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NON-TIMBER FOREST PRODUCTS UTILIZATION IN A TOWN  
IN THE SIERRA MOUNTAINS<sup>1</sup>

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Introduction

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The forests in the Sierra Madre Mountains ~~are~~ major sources of income for the subsistence of many households within the uplands. They are the sources of sawlogs, fuelwood, and other products in various forms. Non-timber forest products (NTFPs), more commonly called "minor forest products" in the past, abound in these mountains. Because of the great demand for NTFPs as raw materials for handicrafts (basketry, wood carvings, & wooven items) and furniture, and because of the recent restrictions in logging, exploitation pressures on them are becoming strong.

In the forest areas, the very survival of the people is inextricably tied to the productivity of these areas (Briones, 1989). Their dependency ends when the forest resources are depleted (Ramirez, 1988). It is therefore necessary to come up with policies so that forest utilization can be rationalized and be managed on a sustainable basis.

Objectives

This paper was derived from a portion of the study undertaken by the author for his MS Environmental Studies program. The study was conducted at San Mariano, Isabela, a town within the Sierra Madre Mountains, where some major non-timber forest products (NTFPs) were highly commercialized and have a significant influence on the livelihood of the people.

The objectives of this paper are: (1) to describe the utilization system of the two NTFPs significantly contributing to

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the households within the San Mariano, Isabela area; (2) to characterize the socio-economic profile of the gatherers of these NTFPs and their households; and (3) to discuss issues and present policy options or recommendations for the rational utilization and management of these products.

### Conceptual Framework

NTFP utilization is a result of the interaction of ecological and social systems which are, by themselves, composed of interdependent factors. The NTFP utilization system interacts with other utilization or production systems (e.g. timber forest products system, agricultural or cultured products system, and formal or informal external sources system. All of these systems, singly or in combination, affect or cause impact on the household's well being. These utilization systems are in turn influenced by environmental factors, i.e. biological and socio-economic, which are influenced by them in return. These relationships, interactions and interdependence are shown in Figure 1.

### The Study Area: The Municipality of San Mariano, Isabela

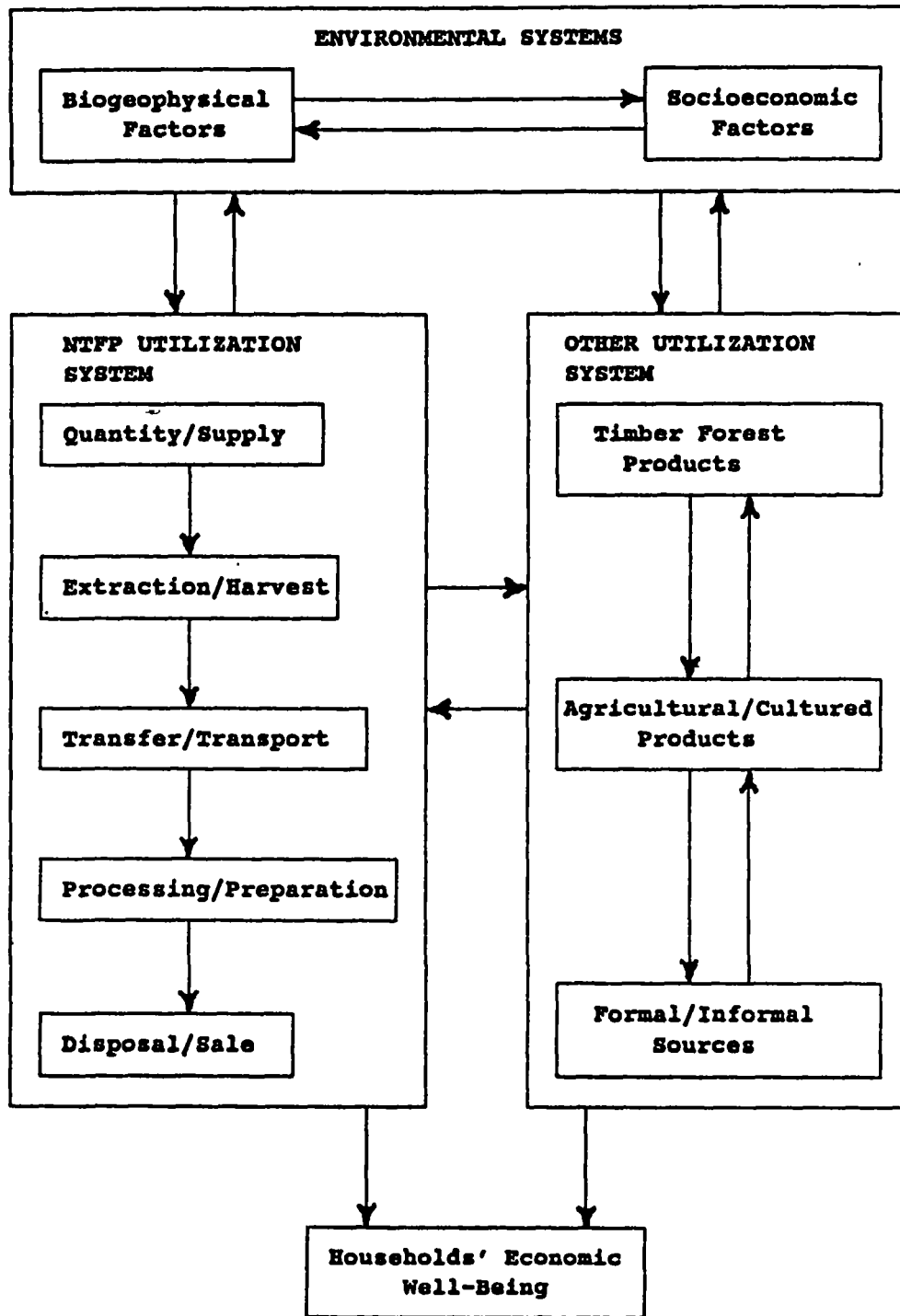
#### **Geographical Profile**

**Location.** San Mariano, Isabela is in the eastern fringes of the province of Isabela in northeastern Luzon (Fig. 2). The Poblacion is around 25 km away from the Maharlika national highway junction in Naguilian via a concrete road going eastward. The municipality, bounded by seven other towns, bisects the Sierra Madre mountain ranges and extends eastward up to the Pacific Ocean (Fig. 3).

**Area and topography.** San Mariano has a total land area of 146,950 ha. Most land area of the town is within the Sierra Madre mountain ranges; only 15 percent has less than 8 percent in slope and these areas are generally found within the floodplains of the two major rivers within the municipality.

**Hydrology.** The two major river systems, with 11 other river tributaries (aside from the numerous creeks), drain the watershed area within San Mariano. These two rivers meet near the Poblacion. The average rainfall within the town is 2.08 m.

**Vegetation and land use.** Around 61 percent of the municipality are uplands and mountains composed of mossy forest,



**Figure 1. Conceptual framework for Non-Timber Forest Products (NTFP) Utilization and Related Systems.**

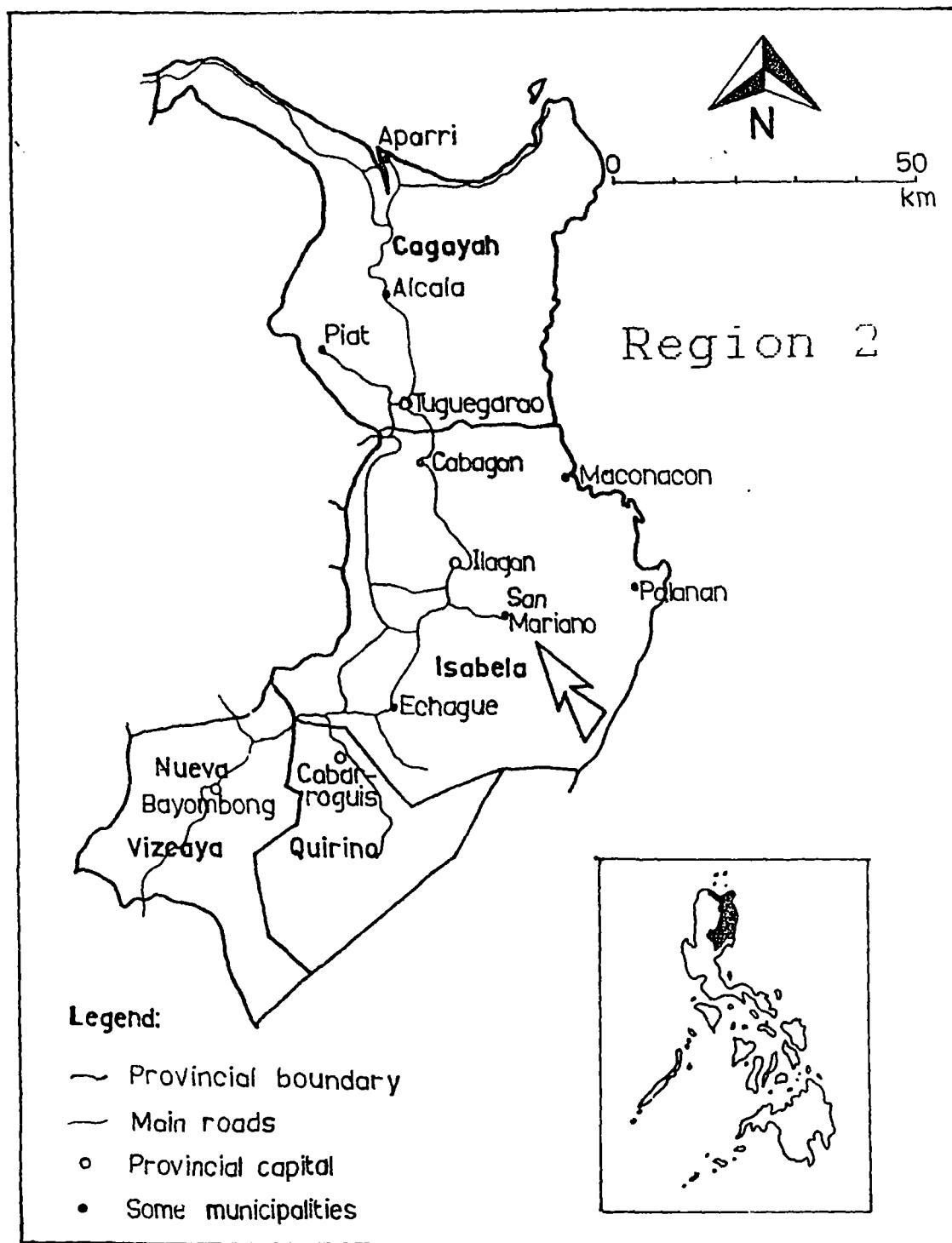


Figure 2. General location of the study area relative to Region 2 and the Philippines.

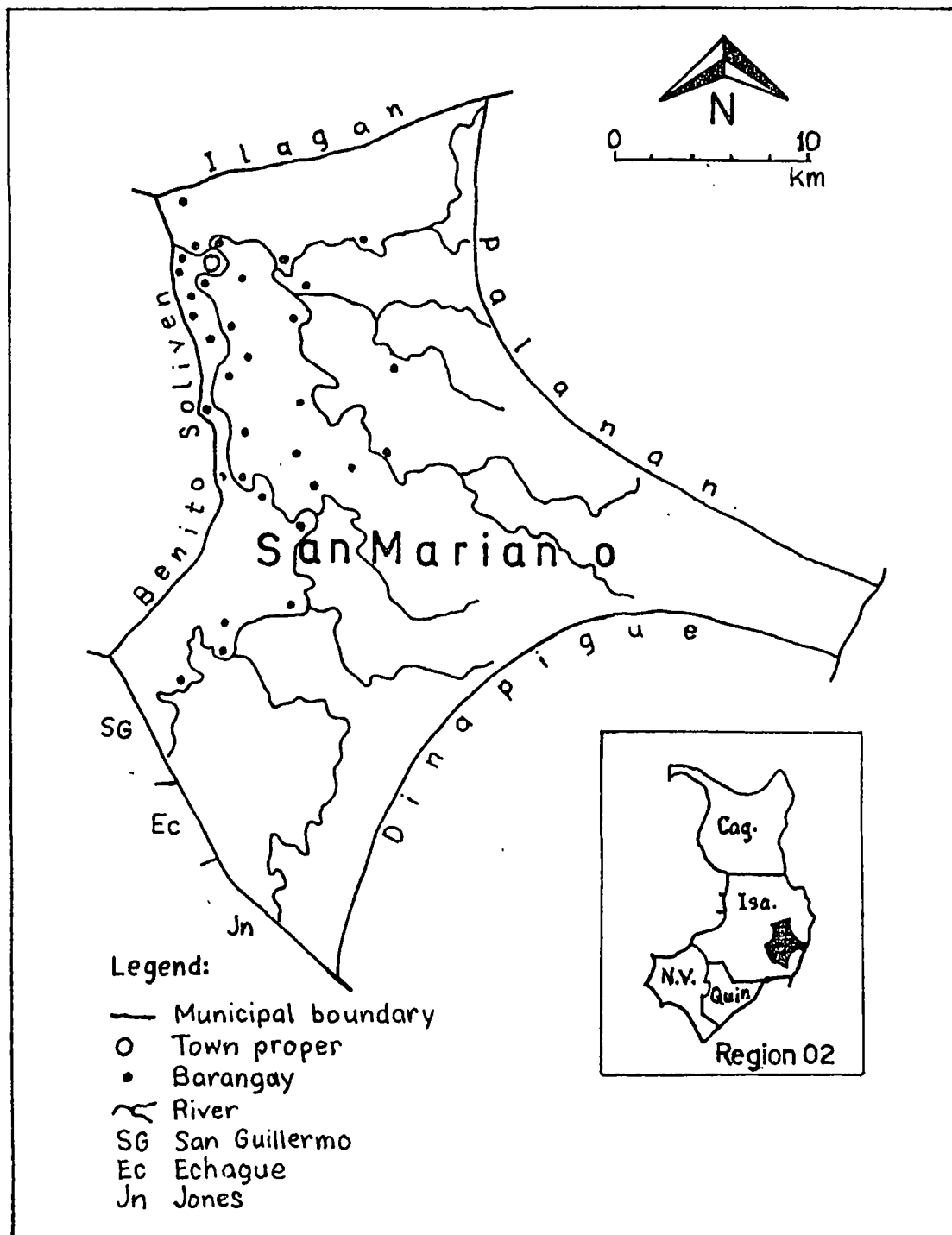


Figure 3. Specific location of the study area: San Mariano, Isabela.

primary and secondary dipterocarp forests. The remaining areas are either cultivated parcels or mixed brushland/grassland areas.

### **Socio-Economic Profile**

**Villages and demography.** San Mariano is composed of 37 barangays, including the three districts or "zones" in the town proper, mostly found along the major rivers. The settlements are clustered near or within the floodplains.

**Demography.** San Mariano has a population of 40,486 with 60 percent classified as urban (1990 Census). The population density is 0.28 per ha; growth rate is 4.9 percent; sex ratio is 104 males to 100 females. There are around 6,800 households ranging from 61 to 356 per barangay. Average household size, which range from 4.4 to 6.6, is 5.4.

**Infrastructure.** The town proper has concrete or gravel roads. It is surrounded by the Pinacanauan River. Most of the barangays are isolated because of the absence of serviceable roads and bridges. Roads previously constructed to reach the different barangays are now unusable because of lack of maintenance.

**Agricultural production.** Agricultural produce in the town include palay, corn, banana, and peanut. Around 6,000 families are involved in such production activities and 27,200 ha of the area is covered for the purpose.

**Logging activities.** San Mariano was a logging town. A logging moratorium was declared in February 1989. Yet, illegal logging persisted because of the existence of many portable sawmills in the area. The moratorium was lifted in April 1990 but there is now a virtual logging ban in the area because the legitimate concessionaires opted not to operate within San Mariano. Recently, different task forces were created for more strict implementation of forest laws and regulations. As a result, most of the mini-sawmills were padlocked, many logs and lumber were confiscated, machineries and equipment were impounded.

### **NTFP Utilization in San Mariano, Isabela**

#### **NTFPs Utilized in the Study Area**

Generally, all NTFPs except buho (*Schizostachium lumampao*), rattan (*Calamus spp.*), and almaciga (*Agathis philippinensis*) resin are open for utilization; there is free access for NTFPs, they are common properties. Many plant species are locally known to be

suitable for human consumption and are usually gathered for the use of the household in minimal quantities. Some are commonly eaten, while others are sought as rare delicacy. Because of this unrestricted access, the forest is of great help to the local residents especially in times of food scarcity. Other NTFPs, aside from edible products (such as ferns, mushrooms, cassava, shoots of palms and bamboo, some wildlife, e.g. wild chicken, monitor lizard, wild cat, birds, eel, shrimps, frogs, etc.), include medicinal plant parts and animal products, and many in non-edible forms (such as Manila copal, ornamental plants and orchids, house construction materials used as substitute for wood, and tying materials).

### **Major NTFPs in the Area**

Two major NTFPs were identified to be contributing to the household economy within the area, namely: rattan and buho. The utilization systems of these NTFPs were analyzed and briefly discussed in this paper.

**Rattan: the climbing palm.** Having vine-like climbing stems, old stems of rattan are clean, hard and greenish with the upper younger part sheathed. The stem is used for making walking sticks, wicker work and cordage and is used primarily for furniture making and for basketry. Although there are 72 species identified in the country, only ten are commercially exploited. In the San Mariano area, however, rattan species are generally grouped into two for ease and practicality: "Tumalim" (all rattan species with small nodes) and "Limuran" (all species with big nodes).

**Buho: a useful grass.** Classified as one of the tallest grasses (bamboos), buho has an erect culm, spineless, 10-12 m tall, hollow culms 4-6 cm in diameter. It is widely used as walling materials of houses either in alternated-halves form ("taleb," Ilocano) or in matted form ("sawali," Tagalog). In some cases it is being used as thatching materials for roofs and even as flooring materials. Outside San Mariano, it is also used for the construction of sheds and fishpens.

### **Rattan Utilization System in San Mariano, Isabela**

#### **Management System**

Rattan utilization license is awarded by the Department of Environment and Natural Resources (DENR) to the most qualified bidder in the form of 5,000 ha blocks. An allowable annual cut (AAC) is estimated based from a 5 percent NTFP national inventory

data and using a rotation of 10 years; utilization efficiency was likewise considered.

Within the San Mariano area, there were six blocks awarded to bidders. The AAC for each block was based from rattan stocking gathered in the inventory conducted and assumed that each of the block is entirely covered with forests. The total AAC for all the blocks within the San Mariano area is 1,519,064 lineal meters (l.m.).

### Utilization System

**Activities and participants involved.** The activities involved in the rattan utilization system in San Mariano include cutting or gathering, sectioning, varying transportation activities, different forms of processing, and various disposal or sale types. These activities involve different participants or actors: gatherer, agent, licensee, and buyer. These activities and actors are shown in Table 1.

The interrelationships of the different activities enumerated in Table 1 are illustrated in Figure 4. The sequence of activities depends on the actors involved.

**Processing of rattan.** Processing include manual or mechanical splitting, scraping, and assembly. The intermediate products from poles include scraped poles, rattan splits from manual splitting or malacca from mechanical splitting, square core, round core, center core, and wicker. After assembly (e.g. weaving), the final products are the different types and forms of baskets, furnitures, and other novelty items. The interrelationships of the different steps in the rattan processing cycle and the inputs/outputs for each step are shown in Figure 5.

**Pricing.** Prices of rattan vary among agents, between agents and licensees, and among licensees. Price is a function of the species and size of rattan pole, but prices may also vary depending upon the place of disposal. The prices of semi-processed and processed forms also vary between and among actors. Poles may vary from ₱1.00 to ₱3.50 for 1/2-inch diameter poles and from ₱7.50 to ₱15.00 for 1-1/4-inch poles. Splits cost around ₱23.00 per hundred while a bundle of malacca (60 pieces) costs ₱7.00.

Ideally, the price of a pole is dictated by its size which is based from scaling. When handmade fixed calipers are used, scaling a truckload of rattan takes almost two days. In some instances, rattans are scaled into three categories in order to save time: (1) small (1/2 to 5/8 inc), (2) medium (3/4 to 7/8 inch), and large (1



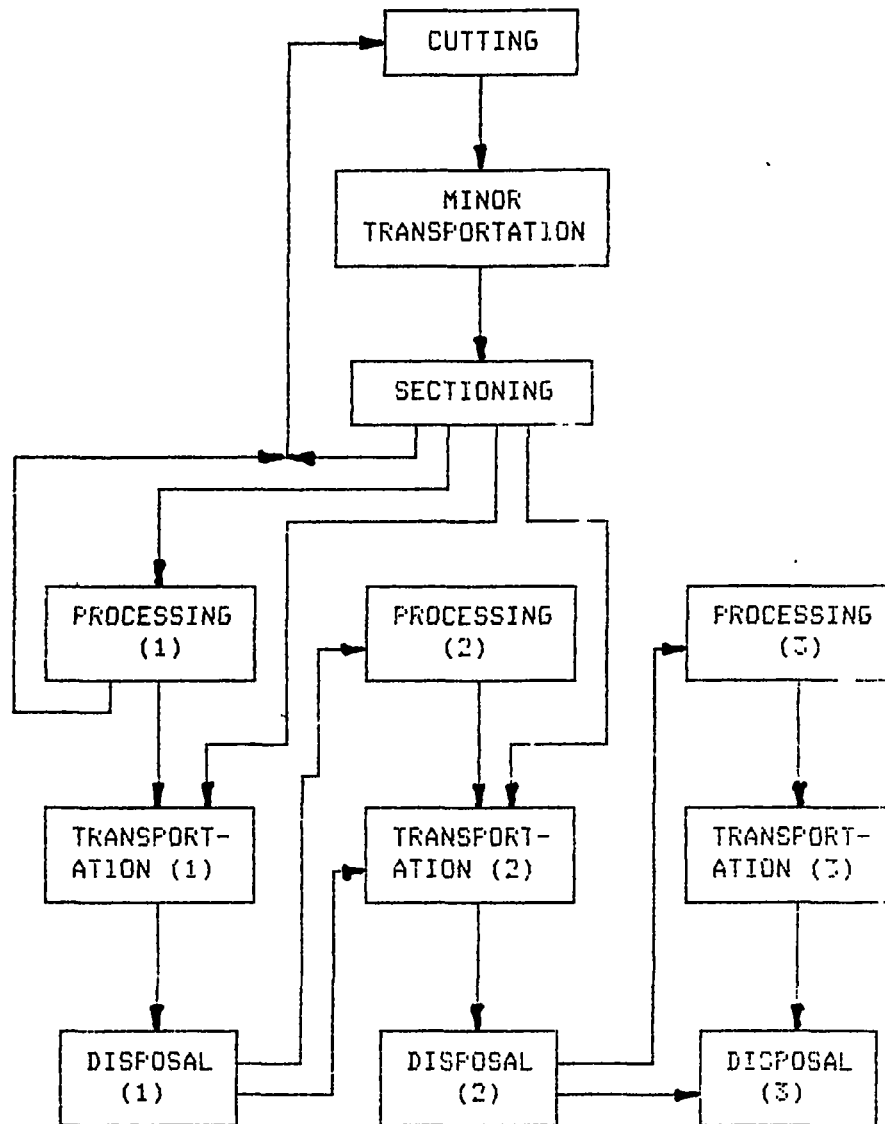


Figure 4. Flowchart of the different activities in rattan trading in San Mariano, Isabela.

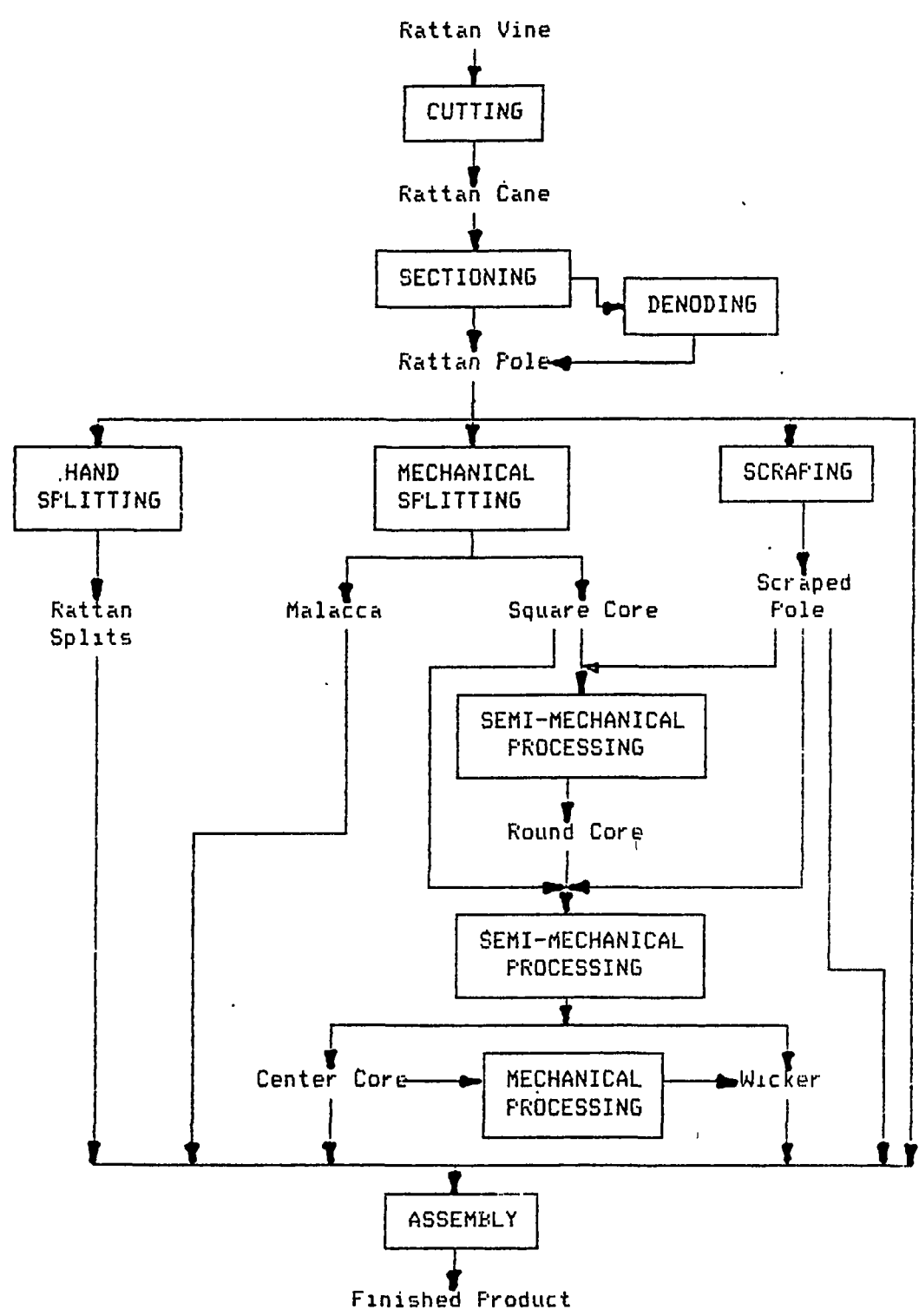


Figure 5. Flowchart showing rattan processing and the input and output forms.

Table 1. Activities and participants in the rattan utilization system in San Mariano, Isabela and the venue of transaction.

ACTIVITY	: PARTICIPANTS	: VENUE
Cutting	Gatherer	Stump site
Minor transport- ation	Gatherer	Roadside Camp site
Sectioning	Gatherer	Roadside Camp site
Processing (1)	Gatherer	Roadside Camp site
Transportation (1)	Gatherer Agent Licensee	Barangay
Disposal (1)	Gatherer-Agent	Barangay
Processing (2)	Agent	Barangay
Transportation (2)	Gatherer Agent Licensee	Town site
Disposal (2)	Gatherer-licensee Agent-licensee	Town site
Processing (3)	Licensee	Town site
Disposal (3)	Licensee-Buyer	Town site Out-of-town

inch and larger). Sometimes, poles are paid based from one size, a scheme without any scaling, which is even faster. This last scheme is usually resorted when the gatherer needs cash immediately.

When rattan raw products are transported, forest charges are collected. This depends on the sizes:  $\leq 2$  cm, ₱30.00 per thousand l.m.;  $> 2$  cm, ₱75.00; and for split rattan, ₱50.00 per kg.

### Buho Utilization System in San Mariano, Isabela

#### Management System

There is no specific government management system implemented for buho in the area because of the absence of a licensee. There was once a licensee who controlled buho extraction, transportation, and other related transactions. But instead of operating his

concession area, he collects a fee for each buho taken out from San Mariano in exchange of the required documents (invoice and certification that the products came from legitimate sources). He was evaded by gatherers and traders because of the exorbitant fees he imposed. Eventually, he surrendered his license because he was not able to control buho gathering within the area.

Since buho transported outside San Mariano need a certificate of origin of the product, in addition to the forest charges payment, the common practice is to get a certification that the buho comes from private lands. This certification is usually issued by a Barangay captain and even products taken from public forest areas are certified to have come from private lands.

### Utilization System

**Activities and participants.** Buho gathering is conducted in all accessible places where buho is available. Although there is no buho license holder the present utilization has a distinct hierarchy of activities involving different actors. The participants involved include the gatherers, the agents, and the transporters. The activities include gathering (cutting, lopping, and topping), minor and major transportation, and disposal or sale. These activities and actors (with the place of activity) are shown in Table 2.

The initial activity is cutting a pre-selected mature buho stem. The bushy branches are then lopped. When a length of 5 m is cleared the pole or culm is cut (or topped). The product output thus is a 5-m clean pole. The next culm is then gathered following the same sequence. This process is done until a batch of 25 pieces (locally called "paguyudan") will be completed. A hole is made at the base of each so that they can be interlinked (in 10-, 10-, and 5-piece groupings) and assembled into a carabao-drawn sledge for transportation. Series of transport-disposal options are then possible (Fig. 6).

After harvesting, the bundles in batch may be transported (minor transportation) from the stump site to either a station or near a river/road where the long haul (major transportation) can start. In the major transportation, the bundles assembled as rafts will be floated downstream to a point near the town proper for disposal. Sometimes, disposal may take place within the station or the river/road side and the buyer/agent will take charge of the long haul.

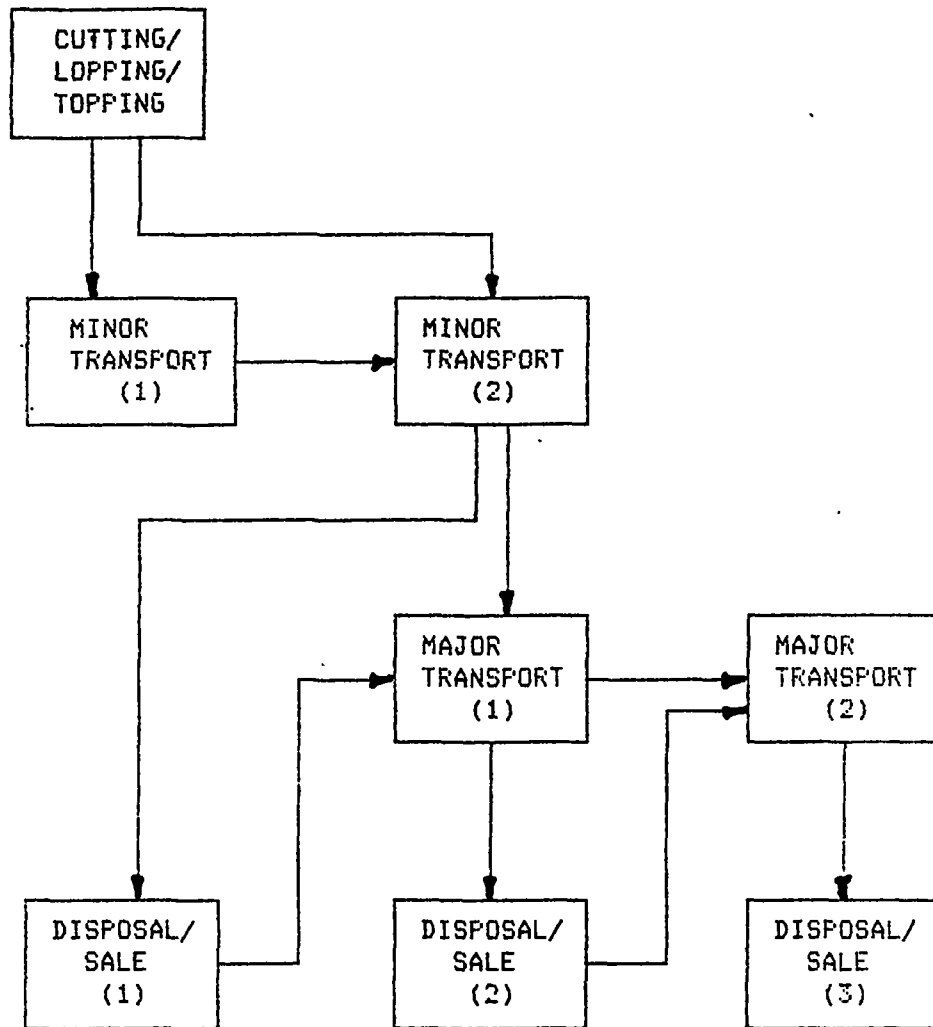


Figure 6. Flowchart of the different activities in buho trading in San Mariano, Isabela.

Table 2. Activities and participants involved in the buho utilization system and the places of transactions.

ACTIVITY	PARTICIPANTS	VENUE
Cutting/Lopping Topping	Gatherer	Cutting area
Minor transport (1)	Gatherer	Cutting area- House/Station
Minor transport (2)	Gatherer	House/Station- River/Road side
Disposal (1)	Gatherer-Agent Gatherer-Trader	River/Road side
Major transport (1)	Gatherer "Bugador" Trader	River/Road side -Town area
Disposal (2)	Gatherer-Agent Gatherer-Trader Agent-Trader	Town area
Major transport (2)	Trader	Town area- Destination
Disposal (3)	Trader-User	Destination

At the town proper, the buy-sell transaction may either be a gatherer-agent, or gatherer-trader transaction. In the same place, the trader may buy from the agent so that he can readily come up with a truckload (1,000 to 1,100 pieces) of buho. From San Mariano, buho is transported to different parts of Isabela. Sometimes, bigger rafts are assembled for transportation to as far as Tuguegarao, Cagayan. The final disposal to the end-use is done by the trader at the final destination of the products.

**Pricing.** The buying price, usually dictated by the agent, may be as low as ₱25.00 per bundle (1 "paguyudan"). Sometimes it may reach ₱100.00 per bundle when the supply is low and the demand from buyers outside San Mariano is very high. Demand is high just after rice harvest in these areas or during tobacco harvesting time. With good quality buho, the price ranges from ₱60.00 to ₱70.00 per bundle. The selling price at the end users place outside San Mariano is at least ₱175.00 per bundle.

A forest charge of ₱0.50 per piece, paid to the local government, is collected if buho is transported outside San Mariano.

**Socio-Economic Profile of NTFP Gatherers  
in San Mariano, Isabela**

The socio-economic profile of the gatherer-respondents covered by the study are herein briefly discussed. The rattan gatherers and the buho gatherers are discussed separately when there are interesting comparisons between them. Otherwise, they are presented as one, as NTFP gatherers.

**Demographic Characteristics  
of NTFP Gatherers**

**Place of origin and length of residence.** Most of the rattan gatherers (64 percent) are not from Isabela. They come from as far as the Bicol provinces, Quezon, and Aurora and only recently; average residence is 12 years (46 percent resided less than 5 years). On the other hand, almost all of the buho gatherers (95 percent) come from the province and most of them are residents in the area; average stay is 22 years.

**Age of gatherers, household size and children.** Rattan gatherers are generally younger than rattan gatherers (29 years old against 35 years old). Average household sizes are five (ranging from 1 to 14) and six (2 to 9), respectively. The average number of children are three and four. Most of the children are less than 16 years old.

**Household head occupation.** Eighty seven (87) percent of the NTFP gatherers (80 percent for rattan gatherers and 97 percent for buho gatherers) are basically farmers. The household, however, has other sources of cash income derived by the family head or by other members of the household.

**Property Ownership**

**Land ownership and use.** Around a third (31 percent) of the rattan gatherers do not own any piece of land. However, almost all of the buho gatherers (97 percent) own at least one. The average area of land owned by the rattan gatherers is 3.46 ha; this includes claims to abandoned kaingin areas (those under fallow). In comparison the buho gatherers have landholdings of 2.41 ha, most of which are in alienable and disposable (A&D) areas. The average farm area used by rattan and buho gatherers are 2.17 ha and 2.33 ha, respectively.

**Draft animal.** Most of the NTFP gatherers own at least one carabao. The animal is a necessity in NTFP gathering but much more so in farming. Some gatherers who do not own one borrow from their

relatives in time of need. Only the rattan gatherers from outside the Region, the full-time gatherers, do not own carabao.

### **Agricultural Activities**

Crops raised and yield. Rice, corn and banana are the major crops raised by the NTFP gatherers. Rice and corn are the staple food in the area. In the upland inaccessible areas, upland rice and corn (white) are extensively raised just for home consumption. In the more accessible areas within the floodplains, high yielding corn (yellow) are raised for commercial purposes. On the average, crop yield for all crops raised by the gatherers is very low. In comparison, relatively higher yields are obtained by buho gatherers whose farms are usually in the floodplain than by the rattan gatherers whose farms are found in the uplands.

Fertilizer use. Very few NTFP gatherers use fertilizers for crop production because of the inaccessibility of their farms and the prohibitive costs of fertilizers. Only those who stay in the floodplains and who raise yellow corn use fertilizers.

### **Sources of Household Income**

Income from agriculture. Almost two-thirds (56 percent) of the rattan gatherers did not obtain any cash income from agriculture (as compared to 31 percent of the buho gatherers). This means that they either only produce crops for home consumption. Also, the inaccessibility of their farms does not permit them to sell their products. For those who sold parts of their produce, only 8 percent of the rattan gatherers (as against 31 percent of the buho gatherers) had cash income of more than ₱10,000.00.

Income from other sources. Aside from agriculture, other sources of income of the household include: formal (employees), informal (paid labor), logging (mechanized), and "unmechanized" logging (locally called "water logging").

Formal cash income (derived from regular employment) is available to very few households (rattan gatherers, 8.47 percent; buho gatherers, 2.56 percent). However, majority of the gatherers have informal cash income sources (66 percent for rattan, 72 percent for buho).

Some of the households involved in rattan gathering (17 percent) have cash income coming from logging. This means that a member of the household is either a bulldozer operator, a truck driver, or a chainsaw operator. None of the buho gatherers is involved in logging. A common source of income of many inhabitants of San Mariano is "water logging," a method used herein to mean



transporting squared logs through the river systems. As for the NTFP gatherers, 32 percent of rattan gatherers and 38 percent of the buho gatherers augmented their household cash income through this type of logging.

### **Non-Timber Forest Products Gathering**

Involvement in NTFP gathering. As discussed, most of the gatherers are farmers. They do NTFP gathering only on a part-time basis. Only 14 percent of the rattan gatherers and none of the buho gatherers are doing it on full-time basis. Eighty (80) percent of the rattan gatherers are doing it for the first time (involvement is not more than one year) and only 5 percent were involved in it for more than 2 years. In comparison, only 10 percent of the buho gatherers are doing it for the first time and that 74 percent have been doing it for more than 2 years.

Cutting area and accessibility. Of the rattan gatherers, 76 percent are within 10 km away from the cutting area; the average distance is 12 km. The buho gatherer's house is relatively closer to the cutting area (95 percent within 5 km away). Likewise, the total hauling distance for the transportation of rattan is more than that of buho (30 km and 24 km, respectively).

Frequency of trips and volume hauled per trip. Most of the NTFP gatherers (80 percent for rattan, 90 percent for buho) make less than 24 trips per year (2 trips per month). They make 21 and 14 trips per year, respectively. More than half of both gatherers (both 56 percent) haul not more than 200 poles per trip. One rattan pole is 3.7 m long while a buho pole is 5 m long. Usually, three or more poles are derived from each rattan cane (plant) while only one pole is obtained from each buho trunk. Proportionate to the poles hauled, 56 percent of the rattan gatherers hauled less than 800 l.m. (216 poles) of rattan. For buho gatherers, 82 percent hauled at least 800 l.m. (160 poles).

Volume hauled per year and income. Most of the rattan gatherers (64 percent) are capable of gathering and delivering only up to 5,000 l.m. of rattan (around 4,000 poles) per year. In comparison, most of the buho gatherers (59 percent) can gather and deliver from 5,000 to 15,000 l.m. (1,000 to 3,000 poles) per year. Very meager portion of the household income is derived from NTFPs: 83 percent of rattan gatherers and 74 percent of the buho gatherers earn not more than ₱5,000.00 per year from NTFPs.

**Distribution of Household  
Total Cash Income**

The average cash income of the household coming from different sources for rattan gatherers, buho gatherers, and NTFP gatherers (rattan and buho combined) are separately shown in Table 3. Their separate distributions are illustrated in Figures 7, 8, and 9.

The household income of rattan gatherers mostly came from water logging and informal sources, 24.78 percent and 23.38 percent of the total income, respectively. Buho gatherers' income came primarily from agriculture (46.05 percent) and "unmechanized" logging (30.39 percent). The mean income from NTFPs are only ₱3,354 and ₱4,573 for rattan and buho gatherers, respectively. The total annual household income from different sources are ₱20,642.33 and ₱33,522.07, respectively for the two groups.

Table 3. Average annual cash income distribution of NTFP gatherers based from different sources.

SOURCE OF INCOME BY GROUP	CASH INCOME (Pesos)	PERCENT OF TOTAL
<b>Rattan gatherers:</b>		
Agricultural activities	₱ 2,197.55	10.64
Formal sources	1,352.41	6.55
Informal sources	4,826.41	23.38
Logging activities	3,798.03	18.40
"Unmechanized" logging	5,114.32	24.78
Rattan gathering	3,353.61	16.25
Total	₱20,642.33	100.00
<b>Buho gatherers:</b>		
Agricultural activities	15,435.64	46.05
Formal sources	657.89	1.96
Informal sources	2,668.72	7.96
Logging activities	0.00	0.00
"Unmechanized" logging	10,187.18	30.39
Buho gathering	4,572.64	13.64
Total	₱33,522.07	100.00
<b>NTFP gatherers:</b>		
Agricultural activities	7,934.06	30.27
Formal sources	1,080.33	4.12
Informal sources	3,943.86	15.04
Logging activities	2,286.57	8.72
"Unmechanized" logging	7,133.11	27.21
NTFP gathering	3,838.73	14.64
Total	₱26,216.66	100.00

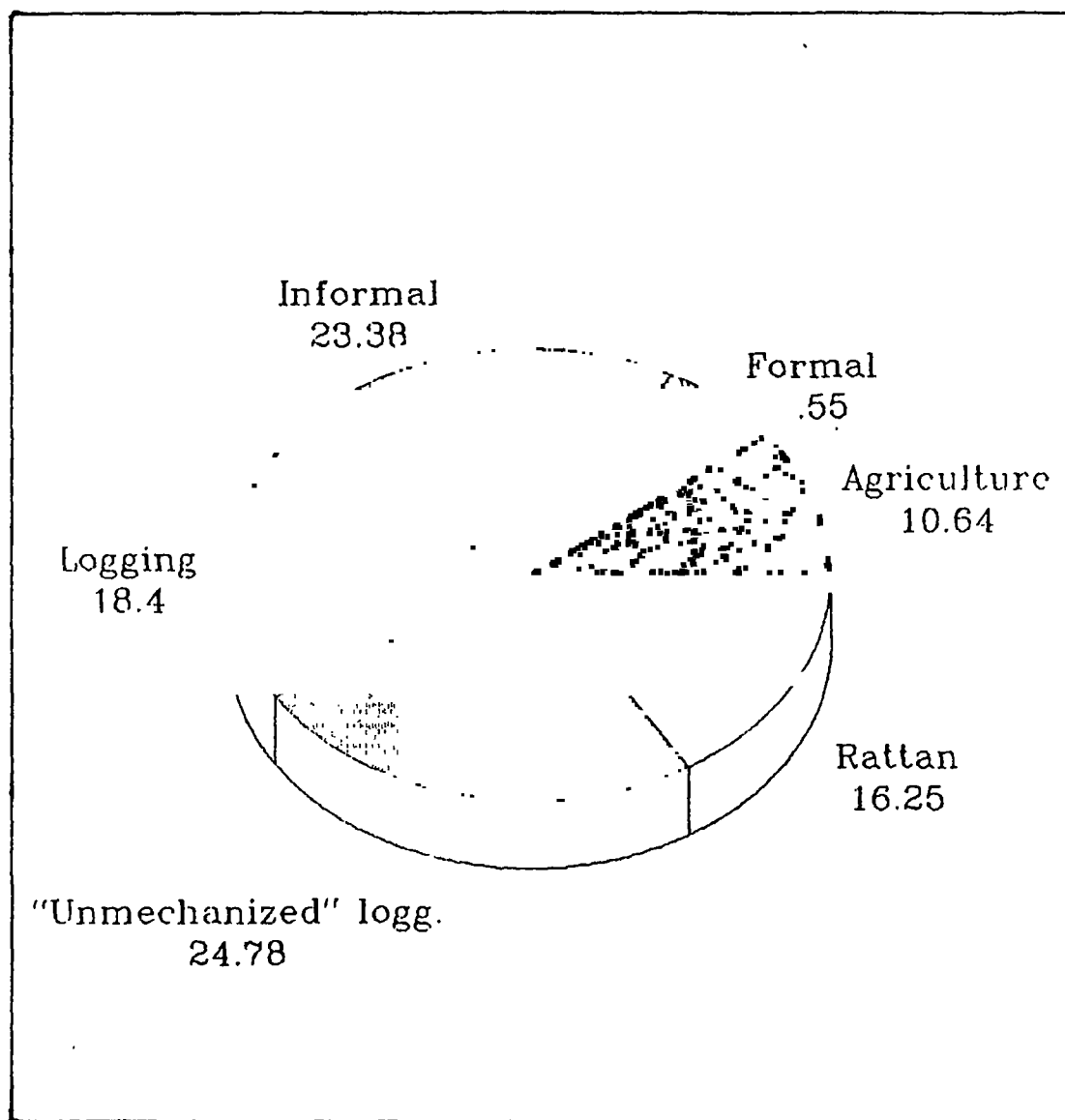


Figure 7. Mean cash income of rattan gatherers from different sources (in percent).

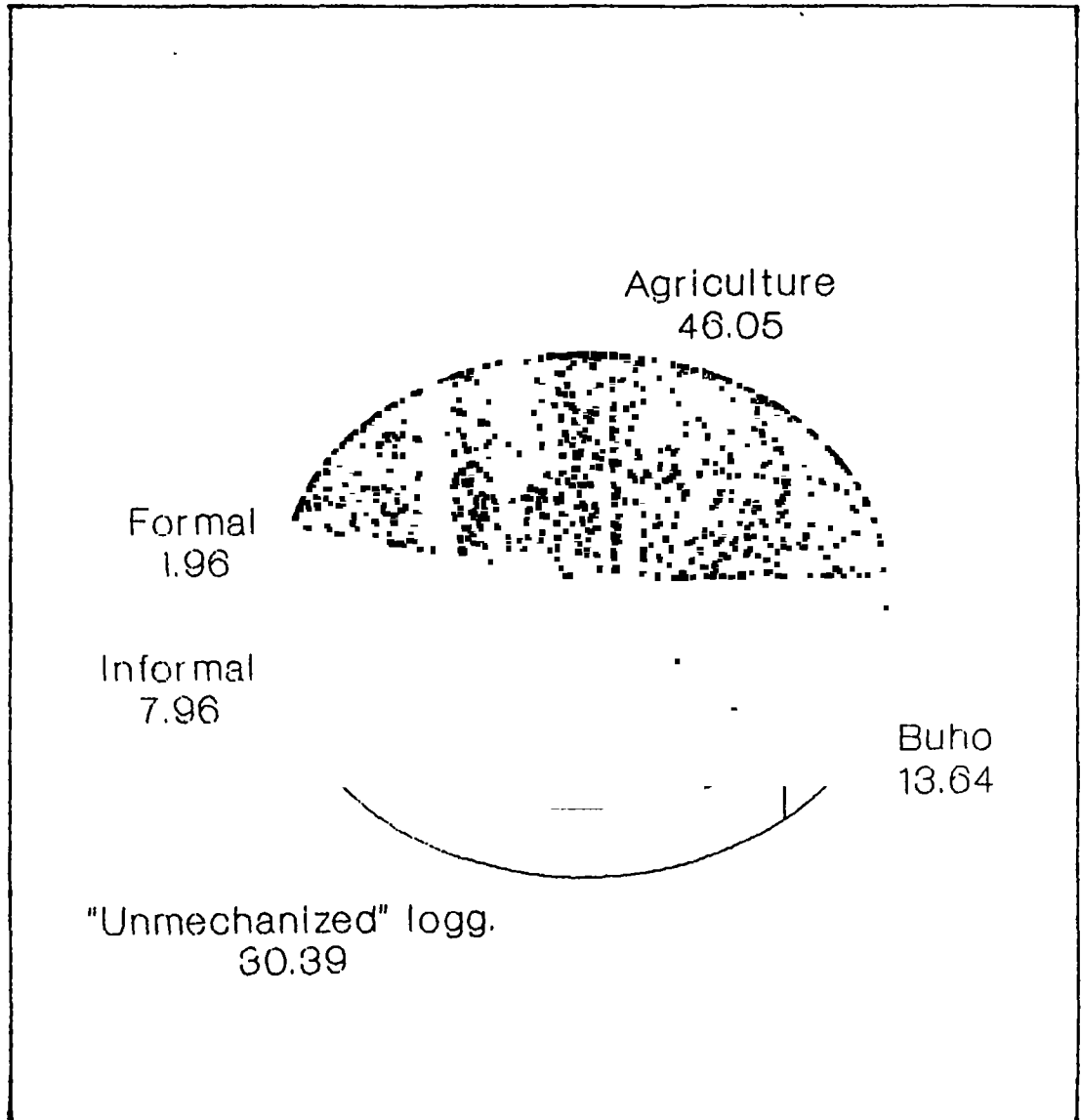


Figure 8. Mean cash income of buho gatherers from different sources (in percent).

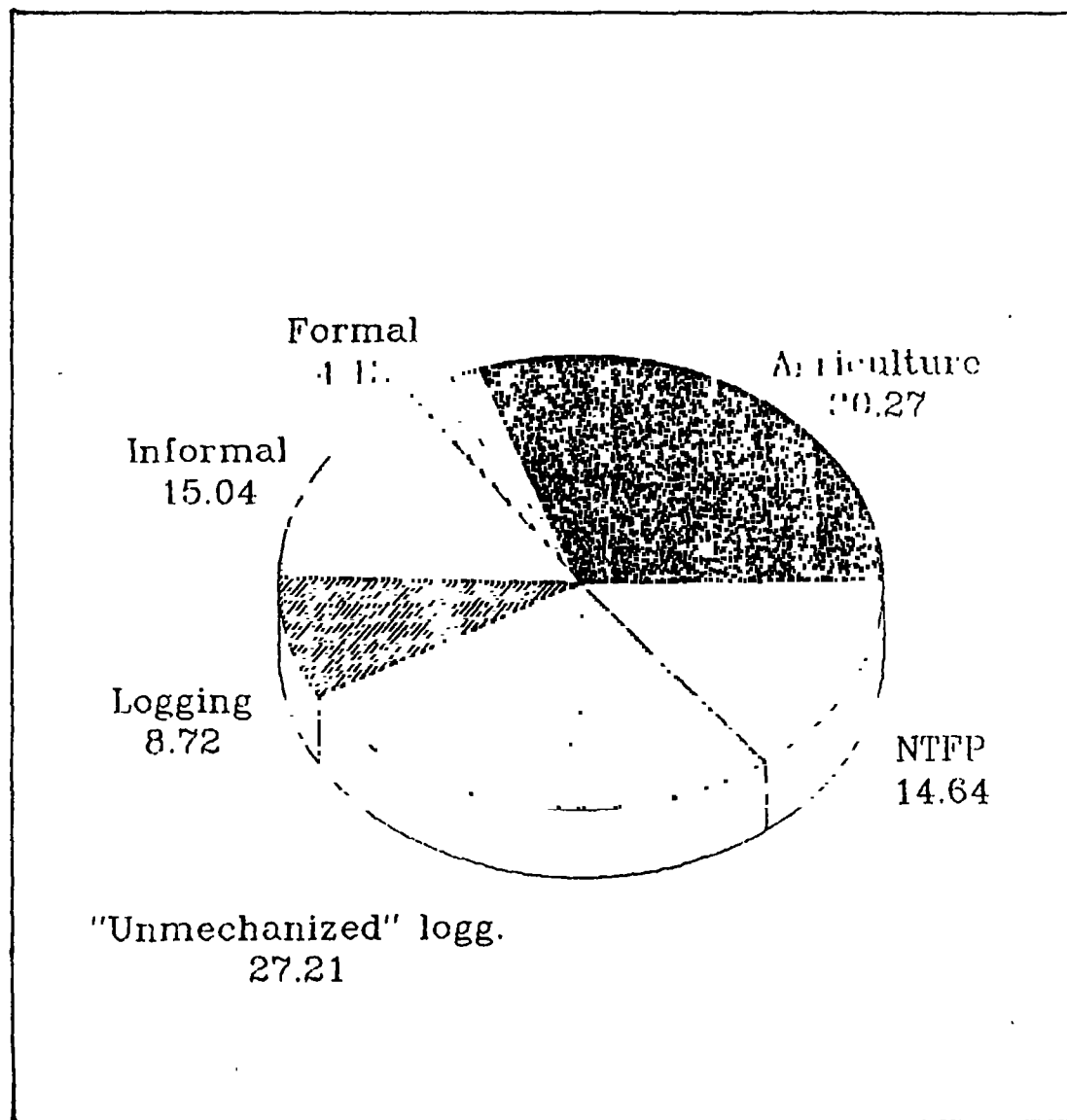


Figure 9. Mean cash income of NTFP gatherers from different sources (in percent).

## Policy Issues and Recommendations

### **On NTFP Utilization**

NTFP utilization in San Mariano is a complex system composed of interrelated, interacting and interdependent subsystems. Rattan and buho are the major NTFPs utilized in the area and both products contribute significantly to the household income of the participants involved. NTFP utilization is a major factor in the economy of the municipality. Hence, it is necessary for the government, preferably the local government, to systematize NTFP utilization within the area to perpetuate this source of income for the townspeople. As a prerequisite, the local government unit must realize that there are alternatives to logging even when they may not be as lucrative. Equally important is for them to understand that they should play an active role in its rational use or conservation.

The utilization of NTFPs is influenced by many factors which may be modified (or manipulated to some extent) in order to come up with the most favorable and desirable outcome. The making of any policy decision concerning NTFPs, therefore, should always give due consideration to these factors. Preferably, the policy should be based on known and established cause-and-effect relationships of these factors.

Rational utilization of NTFPs is dependent upon accurate, honest-to-goodness monitoring of all activities. This will ensure that deviations from projected outputs can be checked regularly and immediately. Complete verifications and validations should be undertaken at the cutting area, at transit routes and even at outlets within the municipality.

The support of the people is very necessary for the success of any natural resource conservation program. The environmental issue of NTFP utilization should first be realized by the people so they will be concerned and responsible for their management, protection, utilization and conservation.

The income derived from NTFP has a lopsided distribution. There tends to be an inverse relationship between effort and income; those who exerted the most efforts received the least share in the total income derived in the trading process. Efforts should be exerted to unite the lowly local gatherers to maximize the share that will accrue to them. The powerful and the mighty, the holders of power and monopoly, must be neutralized.

NTFP utilization within the area must be properly legitimized so necessary regulations can be implemented and monitored. This should be spearheaded and undertaken by the local government.

NTFPs are just components of the forest ecosystem. NTFP extraction and utilization will affect the whole ecosystem as the NTFPs are affected by any change in the ecosystem. Therefore, other areas of concern in the ecosystem should be considered in the utilization of NTFPs, e.g., the soil, biodiversity, other on-site effects, off-site effects, etc. These areas of concern, to encompass the whole interrelationships and interactions between and among them, should be prioritized for future researches.

Since NTFPs are gathered by anybody anywhere (open access), it is necessary that some control measures should be devised to rationalize their utilization. Otherwise, the occurrence of "tragedy of the commons" in the San Mariano, Isabela area is not very remote.

### **On Rattan Gathering**

There is a need to improve the present management system implemented by the government for rattan. The licensing system should take into consideration the capability of the awardees before they are awarded a block to operate. Some "awardees" lack the resources so they either do not operate or let others operate their concessions. A background investigation or prequalification proceedings may be undertaken to ensure the effective management of the rattan blocks to be awarded. The required payment of a performance bond may not be enough as an indicator of capability to operate.

The prescribed minimum harvestable length of 25 m for rattan is impractical given the realities in the field. The regional stocking conditions can hardly meet this restriction. This limit must be reviewed and revised.

Area delineation of the blocks were based from maps. The map should be validated to reflect ground truths and the boundaries of the blocks must be clearly delineated in the ground. Monuments must be erected legibly so as to ensure that activities are where they are supposed to be. Boundary delineation is a prerequisite to sound management of rattan utilization.

Through ground validations also, vegetative cover types within each block can be classified or verified. This would ensure that the blocks to be awarded are really found in forested areas and that they are adequately stocked as they are supposed to be.

Tracing the source block for each bulk of rattan gathered is based on the information from the gatherer. This aggravates the prevalent conflicts between license holders in claiming rattan brought to the town. If the block are properly delineated, the identification of source blocks can be facilitated. Proper

monitoring of blocks must be systematized by the government for this purpose.

Faster and easier ways of scaling rattan products should be devised so that prices for rattan products can be standardized. This would ensure that gatherers will not be exploited. Research aspects on this regard should be prioritized by research agencies and educational institutions.

Rattan gathering was done without due regard to the number of poles that may be derived from each culm. Overcutting is usually done in relatively more accessible areas. An annual cutting area should be properly delineated, strictly implemented, and monitored.

There is a need to improve the present system of monitoring rattan products that are transported. Underestimation and undervaluation must be checked to maximize revenues for the government.

#### **On Buho Gathering**

Since there is no legitimate management system for buho in the area, there is a need for the establishment of a systematic one. With the local government unit (LGU) empowerment, the possibility of using the LGU for the management of this resource should be considered. Aside from maximization of revenues for the government, this would ensure proper implementation of regulation methods. Irregularities can be avoided; management focus can be geared towards sustainability.

The above necessitates the clear delineation of forest areas from allienable and disposable (A&D) areas. Buho harvested from private lands can thus be validated. This would also be a good basis for awarding license(s) within the public forest areas with buho. These would result to the proper management of this natural resource.

For the effective implementation of forest regulation for buho, the cut levels and their transport must be properly monitored. A good monitoring system, e.g., a monitoring station in each of the major outlets, should be designed.

Required documents for the transportation of buho (certificate of origin, permit to transport, etc.) should truly reflect the correct information about the products certified. When document information is dubious, cross-checking should be done in monitoring stations.



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