LPF/02/2006

Biodiversity in a Batak village of Palawan (Philippines)

A multidisciplinary assessment of local perceptions and priorities

Manuel Boissière and Nining Liswanti

A report on

Biodiversity in a Batak village of Palawan (Philippines):
A Multidisciplinary Assessment of Local Perceptions and Priorities

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All photos by Manuel Boissière

1. Introduction

a. Levelling the Playing Field project and purpose of the survey

The Levelling the Playing Field (LPF) project aims to help the different stakeholders in three countries (Indonesia, Malaysia and Philippines) to achieve natural resources management that supports their own livelihood. 'The project posits that stakeholders have different interests, goals, and views on how the natural resources will be managed. Thus the project looks at appropriate mechanisms and tools to facilitate communications among stakeholders and thus contribute to the improvement of planning and management of natural resources. Poor planning and management have contributed a lot to unwise land use and allocation, disregard of welfare of local people…' (LPF/03/2004, Philippines Country Report, Year 1).

To achieve its goals, the LPF team needs information about the Bataks from Palawan, who are leaving in Kalakwasan, a village in Tanabag Valley, one of the reference sites of the project. The Batak, a marginalized minority group, still greatly relies on natural resources for its livelihoods, has a strong sense of ownership on its traditional lands, and has developed complex relationships with the migrants settling on the coast (relationship of power, dependency and business). It is therefore crucial for LPF to better understand the Bataks' perception of the different landscapes and their perspectives on natural forest management and therefore to integrate their priorities into the objectives of the project. The MLA (Multidisciplinary Landscape Assessment) method is considered as a relevant tool for this purpose.

b. Context of the study

The MLA, is a set of methods to determine 'what is most important to local communities in terms of landscape, environmental services, resources, etc.' The approach is rooted in social (anthropology, ethnobotany, and socio-economics) as well as natural sciences (ecology, botany, pedology, geography). The methods are fully detailed in four languages (Sheil *et al*, 2003 and http://www.cifor.cgiar.org/mla/). Here we summarise some key aspects of the methodology.

An MLA survey team usually consists of a 'village team' (which applies various survey tools in the village) and a 'field team' (which carries out ecological studies in plots). The first step is to draw, together with the villagers, a map of the landscape that shows the local names of rivers and places as well as the locations where main resources are found, according to the villagers. The objective of this map is to build a common understanding of the territory and to gather information about natural resources, special sites and local perceptions within a shared geographical framework. Therefore it is considered a support for all the other activities of MLA, which is why this map is drawn at the very first days of our presence in a village. The mapping exercise is generally done with four groups: two groups of women, young and old, and two such groups of men. The four initial maps are combined into one.

The village team uses questionnaires to poll most households. Information is gathered from each head of household on socio-economic aspects (demography, level of education, main sources of income and livelihoods) and cultural aspects. The questionnaires also collect basic information on local views regarding threats against biodiversity, perspectives on natural resource management and conservation, and land tenure.

A scoring exercise known as Pebble Distribution Method (PDM) was used to quantify assessments of the importance of forest products and landscape units for different groups of informants. Informants are asked to distribute 100 pebbles, beans or seeds among illustrated cards according to the importance they give to what each card represents. Scoring exercises include assessments of the importance of:

1. land and forest types, as defined by the community;
2. forest at present, past and future;
3. different sources of plants and animals (wild, planted/ farmed, bought); and
4. species of plants and animals for each category of use, as defined by the community.

The scores and the reasons given for them aid in the development of a dialogue with the community and in gaining a better understanding of local priorities.

The field team sizes plots in each category of landscape defined by the villagers, and studies the different resources (botanical specimen) and their uses by the local villagers. All field surveys were made in collaboration with local informants, in this case mostly shamans, called *babaylan* in the Batak language. Both teams worked in close collaboration, with daily meetings to discuss results and the difficulties that might occur during the activities. The field team also helped the village team to collect specimens related to PDM-identified most important species of forest resources.

A group of Batak women discuss the relative importance of land and forest types in their landscape.

c. MLA in an LPF context

Our approach helps to assess how the Bataks use and perceive the natural resources of their forested area. The method brings information on the local biodiversity (the different types of landscapes including forests), the richness of wildlife (plants and animals) and the situation of the Bataks' forests to the LPF project. This information is a requirement for every project that works on land use planning and that includes the local stakeholders in the mechanism of sustainable use of the forest. To facilitate communication among the different stakeholders, LPF will also use the information brought by our survey on the local priorities: How do the Bataks consider the different landscape units? How do they think about the future of these landscapes? What role would they like to play in the future management of the biodiversity in Palawan? And what are the traditional mechanisms of control of the forest resources? All these questions need appropriate answers to successfully organize a management of this territory that concretely involves the local population from the very beginning of the planning.

Furthermore, this report will show that Batak society, even as it experiences big challenges (decreasing population; increasingly threatened biodiversity, mostly because of outsiders; dependence on their relationships with lowlanders; increasing dependence on trading for their livelihoods; lack of control of the market etc.), tries to keep its knowledge, traditional or recently acquired, concerning the use of forests products, gardening techniques, hunting and semi-nomadic livelihoods. The Batak perception of the forest and their ideas on its conservation carry strong messages that should be taken into account in the context of any project in their territory.

This report presents information on land tenure, local management of forest resources, relations with the 'outside' world and how the Bataks think of their future and the role they will play in it.

In the following, we will try to show how the Bataks react to the many projects and scientific studies that take place in their territory and how they agree to provide an insight into their cultural values and their society. For each category of landscape defined by the community, we will assess the local perception of it and its importance for the main activities of Batak society. Last, we will give recommendations, based on our results, in relation to natural resource management in the Batak area of Palawan.

d. MLA team in Palawan

The MLA team consisted of one ethnobotanist, three botanists (including one assistant) and three socio-economists. Table 1 gives the details of the team members.

Table 1. MLA team members in Kalakwasan.

Name	Function in the team	Institution	Address	E-mail
Manuel Boissière	Team Leader and ethnobotanist	CIFOR/CIRAD	Jalan CIFOR, Situ Gede, Sindang Barang, Bogor Barat 16680, Indonesia	m.boissiere@cgiar.org
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Elizabeth P. Gironella	Botanist	Palawan Herbarium, College of Science, Palawan State University	Puerto Princesa, Philippines	—
Reymar R. Castillo	Botanist	E Can Zoning Component SEMP PCSDS	Puerto Princesa, Philippines	foresterei_uplb@yahoo.com
Alan R. Artajo	Research assistant	E Can Zoning Component SEMP PCSDS	Puerto Princesa, Philippines	alan_artajo@yahoo.com
Samuel Fabila	Village liaison	—	Tanabag Puerto Princesa City, Palawan, Philippines	—
KGD Gandencio A. Osano Jr.	Cook	—	Tanabag Puerto Princesa City, Palawan, Philippines	—
Agripeno Patero	Cook	—	Tanabag Puerto Princesa City, Palawan, Philippines	—

2. Recent studies and projects with the Bataks

Many studies have taken place in the Batak territory. One of the most famous was that undertaken by James F. Eder in the 1980s (see for example Eder, 1978, 1987, 1988), who spent years to study the Bataks, their social organization and behaviour and the causes of their decreasing population. According to Eder, with a population of less than 400 people, the Bataks could not survive unless they mixed with other ethnic groups (e.g. Cuyonen, Tagbanua). The Bataks still remember the presence of Eder, even if many other scientists have visited their territory and villages since then.

When we arrived in Kalakwasan, our first insight was that the 'Bataks' where still there 20 years after Eder predicted their disappearance, but we realized that most of the families were mixed with other people of Palawan. The question was: Can they still be considered Bataks since the villagers still use the Batak language, still respect the Batak cultural values (Batak rituals of wealth and curing are still performed) and consider themselves to be Bataks? The Bataks have changed and survived possible extinction, but they had to adapt to a changing environment, with inter-marriages with neighbouring groups, and they are still fighting for the recognition of their specificity as a group and for their rights to their lands.

Part of the history of the Bataks is their interaction with outsiders, with recently increasing activities by government agencies, scientists, projects and non-governmental organizations (NGOs). The Bataks are becoming the target of 'everyone's' attention, with more or less ethical objectives.

The anthropologist Dario Novellino, who stayed in Kalakwasan more recently than Eder, wrote about how the Bataks are confronted to problems of development and conservation (Novellino 2002, 2003). Novellino described the reaction of the Bataks when confronted with increasing activities by NGOs (see the report on activities of Haribon Palawan NGO, http://www.haribon.org.ph). Novellino (2003) summarized the conditions as follows: 'Wherever we go, far in the mountains or close to the coast, it is exactly the same. Those who want to contact us will reach us anyhow. When election time comes candidates send their representatives even to our summer camps. Missionaries have followed us from one settlement to the other. The Haribon (a local NGO) has sent his field staff to live in our village. No matter how far we go, outsiders will show up unexpectedly and say they want to help us.' We may well have been perceived in such a way during our short stay, as Novellino strongly emphasized during the International Congress of Ethnobotany (ICEB, 2005). But on the other hand, the situation may be similar, when an anthropologist, staying for a long time in the Batak area, makes him- or herself the 'voice' of the Bataks and speaks 'in their name' during negotiations. It is, therefore, not an easy task to make an ethical approach to this society, and our visit was certainly considered one more intrusion by some scientists doing obscure activities (for the villagers), even if we tried to explain our objectives and to get local people's approval for our activities.

Students regularly visit Kalakwasan. The work of Aulong (2000) on the local management of forest resources and the household economy provides valuable comparative information that can be used in the frame of LPF project.

The long and complex process of building Community Based Forest Management (CBFM) in the Batak area, involving lowlanders, was the result of a political struggle among government agencies, NGOs, scientists, and the Bataks themselves (Novellino, 2000). The borders of this CBFM area are still subject to contestation by the villagers of Kalakwasan.

3. The Bataks of Palawan

a. Location

Administratively, the village of Kalakwasan is part of the *barangay* (district) of Tanabag, which depends on Puerto Princesa City in the province of Palawan. The village of Kalakwasan is located about 45 minutes on foot from Tanabag, which is about a two-hour drive on the national road from Puerto Princesa (Figure 1).

Palawan Island in the Philippines

Kalakwasan in Palawan Island

Figure 1. Location of Palawan Island and Kalakwasan.

b. People, society and livelihoods

People

The word 'Batak' comes from an old Cuyonen term that means 'mountain people' (Abriza, 2005). The Bataks still strongly depend on the forest for their livelihoods. They often go to the forest for hunting and gathering activities, even if for shorter periods than in years past. Although forest resources are becoming scarcer, hunting and gathering remain of seasonal importance (Eder, 1988).

Before settling more permanently in the village, the Bataks moved around a lot, even outside their territory, including to Tanabag on the coast and to the higher mountains such as Tina, Kalabayog and Mayseray.

The Bataks represent the smallest of the three major ethnic groups of Palawan province (the others are the Tagbanua and the Palawan). They also appear to be the most endangered and marginalized group. Their population has progressively decreased (Abriza, 2005). In the early 1900s the Batak population was around 600

(Miller, 1905), while in 1970 the population was only 393 (Liamzon, 1978). The Batak can still be found in six *barangays* of the City of Puerto Princesa—Tagabinet, Maoyon, San Rafael, Tanabag, Concepcion, and Langogan—and in two *barangays* of the adjacent Municipality of Roxas—Caramay and Abaroan. This study focuses only on Tanabag *barangay*.

In this study, we encountered only 33 Batak families staying in the village of Kalakwasan, with a total of 136 inhabitants (62 adults and 74 children; 63 females and 73 males). Only few families live in Kalakwasan, as most are staying upstream along the Tanabag River to work in their gardens and look for forest products. The Bataks choose a leader from among the best hunters and fighters. The name of the village, Kalakwasan, derives from the name of a plant that used to grow in abundance in the Tanabag valley, *lakuas*, or *Alpinia sp.* (Zingiberaceae).

Traditional houses at Kalakwasan.

Society

In the past, most of the Bataks believed in good and bad spirits dwelling in trees, rocks, and mountains (Abriza, 2005). They used intermediaries called *babaylan* (or *babaylan*) to communicate with these spirits. More recently, most Bataks have started to follow Christian religion, yet very few villagers attend church. Officially, the majority of Bataks in Kalakwasan is Evangelical (74%), while 5% are Protestants and 5% Catholics. The remaining 16% are still following the religion of their ancestors. If the Bataks are the main ethnic group of Kalakwasan, some other groups are also represented, e.g. the Tagbanua (4%) and the Visaya (5%). The languages used in Kalakwasan are Batak, Tabagnua, Tagalog and Cuyonen.

Approximately 27 (20%) of the 136 inhabitants are not yet 6 years old.[1] Around 56 people (or 51% of those 6 years or older) have followed some education curriculum, 43 (40%) have not, and 10 (9%) are following an 'informal education' conducted by the national government from Manila through the Department of Education, Culture

[1] Primary school usually begins at age 6.

and Sports since November 2004. This training program aims to teach villagers how to read, write, and do arithmetic.

The Bataks are still semi-nomadic, shifting from one place to another—Tarabanan, Tanabag or San Rafael. They move a lot inside their territory, from one camp to another, before returning to Kalakwasan. They alternate residence among swidden farming areas, the forest and along the rivers. This mobility gives them better access to forest resources such as rattan and *almaciga/Agathis philippinensis* Warburg, to their swidden farms and to places for hunting and collecting forest products. In 1998 they started to settle more permanently in Kalakwasan, but still undertake activities all around their territory. The Bataks used to stay in Tina and Calabayog, but then settled in Kalakwasan, even if occasionally residing in Mayseray.

Traditionally, the Bataks wore clothes made from the bark of specific trees (Abriza, 2005), but now these traditional costumes are mainly used by the medicine man, while others use fashioned clothes such as t-shirts, skirts or pants.

Livelihoods

If most of the Bataks of Tanabag stay in Kalakwasan during the swidden farming season from March to September, they scatter in small groups to the different areas upstream from the village along the Tanabag River. Only some Bataks stay in the village to take care of their domestic animals.

According to the demographic survey, 42 (31%) people receive incomes from forest products, 28 (21%) people stay in the vicinity of the village and 66 (48%) people are still young and only help their parents at home.

Houses are made from light materials (soft wood and leaves). The season when we conducted our survey was a difficult time for the Bataks, as they were just beginning new gardens and lacked sufficient food. They often had to buy rice from the *barangay* and to look for shells (locally known as *begay, bayo-yuko, and suso,* class Gastropoda), for fishes from the river and for young leaves of *Gnetum gnemon L.* (bago tree). Usually they get water from the river, for their daily needs. They use firewood for cooking, when it is cold and as insect repellent.

Bataks are still relying on forest resources and as the forest landscape is still important, they try to protect it. The collection of *almaciga* is still an important activity and a resource for considerable cash earnings, even if they have to go farther to collect it (the resource is depleting close to the village due to over-harvesting and logging by companies). Honey and rattan are still harvested for cash earnings, but only in small amounts, and wild pigs are becoming scarce (many people including outsider try to hunt wild pigs by using pig bombs).

A temporary house alongside the Tanabag River where the Batak stay to hunt and to collect forest products like honey, rattan, and resin.

A Batak woman carries her baby while making a mat from *pandanus* leaf.

c. Village limits

The village of Kalakwasan exists since 1954, but little information is available on it from before it became officially recognized by the government. The village area covers approximately 3,458 ha. According to the Bataks, the northern part of the village territory is limited by Kaaldawan Mt (no village stands near Cleopatra Mt), the

eastern part by Lumangob Mt (Tagnaya village), the southern part by the *barangay* Tanabag and the western part by Kapuyan creek (Riandakan village).

d. Traditional regulations and taboos

Traditional rules are still strong among the Bataks but, as influence from outsiders grows, some of these rules are disappearing. For example, during the dry season, people used to stay several days on the riverside and build a temporary house. Then they moved to the other places until the rainy season. Nowadays, this situation is becoming rare.

An example of traditional rules still important to the local people concerns *kaingin*, or swidden farming. People work together and help one another during the making of the *kaingin* and until they have finished all the *kaingin* of the village. The Bataks have also banned tree cutting along the riverside. According to them, cutting trees there would provoke floods and erosion. According to the villagers, cutting trees is allowed only in the forest, for household use and with permission from the village head or the *barangay* Council in Tanabag (governing body of the smallest unit of government of the Philippines). But we also assume that when they need wood, they just go to the forest and cut it. Some of the answers we collected may have been influenced by the presence of *barangay* officials with us.

The Bataks also allow swidden farming in areas covering a territory from the village to Tina (Kalakwasan–Kalabayog–Tina) and they allow no one to do *kaingin* in the upper part of the valley, from Tina to Cleopatra Mt, in order to keep the forest resource available. From Tina to Cleopatra Mt, the Bataks only allow some forest resources collection. *Almaciga* is still abundant there, with honey and rattan. Those products represent an important source of income for the Bataks.

If someone in the Batak village breaks the traditional rules, there is no special sanction, but the Bataks believe that the unseen people (spirits/ghosts) will punish them. When such problems happen, the shaman, or *babaylan,* provides assistance. If outsiders are accused of these degradations, the village head brings them to the *barangay* Council in Tanabag.

Several special sites in the village area are protected from any disturbance by local people and outsiders. The Bataks believe that unseen people (ghosts) are living there and assisting them in protecting these places:

- sacred cemetery, or *kakaden*
- sacred mountain, or *riagrasan*
- waterfalls, or *kamantanen*, are protected because they are good for tourism and provide additional income to villagers
- river areas are protected to cover the needs of water and to avoid floods and water pollution.

e. Threats to the forest and human life

The Bataks consider outsiders' activities such as cutting trees for timber, collecting non-timber forest products (NTFP) like rattan, *Agathis* resin and honey, hunting wild animals, swidden farming and fishing with poisons the main threats on their territory. Mining activity and forest fires are also considered threats for the forest resources. Although the Bataks never experienced them, they recognize that mining and fire can disturb the sustainability of forest functions. To prevent that, the Bataks try to control the only access to the forest, through Kalakwasan. According to their perception, natural disasters are threats and very dangerous for human life, such as illness and disease (cholera), natural calamities (storm and heavy rain), hunger, floods and typhoons. In 2003, seven children died from measles.

f. Land use, land tenure

Land tenure applies to the entire community within the official limits of Batak territory, including CBFM and Ancestral Domain Claims (ADC). Resources are on a free-access basis for all the villagers, but land tenure concerns mostly the shifting cultivation and the rice fields. The elders and the village chief divide plots in the rice fields among the various families. The government does not interfere in these matters. The arrival of a more sedentary way of life has led to a different system of land tenure. The attribution of plots in the big clusters of gardens reflects the household division in the village, and each plot is shared among the members of each household. But according to informants the forest belongs to everyone in the village. There is no division of the forest landscape according to lineages. Land use rights are applied here, more than land property.

In Kalakwasan, each family is officially entitled to use 1 ha of land as a garden. After harvesting, they can use another 1 ha, but they usually return to old fallow instead of primary forest. Land use plans for swidden cultivation have to be discussed among the community. The community will claim a parcel of land if they grow permanent crops like cashew or fruit trees like mango on it.

g. Activities of the Bataks, agriculture, collection of NTFP, subsistence activities, cash earning activities

Swidden farming (*uma*). Rice is cultivated in special locations, reserved for that specific use. Tasks follow a gender division. Usually men are in charge of the clearing phase, the opening of a new rice field. Women work on plantation and weeding. Both men and women share the harvesting. Individual plots are shared among families. Rice cultivation is often mixed with cassava and sweet potato. The phases of the opening of a rice field are clearing (*tigbas),* burning (*dalus)* and planting (*tugda). Uma* is when the field is ready. *Panguma* represents a cluster of rice fields. When the field is old but people still harvest some crops, it is called *kalagian.* Rice fields in the mountains are usually made for one single harvest. They are then left in fallow during several years (up to 10 years, according to informants). The space allocated for *uma* gardens is important, at the margins of shifting cultivation zones.

Swidden rice field in the mountain areas of Kalakwasan.

Shifting gardens (*taraneman* or *rululwaken*). These gardens are situated not far from the river, either close to the village or in the upper part of the valley. These gardens are planted with mixed crops, such as coconut, banana, coffee, sweet potato, papaya etc. They are opened during the dry season, in January or February. Gardens are active for 2 or 3 years, then left in fallow for 1 year and opened again.

Resin collection (*bagtik*). Resin from *almaciga (Agathis philippinensis)* provides an important source of cash to the villagers. During the 1970s, the mayor of Puerto Princesa favourably endorsed the granting of a permit by Department of Environment and Natural Resources (DENR) for the opening of a logging concession in the mountain dominating the village, in an *almaciga* forest. The result was that almost all the *Agathis* were exploited for timber, and very few remained standing for tapping activities. Villagers now have to go farther into the upper part of the valley to find *almaciga* trees. Resin is harvested during the dry season, between December and May. Resin is sold at 6–7 PHP[2] per kilogramme only, in the *barangay* of Tanabag. Collectors carry it in bags to the village, and then use an ox-cart if they can afford it.

Rattan collection. Rattan is collected in the forest. The map of the natural resources (figure 4) shows the location, according to the villagers, of the main rattan resources. Many different kinds of rattan are collected for cash, but some are of better quality than others. The best qualities of rattan to be sold are *bugton, palasan, pinpin, kalabang, kolombi* and *lapsig*. Prices vary according to the diameter of the liana: 5 PHP per liana of ¾ inches diameter, 2–3 PHP for ⅝ inches, 1.50 PHP for ½ inches and about 1 PHP for rattan of less than ½ inches. Rattan is often transported by river, the collector guiding a bunch of rattan lianas, tied together, along the Tanabag River, when there is still enough water. From the village to the *barangay,* collectors

[2] 1 USD = 55 PHP (Philippines pesos)

themselves often carry their harvest, or they use cattle. Rattan can be collected all around the year, but it is easier during the dry season.

A Batak man carrying rattan from the forest to sell it in the district.

Honey collection (*taro)*. Villagers make a double circular frame from a liana named *bekal (Schizostachum* sp.) and put it on a high branch of one of the numerous trees appreciated by bees to make their nest. Bees then build their nest on the frame. Honey is one important resource for cash. The Bataks can sell one half gallon of honey for 125 PHP (about 2.30 USD). The best time to collect honey is during the dry season, between January and May, and especially after March, when villagers perform a fertility ritual, called *lembayan,* to obtain good harvests of honey and rice for the Batak communities. The ceremony ends after one week and is important to all the Bataks (not only those in Kalakuasan). Honey is called *lanau* or *taro* in Batak, and the honeybees are named according to the variety. The most interesting bees for producing good honey are the *pucukan,* or big honeybee, and *niguan,* a small bee.

Pig hunting (*baboy*). Villagers have a number of domestic animals in Kalakwasan—pigs, goats, chicken, dogs, water buffalo—but they also regularly go to the forest to hunt wild animals such as monkeys (*bakes),* wild pigs (*baboy),* wild chicken (*manok)* etc. Wild pigs are an important resource for household alimentation, but can also be sold to the *barangay.* For 1 kg of pork, one can expect about 60 PHP. Pigs can be hunted anytime during the year, but the best time is during fruits season, in August, when the pigs are busy looking for food, and fatter. Pigs are hunted with shotguns *(pusil)* or pig bombs. Pig bombs are very popular and easy to make. Powder from firecrackers, sold in small packets, is generally mixed with a cap, and with dry and smelly fish to entice the pigs. The pig bomb is a small bowl of 3–5 cm diameter that is left in the forest where pigs are thought to come for foraging. It is still common to hear pig bombs blow up in the valley.

h. The different categories of landscape according to the Bataks

Twelve sample plots were sized, one in each category of landscape that was recognized and named by the Bataks. Figure 2 shows the location of each plot around the village of Kalakwasan. In each plot, information was collected about the trees (diameter, name, height, furcation index, distance from the centre of the plot etc), the non-trees, the history of the site according to the Bataks, the ecological description of the site, and all local names and uses of the plants collected and described. Annex 1 provides the identified botanical and local names of all the specimens of plants collected within and outside the plots.

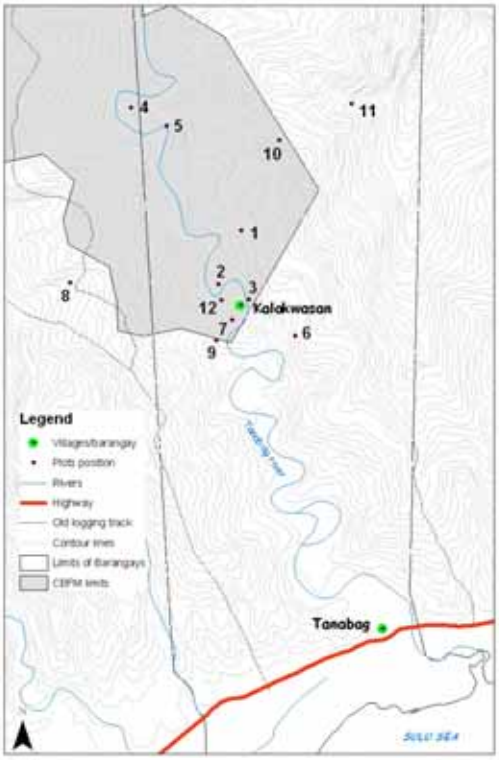

Figure 2. Distribution of field plots around Kalakwasan.

Determining the different categories of landscape with the Bataks was a difficult task, partly because we could not speak Batak or Tagalog, and it was therefore difficult to check each name and make sure that it corresponded to the landscape and not to other environmental features. We did much cross-checking for these categories, with different groups (men, women), with single informants and by repeatedly asking all the informants about it during our activities in the forest. We think we have collected correct information about the various landscapes. Table 2 lists the main features of each landscape category.

Table 2. Plots sized at Kalakwasan and their corresponding landscapes.

Plot No.	Location	Landscape (local name)	Dominant tree species	Main uses	Remarks
1	Balingasag	Secondary forest (**lumakad**)	*Barringtonia acutangula* (L.) Gaertn.	b, c, f, j	Muddy area, used to collect plants (timber, medicine)
2	Suyungan	Cultivated garden (**taraneman**)	*Barringtonia acutangula (L.)* Gaertn*; Canarium asperum* Benth.*; Garcinia benthami* Pierre	b, d, f, j	On a hill. The house is beside the garden, close to the village
3	Bago	Secondary forest near the river (**lumakad**)	*Lagerstroemia speciosa* (L.) Pers.*; Pterocymbium tinctorium* Merr.	a, b, c, f, e, i	Flat place with floods, near the river. Place of former refugees
4	Seray	Old fallow near old village (**jaring**)	*Artocarpus ovatus* Noronha	b, e, f, g, n	Flat area by the river, upstream from Kalakwasan
5	Malusungon	Old secondary forest near the river (**geba**)	*Pterocymbium tinctorium* Merr.	b, c, f, j	Protected area used to perform the *lembayan* ritual. Previous logging activities
6	Kapisaan	Old swidden rice field (**kalagian**)	—	a, b, d, j, o, n	Big cluster of rice fields, soggy area
7	Kalakwasan	Village surroundings (**bario**)	*Mangifera indica* L.	a, b, e, f, n	Inside the village. Planted with fruit trees
8	Mamanga-bungo	Agroforest	*Acacia mangium Willd.; Anacardium occidentale* L..	a, b, c, e, h	Managed in collaboration by Bataks and Tagbanua
9	Kapuyan	Regrowth, *Gmelina arborea* plantation (**lumakad**)	*Gmelina arborea* Roxb.	a, b, f, h, j	Shrubland near the village. Typical landscape with many medicinal plants
10	Lubog	Primary forest with rattan (**geba**)	*Aphanamixis polystachya* (Wall.) R.N. Parker	a, b, e, j	Flat land atop a big slope, used for rattan collection
11	Mabegra-sanen	Primary forest with *Agathis* (**kebakteken**)	*Chisocheton cumingianus* Harms	b, c, g, i, j	On the top of the mountain, some remaining *Agathis*, used to be logged
12	Maybunglon	Young regrowth with plantation of *Gmelina* (**lumun**)	*Gmelina arborea* Roxb.	b, d, f, h	Close to the village, shrubs. Used for gardens

Note: The different uses of the landscapes and their plants are a. food; b. medicine; c. light construction; d. heavy construction; e. tools; f. firewood; g. basketry, cordage; h. ornament/ ritual/ tradition; i. marketable items; j. hunting functions; k. hunting places; l. recreation; m. future use; n. no known use; o. miscellaneous.

Table 2 shows that we set up plots in almost every kind of landscape in the vicinity of the village. For each place where we worked with the Bataks the first interesting result was that they know almost all the plants we encountered, and that the *babaylan* had a superior knowledge of the herbaceous medicinal and magic plants. Various categories of plant use were represented in each plot, but the main one remained the use of plants for medicine. One reason may be that most of the time a *babaylan* accompanied us in the field, but even though, a part of this specific knowledge is still shared by a number of villagers. Firewood is also a very common use for most of the sampled trees, even if the Bataks rarely go far from the village to collect it. Marketable products include resin from *Agathis philippinensis* and wild honey.

Looking at the map of distribution of sample plots (Figure 2), we observe that old secondary forest and even primary forest (on the crests) can be found not far from the village (less than two hours walking in a mountainous area). If some part of the Batak territory is reserved for agriculture, forests on the slopes and close to the sources remain in very good condition. The eastern slope of the valley is covered by a non indigenous species, *Gmelina,* planted after the logging activities, near the former airstrip, for reforestation.

The entire specimen collection has been deposited at the Herbarium of Puerto Princesa University. No herbarium specimen has left Palawan Island, in accordance with national regulations. All specimens were conserved with alcohol, before being dried at the Herbarium.

The identified specimens were divided into 85 families, 150 genera and 110 species (with 14 families and 53 genera unidentified). On the other hand, only 56 species could not be identified. Table 3 shows the repartition of identified specimens among the various life forms. A total of 1028 specimens were collected during the survey.

The most important life form recorded on nontree plots was the herb, followed by the woody liana and the liana (Figure 3). These life forms were present in large numbers and were well identified by the Bataks. Because of the presence of a shaman during almost all our field activities, we discovered that the knowledge of trees and their uses (timber, firewood, honey etc.) is well shared among all the villagers, but the names and uses of nontrees, especially herbs, represent knowledge that mostly belongs to the shamans. For this reason, the shamans were reluctant to talk about trees, which knowledge they considered common. 'Nontrees' have more uses for medicine and magic than trees. On plot 11 (primary forest of *Agathis),* more ferns were present than on the other plots. Tree palms were also more abundant in that plot than in any other location. More plots would be necessary to characterize the landscapes more precisely.

Among the 469 collected plants with distinct local names, the main use was for medicine (366 plant records), mostly of the herbaceous plants (see Table 4). This result stands out, as of 1219 records almost one third were used for medicine. And this is not counting the magic uses, which functions the shaman controls. The second-biggest use was firewood (156 plant records), as almost all the trees can be used for firewood. Distance from the habitation is the key factor in firewood collection. Only a

few recorded plants had no specific uses (153 plants, or about 12% of the total), which shows the great knowledge the Bataks have of forest resources.

Table 3. Identification of plants from 12 plots at Kalakwasan.

	Family	Genus	Unique Species	Total Record
Tree	41 All identified	89 Identified = 69 Unidentified = 20	105 Completely Identified = 65 Identified up to sp. = 20 Unidentified = 20	479
Non tree	55 All identified	100 Identified = 72 Unidentified = 28	113 Completely Identified = 39 Identified up to sp. = 46 Unidentified = 28	456
Abundant	40 Identified = 27 Unidentified = 13	65 Identified = 40 Unidentified = 25	66 Completely Identified = 29 Identified up to sp. = 12 Unidentified = 25	93
All plants	98 Identified = 85 Unidentified = 13	203 Identified = 148 Unidentified = 55	235 Completely Identified = 110 Identified up to sp. = 70 Unidentified = 55	1028

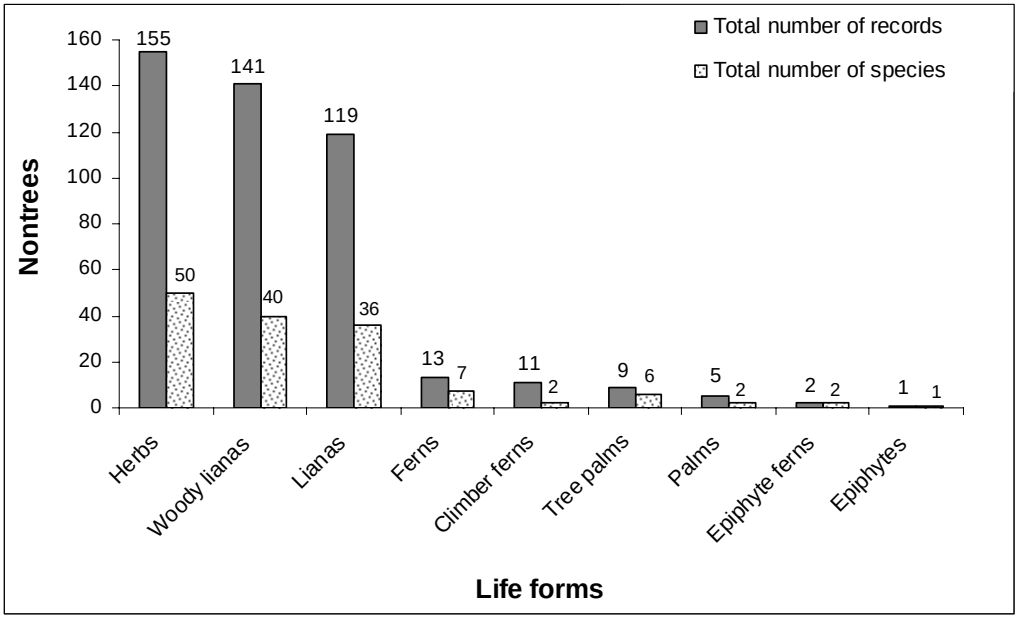

Figure 3. Total number of records and species of life forms found on nontree plots.

According to the Bataks, among all the plants we collected and identified, only **34 were not substitutable.** If these species were lost, they could not be replaced for the same use. This result is influenced by the fact that our main informants during field activities were *babaylan*. Information on the more common plants, and therefore shared knowledge, was collected during the scoring exercise from different groups representing the main categories of villagers.

Table 4 indicates the main categories of uses of life forms. The most important life form for medicine is woody lianas (114 records), followed by herbs (86 records). For the lianas, the most important use is basketry (43 records), followed by medicine (39 records) and magic uses (31 records). In comparison, the most important use for trees is firewood (118 records), followed by medicine (75 records), even before timber (73 records). Table 4 shows that among all life forms medicine is a very important use. In the tree category, the hunting function is important.

Table 4. Total number of tree and nontree records of each life form per use-class.

			Recorded Plant Uses															
			Food	Medicine	Light construction	Heavy construction	Firewood	Tools	Basketry/cordage	Marketable items	Ornament/ritual/tradition	Hunting function	Hunting place	Food for honey bees	Magic use	Miscellaneous	No known use	Total
Nontrees	**Life form**	CF		10					6		2	1					1	
		E									1							
		EF		1							1							
		F	1	6				1				3			9		3	
		H	6	86			1	3	6			7		4	14	2	54	
		L	21	39	1			4	44	7	2	1		1	32	4	30	
		Pa		3		1		2	10								1	
		TPl	4	3	3	1			2							2		
		WL	6	115			2	3	10	2	1	4		5	21	2	37	
Total nontrees			39	263	4	2	3	13	78	9	7	16	0	10	76	10	126	656
Trees			24	75	5	73	118	39	9	1	4	45	4	18	7	6	22	450
Abundant		Sd	4	7		3	11	5	2						3		2	113
		Sh		14		2	15	3				3			2	1	1	
		M	6	3								1			1			
		Sp		4		1	9	1		1	1	2			2	1	2	
Total Nontrees, Trees and Abundant			73	366	9	81	156	61	89	11	12	67	4	28	91	18	153	1219

Note: CF=Climber ferns; E=Epiphytes; EF= Epiphyte ferns; F=Ferns; H=Herbs; L=Lianas; Pa=Palms; TPl=Tree palms; WL=Woody lianas; Sd=Seedling; Sh=Shrub; M=Monocot; Sp= Sapling.

Cross checking the names and uses of herbarium samples with local informants.

i. Summary

The Bataks represent a marginalized group with a strong sense of ownership, great knowledge of the forest resources and landscapes, and a complex system of land management. The Bataks have been obliged to mix with other groups of Palawan to survive, and their relationships with lowlanders and government are often difficult, because of the activities of outsiders coming into their territory to hunt or collect forest products, because of the delimitation of a CBFM area despite the reluctance of the Bataks and because of the inequitable business and power relationships with the lowlanders of the Tanabag *barangay*.

The Bataks have important uses for the forest resources for their livelihoods, their economy and their traditions. Knowledge of forest resources is still great, considering all the changes the Bataks have endured. The most remarkable knowledge concerns the medicinal and magic plants, which belongs essentially to the *babaylan*. Many activities take place in the forest in connection with rattan, resin and honey collection, hunting, fishing etc. The condition of the forest around the village is still good, as many forest products can still be collected not far from Kalakwasan.

The east side of the valley is in better condition, with old secondary forests, and even primary forests at the mountain ridge. Traces of previous logging activities, during the 1970s, are still present, but logging affected only specific resources, such as *Agathis*

trees, which are an important resource for resin collection as well as for timber. This is also the place for mountain rice fields for the villagers.

The west side of the valley has been more affected by deforestation, with the presence of an old airstrip, a small road coming from the *barangay* to the previous logging area, and some shifting cultivation keeping a young regrowth forest.

The main forest products used for cash earning (*almaciga*, rattan, pigs, and honey) are becoming scarce in the village vicinity and have to be collected or hunted farther afield, in the upper part of the valley. It takes more time to collect than before, but it discourages outsiders from over-collecting the forest products without the approval of the Bataks.

4. Local perception on landscapes

The different types of landscape have been defined and characterized in the previous chapter (3.h). We analyze here the importance of each category according to the local perception and to the different activities and use categories. Local perceptions of landscapes were assessed during the participatory mapping with the community at the beginning of the survey.

The participatory mapping was an important step to building a common understanding of the Batak territory and resources. It gave valuable information for the set-up of plots, but also for a better understanding of the local uses of resources, the ecological conditions of important resources and the different categories of landscapes according to local people.

The map (Figure 4) was made by the villagers, during the overall survey, each group or individual adding information to it, based on their knowledge of part of the territory or some more specific activities. We brought with us a basic map showing the coordinates and the locations of village, *barangay* and main rivers. All other items were added based on local knowledge. The tributaries of Tanabag River until Kawati River were located by GPS, whereas the northern part is based only on information collected from villagers.

The map shows the richness of the Batak knowledge concerning the resources, and the importance of forest products to their livelihoods. Villagers gave inputs to the map until the very last day of our survey, together correcting some mistakes, adding new resources or a new location. This map, which was returned to the Batak community after the survey, was not only a valuable tool for our activities, but should also be considered as an important means of negotiation during discussions among Bataks, outsiders and government officers about the Batak rights to their land and resources. It shows that knowledge on land use is outstanding and well shared throughout Batak society and should be recognized as a pattern of this society's relationship with its natural environment. We notice that the CBFM is largely overlapping the Batak territory, which probably leads to conflict situations. No less than 39 categories of landscapes, land types, resources and specific places (caves, graves or enchanted

places) were identified and mapped by the Bataks, even in places far away from the village. Every area of the territory is well known to almost all the villagers, as they circulate together all over and camp close to the river or in the forest when looking for forest products or working in the gardens upstream from Kalakwasan.

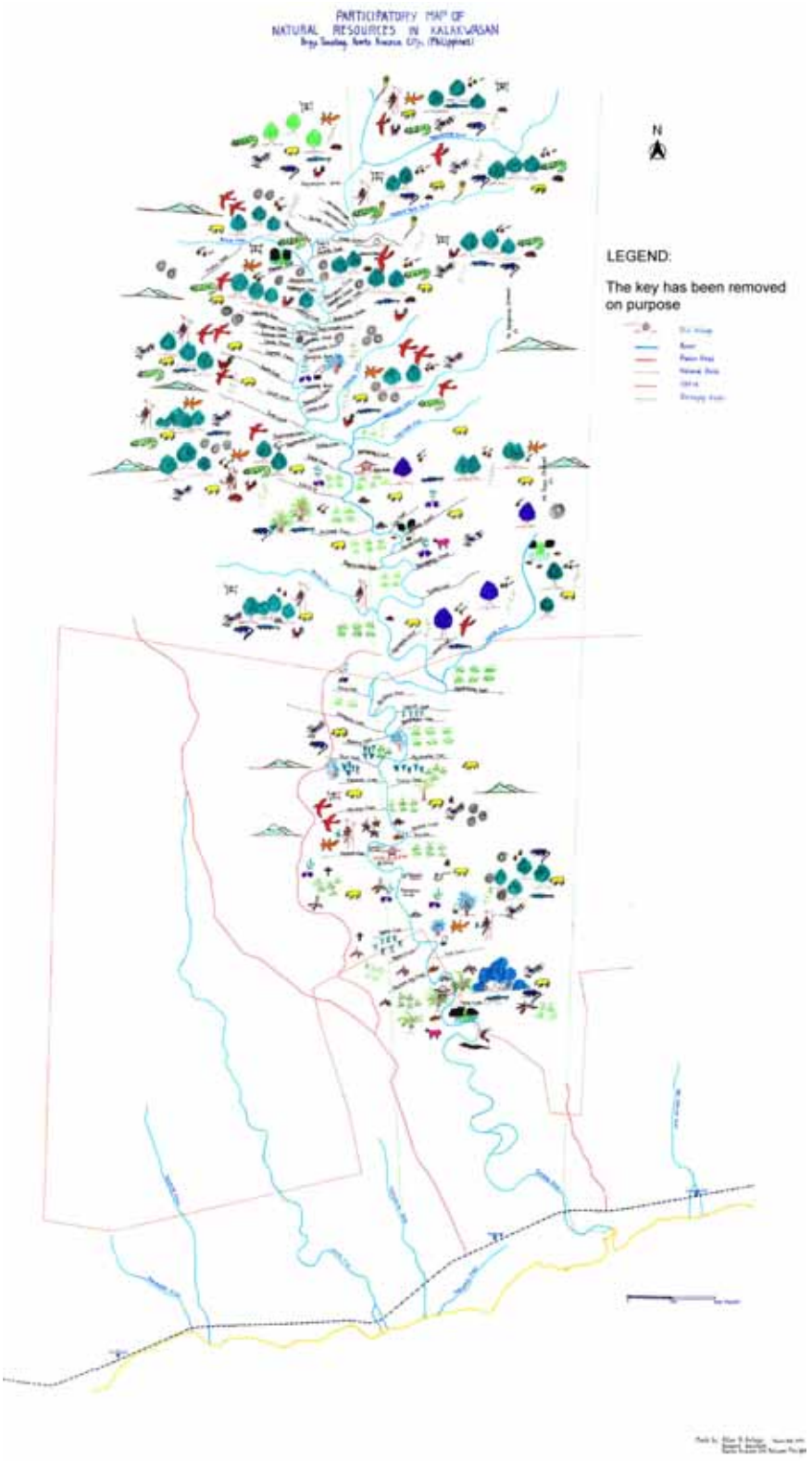

Figure 4. Participatory map of the natural resources in the Batak territory of Tanabag.

a. Important land types

The Bataks named eight land types in their territory: village, abandoned village, garden, swidden rice field, river, regrowth, waterfalls, and forest. Results from scoring exercises show that the four groups (two groups of men and two groups of women) valued the forest as the most important land type (25.8%) for all categories of use (Figure 5). According to the informants, forest is the place to get useful resources from plants and animals, such as honey, *almaciga* resins, rattan, wild pig, and wild root crops for their livelihoods and for cash earning. Forest has also been very important in the past especially for the establishment of the first swidden rice fields.

Perceptions about the importance of the other land types differ between the groups of men and women (Figure 5). Men valued gardens as the second most important land type (22.5%), because they keep seeds there for the next planting season and some crops still can be harvested sometime after the garden is abandoned. Local people also use the gardens for temporary accommodations. During garden activities, Bataks usually gather food for only one day. The men look for any forest product to sell, and they use the money to buy additional rice, sugar etc. If they cannot find forest products, they collect root crops or vegetables from their gardens. Meanwhile, the women stay in the village and take care of the children. For these reasons, the gardens are more important to men than women. The village (17%) is in third position, after the gardens, because it is the place where the Bataks stay for long periods of time. The establishments of a more permanent settlement in Kalakwasan may have influenced their response. It reveals their perception of the landscape. Kalakwasan remains the place where all the Bataks of Tanabag Valley meet after agricultural and gathering activities, which involve smaller groups scattered across the territory. Occasions to meet and to discuss in common problems concerning the community are rare, except during some special occasion, such as the *lembayan* ritual, or when opening a big cluster of rice fields.

The men valued other land types based on their need for their livelihoods. Regrowth is important during the new gardens season. Rivers are important as they provide food (fish, shell, shrimp etc) and water. Swidden rice fields are important for food. The abandoned village is important for cultural reasons and because it still provides fruits. Waterfalls are less important than other land types as the main benefit derives from occasional visitors (tourists). According to the women, swidden rice fields represent the second most important land type (17%) after forest, because they are a source of rice, crops and vegetables. Swidden rice fields are more important to the women than to the men, because the women are doing the planting and harvesting, whereas the men are primarily responsible for field preparation. Village (14.5%) and river (14%) are in third and fourth places for the women. The village is the place where women can stay permanently and for gathering activities, while rivers are important because they provide food and water.

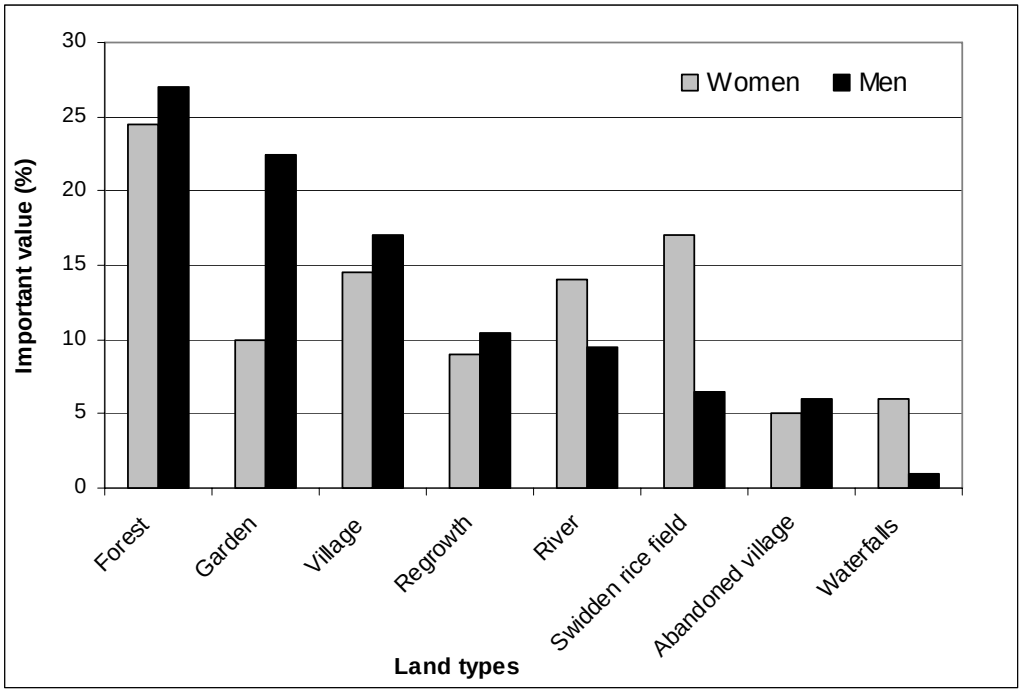

Figure 5. The importance of land types according to the Bataks of Kalakwasan.

The results shown in Table 5 are different from those collected during field activities, because the categories of uses in the plots were determined according to the actual uses of specific forest resources, as recorded by the field team, rather than the overarching uses of the particular landscapes. The scoring exercises better reflect the general and shared opinion of the Batak community on the uses of different landscapes.

Table 5. PDM exercise summary; means per land types, by use-classes for all groups at Kalakwasan (each result is the mean of four groups, two groups of men and two groups of women).

	Food	Medicine	Light construction	Heavy construction	Tools	Firewood	Basketry	Ornament/trad/ritual	Marketable	Hunting function	Hunting place	Recreation	The Future
Village	10.8	4.3	5.5	1.8	0.0	10.3	0.0	0.0	0.0	5.8	0.0	**43.5**	21.8
Abandoned village	2.5	10.5	11.0	2.8	2.3	11.0	7.5	3.3	2.3	0.0	8.5	0.0	6.0
Garden after swidden	12.5	5.0	2.3	1.3	0.0	10.5	0.0	3.0	4.0	9.5	5.0	0.0	6.0
Swidden field	14.8	6.5	2.5	1.3	0.0	5.8	0.0	11.5	0.0	0.0	0.0	3.3	10.3
River	12.3	13.5	6.0	9.0	16.3	19.8	12.3	9.8	0.0	26.5	19.0	37.0	19.3
Regrowth	15.3	19.3	**39.8**	15.8	**43.3**	**21.5**	33.3	24.3	26.3	11.8	19.0	5.3	9.0
Waterfalls	2.0	2.8	1.5	1.5	0.0	5.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0
Forest	**30.0**	**38.3**	31.5	**66.8**	38.3	16.3	**47.0**	**48.3**	**67.5**	**42.5**	**48.5**	11.0	**27.8**
Total per use =100	100	100	100	100	100	100	100	100	100	100	100	100	100

For each category of use, the Bataks consider ‘forest’ the most important land type especially for food, medicine, heavy construction, basketry, ornament, marketable items, hunting function, hunting place and for the future. Light construction, tools and firewood uses are found mostly in forest regrowth, according to the scoring exercises, while the village is the best place for recreation.

Heavy construction and marketable items are considered the most important categories, because the Bataks build more houses in the village than they did previously, they built a community hall, a church and a CBFM house. The sale of NTFP represents the main source of income for their households.

b. Important forest types

The Bataks recognize four main forest types: natural forest, regrowth forest, *Agathis* forest and mountain forest. One pattern of the local typology of forest was the broad definition of *geba*, or natural forests. The explanations of the Bataks are closely akin to those of scientists who define ‘natural forest’ areas as forests where no garden has ever been established, or at least not in the last 50 years (‘long time ago’). The only distinction they make is with *lumakad*, or secondary regrowth after cultivation, which can also be a very old secondary forest. Human activities are the key pattern to distinguish the two categories of forests that represent most of the forests of the Batak territory. This shows a very clear understanding of the forest ecology, from the Batak point of view.

Men and women in all four groups values the natural forest as the most important forest type in the landscape (see Figure 6). They can easily collect the main forest products (plants and animals) important for their livelihoods. The men’s group considers the importance of natural forest (32.5%) almost identical to the *Agathis* forest (31%) because resin collection is one key activity for cash earning, even if they have to travel far from Kalakwasan to find this type of forest.

The women consider forest regrowth (32%) the second most important forest landscape. Forest regrowth, which is founds everywhere around the village, represents the place where to open new rice fields and other types of gardens. Many plants and animals can be found in these forests, not far from the settlements.

Mountain forest is less important for both men and women (average=6.25%), because this type of forest is far from their village, in the upper part of the valley or in the mountains dominating the village. Gardens are traditionally prohibited there, together with timber collection, but many sacred places can be found there and only NTFP are collected in the mountain forests. Any visit to the sacred places should be done after informing the *babaylan* and after performing a ritual to allow any gathering activity.

Among all the forest types, the Bataks give most importance to natural forest for many categories of uses, including food, medicine, heavy construction, ornament, hunting function and place, and for the future (Figure 6). Light construction, firewood, basketry, and recreation are taking place mostly in the regrowth, because villagers use softwood for light construction, find firewood close to their houses and find a lot of rattan in the secondary forest. The *Agathis* forest is important for

marketable products because of the collection of resin. Natural forest, on the other hand, is the best place for hunting, especially for wild pig, for their own consumption or for selling.

Tables 5 and 6 show the interest Bataks of both genders and all generations have in the forest, how important it is for their livelihoods and how they rely on forest products to ensure availability of food, tools and cash income. The Bataks spend long periods in the forest to gather NTFP, to hunt or to open new gardens in places allocated to agriculture. The following section considers a more dynamic aspect of the relationship of the Bataks with their natural environment.

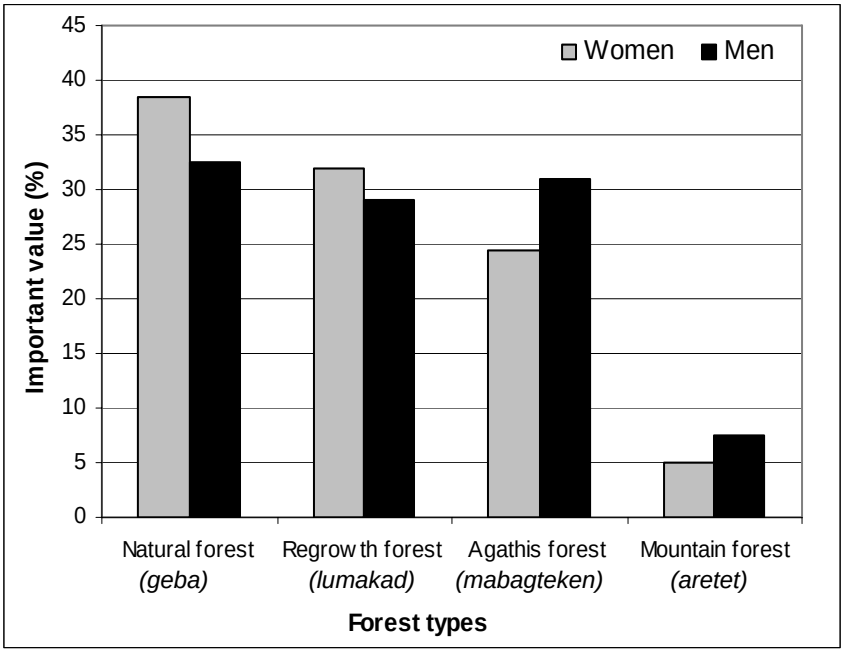

Figure 6. The importance of forest types according to Bataks of Kalakwasan.

c. The importance of forest in the past, present and future

Figure 7 shows the importance Bataks place on forest landscapes and resources over time. The length of time proposed for this scoring exercise was long enough to refer to a very distinct period of their life: 50 years, which represents two generations. Thirty years ago means, in fact, 'a long time ago', when Eder was still working with the Bataks. Asking about the next 20 years explores how villagers understand the importance forest will have for their children, and probably for themselves in old age. It is soon enough to keep a direct interest for themselves or for their most direct family members, but far enough into the future to distinguish it from the present. The result of this exercise was largely in favour of the present. Forest is important in the present, and will be more important in the future than it was in the past. The Bataks are still relying on forest products, which are a source of materials for construction and of plants and animals for medicine and foods. Forest provides cash earnings from rattan or *almaciga* resin. Bataks consider it important to maintain sustainable use of the forest by protecting it for the young generations.

Table 6. PDM exercise summary; means per forest types, by use-classes for all groups (each result is the mean of four groups, two groups of men and two groups of women).

Men and women groups	Food	Medicine	Light construction	Heavy construction	Tools	Firewood	Basketry	Ornament/trad./ritual	Marketable	Hunting function	Hunting place	Recreation	The future
Natural forest (*geba*)	46.3	49.7	28.3	55.7	48.0	36.0	38.5	47.7	40.5	37	52.5	44.3	38.0
Mountain forest (*aretet*)	0.0	4.7	0.0	11.0	9.3	5.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3
Regrowth forest (*lumakad*)	28.7	32.3	61.2	21.5	32.7	43.7	50.0	37.5	17.7	35.5	28.7	55.7	24.7
Agathis forest (*mabagteken*)	25.0	13.3	10.5	11.8	10.0	15.3	11.5	14.8	41.8	27.5	18.8	0.0	34.0
Total per use = 100	100	100	100	100	100	100	100	100	100	100	100	100	100

Forest in the future comes in second position (see Figure 7). Because Bataks, like everyone else, do not know what may happen in the future, the forest has an important role as safety net. Villagers protect the forest and the natural resources by using traditional rules. They also teach their children how to protect the forest so as to reap benefits from it in the future. The most important forest uses for the future are heavy construction (to build permanent houses), food, basketry and marketable product.

For the Bataks, forest was less important in the past than it is now or will be in the future (see Figure 7). Both the men and the women groups explained that they were still children 30 years ago, but they used to hear from the elders that forest was important because it provided them land for swidden rice fields and food (plants and animals), medicine and light construction materials.

In Figure 7 we considered the overall results of the importance of forest in the past, present and future based on all use categories, and now we add the individual results to get an overall idea for all activities. Table 7 shows the importance of forest in the past, present and future for all 14 use categories. Looking for food was voted the most important forest activity in the past, present and future, whereas marketable products are growing in importance over time. Because of the difficult access to 'modern' medicine at the *barangay*, the Bataks do not see any change over time in the importance of traditional medicine from the forest.

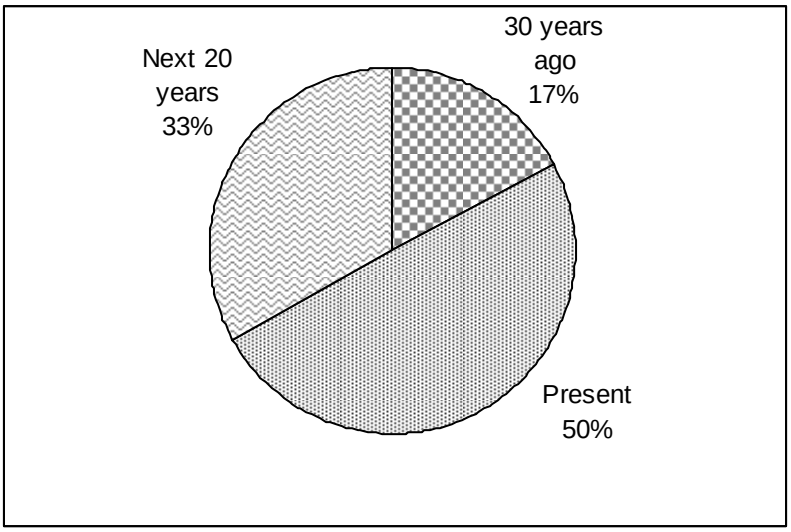

Figure 7. Importance of forest in the present, past and future according to the villagers in Kalakwasan.

Table 7. The importance of forest in present, past and future by use categories (compound average for all groups).

	Overall	Food	Medicine	Light construction	Heavy construction	Tools	Firewood	Basketry	Ornament/trad./ritual	Marketable	Hunting function	Hunting place	Recreation	The future	Total
30 years ago	20.0	15.5	8.7	6.2	4.7	7.0	8.3	6.3	8.5	5.0	8.5	7.3	7.5	6.5	100
Present	46.0	15.0	9.2	6.0	6.8	6.3	8.3	6.3	7.7	9.0	5.7	5.3	6.2	8.2	100
Next 20 years	34.0	16.0	8.5	5.0	7.8	6.8	9.3	6.7	7.5	9.7	3.5	5.7	5.5	8.0	100

d. Summary

The Batak have a precise nomenclature for forest types, based on ecological criteria and according to human impact on the forest typology. Among all the categories of landscapes assessed by the Bataks, forest remains the most important one for both women and men of all generations for most of the use categories. And among the different categories of forest, natural forest is the most important one, even if regrowth is important for firewood and light construction materials and *Agathis* forest is the best place where to find marketable products, including the all-important resin. On a diachronic basis, forest in general has more importance in the present than it had in previous times or will have in the future. Villagers feel more concerned with what is happening to their forest here and now, because of all the issues concerning land use rights, relation of power between Bataks and *barangay* authorities, land management, government rules and extractivist activities of lowlanders. This situation

is revealed by the increasing importance of marketable forest products, according to the Bataks, in the future.

5. Local perception of the resources

This section considers the most important resources for the Bataks. We provide information on the uses of these resources, their importance for the Bataks, their scientific names and, when possible, their availability in Tanabag valley.

a. Importance of resource products

To understand the importance of natural resources for the Bataks, we classify these resources into three categories: **wild** resources (plants and animals) from the forest or outside, **cultivated/farmed** resources and **purchased** items (see Table 8).

Table 8. Importance of resource products according to the Bataks from Kalakwasan (average for all groups compounded).

	Wild Plant		Wild Animal		Cultivated/ Farmed		Purchased		Total
	Forest	Not from forest	Forest	Not from forest	Plant	Animal	Plant	Animal	
Women	14.4	11.7	13.2	10.1	18.9	14.0	9.4	8.3	100.0
Men	22.3	14.1	12.5	8.6	14.1	11.0	9.4	8.0	100.0
Mean	18.4	12.9	12.9	9.3	16.5	12.5	9.4	8.1	100.0

According to the Bataks, plant and animal resources are still abundant in their territory and are very important for the local livelihoods. The Bataks recognize that natural resources should be managed for the young generation. Traditional rules are therefore still applied to the collection of forest resources.

From the scoring exercise we found that the main resources collected are wild (53.5%). Of the total resources collected 31.3% comes from wild plants and 22.2% comes from wild animals (see Figure 8).

Wild animals are important to local people because the resource is still available in the forest, especially wild pig and bees, the latter producing honey to be sold at the *barangay* or even in Puerto Princesa. Revenue from the sale of honey is a main income for the Bataks. Table 8 shows that even if wild plants and animals are mostly found in the forest, they also represent a substantial resource outside the forest (in the village vicinity, near the river, along the tracks etc). All categories confounded, plants are considered in average, as more important than animals.

According to the men, wild plants from the forest are more important than other categories because they represent the main source for cash earnings (*almaciga* resin and rattan). Other wild plants are used for household consumption, but not sold, for example tubers such as wild yam *Dioscorea sp., abagan* and *kudot* varieties.

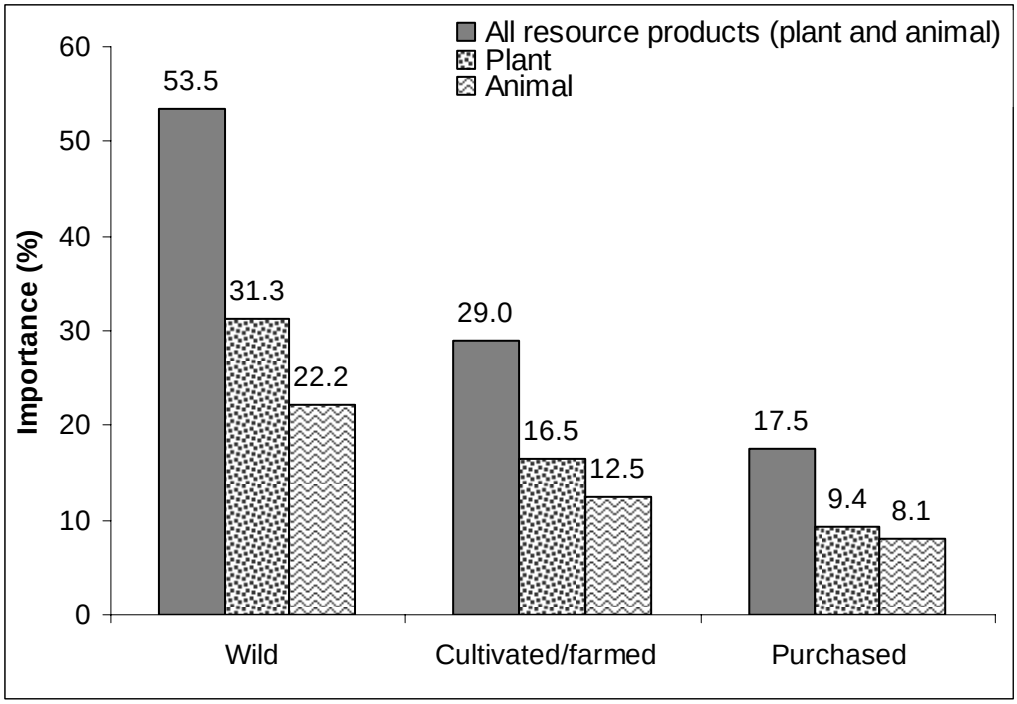

Figure 8. Importance of resource products (plants and animals) for the Bataks from Kalakwasan.

An interesting result comes from one of the *babaylan*. He valued wild plants as the most important resource product because he obtains most of the traditional medicine and magic plant material from them. In addition, wild plants are also used for house construction, basketry and firewood.

The Bataks consider cultivated/ farmed resources the second most important (29.0%). Women value these resources higher (18.9%) than any other, even wild resources (see table 8). In general, women rarely enter the forest. They usually stay in the village or at the camp to take care of the children or they go to the gardens. Hence, products from cultivated areas such as root crops, rice, fruit and vegetables are considered more important than other resources.

Annex 2 lists the main species of plants and animals identified by the Bataks during scoring exercises, for each category of product. These resources were identified by two groups of men and two groups of women. Results are quite different from those obtained during plot activities, but better reflect the common knowledge of the Batak society of Kalakwasan.

The list, even if not exhaustive, gives an idea of the diversity of wildlife in the valley and shows that villagers share important knowledge of the natural resources, the plants and animals from the forest and from the domestic space.

b. Importance of plants and animals species and their uses for local people

Scoring exercises allowed for the identification of the most important species. In the first exercise, the different groups participating in the activities gave overall scores for each category of use of forest products. Figure 9 illustrates the importance of species for each category of use according to the Bataks from the PDM activities. To them, food was the most important followed by medicine and marketable products.

Then they ranked the ten 'most important' species of plants and animals. Based on the scores obtained in this exercise, we identified the importance of species using the local user's value index (LUVI). This approach is based on the general hierarchical principle used in analysing importance. The procedure elicits local information about the importance of species by asking for a hierarchical weighting. The results allowed us to evaluate the relative importance of a diverse system of locally valued forest species (see also Sheil and Liswanti, 2006).

Annex 3 shows the summary results of the LUVI for the 'food, medicine and marketable product' importance of plants. Based on the LUVI, the most important plant species for food were *kudot* (*Dioscorea hispida* Dennst.) with a LUVI of 1.185, *paco-paco* (*Athyrium esculentum* (Retz) Copel) with LUVI of 0.718, *banag* (S*milax leucophylla* Bl.) with a LUVI of 0.708, *bago* (*Gnetum gnemon* L.) with a LUVI of 0.592 and *dugyan-dugyan* (*Durio* sp.) with a LUVI of 0.567.

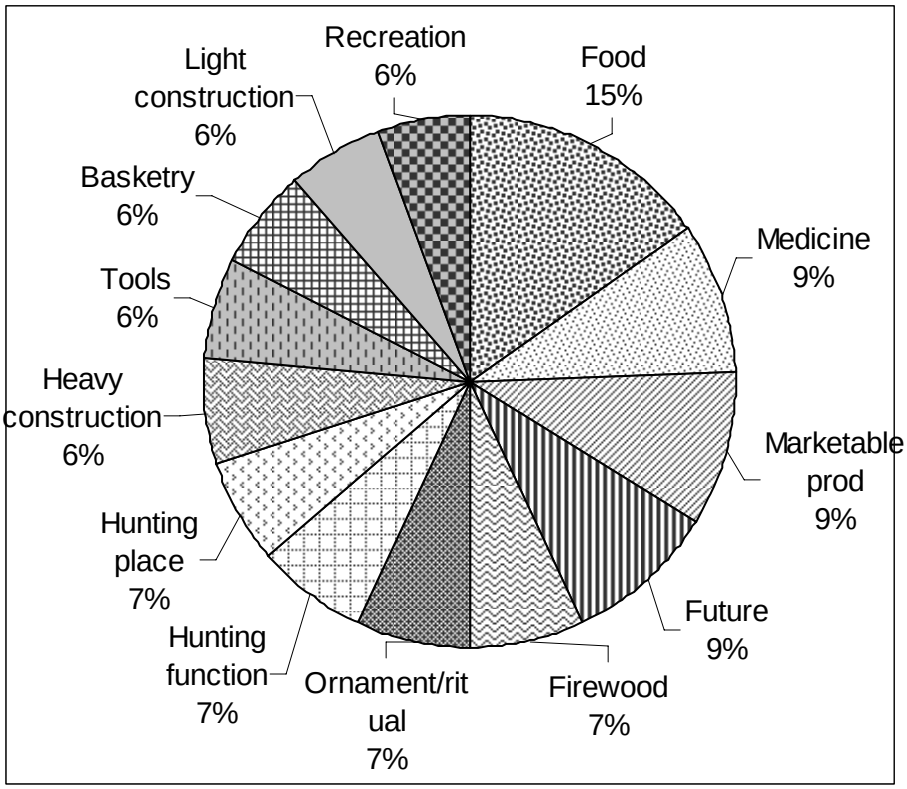

Figure 9. Average importance of categories of use of forest products in Kalakwasan.

Among animal species (see Annex 4), *mogung* (bee) with a LUVI of 1.285 was the most preferred resource in the forest. The Bataks collect honey regularly because this product is valuable for cash earnings. *Baboy* (wild pig), with a LUVI 1.235, is often hunted in the forest. This animal is still abundant and easily found in the forest, and the Bataks employ pig bombs to kill it. Other animal species of importance for food include *seda* (fish), *suso* (shell), *baboy* (wild pig), *bakes* (monkey), *bayu-o* (turtle), *carundang* (shrimp) etc. The Bataks prefer fish for food over all other species. The Bataks often stay along the river, and fishing is the easiest activity for supplementing household consumption. Animals for food are rarely sold.

c. Summary

Plant and animal resources are still abundant in the Batak territory, and villagers want to manage these resources for future generations. Both plants and animals are important for the Bataks as their livelihoods depend on forest products, but the Bataks say that wild plants are even more important than wild animals. *Almaciga* resin and rattan provide some cash income to the Bataks. Wild plants are also given a high value for medicine. Other cultivated plants, farmed animals or purchased products are less important compared with the wild plants and animals. These resources are usually found outside the forest.

Pandanus leaves are an important resource for the women in Kalakwasan

Asked to classify the importance of plants and animals based on 13 categories of use, the Bataks ranked food topmost, followed by medicine and marketable products. The

scoring exercises helped the local people to list 10 species of plants and animals, and to rank them based on their importance. This information will be helpful for land-use planning in the future.

6. The Bataks' priorities: relationship with lowlanders, government, keeping a Batak identity

The Bataks' priorities for the future are fourfold:

- to keep the Batak identity
- to gain advantages and recognition from the government of their rights to the resources and landscapes of Tanabag Valley
- to control activities of outsiders linked to natural resource management
- to bring good health and prosperity to the Batak society.

Identity is under constant construction, because of the different origins of the settlers in Kalakwasan, because of the regular interaction with lowlanders, scientists, businesspeople, collectors and politicians, and because of the slow demographic growth of the society. Emphasis on the language and many other cultural aspects is a relevant way to preserve the cultural patterns of Batak society. The *lembayan* is an interesting example of this cultural priority. This ceremony, which was condemned to near-extinction in the recent past, still exists and gathers most of the remaining Bataks of Palawan Island. It represents the key ritual for all the Batak activities during the year, for the health of the society, good honey and rice harvests, and also serves to keep alive the traditions of the society—even if it is becoming a tourist attraction and many non-Batak visitors assist in it. Batak society is fighting to keep its identity while facing new challenges with all the visitors coming to watch and study the 'traditional way of life' of this marginalized Negrito group.

Increasing dependency on tourism, development projects, church activities and help from scientists and NGOs is threatening the tradition and identity of the society. Recognition of the Bataks' practices is also a priority, especially in agriculture, but also concerning their livelihood, which is generally poorly understood by province officials, if known at all. Officials often argue that the Bataks are lazy, stay in poorly made houses and lack the willingness to develop the valley, but they rarely try to understand all the pressures this society has to face or the richness of its traditions and knowledge. The village priest, a lowlander, provided a horrifying example of this lack of understanding of the Bataks' culture when he once told a villager that with their knowledge of all these medicinal plants, the Bataks should be ashamed to have let so many children die during a recent epidemic. Efforts should be made to help all officials, church workers, NGO activists etc. to understand Batak society and how the Bataks perceive and manage their environment.

Big discussions with government officials took place concerning the management of the area and the delimitation of a CBFM shared with outsiders, but as their voice is rarely heard by officials, the Bataks could not secure a key role in the decisions taken regarding the management plan. As a result of the negotiations, a zone was delimited for the Bataks under a Certificate for Ancestral Domain Claim (CADC), which

theoretically improved the rights of the Bataks to their land, but concretely reduced the territory they claim as theirs and overlapped it with the CBFM limits, thus creating the potential for additional problems. To the present day, land rights recognition remains an important issue for the inhabitants of Tanabag Valley.

Outsider activities are relatively limited, as the village controls the only way to the natural forest where *almaciga* can be found. But relationships with lowlanders largely favour the lowlanders, who control the economic activities through their stores and the official authority of the district. If lowlanders rarely enter the forest to collect honey, resin, or other NTFPs, the Bataks who collect the forest products and sell them at the *barangay*, or more rarely in Puerto Princesa, have no control over prices. Building a fairer relationship with lowlanders is therefore a priority for improving the Bataks' livelihoods.

Informal education is a good idea to strengthen the Bataks' the ability to contest government decisions and to improve relationships with lowlanders, but that should be done with respect for the cultural patterns of the society and according to their traditional rules, their calendar of activities and their expressed interests and priorities.

7. Conclusions and recommendations

a. Conclusions

This survey of nearly three weeks was a good opportunity for the MLA team to use the method in a context starkly different from previous exercises and in a society with which we had little experience (If some team members had already experienced the Batak society before, it was the first time a MLA study was conducted there). It was therefore a valuable experience for us, one that showed that the set of methods is relevant to this kind of situation.

From the results of the study we conclude that the Bataks represent a group with a strong sense of ownership, which possesses great knowledge of the forest resources and landscapes and has a complex system of land management. They have important uses for the forest resources of resin, honey, rattan, medicinal plants, timber and game for their livelihoods, their economy and their traditions. Knowledge of forest resources is still great, considering all the changes the Bataks have been through, and it is the *babaylan* who have the most important knowledge of forest resources (especially plants) among all the community.

Landscapes have changed over time. Forests on the west side of the valley are better preserved than those on the east side, where logging activities have affected the landscapes for years and where swidden farming takes place. Some areas on the west side of the valley were converted to farms and patches of agricultural plantation are evident. For that reason, and because of over-harvesting of the resources, forest products are becoming scarce close to the village. The Bataks try therefore to control, as much as they can, the access to valuable resources.

Forest is the most important category of the landscape, for both women and men, for most of the categories of use. Natural forest is the most important landscape among all the categories of forest. There is a will to manage locally the forest resources of the valley, to preserve valuable products for the future.

All our interviews and activities showed the great concern the Bataks have for their forests, for the sustainability of resources, for the rights to traditional land and for the way their relationship with outsiders may affect that situation.

b. Recommendations

- Any project related to land use planning and natural forest management in the Tanabag Valley should take into account the Batak priorities, wishes, perceptions and activities related to forest resource management.

- The Bataks represent a marginal, fragile group, and any step, any decision that could affect their livelihood and threaten their way of life should be considered with great care and in collaboration with the Bataks themselves. This said, the geographical, economic and political isolation of the Bataks as a group is one of the several reasons for their marginalization. Keeping them isolated will not help them in their relations with lowlanders, migrants and government institutions. It is therefore necessary to bring LPF activities to Kalakwasan, to involve the Bataks in such a project and to ask them about their expectations prior to any activity. The idea here is not to implement all the remaining LPF activities in Kalakwasan, but to integrate the Bataks into the project by visiting their village directly.

- Our approach provides some information about the Batak livelihoods and which resources and landscapes are important for this society, but more information is necessary to better involve the Bataks in any decision taken about their environment. Closer collaboration should be made with scientists and NGOs working in the area, to obtain a more precise picture of the relationship of the Bataks with their natural environment. Anthropology would be an important domain to study, as the Bataks' conception of the world, their cosmogony and kinship system can provide important information for a better understanding of this society.

- Even if we explained the aims of our activities, the villagers seemed still confused about our objectives. The presence of *barangay* staff did not facilitate our integration, because of conflict issues and power relationship. We recommend here to interact directly with the Bataks, without involving intermediaries from the *barangay*, and to inform them regularly about the objectives of the project.

- The information collected during our survey provides a good basis for the development of further activities involving Batak villagers. The participatory map is a relevant tool for the exploration and discussion of the limits of Batak territory, taking into account their outstanding knowledge of forest landscapes, forest ecology and forest resources. Special sites that have importance for the traditions of Batak society can be identified, such as graves, haunted and sacred places, *almaciga* (*Agathis*) forests and rattan areas. The map can be used as a basis for

negotiations, even if it was made by the villagers and lacks scientific precision concerning the exact locations of individual features. This participatory mapping could be used by LPF for the negotiations about the role of the Bataks in the CBFM and the CADC. Much dissatisfaction was perceptible among the Bataks concerning the problems of land tenure, land rights and limits of CBFM[3]. The Bataks are part of any good resolution of these problems and should therefore be part of the negotiations.

- Any new survey in Batak territory should be conducted only after clear agreement about compensation and other arrangements (logistics, informants, guides, food etc.)

- The Bataks respect the *barangay* authorities, but they fear them too. This information originally given by Dario Novellino was confirmed by our experience during the survey and by our perception of the relations between Bataks and *barangay*. Indeed the Bataks respect the *barangay* chairman, but this does not mean that the relationships between Tanabag and Kalakwasan are simple and without problem of power and dependency. For these reasons, activities directly related to the Bataks should be undertaken without any important involvement of the *barangay Kapitan* and his staff, at least at the beginning. The relations between Bataks and *barangay* authorities are complex and coloured by strong relations of power and dependency. LPF should also carry on activities in the Batak village (Kalakwasan) and not only in the *barangay* (Tanabag). Another reason to do so is that the Bataks usually go to the *barangay* as individuals who do not represent the overall community if they attend meetings there. We are not even sure that the results of the discussions are reported properly to the other members of the community. Bringing a part of the LPF activities to the Batak village will guarantee the participation of more, if not all, Bataks.

- Trust from the villagers was difficult to gain, but no direct confrontation took place. When villagers are unhappy, they just leave the village for a week or two and stay alongside the river in the upper part of the valley. Activities involving a big team and elaborate logistics may disturb the local community. Small teams should be considered as an option to work with the Bataks.

- Respect of the annual calendar of the villagers is important, considering the seasons of new mixed crop gardens, for honey collection and for rice field cultivation. To work in the village during the hard season (February was obviously one) is more sensitive as people lack everything, including food.

[3] According to Eduarda Devanadera of the LPF staff, previous projects with the Bataks included the CBFM initiative by Haribon Palawan and the more recent project by Bansa Palawan. Neither of the two projects were able to achieve their final objective, and they were not very good experiences for the Bataks. In the CBFM project, the annual work plan required by the project was not approved by DENR during the implementation stage. Utilization and protection of forest resources therefore never materialized. In the Bansa Palawan project, the project manager used part of the funding for his personal interest, which has become a legal issue. Still according to Eduarda Devanadera, it is important to consider the cultural practices and traditions, the indigenous knowledge and experiences in the design of future plans and projects. It is also important to take note of what development the Bataks would like and what skills would benefit them on a long-term basis.

- NTFPs are an important source of income for the villagers. Collection of rattan, honey, game and resin provide the main source of cash for the people. Activities should be developed to secure these resources for the exclusive use of the Bataks, as they are becoming scarce because of over-harvesting (mainly by lowlanders) and collectors have to go farther to find them.

- The market for these products should also be secured, especially at the *barangay*, where the villagers find other marketable products to buy or exchange, and in the province capital, Puerto Princesa. LPF could work on market issues and help to strengthen the position of the Bataks towards the different stakeholders. Existing trading channels are unfavourable for the Bataks, who usually are in debt to shopkeepers. Adaptations of the existing system could be proposed by LPF that emphasize capacity building and simplified administrative procedures. The existing trading system is advantageous for local traders, who buy NTFPs at low prices or exchange the products for '*consumo*' or food items the Bataks need during the NTFP harvest.

- LPF could build on this survey to provide more information to the Bataks concerning lowlanders, institutional linkages, market forces etc. Informal education already exists in Kalakwasan, but it could be augmented and improved with more specific topics. *Almaciga* resin, honey and beeswax were considered potentially interesting products for the Bataks during the previous LPF discussions on the market chain, but further research should be done on that, as in the end these products were not selected. *Natripal, Nagkakaisang Samahan ng Katutubo sa Palawan,* a federation of Indigenous people in the province, has been involved, however, in honey and beeswax collection, processing and marketing. It was assisted by UP Los Banos experts in its attempt to improve the honey and beeswax market chains.

- An outstanding result came from the important knowledge of the *babaylan* of medicinal and magic plants. These skills are highly useful, and people rely on natural medicine to cure their diseases and help them in their daily activities (gardening, hunting etc). This local science should be respected, conserved and even developed for the sole use of the Bataks, as only two skilful shamans remain and it is difficult for them to find young men to replace them. Attention should be paid to property rights for medicinal and magic plants.

- Any project should improve the property rights of the Bataks for their natural resources, so that they cannot be spoiled by outsiders (lowlanders, but also government and private sector). This is a sensitive issue that the Bataks are well aware of and care for strongly.

8. Acknowledgements

Field activities were funded by the European Commission through the project Levelling the Playing Field.

We are especially grateful to Philippe Guizol, Herlina Hartanto, Teodoro Villanueva and Eduarda Devanadera for their support and constructive comments.

We are very grateful to the villagers of Kalakwasan, Office of the City Planning and Development Coordinator, Palawan Council for Sustainable Development staff, DENR-CENRO, Palawan State University and Barangay Council of Barangay Tanabag for their collaboration.

We wish to acknowledge all the members of the MLA team in the Kalakwasan village for their teamwork, support and suggestions for the redaction of this report: Azucena Gamutia, Daniel G. Tejada, Elizabeth P. Gironella, Reymar R. Castillo, Samuel Fabila, Alan R. Artajo, KGD Gandencio A. Osano Jr. and Agripeno Patero.

We thank Levania Santoso, Rosita Go and Eko Priyanto for layout, editing and cover design.

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Annex 1. Botanical and local names of all the plant specimens

No	Botanical Name	Family	Local name
1	-	Acanthaceae	Bayak
2	-	Acanthaceae	Botabotat
3	-	Acanthaceae	Bulak lak et dewata
4	-	Acanthaceae	E-ged (2)
5	-	Acanthaceae	Gansuri
6	-	Acanthaceae	Pangoy koyun
7	-	Acanthaceae	Parok puk
8	-	Acanthaceae	Rangbu rangbu
9	-	Acanthaceae	Sarimsim
10	*Adiantum sp.*	Pteridaceae	Panapa
11	*Alocasia sp.*	Araceae	Badiang
12	*Alocasia sp.*	Araceae	Soa soang
13	*Alpinia sp.*	Zingiberaceae	Lakuas
14	*Alpinia sp.*	Zingiberaceae	Tagbag
15	-	Amaranthaceae	Tangar tangar
16	*Amorphophallus sp.*	Araceae	Ekogit biyawak
17	*Amorphophallus sp.*	Araceae	Sea seang
18	*Ananas comosus* (L.) Merr.var. *bracteotus* (L.) Merr.	Bromeliaceae	Pinia
19	-	Annonaceae	Angrat bakus
20	-	Annonaceae	Ulagak
21	*Antigonon sp.*	Polygalaceae	Aroperan
22	*Antigonon sp.*	Polygalaceae	Kamandag
23	*Antigonon sp.*	Polygalaceae	Pana bugan
24	*Antigonon sp.*	Polygalaceae	Sabud
25	-	Apocynaceae	Awed
26	-	Apocynaceae	Ayot-ut
27	-	Apocynaceae	E-ged
28	-	Apocynaceae	Pela
29	-	Apocynaceae	Sabud
30	-	Apocynaceae	Sera saan (very strong)
31	-	Araceae	Soa soang
32	*Arcangelisia flava* (L.) Merr.	Menispermaceae	Galapen
33	*Arcangelisia sp.*	Menispermaceae	Galapen
34	-	Arecaceae	Lapsik
35	-	Arecaceae	Sambolagan
36	*Arenga pinnata* Merr.	Arecaceae	Buklid
37	*Asplenium nidus* L.	Aspleniaceae	Lepay
38	*Asplenium sp.*	Aspleniaceae	Dapo dapo
39	*Asplenium sp.*	Aspleniaceae	Lepay
40	-	Asteraceae	?
41	-	Asteraceae	Baray hibo pitut
42	-	Asteraceae	Barung ngut kasili
43	-	Asteraceae	Bazay but buyata

No	Botanical Name	Family	Local name
44	-	Asteraceae	Da nge nge
45	-	Asteraceae	Gabung gabung
46	-	Asteraceae	Ripugus
47	-	Asteraceae	Sering sering
48	-	Asteraceae	Unlang-unlang (2).
49	*Bauhinia sp.*	Fabaceae	Kaloa
50	*Bauhinia sp.*	Fabaceae	Talua
51	*Blumea balsamifera* DC.	Asteraceae	Kalibun
52	*Blumea balsamifera* DC.	Asteraceae	Maritana
53	*Brassica sp.*	Brassicaceae	Kulo kulo
54	*Bryophyllum pinnatum* (Lam.) Oken	Crassulaceae	Maritana
55	*Caesalpinia sp.*	Caesalpiniaceae	Akaray
56	*Caesalpinia sp.*	Caesalpiniaceae	Dekat dekat
57	*Calamus microsphaerion* Becc.	Arecaceae	Danket
58	*Calamus sp.*	Arecaceae	Abuan
59	*Calamus sp.*	Arecaceae	Bityed
60	*Calamus sp.*	Arecaceae	Bugtong
61	*Calamus sp.*	Arecaceae	Dagket
62	*Calamus sp.*	Arecaceae	Kalabang
63	*Calamus sp.*	Arecaceae	Lapsik
64	*Calamus sp.*	Arecaceae	Lipi
65	*Calamus sp.*	Arecaceae	Marua
66	*Calamus sp.*	Arecaceae	Nanga
67	*Calamus sp.*	Arecaceae	Palasan
68	*Calamus sp.*	Arecaceae	Taloloda
69	*Carica papaya* L.	Caricaceae	Kapayas
70	*Caryota cumingii* Lodd. Ex Mart.	Arecaceae	Barog
71	*Caryota sp.*	Arecaceae	Barog
72	*Chromolaena odorata* (L.) R. King & H. Robinson	Asteraceae	Agunoy
73	-	Clusiaceae	Kabiligan
74	*Cocos nucifera* L.	Arecaceae	Niog
75	*Commelina sp.*	Commelinaceae	Agbu agbug
76	*Commelina sp.*	Commelinaceae	Angu-angu
77	*Commelina sp.*	Commelinaceae	Baray butang dayad
78	*Commelina sp.*	Commelinaceae	Ilamunun
79	-	Commelinaceae	Tiring tiring
80	-	Convolvulaceae	?
81	-	Convolvulaceae	Belagen
82	-	Convolvulaceae	Gatas et dugyan
83	-	Convolvulaceae	Solpot
84	-	Convolvulaceae	Tabuyo wan Etwawa
85	-	Convolvulaceae	Tayokut et tomanan
86	-	Convolvulaceae	Wakag
87	*Costus sp.*	Zingiberaceae	Ubud ubud
88	*Costus speciosus* Sm.	Zingiberaceae	Kulaygan

No	Botanical Name	Family	Local name
89	*Costus speciosus* Sm.	Zingiberaceae	Lakuas
90	*Curculigo capitulata* (L.) O.K.	Hypoxidaceae	Langba langba
91	*Cyanotis sp.*	Commelinaceae	?
92	*Cyperus sp.*	Cyperaceae	Agbu agbug
93	*Cyperus sp.*	Cyperaceae	Anggu-anggu
94	*Cyperus sp.*	Cyperaceae	Bag bag
95	*Cyperus sp.*	Cyperaceae	Boldong
96	*Cyperus sp.*	Cyperaceae	Ubud ubud
97	*Daemonorops sp.*	Arecaceae	Aring ingan
98	*Derris elliptica* Benth.	Fabaceae	Balibag
99	*Derris sp.*	Fabaceae	Tigamara
100	*Dimorphocalyx luzoniensis* Merr.	Euphorbiaceae	Nilo
101	*Dioscorea sp.*	Dioscoreaceae	Abagan
102	*Dioscorea sp.*	Dioscoreaceae	Ambognag
103	*Dioscorea sp.*	Dioscoreaceae	Kudot
104	*Dioscorea sp.*	Dioscoreaceae	Tingat babuy (tingat = teeth)
105	*Donax cannaeformis* (G. Forst.) K.Schum.	Marantaceae	Banban
106	*Dracaena sp.*	Dracaenaceae	Darau
107	*Entada phaseoloides* (L.) Merr.	Fabaceae	Balogo
108	-	Euphorbiaceae	Da nge nge
109	-	Euphorbiaceae	Ulagak
110	-	Fabaceae	?
111	-	Fabaceae	Ayet-et
112	-	Fabaceae	Ayot ot
113	-	Fabaceae	Ayot ut
114	-	Fabaceae	Bagna
115	-	Fabaceae	Bayak
116	-	Fabaceae	Boge
117	-	Fabaceae	Bugy
118	-	Fabaceae	Gey gey
119	-	Fabaceae	Inlangay
120	-	Fabaceae	Kabug
121	-	Fabaceae	Keuyangyang
122	-	Fabaceae	Kuyang yang
123	-	Fabaceae	Magobay
124	-	Fabaceae	Malabnang
125	-	Fabaceae	Melabnang
126	-	Fabaceae	Panala
127	-	Fabaceae	Sapinit
128	-	Fabaceae	Sarain
129	-	Fabaceae	Sik sikit magaragan
130	-	Fabaceae	Tagbung
131	-	Fabaceae	Tibalbag (babaye)
132	-	Fabaceae	Tigamara

No	Botanical Name	Family	Local name
133	-	Fabaceae	Tuba tuba
134	-	Fabaceae	Uyang yang
135	-	Fabaceae	Wakag et beget
136	*Ficus ulmifolia*	Moraceae	Balogo
137	-	Flacourtiaceae	?
138	*Flagellaria indica* L.	Flagellariaceae	Pagrun sayen
139	*Flagellaria sp.*	Flagellariaceae	Pagrun sayen
140	*Globba campsophylla* K.Schum	Zingiberaceae	Tipu tipus
141	*Hoya sp*	Asclepiadaceae	Atben
142	*Imperata cylindrica* (L.) P. Beauv.	Poaceae	Kogun
143	*Imperata cylindrica* (L.) P. Beauv.	Poaceae	Sabud
144	*Ipomoea sp.*	Convolvulaceae	Akaray
145	*Ipomoea sp.*	Convolvulaceae	Aras
146	*Ipomoea sp.*	Convolvulaceae	Balagun
147	*Ipomoea sp.*	Convolvulaceae	E-ged
148	*Ipomoea sp.*	Convolvulaceae	Gatas et dugyan
149	*Ipomoea sp.*	Convolvulaceae	Kulagbau
150	*Ipomoea sp.*	Convolvulaceae	Panari bangbong
151	*Ipomoea sp.*	Convolvulaceae	Tulangan
152	*Ipomoea sp.*	Convolvulaceae	Ulagbau
153	*Ipomoea sp.*	Convolvulaceae	Wakag et kiladmanan
154	*Ipomoea sp.*	Convolvulaceae	Wakag et pogo
155	*Ixora sp.*	Rubiaceae	Pamda
156	*Justicia sp.*	Acanthaceae	Talaksug
157	-	Lamiaceae	Talaksug
158	-	Lamiaceae	Tenga et dugyan
159	-	Lamiaceae	Tengat
160	-	Lamiaceae	Wakag et uyau
161	*Lantana camara* L.	Verbenaceae	Muyo muyo
162	-	Liliaceae	Bawang-bawang
163	*Lygodium circinatum* Sw.	Schizaeaceae	Bayak bakau
164	*Lygodium circinatum* Sw.	Schizaeaceae	Neto (black, if white = bayak bakau)
165	*Lygodium sp.*	Schizaeaceae	Bayak bakau
166	-	Malvaceae	Dalupang
167	-	Malvaceae	Imbobuyukan
168	-	Malvaceae	Pamugat
169	-	Malvaceae	Pandraba
170	-	Malvaceae	Pasulsug
171	-	Malvaceae	Sarasa
172	-	Marattiaceae	Apone
173	*Maranta sp.*	Marantaceae	Dublaan
174	*Melastoma sp.*	Melastomataceae	Bukang kang
175	-	Menispermaceae	?
176	-	Menispermaceae	Agong ongay
177	-	Menispermaceae	Awed

No	Botanical Name	Family	Local name
178	-	Menispermaceae	Ayet-et
179	-	Menispermaceae	Ayot-ut
180	-	Menispermaceae	Balibag
181	-	Menispermaceae	Bana banay
182	-	Menispermaceae	Baro nge-nge
183	-	Menispermaceae	Barong nga nga
184	-	Menispermaceae	Bayak
185	-	Menispermaceae	Dan dangitbaga
186	-	Menispermaceae	Dangra et bakus
187	-	Menispermaceae	Dayana
188	-	Menispermaceae	Diaray et manok
189	-	Menispermaceae	Doklay
190	-	Menispermaceae	E-ged (1)
191	-	Menispermaceae	Kagatdan
192	-	Menispermaceae	Kalam pinay
193	-	Menispermaceae	Kaloa
194	-	Menispermaceae	Keketlen
195	-	Menispermaceae	Langina
196	-	Menispermaceae	Mabegat
197	-	Menispermaceae	Magdalung
198	-	Menispermaceae	Manseringan
199	-	Menispermaceae	Nga ngaan
200	-	Menispermaceae	Palbadan
201	-	Menispermaceae	Pamolpol
202	-	Menispermaceae	Pana bugan
203	-	Menispermaceae	Panampalas
204	-	Menispermaceae	Pangraba
205	-	Menispermaceae	Paole
206	-	Menispermaceae	Rabnitan
207	-	Menispermaceae	Runas et manawan
208	-	Menispermaceae	Sabud
209	-	Menispermaceae	Salau
210	-	Menispermaceae	Takes takes
211	-	Menispermaceae	Timla timlag
212	-	Menispermaceae	Tulangan
213	-	Menispermaceae	Ulagak
214	-	Menispermaceae	Wakag et isi isi
215	*Merremia vitifolia* Hallier f.	Convolvulaceae	Kulagbau
216	*Merremia vitifolia* Hallier f.	Convolvulaceae	Ulagbau
217	*Microsorium sp.*	Polypodiaceae	Apo apone
218	*Moghania strobilifera* Jaume St. Hil.	Fabaceae	Dekat dekat
219	-	Moraceae	E-ged
220	-	Moraceae	Pusud et kasili
221	*Morinda citrifolia* L.	Rubiaceae	Bangkudu
222	*Musa sp.*	Musaceae	Punte = Balayang (banana)
223	*Orania paraguanensis* Becc.	Arecaceae	Baga

No	Botanical Name	Family	Local name
224	*Orania paraguanensis* Becc.	Arecaceae	Banga
225	*Orania paraguanensis* Becc.	Arecaceae	Bolong et tandayag
226	*Palaenopsis amabilis*	Orchidaceae	Dapo
227	*Pandanus luzoniensis* Merr.	Pandanaceae	Imbayasan
228	*Pandanus sp.*	Pandanaceae	Bara-barasan
229	*Pandanus sp.*	Pandanaceae	Bariang
230	*Pandanus sp.*	Pandanaceae	Bariang (small)
231	*Pandanus sp.*	Pandanaceae	Imbayasan
232	*Panicum sarmentosum*	Poaceae	Bayut but
233	*Panicum sarmentosum*	Poaceae	Gasa
234	*Passiflora sp.*	Passifloraceae	Kendi kendi
235	*Phyllanthus sp.*	Euphorbiaceae	Oya oya kat bukid (Oya oya de montagro)
236	*Phyllanthus sp.*	Euphorbiaceae	Salamagi
237	*Pinanga sp.*	Arecaceae	Pisa
238	-	Piperaceae	Kalam kam
239	-	Piperaceae	Kerai
240	-	Piperaceae	Ma otot
241	-	Piperaceae	Samurara
242	*Piper sp.*	Piperaceae	Angia angiun
243	*Piper sp.*	Piperaceae	Buyo buyo
244	*Piper sp.*	Piperaceae	Buyu et mangaluk
245	*Piper sp.*	Piperaceae	Kalam kam
246	*Piper sp.*	Piperaceae	Kaloa
247	*Piper sp.*	Piperaceae	Lukadok et mangalok
248	*Piper sp.*	Piperaceae	Ma otot
249	-	Poaceae	Dang dang
250	-	Poaceae	Kogun
251	-	Poaceae	Kway kway
252	-	Poaceae	Landsa-landsan
253	-	Poaceae	Ogio-ogiang
254	-	Poaceae	Parabung
255	-	Poaceae	Paray paray
256	-	Poaceae	Sabuan sabuan
257	-	Poaceae	Tage tage
258	*Poikilospermum suaveolens* (Blume) Merr.	Cecropiaceae	Keliat
259	-	Polypodiaceae	Dalo doan
260	-	Polypodiaceae	Kari kari
261	-	Polypodiaceae	Loagan lelaki
262	-	Polypodiaceae	Paku-paku
263	-	Polypodiaceae	Panada
264	-	Polypodiaceae	Panapa
265	-	Polypodiaceae	Parok puk
266	*Pteris ensiformis* Burm.	Pteridaceae	Loagan babay

No	Botanical Name	Family	Local name
267	*Pteris ensiformis* Burm.	Pteridaceae	Pako-pako kat geba (from forest)
268	*Pteris ensiformis* Burm.	Pteridaceae	Paku-paku
269	*Pteris sp.*	Pteridaceae	Paku-paku
270	*Quisqualis sp.*	Combretaceae	Ayet-et
271	-	Rhamnaceae	Tangar tangar
272	*Rhaphidophora sp.*	Araceae	Amray
273	*Rhaphidophora sp.*	Araceae	Galak galakan
274	*Rhaphidophora sp.*	Araceae	Runas
275	-	Rubiaceae	Dekat dekat
276	-	Rubiaceae	Do ngog
277	-	Rubiaceae	Dungog
278	-	Rubiaceae	Omo omok
279	-	Rubiaceae	Parok puk
280	-	Rubiaceae	Pusud et kasili
281	-	Rubiaceae	Sagad sad
282	-	Rubiaceae	Tangar tangar
283	-	Rubiaceae	Tud tud
284	-	Rubiaceae	Wakap et uyau (uyau = spirit)
285	-	Rutaceae	Lamakan
286	*Schizostachyum dielsianum* Merr.	Poaceae	Bikal
287	*Schizostachyum sp.*	Poaceae	Binsag
288	*Schizostachyum sp.*	Poaceae	Sim sim
289	*Scleria scrobiculata* Mor.	Cyperaceae	Daat
290	*Scleria sp.*	Cyperaceae	Daat
291	*Setaria palmifolia* Stapf	Poaceae	Langba langba
292	*Smilax leucophylla*	Smilacaceae	Ambognag
293	*Smilax sp.*	Smilacaceae	Ambognag
294	*Tabernaemontana pandacaqui* Poir.	Apocynaceae	Alibutbut (butbut = liar (wild))
295	*Tacca sp.*	Taccaceae	?
296	*Tarenna sp.*	Rubiaceae	Koliat
297	*Tetracera scandens* (L.) Merr.	Dilleniaceae	Aginis
298	*Tetracera scandens* (L.) Merr.	Dilleniaceae	Karnes
299	*Tetrastigma sp.*	Vitaceae	Aroperan
300	*Tetrastigma sp.*	Vitaceae	Da nge nge
301	-	Thymelaeaceae	Saraging
302	-	Thymelaeaceae	Tangar tangar
303	-	Thymelaeaceae	Tindo tindog
304	*Urena lobata* L.	Malvaceae	Dalupang
305	-	Verbenaceae	?
306	-	Verbenaceae	Bulak lak nang arao
307	-	Verbenaceae	Eme emek
308	-	Verbenaceae	Eme emek (2)
309	-	Verbenaceae	Gabung gabung

No	Botanical Name	Family	Local name
310	-	Verbenaceae	Poso poso
311	-	Verbenaceae	Rabug
312	-	Verbenaceae	Sagad sad
313	-	Verbenaceae	Tarob et tamote
314	-	Verbenaceae	Unlang-unlang
315	-	Vitaceae	Aroperan
316	-	Vitaceae	Da nge nge
317	-	Vitaceae	Da-ngi-ng kat kabaktikan
318	-	Vitaceae	Kura kura buan
319	-	Vitaceae	Tapo et keladmanun
320	*Widelia sp.*	Commelinaceae	Siksirika
321	*Zingiber sp.*	Zingiberaceae	Dag kot et maorungun
322	*Zingiber sp.*	Zingiberaceae	Langkawas
323	*Zingiber sp.*	Zingiberaceae	Obud obud
324	*Zingiber sp.*	Zingiberaceae	Tagbag
325	*Zingiber sp.*	Zingiberaceae	Tepos tepos
326	*Zingiber sp.*	Zingiberaceae	Tipu tipus

Annex 2. Local and Latin names of the Bataks' main products

***Wild Plant From Forest*:**	***Wild Plant Not From Forest*:**
Bagtik (*Agathis philippinensis* Warburg.)	Muyo-muyo (*Lantana camara* L.)
Baju	Baniklong (*Colona serratifolia* Cav.)
Uway (*Calamus sp.*)	Bayanti (*Homalanthus populneus* Pax.)
Banga (*Orania paraguanensis* Becc.)	Haginog
Kudot (*Dioscorea hispida* Dennst.)	Bunot-bunot (*Melochia umbellata* Stapf.)
Sugaok (*Dioscorea sp*.)	Sayapo (*Trema sp.*)
Abagan (*Dioscorea luzonensis* Schauer)	Talway
Bonog (*Garcinia benthami* Pierre)	Alamutyokan (*Mallotus sp*.)
Balisangkad (*Nephelium lappaceum* Linn.)	Kulagbaw
Anibong (Arecaceae)	Gatas et dugyan (Sterculiaceae)
***Cultivated Plants*:**	***Farmed (Domestic) Animal*:**
Abokado (*Persea gratissima var. drymifolia* Schltdl. & Cham. Mez.)	Chicken (*Gallus domesticus*)
Bayabas (*Psidium sp.*)	Pig (*Sus scrofa*)
Kalamonding (*Citrus sp.*)	Monkey (*Macaca sp.*)
Kopi (*Coffea sp.*)	Carabao (Water buffalo/ *Ictiobus sp.*)
Mameken	Cat (*Felis sp.*)
Kapayas (*Carica papaya L.*)	Dog (*Canis sp.*)
Mang-ga (*Mangifera sp.*)	Goat (*Capra sp.*)
Kasoy (*Anacardium occidentale L.*)	Palawan bear cat (*Artictis binturong* Withei)
Niog (*Cocos nucifera L.*)	Talking mynah
Ponti (*Musa sp.*)	Parrot (*Tanygnathus sp.*)
Root crops (cassava, sweet potatoes, eggplant, ampalaya, beans, squash)	
Rice (*Oriza sativa* L.)	
Vegetables: - leaf of bago /*Gnetum gnemon* L. - Sugi-sugi /*Celosia argentea* L. - Anupol /*Poikilospermum suaveolens* (Bl.) Merr. - Pako-pako /*Pteris ensiformis* Burm.	

***Wild Animal From Forest*:**	***Wild Animal Not From Forest*:**
Dugyan (Palawan porcupine/ *Hystrix pumila*)	Bakes (Monkey/ *Maceca phillinensis* Geoffrey)
Amantoron (Palawan bear cat/ *Artictis binturong*)	Bising (Squirrel-quite small)
Buyatat (Flying squirrel/ *Hylopetes nigripes nigripes* (Thomas)	Kamay (Squirrel biger than Bising)
Miro (Wild cat/ *Felis silvestris sp*.)	Pugu (Quail/ *Coturnix cotumix japonica*)
Bayo-o (Turtle/ Class Gastropoda)	Baboy (Wild pig/ *Sus sp.*)
Baboy (Wild pig/ *Sus palawensis* Nehring)	Kagurangan (Wild chicken/ *Gallus sp.*)
Tandikan (Peacock/ *Polyplectron emphanum* Temminck)	Tandikan (Peacock/ *Polyplectron emphanum* Temminck)
Kagurangnen (wild chicken)	Bayawak (Mountain lizard/ *Phyrnosoma sp.*)
Tabon (Birds)	Miro (Wild cat/ *Felis silvestris sp*.)
Balod (Birds)	Dugyan (Palawan porcupine/ *Hystrix pumila*)
***Purchased Plants*:**	***Purchased Animal*:**
Okua	Baboy (Pig/ *Sus scrofa*)
Sitaw (Beans/ Fabaceae)	Chicken (*Gallus domesticus*)
Kalabaga (Squash/ *Cucurbita sp.*)	Goat (*Capra sp*.)
Kalubay (Upo-gonna)	Dog (*Canis sp.*)
Ubi (Root crop/ *Manihot sp.*)	Fish
Tarong (Eggplant/ *Solanum melongena* L.)	Water buffalo (*Ictiobus sp*.)
Mongos (Mango/ *Mangifera sp.*)	Horse (*Equus sp.*)
Luya (Ginger/ Gingeraceae)	Cattle
Marajuno (Bitter gourd/ *Beta vulgaris* L.)	
Bawang (Garlic/ *Allium sp.*)	

Annex 3. LUVI importance of plant species for food, medicine and marketable products

No	Local name	*Species name*	LUV x 100		
			Food	**Marketable product**	**Medicine**
1	Abagan	*Dioscorea luzonensis* Schauer	**0.430**		
2	Albutra	*Arcangelisia flava* (L.) Merr.			**0.456**
3	Ali-aliman	*indeterminate*	0.288		
4	Anunang	*Cordia obliqua* H. B. & K.			**0.456**
5	Aring-ingan	*Calamus sp*		0.288	
6	Arurog	*Alocasia sp.*		**0.421**	
7	Ayabo	*Dioscorea bulbifera*	0.284		
8	Bago	*Gnetum gnemon* L.	**0.592**		
9	Bagtik	*Agathis philippinensis* Warburg		**0.762**	
10	Balisangkad	*Nephelium sp.*	0.311		
11	Banag	*Dioscorea sp.*	0.016		
12	Banag	*Smilax leucophylla*	**0.708**		
13	Baribadan	*indeterminate*	0.144		
14	Bates	*indeterminate*			**0.456**
15	Bogtong	*Calamus subinermis*		**0.571**	
16	Bogu	*Garuga floribunda* Decne.			0.082
17	Bonog	*Garcinia benthami* Pierre.	0.126		**0.456**
18	Candis	*Garcinia laterifolia*	0.194		
19	Dagket	*Daemonorops sp.*		0.235	
20	Dangi-ngi	*Tetrastigma sp.*			0.062
21	Dapo	*Dendrobium anosmum*		0.052	
22	Dugya-dugyan	*Durio sp.*	**0.567**		
23	Guma	*Tinospora sp.*			**0.646**
24	Kalabang	*Calamus ornatus var. philippinensis*		**0.443**	**0.456**
25	Kalibon	*Blumea balsamifera* D.C.			0.234
26	Kamanglit	*indeterminate*			**0.456**
27	Kanumay	*Diospyros sp.*			0.345
28	Keramo	*Azadirachta sp.*			0.388
29	Kolombi	*Calamus sp.*		**0.480**	
30	Kudot	*Dioscorea hispida* Dennst	**1.185**		
31	Kulyat	*Tarenna sp.*	0.019		

No	Local name	*Species name*	LUV x 100		
			Food	**Marketable product**	**Medicine**
32	Lipi	*Calamus sp.*		**0.473**	
33	Mamulingan	*Arcanglesia sp.*			0.098
34	Mansiringan	*Guioa sp.*			0.211
35	Maotot	*indeterminate*			0.309
36	Maritana	*Bryophyllum pinnatum* (Lam.) Oken			0.220
37	Mayborot	*indeterminate*	0.192		
38	Maytuwad	*indeterminate*	0.096		
39	Olagak	*Casearia sp.*			0.095
40	Ololos	*Cratoxylum sp.*			0.098
41	Paco-paco	*Athyrium esculentum* (Retz) Copel	**0.718**		
42	Palao	*Bauhinia sp.*	**0.425**		
43	Palasan	*Calamus merrilli*		**0.533**	
44	Pali	*Mangifera sp.*	0.171		
45	Pamulpol	*Pericamphyllus sp.*			0.302
46	Pan-pan	*Ficus septica* G.Forst			**0.456**
47	Pao	*Mangifera altissima* Blco	0.205		
48	Pup-mean	*indeterminate*	**0.708**		
49	Sambulagan	*Calamus sp.*		0.062	
50	Seka	*Calamus microsphaerion* Becc.		0.359	
51	Sirang-sirang	*Gloeocarpus sp.*			0.302
52	Sudan	*indeterminate*	0.066		
53	Sugaok	*Dioscorea sp.*	0.154		
54	Sugi-sugi	*Celosia argentea*	**0.444**		
55	Tabas	*Garcinia benthami* Pierre.			**0.456**
56	Tabu	*Wellughbeia sarawacensis*	**0.425**		
57	Tagongtong	*indeterminate*			0.098
58	Takes-takes	*Pericamphyllus sp.*			**0.474**
59	Wakaga matanis	*indeterminate*			**0.431**
60	Way-way	*Gnetum gnemon* L.	0.171		

Annex 4. Example of LUVI importance of animal species for specific use categories

No	Animal names	Common name	Scientific name	LUV x 100				
				Food	Marketable product	Ornament/ ritual	Hunting function	Hunting place
1	Baboy	Wild pig	*Sus barbatus palawensis* (Nehring)	0.129	**1.235**	0.281		
2	Bakes	Maqaque	*Maceca phillinensis* (Geoffrey)	0.147		0.328	0.126	0.290
3	Bayawak	Lizard				**0.562**	0.189	
4	Bayu-o	Turtle	Class Gastropoda	0.202			0.168	
5	Bayu-yuko	Shell	Class Gastropoda				0.231	
6	Begay	Shell	Class Gastropoda	0.276			0.273	
7	Byatat	Flying squirrel	*Hylopetes nigripes nigripes* (Thomas)	0.202		0.398		
8	Carundang	Shrimp	Crustacea	0.110				
9	Dengen	Dwarf small clawed otter	*Amblonyx cinerea cinerea* (Illiger)			0.257		
10	Kagurangnon	Wild chicken						0.235
11	Kaye'ke	Crab	Class Gastropoda				0.210	
12	Kuwaw	Bird						0.386
13	Lu-loy	Earth warm					0.357	
14	Man manok	Bird	Aves	0.074				
15	Manok	Bird	Aves	0.166				
16	Maranyog	Phyton	*Python reticulatus*			**0.515**		
17	Mogung	Bee			**1.285**			
18	Sagway-sagway	Bird						0.235
19	Seda	Fish	Class Osteichthyes	0.331			0.252	
20	Suso	Shell	Class Gastropoda				0.294	
21	Tandikan	Palawan peacock pheasant	*Polyplectron emphanum* (Temminck)	0.202				0.235

Levelling the Playing Field:
Fair Partnership for Local Development to Improve the Forest Sustainability in Southeast Asia

The project is working in contexts where multi-stakeholders with different views and power act on forest management. The project aims to improve the forest management by facilitating stakeholders' coordination and capacity building. It will develop approaches and tools for stakeholders to share views and create condition to manage the forest together.

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) and Center for International Forestry Research (CIFOR) are managing this project with three partners, universities well known for their involvement in forest management research, which are Gadjah Mada University (UGM), University of the Philippines Los Baños (UPLB) Universiti Putra Malaysia (UPM).

http://www.cifor.cgiar.org/lpf

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Faculty of Forestry
Gadjah Mada University (UGM)

Malaysia
Faculty of Forestry
Universiti Putra Malaysia (UPM)

Philippine
College of Forestry and Natural Resources
University of the Philippines Los Baños (UPLB)

About the report

Logging activities and conversion for agriculture have had a severe impact on the Philippines' tropical forests. Nevertheless, the nation's natural forests are still an important source of goods and services for many local people, such as the Batak in Kalakwasan village. Living in the Tanabag valley on Palawan Island, this minority group relies heavily on natural resources for its livelihoods. Traditional activities include shifting farming: planting mixed crops near the river and farming mountain rice fields.

As a semi-nomadic group, the Batak still frequently move inside their traditional territory to look for specific and seasonal forest products, including wild pigs, honey, beeswax, resin of Agathis, and rattan. Some Batak households have adopted a more permanent lifestyle in the village. But most spend considerable time in temporary and seasonal camps along the river, near their gardens and close to the forests where they can find the products that comprise much of their daily livelihoods.

This report identifies which resources and landscapes are important to the Batak people. It also documents their perceptions and priorities regarding forest management. By playing close attention to the Bataks' perspectives, the "Levelling the Playing Field" project (LPF) is able to better understand their opinions and hopes for the present and future use of their natural resources. Further, by understating local perceptions, greater insight is gained into the complex relations between the Bataks and coastal migrants living in the district capital (barangay), and their political and economic marginalization on Palawan Island.

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