

Transforming Interaction of the Local People with the Uplands: A Case Study in Southeastern Nueva Ecija, Central Luzon

Atsuko HAYAMA*

Abstract

Deforestation in the Philippine uplands occurred so rapidly that numerous attempts have been made to elucidate its major causes. The landless and the small-scale farmers in the lowlands have been regarded as the direct actor that expedited deforestation through their forest resource exploitation and forest land cultivation. Little attention, however, has been given as to how environmental changes, dwindling forest resources in particular, have affected the survival strategies of these economically poor people. This paper aims to examine the interrelationships between the diminishing forest resources and survival strategies of the local people, putting emphasis on the landless. It was revealed that forest resource exploitation and forest land cultivation have supported their household economy considerably. In transforming upland landscapes, however, the role of their activities was less significant compared with that of logging activities conducted by enterprises and of grazing activities owned by local elite. It was also revealed that dwindling forest resources did not seriously affect the livelihoods of the landless. They were able to cope with this environmental change through investments, enabling them to possess tangible and/or intangible assets and diversifying income generating activities by household members. The advent of cash crops with a high market value changed the upland landscapes from grasslands to crop fields, which led to the establishment of *de facto* land ownership. This, however, would not ensure their engagement in sustainable upland cultivation, as most of the landless are not seeking cultivation land per se but securing opportunities for survival. They do not consider grasslands as complete waste lands, as this contributes to their household economy to some extent. The government's effort to rehabilitate the grass-covered uplands through empowering the local residents will be in vain unless they are given economic incentives along with an understanding of the significance of the grasslands.

Introduction

Grasslands, termed as "*kogonan*" stemming from the word *kogon* (*Imperata cylindrica*), constitute the most obvious upland landscapes in the Philippines today.¹⁾ *Kogonan* have almost doubled in area over the last 30 years, from 17% of the total land area in 1958 [Buenaventura

* 葉山アツコ, Graduate School of Asian and African Area Studies, Kyoto University, 46 Shimoadachi-cho, Yoshida, Sakyo-ku, Kyoto 606-8501, Japan

1) Large areas of *kogonan* are dominated mainly by two species of grass, *kogon* (*Imperata cylindrica*) and *talahib* (*Saccharum spontaneum*), which are considered the most drought tolerant grass species [UP Science Education Center 1971: 36].

1958: 54] to 35%²⁾ in 1990 [Philippines, DENR 1990: 15]. Most *kogonan* are viewed as fire climax, caused by human activities entailing repeated fires³⁾ [Whitmore 1975: 229].

A great deal of effort has been made in understanding the causes and correlating factors of deforestation in the Philippines.⁴⁾ The spread of *kogonan* is often explained in relation to the farming activities of the lowlanders,⁵⁾ whose dominant farming practice is allegedly *kaingin*⁶⁾ or swidden agriculture with frequent burning of the logged-over forest lands. The majority of these lowlanders were from rural areas, where the number of landless households increased.⁷⁾ It is frequently pointed out that these landless households entered the forest lands to cultivate [Ozbilen 1971: 12, 26; Garrity *et al.* 1987: 566–567; Grainger 1993: 51–52; Rogers 1996: 118].

What seems to be lacking in previous works, however, is a discussion of the viewpoint of these economically poor households, the landless in particular, on how their livelihoods or survival strategies are influenced by the diminishing forest. “Landless” usually refers to the landless agricultural laborers who have no land to cultivate, even on a share tenancy arrangement, and depend mainly on wage employment in agricultural sectors⁸⁾ [Aguilar 1981: 1]. Those who have lands to cultivate in the forest lands⁹⁾ regardless of their landholding status (i.e., *de facto* or

2) The aggregate 35.3% of the total land area in 1990 consists of 8.2% brushlands, 5.1% large-scale grasslands and 22.0% land mixed with brushlands and grasslands.

3) Even after the fires have stopped, large extents of grassland make it difficult to start a succession due to the complete elimination of other plants and the distance from mother trees for the dispersion of seeds.

4) For instance, Boado [1988: 180–187] stated that the government’s revenue collection systems were a major factor behind rapid forest cover loss caused by logging. Kummer [1992: 113–129] concluded that road density was highly correlated with forest cover decrease, with the distance from Manila significant because it represents a lack of control within the forestry bureaucracy. Nagata *et al.* [1994: 87–91] indicated that forest area and farm area have positive correlations with deforestation.

5) “The lowlanders” in this context include both those who utilize forest lands while residing in the lowlands and migrant lowlanders who migrated to the forest lands.

6) *Kaingin* is often referred to as both an agricultural system of swidden farming and the plot itself involving the system [Conklin 1957: 1]. In this paper, *kaingin* is limited to swidden farming and *gulod* is used to refer to “upland fields on a slope,” as the local residents describe.

7) The increasing number of landless households in the 1970s and 80s has been proven by several case studies such as Wolters [1984: 202] in eastern Nueva Ecija, Hayami *et al.* [1990: 13–14] in eastern Laguna, Morooka [1983: 102] in Cagayan, and Umehara [1995: 80] in western Nueva Ecija.

8) The mechanism of how the rural poor population increased in the lowlands in the postwar period can be summarized as follows, based on the works of Hayami and Kikuchi [1981: 41–44, 49–52], Kikuchi and Hayami [1983: 248–249], Takigawa [1989: 24], Balisacan [1991: 40], and Umehara [1993: 77]: Insufficient labor absorption capacity in the non-agricultural sector has not coped with the increment labor population in rural areas. Population pressure or increasing man/land ratio fragmented landholdings and consequently increased the landless population. Developing the technology for the “green revolution” was expected to increase the labor wage with the hypothesis that most of the rural population would be absorbed in the industrial sector. Despite a higher labor absorptive capacity for the high-yielding varieties compared with traditional ones, however, the green revolution could not overcome strong population pressure. In due course, the income and standard of living for the rural poor has continued to worsen. Moreover, agricultural commercialization eventually facilitated the forfeiture of the lands owned by small-scale farmers and increased the number of landless poor.

9) “Forest lands” refer to a term used by the Philippine government for land designated as forest but not

de jure), but are landless in the lowlands, are no longer considered as landless in a strict sense. For convenience, nevertheless, the term “landless” is used in this paper to describe even those who have lands in the forest lands insofar as they reside in the lowlands without lands to cultivate there.

The landless households in this study are those who reside in the lowland plains in the vicinity of the forest lands. Household economy of the landless households in such topographical conditions are conceptually derived from the following four sections; (a) wage employment,¹⁰⁾ (b) livestock production, (c) forest resource exploitation, and (d) cultivation in the forest lands. The hypothesis is that, among these four, forest resource exploitation and/or forest land cultivation have accounted considerably for household economy. Their livelihoods, thus, must have been greatly influenced by the dwindling forest resources. By focusing on this hypothesis as a springboard, this study attempts to elucidate the following four points, all of which are closely related to each other: (1) How the landless households have depended on the forest lands for forest resource exploitation and forest land cultivation and how their activities in the forest lands have transformed the upland landscapes, (2) How the landless households have changed in distributing their labor in response to the forest resource scarcity and, consequently, how their standard of living is affected by such environmental changes, (3) How the farming practice in the uplands has changed in response to vegetative change, including whether agricultural intensification has taken place or whether the farming practice is sustainably managed in the uplands, and (4) Whether resource scarcity in the uplands created any type of ownership of resources among the local people, i.e., whether open access resource use still prevails or communal or private ownership of the resources has been developed.

The *barangay*, the smallest administrative unit of the Philippines, was selected for this study based on the three conditions: (a) Barangay located in the lowlands near grass-covered uplands which were previously forested, (b) Landless households in the barangay accounting for a greater ratio, and (c) A history of the barangay starting before WW II, characterizing more vividly the landscape transformation of the uplands from forests to *kogonan*.

The study site is barangay Bantug in the municipality of Gabaldon, Nueva Ecija province in Central Luzon (Fig. 1). Residential areas and paddy fields extended to the lowlands at the foot of the Sierra Madre mountains, while *kogonan* spread in the pediments of the mountains.

Field surveys were conducted in August and September, 1996 and August, 1997. Data was collected through interviews with most of householders in barangay Bantug and some others in

↘ necessarily under forest cover at present. The lands with slope above 18% are defined as uplands and public lands, which are supposed to be covered with forest.

10) Wage employment consists of agricultural wage income and non-agricultural income. In agricultural wage income, development of the green revolution led to an increase in demand for labour input, which was, however, small [Barker 1973: 29–31]. Nevertheless, it created additional jobs and such practices as fertilization, pesticide spraying, threshing operations and the like [Umehara 1995: 87]. Non-agricultural income constitutes rural-type employment, urban-type employment and overseas employment [*loc. cit.*]. Rural-type employment has no official contract nor regulations regarding working place and working hours, while urban-type employment has an official contract and regulation between employer and employee.

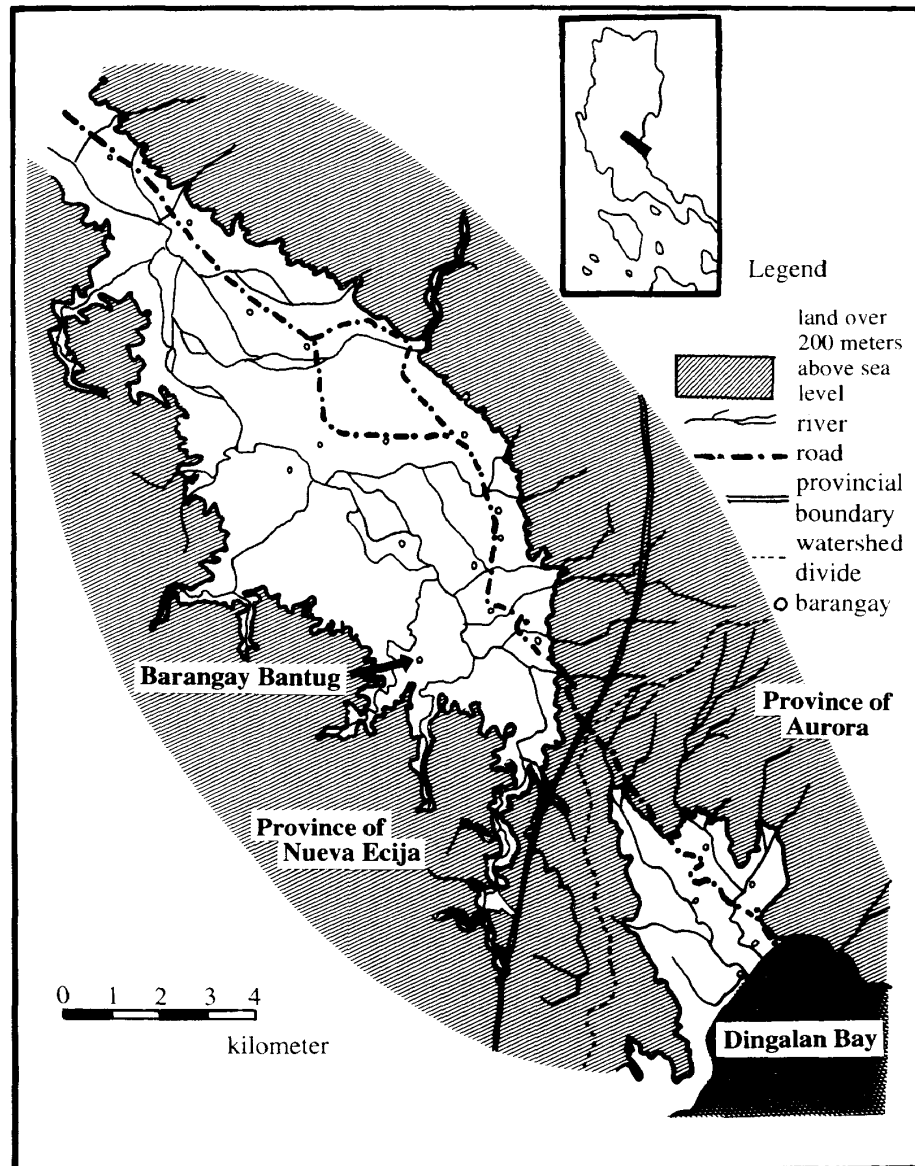


Fig. 1 The Study Site, Municipality of Gabaldon, Nueva Ecija

neighboring barangays. Official data was gathered from the municipal office in Gabaldon and provincial offices in Cabanatuan, provincial capital of Nueva Ecija.

I General Setting

1. *Location and History of Landscape Transformation*

Nueva Ecija province is comprised of extensive flat plains with a far eastern margin of the uplands. The municipality of Gabaldon¹¹⁾ lies in the foothills of the Sierra Madre mountains in the southeastern part of the province. Topographically, Gabaldon consists of a strip of low-

11) Administratively, the municipality of Gabaldon used to be a part of the neighboring municipality of ↗

lands (the Gabaldon valley) and extensive upland areas in the Sierra Madre mountains, covering two thirds of the total land area of the municipality. The Gabaldon valley is a thrust fault of the Sierra Madre mountains running southeastward. The Coronel river runs northwest through the middle of the Gabaldon valley, which joins the Pampanga river running through the Central Plain of Luzon. Gabaldon falls in the monsoon climatic zone, with abundant precipitation from June to November. It is also in the typhoon belt.

The Gabaldon valley links the Central Plain with the Pacific at Dingalan Bay. Public transportation between the center of Gabaldon and Cabanatuan City is about two hours by jeepney or bus. The Pacific Ocean side, from where fish products are brought to the Gabaldon public market every day, is accessible by bus in about half an hour climbing a hilly, winding pass.¹²⁾

The municipality of Gabaldon consists of 16 barangays. Administrative and commercial centers are in barangays North Poblacion and South Poblacion situated at the opposite side of the Coronel river from barangay Bantug, where a public clinic, church, high school and agricultural college are situated.

Prior to the 1880s, when Nueva Ecija province became a major rice producer, the lowland landscapes in the province were comprised mainly of secondary forests, bushes and *kogonan* [McLennan 1973: 35]. Spaniards began to embark on commercial land use in Nueva Ecija in the second half of the 19th century. Grants by the Spanish crown and purchases of public lands (the *realengas*) paved the way for the development of huge *haciendas* in the province. With an insufficient labour force and formidable transportation obstacles at that time, it was difficult to carry out commercial crop production such as sugar cane or tobacco. Cattle raising, therefore, seemed to be the most practical land use. The largest hacienda in Nueva Ecija in the 19th century was located in present-day Gabaldon, Hacienda (Hda.) Sabani,¹³⁾ which exceeded 6,000 ha covering most of the Gabaldon valley and the surrounding uplands [*ibid.*: 333–337]. Ranching enterprises of the hacienda had a great impact on the landscape, transforming it from forests to grasses by repeated burning activities, inevitable in order to feed cattle with the tender young shoots of grasses. It is presumed, however, that the Gabaldon valley was not totally transformed into grasslands.

Before the establishment of Hda. Sabani, the area was occupied by the Dumagats, the negritos.¹⁴⁾ Their means of livelihood were collecting forest products and hunting wild animals in exchange for rice and clothing with the lowland settlers and travelers. It is believed that small Dumagat settlements were already scattered around the Coronel and Dupinga (a tributary

↘ Laur until 1950. The newly separated municipality was first named Bitulok, later changed to Sabani in 1953 and changed again to Gabaldon in 1955 [Alvaran 1988: 18–19]. In this paper, however, Gabaldon is used in the description even before 1955 for convenience sake.

12) The road between Gabaldon and Dingalan was constructed by the Japanese Army through the forced labor of Gabaldon residents [Alvaran 1988: 12]. Logs extracted by the Japanese troops were shipped to Japan from Dingalan.

13) The name Sabani was taken from *sabana*, a Tagalog term for wide open grassy land [Alvaran 1988: 5].

14) Dumagat is used to identify the nomadic foragers who live in the Sierra Madre mountains. The name “Dumagat” originates from a Tagalog word *dagat* meaning sea. Thus, Dumagat literally means “the people who are from coastal areas” [Tamaki 1992: 237].

of the Coronel river) rivers by the late 19th century [Walpole *et al.* 1993: 20]. Establishment of Hda. Sabani, nevertheless, did not push the Dumagats to move further upward, since the valley was still scarcely inhabited by Ilocano migrants¹⁵⁾ and the forests still extended to the valley area. It is recorded that, in the middle of the 19th century, the valley was inhabited by only about 70 Ilocano tenant families, occupying the extreme southeastern part of the valley [McLennan 1973: 337], where the present barangay Bantug is located. While it is not clear how the upland portions were transformed into grasses during that period, it seems that some lower portions of the uplands were utilized for grazing. This is attributed to the fact that herds of cattle spent the rainy season in the upland grasslands and then moved down to the lowland grasslands in the dry season [*ibid.*: 249].

Cattle ranching run by the Spaniard *hacenderos* as a frontier economic activity, however, was put to a sudden end in the 1880s. A serious spread of livestock epidemics prompted the hacenderos to abandon ranching [*ibid.*: 250].

With the end of grazing activity, Hda. Sabani introduced a new economic activity, rice cultivation. The lowland grasslands were transformed into rice fields with increasing Ilocano migrants, although the process was gradual until the mid-1930s.

The land ownership of Hda. Sabani was transferred to an American in 1900 by virtue of the colonial policy, and then to the Insular Government in 1918 [Gleeck 1981: 111]. In 1930, it was sold to the National Development Corporation (NDC) for investment purposes.¹⁶⁾ A cadastral survey of farms and residential lots was finished in 1935 [Alvaran 1988: 16]. Actual cultivators became, thereafter, the tenants of the NDC, and were forced to pay farm-rent.¹⁷⁾

According to one elder resident in Gabaldon who migrated there from Pangasinan province with his family in 1920, the way his parents acquired their land for cultivating was to work as tenants (*kasama*) of pioneer settlers for several years while opening their own lands. It was *de facto* land ownership customarily acknowledged among the local residents. When Hda. Sabani became an NDC's property in 1930, residents were convinced to "surrender" to the NDC by paying the rent. After the cadastral survey in 1935, those residents who could afford to buy the land they occupied acquired *de jure* ownership. There were few who were able to do so, however, and most cultivators had to remain as tenants.¹⁸⁾

In spite of the fact that the frontier in the western part of Nueva Ecija was gone at that time, transformed to paddy fields, Gabaldon valley remained thinly populated due to the lack of

15) Ilocano migration to the southern region began to accelerate in the early 19th century, prompted by rapid population growth in Ilocos region. By the 1840s, Ilocano pioneers began to penetrate Nueva Ecija directly from the north and circuitously by way of Tarlac [McLennan: 1982: 63].

16) As for the year of purchase of Hda. Sabani by the NDC, it is recorded as 1925 in Gleeck's chronological history [1981] but as 1930 in Alvaran's [1988].

17) The rent was 50/50 sharing at first. It was changed to 25/75 sharing in 1937 after the tenants petitioned the NDC in Manila [Alvaran 1988: 8]. In 1948, all bona fide farmers were issued certificates of "Contract to Sell" by the NDC [*ibid.*: 14].

18) One elderly woman in barangay Bantug recalled that the land her father cultivated as a *kasama* before the war was eventually defrauded by *katiwalas*, overseers in hacienda, only to become "a landless household."

access roads from Cabanatuan. There were only 130 tenants in the valley in 1927 [Gleeck 1981: 111].

2. *Migration Movement to the Gabaldon Valley*

The year 1936 was epoch-making for a population increase in Gabaldon. Felipe Buencamino, Jr.,¹⁹⁾ a sugar cane hacendero in Cabiao, Nueva Ecija, obtained the logging concession in Gabaldon valley and the northeastern part of the Sierra Madre mountains. He opened sawmills in Gabaldon (the Bitulok Sawmills) and in Dingalan [Alvaran 1988: 8]. It was said that he brought a number of sugar mill workers to the newly opened sawmills.²⁰⁾ A provincial road was constructed in 1938, connecting Cabanatuan and Gabaldon for transporting logs and timbers to Manila. Inception of logging activity and the construction of the provincial road became an impetus to accelerate the in-migration movement to the valley for the lowlanders seeking job opportunities in logging and sawmill operations, as well as acquiring lands to cultivate in the valley. People migrated here from neighboring towns and provinces such as Bulacan, Tarlac and Pangasinan [*ibid.*: 9]. In 1941, there were some 700 tenant households there, or an increase of 570 households in the 14 years from 1927 [Gleeck 1981: 178].

As migrants moved into the valley, the Dumagats were pushed into the upland forests, and all the Dumagat settlements disappeared from the lowlands²¹⁾ [Walpole *et al.* 1993: 20]. Hereafter, there were no more Dumagat communities in the valley, but only the Christian lowlanders, namely migrated settlers and their offspring.

From 1918 to 1939, the municipality of Gabaldon experienced a very large population increase at an annual rate of 7.13%, in comparison with 2.11% in the Philippines as a whole (Table 1). This was attributed to in-migration movement. From 1960 to 1970, Gabaldon again experienced a population increase (3.42% for Gabaldon and 3.08% in the Philippines), which also indicates increase through in-migration, though not as high as that from 1918 to 1939. The tendency of population dynamics in Gabaldon during the postwar period showed that the population increase through in-migration was not high in spite of the logging boom which continued in the area during the 1960s and 70s.

Based on the interviews, two implications can be drawn on population dynamics during the

19) He established Nueva Ecija Sugar Mill, Inc. in 1927, which had a cane press capacity of 300m/ton/day. It stopped its operation in the crop year of 1938/39 [Nagano 1986: 310]. This is because it became unprofitable due to production cutbacks imposed by the Sugar Administration [Gleeck 1981: 168]. The Buencaminos were politically aligned with then president Manuel Quezon [*ibid.*: 147], which enabled Buencamino, Jr. to obtain a logging concession in Sierra Madre. He then sold the sugar mill and embarked on logging activities.

20) The Bitulok Sawmills provided housing equipped with electricity to logging and sawmill operators near the sawmills (interviewed with the local residents). The area is called barangay Sawmill.

21) In accordance with logging activities in the uplands in the postwar period, the Dumagats moved farther to the inner forests. The Dumagats have not played a substantial part in the deforestation that took place in the uplands. At present, there are two Dumagat settlements in the uplands in Gabaldon belonging to two barangays. Although the Dumagats are also forest resources users in the same area, this paper focuses on the lowlanders.

Table 1 Average Annual Rate of Population Increase of the Philippines, Nueva Ecija and Gabaldon: 1903–1990

(%)			
Year	Philippines	Nueva Ecija	Gabaldon
1903	–	–	–
1918	2.03	3.57	–
1939	2.11	2.93	7.13
1948	2.07	1.29	2.46
1960	2.89	2.21	1.82
1970	3.08	3.42	3.42
1975	2.78	2.18	2.48
1980	2.71	2.44	1.84
1990	2.35	2.07	2.39

Source: 1970, 1980, 1990 Census of Population and Housing, National Census and Statistics Office

Note: Gabaldon used to be a part of the municipality of Laur until 1950.
Annual rate of population increase until 1960 is, therefore, that of Laur.

postwar period in relation to logging activities, and these are confirmed by the statistical data in Table 1: (a) The thriving logging operation in the 1960s and 70s in Gabaldon stimulated in-migration, but most migrants for logging activities were temporary residents. Interviews with the local residents revealed that many people from the Bicol region came to Gabaldon during the logging boom in the 1960s and 70s and resided along the east bank of the Coronel river, although most moved out when the logging operation sites moved to the neighboring provinces of Aurora and Quezon. Those who settled in Gabaldon after the logging boom were small in number. (b) Few settled in the logged-over forest lands, and most of them were people from Bicol who came to engage in the logging activities but did not move out together with the logging operations. The logged-over lands in Gabaldon, despite being open access resources, did not induce an in-migration movement for those who sought cultivation lands.

3. *Barangay Bantug and Its Residents*

Barangay Bantug is the oldest among 16 barangays in Gabaldon. It is located on the west bank of the Coronel river, with the center of Gabaldon being across the river. Residential houses are clustered at the edge of the valley. Paddy fields (*bukid*) lie between the residential area and the Coronel river, extending about 300 ha (Barangay Bantug Socioeconomic Profile, 1996). Irrigated paddy fields are only a quarter (70 ha) of all the paddy fields in barangay Bantug, while the rest (230 ha) are rain-fed. During the dry season, rain-fed fields are planted with vegetables, but not to a large extent. Lowland dry fields (*bakod*) cultivated mainly with vegetables are located between the foot of the uplands and residential houses, extending about 180 ha.

The latest population census of 1995 showed that the population of barangay Bantug was 761, with 148 households, a figure much smaller than the average population of all the barangays in Gabaldon (1,605 persons/barangay). A field survey conducted in August 1997

showed that the population of barangay Bantug was 733²²⁾ with 134 households, revealing a decrease of 28 persons and 14 households compared with the census data in 1995. This shows that barangay Bantug has experienced out-migration over the last two years. The other available population census of barangay Bantug showed that in 1970, 1975, 1980 and 1990 the population was 213, 447, 547 and 551 respectively. In spite of the fact that the population in Gabaldon as a whole experienced out-migration from 1970 to 1980, a drastic population increase in barangay Bantug was recorded during the same period. This could be due to the fact that most were not migrants from outside Gabaldon but previous barangay Bantug residents living in the neighboring barangay of South Poblacion, having returned to barangay Bantug during this period because of the reconstruction of a bridge between the two barangays.²³⁾ In contrast, barangay Bantug experienced an out-migration from 1980 to 1997.

Among 134 households in barangay Bantug, the husband and/or wife of 125 households were interviewed. The total population of 125 households was 684 persons (359 males and 325 females), in which those living apart for work or study were also included as household members as long as they were single. The out-migrating population in each household, between 20 and 49 years of age, were already married and independent, among whom one fourth were residing in neighboring barangays in Gabaldon. Household members working outside the barangay, who were between 15 and 49 years of age, totaled 37 persons (22 males and 15 females), which is 10.0% of the total production age population (Fig. 2). The majority of the males were working as construction workers in Manila and rattan gatherers in Quezon and Bulacan provinces, while females were working mainly as domestic helpers in neighboring barangays, Cabanatuan, Manila and even in Middle East countries (Table 2). Five females were attending school in Cabanatuan.

Among 125 households interviewed, 57 husbands and 47 wives were found to be the first generation migrants, i.e., they migrated to Gabaldon from other municipalities in Nueva Ecija or other provinces. These first generation migrants include those who migrated with his/her parents in their childhood, those who migrated with family after marriage, and those who migrated while still single. The majority of the barangay members, thus, belonged to the second and third generations, born in barangay Bantug or neighboring barangays.

Fifty three of 57 men and 47 women of the first generation could be identified with their year of immigration from outside Gabaldon and by their birth place (Table 3). Based on their main purpose for immigration, in-migration movement from outside Gabaldon is divided into three trends among men, and the division of periods is closely related to the commercial logging activity in the southwestern part of the mountains, i.e., (a) family unit land-seeking migrants until the 1950s (before the logging activity), (b) single logging worker-migrants in the

22) Fieldwork conducted in August 1997 revealed that the total number of households in barangay Bantug was 134, among which 125 households were interviewed. The total population was obtained based on the average number per household.

23) During the war time, residents of barangay Bantug were forced to evacuate to neighboring barangays by the Japanese troops for their base. Not all of them returned after the war.

A. HAYAMA: Transforming Interaction of the Local People with the Uplands

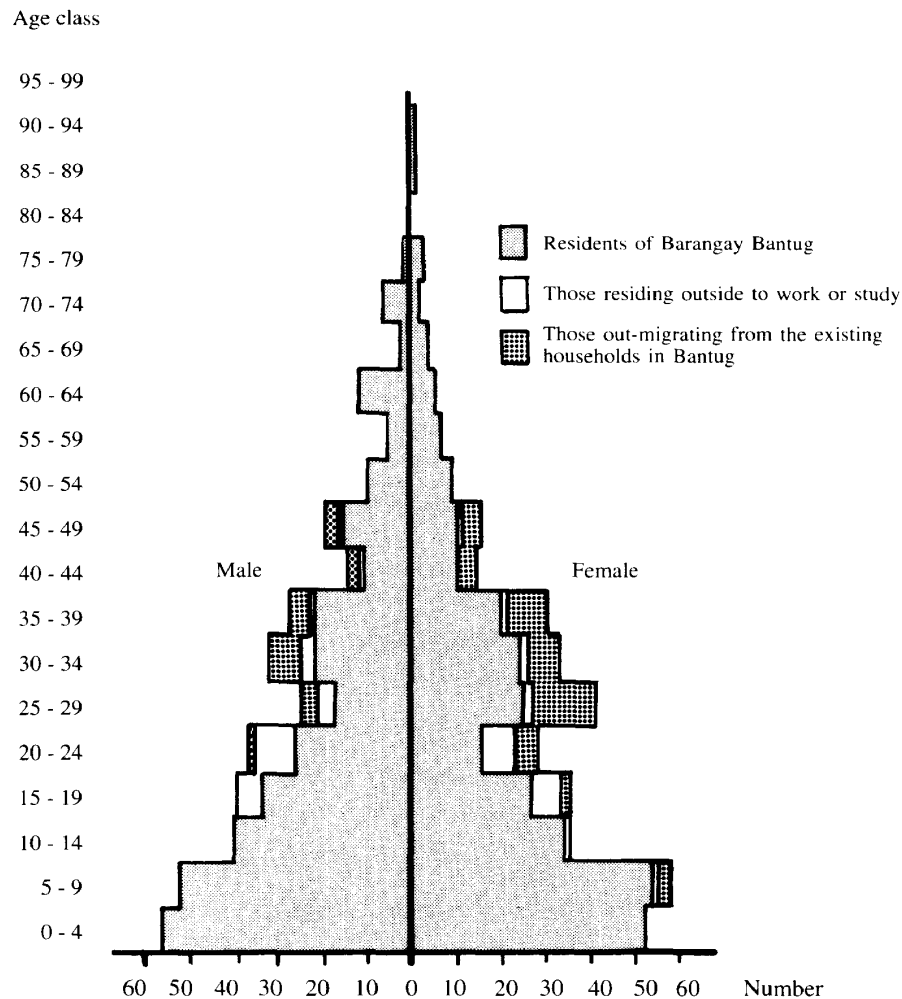


Fig. 2 Population Pyramid by Age Class in Barangay Bantug in 1997

Note: Among the total number of households of 134 as of August 1997, 125 households were interviewed. The total population of 125 households was 684, which included household members working or studying outside the barangay.

1960s and 70s (during the logging activity), and (c) mixed typed; migrants seeking any kind of job since the 80s (after the logging activity).

(a) Those who immigrated until the early 1950s intended to acquire lands to cultivate in the valley, and arrived with their parents. They were from other municipalities in Nueva Ecija and the neighboring provinces. As mentioned before, the drastic population increase in prewar Gabaldon was due to an in-migration movement of people who sought not only the lands to cultivate in the valley but also working opportunities in logging activities and sawmill operations. The interviews revealed, however, that those who settled in barangay Bantug before the war did not engage in logging or sawmills operations, rather they immigrated to seek lands to cultivate. This is because the logging concession areas and the sawmill were located on the east side of the Coronel river. Those migrants who sought working opportunities in logging and sawmill operations settled, thus, near the sawmills on the east side, and not on the

Table 2 Household Members Working outside Barangay Bantug

Household Number	Household Member (age as of 1997)	Working Place	Occupation
1	daughter (24)	Abu Dhabi	domestic helper
	daughter (22)	Abu Dhabi	domestic helper
2	husband (24)	Manila	construction worker
13	son (27)	Bulacan	mechanics
18	son (22)	Cabanatuan	seeking a job
22	daughter (26)	Bongabon, Nueva Ecija (N.E.)	midwife
28	son (24)	Infanta, Quezon	rattan gatherer
	daughter (21)	Baguio, Benguet	domestic helper
31	son (17)	Pampanga	salesman of TV screens
34	husband (31)	Cabanatuan, N.E.	poultry project worker
38	son (26)	Manila	carpenter
	daughter (17)	Barangay South Poblacion, Gabaldon	domestic helper
43	son (23)	Cabanatuan, N.E.	seeking a job
	son (22)	Infanta, Quezon	rattan gatherer
48	wife (47)	Manila	dressmaking factory worker
53	wife (39)	Saudi Arabia	domestic helper
59	son (23)	Infanta, Quezon	rattan gatherer
60	husband (29)	Manila	construction worker
62	son-in-law (30)	Tarlac	sugar cane truck driver
64	son (20)	Bulacan	rattan gatherer
	daughter (15)	Barangay North Poblacion, Gabaldon	domestic helper
88	daughter (19)	Cabanatuan, N.E.	domestic helper
91	son (19)	Manila	welder
	son (19)	Laur, N.E.	?
98	daughter (22)	Cabanatuan, N.E.	domestic helper
99	daughter (26)	Manila	domestic helper
105	husband (32)	Manila	construction worker
106	husband (38)	Manila	construction worker
109	son (27)	Bulacan	rattan gatherer
	son (23)	Bulacan	rattan gatherer
	son (19)	Bulacan	rattan gatherer
113	daughter (30)	Manila	?
115	daughter (19)	Angeles, Pampanga	domestic helper
	son (18)	Muños, N.E.	food vendor
	daughter (17)	Muños, N.E.	food vendor
121	son (24)	Manila	construction worker
	daughter (21)	Manila	domestic helper

Source: Interviews in August, 1997

west side where barangay Bantug is located. (b) Those who came in the 1960s and the early 70s intended to work mainly for logging activities which were operated in the southwestern part of the mountains. Most of them were single males who decided to settle in barangay Bantug

A. HAYAMA : Transforming Interaction of the Local People with the Uplands

Table 3 Birthplace and In-migration Year of the First Generation of Migrants

Region	Province	1930s		1940s		1950s		1960s		1970s		1980s		1990s		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	Male	Female
Central Luzon	Nueva Ecija	5	1	5	5	2	1	4	2	3	2	6	8			25	19
		(5)	(1)	(5)	(5)	(2)	(1)	(1)			(1)		(3)			(13) ⁽¹⁾	(11)
								[2]		[1]	[1]	[3]	[2]			[4] ⁽²⁾	[5]
								(3)		(2)		(3)	(3)			(8) ⁽³⁾	(3)
	Bulacan			1				1								1	1
				(1)				(1)								(1)	(1)
	Tarlac				1							1					2
					(1)								(1)				(1)
																	(1)
Ilocos	Pangasinan			3	2	1		3		1		1		1		8	4
				(2)	(1)	(1)		(2)								(4)	(2)
					[1]									[1]			[2]
				(1)				(1)		(1)		(1)				(4)	
	La Union			1		1		1								1	2
						(1)		(1)									(2)
	Ilocos Sur			(1)								1				(1)	
												[1]				[1]	
Cagayan	Isabela							1		1				1		2	1
								(1)								(1)	
										(1)				(1)		(1)	(1)
												1		3	3	4	3
	Cagayan											(1)		[2]	[3]	[2]	[3]
														(1)		(2)	
	Kalinga-Apayao											1	1	[1]	[1]	1	1
	Nueva Viscaya												1			1	
													(1)			(1)	
National Capital	Manila							1		1				1	1	2	2
								(1)		(1)				(1)		(2)	(2)
														(1)			
Southern Tagalog	Quezon									2	1			1		2	2
										(1)	(1)					(1)	(1)
										[1]						[1]	
														(1)			(1)
	Aurora									1		1	1	1		2	2
												(1)	(1)			(1)	(1)
														[1]		[1]	
	Batangas									(1)						(1)	
												1	1			1	1
												(1)				(1)	
														[1]		[1]	

Table 3-Continued

Region	Province	1930s		1940s		1950s		1960s		1970s		1980s		1990s		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	Male	Female
Bicol	Albay							1		1						1	1
								(1)		(1)						(1)	(1)
	Camarines Sur											1				1	
	Camarines Norte									1		[1]				[1]	
	Sorsogon									(1)				1		1	1
														[1]		[1]	[1]
Western Visayas	Iloilo											2				2	
												(1)				(1)	(1)
												(1)				(1)	(1)
Western Mindanao	Zamboanga del Sur													1		1	
														(1)		(1)	(1)
Southern Mindanao	Cotobato city													1		1	
														[1]		[1]	[1]
Total		5	1	10	8	2	3	10	4	8	6	11	13	7	12	53	47
		(5)	(1)	(8)	(7)	(2)	(3)	(4)	(2)	(1)	(5)	(1)	(6)		(1)	(21)	(25)
					[1]				[2]	[2]	[1]	[5]	[2]	[4]	[8]	[11]	[14]
				(2)				(6)	(5)	(5)	(5)	(5)	(5)	(3)	(3)	(21)	(8)

Source: Interviews in August, 1997

Notes: (1) Italic parentheses: those who immigrated in childhood with parents

(2) Brackets: those who immigrated with family after marriage

(3) Parentheses: those who immigrated while single

when they got married there. (c) Those who immigrated from the late 1970s came to seek any kind of working opportunity. They were not only from the nearby provinces but also from far off provinces such as Kalinga-Apayao in the north and Zamboanga del Sur in Mindanao in the south. Many already had their own families. They received information about barangay Bantug from relatives residing there before immigration. Other migrants were single. In this case, they met Bantug women in the cities of Manila or Cabanatuan while still single and decided to settle down in barangay Bantug for marriage. As for 47 women of the first generation migrants, most cases included immigration with family, i.e., with their parents in childhood and with their own family after marriage. Since the 1980s, single women meeting Bantug men in the cities have migrated to barangay Bantug for marriage.

4. Small-scale Landholdings in the Lowlands

Among 125 households interviewed, 47 (37.6%) had land to cultivate as owner cultivator, tenant,

mortgagor or borrower of parts of their father's lands²⁴⁾ (Table 4). Twenty-six of these households had their own cultivated lands, in which 17 owned only paddy fields, five owned lowland dry fields and four owned both paddy fields and lowland dry fields. The landholding size of owner cultivators was 1.28 ha, including both paddy fields and lowland dry fields (0.89 ha for paddy fields only and 1.44 ha for lowland dry fields only). Tenants totaled 19 households, of which 12 rented only paddy fields, 5 rented only lowland dry fields, and 2 rented both fields. Three kinds of tenurial arrangements were observed in barangay Bantug, i.e., *nakikisaka*, *nakikisama* and *namumuwisan*. In *nakikisama* and *nakikisaka*, a land owner carries all the management costs and the net profit after reduction of all the costs is shared equally between a landowner and a cultivator. *Nakikisama* is a permanent arrangement, while *nakikisaka* is a temporary contract, usually for one or two terms of cropping. In *namumuwisan*, on the other hand, a cultivator carries all the costs and pays a rent or *buwisan* to a landowner. A commonly observed arrangement of *buwisan* in barangay Bantug was 25%/75% (owner/cultivator) for paddy fields with a fixed rent of about 2,000 pesos annually for lowland dry fields.²⁵⁾ Most of the land owners resided in the neighboring barangays. The average size of rented land per tenant household was 1.95 ha, including both paddy fields and lowland dry fields (1.67 ha for paddy field only and 2.0 ha for lowland crop field only). There were five mortgagors (*nakasanla*). Mortgagees, original owners of the land (*nagsanla*), were also resi-

Table 4 Landholdings in the Lowlands, Barangay Bantug

	Owner Cultivator	Owner Cultivator- and-Tenant		Owner Cultivator -and- Mortga- gor	Mortga- gor	Tenant			Total
		Share- crop	Fix rent			Share- crop	Fix Rent	Both	
Paddy	17 ⁽¹⁾				2	5	5	1	30
Dry field	2 ⁽²⁾		1		2	1	3		9
Both	4	1 ⁽²⁾⁽³⁾		1 ⁽³⁾		1	1		8
Total	23 ⁽⁴⁾	1 ⁽⁴⁾	1 ⁽⁴⁾	1 ⁽⁴⁾	4	7	9	1	47

Source: Interviews in August, 1997

Notes: (1) Five of them shared one field to rotate cultivation every five years.

(2) One of the owner cultivators and one owner cultivator-and-tenant helped in the father's field. They were considered as owner cultivators for convenience sake.

(3) Their own lands were dry lands, and tenant land and mortgaged land were paddy fields.

(4) Methods of land acquisition for 26 owner cultivators were as follows: Inheritance 16, Purchase 6, Inheritance and purchase 1, Help father's field 2 and Occupation 1.

24) Among these 47 households, 5 of them, all siblings, cultivated one parcel of 1.5 ha by rotation, inherited from their father. Every five years, each household cultivated the land. They were also categorized as owner cultivators.

25) Nineteen tenants consisted of 1 *nakikisaka*, 7 *nakikisama*, 10 *namumuwisan* and 1 *nakikisaka* as well as *namumuwisan* (who had two lands with different land owners).

dents of barangay Bantug.²⁶⁾ Four mortgagors cultivated the lands by themselves, while one let his mortgagee cultivate the land as *nakikisama* and shared the profits. The average size of mortgaged lands was 1.15 ha, including both fields (0.92 ha for paddy fields only and 1.5 ha for lowland dry fields only).

The number of households who did not have any land to cultivate in the lowlands, therefore, totaled 78 households (62.4%). These households are hereafter defined in this study as “the landless households.” The high ratio of landless households was the result of the main intention of most migrants who came after the 1950s to acquire job opportunities, as described above. Most of the second and third generations of such migrants were, thus, born landless. There were also some cases where even the first generation immigrants who had acquired their own lands lost them later through mortgage and consequently become landless.

It became apparent that the landless households accounted for a high ratio in the barangay and even those households with cultivated lands could not fully support themselves only with farming due to small cultivated land areas. One commonly observed income generating activity was working as hired laborers in paddy fields in barangay Bantug. The green revolution was introduced to Gabaldon in the late 1960s and prevailed in the 1970s. Working opportunities in the paddy fields, however, were not sufficient due to the limited irrigation coverage. Some even traveled to other municipalities in Nueva Ecija or Bulacan province for transplanting and harvesting, where double or even three time rice cropping was practiced.

In such circumstances where labor absorption in agriculture and the rural industry is limited, it is obvious that the livelihood of the local residents, the landless in particular, has been closely related to the forest lands. The interviews revealed that their household economy, to a great extent, have been supported by the forest in the form of resource exploitation of rattan, timber exploitation, wild boar hunting, kogon gathering and the like, as well as forest land cultivation. Before going into their economic activities in the forest lands, it is of importance to first review the transformation of the upland landscape in Gabaldon.

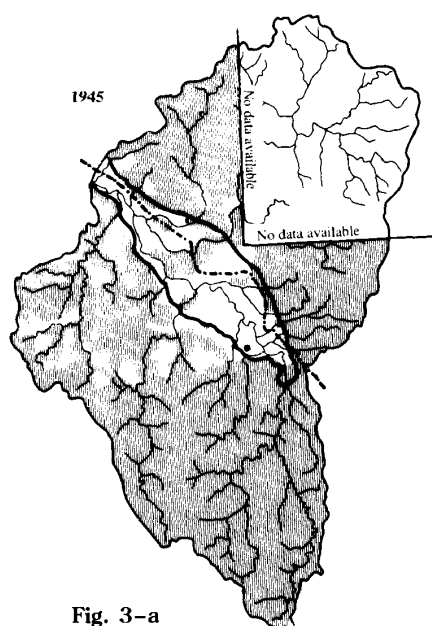
II Transforming Upland Landscape and Its Main Actors

Transformation of upland landscapes around barangay Bantug is divided into three stages: (a) from forests to logged-over forests, (b) from logged-over forests to *kogonan*, and (c) from *kogonan* to crop fields. Transforming upland landscapes from the early 1930s is reviewed by focusing attention on those who have played substantial roles in these transformations.

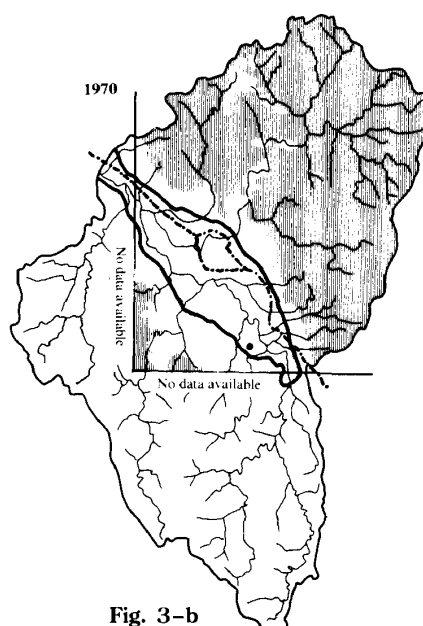
1. From Forests to Logged-over Forests

A 1945 Gabaldon map shows that the lowland forests occupied only small portions of the valley, and that most of the Sierra Madre mountains were still forested except for some areas near the lowlands and the interiors (Fig. 3-a) [Manila Observatory 1993a: 7]. The logging operations

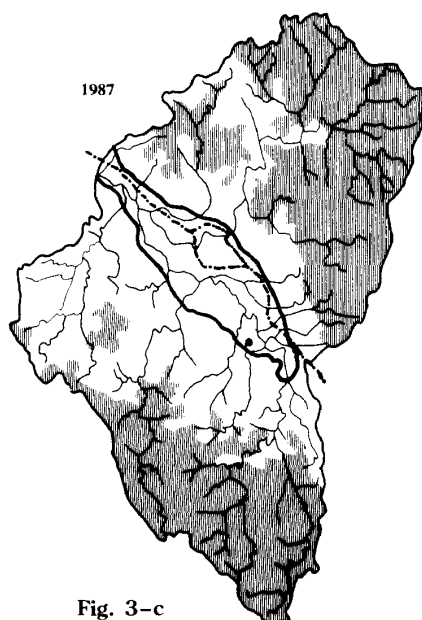
26) Among five mortgagors, two wives used to work in Hong Kong and Taiwan. The mortgage loan was between 6,000 to 15,000 pesos.



Source: 1945 U.S. Army Topographical Maps (1:50,000)



Source: 1969, 1970, and 1971 Aerial Photographs (1:20,000)



Source: 1987 Swedish Space Corp. SPOT Satellite Images (1:250,000)
1987 Satellite Images from NAMRIA (1:50,000)

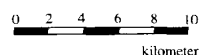
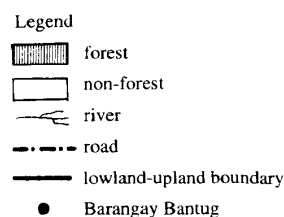


Fig. 3 Forest Decrease in the Coronel Watershed (1945–1987)

Source: [Manila Observatory, Environmental Division 1993a]

first started in the lowland forests, most of which were later transformed into crop fields. The deforestation portions in the uplands near the lowlands seemed to be caused mainly by cattle raising in Hda. Sabani in the 19th century. This indicates that the commercial logging activity which started in 1936 did not bring drastic changes to the upland landscapes. Interviews with the elderly people who used to work at the sawmills before the war revealed

that only large trees were extracted then by manual sawing (two-man saws) and ax, and hauled by *carabao* (water buffalo) and trucks. Notable tree species for commercial logging were Narra (*Pterocarpus indicus*), Tindalo (*Pahudia rhomboidea*) and Dipterocarp species such as Yakal (*Hopea plagata*), White lauan (*Shorea contrata*), Mayapis (*Shorea palosapis*), Tangile (*Shorea polysperma*), and Apitong (*Dipterocarpus grandiflorus*).²⁷⁾ Logs were moved to the saw-mills and forest products were transported to Cabanatuan and Manila.

In areas within the typhoon belt, like Gabaldon, trees rarely grow more than 50 cm in DBH (diameter at breast height), however, many pole-sized trees of DBH from 5 to 15 cm were found [Manila Observatory 1992: 33–34]. It is assumed, therefore, that the logging operation in the prewar period was not extensive, as pointed out by the local residents, due to the existence of a limited number of large trees and the practical limitations of manual labor and transportation. The local residents recalled that very few people intruded into the logged over forest lands to seek cultivated land, due to the presence of concession guards and the many remaining trees which prevented such intrusion. People also feared malaria. In addition, it seemed that people were not encouraged to cultivate the forest lands due to the fact that uncultivated lands were still available in the lowlands.

In 1942, Japanese troops requisitioned the sawmills and took over the logging and sawmill operations²⁸⁾ [Alvaran 1988: 10]. The methods of extracting logs during the Japanese occupation were said to be technically the same, and this continued for almost two years. For the local residents, the forest lands during the war time served both as refuge areas from the Japanese troops and a source of daily subsistence. It seems that deforested lands distributed like mosaic in the interiors, shown in the 1945 Gabaldon map (Fig. 3–a), were attributed to refugee farming activities during the war time.²⁹⁾

In 1945, the US Army replaced the Japanese troops in sawmill operations, procuring logs and timbers for war-damaged cities. This lasted less than a year. In the same year, the management of logging and sawmill operations was restored to Buencamino, Jr., a concession owner [*ibid.*: 13]. In 1958, the sawmills were accidentally destroyed by fire, but Buencamino could not rebuild them. Instead, in 1960, the rights of the logging concession were sold to a Chinese group (DFPC, Dingalan Forest Products Corp.),³⁰⁾ after which the upland landscapes were drastically transformed. The logging boom which prevailed in the archipelago in order to

27) Commercially valued lumber was classified in three groups by the Philippine Bureau of Forestry. The first group, e.g. Narra and Tindalo, is hardwoods used for furniture and fine lumber; the second group is usually used as construction wood; the third group, e.g. Yakal and White lauan, is chiefly used as rough construction wood [Wernstedt and Spencer 1967: 614–617].

28) Buencamino, Jr. who took an interest in log exports to Japan and its colonized countries established a joint corporation, Nippi Kogyo KK (Japan-Philippine Industrial Company) with Tokuichi Kuribayashi, president of Kuribayashi Trading Company in 1938, which was eventually forced to cease under the U.S. policy [Hagino 1997: 23–26].

29) The forest lands which were refuge areas were different from the area of logging operations in Japanese hands.

30) Under the DFPC, there were several contractors of logging operations working on a royalty basis. The sawmills were newly constructed by the DFPC in Gabaldon and Dingalan.

meet the large demand for logs in Japan also reached Gabaldon.³¹⁾ In Gabaldon, many laborers from Bicol were recruited to engage in logging activities because of their skills with two-man saws.

A 1970 Gabaldon map shows that all riparian forests in the lowlands and the upland forests in the lower parts of the pediments of the Sierra Madre mountains disappeared (Fig. 3-b). Forests in the interior uplands, however, remained (although data for the western side of the Coronel river is not available).

In 1972, the logging concession which covered the northernmost portion of the Coronel watershed in Nueva Ecija and Aurora provinces was granted to a new concession holder, Federated Timber and Development Corp. (FTDC).³²⁾ Chainsaws and large trucks equipped with 100 meter cables, introduced in the logging operations in the early 1970s, accelerated and intensified log exploitation. Modern equipment led to indiscriminate cutting, including pole-sized trees, disregarding the selective logging regulations set for logging concessionaires by the government.³³⁾

In 1978, a devastating typhoon (Typhoon Kading) was the turning point for the declaration of a logging ban in Nueva Ecija by President Marcos, including the entire Nueva Ecija side of the Sierra Madre mountains. Gabaldon valley was submerged and most of the fields were destroyed by floods and landslides [Manila Observatory 1992: 23–24]. The logging equipment and the sawmills were also washed away. The local residents were almost totally dependent on forest resource exploitation for their livelihoods during that period until crop field recovery two years later. Charcoal-making, utilizing washed-away logs and the remaining trees in the uplands, became their major income-source. Extensive landslides drastically altered river courses [*ibid.*: 24] and the total destruction of a large portion of paddy fields prompted people to abandon rice production.

In the early 1980s, after the logging ban, “illegal” logging activities by the local residents cropped up triggered by the establishment of many small-scale sawmills managed by wealthier residents with sufficient capital.³⁴⁾ Logging activities of the local residents were called “*carabao*

31) Japan's rapid economic growth in the early 1960s gave impetus to log imports not only from the Philippines but also from Indonesia and Malaysia. The Philippines became the leading log exporter until 1970 [Tsutsui 1978: 18]. In the Philippines, forest products, mainly logs, had been one of the leading export earnings since the early 1960s until 1970. Even after the peak as a major export in the early 1970s, forestry products were about 10% of the total exports of the country until the early 1980s [Boyce 1993: 167]. New transportation means such as army-surplus trucks and bulldozers, and utilization of chainsaws facilitated large scale log exploitation throughout the country.

32) The exact areas issued to the FTDC could not be determined due to incomplete government records. Nearly all of the Aurora forest lands was newly issued to the Inter-Pacific Forest Resources Corporation in 1985, and this is effective until 2010 [Manila Observatory 1992: 72].

33) Selective logging was supposed to be implemented in the *Dipterocarpus* forests, in which trees of DBH less than 40 cm were preserved. Some operational weakness of the selective logging in logging companies, however, were failure to compute allowable cut, half-hearted implementation of selective logging, failure of tree marking and residual inventory, and poor implementation of forest protection [Tomboc 1987: 85–89].

34) In 1992, clamor for environmental conservation in Gabaldon eventually forced these small-scale saw- ↗

logging” or “water logging” since *carabao* or inner tubes of tires floating in rivers were used to transport logs and timbers.

Meanwhile, in 1955, about 73,000 ha was set aside for a military reservation (Magsaysay Military Reservation) in the southwestern part of the Sierra Madre mountains, behind barangay Bantug. Although it was supposed to be reserved forests, in reality forested areas were reduced to only about one fifth of the entire reservation area and the rest was *kogonan* or brush lands. Logging operations were facilitated by permits from the military [Vitug 1993: 103–104]. Five meter wide roads were constructed on the ridges of the mountains. The local residents recalled that large trucks loaded with logs could be seen frequently running along these roads. A 1987 Gabaldon map shows that forests within the military reservation were more depleted than those in the logging concession sites (Fig. 3–c).

2. From Logged-over Forests to Kogonan

The local residents recalled that *kaingin* or swidden agriculture came to the fore in the uplands in the late 1950s and was frequently practiced until the late 1970s. *Kaingin* included cutting trees and burning them before planting crops.

Kaingin sites were in the logged-over forests, not primary forests in the interiors nor *kogonan*, which were already rampant in the lower portions of the pediments. Hence, it seems that *kaingin* synchronized well with commercial logging activity, i.e., after logging operations shifted to other logging sites, the logged-over forest lands were taken over by *magkakaingin* (those who practice *kaingin*).

Commonly practiced *kaingin* consisted of cutting remaining trees with bolo in a selected *kaingin* site, burning them, planting upland rice with dibbling sticks, and harvesting with ear-breaking cutters. Plowing was not commonly practiced. A single site was usually cultivated with only one cropping of upland rice due to the heavy labour requirement for weeding in the second year. Planting upland rice was intended mainly for home consumption, thus one planted area seemed to be small. Claiming *de facto* land ownership of the cultivated land was not prevalent among *magkakaingin*, since most of them abandoned the sites after harvesting rice and rarely planted with perennial crops. Rotational use of land was not prevalent. Because of ample land, methods of agreement among *magkakaingin* in allocating land were unnecessary except for “first come, first served” agreements. The logged-over forest lands, in spite of being state properties, were open access resources for anybody, without rules or regulations with respect to land utilization.

Magkakaingin, those who engaged in *kaingin* in the logged-over forest lands were either local residents or logging operation laborers who came mainly from the Bicol region to engage in logging operations. It was also revealed that the *magkakaingin* of the local residents included not only the landless but also landed households of owner cultivators and tenants. They resided in the lowland residence and commuted to their *kaingin* site for neces-

↘ mills to cease operations. Although the number of sawmills decreased, several of them continue to operate as furniture makers, to which the local residents still bring down extracted timbers.

sary activities. *Kaingin* in the upland was, thus, a supplemental livelihood. One plausible explanation for why local residents engaged in *kaingin* is the insufficient size of paddy fields and the low absorptive capacity of lowland economic activities. Most of the lowlands suitable for cultivated lands had already been developed, though few lowland income generating activities were available for the local residents. Meanwhile, logging operators and their families also engaged in *kaingin*, which indicates that logging operations became concomitant with *kaingin* when income from logging operations was not sufficient to support their families.

Kaingin became less popular, however, in the early 1980s when logged-over areas moved farther from the lowlands. Logging operations, together with logging operators and their families, moved to the neighboring provinces of Quezon and Aurora. Upland cultivators were aware that *kogonan* were not suitable for upland rice production since kogon competes with upland rice. This was the main reason for the decline of *kaingin*.

Acknowledging the *kaingin* practiced by the local residents and logging operators, the question here is whether such *kaingin* transformed the logged-over forests into *kogonan*. If the *kaingin* sites were as small as residents mentioned, dispersed seeds could grow to young trees because of the proximity to logged-over forests. Other weeds such as *amor-seko* (*Chrysopogon aciculatus*), *bayakibok* (*Echinochloa glabrescens*), *balabalanoyan* (*Cleome rutidosperma*), *kamo-kamotihan* (*Ipomoea triloba*), *talahib* (*Saccharum spontaneum*), not kogon, could reproduce as referred to by the local residents. Since *kogonan* had already spread in the uplands near the lowlands in the 1960s, however, it is presumed that the seeds of kogon were easily carried to *kaingin* sites by the wind. Settling in the ground, kogon seeds started to germinate. If tree seedlings and other weeds including vines also started to germinate, kogon would have been gradually replaced by them [Brown 1941: 159]. In reality, kogon spread farther and became a predominant vegetation. This is attributed to the fact that tree seedlings and other weeds without rhizomes could easily be killed by frequent fires, but not kogon, which has deep-seated rhizomes [*ibid.*].

Another question arises as to who set these frequent fires and for what purpose. During the dry season grass leaves easily catch fire, and even the accidental lighting of a cigarette can be the cause. It was also found that the local residents set fire to the uplands for reasons other than *kaingin*, including deer and wild boar hunting, since they are believed to emerge in burnt areas. The impact of the establishment of pasture lands in the 1960s and 70s in the pediments, however, seems to have been a much greater factor in transforming the upland landscapes into *kogonan*. Fires were often set to encourage the growth of young shoots as forage for cattle. Although this was also a commonly observed practice for the local residents holding cattle, it is obvious that pasture lands holding a large number of cattle enforced the transformation of wider areas of the uplands to *kogonan*. Those who established pasture lands were not only wealthier residents in Gabaldon but also entrepreneurs or political leaders living outside Gabaldon (Table 5). Not all of them acquired legal permits for pasture lease.

The pasture lands did not bring about serious problems to the local residents as long as the number of cattle was small. Since these pasture lands did not have fences, an increasing

Table 5 Pasture Land Holders in the Gabaldon Uplands

No	Occupation	Legal Permit	Place	Period	No. of Cattle (max.)	Reason to Stop Pasturing or the Transfer of Cattle
1	DENR employee	○	Pinamalisan	1970 to now	70	
2	Businessman in San. Leonardo, N.E.	○	Pinamalisan	1970 to 80	24	stopped due to complaints from the local residents
3	Businessman in San. Leonardo, N.E.	○	Pinamalisan	1970 to 80	30	stopped due to complaints from the local residents
4	Businessman in San. Leonardo, N.E.	○	Pinamalisan	1970 to 80	30	stopped due to complaints from the local residents
5	Farmer in Gabaldon, who was a former sawmill worker	○	Sawmill, transferred to Pinamalisan in the early 1980s	late 1960s to now	70	transferred due to complaints from the local residents
6	Resident in Gabaldon	×	Cuyapa, transferred to Pinamalisan in the early 1980s	late 1960s to now	25	transferred due to complaints from the local resident, all cattle was taken over by No.5
7	Farmer in Gabaldon	×	between Bantug and Camachili	early 1970s to early 80s	30	stopped due to owner's sickness
8	Resident in Gabaldon formerly engaged in logging activity	×	Bantug	early 1960s to 1975	20	stopped due to owner's sickness
9	Hacendero in Natividad, N.E.	○	Sawmill	1970 to 80	70	stopped due to complaints from the local resident
10	Former governor	○	Bugnan, transferred to Guimba in the early 1970s	early 1960s to early 70s	45	transferred due to cattle sickness
11	Provincial attorney	×	Dupinga	1960s to early 80s	45	stopped due to complaints from the local residents
12	Former mayor of Bongabon, N.E.	○	Calabasa, transferred to Bongabon in 1980s	1960s to 80s	45	transferred due to complaints from the local residents
13	Judge	○	Bagtin transferred to Laur in 1985	1960s to 85	75	transferred due to complaints from the local residents
14	Agricultural School in Gabaldon	○	Sawmill, transferred to Pantoc in the late 1980s	1960s to now	60	transferred due to complaints from the local residents
15	Former agricultural college professor	×	Malinao and Pantoc	1960s to 70s	20	sold all cattle and migrated to the US
16	Businessman in Gabaldon	×	South Poblacion, transferred to Pinamalisan in the early 1990s	1970s to now	25	transferred due to complaints from the local residents
17	Farmer in Gabaldon who used to own the largest farm in Gabaldon	×	Bantug	1970s to now	20	
18	Son of former mayor of Gabaldon	×	Macasandal, transferred to Pinamalisan in the late 1980s	1970s to now	25	transferred due to complaints from the local residents

Source: Interviews of personnel in the Bureau of Animal Industry in Cabanatuan, Nueva Ecija and the local people in Gabaldon in 1996 and 1997

Notes: (1) Legal pasture lease is issued by the Department of Environment and Natural Resources (DENR).
 (2) Regarding places for pasture lands, Pinamalisan, Sawmill, Cuyapa, Camachili, Bantug, Calabasa, Malinao, South Poblacion and Macasandal are names of barangay in the municipality of Gabaldon. Dupinga is a part of Gabaldon. Guimba, Bongabon and Laur are municipalities in Nueva Ecija.

number of cattle often destroyed lowland paddy fields and dry fields. Angry residents frequently killed cattle during the night. In the early 1980s, the complaints and rage from the local residents eventually forced pasture owners to abandon the pasture or transfer cattle to sparsely populated remote uplands in Gabaldon. Afterwards, *kogonan* in the uplands were left as “unused” or “waste” lands for cultivation for almost a decade.

3. From *Kogonan* to Crop Fields

After the local elite abandoned pasturage in the uplands, the *kogonan* remained uncultivated. In a strict sense, however, *kogonan* were neither “unused” nor “waste” lands for the local residents. Kogon everywhere in the uplands was gathered as fodder for *carabao* or *carabao* were taken to *kogonan* for feeding. Kogon was also gathered and sold as thatching material. Moreover, *kogonan* was often burned by the local residents to hunt wild boars, which, in turn, were sold at the local market. Fires set in *kogonan* spread easily but stopped naturally. Hence, *kogonan* were, likewise, reproduced as fire climax.

Although some local residents cultivated crops in *kogonan* in the 1980s, they were few in number, and they cultivated only on a small scale. Several kinds of crops such as maize, banana, taro and squash were planted mainly for home consumption and local markets. In 1992, the local residents started to engage in the exclusive planting of taro (*Colocasia esculenta*). This change in upland cultivation was induced by middlemen from Cabanatuan who brought in taro planting materials.³⁵⁾ The price of taro at the Cabanatuan market went up and thereafter remained relatively high regardless of seasonal fluctuation. This signaled the turning point for *kogonan* transformation into crop fields for taro production.

Upland fields on a slope are termed *gulod* (“hill”) by the local residents, different from lowland dry fields (*bakod*). When the logged-over forests were cultivated in the 1960s and 70s, those who practiced *kaingin* were called *magkakaingin* because they cut trees, while those who cultivated *kogonan* were termed as *maggugulod*, who cut grasses. *Magkakaingin* planted upland rice for home consumption, while *maggugulod* produced taro exclusively for the Cabanatuan market. Every year, the number of taro producers in the uplands increased. Land scarcity became apparent among those who took an interest in taro production, and conflicts along boundaries became frequent. To solve this problem, *de facto* ownership of the land upland cultivators occupied was settled through mediation of the barangay captain. Boundaries could also be defined through the upland farmers association.³⁶⁾ Among 125 households in barangay Bantug, 118 households planted taro in the uplands in 1997. These

35) The reason for the price hike of taro in 1992 was said to be an increasing demand for an ice-cream ingredient and substitutes for flour and soap ingredients.

36) The uplands with slopes of 18% and above, the state properties, are the jurisdiction of the Department of Environment and Natural Resources (DENR). However, since the Gabaldon uplands were once owned by the NDC, jurisdiction was transferred to the Department of Agrarian Reform (DAR). Each barangay in Gabaldon was requested by the DAR to form an upland farmers' association, applying to upland cultivators to make their upland occupation legal. The title holder is the association itself, not individual cultivators.

118 upland cultivators consisted of 42 landed households and 76 landless households. Seven households who did not have upland fields explained that 5 landed households held lowland dry fields to produce taro there and 2 landless households could not find “unoccupied” lands in the uplands. Since there was no cadastral survey on their *de facto* landholding in the uplands, the landholding size cannot be specified. However, it can be assumed that each household occupied about one hectare.

Taro can be grown in *kogonan*. Kogon leaves were cut with reaping-hooks and burnt. Hoes were used to eradicate kogon roots. They used three sizes of hoe for cultivating, planting and harvesting. Weeding was done with bolo one or two times before harvesting. Fertilizers were not applied. Sites for taro production were selected where kogon leaves were green, tall and wide. Some taro producers mentioned that they selected the upper portion of the uplands directly facing the wind and sunlight to assure them of vigorous taro leaves and leafstalks, believed to produce bigger tuber. Two to three consecutive croppings of taro production were common in the same site, and the field was then transferred to another area within a cultivator’s claimed land. The abandoned fields were fallowed for about three years on the average and planted again with taro.

Taro cultivation created new job opportunities for the barangay members, including grass cutting, hoeing, planting, weeding, harvesting and carrying taro from the uplands to the barangay site (Table 6). Since many of the taro producers were still in the process of reproducing planting materials, taro cultivation areas were small; about 0.2 ha per household.³⁷⁾

Fruit trees such as mango, coconut and jackfruit were also planted. It was observed that those who planted a relatively large number of these fruit trees also constructed residential

Table 6 Wage Rate for Taro Production in the Uplands

Activity	Wage per Day ⁽¹⁾
Cutting grasses ⁽²⁾	70 without meals
Hoeing ⁽²⁾	100 without meals
Planting taro ⁽²⁾	100 without meals
Weeding ⁽²⁾	70 without meals
Harvesting	70 without meals
Selecting taro for sale and planting material	1/kg
Carrying to Barangay site	2/kg from a distant place
	1/kg from a near-by place
(including harvesting and carrying)	3/kg from a distant place
	2/kg from a near-by place

Source: Interviews in August, 1997

Notes: (1) 1US\$ = 29.471 pesos as of 1997

(2) Labor exchange (*suyuan*) was frequently observed in taro production.

37) It was calculated that the monthly net income of taro production in one hectare was about 7,000 pesos provided that the production period is 7 months and the market price does not drop drastically (i.e., 15 pesos/kg).

houses, not huts, in their upland landholdings. They spent most of the time there in spite of already having houses in the lowland barangay site. The majority of upland cultivators who planted only a few fruit trees in the upland fields were those who had residential houses only in the lowlands. For these people who did not have these residential houses in the uplands, planting trees would require them to invest their time in watching over the land. Likewise, constructing another house in the uplands would require trade-offs (i.e., transportation costs, little access to market information, etc.), often impractical in the end.

Although the majority of upland cultivators still engaged in taro production, some of them became concerned about soil erosion and the decline of soil fertility, brought about through their own farming practices. In 1996, the Department of Agrarian Reform arranged a production contract for coffee (*C. robusta*) with a manufacturing company.³⁸⁾ A shift from annual crop production to perennial crop production in the uplands, more specifically, from taro to coffee, is slowly taking place.

4. Forest Resource Exploitation as Economic Activity

Although dependence on the forest lands shifted from natural resource exploitation in the forest to taro cultivation in *kogonan* due to resource depletion and the high market price of taro, many of the residents still engaged in forest resource collection. Forest resources, in particular timber and rattan, have contributed significantly to their household economy. The peak months of *carabao* logging and rattan gathering are from December to June during the dry season, since going into the forests during the rainy season is rather difficult and dangerous.

Carabao logging was practiced mostly by owners of *carabao*. However, all were free to engage in logging by renting *carabao* and sharing the profits equally with the owners. About 25% of the households in barangay Bantug kept *carabao*. Demand for timber came from small scale furniture makers in Gabaldon and from residents in barangay Bantug who wanted to construct new houses.³⁹⁾ Financiers for logging activities, who were also owners of chainsaws, resided in barangay Bantug and barangay South Poblacion. Advance payment (*bali*), which was good for a one or two-day trip into the forests, was given to loggers by financiers. Usually four to six persons with their own *carabao* entered the forests with one chainsaw operator. Logs, mainly Narra and Tindalo, were cut into timbers with the chainsaw in the forests and hauled by *carabao*. Timbers were then brought to financiers and sold at 3 pesos per bdft (as of 1997). An average of 50 bdft of timber per person could be harvested in one trip.

Unlike *carabao* logging, rattan gathering did not require machines or working animals. Anyone could engage in this income generating activity, although it was considered much more

38) Qualification to be a coffee producer, a contractor of Nestle, was that he should be a cooperative member. A loan of 30,000 pesos/ha could be availed from the Land Bank to the members, but the membership fee for the cooperative was 1,000 pesos, a substantial amount for most people. As of August, 1997, only 28 persons in barangay Bantug could afford to be coffee producers.

39) The "taro production boom" led to a "housing construction boom" in the barangay. People preferred houses made of concrete blocks as protection from typhoons. Construction of new houses required timber for pillars and beams, which led to a demand for *carabao* logging among the local residents.

laborious and risky than *carabao* logging (the majority were, thus, young men). Wholesale rattan buyers or middlemen (*ahente*) residing in barangay Bantug also financed rattan gatherers in the form of advance payment. Three to five rattan gatherers entered the forest together. Harvested rattan was then split in the forests to make bundles consisting of 50 split skins. As of 1997, one bundle could be sold to a middleman for 10 pesos and rattan gatherers were paid by the number of bundles they harvested, less the advanced payment. On the average, one person gathered about 50 bundles in five days. A small harvest of rattan, however, rendered them indebted to the middleman. The middlemen brought gathered rattan to other middlemen in Gabaldon where each bundle sold at 12 pesos. Rattan gathering was found to be an immediate and direct income generating activity for the local residents. When they were in need of money, they could easily engage in rattan gathering without asking for advance payments. Just by spending several days in the forests, they brought rattan to a middleman who would buy the rattan without hesitation.

When rattan was still ample, until the late 1970s, rattan exploitation was the main income source of the landless households in barangay Bantug. That tendency was also found in the other barangay in Gabaldon [Seki 1997: 90]. Dwindling rattan resources became apparent with the fact that, in the 1970s, they could harvest rattan in the nearby forests, whereas recently they travel to more distant forests and spend about five to seven days searching for it. The interviews revealed that the number of rattan gatherers has decreased since the early 1980s. The number of rattan middleman in barangay Bantug has also decreased from six in the 1980s to two in 1997.⁴⁰⁾

III Transforming Interaction of the Local People with the Forest Lands

This chapter attempts to elucidate the four points raised in the early part of this paper.

1. *How the landless households have depended on the forest lands and how their activities in the forest lands have transformed the upland landscapes*

It was found that forest land utilization in the forms of forest resource exploitation and forest land cultivation has contributed to the household economy of the local residents, the landless households in particular. The majority of landless males described their main occupation as rattan gathering until the late 1970s. From the early 1980s, when many small-scale sawmills were constructed in Gabaldon, until the early 1990s when most of these sawmills ceased operation, exploitation of timber with a high commercial value contributed considerably to their household economy. Although the scarcity of these forest resources has become apparent recently, exploitation of rattan and timber still contributes to their income.

The concern here is whether their forest resource exploitation has led to a transformation

40) The way the lowlanders extracted rattan precipitated rattan exhaustion. Unlike the Dumagats, who usually cut rattan poles one meter above the ground to preserve resources for reproduction, the lowlanders cut all of it at ground level [Manila Observatory 1993b: 32].

of the upland landscapes. It is obvious that exploitation of rattan did not have an impact in this transformation. Exploitation of timber, on the other hand, may be one culprit in transforming the upland landscapes by reducing trees. Exploitation of timber by the local residents, described as *carabao* logging or water logging, however, did not lead to a transformation of the forests to *kogonan* or crop fields. This is due to the facts that loggers entered the inner forests which were too far from the lowland barangay site and the local residents did not bother to enter and utilize the logged-over forest lands for agricultural or pastoral purposes. The *carabao* and water loggings had transportation limits in terms of capacity so that large volumes of timber could not be extracted. Unlike the logging activities of the enterprises utilizing bulldozers and large trucks, this, consequently, did not result in large tracts of landscape transformation. It seems reasonable to conclude, therefore, that forest resources exploitation by the local residents did not bring about the drastic transformation of upland landscapes.

In considering forest land cultivation by the local residents, two forms of cultivation were observed, i.e., cultivation in the logged-over forests and that in *kogonan*. The former is *kaingin* to produce upland rice for home consumption. It is likely that *kaingin* in logged-over forests had an impact in transforming the upland landscapes to some extent. It is clear, however, that the impact of *kaingin* in creating *kogonan* was small compared to frequent burning by the local elite, who hold large numbers of cattle in the pasture lands. Meanwhile, cultivation in *kogonan* is related to cash crop production, attributed to the fact that removing kogon requires so much labor that only cash crop production is worth the cost of their labor. Cash crop production is based on the establishment of markets, which influence large numbers of local residents, especially the landless households. Their response to the market transformed the upland landscapes from *kogonan* to crop fields. Recently, many of the landless householders who planted taro in *kogonan* describe their main occupation as upland cultivator. "The landless" here refers to those who do not have any land to cultivate in the lowlands, as explained in the Introduction. "Upland cultivator" refers to those who cultivate *kogonan*.

2. *How the landless households have changed in distributing their labor in response to the forest resources scarcity and, consequently, how their standard of living is affected by such environmental changes*

It was hypothesized that the landless households faced a lower standard of living in response to the scarcity of forest resources, due to a previous high dependence on forest resources exploitation. Contrary to this hypothesis, the majority of the landless householders responded that their standard of living remained the same or even improved compared to the time when forest resources were still ample. It is true that taro production in the uplands, which was started in the early 1990s, contributed to the household economy to some extent. This was proved by the fact that many taro producers constructed new houses made of concrete blocks due to profits from taro sale. The introduction of taro production, however, was not the consequence of forest resource decline but an unexpected fortune. Even before taro production started, it is said that the standard of living of the landless households was not affected by the

Table 7 Income Generating Activities Found in the Barangay

(peso)

A Urban-type Employment	Wage per Day
Jeep driver (2 persons)	
Jeep conductor (1 person)	
Tricycle driver (1 person)	100/day
Government employee (1 person)	
Elementary school teacher (1 person)	
Day care teacher (1 person)	
Barangay hall construction worker	130/day
B Rural-type Employment	Wage per Day, <i>Cavan</i> ¹⁾ or Piece
(a) Agricultural Labor	
Plowing paddy field with <i>carabao</i>	200 without meals
Harrowing with <i>carabao</i>	200 without meals
Making seedling bundles	0.20–0.25/bundle
Transplanting	60 without meals
Weeding	60 without meals
Harvesting (including threshing)	<i>Hunusan</i> , 1:12 (harvester to owner)
Drying <i>palay</i> (unhusked rice grain)	5/ <i>cavan</i>
Hand tractor operator	75/day
Thresher operator	0.5 <i>cavan</i> /100 <i>cavans</i>
(b) Forestry-related Labor	
<i>Carabao</i> logger	3–4/bdft
Chainsaw operator	5–6/bdft
Rattan gatherer, <i>magyayantok</i>	10/ <i>sukong</i> ²⁾
Rattan middleman, <i>ahente</i> (2 persons)	
Wild boar hunting, <i>nagsisilo</i>	80/kg
Orchid flower (<i>halaman</i>) gathering	10–150/piece
Catching small fish (<i>biya</i>), <i>nangunguryente</i>	50/kg
Kogon gathering, <i>nagkokogon</i>	5–8/bundle
Charcoal making	40/ <i>cavan</i>
Vine gathering (for handicraft)	2/kg
Vine middleman (1 person)	0.25/kg
Bamboo (<i>bukawe</i>) gathering (for broomstick)	0.20–0.50/piece
Rattan shoot, bamboo shoot selling	
Winnow (<i>bilao</i>) making	60/piece
(c) Other	
<i>Sari-sari</i> store owner (7 persons)	
Carpenter (3 persons)	100–150/day
Mechanics (2 persons)	500/motor
Umbrella repair (1 person)	5–25/piece
Bulb changing (1 person)	35/bulb
Battery charging	7/battery
Washing clothes, <i>naglalaba</i>	50/day
Jeepney owner (1 person)	
Threshing machine owner (1 person)	6.5 <i>cavans</i> /100 <i>cavans</i>
Hand tractor owner (2 persons)	200/day
Chainsaw owner	5–6/bdft
Buy-and-sell, <i>biyahero</i>	
Food vendor	
Vegetable vendor	
Livestock raising	

Source: Interviews in August, 1997

Notes: One person had several income generating activities.

1US\$ = 29.471 pesos as of 1997

1) *Cavan* is Philippine measurement of 50 kg.2) *Sukong* is a bundle of rattan strips.

scarcity of forest resources.

It is assumed that those who were engaged in forest resource exploitation were aware of the dwindling resources, and they anticipated and prepared for the prospective dwindling of forest resources. These people used the capital accumulated through forest resource exploitation to build up assets. Commonly observed assets among the landless households were purchasing livestock and sending children to high school. Livestock assets included *carabao*, goats and pigs, which are regarded to secure household incomes of the landless households. *Carabao* is still widely used as a working animal in the Gabaldon paddy fields, since a parcel of paddy field is relatively small and tractors cannot be used effectively. *Carabao* owners have a better chance to engage in land preparation activities in paddy fields and lowland dry fields. They may also be hired to haul crops and timbers.

Forest resource exploitation is, therefore, the first step in improving the standard of living. One peculiar example is one householder who runs the biggest *sari-sari* store and is the only owner of a threshing machine in the barangay. While still landless, he first engaged in the exploitation of forest resources of timber and made a small-scale sawmill in the backyard of his house. Later, he purchased tenancy rights for a total of eight hectares of paddy fields and lowland dry fields.

The landless households' strategy in maintaining a stable standard of living is to possess tangible and/or intangible assets such as livestock, rented lands and higher education for children. In order to obtain these assets, they tried to secure income sources through diversifying income generating activities by household members. Many kinds of rural-type employment were observed (Table 7).

Their survival strategies are dependent on available markets and information, and they attune themselves to whatever forest and agricultural products and labor are marketable at any particular time. In this regard, they see the forest lands and upland cultivation as less for subsistence than for supplemental economic activities to obtain more stable assets.

3. *How the farming practice in the uplands has changed in response to vegetative change, including whether agricultural intensification has taken place or whether the farming practice is sustainably managed in the uplands*

As already discussed, cultivation in *kogonan* required much more labor than *kaingin* in the logged-over forests. Agricultural intensification was, thus, inevitable in *kogonan* crop production in terms of labor and cash inputs (mainly for hired laborers). Most of the local residents embarked on taro production in the uplands, and this consequently led to the establishment of *de facto* ownership of their lands in the uplands. Land use intensification also took place in crop production in *kogonan*. These kinds of intensification are all related to the establishment of the taro market.

The concern here is whether taro production in the uplands will be sustained. Sustainability of upland cultivation is first discussed in a narrow sense, i.e., soil fertility and crop production. It is recorded that *kogonan* are marginal lands in terms of soil fertility and they

are susceptible to soil erosion [UP Science Education Center 1971: 36]. Taro producers judged the soil fertility from the color and height of kogon leaves grown in the site for selection. They believed that land covered with kogon are not always infertile, shown by the fact that fertilizer have not been applied to taro production. Rotational land use was exercised to restore the soil fertility within the upland cultivator's claimed land. Recently, however, as already mentioned it became apparent among taro producers that only cultivating taro on sloping lands leads to soil erosion during the rainy season, consequently bringing about a production decline. Application of commercial fertilizer for taro production in response to soil fertility decline is highly dependent on the market price of taro.

The other aspect for sustainability of upland cultivation is a continuation of the landscape for crop fields, namely whether upland cultivators have the intention to continue to cultivate the upland even though soil fertility is not a problem. If the price of taro drops and continues to be low or if there are no other cash crops with a high market value, they are likely to abandon cultivation. This is because they are not seeking cultivation land per se, but rather securing opportunities for survival. Capricious markets encourage local people even to move to other places seeking better opportunities. Establishment of *de facto* ownership, and even *de jure* ownership, does not mean sustainability of land use in the uplands.

Some have started to shift from taro to coffee production in anticipation of the production decline of taro, but the shift will not be extensive unless they are aware of the profitability of coffee production compared with taro in a short term period, since coffee production requires a bigger investment.

It is obvious that forest resources decline does not prompt the local residents to plant trees. Residents in barangay Bantug are still predominantly dependent on firewood for every day cooking. Declining forest resources, nevertheless, have not affected their firewood procurement. They can secure firewood from bush in the uplands, the river banks, and from their own gardens. When men enter the forest lands to gather timber and rattan, they often gather firewood as well. Being aware of firewood availability, it is not likely that they will plant trees in the uplands for the purpose of securing firewood.

There was a fear of landslides in *kogonan* among the local residents during the typhoon season. For landslide prevention, Ipil-ipil (*Leucaena leucocephala*) and Madre-de-cacao (*Gliricidia sepium*) were planted thickly at the very foot of the uplands by some land owners of the lowland fields.

Planting trees in remote places requires the investment to maintain them. This is a matter of labour distribution and cost. Since uplands predominantly covered with kogon are susceptible to fire, maintaining trees in such uplands requires the substantial cost of watching over them. It is, therefore, considered unlikely that they will plant more trees in the uplands, unless they also have residential houses there. The relation between lowlanders, who reside in the lowlands, and the uplands in their surroundings is different from that between migrant lowlanders, who moved to reside in the uplands, and their surroundings. In the latter case, many of them eventually developed mixed garden and/or orchard in the uplands, as shown by

some case studies.⁴¹⁾

4. *Whether resource scarcity in the uplands created any type of ownership of resources among the local people, i.e., whether open access resource use still prevails or communal or private ownership of the resources has been developed*

The biggest factor regarding forest resource exploitation contributing substantially to the local residents' household economy is that these resources are, in reality, open access ones. The concern here is whether resource scarcity in the uplands led to the formation of any types of ownership among the local residents for previously open access resources. As already observed, *de facto* private ownership of lands was established in the uplands covered with *kogonan*, prompted by the advent of a cash crop. The important point to note here is that *kogonan* had not been utilized for cultivation for a long time before taro became a cash crop with a high market value. No matter how accessible *kogonan* was for cultivation, most of the local residents opted to go into the forests to exploit available forest resources. Cash crops with a high market value changed the meaning of *kogonan* for the local residents and land scarcity became apparent among them. Once *de facto* ownership of the lands they claim was finalized, it was their tacit understanding that no one could cultivate without the land owners' permission, regardless of whether he was a barangay member or an outsider.

Resource scarcity, however, does not always bring about the formation of ownership. In spite of the fact that gatherers were aware of forest resource decline, neither formal nor informal regulations on forest resource exploitation has been developed. This case study makes it clear that forest resources scarcity did not result in any type of ownership nor any regulation of resource use among forest resources gatherers, no matter how much they depended on these resources for their household economy. Land for cultivation is, thus, different from forest resources in terms of ownership. Efforts toward land development, such as removing *kogon* and cultivating the land, are respected and recognized as the basis for claiming *de facto* private ownership. On the contrary, it has not been observed that private ownership is claimed for naturally grown forest resources. No formation of even communal ownership of forest resources among the gatherers seems attributed to the following facts, with the exception that they were able to cope economically with the forest resources decline as previously discussed: (a) Forest resources such as timber and rattan do not directly relate to their every day lives, aside from being income sources, so that, even if these resources become scarce, they do not feel that their lives are immediately jeopardized, (b) Anybody, even those outside of Gabaldon, can engage in forest resource exploitation and, thus, there is no exclusive group restricting participation of resource exploitation, and (c) Conceptions of territory and boundary, which tell barangay members that such lands belong to the barangay, have not customarily developed in the uplands. This is because the local residents have long observed the forest lands being

41) Among other places, this took place in the uplands in Laguna province, Luzon [Fujisaka and Wollenberg 1991: 123–126] and in the uplands in Misamis Oriental province, Mindanao [Garrity and Agustin 1995: 85].

exploited by different resources users such as logging concessionaires, military, cattle owners and others. Local residents had never conceived that the uplands, both lands and forest resources, belonged to them or a barangay.

It is only when the uplands were changed to *kogonan*, which did not attract most of other resources users, and taro became a cash crop, that the local residents developed the conception of ownership in the uplands. Nevertheless, it is obvious that establishment of private ownership of lands does not mean that ownership claimants continue to cultivate in perpetuity.

Concluding Remarks

Through this case study in a barangay situated in the vicinity of the forest lands, it was revealed that the livelihoods of local people, the landless households in particular, have been closely related to the forest lands in the form of forest resource extraction and upland cultivation. Forest resource exploitation of timber and rattan with a high market value has been a significant contributor to their household economy. They did not, however, have overly serious economic predicaments in the face of dwindling forest resource, as they coped with the environmental changes through investment of capital accumulated in forest resources exploitation, possessing tangible and/or intangible assets and diversifying the income generating activities of household members. Such economic responses, in turn, did not lead to the establishment of regulations on forest resource exploitation among the resource users. Forest resources, therefore, remain open and accessible to anybody.

It was also found that drastic upland landscape transformation was brought about primarily by logging activities operated by enterprises and grazing activities run by the local elite, in which the formation and spread of *kogonan* was greatly facilitated by the latter. It should be noted that, although *kogonan* had long been openly accessible to the local residents, it has not lured them to cultivate. It was only at the time when the price of taro commanded a high market value that their attention was focused on *kogonan* as land for cultivation. Not only the landless households, but also the landed ones, took advantage of this opportunity. *Kogonan*, from that time, changed from “open access resources” to “privately occupied productive resources” when the local residents felt the land scarcity.

These facts proved quite contrary to the prevailing view that the landless in the lowlands played a substantial role in destroying the upland environments, i.e., transforming forests to *kogonan* through forest resources extraction and upland cultivation. It is also important to note here that, without the incentives driven by high market demands, *kogonan*, requiring much labor input for cultivation, will not encourage local resident to utilize it. It is evident, through the case study, that the landless seeks for opportunities for survival, not land for cultivation per se.

At present, the government is trying to rehabilitate *kogonan* to convert it back to forests through reforestation projects or to transform it to mixed gardens or orchards through securing the legal land use rights of upland cultivators under the name of social forestry projects. It is found that many projects sites have not turned out to be as successful as the government

expected. Two convincing causes can be drawn from the case study. One is that *kogonan* is not necessarily unused or waste land but does, in fact, contribute to the household economy of the local residents. The importance of *kogonan* for the local residents needs to be examined before the introduction of reforestation projects. Also, in spite of government expectations for upland cultivators developing the uplands through planting perennial crops by securing their legal status, labor distribution for upland development is highly dependent on the market. Without a visibly high market value, they will hardly be prompted to commit their labor for planting perennial crops.

Acknowledgement

This study was supported by a Grant-in-Aid for International Scientific Research (Monbusho), that Dr. Hiromitsu Umehara, Rikkyo University, organized with a research group for "Labor Migration and Sustainable Resource Management: A Case of the Philippines." During the Cebu seminar in September, 1997, members of Dr. Umehara's group gave me much thought-provoking advice. I am indebted to Mr. Gary Tengco and Ms. Trina Galido of the Environmental Research Division, Manila Observatory for materials and data collection. I am also grateful to Mr. Adel Manabat, councilor of Municipality of Gabaldon and the people in barangay Bantug for their enduring support for this research.

References

- Aguilar, Filomeno, Jr. 1981. *Landlessness and Hired Labour in Philippine Rice Farmers*. Monograph No. 14. Centre for Development Studies, University of Wales.
- Alvaran, Pedro B., Sr. 1988. Chronological History of Gabaldon. Municipality of Gabaldon, Nueva Ecija. 20p.
- Balisacan, Arsenio, M. 1991. *Agricultural Growth, Landlessness, Off-farm Employment, and Rural Poverty in the Philippines*. Discussion Paper No. 91-01. School of Economics, University of the Philippines. 42p.
- Barker, Randolph. 1973. Labour Absorption in Philippine Agriculture. *The Philippine Economic Journal* 12: 24-48.
- Boado, Eufresina, L. 1988. Incentive Policies and Forest Use in the Philippines. In *Public Policies and the Misuse of Forest Resources*, edited by R. Repetto and M. Gillis, pp. 165-203. Cambridge University Press.
- Boyce, James. K. 1993. *The Political Economy of Growth and Impoverishment in the Marcos Era*. Ateneo de Manila University Press.
- Brown, William, H. 1941. *Useful Plants of the Philippines*. Volume 1. Department of Agriculture and Commerce, Bureau of Printing, Philippines.
- Buenaventura, P. San. 1958. Reforestation of *Imperata* Waste Lands in the Philippines. *Proceedings of the Ninth Pacific Science Congress* 11: 54-66.
- Conklin, Harold, C. 1957. *Hanunoo Agriculture: A Report on an Integral System of Shifting Cultivation in the Philippines*. Rome: FAO.
- Fujisaka, Sam; and Wollenberg, E. 1991. From Forest to Agroforest and Logger to Agroforester: A Case Study. *Agroforestry Systems* 14: 113-129.
- Garrity, Dennis P.; and Agustin, Patricio, C. 1995. Historical Land Use Evolution in a Tropical Acid Upland Agroecosystem. *Agriculture, Ecosystems and Environment* 53: 83-95.
- Garrity, Dennis. P.; Kummer, David. M.; and Guiang, Ernesto, S. 1987. The Philippines. In *Sustainable Agriculture and the Environment in the Humid Tropics*, edited by Committee on Sustainable Agriculture and the Environment in the Humid Tropics. National Academy Press.

- Gleeck, Lewis, E. Jr. 1981. *Nueva Ecija in American Times (Homesteaders, Hacenderos and Politicos)*. Historical Conservation Society, Casalinda.
- Grainger, Alan. 1993. *Controlling Tropical Deforestation*. Earthscan Publications Ltd.
- Hagino, Toshio. 1997. *Nihon Gunsei to Nanposenryochi Rinsei* [Japanese Military Administration and Forest Policy in the Southern Occupation Area]. Tokyo: Nihon Ringyo Chosakai.
- Hayami, Yujiro; and Kikuchi, Masao. 1981. *Asian Village Economy at the Crossroads: An Economic Approach to Institutional Change*. University of Tokyo Press.
- Hayami, Y.; Kikuchi, M.; Bambo, L. M.; and Marciano, E. B. 1990. *Transformation of a Laguna Village in the Two Decades of Green Revolution*. IRRI Research Paper Series No. 142.
- Kikuchi, Masao; and Hayami, Yujiro. 1983. New Rice Technology, Intrarural Migration, and Institutional Innovation in the Philippines. *Population and Development Review* 9 (2): 247-257.
- Kummer, David M. 1992. *Deforestation in the Postwar Philippines*. Ateneo de Manila University Press.
- Manila Observatory, Environmental Research Division. 1992. Analysis of Community Forest Land Management: A Mid-Year Report submitted to International and Area Studies Center for Southeast Asian Studies, University of California at Berkeley. 93p.
- . 1993a. Flooding in the Gabaldon Valley: Gabaldon, Nueva Ecija. 35p.
- . 1993b. An Integrated Report: Community and Environment Issues, Gabaldon, Nueva Ecija. 50p.
- McLennan, Marshall, S. 1973. Peasant and Hacendero in Nueva Ecija: The Socio-Economic Origins of a Philippine Commercial Rice-growing Region. Doctoral Dissertation, University of California, Berkeley.
- . 1982. Changing Human Ecology on the Central Luzon Plain: Nueva Ecija, 1705-1939. In *Philippine Social History: Global Trade and Local Transformations*, edited by Alfred W. McCoy and Ed. C. de Jesus, pp. 55-90. Ateneo de Manila University Press.
- Morooka, Yoshinori. 1983. Technology Transfer and Social Transformation: Case Study in Northern Luzon, Philippines (in Japanese). *Nogyokeiei Kenkyuseika Shuho* 4: 100-108.
- Nagano, Yoshiko. 1986. *Firipin Keizaishi Kenkyu* [Study on Philippine Economical History]. Tokyo: Keiso Shobo.
- Nagata, Shin; Inoue, Makoto; and Oka, Hiroyasu. 1994. *Forest Utilization Patterns in the Course of Economic Development: In an Inquiry of the U-shape Hypothesis of Forest Resources* (in Japanese). Tokyo: Nosongyoson Bunka Kyokai.
- Ozbilen, E. 1971. *Demonstration and Training in Forest, Forest Range and Watershed Management: The Philippines: Shifting Cultivation*. UNDP, FAO.
- Philippines, Department of Environment and Natural Resources. 1990. *Master Plan for Forestry Development*. Quezon City. 482p.
- Rogers, Mark. 1996. Poverty and Degradation. In *The Economics of Environmental Degradation: Tragedy for the Commons?*, edited by Timothy M. Swanson. UNEP.
- Seki, Yoshiki. 1997. Transformation of Post-logging Community in the Philippines: A Case Study in Gabaldon, Nueva Ecija (in Japanese). *Journal of Forest Economics* 43 (1): 87-92.
- Takigawa, Tsutomu. 1989. Development of Cash Economy and Transition of Land Ownership in the Philippine Rural Areas in 1980s. In *Agricultural Commercialization in Southeast Asia* (in Japanese), edited by Hiromitsu Umehara, pp. 5-33. Tokyo: Institute of Developing Economies.
- Tamaki, Yasuaki. 1992. Dumagat. In *Encyclopedia of the Philippines* (in Japanese), edited by Shizuo Suzuki and Shinzo Hayase, p. 237. Dohosha.
- Tomboc, Carlos C. 1987. An Evaluation of Selective Logging as a Sustained Yield Timber Management System. Doctoral Dissertation, University of the Philippines at Los Baños.
- Tsutsui, Michio. 1978. *Tenkanki no Nanyozai Mondai* [Tropical Timers Problems at Turnabout]. Tokyo: Nihonringyo Chosakai.
- Umehara, Hiromitsu. 1993. A Short Note on Agrarian Differentiation in the Philippines. In *Agrarian Differentiation in Southeast Asia* (in Japanese), edited by H. Umehara and K. Mizuno, pp. 43-87. Tokyo: Institute of Developing Economies.
- . 1995. Occupation Structure in the Rural Philippines. In *Rural Employment in Southeast Asia* (in Japanese), edited by Kosuke Mizuno, pp. 79-110. Tokyo: Institute of Developing Economies.

A. HAYAMA: Transforming Interaction of the Local People with the Uplands

- UP Science Education Center. 1971. *Plants of the Philippines*. University of Philippine Press.
- Vitug, Marites, D. 1993. *The Politics of Logging: Power from the Forest*. Philippine Center for Investigative Journalism.
- Walpole, Peter, S. J.; Braganza, Gilbert; Ong, John Burtkenley; Tengco, Gary, James; and Wijance, Ernesto. 1993. *Upland Philippine Communities: Guardians of the Final Forest Frontiers*. Research Network Report No. 4. Center for Southeast Asia Studies International and Area Studies, University of California, Berkeley.
- Wernstedt, Frederick, L.; and Spencer, J. E. 1967. *The Philippine Island World: A Physical, Cultural, and Regional Geography*. University of California Press.
- Whitmore, T. C. 1975. *Tropical Rain Forests of the Far East*. Clarendon Press.
- Wolters, Willem. 1984. *Politics, Patronage and Class Conflict in Central Luzon*. New Day Publishers.