Case studies on the occupation and cultivation of the forest lands of Leyte, Philippines

Buenaventura B. Dargantes[1] and Werner Koch[2]
[1]Center for Social Research, VISCA, Baybay, Leyte 6521, Philippines
[2]University of Hohenheim, Germany

ABSTRACT

The loss of the forests of Leyte is mainly attributed to the conversion of timberlands into *kaingin*, commercial agricultural use and non-timber plantations. Poverty and marginalization have led small-scale farmers and other rural residents into the cultivation of forest lands. Increasing participation in a market-oriented economy has spurred the encroachment of commercial agriculture into the forest zone. Available data also show that policy factors such as settlement projects, agricultural and forestry development projects and road construction have facilitated these conversions. This report attempts to portray through illustrative case studies conducted within Leyte the interplay of these factors as they contribute to forest loss.

Keywords: *Forest, forest loss, shifting cultivation, forest farming, social forestry*

INTRODUCTION

Status of the Forests of Leyte

The island group of Leyte, composed of the Biliran islands, the Leyte mainland and the Panaon islands, covers a total area of 799,500 ha. It is mountainous and roughly broken by steep slopes. Of the central mountain range, Mt. Janagdan, Alto Peak, Mt. Tinag-an, Mt. Lunas and Mt. Sacripante attain peaks of more than 1,000 meters (Barrera et al., 1954). As described by the Philippine Almanac and Handbook of Facts (Yambot, 1975).

> ...A high rugged backbone of mountain traverse the center axis of Leyte... The average elevation of the peaks is 700 to 1,100 meters. Southern Leyte is hilly and mountainous except for the tip facing Leyte Gulf.

Of the islands' total land mass, 38.60 percent has a slope of more than 18 percent, the area which legally should remain in the public domain (PD 705). As of 1990, however, only 259,700 ha. or 32.48 percent of the island's total area remained as the legally designated Forest Lands or Unclassified Public Lands (Acosta, 1991; please see Table 1).

The data presented by Acosta (1991) would further depict a grim scenario: only 12.51 percent of the islands' area actually had forest cover with 11.63 percent still under the public domain and 0.88 percent already subject to private own-

Table 1. Basic information on the forests of Leyte as of 1990.

Variable	Area (ha.)	Percent (%)
Total land area	799,500	100.00
Area of legally designated public forests & unclassified public lands	259,700	32.48
Area with more than 18% slope	309,000	38.60
Actual area of forest cover	93,000	11.63
a. Mossy forest	15,700	1.96
b. Old-growth forest	18,400	2.30
c. Second-growth forest	58,900	7.37
Area under forest cover classified as alienable & disposable lands	7,000	0.88
Area of legal forest lands under cultivation or non-forest cover	170,000	21.26

Source: Acosta, 1991

ership. Reportedly, 170,000 ha. of legally designated forest lands had already been cultivated or under other forms of land use.

These data would show a stark contrast to the situation prevailing in 1938 during which Leyte and its adjoining islands were reported by Barrera et al. to have 278,270 ha. of commercial forest and 56,660 ha. of non-commercial forests, representing 34.80 percent and 7.30 percent respectively of the 789,690 ha. covered by the survey. Even the situation of about 20 years ago-before the entry of large-scale logging operations- did not portend the environmental crisis which Leyte would face in the 1990s. As described in the Philippine Almanac and Handbook of Facts (1975):

> "...The forest lands are concentrated in the interior of the island... The main species of timber are the lawaans, apitongs, guijos and other dipterocarps. This type of forest represents the heaviest stand of any class of natural vegetation. As of June 1972 the inventoried area of 104,187 hectares contain 67,369 hectares of productive old growth forests, 21,102 hectares young growth productive forests and 1,845 hectares of reproductive brush. 7,491 hectares are open land and 6,380 hectares cultivated.

Acosta (1991) attributed the loss of the island's forests to the conversion of timberlands into *kaingin* or marginal upland agriculture, into commercial agricultural use (e.g. grazing) and into non-forest plantations (e.g. coconut, abaca), and to the destructive timber harvesting practices of both legal and illegal operators. Past studies and available data further show that policy factors such as the establishment of settlement areas, the implementation of agricultural and forestry development projects, and the construction of roads (Sommer et al., 1990) have also contributed to forest conversion. For purposes of this report, however, only the conversion of forest lands into agricultural uses will be discussed. The interrelations of the above-mentioned factors to forest conversion will be illustrated by case studies conducted within Leyte and by data obtained in the course of an 18-month field work.

FACTORS CONTRIBUTING TO THE OCCUPATION AND CULTIVATION OF FOREST LANDS

Occupation of Forest Lands and Conversion into *Kaingin*

The occupation of forest lands serves as the first step in their eventual cultivation. The whole process could take a varied sequence of events. In Leyte, the household's decision to migrate, settle in and cultivate portions of the forest has been reported to result from the interplay of the factors prevailing at the place of origin, and the conditions prevailing at the destination (Dagoy and Abenoja, 1985; Ponce et al., 1990; Dagoy et al., 1994). Pressures at the place of origin would include: i) population growth leading to an increased man-to-land ratio, ii) assimilation into a market-oriented economy, iii) inequitable distribution of land, iv) farmers' lack of skills coupled

with the absence of livelihood opportunities, v) insurgency conflict, and vi) interpersonal problems with other members of the community. At the destination, such factors as i) strong family ties and social acceptance and belongingness, ii) acquisition of usufructuary rights, and iii) the perception of a land's favorable bio-physical features could serve as inducements.

Increase in the Man-to-Land Ratio

Acosta (1991) regarded this offshoot of population growth as a major factor in the loss of forest cover. This situation was graphically reported by Dagoy and Abenoja (1985) in their case study of an upland farm household in Kansungka, Baybay, Leyte. They wrote:

> "Jimmy [not his real name] started farm work on a 0.15 hectare hillside area owned by his parents. This area was mainly planted to root crops... [H]is harvest was minimal and not sufficient for their consumption."
>
> "In August 1983, he applied for a stewardship contract [with]... the Bureau of Forest Development ... If ... granted, he may have the right to cultivate the 2.0 hectare upland area (part of the forest reserve which was about 5 kms. away from his home) for 25 years. While waiting for the approval, Jimmy already had started clearing the upland area and planted it to rootcrops, bananas, vegetables, coffee and abaca."

In here, the inadequacy of his farm area motivated him to seek other lands which the Integrated Social Forestry Program (ISFP) happened to provide.

Apparently, adversity could not even deter people from encroaching into the forest. In their case study of farmers cultivating portions of the forest reserve held by the Philippine National Oil Corporation (PNOC), Ponce et al., (1990) revealed that:

> "...Some of these parcels are claimed to have been owned while others are tenants and still others are self-acknowledged public land 'squatters' ... Land clearing is back-breaking work, support services are absent, markets are far; lastly, they could not concentrate on their work because they are always on the look out for forest guards and other government authorities. Despite their fear of authorities, ... people could not be restrained. What they do is open in areas not easily visible from vantage points such as roads, village centers, etc. in this way, they are not detected immediately and by the time they are detected, they are already established in the area and it would be a little more difficult if not impossible to eject them. Actually, they would not have been dogged by this constant fear if PNOC accedes to their demand for an increase in the area of allotment for cultivation. The residents of Danao [a village of Ormoc], for example, would like that their area allotment be increased from 100 hectares to 400 hectares. This demand becomes more acute because the number of families living in the villages has dramatically increased."

Assimilation into a Market Economy

In an increasingly market-oriented mode of agricultural production, distribution and trade; farmers need to earn income either by selling some of their subsistence crops, raising cash crops or getting employed. But when their incomes remain inadequate, other sources would usually be soughted. In rural areas, the forest is usually seen as an open resource which could give additional income.

In a survey of 216 farmers living in the villages around ViSCA, Dagoy et al. (1994) identified 69 to be migrants of whom 20.29 percent moved to the study areas because of employment opportunities there. But with the intermittent availability of jobs and the consequent inadequacy of incomes, these people turned to an alternative source of livelihood--the cultivation of portions of the ViSCA Forest Reserve.

In another case, Ponce et al. (1990) reported:

> "The pressure to encroach on the forest is brought upon these settlers by the sheer necessity to survive. While they feel that it is very hard work, they also insist that there is no alternative

for them. The several square meters of forest clearing is not even enough to provide them their basic needs. Others cultivate patches of the forest to supplement their incomes from other sources which are very inadequate for their needs. For example, residents of Nueva Vista [a village of Ormoc], whose major livelihood is labor in the sugarcane fields, would go up to the forested areas of Tongonan [another village of Ormoc] to open up a kaingin to plant food crops because their wages as laborers cannot sustain them. Others also need to expand their present clearings because they want to plant permanent crop that they can look forward to as future sources of income and as inheritance for their children."

Inequitable Distribution of Land

This factor together with those mentioned above could exclude small farmers from engaging even in subsistence farm production. This could be discerned in the case presented by Ponce et al. (1990) wherein owners of large tracts of sugarlands could not devote portions thereof for the production of food for the workers while the industry could not also give wages equivalent to the poverty threshold. The lack of control over the land could even be traumatic to some farmers who were forced to migrate after the "land they were farming was sold by the owner" (Dagoy et al., 1994). It could further serve as impetus for the occupation and cultivation of forests lands because, [to paraphrase some forest farmers interviewed by Dargantes (forthcoming)], such lands offer a means of livelihood which eliminates sharing of the produce with or the payment of rent to a "landowner" or claimant.

In their survey of 50 cooperators of the Comprehensive Agrarian Reform Program-Integrated Social Forestry (CARP-ISF) livelihood project, Nasayao and Ballera (1993) reported that 66 percent of their respondents cultivated only one parcel with an average size of 3.73 ha. This could mean that they had no other arable lands aside of the lands covered by their respective Certificates of Stewardship Contract (CSCs). In contrast, forest farmer-respondents covered by the survey of Dargantes (forthcoming) claimed that they occupied and cultivated three to four forest farm parcels (average area per parcel = 1.4 ha.). Some of these parcels, however, were placed under fallow such that the effective cultivated area averaged only 1.3 ha. They encroached into the forest due to absence of other means of livelihood or other farms to cultivate.

Lack of Skills

The farmers' lack of skills to earn incomes outside of agriculture coupled with the general absence of opportunities for alternative means of livelihood had contributed to a desperate situation among forest occupants. The study of Dagoy et al. (1994), points out that those who came to ViSCA because of employment opportunities had to contend with fluctuating demand for their services. Their inability to accept jobs requiring new skills left them jobless and consequently with inadequate income for a long time. Under these conditions, farming the ViSCA Forest Reserve served to bridge the income gap that occurred from time to time.

In the survey of Nasayao and Ballera (1993), 86 percent of the respondents reported crop and livestock production as their primary source of income. The other 12 percent cited off-farm employment as their primary income source, while two percent were engaged in small-scale business. For these respondents, the cultivation of forest lands served mainly as an income augmentation strategy during times of favorable employment or as a fallback source of income in times of unemployment. Interestingly, those having off-farm employment reportedly earned average incomes of about three times (P13,750) compared to those relying primarily on farm production (P4,275). However, is that the income levels of the respondents, (regardless of income

source) were predominantly below the poverty threshold. In other words, forest farmers mainly belong to the socio-economically disadvantaged sector of the rural population who would profit much from non-farm sources of income if provided with the skills to engage in them.

Insurgency Conflict

The insurgency conflict in Leyte had contributed to the occupation of forest lands. The study of Dagoy et al. (1994) revealed that of the 69 migrants 27.54 percent left their villages and occupied portions of the ViSCA Forest Reserve because of the insurgency war. Similarly, a group of *Manobo*, displaced by an aggressive anti-insurgency campaign in the hinterlands of Basey, Samar, migrated to Leyte and got resettled near the forest zone of Bagacay, Tacloban City , with help of government agencies and private organizations (Philippines Free Press, 1993).

The subsistence farmers were the most affected by the insurgency conflict (Dargantes, forthcoming). In areas declared by the military as "no-man's-land", farmers stopped cultivating their farms. Despite the danger but driven by object necessity, some would surreptitiously visit their farms very early in the morning, harvest whatever food crops were available, if practicable replant the harvested crops, and then hurriedly return to the migration centers before sundown. Under conditions of fear, farms in "no-man's-land" areas eventually got abandoned and reverted into a "forced fallow". To be able to meet the basic needs of their families, the affected farmers engaged in any means of livelihood they can do. Unfortunately, the encroachment of forest lands unaffected by the insurgency conflict seemed a natural extension of the shifting cultivation. With one field placed under 'forced fallow", another got opened up and cultivated in order to maintain the cycle of food availability despite disruptions in the food production cycle.

Interpersonal Problems with Other Community Members

Strained interpersonal relations between members of the community could lead some to seek refuge in remote areas. As cited by Dagoy and Abenoja (1985), members of one study household left their former place of residence to avoid the wrath of the wife's former live-in partner. At the study village, the couple first lived with the husband's aunt. Later, a family offered them a homelot. To provide for the family's food, the husband cultivated a portion of the forest reserve which later got included in the ISFP. Nonetheless, this case exemplifies the confluence of a push factor (strained interpersonal relations) and a pull factor (dependable family ties and community acceptance) both of which eventually led to the occupation and cultivation of forest lands.

Strong Family Ties and Community Acceptance

As in the foregoing case, conditions prevailing at the destination would clearly exercise a strong influence on the decision to occupy and cultivate portions of the forest zone. This could further be discerned from the survey of Dagoy et al. (1994) which showed that of the 69 migrants, 14.49 percent moved to the study villages because their parents or spouses came from these villages, while 11.59 percent had relatives or parents and 7.25 percent had children who were already residents there.

Strong family ties could be manifested by the clustering of related households and in the sharing of the means of production as well as the products themselves. As Dagoy and Abenoja (1985) reported in one of their case households: The wife's parents lived in a neighboring island at first but later decided to settle in the study village where their parents (or her grandparents) had a farm in the uplands. When she married a man from another municipality, she prevailed

upon him to settle at the study village because she "wanted to live near her parents." Her husband granted her wish even though he preferred to live in his hometown because there he could gather "*tuba*" [coconut toddy] from his parents' coconuts. The household experienced difficulties in having enough food but these were surmounted "because [her] parents were ready to help them in times of need." Being landless, the husband cultivated a 0.5 ha. upland farm which was a part of the forest farm being claimed by her parents. This whole sequence of events reinforced the acquisition of usufructuary rights to cultivate forest lands through inheritance.

Acquisition of Usufructuary Rights

Despite legal limitations, the acquisition of rights to occupy and cultivate forest lands had not been confined to inheritance. In certain cases, such rights had been acquired through purchase from previous cultivators (Dargantes, forthcoming). Based on interviews with forest farmers, payment for the right to cultivate a forest farm parcel was considered as compensation for the effort and sacrifice entailed in the initial clearing. Reportedly, former cultivators of farms under fallow and already repopulated by saplings should be paid as dictated by commonly held social practices. Fallowed farms with nearly mature second growth forest vegetation would no longer be paid for. However, their former cultivators, when still present in the community, would have prior rights to their clearing or would have to be consulted when the area would again be cleared by another farmer. On the other hand, payment for forest farms planted to cash crops such as coconut (*Cocos nucifera* L.) and abaca (*Musa textilis* Née) and/or to fruit trees could represent payment for the right to manage the farm, to harvest the yield of the crops thereon, or both depending upon the terms of the transaction.

Community acceptance of a person's usufructuary rights on cultivated forest lands could be a manifestation of family ties (as exemplified by the case study of Dagoy and Abenoja, 1985) and social concern for the person's well-being. Interviews with forest farmers in Leyte revealed that a village resident desirous of augmenting her/his income by cultivating forest lands could do so as long as the new clearing had not been cultivated before or the prior cultivator had been consulted and had given his/her consent. One farmer even disclosed to have decreased the size of his forest farm upon learning that one of his neighbors wanted to till the area adjacent to his (Dargantes, forthcoming).

The flipside to such arrangements is that farmers who are not members of the community and have not been "granted" permission to cultivate forest lands within the territorial jurisdiction of the village could expect sanctions from the community and rejection by its members. With the granting of power to village governments to manage resources within its territory, sanctions to "unwelcome" encroachments had been increasingly undertaken in the legal sphere. Where formerly a visit from the village head and other residents to the contested forest farm would usually settle community-level forest occupancy disputes, recent encroachers had been brought before the *Lupong Tagapayapa*, which is a form of village-based justice committee. In effect, sanctions pertaining to forest occupancy have assumed a more formalistic and legalistic stance.

Favorable Bio-Physical Features

Another influencing factor in the occupation and cultivation of forest lands is the perception of their suitability to crop production. As gathered from forest farmers, favorability would be indicated by the absence of large trees (e.g. areas that had been commercially logged over or those wherein such trees had been felled) and the presence of pole-sized trees and saplings and sparse undergrowth. Farmers reckoned that under these conditions, the soil would be fertile and

actual work in clearing would not be as arduous as in a mature forest (Dargantes, forthcoming). This perception could have motivated the pioneer settlers to occupy and cultivate the area which later became the village of Hinaguimetan located in the hinterlands of Mahaplag, Leyte. (The name of the village translates into "with Haguimet" which is the local name for the tree *Ficus minahassae*). Interviews with village leaders and historical accounts of the village (undated) revealed that the village site was dominated by this tree species and the first explorers to reach the area found the soil to be fertile and the terrain suitable for farming.

The cultivation of grasslands points out to differences in farmer perceptions and preferences. In the study of Dargantes (forthcoming), some farmers considered areas dominated by *cogon* (*Imperata cylindrica* L. Beauv.) and *bugang* (*Saccharum spontaneum* L.) not worth the effort especially that the control of their resurgence would be extremely difficult and the soil very poor to produce worthwhile yields. The *Manobos* resettled in Tacloban, however, cultivated the *cogon*-dominated grasslands which were supposedly become their homelots because of the very limited area allocated to them. Moreover, swidden parcels planted to corn had plenty of the unburned stalks of *S. spontaneum*. This could means that areas with this species as a significant (if not dominant) component of the vegetation would still be cultivated. This would corroborate the claim of residents of Tigbawan, Maasin, Southern Leyte, that when the pioneer settlers arrived, the land which later became the village was dominated by *Tigbaw*--the local name of *S. spontaneum*.

The previously mentioned attitudes toward the cultivation of grasslands which seem to contradict the actual practice of farmers would highlight the underlying reason for the cultivation of forest lands---namely: necessity to survive. Given adequate options, farmers would prefer to cultivate lands with more favorable terrain, soil and vegetative cover. Faced with the prospect of deprivation, however, the unfavorable conditions of the land would be disregarded such that a newly-fallowed swidden parcel would be subjected again to cultivation. Unfortunately, this truncation of the fallow period eventually lead into a more marginal form of upland agriculture.

Kaingin Practices

Forest farming in Leyte would readily fall into what Conklin (1957) distinguished as partial systems of swidden farming with characteristics of both supplementary and incipient subtypes. To illustrate: In their study of an ISFP model site in Southern Leyte Tabada and Escasinas (1993) reported that "[t]he slash and burn method was still practised by the farmers in clearing their land." In the swiddens, such food crops as cassava (*Manihot esculenta* Crantz), *karlang* (*Colocasia esculenta* L. Schott), yams (*Dioscorea spp.*) and bananas and plantains (*Musa spp.*), as well as cash crops as abaca and coffee (*Coffea spp.*) were planted. These annuals were reportedly present in the farm the whole year round. Dagoy and Abenoja (1985) described this method as:

> "There is no specific schedule for planting. Planting of rootcrops... was done ...after a hill was harvested; ...planting material[s] from the harvested plant would be prepared and planted right [on the spot] where the mature plants have been removed or harvested. In some instances,... a large area is prepared ... A case like this would require the help of the members of the 'ayon' (exchange labor group) to [be able] to finish the work".

As cultivation would augur in the depletion of the soil, it is necessary to fallow the field. Usually, swidden farmers would utilize forest lands intensively until such time that the soil could no longer be productively cultivated. At this stage, the options would be to re-cultivate fallow areas or to open new lands. With their limited re-

sources, both in terms of land which could be opened or rotated to give each swidden parcel an ample fallow period, and off-farm occupation, there would then be increasing pressure to shorten the farm's fallow period.

On the other hand, some forest farmers of Leyte had adopted cultivation methods involving various forms of tree-crop combinations. In many cases, the adoption had been influenced by the introduction of agro-forestry projects (see Tabada and Escasinas, 1993; Tabada et al., 1993; and Escasinas and Manacpo, 1993). Other farmers, however, merely followed "traditional practices" of leaving unharmed fruit and forest tree species in the field. Among the fruit trees, the most common are the jackfruit (*Artocarpus heterophyllus* Lam.), *lanzones* (*Lansium domesticum* Correa), guava (*Psidium guajava* L.), avocado (*Persea americana* Mill.) and star apple (*Chrysophyllum cainito* L.). The forest trees included narra (*Pterocarpus indicus* Willdenow), *ani-i* (*Erythrina fusca* Lour.), and various *Ficus* species. Reportedly, the major considerations in determining which species to retain were: 1) uses of the various tree parts, 2) effect of the tree on the cultivated plants, and 3) effect of the tree on the implementation of farm practices such as clearing and harvesting.

Some forest farmers who were forced to abandon their forest farms due to insurgency problem also revealed that their abandoned farms continued to yield rootcrops (due to replanting immediately after harvest), plantains and bananas (whose suckers thrived and bore fruit even with minimum care) while pioneer tree species got established there. Although it is an unintended state of the forest farm, such conditions mimic the "succession of different types of crop and fallow vegetation" occurring in the integrated system of Hanunóo swidden agriculture as described by Conklin (1957). With the decrease in insurgency activity, however, forest farmers have increased the frequency of their visits. Their growing confidence in the stability of the peace and order situation could mean the end of the "forced fallow period".

CONVERSION INTO COMMERCIAL AGRICULTURE AND NON-FOREST PLANTATION

Increasing participation in a market-oriented economic system had entailed the commercialization of production, processing, distribution and trading of certain agricultural products. Expansion of commercial operations had led into the exploitation of a seemingly open resource--forestlands.

Grazing

Acosta (1991) cited grazing as an example of commercial agricultural use into which forest lands had been converted. Commercial production of cattle and other grazing animals in Leyte seem, however, to be limited to certain areas in Ormoc City and some towns in the northwestern portion of the island (e.g. see Barrera et.al., 1946). In the absence of detailed studies, data assembled by the Ormoc Task Force Scientific Study Group (1991) in its *Scientific Assessment Report: Ormoc City Flood on 05 November 1991* might provide glimpses into the use of forest lands as grassland for pasture.

According to the report, 18 percent of Ormoc City's 46,430 ha. belong to the 18-30% slope range with open grassland and shrubland as the dominant land use or vegetation. In the 4,500 ha. Anilao and Biren-Malbasag watersheds--the area affected by the November 5 flood--grasslands occupied nine percent of the total area with slopes ranging from 18 to 50 percent. Shrublands with slopes ranging from 18 to 30 percent accounted for four percent of the watershed area. As observed (although not mentioned by the report), most of these grassland and shrubland areas have been devoted to production.

Sugarcane

The Scientific Assessment Report further showed that sugarcane (*Saccharum officinarum* L.) occupied areas which should have been placed under forest cover. In the Anilao and Biren-Malbasag watersheds, 186 ha. of sugarcane fields are located in slopes ranging from 18 to 30 percent while another 437 ha. had 30 to 50 percent slopes. Interestingly, these areas fall within those lands classified as alienable and disposable (Dagoy and Abenoja, 1985).

The above-cited data would demonstrate that Acosta's (1991) recommendation to limit non-forest land uses to areas with slopes of 18 percent and lower is extremely difficult to realize despite the provision in the Forestry Reform Code which states that:

> Lands eighteen percent (18%) in slope or over which have already been declared as alienable and disposable shall be reverted to the classification of forest lands by the Department Head, to form part of the forest reserves, unless they are already covered by existing titles or approved public land application ... Provided, that said lands which are not yet part of well-established communities shall be kept in a vegetative condition sufficient to prevent erosion and adverse effects on the lowlands and streams: Provided, further, that when public interest so requires, steps shall be taken to expropriate, cancel defective titles, reject public land application, or eject occupants thereof.

Abaca

The conversion of forests into non-forest plantation results from what Ponce et al., (1990) reported as the farmers' desire "to plant permanent crops that they can look forward to as future sources of income and as inheritance for their children." In Leyte, the most common permanent crops are abaca and coconut. Based on interviews of forest farmers, the decision which to plant is more often influenced by the bio-physical characteristics of the farm.

The study of Dagoy and Abenoja (1985) indicate that the relatively late comers into the forest zone devoted comparatively significant attention to the planting of abaca rather than coconut. Among the reported cases, only the "'Old-timer' in the 'kaingin'" had coconut in the forest farm. These observations would jibe with the claim of many forest farmers that after the initial clearing (or reclearing after several years of fallow), food crops mainly rootcrops and vegetables--would be planted (Dargantes, forthcoming). While these are growing, abaca would then be planted all over the clearing. After the first 2 to 3 years, the abaca plants have already established, and would by then require partial shading. Thus, shade-intolerant food crops no longer be planted while tree seedlings would be established in areas where canopy cover is perceived to be inadequate. Reportedly, as long as proper care is given to the abaca plants, especially in terms of controlling plant density and weeds, yields would be good. Otherwise, the plants would become stunted and yields would decline particularly when grasses would start to dominate the plantation,

Coconut

At the stage of declining abaca growth and yields, farmers would start to plant coconut based on their understanding that this crop could thrive better than abaca in a grass-dominated environment. They realize that the coconuts could eventually suppress the growth of abaca thereby leading into a complete change in the plantation crop.

In forest farms which had not been planted to abaca, continuous planting of food crops (including upland rice and corn during the initial years of clearing) would readily deplete the soil. Farmers would characterize it as *pulahon* (reddish), *kley* (clayey) and *bagtokon* (hard). They would

also associate such soil to a grass-dominated vegetation. Many of them reportedly started planting coconut even before depletion of the soil. Others, however, started planting coconut once grasses had become dominant. This would explain why Dagoy and Abenoja (1985) only found coconut in the farm of the "Old-timer".

Another course in the conversion of forest lands into coconut plantations was through plantation establishment by land speculators. According to the former concession manager of the Velbros Timber Corporation, residents of communities adjacent to the logging sites started to cultivate portions of the areas logged over by the company upon the termination of their operations in 1973. Some of these residents proceeded to register their claims with the municipal assessor's office, but they were reportedly told that their claims could not be registered because the subject lands are not yet classified as A and D. They were, however, advised to plant permanent crops particularly coconut because these would serve as best proof that they had been cultivating the land. Later, some of the cultivated areas were sold to businessmen from the towns of Mahaplag, Abuyog and Javier, Leyte who then ordered the planting of coconuts on their newly acquired land.

IMPLEMENTATION OF SETTLEMENT AND RURAL DEVELOPMENT PROJECTS

Settlement Projects

As a government program, rural settlement is seen as the planned movement of people to areas with agricultural potential. In Leyte, there are three of these undertakings, namely: the Southern Leyte Settlement Project (SLSP---formerly known as the Imelda Settlement Project) located within the municipalities of Hinunangan and St. Bernard, Southern Leyte; the Kauswagan Agricultural Cooperative Settlement Project (KACSP) located in the village of Barayong, Palo, Leyte, and the newly approved Leyte Settlement Project (LSP). Parcel I of the LSP is located in municipalities of Mahaplag, Abuyog, Javier and Baybay, while Parcel II is located in Hilongos.

The proclamation which created the SLSP succinctly provided that "[i]n order to facilitate the development of the area ..., the Department of Agrarian Reform (DAR) is hereby allowed to cut the available timber in the area for its use in the development of the settlement; subject to forestry rules and regulations governing the matter." Nonetheless, it was revoked by Proclamation No. 106 dated May 11, 1987 thereby reverting the SLSP site to the status of forest land. Such revocation was issued "to prevent illegal logging in the area under the guise of clearing lands for settlement purposes". Later, however, this proclamation was again revoked by Proclamation No. 246 dated April 13, 1988 because "the reversion of the area to the status of forest land will not only affect the rights of individual settlers who have introduced improvements and developed portions of the said tract of land, but will also negate the developments and improvements introduced by the [DAR]." By this, the implementation of the SLSP continues.

Based on Proclamation No. 1497 dated September 11, 1975; the SLSP would supposedly occupy 12,900 ha. After the boundary and topographic survey, and as reflected in its 1981-1990 development plan the SLSP covers 16,415 ha. situated in 22 villages belonging to the two municipalities. Initially, 8,000 ha.. were identified as suitable for cultivation of which 2,709 ha. had already been cultivated by pioneer inhabitants. The 1977 socio-economic survey conducted by the then Ministry of Agrarian Reform counted 1,202 households composed of 6,559 persons inhabiting the settlement area. By 1980, another 96 households were added to the list of pioneer inhabitants. Envisioned to serve a total of 2,289 households, an additional of 991 households were planned to be recruited. For all these clien-

tele, the SLSP planned to award 7,764 farmlots covering an area of 9,840 ha. and another 2,289 homelots. Other conversions would include 205 public lots and 51.9 kms of roads. Once completed, additional deforestation attributable to the project would reach some 10,000 ha. Moreover, the remaining forest lands had become increasingly vulnerable to conversion due to greater accessibility.

The KACSP, on the other hand, occupies only 1,349 ha. principally within the administrative jurisdiction of Barangay Barayong, Palo, Leyte. According to the project manager, the KACSP had allowed 27.1 ha. for a total of 271 homelots. The areas for farmlots and reserve forests could not be definitely ascertained due to discrepancies in the May 12, 1978 Cadastral Survey and the Approved Survey Returns of May 10, 1990.

The LSP, created through Proclamation No. 418 which was approved only in July 1, 1994, would cover 21,888 ha. in Parcel I and 4,641 ha. in Parcel II. Even though areas within the settlement classified as timberland, forest land or mineral public land are excluded from the scope of the proclamation, the plan enunciated in the proposed Mahaplag Settlement Project--the precursor of the LSP--envisions to resettle landless families/tillers from surrounding areas, other qualified farming families from Leyte, and rebel returnees. Data obtained from the villages of Hinaguimetan and Oguis, both are within the project site, show that A and D lands including those supposedly still under the public domain already had occupants and were in fact cultivated. Even the timberlands of Hinaguimetan were covered by ISFP applications and actually planted to various crops. Those of Oguis did not have ISFP applications but were nonetheless occupied and cultivated.

Agricultural Development Projects

The Leyte Sab-a Basin Development Authority (LSBDA) which was promulgated by virtue of Presidential Decree No. 625 on December 26, 1974 was the island's most grandiose and ambitious project "[t]o develop a food basket within the Province of Leyte and Region VIII by increasing agricultural productivity; and ... [t]o provide a model for the development of agricultural estates". As promulgated, LSBDA had territorial jurisdiction encompassing "all the lands, timber, vegetation, minerals and waters within the municipalities of Alang-alang, Barugo, Palo, San Miguel, Sta. Fe and Babatngon; ...portion of the Municipality of Jaro...; and all the forestlands, timberlands, pasturelands and reforestation areas in the City of Tacloban." It was also given "preventive jurisdiction over timber and mineral lands ...to the end that same may not be disposed of ... or converted to agricultural, residential, or other purposes incompatible with their administration."

In relation to its function on preventive jurisdiction and backed with its territorial powers, the LSBDA initiated the resettlement of *kaingineros* at the KACSP site, at the Lanahan Resettlement Project site in Divisoria, Alang-alang, Leyte and for the group of *Manobo* at Barangay Bagacay, Tacloban City. Aside from resettling them, the *kaingineros* were encouraged to engage in lowland agriculture. But in 1989, about 15 years from its creation, the LSBDA still reported that:

> "The principal reason why the hilltops of the Basin upland range are devoid of forest cover has been the absence of livelihood endeavours to provide modest income among the hill people. By unavoidable circumstance, they turned into kaingineros. LSBDA and other cooperating agencies had set up resettlement, farming and other community development programs for them. Yet, because primarily of population increase, there is a need for more economic development assistance to the inhabitants."

LSBDA's "new approach to this problem" involved the employment of the locals in an agro-reforestation project being undertaken by a non-governmental organization (NGO) named

Hinterwealth Agro-Industrial Corp. Aside from the reforestation activities within its 225-ha. project site, Hinterwealth also envisioned "the commercial planting of export crops." Such strategy exhibited similar directions to LSBDA's 1988 operations plan for agro-forestry or upland development. Sidestepping its first purpose to "restore the productive capacity and *ecological integrity of the denuded forests*" (emphasis supplied), and concentrating on the second and third purposes to "provide livelihood to kaingineros [and] provide [a] steady supply of fruits and vegetables", LSBDA identified the following primary projects: fruit tree farms for *atis* (*Annona squamosa* L.), *guayabano* (*Annona muricata* L.), papaya (*Carica papaya* L.) and jackfruit (*Artocarpus heterophyllus* Lam.); plantations for coconut, citronella (*Cymbopogon nardus* Linn. Redle) and banana (*Musa paradisiaca* L.); and rattan plantations in areas with standing trees. Except for the rattan plantation which was established by members of the Manobo tribe, the other projects would clearly promote food production with minimal contribution to the restoration of the forest's ecological integrity.

The other program which reclassified portions of the forest lands into Aand D lands was the erstwhile Kilusang Kabuhayan at Kaunlaran (KKK--the National Livelihood Movement and currently known as the National Livelihood Support Fund or NLSF). This program could again be seen as the struggle between proponents for the conversion of forest lands into agricultural use and those in favor for their retention as forest lands.

On March 29, 1983, President Marcos issued Proclamation No. 2282 "RECLASSIFYING CERTAIN PORTIONS OF THE PUBLIC DOMAIN AS AGRICULTURAL LAND AND DECLARING THE SAME ALIENABLE AND DISPOSABLE FOR AGRICULTURAL AND RESETTLEMENT PURPOSES OF THE KILUSANG KABUHAYAN AT KAUNLARAN LAND RESOURCE MANAGEMENT PROGRAM OF THE KILUSANG KABUHAYAN AT KAUNLARAN OF THE MINISTRY OF HUMAN SETTLEMENTS." However, this Proclamation was revoked by President Aquino through Memorandum Order No. 17 dated June 17, 1986; thus reverting the subject lands to the public domain. Later, President Ramos issued Memorandum Order No. 107 "CLARIFYING MEMORANDUM ORDER NO. 17...". The new order stipulates that all "lands covered by Proclamation No. 2282 which were reclassified as alienable and disposable agricultural lands prior to 29 March 1983 and used or administered by the KKK-NLSF as agricultural lands shall remain alienable and disposable agricultural lands ... [and all] lands actually classified as agricultural land prior to the effectivity of Proclamation No. 2282 and used or administered by the KKK-NLSF shall be turned over to the Department of Agrarian Reform for disposition to farmer-beneficiaries in accordance with Executive Order No. 407."

Despite the revocation and clarification, the major effect was that farmers and other interested individuals already staked their claims to the subject lands on the ground, on paper or both. On the ground, various claimants had parcelled out among themselves lands which had not been occupied and cultivated. For the paper work; they as well as other forest farmers and speculators, applied for the issuance of tax declaration of real property covering their claims and/or filed applications with the DAR for inclusion of their claim in the NLSF.

Forestry Development Projects

These projects manifest an irony in the loss of forests. The major examples are the projects on reforestation and those on social forestry.

Reforestation projects are mostly undertaken in denuded areas which are legally designated as timberlands or as unclassified public lands. In many cases, however, these interventions would

not allow natural forests to regenerate in these areas. Some of these lands are converted into fruit tree plantations like the ones initiated by the LSBDA, or to plantations based on a few "fast-growing" and usually exotic species with specific industrial or commercial applications similar to what the Leyte Sab-a Basin Development Project (LSBDP) undertook. Reportedly, the LSBDP managed to reforest 180 ha. in 1990. Of this area, 21 ha. were planted with large-leaf mahogany (*Swietenia macrophylla* King), 61 ha. with yemane (*Gmelina arborea* Roxb.) and 48 ha. with yemane, large-leaf mahogany, teak (*Tectona sp.*) and various *Acacia* species. The remaining 50 ha. were supposedly mixed plantations (Ponce et.al., 1990).

Another example would involve the Timber Products and Marketing Corporation (TPMC), a company which was granted a Timber License Agreement (TLA) in 1986 to log in two areas--the first being 10,000-ha. parcel in the middle of Leyte and the other a 16,600-ha. parcel in Southern Leyte. In compliance with its TLA, TPMC planned to reforest 130 ha. in Parcel I and 135 ha. in Parcel II with two species, namely: *Albizia falcataria* (Linn.) Backer and *G. arborea* (Dabuet et al., 1989).

Forest land allocated for agro-forestry and social forestry projects can either be seen as: i) attempts to provide access to a basic means of production--namely land--to the rural population while setting up mechanisms for its maintenance at a stage of land use which is part forest and part agriculture, in effect arresting the full conversion of the area into a mode of utilization which may be incompatible to the environment; or ii) the initial and institutionalized stage for the gradual but inevitable conversion of forest land into other uses. The first scenario would undoubtedly represent a happy compromise in meeting the needs of the beneficiaries and the environment. The problem would lie with the second scenario which had been exemplified in the earlier-mentioned case of "Jimmy" (Dagoy and Abenoja, 1985). Moreover, the granting of security of tenure to ISFP participants, and the formalistic mechanisms set forth in the Stewardship Contract regarding forest protection and conservation vis-a-vis the development of forest lands into productive farms would seem to favor the direction of agriculture as a mode of land use.

Road Construction

The establishment of roads in the forests of Leyte had been undertaken with development as the primary concern. Most major roads encroaching into the forest zone were built to improve the networks of communication, trade and commerce between population centers. Examples include the Mahaplag-Sogod section of the Pan-Philippine Highway, the section of the Abuyog-Baybay national road traversing the Cuapnit-Balinsasayao national Park, a portion of the Kananga-Capoocan national road which passes through the site of the Rainfed Resources Development Project, and the section of the Hinunangan-St. Bernard "cross-country" road traversing the SLSP.

Other roads also served to connect farms and markets, and to penetrate frontier areas which had been threatened by the communist insurgency. Usually referred to as *barangay* (village) roads, these connect villages which erstwhile were inaccessible to motor vehicles.

By far, logging roads would account for the most substantial contribution to the conversion of forest lands. For example, TPMC reported that as of 1988, it constructed a total of 15.20 km. within its area of operations. Moreover, it planned to build another 13.20 km. for 1989 (no follow-up study had been undertaken to determine whether these roads had actually been constructed). The major effect of logging roads had been to increase the accessibility of forest areas to the influx of people. The TLA of the TPMC, for example, stipulated that "[m]ain logging roads built within the concession area shall become

public roads after five (5) years following their construction. During the 5-year period, however, the use of said roads by (residents of the) surrounding communities and other persons for legitimate purposes shall be allowed under reasonable terms and conditions as the Director of Forest Development may impose." A set-up similar to this one could have facilitated the movement of farmers from nearby communities to the logged over areas which the VTC concession manager observed after they ceased operations in 1993.

CONCLUSIONS AND RECOMMENDATIONS

The above-cited cases show that the occupation and cultivation of forest lands will persevere as long as marginalized sectors of the population exist and forest lands remain to be seen as still open for exploitation. Marginalization can come in the forms of landlessness or the lack of control over the land, joblessness or the inadequacy of income from employment, and social dislocation caused by interpersonal and social conflicts, all of which contribute to conditions of poverty and powerlessness. The land's favorable features, the recognition of usufructuary if not ownership, rights, and the reinforcement of human occupation of forest lands through development projects signal that encroachment could still be undertaken as a recourse for socio-economic upliftment.

In this context, the opinion of Acosta (1991) that "the crucial issue is not how to prevent further conversion of the forests *per se* but rather how to provide sustainable livelihood for the island's growing population, so as not to stretch the limits of the carrying capacity of the forests, in particular, and the island's arable land, in general" only addresses the aspect of human marginalization. The prevention of further conversions remains to be a crucial issue especially that policy factors continue to serve as stimuli for further encroachment, and attempts to provide livelihood opportunities have inadvertently led to more forest degradation and deforestation. Along this line, La Viña (1991) wondered "whether ... development should be pursued at the expense of environmental conservation or can both goals be pursued together without sacrificing one or the other?" To the Filipino ecologist specifically, he posed the following questions:

> First, how can conservation be done without condemning the Filipino people to a perpetual state of underdevelopment and poverty? Second, will the environmental agenda necessarily lead to denial of access to the natural resource base of those sectors in Philippine society which need such resources for survival?

To the second question, the answer is: Not necessarily. An agenda for the protection and conservation of forest resources which excludes the poor from deriving benefits from them would not be an agenda at all. Such an agenda, therefore, should involve forest farmers and should address their landlessness, joblessness and powerlessness. Complementarily, it should ban the exploitation of forest lands by those sectors which do not need such resources for survival.

These would then bring about some answers to the first question.

A conservationist agenda should therefore start with agrarian reform. A more equitable redistribution of agricultural lands would remove some of the pressure on forest lands. If, by unavoidable circumstance, forest lands would be utilized to equitably provide land to the tillers, land use should be directed towards the restoration of forest cover with the beneficiary being entitled to the fruits of her/his reforestation endeavors. Therefore, stewardship should be awarded to those who are willing and able to nurture forest lands back into forest cover, with the state relinquishing its claim of ownership over the forest products in favor of the beneficiary.

This set-up would necessitate a complimentary effort of restricting the extraction of forest

resources to those who would participate in their production. No permit or right to harvest timber, rattan, fuelwood, fruits and other forest products should therefore be granted to commercial operators; such privileges should be reserved only for the stewards of forest lands. This way, the socio-economically disadvantaged sectors who are dependent on forest lands would be provided with avenues to improve their well-being and general welfare while bolstering their concern to protect forest lands from further occupancy and conversion.

One major reason for launching the ISFP in the Philippines has been the recognition "that among the less privileged sectors of society, the *kainginеros* and other occupants of forest lands could be made effective agents of the state in food production and in the rehabilitation of forest lands" (LOI 1260). If rehabilitation would be taken to mean the return of forest cover, then forest farmers should be made to understand this goal so that they could devote time and effort toward its attainment. The assumption that the regeneration of forest vegetation would hamper the farmers' food production efforts should not be made a hindrance to the pursuit of forest restoration.

The discussions presented above, would indicate the production of annual food crops is limited by the bio-physical characteristics of the land. After a certain period of food crop cultivation, the land would either return to fallow or get converted into plantations. A fallowed farm would then slowly get reforested--except when interrupted and cultivated again. Under this option, the farmers could only derive minimal economic benefits from the farm but this practice will allow the return of forest vegetation without cost to government. If they could be compensated for nurturing the forest back into maturity, or if they could periodically be given income for seeing to it that the standing volume of the trees in their farms continues to increase, then the objective of social forestry to rehabilitate forest lands could be attained. And allowing the forest steward to harvest and directly profit from the forest products when the forest attains maturity would make social forestry truly a program which makes forests a means for the betterment of the poor.

DEFINITION OF TERMS

In the Philippines, certain terms relating to the environment have been defined by law. The following definitions of the words commonly used in this report have been adapted from the Philippine Forestry Statistics of 1985.

Alienable or Disposable (A and D) Lands - lands of the public domain which have been the subject of the present system of classification and declared as not needed for forest purposes.

Forest - land with an area of one hectare or more which is at least ten percent stocked with forest tree species including seedling and saplings, wild palm, bamboo or brush; provided that narrow strips having such vegetation are at least 60 m. wide and one hectare in size.

Forest Lands - lands of the public domain which have not been declared as A and D and which include the public forest, the permanent forest or forest reserves, forest reservations, timberlands, grazing lands, game refuge and bird sanctuaries.

Forest Reservations - forest lands which have been reserved by the President of the Philippines for specific purposes.

Kaingin - a portion of the forest land which is subjected to shifting and/or permanent slash-and-burn cultivation having little or no provision to prevent soil erosion.

Kainginero - a person who practices *kaingin* as a method of land cultivation.

Permanent Forest or Forest Reserve - lands of the public domain which, subject to the present system of classification, have been declared as needed for forest purposes.

Public Forest - mass of lands of the public domain which has not been the subject to the

present system of classification for the determination of which lands are needed for forest purposes and which are not.

Timberland - land of the public domain which, subject to the present system of classification, has been determined to be needed for forest purposes, and which eventually will be proclaimed as forest reserves by the President.

ACKNOWLEDGMENT

In writing this article, the authors greatly benefited from the assistance of:

The ViSCA-GTZ Ecology Program for providing the funds to carry out the research, Drs. Paciencia P. Milan and Josef Margraf for their comments and suggestions regarding the conduct of the field work and the preparation of this article, and the administrative staff for providing financial, logistic and other support services;

The Center for Social Research in Small Farmer Development of ViSCA, particularly Dr. Salvador C. Dagoy, the former Director, and Dr. Basilio A. Dabuet, the current Director, for allowing access to files and records of the CSR Data Bank, and for providing work space and equipment needed in processing field work outputs;

The officers, staff and employees of the Departments of Environment and Natural Resources and of Agrarian Reform, the Philippine Coconut Authority, the Fiber Industry Development Authority, the Philippine National Oil Corporation, the defunct Leyte Sab-a Basin Development Authority, the provincial governments of Leyte and Southern Leyte, and the city/municipal governments of the study sites who provided access to their records and other documents and/or gave information on more appropriate sources of data and information;

The village officials, residents and case respondents who provided information on the history and the current situation of their respective places, and who shared their experiences and insights, led the authors to their forest farms, and, as a whole, made the field work an enjoyable academic exercise.

BIBLIOGRAPHY

ACOSTA, R.T. (1991)
Leyte Island: Ecosystems in Peril. Paper presented during the Symposium on Environmental Management held at the Visayas State College of Agriculture, Baybay, Leyte on 25 September 1991. 21 pp.

BARRERA, A.; I. ARISTORENAS AND J. A. TINGZON (1954)
Soil survey of Leyte Province, Philippines. Bureau of Print, Manila. 112 pp.

BUREAU OF FOREST DEVELOPMENT (BFD) (1985)
1985 Philippine forestry statistics. xii + 156 pp

CALUB, F.S. (1993)
Public hearing on logging in Leyte. Unpublished briefing notes presented during the Public Hearing on the Resumption of the Logging Operation of TPMC in Residual Forest held at the Municipal Auditorium, Sogod, So. Leyte on July 16, 1993. 6 pp.

CONKLIN, H.C. (1957)
Hanunóo agriculture: A report on an integral system of shifting cultivation in the Philippines. Elliot's Books Northford.

DABUET, B.A.; L.C. BANDOLA and A.P. OLO (1989)
Exploitation of timber resource in Leyte and Southern Leyte: The case of the timber producers and marketing corporation. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. 80 pp.

DAGOY, F.J. and A.L. ABENOJA (1985)
The upland farmers of Barangay Kansungka: Some case studies. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. v + 90 pp.

DAGOY, F.J.; F.D. POLIQUIT; L.S.E. RACHO and L.G. HINAY (1994)
Socio-demographic profile of the upland farmers in the MPSAP pilot barangays at Baybay, Leyte. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. vii + 39 pp.

DARGANTES, B.B. (Forthcoming)
Socio-ecological case studies of forest lands cultivation in Leyte, Philippines. Ph.D. Dissertation. Universität Hohenheim.
DUEÑAS, M. (1990)
Nature's revenge: Illegal logging causes floods, landslides and deaths. Philippines Free Press. January 8, 1994. pp. 13-14
ENVIRONMENTAL MANAGEMENT BUREAU (1990)
The Philippine environment in the eighties. Memorandum for the President from the Department of Environment and Natural Resources dated November 19, 1990.
ESCASINAS, V.A. and J.L. MANACPO (1993)
ISF model site profile: Palarao, Leyte, Leyte. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. iv + 20 pp.
LA VIÑA, A.G.M. (ED.) (1991)
Law and ecology: A compilation of Philippine laws & international documents pertaining to ecology. The Legal Rights and Natural Resources Center, Quezon City. 368 pp.
LETTER OF INSTRUCTIONS NO. 1260. 28 July (1962)
NASAYAO, E.E. and MA. M.M. BALLERA (1993)
Socio-economic survey of farmer-cooperators of the CARP-ISF community-based agroforestry R&D livelihood project in Region 8. Paper presented during the 5th Regional Symposium on R&D Highlights held at ViSCA, Baybay, Leyte on July 15-17, 1993. 34 pp.
ORMOC TASK FORCE SCIENTIFIC STUDY GROUP OF THE DEPARTMENT OF SCIENCE AND TECHNOLOGY (1991)
Scientific Assessment Report: Ormoc City flood on 05 November 1991. Unpublished Report dated November 1991 submitted to the DOST. iii + 14 pp + 13 pp Annexes.
PHILIPPINES FREE PRESS (1993)
Resettling the Manobos of Tacloban. October 9, 1993. pp. 38-39
PONCE, E.R.; B.A. VEGA; E.B. SAZ; B.B. DARGANTES and J.G. BAUTISTA (1990)
Alto Peak Geothermal Exploration Project: Socio-economic impact assessment. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. 142 pp.
PONCE, E.R.; E.A. NASAYAO; N.P. PASCUAL; J.M. ALKUINO; A.C.Y. SANDOVAL; P. ARMENIA; E. BUMATAY and D. GONZAL (1990)
An evaluation report: Leyte Sab-a River Basin Development Project, Tacloban City. Unpublished Research Report. ViSCA Educational Foundation, Inc., ViSCA, Baybay, Leyte. 64 pp.
PRESIDENTIAL DECREE NO. 705 (1981)
"Revising Presidential Decree No. 389, otherwise known as the Forestry Reform Code of the Philippines." dated 14 January 1981.
SOMMER, M.; J. SETTELE; H. MICHELSEN; B. UNMÜSSIG; P. SANDNER (1990)
Countdown für den Dschungel: Ökonomie und Ökologie des tropischen Regenwaldes. Scmetterling Verlag, Stuttgart. 294 pp.
TABADA, A.T.W.; V.A. ESCASINAS AND J.L. MANACPO (1993)
Project profile: Santol ISF model site, San Miguel, Leyte. Unpublished Research Report. Center for Social Research. ViSCA, Baybay, Leyte. iv and 21 pp.
TABADA, A.T.W. and V.A. ESCASINAS (1993)
Panian ISF model site, Saint Bernard, So. Leyte. Unpublished Research Report. Center for Social Research, ViSCA, Baybay, Leyte. vi and 24 pp.
YAMBOT, E. (ED.) (1975)
Philippine Almanac & Handbook of Facts. Philippine Almanac Printers, Inc., Quezon City. 391 pp + 9 pp Appendices.