Today Barangay Ahin is the seat of Kalanguya culture. Its lower portion is a narrow valley following the Ahin River from northwest to southeast on one side, and on the other, a mix of valleys and mountains with moderate to very steep slopes. In Tukucan, a four-hour hike to the southeast, community formation followed the first wave of expansion, with its first inhabitants settling near a hot spring with moderately sloping areas. Having a much wider flat area and favorable irrigation sources, Ahin developed an elaborate rice culture, while Tukucan acquired a more sophisticated knowledge system in shifting cultivation with camote as the main crop.

The sparsely populated area allowed people to pick choice lands, creating dispersed settlements. Ahin extended to as far as Tulludan, a 1-hour hike from the main settlement area, and downward to Wangwang. The Kalanguya were joined in Wangwang by the Tuwali, another ethnolinguistic group in Ifugao found in the neighboring municipality of Hungduan. But eventually the area was dominated by the Kalanguya. The expansion towards Binablayan followed. According to a more than 70-year-old female descendant of one of the first three family settlers, Binablayan is only a hundred years old.

Migration

Several waves of outmigration occurred among the Kalanguya of Tinoc because of conflicts, war and epidemics.[16]

The first was in the early years of terrace building when headhunters from Ifugao tribes in neighboring villages attacked their settlement. The elders referred to this period as *tingpun bonkilew*, the time of turmoil or turbulent life, and the headhunting days as *bohol* (headhunters). The Kalanguya people did not put up any resistance and fled to more remote undeveloped parts, thinking they were only temporarily leaving their source of livelihood, well developed by then, and would return when the enemies had departed. But the invaders stayed, bringing over their families to the Kalanguya settlement. They tried to expand the terraces the

Kalanguya built but were themselves forced to leave when an epidemic caused many deaths among them. Fearing they had incurred the anger of the gods for attacking and driving the peaceful Kalanguya tribe out of their land, the invaders left. Some Kalanguya families returned to their homes but others who were afraid of the plague settled permanently in other places.

The second wave of outmigration happened during the construction of the Spanish trail. Originating from Tirad Pass in Cervantes, the trail passes through Benguet to Tinoc, Hungduan, Banaue and Aguinaldo in Ifugao and ends in coastal Palanan in Isabela. It is said to have been the escape route of General Emilio Aguinaldo after the battle with American forces in the early 1900s. Kalanguyas left Tinoc for two main reasons: they refused to do forced labor imposed by the Spanish colonial government to construct the Spanish trail and to pay taxes in the form of the yearly *cedula* (community tax certificate). People who could not pay the cedula were compelled to work with no pay for 40 days a year. It took more than 30 years for the Spanish trail to be completed. The Kalanguya who resented the forced labor policy migrated southward to contiguous portions of the provinces of Benguet, Nueva Vizcaya, Pangasinan and the hilly fringes of Nueva Ecija.

Another wave of migration took place during World War II when Kalanguya people evacuated to Baguio in Benguet. Those who remained in Ahin and Pulyang were reduced by sickness or became war victims. After the war many returned from Baguio and settled in the area now called Tinoc Poblacion. But not long after, an outbreak of *ham-al*, described as similar to malaria, struck which some people blamed on the bombs dropped during the war. As a result, many people again left and migrated to Nueva Viscaya. Lastly, when President Marcos implemented a homestead program, some of the Kalanguya took the opportunity to acquire new lands, migrating to Nueva Vizcaya, Quirino and Isabela.

Creation of Tinoc Municipality

Before the 80s, Tinoc was a barangay of Hungduan, one of Ifugao's first seven municipalities created in 1966. Tinoc became a municipality on March 16, 1982 with the approval of Republic Act 184,[17] and overwhelmingly affirmed by residents in a plebiscite held a year after.[18] The establishment of Tinoc municipality was an acknowledgment of the distinctive culture of the Kalanguyas in upper Hungduan from the Tuwalis in lower Hungduan. Today Tinoc, with 12 barangays, is one of the 12 municipalities of Ifugao.

Up to 1996 Tinoc had one of the remaining intact mossy forests in the Cordillera region. Its vast forest land is characterized by hilly slopes and areas where creeks, brooks and streams cascade to three main river systems. While supplying the water needs of residents, most of the water flows directly downstream to merge with other river tributaries, forming part of the headwaters of the Magat-Mallig-Siffu River (popularly known as Magat River) that supplies Magat Dam. Located along the Isabela-Ifugao border, the Magat Dam irrigates at least 80,000 hectares of farmlands in Isabela and parts of Cagayan and generates around 360 megawatts of electricity. It is the second biggest power contributor to the Luzon grid after Pangasinan's San Roque Dam.[19]

Tinoc is generally mountainous, marked by rugged and steep ridges with the highest point at 2,932 meters above sea level in barangay Tukucan while the lowest elevation is about 680 MASL in barangay Wangwang. Creeks flow in between mountains, serving as a vital irrigation source for rice fields and vegetable farms. The creeks form rivers that drain in Bambang in the neighboring province of Nueva Vizcaya.

Pilot Communities: a Profile

Up to 1996 Tinoc was the only municipality in the whole country that was not accessible by vehicle. In 2003 the road network was completed, opening the town through three entry points. However, some of the pilot barangays are still difficult to reach even today.

The barangays of Ahin, Binablayan, Tulludan and Wangwang are accessible through the Lagawe-Hungduan-Tinoc road by public transportation. People enroute to Tulludan however either have to wait in Wangwang for the few buses coming from Baguio (which take from 10-11 hours of travel), or hike three hours uphill. Up to the present no regular public transportation goes to Tukucan; one has to hike from 1.5 to 2 hours from Munsuyusoy.

All of the five pilot barangays have physical characteristics that favor agricultural production. The mountain ranges generally have sandy loam soil suitable to temperate crops and fruit plants, as long as irrigation is available in the summer season. Along the riverbanks and low-lying lands, the soil is clay loam, which indicates rich soil suited to rice and vegetable production.

Earthquake hazard zones from the Cadaclan River Valley traverse the Hapao Fault Zone and the eastern border areas of Tinoc. Young lahar deposits and hot springs are found in Tukucan, Tulludan and Danggo, another Tinoc barangay bordering Nueva Vizcaya, but the present generation has no experience or recollection of stories on volcanic eruptions.

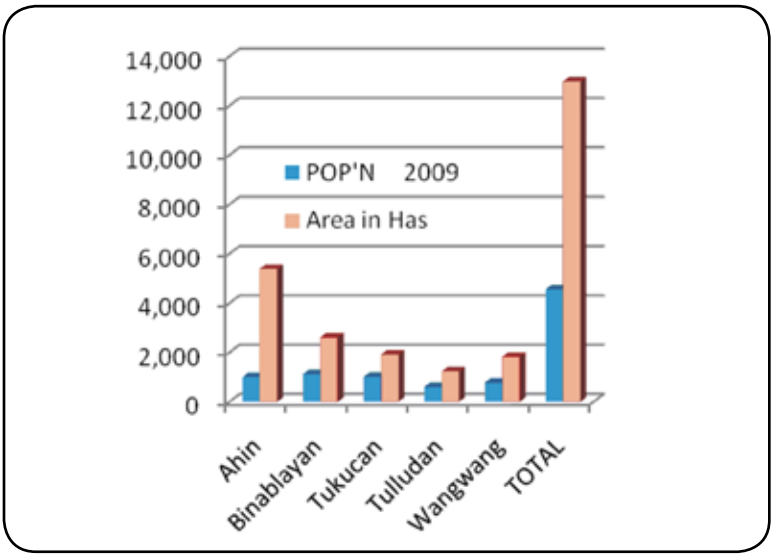
The five villages are generally sub-tropical, cool the whole year round with some warmer months from February to August and colder months from September to January. They have a long rainy season that starts in late May and ends in late February, leaving only March to April as dry season. The lowest temperature is experienced in the months of November until February while the hottest months are from March to May.

The local people in Wangwang and Tukucan have observed that from June to November, an easterly (locally termed *payos*) and westerly (*sese*) wind direction blows into the community. They claim that winds coming from this direction are stronger in velocity especially during the typhoon months from July to October.

Observations showed that almost all household clusters in the pilot barangays receive adequate sunlight from morning till afternoon, indicating the importance of sun exposure in house building. Tukucan usually experiences moisture-laden clouds engulfing the whole village in the early morning and late afternoon, causing the temperature to drop dramatically.

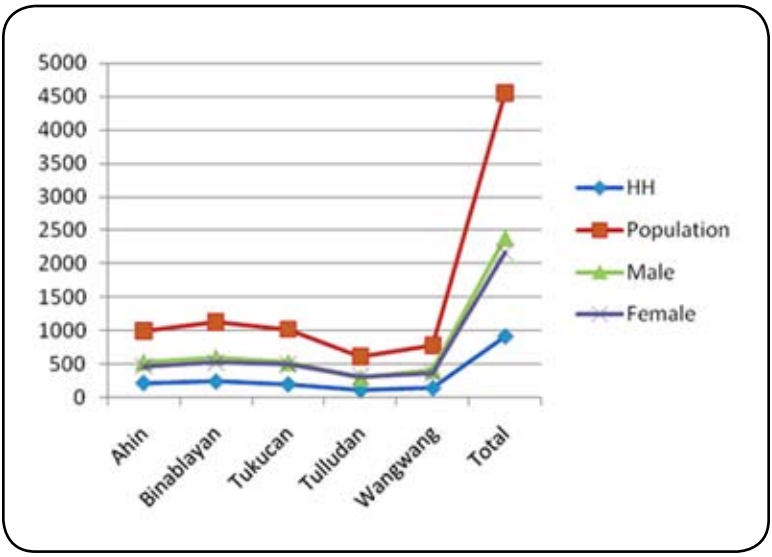
The five barangays make up 51.7 percent or 12,980 hectares of Tinoc municipality's total area of 25,119 hectares.[20] They have a total population of 4,558 distributed in 912 households with an average household size of five (2009 CBMS survey).

Figure 3. Population in Pilot Areas



CBMS February 2009

Figure 4. Household Population by Barangay and Gender



CBMS February 2009

Ifugao was among the 10 poorest provinces in the country until 2000. In that same year, the National Statistical Coordination Board (NSCB) estimated Tinoc to be the 23rd poorest municipality (NSCB Small Area Poverty Estimates) with still relatively high poverty indicators: 46 percent poverty incidence, 13.61 percent poverty gap and 5.47 percent severity of poverty.[21] This means that for every 100 people, 46 live below the poverty threshold or the computed amount required for every individual to meet his/her basic food and non-food needs in a year. The provincial poverty threshold was computed at PhP15,556 in 2006, which is the reference point for the table below.

Table 1. Poverty Threshold in Five Barangays

Barangay	Number of Households	Households below Poverty Threshold	
		Number	Percentage
Tulludan	112	80	71.43
Ahin	218	162	74.31
Wangwang	142	117	82.39
Tukucan	199	129	64.82
Binablayan	241	203	84.23

Tinoc CBMS 2009

Culture and Religion

A survey on ethnicity of parents in the five sites showed a general homogeneity; 92 percent are Kalanguya and almost all speak the Kalanguya language.

Table 2. Ethnicity/language spoken by Residents in Pilot Sites

Ethnicity	Ahin	Tulludan	Wangwang	Tukucan	Binablayan	Total	(%)
Kalanguya	192	73	103	176	97	641	92.10
Tuwali	12	5	3	1	1	22	3.16
Ayangan	1	1	1	0	0	3	0.43
Ibaloi	0	0	0	1	1	2	0.29
Kankanaey	12	6	1	7	1	27	3.88
Others	0	1	0	1	0	2	0.29
Total	217	85	108	186	100	696	100.00

MRDC-Tebtebba survey 2010

But today with access to radio, television and formal education, children at 10 years of age learn other languages such as Filipino (the national language) and Ilocano (the common language in the Cordillera region). Others are exposed to Kankanaey and Tuwali, the languages of neighboring villages, especially the former which many have learned to speak.

The Kalanguya believe they come from the same ancestors and the sense of kinship bonds them closely. They take it as a responsibility to help anyone in need and have developed the mutual aid system called man-ili. The system has no rules but adheres to accepted traditions where every able-bodied or at least one representative of a member household extends help to any member of the community in times of need such as house building, death, accident, wedding and other important family occasions. Assistance can be rendered in the form of labor, finance or materials (i.e., rice, wine) according to the household's means. *Balhan* is a traditional practice of passing the hat or soliciting for someone in need in times of serious illness, hospitalization, death, disaster, e.g., fire, among others.

This same cultural quality has made the Kalanguya devise ways of fulfilling labor requirements for specific tasks, e.g., regular farm activities, construction of communal irrigation, house building and the social responsibility to help victims of disasters (see box).

Before the introduction of christianity, the Ifugao people perceived the world as composed of the sky world, underworld, eastern world and western world inhabited by immortal and powerful deities who can perform miracles and give good as well as bad luck. They believe that souls of the departed can inflict illness and death among the living and that spirits reside in the different parts of the village. To communicate with them, the *mabaki* (traditional priest) performs rituals to determine the cause of illness, to appease the spirits who have caused such and to bring in good luck for a family or community. *Baki* is the act/performance of the traditional priest in communicating with the unseen beings usually accompanied by butchering of chickens or pigs. In Ahin, nearly half of the community still adhere to the traditional belief system.

Christian religions first came to Tinoc with the arrival of Catholic priest Fr. Silbano Castel in 1951 and American Lutheran missionary Pastor Juraine Hornig in 1960. These drew members from the Kalanguya community who adopted the new religious beliefs. Other religious sects followed thereafter, such as the Jesus is Alive, Assembly of God, Wesleyan, Jehovah's Witnesses and New Life Fellowship.[22]

Labor and Mutual Aid Systems

Ubbu is the formation of a partnership or group for labor exchange. A farmer renders service for another farmer for a number of days, and the latter in exchange is expected to do the same. The number of group members depends on the task to be performed. During harvest or transplanting, more people group themselves and go from one field to another owned by members.

Dangah entails helping a member of the community to do tasks that need more hands, like house building or constructing a rice terrace. The beneficiary prepares lunch for those who come to help, and for those who bring their own lunch, provides extra food.

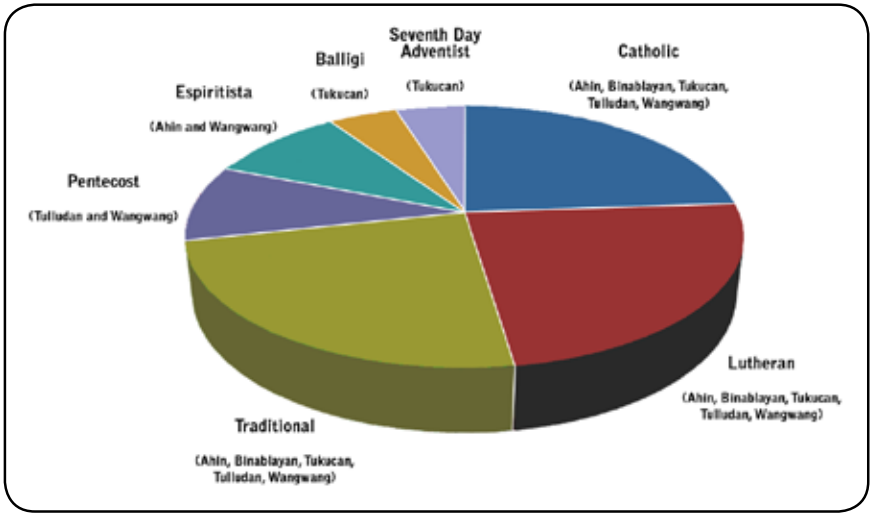
In *kedeng* a pig is butchered, and its meat distributed to those interested to do work for the owner of the pig. The meat is sliced equally and one slice is equivalent to one day's labor. Animals (especially pigs) are a traditional piggy bank. If a pig's owner does not have any ritual to perform, she/he announces that the animal is to be butchered and those who want to have some of the meat and pay for it through labor are given a share. This solves the problem of market outlet. It becomes a social obligation for the neighborhood to contribute their labor or buy the meat so they will similarly be accommodated when it is their turn to butcher their animal. This is also done when a carabao accidentally dies.

Lagbo involves the use of a pig or other animals to pay for labor/wage in the construction of rice terraces and/or irrigation.

Some of these religious groups however denounce traditional rituals, e.g., *timbal* (wedding), *keleng* (thanksgiving) and other ceremonies. This has greatly affected the unity and cooperation of the community on such occasions, decreasing the number of those who extend needed help. In the Man-ili Convention held in Tulludan in October 2010, man-ili leaders of Lower Tinoc and Barangay Tukucan identified religion as

one factor that has weakened their communities. They thus resolved to strengthen their mutual aid and cooperation and forewarned their members of the entry of a new religious group that requires its members to throw away all they possess for a certain period in a year.

Formal education was established in Tinoc in 1947 when a primary school building was erected; other primary schools were later built in some barangays. The Tinoc barangay National High School was opened in 1969; and in 1996 the Ifugao State College of Agriculture and Forestry was established. Literacy rate in the pilot areas is 82.07 percent.[23]



Land Use and Traditional Resource Management

Like other Igorot peoples, the Kalanguya of Tinoc live off the land. Where it was feasible, the rice culture was developed within terraced and stonewalled paddy fields even on steep slopes of more than 50 percent. Where the physical features limited terracing and irrigation was not available, sweet potato production using rotational agriculture was adopted. Rice and camote became staple foods, augmented by other crops both in irrigated and non-irrigated lands, which were

planted to diverse crops including legumes, vegetables, fruits, edible wild plants, mushrooms, weeds and fruits, as well as wild animals and fish from the forests and rivers.

Conklin[24] in his study of Ifugao society recorded eight intermediate landform types and listed in order of increasing agricultural involvement as: *mapulun* (grassland), *inalahan* (forest), *mabilau* (caneland), *pinugo* (woodlot), *habal* or *uma* (swidden), *latangan* (house terrace), *nailed* (drained field) and *payo* (pond field). A typical Kalanguya village has also eight land use and management systems that recognize four types of land ownership.

Forest land

Among the Kalanguya, forest land consists of the *bel-ew* or watershed and the *kiyewan* or woodlots. The mossy forests were characterized by the abundance of stunted trees, orchids, mosses, lichens, vines with dense undergrowth. Stands of dipterocarp are found in the warmer portions of Ahin.

Bel-ew. The watershed area covers the higher peaks of the *ili* or community/settlement and its integral parts are: (1) *along-ni-hebheb*, springs from which flow potable water; (2) *along-ni-danum*, an accumulation of many springs that flow down to the settlement for irrigation via the (3) *hayukung* (creeks and streams); (4) *dowengan*, area for hunting wild game; (5) *lingenan* for bird hunting; (6) *tawangan* specifically for trapping of migratory birds; and (7) *pehyew* or sacred sites believed to be dwelling areas of spirits. In the sacred sites human entry is restricted except when rituals are performed. It serves as a sanctuary for wild animals which, if sustained and maintained, ensures a gene pool for the community. People collect herbal medicines and edible plants in the watershed areas, but cutting trees and farm cultivation are strictly prohibited.

Kiyewan. Adjacent to the watershed are kiyewan or woodlots. These are the source of fuel and timber. For fuel, people usually cut only the branches of trees.

The kiyewan is traditionally the communal property of the community. But in recent years, the practice of *muyung* has become widespread, whereby a family assists in regenerating a cultivated swidden farm into a natural forest by planting choice trees and constructing permanent soil erosion control measures. The muyong system can be viewed from different perspectives: as a forest conservation strategy, a watershed rehabilitation technique, a farming system or an assisted natural regeneration strategy. By doing so, the family claims ownership of that forest land.

Forest Utilization and Conservation Measures

The watershed is open to anyone for collection of food and herbs and for hunting but burning, tree cutting and clearing an area for cultivation are forbidden. This had been the rule up to the 1960s. While there is no pronounced declaration, people also avoid entering sacred sites. These prohibitions are strengthened by the belief in *ba-u i kiyew* or *on-eheng* which says a person who cuts down a tree will become poor or will not progress in life. Moreover, people believe that sacred sites in the forest are dwelling homes of *anitos* or *bib-biyaw*, unseen beings who inflict sickness on whoever disturbs their habitat.

The mossy forest is protected by the people because it is classified as *along ni danum* or a source of water that supplies the rice terraces. The identified hebheb is the source of safe, potable drinking water for the community.

As Magno Dulawon, a recognized elder and leader in Wangwang, declared: "Our legacy from our ancestors is our love for the forest. Where there is a forest we protect it, and where there is none, we create one." He noted that what is now Wangwang and Binablayan (about 4,000 hectares) was once a pastureland of two Ibaloi *baknangs* (rich persons), Codiamon and Peken. The Ibaloi tribe was one of the more affluent groups in the Cordillera during the Spanish period, grazing their horses, cows and carabaos in open grassland. The Kalanguya who settled in Wangwang and Binablayan con-

structed ricefields and created shrublands and agroforests, and in their protected areas, mossy forests grew. At present, the vast grassland is not recognizable except in the humid dry steep areas (less than 25% of original 4,000 hectares grassland). In Ahin, about 1,000 hectares logged by Heald Lumber Company in the 70s have reverted to a forest (see box).

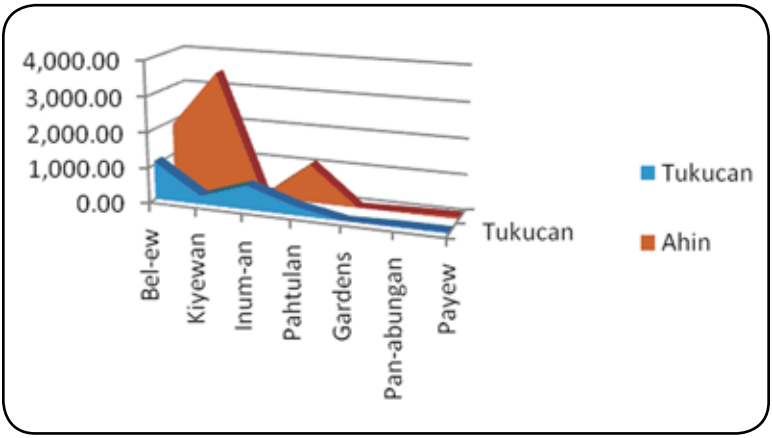
Protecting the Forest

While we do not have written rules, every member of our community knows that we do not cut trees in forests, especially in the bel-ew. And even in the kiyewan, which is designated as our source of fuel and timber, we do selective cutting; importing timber was not known to us. For our fuel, we cut the branches though we usually fell a whole tree during occasions like a wedding, death and kanyaw (prestige or thanksgiving) rituals. Thus the whole community of Ahin was disturbed when the Heald Lumber Company started cutting trees in its territory sometime in the late 70s. I remember people negotiated with the company to stop, but they did not listen. It was only when people resorted to violence, confiscating their equipment that the company stopped. A significant portion (about a thousand hectares) of the kiyewan was logged and that experience showed us that we had to fight for our rights.

Magno Dulawon

The Kalanguya's love of the forest and their conservation measures and sustainable use have enabled some of their communities to maintain a forest cover of more than 50 percent of the total land area of their ili. As seen in the following table, the forested areas in Ahin and Tukucan comprise more than 80 percent and 56 percent respectively of the total land area up to the 1970s. These figures are more than the ideal 40 percent forest cover prescribed by the Department of Environment and Natural Resources (DENR).[25] In Binablayan, Tulludan and Wangwang, forest cover was close to 50 percent of their total land areas before 2000.

Figure 6. Land Use in Ahin and Tukucan, 1970



Computed[26] estimate (number of hectares)

Table 3. Forest Cover in Study Sites[27]

Barangay	Total Land Area (in hectares)	Estimated Forest Cover (in hectares)
Binablayan	1,133	566.50
Tukucan	1,023	511.50
Tulludan	614	307.00
Wangwang	782	391.00
Total	3,552	1,776.00
Percentage of forest cover to total land area 50%		

Forest biodiversity

Mount Pulag National Park, which straddles three provinces including Tinoc, Ifugao, is a protected area covering approximately 11,500 hectares. Lying on the north and south spine of the Grand Cordillera Central Mountain Range, Mount Pulag is one of the Philippines' 18 protected areas identified as having high plant diversity. It is also the habitat of several threatened species of mammals such as the Philippine Brown Deer, Northern Giant Cloud Rat and Longhaired Fruit Bat.[28]

An inventory of the biodiversity of Mount Pulag in 1999 showed four types of vegetation: 1) a mixed vegetation of grass and scattered broad-leaved shrubs and trees (secondary forest); 2) at 1,200 to 2,200 MASL, a belt of open forest dominated by pine species, particularly *pinus insularis*; 3) between 2,200 and 2,600 MASL, a mossy oak forest; d) from 2,600 to 2,922 MASL, a unique forest of dwarf bamboo that looks like an open grassland from a distance. Mount Pulag boasts a rich reservoir of flora and fauna with 101 species of plants belonging to 22 families and 77 avian species.[29]

Flora and fauna identification in August 2009 by people in the project sites (focus group discussions) revealed even wider plant diversity than those listed by Boquiren. They named 120 species of seven plant families as well as 56 avian species, seven species of wild honey bees and eight species of animals in their forests.

Table 4: Number of Plant and Animal Species identified by Community People in Project Sites

	Number Identified
Plants	120
Grasses	18
Vines	12
Ferns	4
Shrubs	13
Herbs	8
Trees	45
Wild Mushrooms	20
Birds	56
Migratory Birds	8
Endemic Birds	48
Honey Bees	7
Wild four-legged Animals	8

This attests to the richness of the people's knowledge of their territory's biodiversity. This is generally high among middle-aged adults.[30] They learned how to identify and use

forest plants and animals as they participated in hunting and gathering in the forest, with their father usually naming what they brought home. Sadly the same knowledge is low among the young generation or those below 25 years old.

In terms of uses, all birds and animals the local people identified are sources of food. Of known shrubs, grasses, ferns and mushrooms, 37 are also edible; 29 are medicinal with specific uses; nine can be used for handicrafts and four are needed in house building. Trees are generally for fuel, lumber and tools, and the people generally know the best tree to use for a certain purpose.

Table 5. Number of Plants identified According to Use

Use	Number of plants
Food	37
Medicine	29
Handicraft	9
House building	4

Traditional Hunting

While there is no particular season for hunting, almost always men engage in this activity after farm work in the rice paddies and inum-an has been completed. They hunt animals with the use of various traps and devices. The *tegdey/ipit* is a piece of rock or wood tied to a tree or sticks suspended above ground that is released to hit a passing animal. Other means are the *bito*, a hole dug in the ground covered with plants and topped with food to trap wild game, and the *pahul* or spear. Hunters are adept in reading the tracks of wild animals, their sources of food (e.g., lizards feed in *alumit*) and their waste, which they locate to determine where to set up the tegdey/ipit and bito. Some hunters also use hunting dogs and a rifle or arrows to pursue and catch wild game. Selective hunting is employed; pregnant or thin nursing animals are spared.

Lingen and *tegdey* are the most common ways of catching birds, which requires a good knowledge of the weather since different flocks arrive in different seasons. *Akik*, the use of lamps or lighted *haleng* (pithwood), and *tawang*, a clearing in the forest where nets are set up, are done at night and during the coldest season of the year when flocks of migratory birds pass through. Using a net, farmers and hunters catch the birds for food.

Hunting is guided by traditional practices and beliefs to prevent accidents or untoward incidents from happening to hunters. For instance, the *ta-ang* is a ritual they must perform in the hunting area in return for the animals they captured. *Hah-lat* is another ritual that portrays their belief in the transformation of the hunted animal into other animal forms. Chickens are commonly used in these rituals.

Pastureland

Open grazing lands of the *naduntog/pahtulan* are moderate to steep sloping areas covered with grassland, some parts of which have trees. The pastureland is a distinct land use maintained as grasslands for ruminants like horses, carabaos and lately goats. This is observable in Central Tinoc (clustered villages of Impugong, Poblacion and Ap-apid). But in the past, pasturelands apparently were not maximized by the Kalanguya, as some elders associated these areas with wild horses and cows abandoned by their Ibaloi owners. The use of carabaos among ricefield owners was also common before World War II but these were left behind when people evacuated their villages. Lower Tinoc at that time apparently became a refuge for Japanese soldiers who harvested the rice and butchered the water buffalo; no carabao remained for those who returned after the war.

Up to this time, the use of the carabao has not regained its popularity. Former grasslands are now gradually being invaded by shrubs or converted into farmlands in the study sites in lower Tinoc including Tukucan. Given a source of water, these areas can transform into agroforests.

Inum-an or Rotational Agriculture

All around the mountainous areas from the foothills to as high as 1,800 MASL and with slopes ranging from 25 degrees to 85 degrees are *inum-an* areas where swidden[31] farming can be done by any member of the community. The inum-an is a non-tillage cultivation of diverse crops in sloping areas dependent on rain for irrigation with features of soil fertility maintenance, soil erosion control measures and land use optimization. It has sustained generations of people and has persisted to the present despite being blamed as the main culprit for deforestation.

In lower elevations, crop cultivation starts with rice. After transplanting the rice plants, farmers clear an area for a swidden. They cut the brush and small trees but leave larger trees, creating a parkland scenery of cultivated and fallow swiddens dotted with single trees. Trees retained in swiddens are a conscious action to preserve "tree seeds" in order to assist regrowth of the forest.[32]

The inum-an is planted to camote as the main crop, as it is a staple and main food for both people and domesticated animals, specifically pigs. Camote is rotated with corn and legumes, and the fringes of the inum-an are planted to cassava, different kinds of legumes (e.g., *kaldih*, *aggayap*, *atab, aknaban, utung, bulhi*), Chinese cabbage, mustard, onions. Some villagers claimed that before the construction of rice terraces, the warmer areas were also planted to upland rice, which until now Barangay Danggo cultivates.

Up to the 1970s, inum-an areas were communal lands of the tribe. Many indigenous peoples in the Cordillera believe there must always be lands held in common so that no person is deprived of a source of sustenance; for as long as one is willing to work the land, no one will go hungry. This is so with the Kalanguya, but they recognize the right of prior use of the family who first opens the inum-an area for cultivation. Hence, if one is interested to farm it, s/he should seek permission from the first user, and such requests have always been readily granted.

Inum-an Tecnology

When February comes around signaling the start of summer, the onset of *hij-uma* or preparation of the inum-an ensues. The transplanting of rice plants would have been completed, and women take over the home front from their husbands, freeing them from the care of small children. This is the time when male members of the household scout for a good place to do *uma* or swidden cultivation. Forested areas are known to be the most fertile, but shrub lands are preferred as work there is much easier. The shrub land was the choice for rice cultivation while cane grass areas were considered good enough for planting camote, as these could yield as much as the former. After selecting a plot, the farmer does *gahat,* clearing a portion of the area, usually on the lowest part. The gahat gives the sign that the area is reserved.

Preparing the inum-an takes place after the *kulpi*. Three to five men form ubbo groups to clear their inum-an plots by slashing the vegetation, leaving some trees to serve as a trellis for climbing plants. The cleared vegetation is spread over the land to dry and burned just before the first rain. The Kalanguya traditionally burned all cut grasses and trees to help soften the soil and ensure healthier plants. Just before the first rain arrives, farmers would already have burned the area. While waiting for the cut vegetation to dry, some men go out of their villages to look for alternative sources of living such as trading or wage labor. The men left behind gather honey, crabs, frogs and fish in the river.

Prior to planting, *ngap-ul* is done where all unburned and remaining debris are gathered for a second burning. The ashes are spread over the land, which is then ready for planting. Controlled burning is ensured by *kinkin* in which surrounding areas are cleared to create a firebreak and the same is done around trees they want to preserve within the swidden.

Usually swiddens are planted to corn intercropped with legumes, which have shallower roots than camote. When the legumes sprout, often at about the same time that around three to five leaves of corn have come out, the camote vines prepared 3-5 days earlier and covered with dry grass is

planted. The method and period of preparation strengthens the camote stem so as not to be brittle, and root development is enhanced, ensuring more tubers to be formed.

Soil erosion control is also part of the inum-an technology. Unburned big plant materials (*bangen*) such as logs are strategically placed on slopes to minimize soil run-off. This is combined with *gengen* or uprooted camote vines during clearing and weeding of the inum-an. The vines are coiled and lined up vertically in slopes, with half being buried to decompose and the other half left above ground to form humps. The buried part serves as green manure and the part sticking out from the soil serves as soil catchment to prevent topsoil from running down the mountain slopes.

Four to six months after the camote is planted, the first tubers can be harvested called *bun-hi*. The biggest tuber is taken and in the first harvest, only one is taken per camote plant. *Baka* is the regular harvesting thereafter, done every two to four days depending on the size of the family and the number of pigs to be fed. Women usually carry a load of 30 to 40 kilos of camote with every visit to the inum-an. The replacement of camote plants is done in a staggered manner to ensure the continuous supply of camote tuber from the same unit of land for a period of two to three years.

After two years of providing a continuous supply of camote, the final harvest is performed with the *lihad* where all remaining tubers are dug up and all camote vines are uprooted (*laklak)*. Together with grasses and weeds within and around the vicinity of the inum-an, these are buried into the soil to serve as green manure for the next crop. The land is then planted either to camote of different varieties from another field, again with legumes and corn, or to ginger or pigeon peas. If planted to camote, another 2-year camote cycle with diverse plants on the fringes is repeated. After the second final harvest on the fourth year, the land is left to fallow. Ginger and pigeon peas are left on their own with irregular checking for ginger, which is harvested in the second year. Pigeon peas are harvested yearly and cleaning is done to maintain the land.

A normal inum-an is planted to about 15 to 20 food crops, and six varieties of camote are usually intercropped in the same area. Since camote vines grow to completely cover the ground, legumes and corn are planted first before the camote. Other crops such as pineapple, sugar cane, vegetables and legumes are planted on the periphery.

The practice of rotating and intercropping various crops is also done in the *bangen*, a smaller version of the inum-an near the homesite, especially in backyards or lands surrounding the three sides of the house.

Before the 70s, long years of fallow (more than 10 years) were observed before a swidden plot was reused. Called *kabukab*, the abandoned land is cultivated and replanted. Kabukab, which is resorted to when no better sites are available, is now being done more frequently.

Table 6. Crops commonly grown in Inum-an

Camote	11 varieties
Spices	garlic, ginger, onions, leeks
Legumes	cowpea, pigeon pea, beans
Other rootcrops	cassava, taro, yam
Fruits	pineapples, bananas
Vegetables	pechay, mustard

Payew

The *payew* is the irrigated pond paddy field carved out and stonewalled on mountain slopes where irrigation is accessible. A rice field includes the *budu-han or* first paddies that get irrigated, *teneng* or dikes that hold the water within the field, *labah* or stonewalls that make the field walls sturdy, *guhingan* or entry and exit points of the irrigation water, *taban* or a dry area within the rice paddy, *lidah*, unirrigated space at the base in a corner or above the rice field that can be planted to vegetables and fruits and camote, and *waklitan*, peripheral parts of the paddy field.

The payew provides not only rice but also a source of protein (e.g., mudfish, snails, frogs) and edible weeds which any member of the community can collect. Rice was once rotated with a variety of vegetables like onions and legumes when *tinu-ul* was practised. The tinu-ul entails forming mounds from a mixture of soil, rice straw and weeds within the paddy (many mounds are made) and planted to non-aquatic vegetables. In the Kalanguyas wet rice cultivation, the land preparation system of the majority can be considered non tillage, as rice stalks are trampled by foot into the soil.

The payew are privately owned lands by virtue of the construction of stonewalls, which are permanent improvements on the land. Collective labor is employed to construct both the irrigation canals (*dang-ah*, working together for the common good) and rice paddies (ubbo). While rice paddies are privately owned, irrigation canals are owned communally. *Alang* or rice granaries are built near rice fields to save on labor in hauling the rice harvest.

In Ahin, Wangwang and Binablayan, rice paddies are well developed and grouped together, and clusters of homesites (4-6 *sitios*, smaller units than the barangay) still retain the typical Ifugao settlement (*bobleh*) pattern of 1-3 households. These three barangays have more rice paddies than Tulludan and Tukucan, rice being the main staple supplemented by swidden camote.

Ahin has vast, impressive stonewalled rice terraces—of 4-8 feet paddy fields, 8-16 feet stonewalls—completed two generations ago. Rice fields were built through labor exchange groups, each field having a distinct owner. The irrigation canals were also built through the collective work of all rice field owners who use them. While potential areas are still available for rice field expansion, building of new paddy fields stopped two generations ago. According to Ahin elders, their rice terraces were erected by their grandfathers and they themselves have not done any terrace building. In Wangwang, this ceased 10 years ago, as almost all available land for rice production has been used. The study was not able to get similar information in Binablayan and Tulludan.

Irrigation canal construction was also done through collective work. All rice field owners were required to render labor until the canals were completed, making them communal and collectively owned. The irrigation canals have not been upgraded since they were built.

Distributing water depends greatly on the flow and volume of water, and for fair distribution the *giti* system is used. Depending on the volume of water, appropriate sizes of wood or stones called giti are placed in diversion canals. These regulate the flow of water and if undisturbed, all will have irrigation. If the wood or stone is moved, it means someone has diverted more water to his ricefield.

To maintain irrigation canals, regular *bulubul* is done wherein more soil is placed in irrigation dikes and along the canal to plug leaks to minimize water seepage.

An ubbo group of Kalanguya women transplanting rice seedlings in Ahin.

Activities in Rice Production

After the rice harvest is safely stored in the rice granary, farmers await the flowering of the *pullet* and *bunyakaw* plants, which coincides with the arrival of the *ahib* and *aladog* birds. This happens around late August to early September and signals the start of work in the irrigated rice fields. Women start cleaning the fields, cutting grass and reeds starting on the higher peripheral areas. All weeds are put into the pond field and, together with rice stalks, mixed into the soil to decompose *(deynek)*.

Deynek is done by both men women. While women are clearing the ricefields, the men clean and repair the irrigation system (*hipawa tan hihudun alak*) to allow the water to flow freely into the rice paddies. During this time, the *hiyet* birds arrive to feed on matured *beket* fruits. This is followed by an inventory and exchange of rice seeds among the women and fixing of the *palay* seed beds by both men and women.

The drying of the *bunyakaw* plant is generally accompanied by strong typhoons. Thus activities in the rice paddies slow down until the coming of the *killing* bird around the month of November, which signals the end of the typhoon season. During this time, women soak rice seeds in panicles called *binatol* for three days. These germinate in three days and are transferred to the seedbed, *hi-hapnak*, where germination continues. The men start to fix the dikes (*menneng*) with the use of long spades (*gaud*). *Titik* birds also arrive and farmers catch them for food (*hi-tegdey ni titik)*.

After the general cleaning of the fields (*hillamon*), the paddies are plowed and leveled (*hi pitew di payew*) to ready them for planting. When the seedlings mature, these are transplanted (*hibgay*) to the paddies, usually about six inches apart. The time after the transplanting is over is called *hibbakla*.

By February (*kulang i-egew* or onset of summer), the hiyet and titik birds take their leave. By this time weeds would have grown, and *kagawkaw* or weeding is done within the paddy pond to remove competitors for soil nutrients and to replace dead or stunted seedlings. At the same time, surroundings of

the rice fields are cleared (*waklittan*) to prevent rats from eating the rice plants. Farmers also weed the dikes, clean stonewalls and look for rat tunnels, plugging holes with bundled grasses to prevent the pest from coming out.

By the time the grains start to mature in late April, farmers prepare scarecrows for the *maya* (rice birds) which feed on the young soft grains. In this season called *hi-adug* (drive away), scarecrows (*tatakut*) are constructed in the rice fields. On the first day of construction, the rice field owner guards the dikes to prevent animals and other people from passing through the fields. Bamboo clappers (*iwad*) on posts are strung across the fields, making loud noises when the strings are pulled. *Altib* (wooden trap), *bantok* (tie wire trap), and *tal-ong* (stick knotted at the end) are utilized to catch rodents that savage the crop.

When the grains ripen, in the season called *hi-ani*, groups of harvesters of men and women through ubbu go to each field to reap the rice grains. A few among them choose the best from the ripened palay to be stored for seedlings (*binatol*). A *gamlang* (hand reaper) is used to cut the rice panicles, and one or two men gather and bundle these with thin strips of *alinew* (bark of a tree).

Farmers dry all the harvested palay before keeping them in rice granaries.

Right after harvest (around July), adolescent boys spread out their *ube* (woven bamboo container) to trap mudfish, leaving it in the pond field in the night to be collected in the morning.

Table 7. Division of Labor in Rice Production

Activities in Rice Production	Gender Role		
	Male	Female	Both
Clearing weeds around rice field		✓	
Incorporating weeds, rice straw into the soil			✓
Cleaning, fixing irrigation systems	✓		
Seedbed preparation			✓
Preparing rice field, cleaning			✓

Seed sowing		✓	
General cleaning of surroundings		✓	
Strengthening dikes, repairing stonewalls, leveling soil within paddy	✓		
Transplanting seedlings		✓	
Irrigation and crop monitoring			✓
Removing rice weeds		✓	
Cleaning stonewalls and destroying rat habitat			✓
Cleaning field surroundings			✓
Guarding young grains against maya birds			✓
Harvesting			✓

Following nature's signs and doing the work collectively results in synchronized activities in the fields, which helps prevent pest build-up. The simultaneous harvesting of rice cuts the food source of pests, killing or weakening them.

The division of work in traditional rice production is based on certain criteria. Men usually do the work that needs more physical strength and women do the more meticulous work of cleaning stonewalls and weeding rice fields. Irrigation canal repair is done exclusively by men while rice transplanting is the women's domain. Except for these, men and women share most of the work in rice production.

The rice fields generally supply the rice needs of the community for six to eight months (2009 interview). In Tukucan very few households can harvest rice as the main irrigation system destroyed by the 1990 earthquake has not been repaired.

Twenty-one rice varieties were recorded in Tinoc: four are traditional varieties and the remaining 17 (*kintoman, balatinaw, galong*, etc.) were acquired from other areas; two (called Oakland and California) were introduced during the promotion of "miracle rice." All of these have adapted to the environment.

Food Availability

The traditional calendar of activities shows the season for the different work in different parts of the ili that provide the community's needs. Rice production takes the bulk of yearly labor allocation followed by work in the inum-an, and the rest of the time is spent for house construction and repairs, hunting, fishing, handicrafts, barter, repair of communal irrigation, cleaning of pathways; or in short, maintaining the ili.

Such a design allows for labor exchange network building and for people to be in common areas at the same time where knowledge in resource management is shared.

In the study areas, the season of plenty under the traditional subsistence production system falls from July to December with September as the peak when almost all foods are available. The staple food is still available in January and February, but a supply shortage starts to be felt in the succeeding months from March to May.

The calendar (page 62) does not reflect the time when families have to maintain three camote farms planted at different times to be able to have a continuous supply of this tuber.

By making camote available the whole year round, the above calendar of food availability can be applied to all five study areas (except for rice supply in Tukucan which for a few families at present can last only for three months). Honey, mushrooms and wild fruits have markedly decreased and near to none in Tukucan and Binablayan.

Table 8. Calendar of Activities

Major Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rice production												
>> preparation	✓✓									✓✓	✓✓✓	✓✓✓
>> transplanting	✓✓✓	✓✓									✓✓	✓✓✓
>> crop maintenance		✓✓	✓✓	✓✓	✓✓							
>> Harvest, storage						✓✓✓	✓✓✓					
>> Tinu-ul cultivation									✓✓	✓✓		
Inum-an Activities												
>> Clearing			✓✓	✓✓								
>> Burning				✓✓	✓✓							
>> Planting					✓✓							
>> Maintenance								✓✓				
>> Harvest	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fishing												
>> in ricefields						✓✓	✓✓	✓✓	✓✓	✓✓		
>> in rivers		✓✓	✓✓									
Hunting												
House building			✓✓✓	✓✓✓	✓✓✓							
Seasonal wage			✓✓✓	✓✓✓✓	✓✓✓✓				✓✓✓			

Table 9. Food Availability

Food Type	Month Available											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Fruits					✓	✓	✓	✓	✓	✓	✓	
Rootcrops	✓	✓							✓	✓	✓	✓
Vegetables	can be available whole year round, abundant in June, July, August											
Corn								✓	✓			
Rice	✓	✓					✓	✓	✓	✓	✓	✓
Wild mushrooms									✓	✓	✓	✓
Wild fruits							✓	✓	✓	✓	✓	✓
Honey						✓	✓	✓	✓			
Migratory birds									✓	✓	✓	

Traditional Occupations

People in the study sites engaged in a great variety of occupations in the past. Twenty-five traditional occupations were recorded including hunting, food gathering, food processing, farming, fishing, pottery, bamboo weaving, barter, salt making, sugar cane processing, stonewall construction and broom making. Except for blacksmithing and weaving, raw materials required for these occupations were found in the community. Farming, food gathering and food processing (fermentation, wine making) involved more than 75 percent of the household, and pottery, blacksmithing, hunting were considered special skills which involved only a few.

Instead of being developed, some traditional occupations were abandoned. Salt making was the first to be dropped. Salt, the people's first barter product, was extracted from salt water taken from a natural spring in Ahin and Tukucan and cooked over firewood. But as the process required a lot of fuel wood, it was discontinued when salt from the lowlands reached their villages.

Household engagement in many of these occupations also lessened due to economic and environmental factors. A declining forest cover affected food, mushroom and honey gathering and wild game hunting. Though most males used to join hunting expeditions after farm work, hunting is now done only by a small number, as many in the labor force opt to work outside the village to earn cash. The forest decrease in Ahin, which started with Heald Lumber Company's logging operation (which logged about 1/3 of the forest) reduced wild game. This later worsened with inum-an expansion and extension of permanent commercial vegetable farms into forest lands in Tukucan, Tulludan and Binablayan.

Stonewall construction in Ahin stopped about 60-80 years ago although potential areas for rice field expansion still exist. Maybe the need to expand has not been urgent. With the series of migrations and evacuations during the headhunting period, World War II and government homestead program, population growth has been slow. Table 10 shows the number of people practicing traditional occupations to date.

Table 10. Traditional Occupations and estimated Percentage of Practitioners

Local Term	English Term	Estimate % of Practitioners		
		75%	50%	25%
Manduwengan/linnen	Hunting			✓
Mang-lan makan	Food gathering		✓	
Mangalan Linnawan	Honey gathering			✓
Manpahtul	Raising ruminants			✓
Man-inum-an	Rotational agriculture	✓		
Man-payew	Wet rice farming	✓		
Man-amag hi banga/Layewan	Pottery	No longer practiced		
Laga/katih	Bamboo weaving			✓
Abel	Cloth weaving	No longer practiced		
Manpakan	Pig raising		✓	
Manmegmeg	Poultry raising		✓	
Man-amag ni hagid	Broom making			✓
Ladit	Blacksmithing	Recently revived by project		
Mem-beng	Fermentation		✓	
Man-kiwa	Food fermentation		✓	
Man paut	Woodcarving			✓

Man-amag ni ahin	Salt making	Not anymore		
Mangudingan	Fishing in river		✓	
Mangubel	Fishing in paddy			✓
Makihihnalat	Barter			✓
Mantuping	Stonewalling			✓
Mangaldin	Vegetable farming	✓		
Mangamag ni Muyung	Forestry		✓	
Mandapil	Sugar processing	Not anymore		

Productive fishing is only done in Ahin today. The Tukucan-Wangwang River, which passes through Wangwang and Binablayan, is heavily silted throughout the year. This has been its state since 2003 due to erosion and soil runoff from the road and vegetable farms. Fish in rice fields have significantly decreased with the introduction of the golden snail.

Of the 25 traditional occupations, four are no longer practiced: pottery, sugar making, salt production and weaving. Hunting, honey and mushroom gathering, fishing, broom making and bamboo making have declined.

Trends and Challenges

Changes have occurred in the five Tinoc barangays. When the local people were asked at the start of the study if changes had been positive for them, their immediate answer was "Yes". The common reasons were that they no longer had to hike long distances with the coming of the road, more children were going to school, and they did not have to perform rituals and need not eat camote every day of their lives.

A year after the first interviews were conducted, the data gathered showed more deep-seated changes in land use and management.

Decreasing forest cover and biodiversity

The big change came with the entry of commercial vegetable production (further discussed in the next chapter). The road network was extended to interior Tinoc in 2003, which hastened farm expansion into forestlands as communities gained more access to markets. Farmlands encroached on forests and watershed areas, with 35 percent of Tukucan's watershed being lost to farms. By 2009 the following estimated decrease in forest cover was recorded.

Table 11. Estimated Forest Land Area Converted to Vegetable Farms

	Area (ha.)	Percentage Decrease
Tukucan	390	35%
Binablayan	300	50%
Ahin	160	08%
Tulludan	150	50%

While biodiversity may still be rich, some plant and animal species are diminishing in number. Villagers in the study areas claimed that certain flora and fauna have disappeared from their forests although these can still be found in other villages of Tinoc; the identified biodiversity is down to 20 percent and for certain species, even as low as two percent of its number in the 1970s.

The opening of vegetable farms in Tukucan and Binablayan, just like the road construction, has contributed to heavy siltation in the Tukucan-Wangwang River. The river is murky all throughout the year, and some fish species have disappeared. In Tukucan two out of the seven streams have dried up.

Another threat to forest biodiversity is the coming of the chainsaw. Some chainsaw owners sell lumber and its use is expected to increase the exploitation of pine tree stands. While this violates customary law that prohibits cutting trees for sale, this however has not been deemed an issue in Tinoc.

In the same vein, the introduction of guns in hunting, which was the first notable change in forest resource management, has enabled gun owners to hunt more and to sell game meat. The popularization of guns around the 80s came at a time when people were starting to feel the increasing need for cash. With this development, most hunters gradually abandoned the obligation to share their hunt and were more inclined to sell it. In the traditional way, hunters usually hunted in groups with non-destructive devices and adhered to the general season for hunting.

Also, while medicinal herbs still abound and people still know their medicinal value, these are rarely used. People now rely more on hospitals and western medicine, and this is increasingly taking up a bigger chunk of their expenditures.

Vanishing inum-an crops

Farm productivity has markedly declined in both the payew and inum-an. Respondents estimated that harvests have lessened by about one-third to one-half of what they were 50 years ago. They traced this to soil fertility depletion and increase in pests, blamed on weakening traditional management of farm lands, synchronized activities and collective labor.

While the communities of Ahin and Wangwang have been able to keep most of their inum-an and continue to cultivate these, Binablayan and Tulludan have started converting them to commercial vegetable farms. The worst case is Tukucan. About 90 percent of its inum-an lands have become monocrop vegetable areas, even extending to forest lands and front and back yards of house lots. The villagers are now greatly dependent on these vegetable farms for their livelihood.

The gradual disappearance of the inum-an means the gradual disappearance of crops grown in these areas. As the elder and leader Ama Biaw lamented the vanishing inum-an:

> *I know that my villagemates solely depend on the money they get from the sale of their produce from vegetable gardens. I also know well that more often than not, the price of vegetables fluctuates. Now that we don't have our inum-an, where do they get their food? While life was hard in the past, we did not experience a situation where we could not produce food for a meal. We always had our camote.*

Camote has been replaced by rice as the main staple. The widespread notion is that commercial vegetable production has brought a better quality of life, as people can eat more rice unlike in the past when camote was the staple. Viewed

as an inferior crop and a poor man's diet, the bias against camote may also have stemmed from formal education. When a student does poorly in school or does something the teacher disapproves of, s/he is sometimes told: "You are good for nothing so better go and plant camote (instead of attending school)."

Yet in truth camote has a far richer nutrition content.

Camote farm in rotational agricultural area.

Table 12. Nutrient Content/Chemical Composition of Different Rootcrops

Tubers	Camote		Cassava		Gabi		Yam		Irish Potato	
	Fresh	Dry	Fresh	Dry	Fresh	Dry	Fresh	Dry	Fresh	Dry
Dry matter	30.0	100.0	35.0	100.0	26.0	100.0	25.9	100.0	19.0	100.0
Ash	1.1	3.7	1.1	3.1	1.2	4.5	1.1	4.2	1.0	5.3
Crude Fiber	.9	2.9	.9	2.7	.9	3.6	1.4	5.7	.5	2.3
Protein	.9	2.9	.9	2.1	1.5	5.7	2.0	7.9	2.6	13.6
Calcium	.03+	.10+	.06	.16	.04	.14	?	?	.10	.03
Phosphorus	.04+	.15+	.07	.19	.07	.25	?	?	.08	.41

Leaves	Camote		Cassava	Gabi leaves	Gabi stems
	Fresh	Sun cured	Sun cured	Fresh	Fresh
Dry matter	27.0	86.0	91.73	9.0	4.0
Ash	2.5	10.0	7.70	1.1	.7
Crude Fiber	2.9	11.0	17.39	1.5	.7
Protein	7.8	29.1	22.38	.2	.4

(Source: Feed composition tables for the Philippines)[33]

Some camote varieties, particularly yellow and red ones, are particularly high in carotene or vitamin A, and camote leaves are rich in essential vitamins and Iron. Calorie yield and raw food per acre of camote is twice the caloric content of maize and six times its yield under a wide range of natural and agronomic conditions.

The significant decrease of areas for inum-an in Tukucan has directly affected food supply. Where before, people could have diverse foods from the swidden farms, today they mainly rely on what they can buy from the market and grocery. The 20 swidden crops have been reduced to five major temperate vegetables, e.g., carrots, cabbage, potatoes, Chinese cabbage and green beans. But households who raise these usually do not eat them, as they know these have been sprayed with harmful pesticides.

The inum-an has long augmented much of the food and nutritional needs of the family. It has served as a fallback in times of crop failures in the pond paddy and as a "risk evasion" strategy, being a mixture and rotation of different crops. Awareness raising is needed to reverse the trend of rising vegetable cultivation for the market and decreasing production of diverse food crops for the community.

Lower Rice Production

Rice productivity has also declined as revealed in the following statements.

> *Since I was big enough to go to the rice fields, I always went with my siblings and parents when there was no class. All household members old enough to work the land are obliged to help in all activities of rice production. It is also a kind of play for a child, with the rice field as a playground, which becomes work if one has to finish the tasks. After the palay was dried, we piled them in the granary, and we put a marker on the wall to indicate where the rice pile reached. My mother's rice*

granary would be filled up to the top. That was about 10-12 years ago. The harvest now can not fill up the granary.

Fraulin Francisco, 27, Tuludan, local researcher

I remember 30 years ago when I walked with my mother along the paddy ponds in the month of May; the bowed rice plants full of grain would get in the way. Comparing the yield then and now, I can say it has decreased by about one-third.

Vilma Caoili, village councilor, Ahin

While the study was not able to establish production per unit area, most respondents claimed that current production as compared to 10-20 years ago has decreased by more than one-third due to the interplay of factors. The growing need for cash (for education, health and other basic needs) forces able-bodied household members to seek outside paid labor after farm work has been completed, i.e., just after harvest or transplanting. More often, women, children and the elderly are left in the community, assuming the responsibilities of those who left. The quality of farm work usually declines, and other activities are discontinued. The practice of tinu-ol is neglected, reducing soil quality as green manuring is limited to the immediate vicinity of rice fields.

With scarce labor, the ubbo labor network is difficult to organize for the farm tasks, leaving each family to cope on its own with the workload. In the past, almost all phases of rice farming was done through ubbo of men or women; today collective labor is limited to harvesting and transplanting. This disrupts synchronized activities and delays rice planting.

Dependence on chemical inputs and growing indebtedness

Commercial vegetable farming has led not only to conversion of inum-an and forest lands but also to monocrop cultivation that is dependent on chemical farm inputs and certified vegetable seeds that cannot be reproduced. To engage in it, people need capital and have to be part of the financial system that places farmers in a viscous cycle of indebtedness.

The adoption of commercial vegetable farming differs in the five study areas. Ahin and Wangwang have gone back to more traditional subsistence farming after farmers went bankrupt at the height of vegetable importation in 2001-2002. Binablayan and Tulludan are in an interphase; they converted some inum-an areas and parts of their watershed to commercial vegetable farms but have kept parts of their inum-an and all their rice fields. Tukucan by 2008 had been completely entrenched in the commercial vegetable production system.

PART 3

Commercial Vegetable Production and its Effects on Community Wellbeing: The Case of Tukucan

In today's global marketplace, no stone goes unturned. Where there is commercial value, there is profit to be made. However, as entrepreneurs scour the world in search of new commodities, a voice of dissent is growing and striving to be heard. That voice belongs to the indigenous peoples, and it is a voice that has been ignored long enough.

Beyond Intellectual Property Rights:
Toward Traditional Resource Rights for Indigenous
Peoples and Local Communities (1996)

Notions of Wellbeing

To the Kalanguya of Tinoc, adequate food, clothing and shelter are the main components of wellbeing, but these are interlinked with other factors and other aspects of community life, such as culture, values and capacities, and these are expressed repeatedly in their traditional prayers and day-to-day living. The Kalanguya pray for good health for people and animals, for bountiful harvests, for a community life that is clean and pure as the fresh water of springs. They pray that people and

animals are granted the capacity to be able to combat sickness and disease. Ingrained as social values and obligations are participation in community occasions and celebrations, helping someone in need and living in harmony with one's fellowmen and nature, and thus the need to appease spirits in the natural world whenever they are offended.

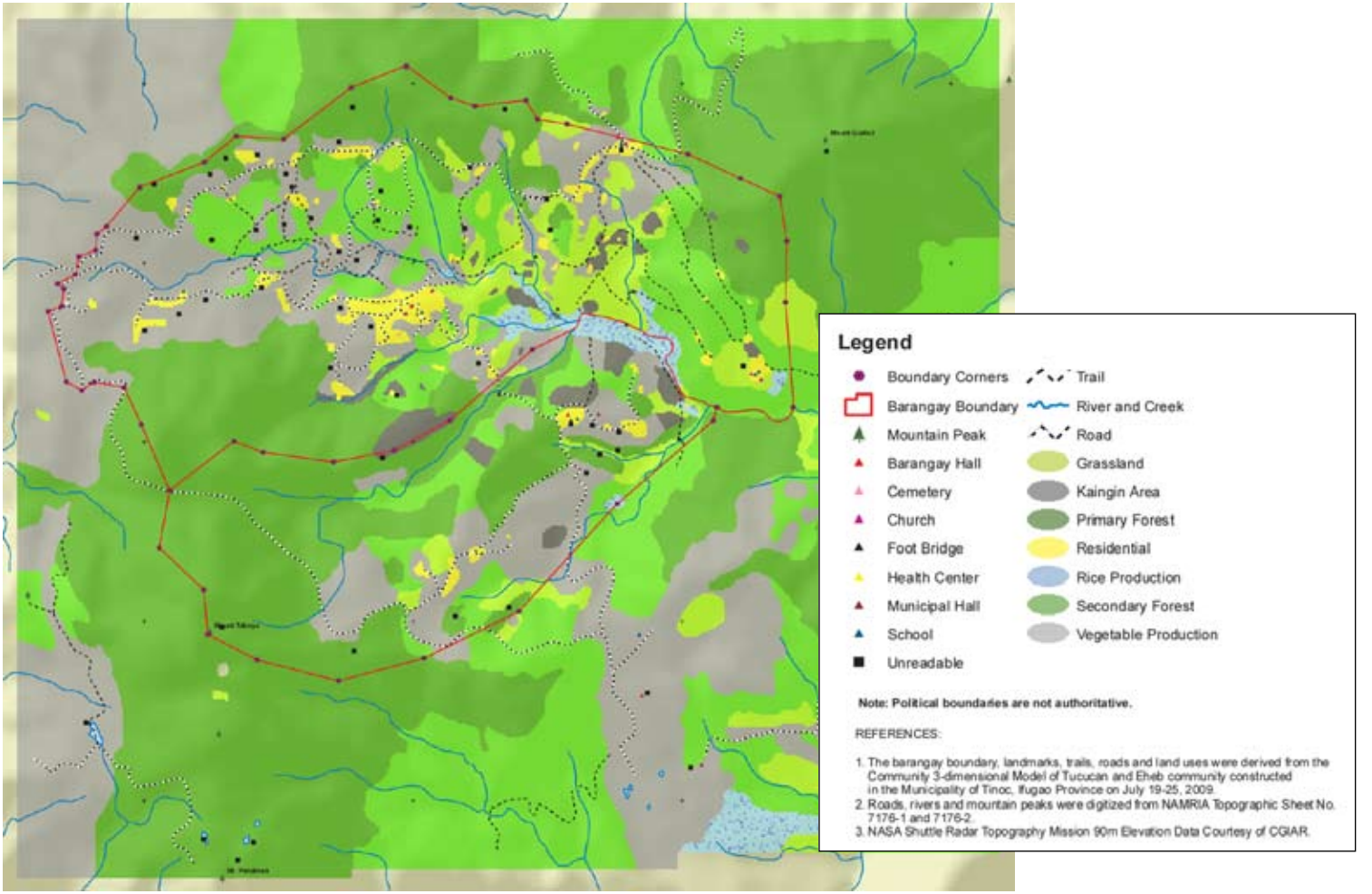
For sustenance and wellbeing, the Kalanguya have developed and sustained a low-energy lifestyle from a sound management and utilization of the resources and biodiversity of their environment. They were able to discover and innovate through time the knowledge and skills on sustainable production of food (from wet-rice cultivation to rainfed rotational agriculture including wild food collection from natural habitats), fabrication of tools and household items through blacksmithing and woodcarving, house construction, weaving, pottery and the beginnings of agro-processing (sugar cane processing, fermentation). To a large extent and over a long period of time, they have relied on what their territory and biodiversity could provide for sustenance and wellbeing.

Unfortunately, like many developing communities, these knowledge and skills did not get the needed support to develop to their full potential. Instead, like many indigenous peoples, some of the Kalanguya in Tinoc have increasingly been subsumed into the market economy, gradually veering away from traditional lifeways and occupations. In the 1980s commercial vegetable farming came to Tukucan and since then changes have occurred in their land use and management that have adversely impacted on their wellbeing.[34]

Tukucan: Changing Landscape

Tukucan is located on the boundary of Ifugao and Benguet provinces and borders the Cordillera's highest peak, Mount Pulag. The barangay has seven sitios, namely, Cocoy, Lama, Pakawan, Amdalaggan, Hanil, Huyuktu and Ababba (Tukucan Proper).

Map of Tukucan

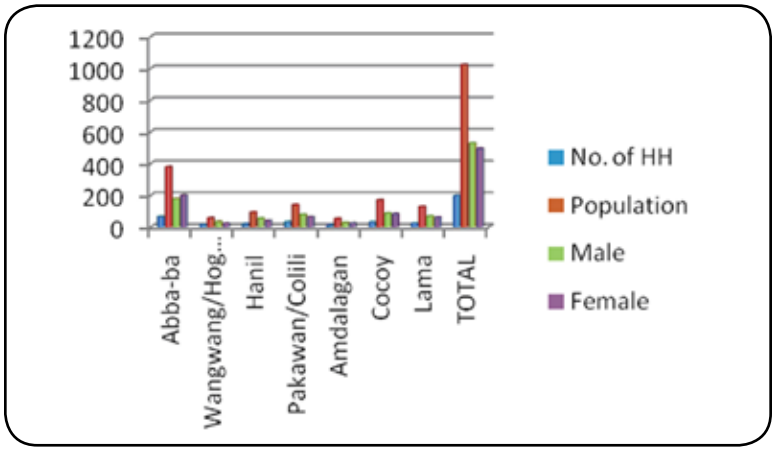


Located around 50 kilometers from the capital town of Lagawe, Tukucan is accessible from three major entry points: 1) from Hungduan via barangay Wangwang; 2) from the poorly maintained Buguias-Mansuyusoy feeder road; and 3) from Poblacion Tinoc via barangay Eheb. While the first two can be reached by truck or a 4-wheel drive, the more common mode is by foot as no commuter rides go through these routes.

Mount Mansuyusuy, the highest mountain peak in Tukucan at 2,523 meters above sea level, serves as the natural boundary of Tukucan and Buguias, Benguet. The village terrain is generally mountainous with slopes from 50 percent and above except in Ababba, which is more or less a plateau that gradually ascends on the southern part. Surrounded by mountains and almost enclosed by two major rivers, Ababba serves as the settlement and farming areas.

The village population is almost evenly distributed between males and females. The dependent population makes up the majority (51.9%), with a significant number (18.9%) belonging to the vulnerable sector below six years old. This leaves the labor force at less than half or 48.1% of the total population (CBMS 2009).

Figure 7. Population Distribution according to Sitio and Gender



CBMS 2009

The villagers have access to rudimentary education and health services. An elementary school with a staff of six teachers and a principal grew out of the first Tukucan primary school built in 1948. Classes for grades 1 and 2 have also been set up in sitios Hanil and Cocoy. A rural health clinic, manned by a midwife, dispenses basic health services and common medicines sold at lower prices are available at a *Botika sa Barangay* (pharmacy in the barrio).

> Tukucan's population increased by 11% from 910 to 1,023 between 2001 and 2009. This is distributed over 199 households at an average size of five persons.

The road and attendant changes came to Tukucan in the 1970s. From 1977-1979 the Department of Public Works and Highways constructed the Bad-ayan-Tukucan road up to sitio Hanil, and in 1987 extended it to Tukucan Proper, but it was not operational until 1996 when it was paved with gravel.

Other physical infrastructure in the village are footbridges constructed in some sitios, and waterworks built through a European Union-funded project including water impounding tanks purposely erected for vegetable farms. Just above the settlement in Ababba is the Ambakba sulfur spring, with other outlets along the river banks. While commonly used for therapeutic and curative treatment of skin ailments, the hot springs also have the potential to be developed for geothermal energy.

Traditional Land Use and Biodiversity

The people traditionally managed their village land according to the eight land uses discussed in the previous chapter: 1) *bel-ew* or watershed, 2) *kiyewan* or woodlot, 3) *inum-an* or rotational agriculture areas, 4) *payew* or ricefields, 5) *pahtu* or grassland, 6) *wangwang* or outflowing rivers, 7) homesites or

pan-abungan, and 8) *dayahan*, a space near the homesite where pigs are left to roam freely to scavenge for food.

The bel-ew is mossy forest and the kiyewan has shrublands and pine and mossy forests. Two major rivers, Wangwang and Malanas, converge on the eastern portion of the barangay, flowing towards Binablayan to join the Ahin river. Seven streams, which are tributaries of these two rivers, drain the entire village, most of the water coming from Mount Mansuyusuy, which derives its name from the cold winds that prevail throughout the year.

Up to the 1970s, Tukucan had a rich biodiversity in these different parts of the village, as evidenced by the many varieties of plants and animals identified by the people as shown below:

Vine	Uses
1. Lilihig	medicine
2. Hapluda	fruit, medicine
3. Biduh-lak	tea, medicine
4. Bag-ih	medicine
5. Da-el	medicine
6. Kakalung	handicraft
7. Iyep	food, fruit
8. Batanak	food, fruit
9. Hithit	weeds, medicine
10. Opey	pesticide

Herb	Uses
1. Bangbangtit	mint plant
2. Pinagiwa	for vinegar
3. Ngangay	for vinegar
4. Kawan	medicine
5. Lagiway	medicine
6. Pit-pitok	medicine
7. Kamhit	medicine
8. Anwad	medicine

Grass	Uses
1. Handiku	food
2. Dampagan	medicine
3. Pudapod	medicine
4. Pugo-pugo	medicine
5. Kalawag	medicine
6. Tanglag	handicraft
7. Gulon	house roof
8. Puwen	house roof
9. Telneg	medicine
10. Putputud	medicine
11. Bang-ngaw	medicine
12. Kattayan	necklace
13. Nagey	useless grass
14. Kiltwagang	wrapper
15. Balay	wrapper

Shrubs	Uses
1. Kape	coffee
2. Lantana	medicine
3. Hapal	medicine
4. Kalamansi	medicine
5. Balangbang	medicine
6. Gipas	medicine
7. Talugtug	tea
8. Bangbanghit	medicine
9. Batikil	medicine
10. Buyut/Pinit	food
11. Bagti	medicine
12. Beket	(poisonous)
13. Leleteng	

Table 13. Plants and their Uses

Still from the wilds, four kinds of bamboo (*kawayan, katlubong, bika, anes*) were available as were 20 species of mushroom, which except for two, were all edible; 51 species of birds, eight of which were migratory, and classified as small, medium and large; eight species of wild animals and seven of honey bees. Forty-seven tree species were identified and classified according to use: fruit-bearing, water-bearing, lumber, fuel, for making tools, for house building, and for carving kitchen utensils, spoons, bowls, containers and other household items.

Up to 2000, the people also cultivated different food crops in their farms, including four kinds of rootcrops—yam, sweet potatoes, cassava and taro; two kinds of legume—peas (pigeon pea, cow pea) and a variety of beans (black, white and red beans, rice beans); fruits and betel nut. For staple foods, the study documented 21 varieties of rice and 11 varieties of sweet potato in Tinoc, which can be readily available in the

barangay as people do seed exchange within their communities and with neighboring villages every planting season.

All of the abovecited crops, except for rice, were also planted on homelots, intercropped with forest trees and plants. Backyard pigs and chickens were raised for family consumption, rituals and sometimes to be sold for cash to meet family needs.

Resource Management and Customary Law

To secure food and other basic needs, almost all the people engaged in farming and seasonal work based on skills, e.g., bamboo weaving, cloth weaving, food preservation, woodcarving, among others. Resources were used but at the same time conservation measures were practiced such as: 1) no cutting of trees and opening of farms in watershed areas; 2) selective and regulated cutting of trees in the kiyewan; 3) no use of poison and other destructive fishing methods; 4) selective and seasonal hunting.

Sustainable food production, while not included as custom law, was followed religiously until about 10 to 15 years ago. This included: 1) erosion protection measures (stonewalling); 2) soil fertility maintenance and enhancement such as green manuring; 3) fallowing; 4) practice of tinu-ol or getting most of the soil in the paddy pond out of water-logged condition, thus improving it, and sun drying of the rice paddy from time to time; and 5) collective work to maintain irrigation canals every year.

Changes in Land Use Pattern

"The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises

through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems."

SBSTTA report, CBD COP 9

This was what happened to Tukucan.

Growing need for cash

Even with its rich biodiversity, the land could not provide for all the community's needs, but they had surplus products like chickens, pigs, coffee and several varieties of legumes that they bartered for iron utensils, salt and clothing. They made wooden tools and most of their kitchen utensils, using specific trees for specific items. Sugar and lard were luxury items that they could do without if not available. For treating the sick, they used herbal plants and the traditional priest performed rituals and rites to appease spirits, unseen beings or dead ancestors believed to be causing the sickness. Education after primary school, which the young had to get outside the village as none was obtainable in the community, was rarely pursued.

But through time people aspired for other needs that were more than what their environment could provide. Foremost was rice, which became a popular food, and higher education which was encouraged among young people. High school students had to leave the village, as there was no secondary school in the community. In the absence of a road, hauling of food from farms and the 4-hour hike to school were difficult, making cash a preferred choice.

The growing need for cash forced more and more people to seek work outside the village. Almost all those who left Tukucan went to work on farms in Benguet's agricultural towns, the Cordillera's vegetable belt. The rising number of students and adults leaving the community reduced labor availability, resulting in an erosion of traditional practices in food production. This was visible in the cultivation of

rotational farm areas. The precautionary measures of *kinkin* or creation of firebreaks weakened significantly. Rampant forest fires became a common phenomenon, transforming mossy forests to secondary pine forests.

Another way by which the people earned cash was cultivation of cash crops, especially sweet peas, which flourished from the 80s to the mid-90s. A choice crop, sweet peas fetched a higher price than other vegetables, ranging from P15-P25/kilo to as high as P60/kilo. The production of sweet peas throughout the 80s continued to use the traditional system, utilizing local seeds and organic fertilizers (ash of mountain vegetation and forest soil). While synthetic fertilizers and pesticides were introduced, these were used in limited amounts.

In 1996 the full implementation of the General Agreement on Tariffs and Trade flooded the market with cheap imported vegetables from neighboring countries such as China and Malaysia. This dragged prices down which severely affected Cordillera farmers including those in Tukucan.

Entry of road and Green Revolution

The road reached Tukucan in 1996, making farm inputs and markets more accessible. Almost immediately the whole package of the green revolution was adopted. This entailed the commercial production of vegetables with the use of certified seeds, chemical fertilizers and pesticides produced by multinational companies that farmers bought from urban retail stores from as far as Baguio and Trinidad some 120 kilometers away. They learned of this farm technology in their seasonal outmigration to Benguet's vegetable farms.

To adopt this new farming technology, cash was needed which the farmers of Tukucan did not have. This need was filled by financiers from neighboring Bot-owan village who supplied farmers with chemical farm inputs. In 2000, a backhoe owner arrived in Tukucan, offering his equipment to open new lands to cultivate.

Financing schemes and new tools for clearing land

The farmers became dependent on the backhoe owner and financiers, using their lands as collateral for loans. Mortgage and sale of lands became prevalent and, for some, grew so acute that one farmer went against custom law and sold his land to an outsider (see box).

Custom Law on Land

Among the Kalanguya, "land ownership" which is the right to be the main steward of a certain piece of land is earned by an individual only through investing labor to make permanent improvements on the land, like building stone walls and planting permanent crops such as trees and hedgerow to control erosion in sloping areas. Others raise pigs or enjoin community members to construct a farm for him in exchange for meat or free meals. Since simple tools were then used, it took months and even years for one to make permanent improvements on the land. This has served as a regulatory mechanism for "controlled" ownership, as one owns land based on his capacity to make it productive.

Everyone in the community knows the hard work required in improving the land, hence it has been a code of conduct not to sell one's inheritance. In case one has to sell, she/he should offer it first to her/his siblings. If no one among them is interested, it is presented to blood relatives and then to any member of the community. Custom law forbids the selling of land to outsiders.

This custom law was firmly enforced when a resident of Tukucan was forced to sell his land to an outsider to repay a debt. The buyer cleared the land but started to expand his farm into the forest. This prompted the elders to intervene, stopping him from extending his landholdings and encroaching on forest land. They upheld the law that keeps the lands of the village for the primary and sole use of the community.

As commercial vegetable production increased, so did clearing of new areas including forest lands. As a response, the Barangay/Village Council passed a resolution on October 21, 2002 reiterating that watersheds are protected areas. The resolution[35] identified the protected forest zones and watershed areas of Tukucan, which constituted about 95 percent of the watershed at that time. Unfortunately, the resolution failed to curtail farm encroachment into these areas.

The SARS (Severe Respiratory Acute Syndrome) outbreak in Asia in 2003, which reduced vegetable importation, resulted in price stability of temperate clime vegetables. More financiers from neighboring villages used this opportunity to expand their business in Tukucan. They offered pre-financing schemes to farmers, whereby they supplied all needed farm inputs and the land owner provided labor. For people who did not have readily available land, they were offered the use of the backhoe and if they did not have the cash to pay, their land was placed under the management of the backhoe owner for up to five years.

Another backhoe was brought into Tukucan in 2005 by a man who married a local woman. The equipment could level a hectare of sloping forest land in eight days, which would take a person about 18 months or more to do manually. In the latter method however valuable topsoil can be retained, which some people carefully segregate in safe areas to be used during planting time; a backhoe completely wastes it.

The adoption of market-oriented, chemical-based monocrop farming resulted in a rapid change from the traditional land use pattern. The following Table shows land use in the 1970s as recalled by the villagers and the current state as recorded by a July 26, 2009 3-D map of Tukucan.

Table 14. Land Area according to Land Use in 1970, 2009

Land Use	Area in Hectares		
	1970	July 2009	Difference
Bel-ew	1,108.73	717.65	(391.08)
Kiyewan	250.00	497.28	247.28
Uma	695.00	67.40	(627.60)
Payew	42.01	42.01	-
Inum-an		698.85	698.85
Pan-abungan	53.00	110.23	57.23
Pahtu	250.00	265.32	15.32
Total	2,398.74	2,398.74	

From the 1970s to 2009, the forest cover decreased significantly, with the watershed being reduced by 391.08 hectares; and the inum-an, by 627.60 hectares. In the 70s, forested areas composed the entirety of the bel-ew, kiyewan and some inum-an that had reverted to a forest (broad leaf primary mossy forest), constituting more than 66 percent of the total land area. By 2009, this had been reduced to 50 percent, which while still above the 40 percent DENR requirement, is low in quality as the wooded area is now dominated by pine savanna.

Impacts of Changes in Land Use

These changes in land use have greatly impacted on land tenure, biodiversity, ecosystems services, occupations and the wellbeing of the community.

Land security

For land held in common, all people in Tukucan have equal access based on their capacity to work the land. All households have usufruct rights and thus can be owner tillers of lands they improve. But the use of the backhoe has hastened the privatization of lands, and the use of land as loan collateral is likely to lead to its accumulation by the few who have the capital.

The privatization of lands in the rotational agricultural areas, some parts of the watershed and wood lots, comprising about 1, 000 hectares or nearly 50 percent of the barangay area, has changed the collective ownership of lands. The privatized lands are no longer subject to custom law on sustainable use, as each individual "owner" can use the land according to his own discretion without having to consider the community's interest.

Table 15. Number of Landowners according to Land Area Owned

Land Area Owned	No. of HH Owners
less than 1 hectare	143
more than 1 to 3 hectares	41
more than 3 hectares	1
No answer	7
Total	192

CBMS, February 2009

Based on a 2009 CBMS survey, a big majority (74%) of Tukucan households have landholdings of about one hectare; and 42, more than two hectares (7 did not respond). With these data, only 228 hectares are accounted for, leaving unclear the ownership of the remaining 470 hectares.

Biodiversity and ecosystems services

The marked decrease in forest cover also destroyed natural wild life habitats, cutting the abundance and diversity of flora and fauna. As shown in Table 16, one kind of honey bee and three bird species are no longer seen in the area; and the number of species and varieties of trees, herbs, birds, mushrooms, grass and ferns have dropped to 5-50 percent from their numbers in the 70s. Aside from the observable destruction of natural habitats, tools for hunting have also changed—from traditional spears, traps and slingshots to today's air guns and guns—further diminishing the number of animals and birds.

Table 16. Decrease in Identified Flora and Fauna in Tukucan, August 2009

	Number Identified	Decrease
Trees	35	all reduced by 50%
Herbs	8	reduced to about 20%
Wild animals	8	4 not seen anymore
Endemic Bird species	47	3 species not seen anymore; others reduced to 5 to 10%
Migratory birds	8	
Wild mushrooms	18	reduced to 15%
Honey bees	3	reduced to only 5% 1 species not seen anymore
Grasses	14	8 of these reduced to 10%
Ferns	3	reduced to 30%

Focus group discussion, August 2009

With reduced biodiversity, the use of herbal home remedies for treatment of common illnesses has also lessened while increasing people's reliance on hospital services and medical care that are available only outside the village.

The shrinking forest cover has already taken a toll on the village's watersheds. In one part of Tukucan where the watershed was completely destroyed, two creeks (of 7 major creeks) have dried up.

Soil nutrient recycling is also threatened by the use of synthetic pesticides and fertilizers, which harden the soil. This has prompted farmers to increase over time the volume of fertilizers used to produce the desired yield. But rather than spend more for fertilizers, many opt to open new forests for cultivation.

Pig raising in the community has relied on the forest for additional feed. Pigs are fed just once a day and let loose to find food on their own. Forests near homelots have been a source of sustenance, but this has become a thing of the past.

If not arrested, the village may lose more of its ecosystems services. Before the entry of commercial vegetable growing, the people depended on their ili, and much of their decision-making on production was related to what it could provide. Nowadays, decision-making is slowly being taken away from farmers who are getting more involved in chemical vegetable production as a main livelihood.

Food security

The boom in the vegetable industry after 2003 completed the change in the production system of the village. From one mainly dependent on local resources, Tukucan residents embraced a production system highly reliant on the market —for farm inputs, for distribution of produce and for their food and other needs.

Notable are the changes in the food/diet of the villagers. In the past, a diverse variety of food produced by the household was available for their consumption: rootcrops such as camote, taro, yam, cassava; green leafy vegetables such as Chinese cabbage, mustard, sayote shoots, onion leeks, other vegetables such as squash, beans and peas of different kinds and varieties, eggplants, string beans, cereals such as rice and corn, fruits such as bananas, pineapples, avocado, pomelo, rattan. Food was mostly available throughout the year. Wild game and wild fruits, vegetables and mushrooms could be collected during the lean season for their own consumption

or bartered for rice; there was also camote that could be relied on during lean months.

Table 17. Food Availability in a Year

Food Type	Month Available											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fruits					✓	✓	✓	✓	✓	✓	✓	
Rootcrop	✓	✓							✓	✓	✓	✓
Vegetables	can be available whole year round, abundant in June, July, August											
Corn								✓	✓			
Rice							✓	✓	✓			
Wild mushrooms									✓	✓	✓	✓
Wild fruits							✓	✓	✓	✓	✓	✓
Honey						✓	✓	✓	✓			
Migratory birds									✓	✓	✓	
Shells	Available year round but mainly collected during land preparation, transplanting (Sept-Feb)											
Fish	Available year round but fishing is mainly done during off farm work (Mar-May)											

With the transformation in land use, i.e., commercial vegetables dominating the agricultural landscape, food intake has drastically altered. The more common fare now are meat, frozen fish transported from other areas, canned goods, noodles and vegetables produced by a few who still cultivate swiddens and commercial vegetables that had not been sprayed with inorganic pesticide.

The limited food sources appear to be affecting people's health, especially among children who have been observed to be more prone to sickness. However, an in depth study is needed to determine the specific effects of chemical-based farming on the health of residents.

Although respondents agreed that food quality in the village has deteriorated, the widespread perception in the community is that life today is much better with the availability of

cash generated by the vegetable industry. On closer examination, however, except for bigger houses built of cement and galvanized iron, incomes have not greatly improved. The CBMS 2009 survey recorded 64.82 percent of Tukucan households as below the poverty threshold.

In a validation workshop, some people in Ahin, which has held onto its traditional food production system, strongly objected to the 74 percent poverty rate finding in their village after being told of the P15,500/year poverty threshold. They declared that they eat three times a day and the value of the food they eat from their farms, rivers and forests for a year is definitely more than P15,500, and thus on this basis they could not be considered poor. Their only problem is how to meet cash needs for other basic needs such as education, medicine and health care.

In comparison, community members in Tukucan readily accepted the level of poverty incidence in their village.

Customary law on resource use

In the past, strong solidarity was manifested in discipline and desistance from committing acts against persons and property. Although unwritten, custom law was generally and strictly adhered to, and disciplinary action the elders imposed was respected and followed. Documented customary law on crime against property, acts of lasciviousness, sexual opportunism and adultery have clear penalty or disciplinary action for specific cases. But the same appears to be absent in violations concerning sustainable resource use, and this has been attributed to lack of information and of specific cases. Until recently, people firmly observed customary law on sustainable use, and where lapses occurred these did not usually merit a case.

Violations became significant by the mid-90s. Farm conversion that extended to protected areas was a new phenomenon that, along with various religious sects that arrived, weakened traditional community solidarity and unity. It also eroded the role of elders who gave up much of their power to

elected village officials. Forest encroachment started in 2000 but it was only in 2010 that one village, Eheb, penalized a perpetrator of forest destruction.

Commercial Farming and Incomes

Traditional food production requires from ½ to 1 hectare. Considering that the majority of Tukucan households have landholdings of less than a hectare, they should be able to earn a good income from commercial vegetable farming. But a look at the production of cabbage, among the most commonly grown vegetable, indicates that rather than ensure economic security, commercial farming places farmers at risk of falling into debt.

Table 18. Production Input for Cabbage Production on .5 Hectare of Land[36]

Item	Quantity	Unit	Price/ Unit	Cost
Seeds	150	grams	P 630.00	P 630.00
Fertilizers				
>> Chicken Dung	60	sacks	150.00	9,000.00
>> Triple 14	3	sacks	1,120.00	3,360.00
>> Foliar	2	sacks	200.00	400.00
Pesticides				
>> Bida (egges)	1		380.00	380.00
>> Binus (Anti DB)	1 to 2	bottles	1,160.00	1,740.00
>> Penant (beetles)	1	liter	570.00	570.00
Herbicide (Geomox-one)	1	liter	425.00	425.00
Fungicide/dithane	2	bags	520.00	1,040.00
>> Antraxo	2	bags	480.00	960.00
>> Bilathone	1	box	700.00	700.00
Subtotal				P19,205
Labor				P14,550
Total				P33,755

From farmers' common experience, the average cabbage yield on ½ hectare is 14.5 tons, and this can go as high as 18 tons or as low as 11 tons depending on various factors. In terms of price, a kilo of cabbage can fetch P15.00 on the average, or a high of P39.00 and a low of P8.00. Given production expenses as shown in Table 18, a farmer can make a net income of about P133,000 in one cropping if the price of cabbage is P15/k or P44,000 at a low P8/k (Table 19). Given a fair price a household can earn an average of some P22,000.00 a month and more if the prices go up. However, of 5-6 croppings in a year, farmers can usually chance on a good price only once or twice.

Table 19. Average Income from Cabbage Production (.5 ha) at P15/k and P8/k

Gross sales	Volume	Less Expenses	Income
P217,500	(P15/kg x 14,500kgs)	P84,505.00	P132,995.00
116,000	(P 8/kg x 14,500kgs)	72,255.00	43,745.00
			176,740.00
Average income per cropping			88,370.00
Average income per month			22,092.50

Price fluctuations are frequent in the vegetable industry, and cabbage prices are the most unstable, sometimes dropping to as low as P3.00/kg when there is an oversupply from vegetable importation. Given transport cost at P3.30/kg, the vegetables are better left to rot in the field, usually causing the farmer a loss of more than P30,000.00 in capital investment.

Because of price instability, indebtedness among farmers is said to be widespread, and some are merely farming to be able to pay debts to financiers or suppliers. Farmers have to contend with the common practice of *pasuplay*, a financing scheme where a financier/trader provides all the needed farm inputs, and in return, the farmer is obliged to sell all his produce to him. From the gross sales, the farmer has to pay back all items the former provided, and this includes fertil-

izers, pesticides and rice for his consumption. After deducting expenses, the financier gets 30 percent-50 percent of the remaining sales and the rest goes to the farmer. Most farmers are dependent on such financiers who extend the needed capitalization.

This problem is also due as much to dependence on agrochemical inputs that are required in commercial vegetable farming and have to be purchased from outside the community. In cabbage production on .5 hectare, P19,205 or 22.56 percent of total expenses goes to the purchase of synthetic fertilizers and pesticides. For carrot production, farmers have to spend some P34,350 for agrochemical inputs, comprising almost 34 percent of production costs in one cropping.

Table 20. Expenditures for Cabbage Production (.5 ha)

Farm Input	Cost	%
Seeds	630.00	0.74
Agro-chemicals	19,205.00	22.56
Labor	14,550.00	17.09
Transport	50,750.00	59.61
	85,135.00	100.00

Table 21. Expenditures for Carrot Production Costs (.5 ha)

Farm Input	Cost	%
Seeds	1,680.00	1.64
Agro-chemicals	34,350.00	33.55
Labor	33,000.00	32.23
Transport	24,675.00	24.10
	102,385.00	100.00

Table 22. Annual Expenses for Agro-chemicals in Cabbage and Carrot Production (300 has)

Crops Grown	Annual Expenses on Agro-Chemicals		
	1/2 hectare	1 hectare	150 hectares
Cabbage	38,410.00	76,820.00	11,523,000.00
Carrots	68,700.00	137,400.00	20,610,000.00
	107,110.00	214,220.00	32,133,000.00

If on 300 hectares of land in Tukucan,[37] 150 hectares were planted to cabbage and the other half to carrots, the investment for agrochemicals would reach around P32.133 million in one year. This is an enormous expenditure that all flows out of the community. It also means an immense poisoning of the land, water and food.

PART 4

Work in Progress

Customary Sustainable Resource Use and Ecosystems Approach

The persistent and effective participation of indigenous peoples for recognition of their rights in various forms and on different levels has led to a series of landmark victories, the highest point of which was the adoption by the United Nations of the Declaration on the Rights of Indigenous Peoples on September 13, 2007. Earlier than this and equally important are Articles 8j and 10c of the Convention on Biological Diversity on promotion of traditional knowledge and customary sustainable use and the adoption of the ecosystems approach as the framework in attaining the objectives of biodiversity conservation, sustainable resource use and equitable sharing of benefits arising out of the utilization of genetic resources.

But such recognition and provisions are meaningless for indigenous peoples and advocates if these are not implemented on the ground. Both groups thus continue to work towards ensuring these are translated into actions to free indigenous communities from their marginalized situation so they are able to enjoy fully their rights as citizens and as indigenous peoples. Piloting the ecosystems approach in Ifugao is one

such effort. It is as well an attempt to link international and state recognition of indigenous peoples' capacities to facilitate processes that enhance their initiatives to chart their own development within the framework of the ecosystems approach and indigenous peoples' rights.

The first year of piloting the ecosystems approach in Tinoc, Ifugao has brought to fore valuable lessons and realizations. Foremost is that the Kalanguya, like other Igorot peoples in the Cordillera, have long practiced the ecosystems approach in their customary use and management of resources. As shown by the project research, the Kalanguya have a high level of understanding of their environment and practice of ecological ethics. These are manifested in their complex and integrated use of distinct land forms in their territory that creates a balanced ecosystem and protects the web of life.

From each of the land uses emerges a distinct set of biodiversity—from the forest to the river, woodlot, rice field, rotational agricultural area and even the space around the house lot. Around 91 percent of the plants and animals identified by community members in the pilot areas are naturally occurring organisms. The research has not gone into direct inventory, limiting its scope to the knowledge of informants who focused on plants and animals that they use. Notable is the non-inclusion of the different kinds of orchids and other flowering plants that abound in the area.

The Kalanguya system of sustainable resource use is governed by customary law and strengthened by their social and political institutions. All watersheds for instance are communal, and no one can cut down trees, farm or enter sacred sites within, thus ensuring a wide habitat for animals and plants. The use of resources within the watershed, such as water, wild game and herbs, are largely shared with other tribes or groups. While no law governs food gathering and collection, these are usually done in certain seasons, allowing for regeneration of flora and fauna.

The benefits derived from the Kalanguya's resource management system do not redound only to their communities. The water coming from Tinoc contributes to the water supply of North Luzon including the Magat-Mallig-Siffu River, which

has a river basin of 5,110 square kilometres and a drainage area of 1,366,000 hectares. It supplies the water requirement of Magat Dam, which generates 360 megawatts of electricity that feeds into the Northern Luzon grid.

Such is the wealth of the Kalanguya's land and resources and their traditional knowledge and practices that sustain them. But as the case of Tukucan shows, real threats endanger this ecological sustainability. Land conversion for commercial vegetable production has reached watersheds, indebtedness among farmers is growing, and land has become collateral for financial loans, threatening land security. Reduced ecosystems services are already evident in the drying up of water sources and decreasing number of plants and animals. All these may lead to the loss of knowledge systems and cultural values that uphold the man-land-nature relationship.

Fortunately for Tinoc, only Tukucan has reached a critical stage. Of the remaining 11 barangays, five still have a primarily subsistent economy, and six are in varying degrees of integration into the market system. In these communities, customary law on sustainable use continues to prevail and biodiversity still abounds.

Project Outcomes

The project's first phase worked towards raising appreciation among the pilot communities of this vital role of the Kalanguya traditional resource management system. And as the following project outcomes indicate, it has made strides in this direction and in uniting a far bigger Kalanguya community than the original target to reverse critical environmental trends and to revive indigenous agricultural practices.

Increasing appreciation of indigenous knowledge systems and practices on natural resource management

The project was able to show, principally to the pilot communities themselves, the profound wisdom of the territorial and natural resource management passed on by their forebears especially at a time when traditional knowledge is beginning to break down and disparaging views against indigenous lifeways are causing some youth to feel shame or disinterest in learning their culture. The small group discussions and educational sessions on sustainable use of resources led them to recognize the sound ecological bases of their traditional practices and to assert these in the face of discrimination.

And this has been translated into action. Members of communities have started initiatives that resulted in the following: a) an increase of six to eight traditional rice varieties through seed exchange among women in two of the five target barangays; b) community campaigns to strengthen traditional labor exchange groups, synchronized agricultural activities and active protest against bulldozing of forestlands; and c) recognition of the superiority of custom law over state law on land and resource management.

However, various challenges remain. The conflict of state laws and customary law on land, decreasing forest cover and continuing changes in land use which threaten food and land security and other components of wellbeing (e.g., dependence on external forces, decreased power of decision-making among those integrated into the commercial vegetable industry, negative trends in food quality, loss of biodiversity and of traditional occupations) are lingering problems.

Promoting development/innovations of traditional occupations towards poverty alleviation

Although the project has just been implemented for a year, innovations on indigenous technologies and revival of traditional livelihoods have taken off the ground. A blacksmithing center has been set up that provides services to communities and training to apprentices to increase the number of practitioners in this trade. Some barangays have also started reclamation of watershed areas through reforestation and improvement of sustainable food systems. Using traditional knowledge, this entails inum-an development and production of organic farm inputs such as biofertilizers to enhance soil fertility.

The bigger challenge however is how to strengthen collective action to enhance watersheds and wood lots, intensify swidden cultivation, revitalize food and honey gathering, hunting and other traditional occupations to answer the growing need for cash. This need has become a major concern of every household.

Enabling communities to advocate and influence policies of concerned government bodies and development agencies towards supporting the general objective of the project on the municipal and provincial level

The project aimed for the empowerment of peoples' organizations to influence policies in the barangay and higher government levels of decision-making. Although an initial difficulty was encountered in convening farmers' organizations, the project was able to provide through trainings and workshops a venue for learning and cooperation among community people, and between and among community and policy makers and planners on the municipal level. Through these activities and initiatives of municipal officials, the project was able to realize the following:

- Municipal-wide unity through the Land Summit Covenant to arrest environmental degradation which has led to an active campaign against conversion of watersheds to commercial vegetable farms;
- Appropriation of funds by the Municipal Council for municipal 3-D mapping towards formulation of a comprehensive land use and sustainable development plan for the whole Tinoc municipality;
- Agreement by the Man-ili Convention of lower Tinoc to popularize and implement the Land Summit Covenant and to use customary law in preparing guidelines in land use planning

Forming or strengthening appropriate groups in the community to spearhead planning, resource generation and implementation of community development plans

Convening farmers' organizations was initially not considered a priority by barangay councils, but this problem was overcome as the need for strong peoples' organizations was reaffirmed. Community leaders and elders at the Man-ili Convention discussed and agreed on a more systematic and comprehensive plan for community organizing as they gained a better appreciation of the role of indigenous peoples' organizations in ensuring self determined development. To date four farmers' organizations have been revived and organizing of elders is ongoing.

Maximizing project outcomes for national and international policy advocacy

Linking the project to national and global policy advocacy has just started. The project experience has been presented in fora organized by Tebtebba in the Philippines with the aim to promote revitalization of indigenous peoples' natural resource management systems, using as an example the pro-

found knowledge of the Kalanguya. It has also been shared with community mappers in different countries supported by the Forest Peoples Programme (a UK-based NGO) working on customary sustainable use through community mapping. A broader perspective was provided to these groups including traditional occupations and traditional knowledge on the development of nested ecosystems.

Continuing Work

The MRDC-Tebtebba partnership continues to work towards the objective of unifying different stakeholders in Tinoc to formulate a road map for the adoption of the ecosystems approach on a higher and wider level taking into account current realities. This requires the formation of a body that will spearhead and ensure adoption and implementation of the Land Summit Covenant on the municipal level through the municipal comprehensive land use plan. To attain this, the following work has to be done:

- Capacity building among different peoples' organizations formed on the barangay level and envisioned to be part of the project's sustaining mechanism;
- Facilitating a workshop among elders to provide guidelines for the municipal comprehensive land use planning using the 3-D map;
- Land use planning after 3-D map digitization;
- Convening an inter-agency roundtable discussion to define roles of each in the implementation of land use and development plans.

Conclusion

The project to pilot the CBD ecosystems approach in Ifugao is a work in progress. But as it moves to the next phase, it is guided by the insights drawn from the first year of work.

1. To introduce the ecosystems-based approach as something new is historically inaccurate and an inappropriate starting point for indigenous peoples because it fails to appreciate and build on indigenous and customary land use and management systems. These systems are anchored on maintaining ecological balance, which is of utmost consideration in their economic system and part of the socio-cultural and political fabric of their community life. These must be supported.

2. Development strategies that require the effective and full participation of local people have long been formulated but implementation has yet to take off in the project sites.

3. The conceptual framework linking ecosystems services to people's wellbeing holds true among the Kalanguya of Tinoc. This and other materials will facilitate the formulation of development indicators themselves.

4. The notion that traditional occupations are directly linked to land use pattern and biodiversity is also affirmed in the study areas.

5. Against an external threat, people can easily unite themselves to resist and fight. However, the democratic processes to resolve conflicts and threats created from within and by members of a community may take a longer process.

6. Land use and sustainable development planning needs to be pursued to ensure the people of Tinoc of the enjoyment of their rights. These are the rights to own and develop their lands, territories and resources; to have legal recognition and protection for

these as well as for their customs, traditions and land tenure systems; and to have their free, prior and informed consent obtained in any project that affects them as provided for in the UN Declaration on the Rights of Indigenous Peoples.

Endnotes

[1] Ecological Visions 2002, 9.

[2] Secretariat of the Convention and Biodiversity 2003, 1-2.

[3] *Ibid.*

[4] Eckholm 1976, 21.

[5] *Ibid.*

[6] <http://www.tebtebba.org>.

[7] MRDC Brochure 2009.

[8] Clement 2005.

[9] Conklin 1980.

[10] Pagusara 1982.

[11] *Ibid.*

[12] Schrekenberg et al. 2010, 25.

[13] MRDC Research Orientation 1988.

[14] Boquiren 2009, 161-162.

[15] Resurrection 1997.

[16] The generation of data on migration took time as very few people were knowledgeable on the subject matter.

[17] Authored by Congressman Gualberto Lumauig.

[18] Ifugao Provincial Development Plan 1993-1998, unpublished.

[19] Lagasca 2010.

[20] Based on 2009 Community-Based Monitoring System peripheral survey which differs from land area in 3-D map as the latter measures surface area. The CBMS is a technical working group under the Municipal Development and Planning Office.

[21] National Statistics Coordination Board. 2003.

[22] There were those who did not check any item on religion in the questionnaire. Probing further, it was learned that these people adhere to the traditional religion which was not included in the questionnaire.

[23] CBMS 2009.

[24] Conklin 1980.

[25] Agribusiness Week. 2009.

[26] Computed estimates based on interviews using 3-D map.

[27] Computed estimates based on interviews using municipal periphery survey.

[28] As cited in the unpublished Tinoc Ethnohistory of Tinoc, Municipal Planning and Development Office of Tinoc.

[29] Boquiren 2009.

[30] Respondents identified 85% of forest plants and animals they knew in one workshop session and completed the list during the validation.

[31] Swidden farms refer to a temporary agricultural land created by cutting and burning of the vegetation, usually in forest or grassland; others call it "slash and burn;" and others, shifting cultivation (ref. W. H. Scott, 1969, On the Cordillera, page 1).

[32] Vogt 2007.

[33] Yen 1974.

[34] The study on the Effect of Commercial Vegetable Production on the Community's Wellbeing, conducted from June 2008 to August 2009, was limited to the following time periods: just before the 1970s, mid-90s and the present. Various methods were employed in the collection of information, namely, a) review of secondary data mainly from the Tinoc ADSDPP (2006) and CBMS (Kalahi, 2008), b) key informant interviews, c) workshops and d) group and focus group discussions.

[35] Barangay Resolution No. 11-2002 declared the following as Tukucan watershed and forest protected areas: the forests of Gibngay, Alibahong, Upper Bangtitan, Upper Golon, Abuyagan Hanah, Upper Bumat-ang, Hayoktong, Upper Napatkaw, Upper Hayokto, Labba, Upper Hanil, Upper Ambanglo, Upper Gibngay, Hayokto, Habit, Upper Mangnaw, Upper Pinchikilah, Binang-ili, Timagong, Gangal. Etong ni Bolbol, Upper Pamillingan, Upper Collaban, Pula, Buhlang, Upper Pinnayag are the protected watershed areas. The resolution included the areas of Hah-day, Nalcah, Angtangnin, Katigil, Pay-ok, Upper Matmatkal, Upper Guhhadan, Upper Tumihangeb, Cagaycay, Upper Bulo-bulo, Amon ulo, Kilong, Upper Kilong, Upper Kauttukot, Halungto, Western Ehit, Lower Naitaynan, Lower Pammuluan, Bito Bahhahwit, Macmac and Bangyuyaw.

[36] Computations for this and succeeding tables were based on production cost on .5 hectare as drawn from experiences of six farmers in focus group discussions.

[37] There are more than 600 hectares of vegetable farm lands in Tukucan, (although the CBMS survey accounted for only 400+ has), and more than half are being cultivated, so it is safe to say more than 300 hectares are under cultivation.

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Our legacy from our ancestors is our love for the forest. Where there is a forest we protect it, and where there is none, we create one.

Magno Dulawon
Elder and leader of Wangwang, Tinoc

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