# FOREST MANAGEMENT SYSTEM PRACTICED BY LOCAL PEOPLE: A CASE STUDY IN IFUGAO

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## Introduction

Due to deforestation of most areas of the Philippine uplands, scholarly attention has been drawn primarily on elucidating deforestation mechanisms as well as the technical and socio-economic aspects of rehabilitation of degraded forest lands. Only a few attempts to examine forest conservation systems practiced by local people have been made. Previous discussions have established that ownership of forest lands and/or forest resources is closely related to environmental problems. This case study attempts to illustrate a forest conservation system developed by local people, focusing on their forest land use, land- and tree-tenure and a unit of resources management.

The study was conducted in the municipality of Banaue in the province of Ifugao. Ifugao is one of five provinces which constitute the Cordillera Mountains, mountain ranges running north-south in northern Luzon. Unlike the province of Benguet in the southwestern part of the Cordillera Mountains, which is blessed with natural resources such as minerals and timber, and Baguio city (the provincial capital of Benguet) developing as a trade center during the American colonial period, Ifugao remained unexplored (Klock, 1995). The Ifugao landscapes, therefore, have been developed undisturbed by external forces of exploitation such as mining and logging activities.

The omnipresent ponded terraces for rice production in the higher elevations is the most impressive landscape in Ifugao. The landscape of ponded terraces was designated as a sight-seeing resource to draw tourists. Forests adjacent to ponded terraces are also a part of the landscape. The ratio of ponded terrace area to forest area varies in different sites in Ifugao, and the ratio of forest area in the municipality of Banaue is higher than other municipalities. One barangay, the smallest administrative unit, in the municipality of Banaue was selected to study the forest conservation system of the local people.

The study was conducted for one month from the middle of December, 1998. About 90% of all the households in the barangay were interviewed, chiefly on their land and forest resource use, livelihood and mutual aid in the community. Respondents were householders and/or spouses. Other information was gathered intensively through the assistance of the present and former barangay captains and barangay council members, municipal officers and government forest officers.

## 1. The setting

### 1-1 Geographic setting

The study site is barangay Poitan in the municipality of Banaue, Province of Ifugao, constituting 11 municipalities. The municipality of Banaue is located in the north-western part of the province, featuring dissected V-shaped gullies and numerous creeks and streams in contrast to the relatively rolling, flat lands of the eastern and south-eastern parts of the province. Most of the province's total land area (82%) has a slope of more than 18%, and is classified by the government as public land (Provincial Planning and Development Office, 1993).

The municipality of Banaue, noted for its ponded terraces for rice production, has an elevation ranging from 700 to 2000 m, in which forest vegetation is classified as mixed montane forests. Oaks (*Quercus* spp.) and *Lauraceae* (*Neolitsea, Cinnammun* and *Litsea*) families represent the forest

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vegetation (Science Education Center, 1971). Pine trees (*Pinus kesiya*) are dominant in a few high ridge areas. The predominant grass is *Miscanthus* spp., which appears in the fallow areas of swidden (Conklin, 1980). Tree ferns and other epiphytic ferns are also commonly found in the forest.

Banaue falls in a climatic zone which has a relatively short dry season of two to four months, with the wet season prevailing during the remaining months (Provincial Planning and Development Office, op.cit.). The dry season with a lesser frequency of rains starts in January, while the well-pronounced rainy season is in July and August. Aside from high annual rainfall, exceeding 3000 mm, Banaue is frequently covered with clouds (Conklin, op.cit.). Climatic features which fall under moist conditions and geographic features characterized by abundant groundwater in the south and east-exposed valleys make Banaue a greenery of rice fields and forests.

The study site, barangay Poitan, is one of the 18 barangays in the municipality of Banaue. Geographically, Poitan has gentle to very steep slopes with elevations ranging from 800 to 1800 m and it is flanked by areas of higher elevation in the north. Gentle slopes (15 to 25%) are located from 800 to 1100 m in elevation, where all the hamlets and ponded terraces are widely spread. A river runs south-eastward in the valley.

**1-2 Population**

Most of the residents of Banaue belong to the Tuwali group, one of four ethnolinguistic groups inhabiting Ifugao.

The population of the province of Ifugao was 104,707 in 1975, 111,368 in 1980 and 147, 281 in 1990 (National Statistic Office). Average annual growth rate from 1975 to 1980 and from 1980 to 1990 was 1.24% and 2.83%, while that of the Philippines as a whole was 2.71% and 2.35% respectively. The low population growth from 1975 to 1980 is due to outmigration, especially from peripheral municipalities, presumably because of the pressure of communist insurgents.

As of December, 1998, Poitan had a total of 259 households with a population of 1566. The population of Poitan in 1990 and 1995 was 1158 and 1300, respectively (National Census and Statistic Office, 1995). The average annual population growth rate was 2.34% in the period from 1990 to 1995 and 6.40% from 1995 to 1998. In Ifugao custom, a newly marriage couple decides their residence on either the husband's or wife's side. Among 236 households interviewed, 108 consist of a husband and wife who are both from Poitan, while 107 consist of a couple whose either husband or wife is from Poitan. The remaining 21 consist of 9 couples in which both husband and wife moved to Poitan and 12 couples in which husband and wife were separated. Increased population growth from 1995 to 1998 indicates that many newly married couples decided to settle in Poitan, seeking transportation convenience. Poitan is located near barangay Poblacion, the administrative and commercial center of the municipality of Banaue.

Traditionally, hamlets consisting of five to fifteen households were widely dispersed in the lower portion of the valleys, far from the vehicular roads (Conklin, op.cit.). The only transportation means from the vehicular road to hamlets is by foot, walking on foot trails outside and between ponded terraces. Barangay Poitan now consists of 29 hamlets. Of these, 26 hamlets, with an average household number of six, are located far from the vehicular road. At present, however, numerous houses are being constructed along the vehicular road, forming three hamlets with an average household number of 34. Many residents living in the three newly formed hamlets are transferees from other hamlets in Poitan and neighboring barangays. Newly constructed houses are made of concrete and galvanized iron sheets, contrasting sharply with the traditional four-posted wooden house and thatched roof.

The population of 236 households interviewed totaled 1,469 persons (720 males and 749 females). Household members in this study includes those who reside outside Poitan as long as they are single. One of the characteristics of age-group distribution is that many of those in their 20s are working temporarily or permanently outside Banaue; 45.5% of the male and 30.1% of the female

population (Table 1). If those who attend schools outside Banaue (most are college students) are included, those who reside outside Banaue account for about half of the population in this age bracket, that is, 56.3% of the males and 49.0% of the females. The major occupation of the men is woodcarving, working in the neighboring province of Nueva Viscaya and other municipalities in Ifugao, where materials for woodcarving are still available, and Baguio and Manila, where there is a market for woodcarving. About half of the females in their 20s who are working outside Banaue are maids, including those working overseas, vegetable garden laborers in Baguio and factory workers in Manila. While there is a low percentage of females in their 30s who work outside Banaue, that of the males is still high (28.8%), and most of them are also engaged in woodcarving. This shows that handicraft skills, woodcarving in particular, acquired through self-training from childhood, helps them generate income in places where they can get wood for the carving. Since most woodcarvers are self-employed, their jobs depend on how well they can secure wood. Many of the woodcarvers working outside Banaue, thus, move from one place to another in search of available wood materials. At present, most of them work at present in Nueva Viscaya, the neighboring province, while some have started to secure wood in other provinces such as Quirino and Isabela.

**1-3 Administrative organization**

A barangay is the smallest administrative unit in the Philippines. The barangay administrative members are barangay captain (elected every three years for a maximum of three terms), seven council men (elected the same as with the barangay captain), secretary (appointed by the barangay captain) and treasurer (appointed by the barangay captain). All men and women over 21 years old are eligible for the elective positions. The barangay assembly is organized with the said members and chairman of the youth council. The youth council consists of a chairman and seven council men, all elected by youth between 15 and 21 years of age. The youth's voices are, therefore, reflected in the barangay assembly. The salaries of the barangay administrative members as well as youth council members are shouldered by the municipal government.

Note: Among 259 households in barangay Poitan, 236 households were interviewed. The total population in the table is 236 households. Household members include those who reside outside as long as they are single.
Source: Interviews in December, 1998

Administrative functions are as follows: barangay captain, secretary and treasurer form the administrative body; a barangay assembly for legislation and barangay court as a judicial body. The barangay captain calls the barangay courts whenever needed. In barangay Poitan, for instance, when two parties claim private ownership over a forest, they seek the help of the barangay captain, who then calls the barangay court. After investigation, the party who loses the case is fined 150 pesos. If he violates the judgment and continues to claim ownership, he is fined an additional 175 pesos the second time and 200 pesos if he continues the same offense.

Every barangay has its own civilian army forces, CAFGU (Civilian Armed Forces Geographic Unit), to protect themselves from communist insurgents.

**2. Customary land management system**

**2-1 Land and soil categories recognized by residents**

Conklin described the landscape of Banaue as consisting of eight major land forms, namely, (1)ponded terraces for rice production, (2)drained fields for vegetable production, (3)swidden area for sweet potato production, (4)low grasslands, (5)high grasslands, (6)community forests, (7)private forests, and (8)housing lots (Conklin, op.cit.). The site of ponded terraces depends on water availability from spring or irrigation canals. These land uses complement each other in the following

manner: The small size of individual holdings in ponded terraces make swidden for sweet potato indispensable as a supplement to the residents' daily diet. Forests sustain rice production in ponded terraces by providing water and controlling soil erosion, as well as providing the inhabitants with animal protein from wild pig, wild deer and various kinds of birds.

The change of landscape of the present Banaue is that, unlike before, swidden areas are rarely observed. The present Banaue landscape, thus, consists mainly of ponded terraces and forests. Previous fallow lands, i.e., grasslands, have turned into bush or forest. Sweet potato is being grown in abandoned ponded terraces and terrace embankments, but its scale is much smaller than before. Sweet potato has ceased to be a daily diet supplement. The production of rice has been stagnant, with traditional rice species requiring a six month growing period. This cannot provide sufficient subsistence production. People supplement the shortage of rice, not with sweet potato production, but with the purchase of commercial rice imported from the lowlands. This is due to the facts that non-agricultural income generating activities make it easier to purchase commercial rice and also that they are discouraged to plant sweet potato in the forest or grassland because they are often eaten by monkeys and rats since people do not frequently visit the fields, unlike before. Low yield also disheartens them to the cultivation of sweet potato.

The dominant soil of the ponded terraces is classified as gravelly clay loam (Central Cordillera Agricultural Programme, 1998). Local residents visually evaluate soil fertility. When people used to practice swidden agriculture in grasslands, they judged the suitability of the land for sweet potato production by soil color and height of grasses (*Miscanthus* spp.). Reddish soil is considered as infertile, while a dark brown color indicate fertile soil. There is no specific or local name to describe these soils. In constructing ponded terraced for rice production, water for irrigation is the prime consideration rather than soil (Barton, 1922).

In ponded terraces, commercial fertilizer is not used. Instead, rice straw remaining from the previous harvest, together with weeds on the dike and the terrace embankment are cut, tread and mixed with mud.

**2-2 Land tenure system**

By the government's land classification, all the lands in Banaue are classified public because of the policy over 18% in slope (Presidential Decree 705, Revised Forestry Code). Customarily, however, local people classified their land into two categories, i.e., privately owned land and community owned land. Community here refers to the agricultural district in a watershed area, which is now administratively considered as barangay. Barangay Poitan is one of three communities constituting a watershed area, and it is located in the middle of it. Three communities, thus, share the same watershed forest and rights to use the watershed are exclusive to them. The watershed forest located in the topmost mountain ridge was customarily set as community forest. Boundaries between the neighboring communities were customarily decided proportional to the amount of irrigation water which each community uses (Conklin, op.cit.). The right of forest resource use in the community forest is limited only to the community members and those whose origin is in this community. In the case of game, if members of a community happened to enter the neighboring community forest in pursuit and it is discovered by the latter community members, the game is supposed to be shared equally.

*De facto* private ownership is firmly established over all the ponded terraces and the private forests. It is described that the Ifugao considered such private properties as those handed down from generation to generation, not those owned with absolute ownership (Barton, 1922). This concept of ownership is still observed among people in Ifugao. In this sense, their individual ownership of property is a transitional possession to future generations. In this paper, however, the term 'own' is used.

Previously, when a wider area was public forest (i.e., public to residents of a community),

residents were free to practice swidden agriculture anywhere. Fallow lands were considered as public lands again if the previous cultivators abandoned them, whereas those which continued to be managed after cultivation were recognized by residents as private property. Swidden fallows with an available water supply were developed into ponded terraces, while others were facilitated to regenerate into forests. Ponded terraces are individually owned, while private forests are either individually or commonly owned by a group of people, i.e., parent and his/her married children or clan of three generations.

*De facto* land ownership has been recognized among residents, and they have their own system to solve land conflicts. *De jure* ownership, however, cannot be established towards external intervention. The only way to protect their land ownership from external intervention is through

Table 1. Population Distribution by Age Group in Barangay Poitan as of December 1998

| Age Group | | Staying within the barangay | Studying outside Banaue | Working outside Banaue | Total | % outside Banaue |
|---|---|---|---|---|---|---|
| 0 – 4 | male | 86 | 0 | 0 | 86 | 0 |
| | female | 108 | 0 | 0 | 108 | 0 |
| 5 – 9 | male | 109 | 1 | 0 | 110 | 0.9 |
| | female | 101 | 0 | 0 | 101 | 0 |
| 10 – 14 | male | 98 | 4 | 1 | 103 | 4.9 |
| | female | 81 | 1 | 0 | 82 | 1.2 |
| 15 – 19 | male | 66 | 12 | 8 | 86 | 23.3 |
| | female | 41 | 26 | 4 | 71 | 42.3 |
| 20 – 24 | male | 21 | 12 | 30 | 63 | 66.7 |
| | female | 29 | 25 | 28 | 82 | 64.6 |
| 25 – 29 | male | 28 | 0 | 21 | 49 | 42.9 |
| | female | 44 | 2 | 15 | 61 | 27.9 |
| 30 – 34 | male | 34 | 0 | 11 | 45 | 24.4 |
| | female | 44 | 0 | 5 | 49 | 10.2 |
| 35 – 39 | male | 23 | 0 | 12 | 35 | 34.3 |
| | female | 24 | 0 | 6 | 30 | 20.0 |
| 40 – 44 | male | 26 | 0 | 3 | 29 | 10.3 |
| | female | 34 | 0 | 1 | 35 | 2.9 |
| 45 – 49 | male | 21 | 0 | 3 | 24 | 12.5 |
| | female | 23 | 0 | 1 | 24 | 4.2 |
| 50 – 54 | male | 18 | 0 | 0 | 18 | 0 |
| | female | 25 | 0 | 0 | 25 | 0 |
| 55 – 59 | male | 18 | 0 | 0 | 18 | 0 |
| | female | 22 | 0 | 0 | 22 | 0 |
| 60 – 64 | male | 16 | 0 | 1 | 17 | 5.9 |
| | female | 19 | 0 | 0 | 19 | 0 |
| 65 – 69 | male | 22 | 0 | 0 | 22 | 0 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | female | 14 | 0 | 0 | 14 | 0 |
| 70 – 74 | male | 10 | 0 | 0 | 10 | 0 |
| | female | 21 | 0 | 0 | 21 | 0 |
| 75≦ | male | 6 | 0 | 0 | 6 | 0 |
| | female | 6 | 0 | 0 | 6 | 0 |
| | | 1238 | 83 | 150 | 1471 | 15.8 |

registration for tax declarations at the municipal office. Registration of land ownership started in Ifugao in the 1970s. Individually owned ponded terraces and forests are, thus, registered for the purpose of taxation under the names of *de facto* owners. For the sake of convenience, commonly owned forests are registered under only one tax payer's name, but co-owners share to pay tax.

**2-3 Forest lands right**

Forest land in the community is, as mentioned above, classified into two parts based on ownership, i.e., community forest and private forest. In local terms, the former is called *inalahan*, and the latter *pinugo* (or *muyong* in other places in Ifugao). Community forest is located in the topmost areas of the mountain ranges. Land use of community forest is customarily divided into two, based on elevation. The lower area of the community forest is the place where residents are allowed to practice swidden agriculture. Although the tenure for cultivated products in swidden is given to cultivators, the lands belong to the community as a whole. Therefore, the land tenure of swidden land is only usufruct to cultivators as long as they cultivate. The higher area of the community forest, on the other hand, is preserved as watershed forest, where swidden practice is prohibited. The boundary of the lower and higher areas for separate land use is decided by customary agreement.

Private forests or *pinugo* are interspersed like a mosaic over the village territory. While the community forest has a natural stand of trees, private forest is man-made and generally originates from swidden. One's effort to cut grasses and/or to plant trees to facilitate forest regeneration is the basis of claim for private ownership. Most pine trees which are now commonly found in private forests were planted, rather than naturally grown. Tree species which can be utilized for housing construction such as Tuai (*Bishofia javanica*) were also planted. It has been noted that, in some communities, the lack of timber for housing led the people to plant trees (Barton, 1922). Other commonly found trees planted in private forests were coffee (*Coffea arabica*), areca palms (*Areca catechu*), and other fruit trees.

Efforts to facilitate forest formation are recognized and have been kept in other residents' memories. Land-related trouble such as theft of trees, or other conflicts over the private forests were previously resolved by the families concerned, including persons immediately concerned, accompanied by pagan priests (*baki*) (Baton, 1922, Klock, op.cit.). Now, the barangay court functions to settle these problems. In the case of a dispute over land ownership, the basis of judgment depends on others' recollections as to which party or which party's ancestors worked and made efforts in the forest in question.

There are two methods of transfer of property within a family, i.e., by assignment during the life of the owner and by inheritance (Barton, 1919). It is common that property, ponded terraces and private forest in particular is transferred to the children at the time of their marriage. Ponded terraces are transferred to the children individually. A private forest can also be transferred to a single person, where the land tenure and the tree tenure are given to only one person. Such private forest owned by individuals is called *ohan un pinugo*, meaning single-person owned forest. It is, however, commonly observed that a private forest is not transferred to children individually but comes to be owned commonly by the original owner with his/her married children. A private forest commonly owned by parent and his/her children is called *pinugon hina agi*, literally meaning sibling forest. Land tenure and

tree tenure are, thus, commonly given to them. When the grandchildren of the original owner (the first generation) marry, they are also recognized as co-owners of the private forest. Sibling forest, thus, becomes clan forest or *pinugon hina ama*, literally meaning father forest, in which three generations commonly own the forest. Clan here refers to a group of kin members in the apical link. Therefore, it may be nearer the truth to say that the ownership of private forest is not transferred but rather shared to include the next generation(s). The reason why a single-person owned forest is not transferred to a single person, or rather, why a rigid individual private ownership has not been established in forests unlike in ponded terraces is attributed to the fact that their forests are not economically valuable unlike ponded terraces. In Kiangan, Ifugao, where coffee has been a commercial crop since the early 1900s, individual private ownership of coffee plantations is firmly established. Private forests in Banaue, on the contrary, have not produced any particular commercial product, which consequently has not generated a rigid individual ownership. The reason for not establishing individual forest ownership may also be explained by the idea that products obtained from the forest is not monopolized by a single individual. The prime product in the private forest has been firewood, which used to be the only fuel in every household. The co-ownership of private forest may have been established to secure forest products, firewood in particular, to the kin members. Co-ownership is, however, limited to a maximum of three generations. By so doing, it prevents an endless increase of the number of co-owners, thereby evading forest resources depletion. Co-ownership of a private forest is not expanded to every member of the fourth generation, considered by themselves as large enough to bring about resources depletion. Clan forest commonly owned by three generations is instead transferred to only one person of the fourth generation when he/she marries. Ownership transfer is through a customary law of primogeniture, the first child of the first child of the second generation. It is the Ifugao law that most of parents' properties, mainly ponded terraces, are transferred to the first child (Barton, 1919, Goda, 1997). The transfer of ownership in private forest also follows the customary rule. The new owner is considered to be the first generation of the private forest owner and a cycle of ownership starts again encompassing three generations: single-person, he/she and married children, and clan of three generations. It is not clear when this ownership cycle was established in Banaue. It was mentioned by the elderly people that the ownership cycle had been already observed during their childhood.

Among 236 households interviewed in Poitan, both husband and wife or either one in 226 households owned at least one private forest. The majority of them are one of the co-owners of sibling forest and/or clan forest.

Private forest which is located right above the ponded terraces is called *lidah*, while that right below ponded terraces is *longyah*. Owners of *lidah* and *longyah* are not necessarily the same as owners of nearby ponded terraces. This has not brought about serious conflicts over water or land erosion, however, due to selective removal of trees from private forests.

**2-4 Forest resource rights and use**

All the community members have the right to extract trees from the community forest without a permit from other members. Extracting trees for sale, however, is strictly prohibited and residents of other barangays are not allowed to extract trees unless they are originally from Poitan. There are no regulations governing resource use of the community forests regarding the volume or species of trees.

Products gathered from private forests are mainly firewood and wood for woodcarving. It is worth noting that the use of private forest is not limited only to the owner. The right to cut and sell trees is exclusive to the owner, but non-owners are also allowed to use private forests as long as they do not cut trees.

A common extraction permitted to non-owners is collecting firewood. There is no household that collects firewood from community forest, as they can do so from others' private forests.

A household collects them two times a week on the average and spends more than half a day and sometimes the whole day. What is customarily required of both owners and non-owners in

collecting firewood is, as emphasized by the people, to clean the forest floor by cutting grass and piling small branches and leaves in one place. By so doing, forest regeneration is facilitated. Piled branches are reserved for elderly people who live alone.

Owners of the private forest can cut trees without asking permission from other co-owners. For firewood, they are expected to cut dying trees, crooked trees and trees which cannot be used for timber and woodcarving. Failure by a person to clean the forest floor elicits a warning from other co-owners, and eventually a ban on forest use. They believe, as stated, that with the use of private forests by non-owners who remove branches from the forest floor, forest regeneration can be facilitated.

Firewood collection practiced by residents does not lead to degradation or deforestation of private forests. Frequent visits to private forests, mainly for firewood collection, also plays a role in monitoring the forest conditions. If it is found that trees were cut without cleaning the forest floor, it is believed that a non-owner did it. He is then sought out and fined.

No strict rules for forest use exists. It is true, however, that it is difficult to live if a person frequently disturbs the order in forest use, especially in others' private forests since he/she will need assistance for carrying a sick family member or hauling timbers from the communal forest for housing construction, etc.

## 3. Present state of the utilization of forest products

### 3-1 Forest products utilized by residents in terms of land ownership

Products gathered from the community forest include lumber for housing and round logs for woodcarving (Table 2). Most houses in Poitan are made of wood extracted from the community forest, since most trees in private forests are not big enough for house construction. Eleven species of trees are listed by the people for housing and all of them are hardwoods found in the community forest.

Sixteen tree species suitable for woodcarving, all of them softwood, are also named by woodcarvers. The amount of round logs consumed for woodcarving is determined by the number of woodcarvers in Poitan. It was calculated that one person may consume 0.57 $m^3$ monthly during the peak months from October to May (since tourists flock to Banaue from December to May) and 0 0.34 $m^3$ during the rest of the year from June to September (Central Cordillera Agricultural Programme, op.cit.). Therefore, it is estimated that a woodcarver annually consumes 5.92 $m^3$. The fact that the 42 people from 131 households engaging in woodcarving procure round logs from other places as far as the provinces of Nueva Viscaya, Isabela and Quirino shows that the community forest does not provide sufficient wood for woodcarving. Hardwood such as Acacia (*Samanea saman*) and Kamagong (*Diospyros Discolor*) used for woodcarving are imported from other provinces.

Other products gathered from the community forest are game such as wild pig, wild deer, monkey, numerous species of birds and the like, as well as various edible fruits (seven species are specified) and mushrooms (three species are named). Plants effective as herbal medicines and pesticides are also often used. The bark of some trees is used as clothing material, but only for special occasions. Elderly people mentioned that rattan could be gathered from the community forest before, but it is now rarely found because many of the big trees have already been extracted for housing and woodcarving purposes.

Aside from firewood, round logs for woodcarving is the main product gathered from private forests. Round logs are extracted only by owners. The tree suitable for woodcarving, only found in private forests, is the Alnus tree (*Alnus japonica* and *A. nepalensis*). Alnus was first transplanted and later naturally dispersed from mother trees. However, since large trees suitable for woodcarving are rare in private forests, many woodcarvers procure them from the community forests or other places. Other products being gathered from private forests are betel nuts and coffee. The interesting thing to note is that anybody, even non-owners, can gather these fruits as long as they do not intend to sell

them. Wild animals such as bats, for food, can be trapped from anyone's private forest.

**3-2 Differences in forest utilization among income groups**

In terms of income generating activities, the 236 households interviewed in Poitan can be classified into four groups. In order from the highest income group; (1) households in which at least one family member is engaged in full-time employment as a teacher or civil servant in Banaue, a factory worker in urban areas such as Manila and Baguio, or as an overseas worker, etc., (2) households in which family members are engaged in both handicrafts, i.e., woodcarving, handloom weaving or wooden-rattan handicraft making, and other self-employment such as carpentry, sari-sari store running, or working as a tricycle driver for handicraft middlemen, (3) households whose income generating activity is mainly from handicrafts, and (4) households whose income is generated mainly from working as agricultural wage laborers. The number of households in each group is 47 (19.9%), 50 (21.2%), 107 (45.3%) and 32 (13.6%), respectively.

Income difference is attributed to whether the family member is engaged in full-time employment requiring a professional skill obtained from a college education, such as teachers and civil engineers. Job availability for such full-time employment is, however, very limited in Banaue. Aside from this, the unprofitability of growing cash crops due to the limited market in Banaue makes the income discrepancy between each group minimal. The quality of their houses is not necessarily an indicator for identifying each income group.

Table 2. Products from the community forest utilized by residents

| Usage | Product |
|---|---|
| House construction | 11 species of hardwood, including Palayon (*Fagaceae* family), Borbor (*Pinus kesiya*) and Tuai (*Bishofia javanica*) |
| Woodcarving | 16 species of softwood, including Bangtinon (*Toona calantas*) and Anardong (*Artocarpus rubrovenia*) |
| Fire starter | Halong (root of old pine tree) |
| Food | Wild animals such as wild pig, wild deer, monkey, and Various kinds of birds |
| | Mushroom (Bulong, Balutak and Gigi-gigi) |
| | Root crop (Ipoy) |
| | Various kinds of fruits |
| Feed | Root crop (Bila) for pigs |
| Medicine | Vines and herbs |
| Pesticide | Vines and herbs |
| Ornament | Orchids |

Note: Scientific names of wood listed by the local people have not yet all been identified.

Source: Interviews in December, 1998

Firewood is the dominant energy source for everyday cooking. Among 236 households in Poitan, 33 (14.0%) of them use only LP gas, 21 (8.9%) use both LP gas and firewood and the remaining 182 (77.1%) use only firewood.

In terms of the different income groups mentioned previously, most of the LP gas users belong to those households who have full-time employment and self-employment other than handicrafts (Table 3). The majority of firewood users, thus, belong to households whose income sources are mainly from handicraft and agricultural wage labor. It is observed, however, that even households belonging to a

higher income group use firewood. Many of the firewood users mentioned that they prefer firewood to LP gas since firewood also warms them up during winter. Therefore, the use of different energy sources does not necessarily reflect different income levels. The tendency is that, nevertheless, those households who use LP gas are gradually increasing.

As an income source, woodcarvers are highly dependent on forests for material procurement. More than half of the households in Poitan are engaged in woodcarving. For the majority of households whose income source depends on handicrafts, woodcarving is the most important income source.

Unlike firewood, trees for woodcarving are mainly extracted from the community forest. Residents mentioned that although the volume of wood for housing and woodcarving is decreasing, wood extraction has not led to degradation or deforestation of the community forest, affecting water supply to the ponded terraces below. This is due to a selective extraction of trees. Trees with a high water content are not cut, because they are unsuitable for housing and woodcarving. In the lower portion of the community forest, previously used swidden areas have turned into bush or are slowly regenerating into forest, since no single household has engaged in swidden agriculture there over the past few years.

**4. Changes in forest utilization**

The forest area has increased compared to the early 1960s (cf. Conklin, op.cit.). This is due to the fact that grasslands, in which residents used to practice swidden agriculture, have now converted into bush or forest. Sweet potato as a diet supplement has been replaced by commercial rice. The other reason for this increasing forest area is that ponded terraces abandoned for a long period of time have also turned into bush or forest.

The necessity of earning cash forces more people to engage in income generating

Table 3. Number of Firewood users and Woodcarvers by Income Group in Barangay Poitan

| Income group | No. | Number of households who use only firewood (% of the income group) | Number of households engaged in woodcarving (% of the income group) |
|---|---|---|---|
| Households whose family members are engaged in full-time employment | 47 | 31 (66.0%) | 25 (53.2%) |
| Households whose family members are engaged with both handicrafts and other self-employment | 50 | 27 (54.0%) | 21 (42.0%) |
| Households whose income generating activity is mainly from handicrafts | 107 | 92 (86.0%) | 85 (79.4%) |
| Households whose income is generated mainly from working as agricultural wage laborers | 32 | 32 (100%) | 0 (0%) |
| Total | 236 | 182 (77.1%) | 131 (55.5% ) |

Source: Interviews in December, 1998

activities. Woodcarving is the most important income source. Since it is self-employment, woodcarvers have to secure materials by themselves. The community forest is the site where many woodcarvers procure wood for that purpose. Free access to trees in the community forest by the residents has led, consequently, to a decrease of big trees suitable for woodcarving. Eventually, more and more woodcarvers have to secure materials in places outside Banaue.

The community forest still plays an important role as a watershed forest for rice production, and this is well recognized by the residents. Thus, extraction of trees has been limited only to those available for housing and woodcarving. Reckless cutting of trees has rarely been practiced.

Hunting wild animals in the community forest used to be very important for their diet. This is still practiced in the community forest, though not as frequently as before. This is because people engage more in income generating activities.

For forest utilization in the private forests, firewood collection is still the most important thing. Most trees suitable for woodcarving have already been utilized and, thus, most of the remaining ones are small diameter trees. There are many tree species planted in private forests, including those for refreshments such as betel nuts, coffee and other fruit trees, and these are free even to non-owners.

**5. Evaluation of forest utilization from the view point of sustainability**

A customary forest management system has sustained the community forest and the private forest .

To secure a water supply for ponded terraces, the necessity to sustain the topmost forest as a watershed forest encouraged the local people to declare it as community property. Community forest preservation has been practiced by residents by prohibiting swidden practice and selectively removing trees suitable for housing and woodcarving. The community forest has also provided sites for food production by residents, delineating the lower portion for swidden where residents used to produce sweet potato to supplement rice production.

Meanwhile, their ancestors' efforts to facilitate forest regeneration in fallow lands led to the establishment of private forests. These efforts were the basis of claims to *de facto* ownership over the forests, where they were able to secure firewood and lumber for house construction. As discussed before, the ownership of private forest is not always exclusively given to a single person. The cycle of forest ownership, i.e., single-person, he/she and married children, and clan of three generations, works as a compromise between securing forest products to kin members as big number as possible and evading resources depletion with an endless increase of kin members.

Due to a high dependence on firewood, most residents visit their forests frequently and monitor other co-owners' use of the forest resources. It seems that limiting co-ownership up to only three generations makes it easier for them to monitor each other. In spite of the fact that ownership of land and trees in the private forests is recognized among the local people, the use of forest resources is open even to non-owners as long as they do not cut trees or sell forest resources. The private forests are, thus, conserved by co-owners, but not totally monopolized by them.

**6. Dual ownership over the forest lands: central government vs. local people**

Most woodcarvers prefer to sell their products not in Banaue, but in Manila and Baguio, where they can sell them at a much higher price and make up for high transportation costs. To ship the products out of Ifugao, they are requested to acquire a permit issued by the government to harvest trees from their private forest. If not, their products will be confiscated at check points along the way to Manila or Baguio.

The legal basis for *de facto* private forest owners requiring the permit is that these forests are classified as public forests and fall under the jurisdiction of the government. Extraction of forest

resources and their disposition, especially for the purpose of selling, is strictly regulated by the government. The permit is called the *Muyong* Resources Permit (*muyong* is the same as *pinugo*, private forest) and it is issued by the Community Environment and Natural Resources Office (Memorandum Circular 96-02, Interim Guidelines Governing the Issuance of 'Muyong Resources Permit' in the Province of Ifugao).

Those who want to cut trees for woodcarving and sell them in Manila and Baguio are requested to submit the following documents: (1) application form, (2) location and size of the private forest and the number of tree species planted within the area, (3) certificate from the barangay captain to verify that the applicant is a resident of the barangay and has practiced traditional forest conservation techniques for the past 20 years, (4) volume and number of the raw material requirements for the applicant's livelihood for woodcarving, handicraft, manufacturing and the like.

The species and volume of trees to be harvested are regulated by the government. Harvesting of pine trees, whether planted or naturally grown, are not allowed because of the government's intention to preserve them. After in-site inventory of the private forests and evaluation of the application, the permit is issued to assure the shipment of their products out of Ifugao. However, cutting trees for woodcarvings sold only in Banaue is allowed without the permit from the government.

One forest officer reasoned that the volume of trees being cut for the purpose of selling handicraft products only in Banaue is at a tolerable level, unlike that intended for Manila and Baguio. Another peculiarity is that, in spite of the fact that the government recognizes the local people's forest management practice in the private forests as an indigenous forest conservation practice, it still tries to exert more control on the use of the forests for the purpose of conservation. In fact, the government' requirement to secure the permit perplexes and discourages most woodcarvers to do it. One of the reasons for reluctance to acquire it is that they believe the forest is their private property and that they have right to use the trees, especially those planted by their ancestors or themselves. The other reason is that issuance of the permit requires considerable cost and time. Presently, the number of those who have acquired the permit is limited, and the majority of woodcarvers have given up selling their products in Manila and Baguio. Furthermore, the ban to cut pine trees will consequently discourage *de facto* owners to plant them.

The use of community forest is also regulated by the government. Extracting trees is prohibited to control the watershed forests, but poor management practices by the government does not change local people's attitude to use the community forests in the same manner. Most local people believe that they can preserve the community forests, as they have been doing since their ancestors' times. The government, with the intention of conserving the nation's diminishing forests, seems to underrate the traditional practices of local people in conserving their forests. Extraction of trees, as stressed by local people, does not lead to deforestation as claimed by the government, because only suitable trees are selectively extracted. To pull these people apart from their forests will, eventually, degrade forest resources by discouraging them from planting or cleaning the forest floor to facilitate forest regeneration.

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