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**Surviving Natural Resource Decline:
Exploring Gender, Class and Social Capital
in Agbanga, Philippines**

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I. Introduction

Examining change and transition of the Philippines' vast coastal, lowland, and upland ecosystems and the livelihood strategies of the resident resource users provides a fertile ground for understanding the linkages between complex social relations and natural resource management. The following case study depicts rural households in one village that rely on a declining natural resource base for their livelihood, against the backdrop of a changing rural economy. The study explicitly focuses on household livelihood strategies to draw out historically and culturally embedded social relations which shape intra- and inter-household natural resource management strategies. The implications for program and policy are presented.

This study demonstrates that a complex web of social relations based on resource exchange can be linked to specific resource management strategies which at once ensure the villagers' survival and impede local tactics of natural resource preservation or renewal. Villagers in Agbanga rely significantly on *social capital* in the form of exchange networks that provide collective benefits for the community despite the ongoing shift from a subsistence to a market economy.

It is at this intersection that sustainable management of natural resources is sacrificed. Villagers continue to rely on social capital, risking the future loss of physical capital due to natural resource decline.

Although all members of this rural community play a role in the exchange network, class and gender emerge as important social variables that differentiate reliance on the network and place along the succession of exchanges.

The study describes this social infrastructure as the rural actors themselves define it and examines its implication for the perpetuation of the social exchange network as it is linked to the declining natural resource base.

To illustrate the significance of these social concepts and relationships to the study of resource management, the study addresses the following questions:

- 1) How are resource access and control determined and how does this structure affect choices and decisions relating to natural resource management?
- 2) How do social factors such as class and gender structure intra- and inter-household livelihood strategies?

Social Capital "refers to features of social organization, such as networks, norms (of reciprocity), and trust, that facilitate coordination and cooperation for mutual benefit. Social capital enhances the benefits of investment in physical and human capital." (Putnam, 1993).

Social Infrastructure is the diversity of symbols, mechanisms of resource mobilization, and quality of networks provided by social organization and interaction. Social infrastructure is the group-level, interactive aspects of organizations, communities, or institutions." (Flora and Flora, 1993).

II. Principal Findings

1. Across class and gender boundaries, communities rely significantly on social capital in the form of an age-old system of resource exchange as a means of ensuring the collective survival of the community. The diversification of livelihood strategies largely depends on access to social capital.

2. As the modern economy encroaches and population pressures increase, the threat of losing social capital as a source of immediate survival prevents villagers from practicing sustainable natural resource management despite their awareness of the long-term effects.

3. Male livelihood strategies — especially carabao raising and dynamite fishing — impinge on female livelihood strategies such as upland farming and home-based production of goods with local natural resources. Not willing to forego important exchange relations that depend on these male-dominated activities, women's livelihood strategies are curtailed and their attempts at limiting natural resource degradation are thwarted.

4. The concept of class, as it is characterized by villagers in Agbanga, is a complex structure whereby wealth and status are equated with the capacity to employ different livelihood strategies through access to resources — that is, a village member's or household's position in the social network. Villagers understand wealth as those elements or characteristics that allow households or individuals to improve their economic and social status.

5. The gendered division of labor in Agbanga is flexible relative to productive work (both women and men are involved in different facets of agricultural work, for instance), but rigid in terms of reproductive work — that is, the daily caring for and maintenance of the children and household.

6. Whereas labor-sharing arrangements form part of the village's social infrastructure, these arrangements, especially in regard to labor, have become increasingly commodified across class boundaries, although share harvesting is still practiced. However, in the fishing industry the importance of exchange relations is still evident, as fishing is largely done collectively.

7. Historically, home-based production activities depended largely on locally available natural resources traditionally acquired in part through exchange relations. As women are increasingly faced with declining availability of resources, these social networks have proven inadequate, forcing women to turn to sources outside the village for raw materials, thereby relying increasingly on the market economy to create work and

less and less on local social capital. This shift poses a serious threat to the perpetuation and stability of secondary incomes and women-centered work.

8. Policies that continue to push privatization of collective resources threaten social capital. Policies that rely totally on social infrastructure to impose sustainable management of natural resources must provide alternative economic strategies for both men and women.

III. Agbanga: A Tour of Its Natural Resources and the People Who Use Them

Agbanga, one of 30 *barangays*¹ that make up the municipality of Matalom, is located two kilometers south of the *poblacion* or the town proper of Matalom on the island of Leyte (Figure 1). Agbanga consists of approximately 250 hectares in land (Agbanga Barangay Council Survey, 1991). Approximately ninety percent is used for agriculture, two percent is used for residential lots and homes, five percent is in government reserves for nipa groves and general harvest, and three percent is set aside for a school.

The name of this small village is testimony to its general history of natural resource decline. The colonizing Spaniards named the village of Agbanga after an indigenous tree known as *baganga*, which at one time grew abundantly in the area. Like much of Agbanga's natural resources, *baganga* trees no longer dot the landscape. The apparent decline in the natural resource base is largely a consequence of two phenomena: (1) increasing numbers of people drawing from a stagnant or declining resource base; and (2) the integration of a historically subsistence-based economy into a rapidly expanding and competitive market economy. The situation is further complicated by a unique social infrastructure based on resource exchange among villagers, which this study will focus on.

The village of Agbanga spreads across three agro-ecological zones which, both historically and currently, significantly support the economic and subsistence activities of the villagers — especially fishing and agriculture. These zones can be classified as: coastal, lowland, and upland (Figure 2). Significantly, these zones — while supporting quite different activities, vegetation, and animal life — can be conceived of as a single *landscape* whose natural resource problems are interconnected due in large part to the *lifescape* — that is, the social relations and activities of community members — which functions like a bridge linking the impact of the *lifescape* of one zone to another.² The *lifescape* will be discussed and characterized in great detail in subsequent chapters. Here we will take a closer look at the three major zones that make up the landscape.

Along the coastal area is a narrow strip of mangrove and nipa swamp, open beach, and coral reefs. The coastal area is a rich source of fishing for both local fishers and those from neighboring towns and islands. Two kilometers offshore from Agbanga, for example, is Canigao

The natural resource base

The coastland

¹ *Barangay* is the smallest political unit in the Philippines.

² This concept is at the core of the research conducted by SANREM-CRSP. SANREM-CRSP stands for The Sustainable Agriculture and Natural Resource Management Collaborative Research Support Project. It is a 5-year research, training, and information exchange program funded by the United States Agency for International Development. The administrative seat is at the University of Georgia.

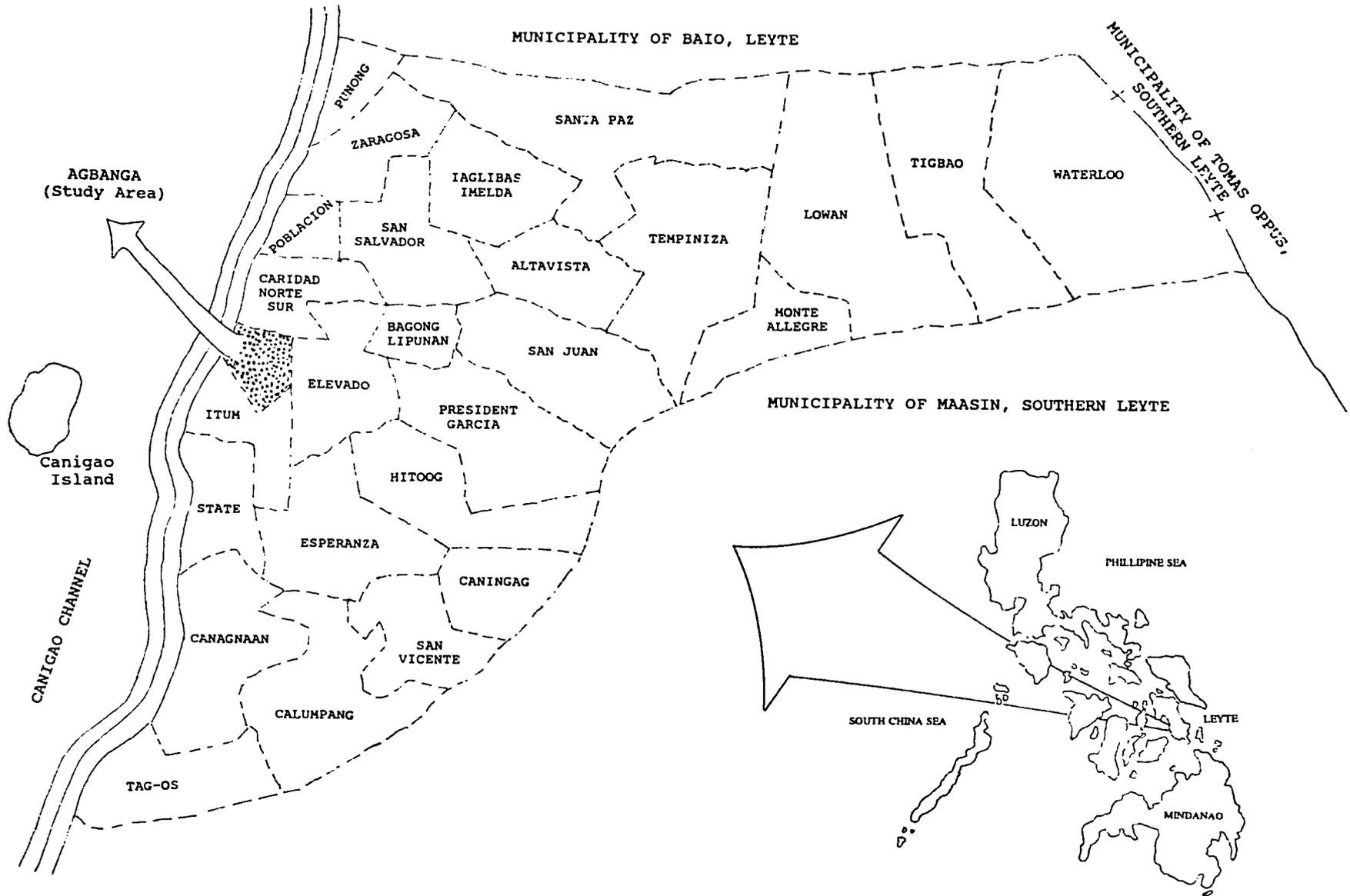


Figure 1. Map of Matalom, Leyte, Philippines.

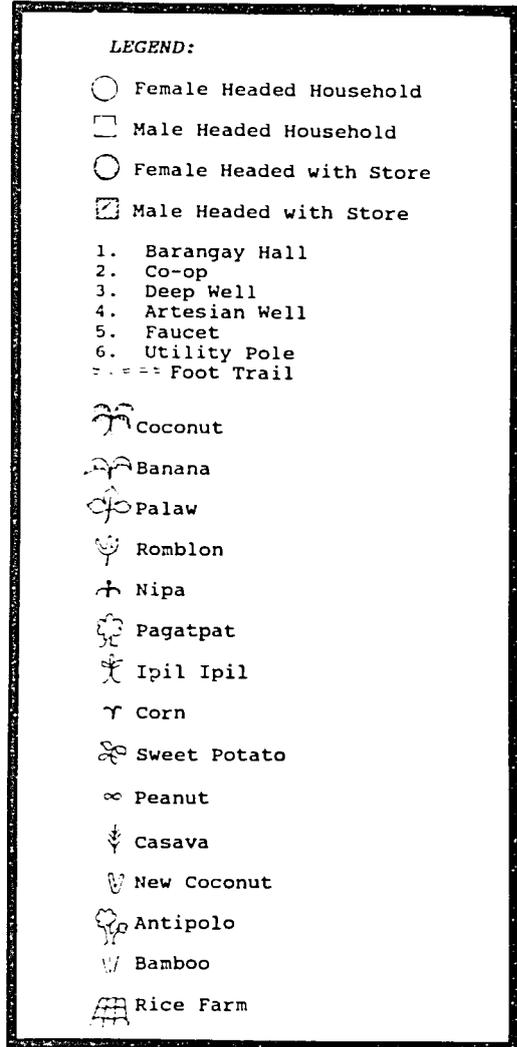
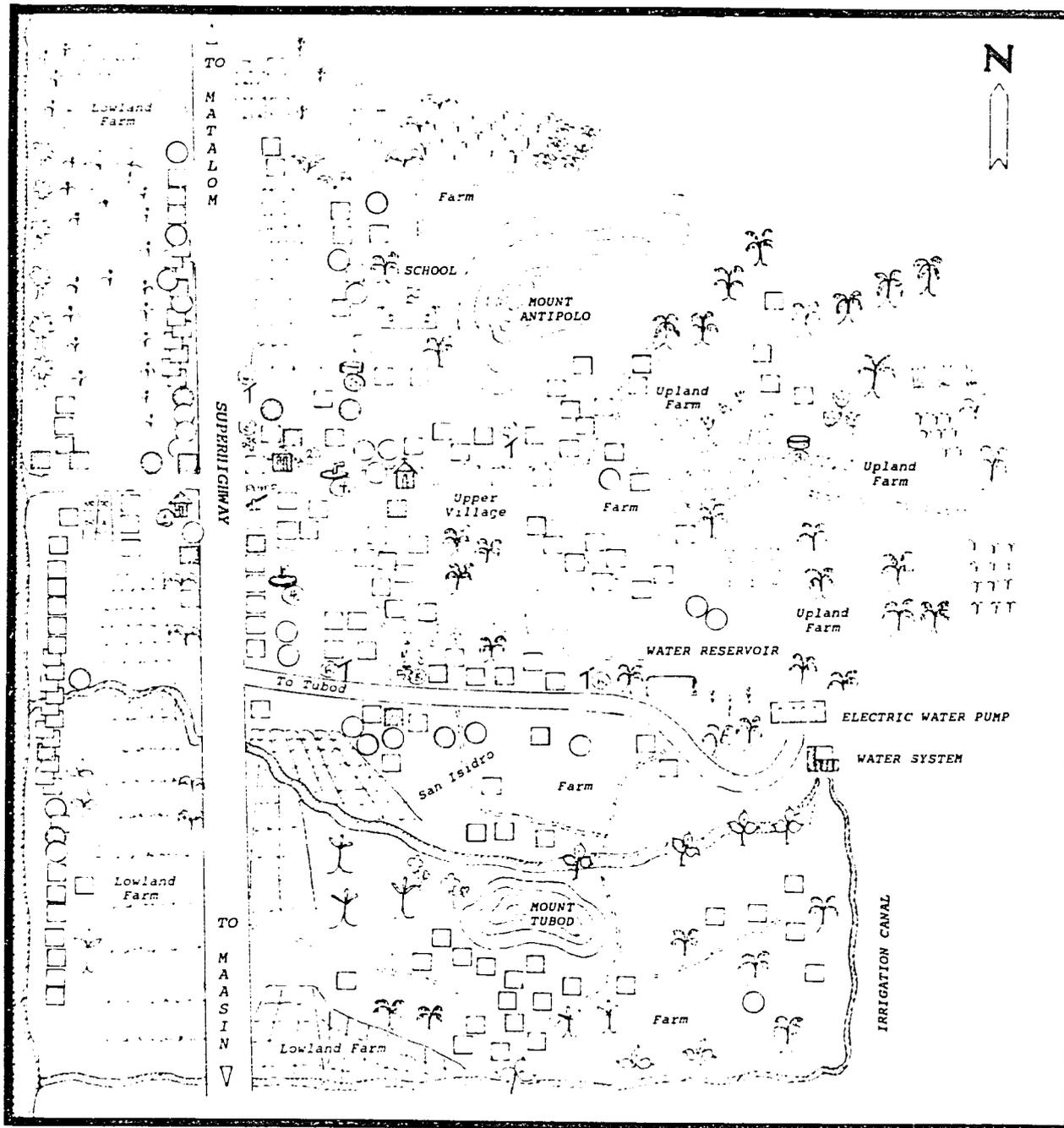


Figure 2. Spot Map of Agbanga.

island — a popular fishing area. Until recently the Canigao Channel itself was considered rich fishing territory. Agbangans now frequently complain of declining yields. Coastal resource degradation appears to be increasingly undermining fishing as a secure economic activity. This degradation can be blamed on a number of readily apparent factors, such as the use of locally-manufactured explosives to blast fish to the surface of the water while indiscriminantly destroying other parts of the ecosystem. Pomeroy (1989) reports that dynamite fishing has significantly destroyed Matalom's original coral reef and the reef around Canigao island. During the period of study, dynamite fishing was also observed around the mangrove area. Indeed, 23% of the households reported engaging in dynamite fishing, probably a conservative figure since others may have felt hesitant to report such illegal activity. Second, this common-property resource, whose fishing population continues to grow, leading to rival consumption, lacks stringent enforcement of regulations. Laws have been instituted against dynamite fishing, and structures of enforcement exist within the Bureau of Fisheries, yet this conspicuous activity persists, diffusing income throughout the village.

The uplands

Agbanga's rainfed upland area is classified into two agricultural land types: flat land (*banica*) and sloping land (*baul*). Mixed and intensive agricultural systems characterize upland cultivation. Farmers rotate subsistence food crops consisting of maize, sweet potatoes, and cassava. A few farmers also grow peanuts and mung bean. Vegetables, other types of rootcrops, and *romblon* (used by the women to weave mats) are commonly grown in the marginal fields. Banana and coconut trees as well as bamboo are found in the upland areas. Durable trees are sparse; leguminous trees are grown along the borders of the farm plots. Like the coastlands, the uplands are characterized by rapid degradation of the natural resource base. Soil erosion and declining soil fertility prevent crops from sustaining households, whose members in turn seek employment in the lowland rice fields. Over-use of this land by an increasing population is the main culprit. For instance, men who tend carabao lead their animals to graze in the upland areas as lowland areas are increasingly devoted to crops. Overgrazing of the upland areas has made it an extremely fragile zone.

The lowlands

The lowlands is the least threatened of the natural resource zones. Although there is some evidence of declining soil fertility, Agbangans seem to have stabilized land degradation in the lowlands. Irrigated rice fields (*lamak*) stretch along Agbanga's lowland area. Water from an upland spring (*tubod*) flows through the hand-excavated canals. With the spring as a reliable water supply, farmers grow rice twice a year — an increase from the traditional yearly rice crop, but a decrease from triple cropping systems inspired by development programs in previous years. Along the earthen dams, which demarcate rice farms, farmers cultivate rootcrops. They also tend a few banana and coconut trees. Harvest is adequate, providing employment and food security to the landless.

Natural disasters

Agbanga occasionally experiences natural calamities. The older residents recall the catastrophic Typhoon Amy in 1949. A year later, the area was stricken by a ten-month drought. A series of typhoons ravaged the area in the early eighties and as recently as 1990, causing major damage to agricultural crops and homes. Such natural disasters complicate the problems of declining natural resources, adding to the degradation and threatening livelihood strategies. Natural disasters have, on occasion, forced Agbangans to alter their income-generating and food-security strategies, which we will examine more closely later.

Oral history reveals that settlers originally came from the islands of Bohol, Cebu, Negros, and Panay. The Boholanos and Cebuanos stayed in the area; traces of *Binul-anon* and *Sugbuanon* are still heard in the spoken dialect. Migrants from Negros and Panay moved to the plains north of Matalom. More migrants, mostly fishers from the small islands of Cebu, came after the Second World War.

Agbanga's population grew from 765 in 1980 to 868 in 1990 — a significant increase of about seven percent (National Census and Statistics Office, 1980; National Statistics Office, 1990). At this rate of increase, growing numbers of people will continue to draw from a dwindling natural resource base, complicating other reasons for natural resource decline and threatening the livelihood strategies.

Despite rapid natural increase, Agbanga has out-migration, particularly of educated young people. The 1980 census shows a sex ratio of 108/100, indicating a presence of more males (393) than females (363), probably because of the higher out-migration rate of younger women seeking urban employment — usually as household help — in order to contribute to the family's income.

According to the 1991 barangay census, Agbanga hosts a relatively young population. Approximately 43% of the population is fifteen or under. The total number of households climbed from 174 in 1990 (National Statistics Office, 1990) to 193 in 1992, an increase of nearly 11% in two years, considerably higher than the annual rate between 1980 and 1990. Furthermore, of these 193 households, thirty-two were headed by women living without male partners for a variety of reasons, the dominant one being the death of the spouse. The increase in number of households is in part a result of the young adults forming their own households — the result of past high rates of fertility, which continued into the 1990s.

Agbanga has ten active community organizations. These organizations form five clusters: agriculture, which involves both credit and technology by the Ministry of Agriculture; the Church; death and youth associations; parent-teacher associations; and local government.

An elected *barangay kapitan* heads the village. The seven sub-villages of the barangay are each represented by elected *purok* leaders, two of whom are females.

The people: A demographic profile

Organization and infrastructure

Agbanga offers modest public facilities — a *barangay* hall (or public meeting place), a reading center, a nursery or seedhouse, a Catholic chapel, a concrete basketball court, and a three-room school building. The village public school employs three teachers and provides primary instruction to 97 pupils (Agbanga Barangay Council Survey, 1991). Thus, nearly all the eligible children are enrolled in elementary school, although attendance decreases as the grades increase.

IV. Social Organization: Livelihood Strategies at the Intersection of Class and Gender

Agbangans employ diverse livelihood strategies to ensure their survival, frequently relying on more than one strategy per household. What is unique about these livelihood strategies is that they are embedded in an age-old practice of resource exchange. Neighbors share their harvest, catch, products, and even labor with one another, allowing households to diversify their income and subsistence resources. Although much property is privatized and physical capital is an indicator of wealth in the community, control of and access to *social capital* is also a measure of assets. Social capital is defined as “features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit” (Putnam, 1993). Villagers, at least indirectly, depend on all three ecological zones to varying degrees for the diversification of livelihood strategies. An individual may own a plot of land in the lowland, but may exchange labor opportunity for the chance to graze his carabao on another villager’s upland plot. Although property is legally considered private (in the case of land) and collective (coastlands), villagers more commonly think of property as a continuum. Through exchange relations community members gain access to resources and land that they do not necessarily own.

A diverse natural resource base is, thus, an important source of the community’s physical, economic, social, and cultural sustenance. Before examining the structure of exchange relations in greater detail, we will first look at the social variables that most significantly influence and characterize exchange relations around natural resources. Access to and use of natural resources in Agbanga is structured according to class and gender. In other words, changes in the quantity and quality of natural resources have differential impacts on women and on men, depending on their socio-economic status.

Livelihood strategies — that is, tactics for ensuring the continued survival as well as the struggle for prosperity — have changed along with the resource base. Our research shows that the response to change, as well as the effects of it, can in many cases be differentiated by gender and socio-economic status. In the next section we will first examine *class* as an important variable in the social infrastructure as the villagers themselves characterize it. In particular we will look at how the breadth of the network of exchange relations depends on class. Second, we will look at the variable *gender* as a social distinction, particularly as it relates to the division of labor. Finally we will examine certain livelihood strategies as a function of resource exchange at the intersection of class and gender as they are currently evolving in response to changing resource conditions.

The concept of *class* as it is characterized by villagers in Agbanga reflects a complex structure whereby wealth and status are equated with the capacity to employ different livelihood strategies through access to resources — that is, a village member’s or household’s position in the

**Social
differentiation
by wealth**

social network. Villagers understand wealth as those elements or characteristics that allow households or individuals to improve their economic and social status. Villagers delineated four classes based on access to certain resources. These resources included the expected ones such as access to land, employment or sources of income, and level of education. The list also included those resources unique to Agbanga's social infrastructure such as migrant remittances, household composition, social networks. While the first and fourth classes have a diametric relationship, the distinction between the two middle classes is in many cases muddy. Respondents attributed the difference between the second and third classes to life cycle stage. The class three tended to be at the beginning of household formation. In the following discussion, we will examine the criteria for wealth, according to our informants, and take a comparative look at the class system.

Production resources

Production resources are the material resources available to households that yield products for market trade or sale and/or for household consumption. Differential availability of resources determines the mix and scale of household livelihood strategies. These resources range from natural resources to material goods or possessions (Figure 3). In Agbanga the most important and abundant material resources include land, equipment, and livestock.

Land ownership is perhaps the most significant indicator of wealth and status, given that it represents one of the primary sources of employment, subsistence, and cash income. Land can be differentiated in terms of its ecological zone: lowland or upland. Upland systems are further classified into sloping or flat. Analysis of land distribution in the village takes into account patterns of ownership, forms of access, and variations in control over land. There are no large landowners in the barangay, and most of the households are tenants to small parcels, often owned by friends or relatives. No one farms more than a hectare of land.

Equipment denotes an enterprise's productive capacity. It includes various kinds of fishing craft and gear, and farm machinery and tools. Therefore, access to equipment, particularly for fishing, is an indicator of social and economic status.

Livestock, like agriculture, provide a significant source of income for the household. Men raise carabao, which are mainly used as draft animals, providing a farmer with labor flexibility. In other words, farmers are not obligated to hire labor to plow their fields because they have the means to do it themselves. They also have the possibility of hiring themselves out as labor for land preparation. Similarly, women raise pigs for multiple purposes: to slaughter and roast during community fiestas, as a market commodity, to breed, and to provide quick cash in emergencies. Households acquire livestock through purchase, inheritance, or participation in a share-breeding arrangement (the *alima* system).

Table 1 shows how the different class groupings compare on some of these items.

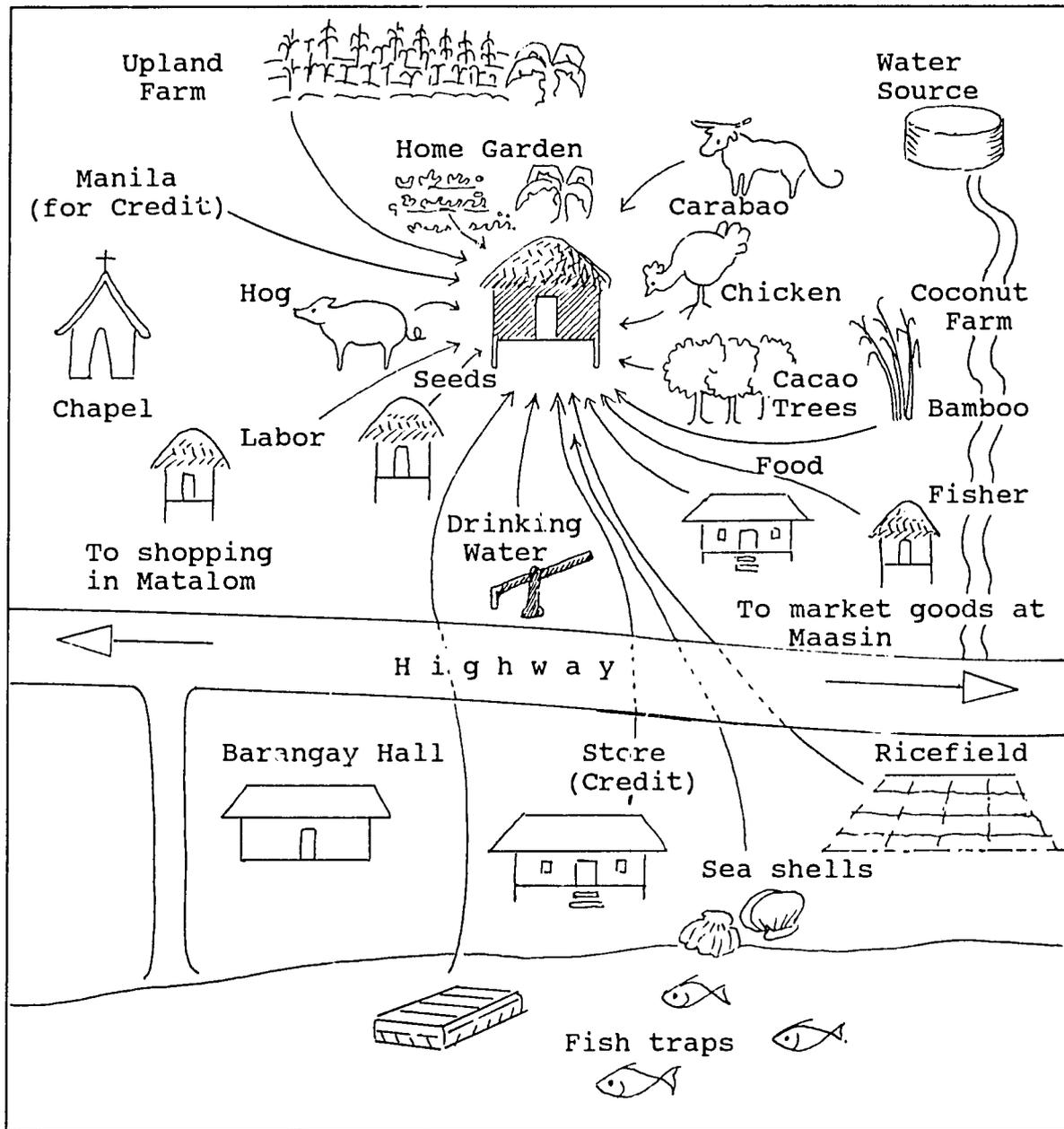


Figure 3. Household Resource Map.

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Table 1. Percentage of Households with Access to Production Resources by Social Class

Class:	I	II	III	IV
LAND				
Lowlands				
Inherited and owner cultivated	18.9	4.5	10.7	12.8
Inherited and tenanted	8.9	4.5	3.6	0
Purchased and owner cultivated	10.8	2.3	1.8	0
Purchased and tenanted	2.7	0	0	0
SLOPE				
Inherited and owner cultivated	2.7	4.6	3.6	7.7
Inherited and tenanted	0	0	1.8	2.6
Purchased and owner cultivated	2.7	0	1.8	0
Purchased and tenanted	0	0	1.8	0
UPLANDS				
Inherited and owner cultivated	32.4	25	14.3	23.1
Inherited and tenanted	8.1	2.3	7.1	0
Purchased and owner cultivated	10.8	2.3	7.2	2.6
Purchased and tenanted	2.7	0	1.8	0
LIVESTOCK				
Caraboa raising	27	36.4	28.6	25.6
Hog raising	56.8	22.7	30.4	15.4
EQUIPMENT*				
Motorized boats	10.8	13.6	10.7	15.4
Non-motorized boats	8.1	9.1	14.3	7.7

Note: Rows and columns do not necessarily add up to 100 percent, because this is not an exhaustive nor mutually exclusive list of productive resources.

*These figures reflect the percentage of members in each social class who own at least one boat. Only members in Class I reported owning more than one boat.

Cash income

Cash income provides some households with the opportunity to accumulate savings toward the financing of productive enterprises. For others, cash income is a vital resource to meet household members' daily subsistence needs through the purchase of food items they do not grow themselves. Cash typically comes from family businesses, migrant remittances, and formal sector employment or wage labor.

Businesses in Agbanga are entrepreneurial activities including management of *sari-sari* stores, operation of motorcycle cabs (pedicabs), fish processing and vending, and other types of petty trading and semi-industrial home work, which is mostly done by women.

Remittances, especially from young adults working outside Agbanga, constitute an important source of income for many households. Remittances are mainly used for households' daily consumption and production needs. In the more prosperous households, remittances are used to invest in entrepreneurial activities, purchase material assets, and remodel dwellings.

Employment in the *formal sector* provides the security of regular cash income. Several households in Agbanga have members who are teachers or government bureaucrats. Both men and women are found in

these types of professions, for which education is a prime qualification. Other households depend on seasonal wage labor, particularly in the agricultural sector.

Table 2 shows source of cash income by social class.

**Table 2. Source of Cash Income by Social Class
(percentage of households)**

Class	I	II	III	IV
Monetary returns from group fishing	18.9	34.1	30.4	35.9
Sell processed food (predominantly women)	5.4	18.2	7.1	7.7
Receive remittances	45.9	43.2	46.4	35.9
Owns sari-sari store	16.2	6.8	5.4	10.3

Note: Rows and columns do not necessarily add up to 100 percent, because this list is neither exhaustive nor mutually exclusive.

Education is highly valued in Filipino society. Education can be viewed as the major contributor to human capital in Agbanga, and it is appreciated for that reason. Households are differentiated by their capacity to allocate resources towards their children's college education, which is viewed as a way out of farming and into high-paying white-collar or skilled occupations. A college degree not only ensures a higher economic status but accords prestige to the family. In this instance, prestige is the stronger indicator of wealth. Boys and girls are encouraged to attend and excel in school. However, among the poorest families, because the children's labor is often needed at home, their academic activity is curtailed. If financial resources are limited, parents still choose to invest in those children, male or female, who aspire to go to school or earn a degree. Commonly, older siblings with financial means, who were once supported by their parents, reciprocate by sponsoring their younger siblings' college education.

Table 3 shows presence of a household member with at least some college education by social class.

Table 3. Education by Social Class (percentage of households)

Class	I	II	III	IV
At least one college graduate in the household	24.3	18.2	5.4	0

Note: Rows and columns do not necessarily add up to 100 percent, as this list is not exhaustive nor mutually exclusive.

Education

Household composition

Age, physical condition, and gender of household members determine to some extent a household's ability to employ multiple income livelihood strategies. These criteria can be distinguished from the previous ones in that they depend partially on the *life cycle stage* of household members rather than on their education or skill level. For instance, the presence of adults in their prime productive years implies the availability of labor for wage-earning activities as well as household consumption and maintenance. Limited employment opportunities in the village encourage young men and especially young women to migrate to Manila to seek employment either as domestic helpers or as factory workers. As mentioned earlier, out-migrants make vital contributions to the household economy through their cash remittances and material contributions.

Children are also depended upon for their contributions to income generating and subsistence activities. They participate in exchange relations, fulfilling part of the family's labor obligations. Children — both boys and girls — participate in nearly all types of productive work from fishing to agriculture, although they never account for the bulk of labor in any one sector.

Presence of male householders (all households had females present) is shown in Table 4.

Table 4. Household Composition by Social Class

Class	I	II	III	IV
Presence of males in household* (percentage of households in each class)	78.4	84.1	91.1	79.5

*Females were present in all households.

The *physical condition or health* of household members either limits or encourages their ability to engage in productive activities. Physical condition is an important indicator of the dietary and nutritional status of household members.

Gender is perhaps one of the most important variables in household composition, especially as it relates to livelihood strategies. The division of labor in Agbanga is largely structured by gender. Certain activities, tasks, and employment opportunities are gender-exclusive. Men dominate the fishing industry while women make up the bulk of home-based productive activities. In other words, the socio-cultural expectation among villagers is that certain tasks will be performed appropriately only by males or only by females. These norms are deep-seated and are not, as might be assumed, solely based on the biological distinctions between the sexes. Gender refers to the differences in social roles of men and women that are contextually defined. That is, gender roles are socio-culturally, economically, and psychologically determined and can vary over time and among different cultures. As we will explore in detail in the next section, gender

as an organizing variable in social structures is most visible at the level of the household. It is, therefore, crucial to look at intra-household organization in order to understand how gender affects livelihood strategies.

Based on the wealth-ranking exercise determined by the villagers, four distinct classes emerge in Agbanga, which can be ranked according to economic survival and social status. The criteria outlined above determine a household's ability to participate in the social network of exchange relations. There is not, however, a clearly defined positive relationship between class status and participation in the social network of exchange relations. While the upper class tends to have greater access to resources, the second class uses their somewhat reduced access to resources more stridently to broaden and secure their position in the social network. The second class, more than any other, depends on social capital as a livelihood strategy. Since class II is one of the largest classes, the preservation of social capital takes on even greater significance in understanding the social and economic changes underway in Agbanga and the consequences for natural resource management.

Class I can be characterized by those households which most fully participate in the emerging market economy in diverse, often multiple, ways. Approximately 21% of the population falls into this category. These villagers rely significantly on their economic assets and access to capital — the means of investment in production resources or the investment itself — to secure their livelihood. Economic assets enable them to hire labor at any stage of the production process. Approximately 72% of those in our sample in this class who use outside labor regularly hire on a daily basis. Daily survival is not a constant anxiety; they confidently envision a secure economic future.

Class I members face few constraints in sending their children to college. Approximately 45% of college graduates in the community can be found in these households. As a consequence, some Class I households have members who are professionals in the formal sector. Although approximately 45% of the households in this class receive remittances from migrant household members, they are not dependent on them. Rather they tend to reinvest remittances in current productive activities.

Class II, or the middle income group, employs livelihood strategies that are somewhat less secure than those of the wealthier class because they are less bound to physical capital. Of all the categories, they perhaps depend the most on family and social networks instead of capital assets to maintain their economic activities. They are, therefore, not completely absorbed into the burgeoning market economy. Farming households in this class have access to small parcels of agricultural land in both the lowlands and the uplands. As with others in the village, most are tenants and not owners. They hire workers only for labor-intensive activities, especially in agriculture. Some households in Class II hire out their labor to earn additional cash and non-cash income. Middle-income households

The class system

Class I

Class II

engaged in fishery typically work for financier-supported fishing groups, although some do own gear.

Like those of Class I, middle-income households receive remittances from household members who have out-migrated. They are, however, more dependent on these remittances for primary economic income. For instance, they reported using nearly 90% of remittances for household needs and improvements. Twenty-six percent of the total population rank in Class II.

Class III

Class III households, the largest class in Agbanga at 33% of the total households, have limited control over productive resources, although they rely heavily on exchange relations for access to them. While they occasionally hire workers for labor-intensive operations on their own farms, they depend more than any other class on hiring themselves out. Members of this group are most likely to join the fishing industry. They tend to fish collectively in groups, dividing up their catch, and they use exchange relationships to gain access to land for grazing livestock.

Class IV

The rural poor, 21% of the population, do not own any productive resources. They depend on their physical capacity as a capital asset. Wage labor is a necessary means by which they gain access to cash and non-cash income on a daily basis. Community members in this class acknowledge that they live a "hand to mouth" existence. Members of this class have the least diverse sources of livelihood. For instance, they may engage in informal, micro income-generating activities that do not require significant capital outlay. They also tend to gather raw materials from public or open access areas to make nipa shingles and other products. The health of household members tends to be fragile relative to the other classes due to low caloric intake and lack of access to health care. Many of these households have a largely elderly composition, with few able-bodied members to supply labor. They are less likely to receive remittances.

Table 5 compares classes on their access to certain resources and participation in different livelihood strategies.

Table 5. Some Indicators of Access to Social and Human Capital by Social Class (percentage of households)

Class	I	II	III	IV
Females in high school	18.2	6.9	10.8	4.0
Males in high school	15.2	18.4	12.2	9.4
Females in vocational school or college	18.2	3.4	0	0
Males in vocational school or college	36.4	5.3	4.9	3.1
Involved in collective/dynamite fish	2.7	4.6	19.6	5.1
Hire occasional labor	72.4	52.8	52.4	58.6
Sell labor	32.4	52.3	48.2	74.4
Access to caraboa grazing	27	34.1	28.6	25.6
Involved in "free" grazing (on someone else's land)	5.4	15.8	5.4	12.8

V. Gender and Livelihood Strategies: Examining Relations within the Household

The Philippines, unlike other developing countries in South Asia, reportedly boasts fairly equitable social relations and opportunities between the sexes. Indeed, the data on educational attainment and earned income would suggest that the Philippines' course of development is a model to be replicated, especially in terms of gender equity. Yet, while the chasm is indeed less wide compared to other countries, a gendered division of roles and responsibilities is in place, especially at the household level, influencing livelihood strategies and disadvantaging those over which women exert the most control.

Analysis of gender relations in Agbanga begins within the household, the basic unit of production and reproduction. Households are not unified, neatly bound entities. They are "more than individual units of decision making" (Elster, 1986), characterized by hierarchical internal social relations that define access to and control over resources and the division of labor. Households embody "cooperative conflicts" between males and females (Sen, 1990). In other words, beneath the seemingly consensual survival strategies undertaken by certain household members lie relations of power, resistance, and inequality based on gender and age (Wolf, 1990).

It is difficult to decode relations of power within Filipino households. On the one hand, social norms accord the adult male laborer the status of household head and primary provider. On the other hand, the ideology of female domesticity dictates an indispensable social function for women as homemakers and managers of household resources. Therefore, while men have considerable power in the "public" sphere, where they officially represent the household and thus appear to be the primary decision makers, women have significant power in the "private" sphere where decisions for household livelihood strategies are made.

For instance, women are responsible for managing the household's financial resources. Their intimate knowledge of the household economy necessitates their participation in decision-making processes. They do not, however, have complete control over the allocation of household funds. Male income earners commonly exercise the prerogative to keep an undisclosed amount of cash for their personal needs before contributing resources for general household expenses. In their role as household budgeter, women are expected to allocate some funds to their spouses and other income earners for recreation purposes. Since the socio-cultural environment defines the male sphere outside the household, it is acceptable and common for men to spend time and money fraternizing, especially at the conclusion of a day's work. Such fraternizing involves drinking tuba (a coconut wine), gambling, and gossiping in exclusively male groups.

Access to cash income, multiple productive resources, and external support systems shape a member's relative power and authority within the household. Migrant workers, for example, have a say as to how the

A look inside the household

remittances they send should be spent. Both males and females migrate for wage labor, salaried positions, and education and send income home to support the household. However, increasingly more females out-migrate compared to men — a phenomenon evident throughout the rural areas of the Philippines (Eviota 1992). Migration of young single women constitutes a household livelihood strategy, as females tend to be in larger demand in the urban areas in the informal sector.

The gendered division of labor: productive vs. reproductive work

While a gendered division of labor does exist in Agbanga, it is characterized by some flexibility in the allocation of intrahousehold tasks. Except for land preparation, which is relegated to adult men, household members, regardless of gender, trade off farming tasks as need and opportunity occur. In fishing enterprises, labor processes tend to be gender-sequential (Agarwal, 1985). Men fish while women take care of postharvest activities such as the marketing and processing of fish. When harvest is abundant, however, everyone — men, women, and children — tend to help out in fish processing. In terms of domestic chores, tasks are occasionally shared by household members, but women are held ultimately responsible for their completion. Household members weave domestic chores into their daily schedules and production activities.

As most of the above activities illustrate, in productive work — defined as market production with exchange value or home/subsistence production with use value (Moser, 1993) — household members are willing to adjust gendered labor roles as the circumstances require. However, reproductive work is fairly rigid. Eviota (1992) defines reproductive work as childbearing in addition to “the caring — the daily physical and ideological maintenance of human beings.” For example, one of the households in Class II shared decisions in terms of the allocation of productive resources. However, the food preferences of the husband dictated the end use (market or home consumption) of the food products (chickens and vegetables) produced by the wife *and* they only could be consumed if she cooked them, as he did not engage in that type of reproductive work.

Based on cultural norms that women are the primary caretakers of children and responsible for their upbringing, male household members rarely participate in reproductive work. Women, thus, have a dual labor role unique in the household structure. They frequently combine their productive activities in farming and fishery enterprises with reproductive work and independent income-generating activities. That is, women work mainly in or close to the home. In many households, women produce items of use value for home consumption as well as items for monetary exchange. Some Agbanga women, for example, process extra food which they or younger household members sell locally. At the same time, mothers provide early training to children on marketing and harvesting techniques. Transmission of knowledge in important reproductive work is dominated by mothers and elder women. After a large catch, particularly with the anchovies resulting from dynamite fishing, women and the children they are caring for lay out the fish to dry in front of the house, an activity that teaches the children how to prepare a key product for both market and home consumption. These dried fish are also a key element in exchange relationships, including with relatives in urban areas.

The nature of reproductive work — the fact that it is not remunerated and is primarily performed within the private sphere of the household — means that it is not translated into economic value and is therefore left out of the typical appraisal of productive contributions to the household. Despite gender neutral labor-sharing by household members, thus, gender relations in intrahousehold labor allocation place greater emphasis on men's contribution compared to that of other household members — especially women. Men are viewed as possessing the required strength and skills that enable them to perform production tasks independently. Women's and children's labor contribution are perceived as secondary. They merely "help-out," regardless of whether or not they allocate more time or perform more tasks than men do. Consequently, women's reproductive work and subsistence production falls second in the allocation and use of scarce resources. For instance, many women plant and tend trees and other leguminous plants in the upland zone for multiple purposes such as controlling soil erosion and producing fruits (such as coconut) and raw materials for mat weaving. These efforts at preserving the usefulness of the uplands are constantly thwarted by men — family members or others — who graze their carabao and allow them to eat the trees and plants that women have planted.³ Since carabao raising is seen as a more important economic activity and is part of an exchange agreement with lowland farmers, a woman has no recourse for ensuring that the resources she derives from the upland are protected.

Socioeconomic status and household structure are two important factors that influence flexibility of the gender division of labor. Intrahousehold labor allocation varies with the household's socioeconomic situation or wealth status. Low-income households, or "daily survivors," use family labor more extensively to ensure access to cash and non-cash resources. Middle income and limited resource households both depend on family members' labor and hired labor when capital accumulation allows. Those rich in capital tend to substitute family labor with hired workers or technology. Even women in these households contract other women in the village for livestock share-breeding arrangements.

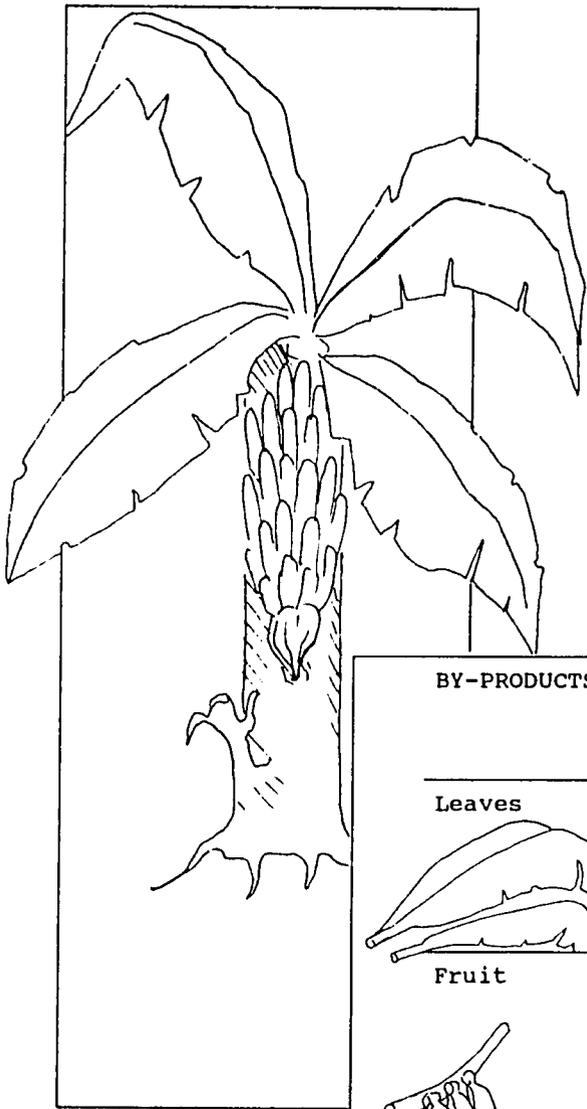
Women are the first to withdraw their labor from intensive farming activities when the household reaches a wealth status that allows them to do so. However, they join the wage labor force without hesitation if circumstances — such as low income or death of a spouse — require it. Since labor sharing of reproductive work does not fall within cultural norms, women in the poorest households, therefore, tend to work significantly more than do other household members as they perform the double roles of both productive and reproductive work. And in Agbanga itself, even the wealthiest households do not hire others to do reproductive work, although poor relatives may move in to provide the same function.

³ Fujisaka and Cenas (1993) have noted the lack of sustainability of contour hedgerows in the Philippines due to the grazing of neighbors' animals, but have not explored the gender or exchange relationship implication of the "failed" technology.

The gendered nature of resource management

Resources and resource products have multiple uses and users (Figure 4). Some resources are managed mainly by men, while others are managed by women. There are also resources that women and men manage jointly such as crop land. More often women and men may have conflicting interests in how resources should be used and managed. For example, although women generally raise chickens (therefore *managing* this resource), they do not decide independently how the resource will be used. Women may wish to use the resource products for home consumption, while men may choose to use them for breeding. In other instances, they may have to decide jointly about whether to sell the chickens, or save them for feasting at social occasions such as *fiestas*. In one case household, the husband wanted to apply hog manure as organic fertilizer to the garden which his wife tends. His wife, who did most of the production activities at home, objected to the use of manure because of its offensive smell. Again, in carabao raising, male members of a household tend to choose to graze their livestock on the very land where women wish to plant trees and vegetables for household subsistence purposes.

Thus within households conflicts pertaining to resource management strategies are a daily reality. The level of negotiation can be simple or complicated, depending on the kinds of resources involved and the differentiation of authority among the negotiators. Some projects in their planning assume that household members will make a rational choice to cooperate on decisions that would improve the household's capabilities (Ostrom, 1990). Yet, the social reality in Agbanga suggests that decisions on household resource management strategies are usually not collective. They embody "cooperative conflicts" that characterize social relations within households (Sen 1990).



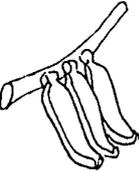
BY-PRODUCTS	HOW USED	WHO DECIDES ON USE	WHO DOES IT	HOW CASH IS USED	WHO DECIDES CASH USE
 Leaves	Sun or rain umbrella Dish/Platter Food wrapper	Anyone	Anyone		
 Fruit	Sold at markets stores Gifts to friends Home use (boiled, fried, raw) Sold at local social events	♀ ♀•♂ ♀ ♀	♀•♂ ♀•♂ ♀ ♀•♂•♀	For home needs (food, basics)	♀
 Flower	Home use (salads, and vegetables) Given to friends	♀ ♀•♂	♀ ♀•♂		
 Trunk	Shaved into pig feed	♀	♂ (cuts down) ♀ (processes)		
 Sprouts	Transplanted to household plots Given to friends	♀•♂ ♀•♂	♀•♂ ♀•♂		

Figure 4. Benefits Analysis Flow Chart.

VI. Coping with an Economy in Transition: Diversification as a Livelihood Strategy

The small village of Agbanga is in the midst of a transition from a predominantly subsistence economy, whereby villagers depend on and share the natural resource base, to a market economy, characterized by land privatization, competition, the need for cash and a means of production. Agbanga is increasingly tied to the market economies of neighboring towns and villages and the nation as a whole. Local processes reveal the penetration of market relations, but yet non-market transactions, in the form of exchange relations, persist in various areas of production (Flora, 1990).

This section begins to examine the villagers' livelihood strategies in the midst of Agbanga's incorporation into a market economy. Integration into the market economy brings about changes in the control and management of natural resources in response to the semi-proletarianization of labor (de Janvry, 1981) and the dependence on cash income. This transition, complicated by an increase in population pressures and natural resource decline, results in new responses to the basic question of survival for some and continued prosperity for others as well as the perpetuation of traditional systems that are a source of security for a majority of the population. While the upper class is increasingly able to participate in a cash economy, the rest of Agbangans cling to social capital. These new responses and traditional systems are revealed in an analysis of the livelihood strategies that households and individuals employ in order to maintain or improve their economic and social situation in a dual economy where rules, resources, and social relations are rapidly changing, forcing new circumstances upon them. Ironically, exchange relations, a crucial component of Agbangan's social infrastructure, have unintended consequences for natural resource management. The social and economic fabric of the community is changing. Hence, it is crucial to examine these strategies and evolving responses to changing resource conditions in the context of the historical and actual "social map" of the community, which guides the analysis of the different responses and strategies in the context of variables central to the social fabric of Agbanga: class and gender.

Most livelihood strategies employed by the villagers in Agbanga can be characterized by diversification, which is essentially linked to the social infrastructure. In other words, all villagers — whether on the community, household, or individual level and to varying degrees depending on gender and class status — turn to a variety of means and mechanisms for the use and management of resources. One important way they gain access to different resources is through exchange relations. In the community and within the household, members are thus able to pursue multiple livelihood strategies day to day by combining agriculture production, fishery enterprises, public service, and other occupations within and outside the village.

Diversification of the household economy is necessary due to the seasonality of agriculture and fishing, and to insure against the risks of failure in a declining natural resource base and of competition in the market economy. Diversified economic activities allow some individuals

and households the opportunity to earn cash, which is increasingly important in a growing market economy for investment in productive activities and the purchase of foodstuffs and other items that cannot be grown or traded. At the same time, households continue to participate in the subsistence economy, providing for household needs from the natural resource base and exchanges or “gifts” to and from neighbors, which fortify their social capital.

Diversification of livelihood strategies varies in mix and scale across the social categories. The upper and lower classes tend to diversify their strategies the least — the upper class because they possess the physical capital to centralize their investments and labor, and the lower class due to the sheer absence of resources that would enable them to participate in exchange relations with other classes. For the most part, the poorest class relies on charity. Flexible division of labor and access to diverse resources allow household members to engage in multiple income-generating activities. Some households engage in lowland and upland agriculture, while others combine agriculture and fishery. As we will explore in some detail below, women incorporate year-round, home-based production into their daily reproductive tasks and household activities. The activities analysis shows that households synchronize several activities all year round, using creativity and resourcefulness to synchronize seasonal opportunities and constraints (Figure 5). Gender has an important influence on the diversification of livelihood strategies within the household. Women are not confined to non-economic subsistence production. The gendered division of labor is such that, although women are primarily responsible for reproductive tasks, their economic contribution is important — sometimes central — to the household’s combined income. For instance, during a disastrous typhoon in the 1980s which nearly wiped out agricultural and fishing activity, women responded by increasing their hog-raising activities. This female-dominated activity became the central means of income generation.

Women have also been significantly involved in “outwork” as a response to the village’s increasing integration into a larger market economy. Women have always been involved in cottage industries which they operate out of their homes. With the decline in the ability of the natural resource base to provide raw materials, women have turned to extra-community inputs and markets for the acquisition of raw materials and for access to markets for sale of the finished products. The knotting of abaca and the assembly of earrings are both examples of the comparative advantage of women’s cheap labor within the household, which is utilized in a putting-out form of capitalist production. Through this “home work,” women purchase the partially finished materials from the wholesaler, usually based in Manila, and then sell it back at a somewhat higher price, having added value through their labor-intensive activity. Women can carry out the simple assembly process in their homes, fitting it in between other productive work as well as their reproductive tasks. Both products require excellent small motor coordination and long periods of leaning over one’s work, either knotting the strings of natural fiber by hand or using simple tools to put together pieces of earrings with their backing.

Although women, as a labor source, have been able to rapidly adjust to a changing economy, they have, as a result, become increasingly

ACTIVITIES] [DRY SEASON] [WET SEASON						
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Crop:			Select Seed			Seed Bed Prep.	Transplnt Hm			Harvest M,F	Bed prep M	Transplnt Hm
R			M			M	Weed M,F,m			Carry M,m	Seed prep M	Weed M,F,m
I			Harvest M,F			Seed Prep. M	Fertilize M			Thresh M,m	Broadcast M,F	Fertilize M
C			Carry M,m			Broad-cast M	Irrigate M			Winnow F	Land prep M	Irrigate M
E			Thresh M,m			Lana Prep. M	Spray Hm			Share M	Plow M,Tr	Spray Hm
			Winnow F			Plow M,Tr				Mill F	Irrigate M	
			Share M			Irrigate M				Manual mill M,m	Level M	
			Mill F			Level M				Account M,F		
			Manual Mill M,m			Uproot Seedlings M,F,Hm				Select seed M	Harvest Seedlings M,F,Hm	
			Account M,F									
Livestock												
Hog	M, F											
Carabao	M											
Chicken	M, F, m											
Fishery												
Fishing	M											
Process												
ash	F											
Sell fish	M, F											
Collect-seashell	M, F											
Off-Farm												
Sales:												
labon			M						M			
Harvest coco	M											
Hand crafts	F											
Home:												
Cook	F											
Get water	m											
Firewood	F, M, m											
Laundry	F											

Source: Hilary Sims Feldstein and Susan V. Poats, WORKING TOGETHER: GENDER ANALYSIS IN AGRICULTURE. Kumarian Press, 1989.

KEY TO SYMBOLS:

Adult Male M Hired Mule Hm Continuous Activity ——— Sporadic Activity - - - -
 Adult Female F Hired Tractor Operator Tr
 Male Child m

BEST AVAILABLE DOCUMENT

Figure 5. Gender-desegregated Household Activities Calendar.

dependent on outside suppliers, compromising their control over the cottage industry. They also bear considerable risk if oversupply drops the market price for their still unfinished product. In the case of abaca, the semi-processed natural fibers come from a distant location and, after the strands are knotted together, the knotted strands are taken to yet another village for weaving into purses and other craft items for sale in Manila or internationally. The assembled earrings, whose pieces are cut out of sheet metal by a local middle person who acquired the technology from the Manila earring wholesaler, are shipped to Manila for dipping in gold plate prior to sale. Thus the women cannot sell their product — despite the value they have added — directly to a consumer, but only to the wholesaler.

Households engaged in farming integrate a variety of crops. The most common mix is the rotation of corn, sweet potato, and cassava in an area already planted with coconut. In the lowlands, rice is the main crop, but several farmers also tend tree crops. Coconut cultivation is attractive among farmers because of the multiple products they derive from the coconut. Nuts are harvested at least three times a year. Most households harvest nuts during a seasonal food crisis, usually around February and March. Labor allocation in coconut cultivation is well-defined. Men tend the trees and harvest the nuts and *tuba*, while women and children perform most of the postharvest activities, including the drying of copra for sale. Copra, destined for the international market, is subject to radical price changes.

VII. The Gift Economy: From Customary Practice to Survival Strategy

In Agbanga, households across all class categories to varying degrees have carved a web of social networks and patron-client relationships that serve as mechanisms to gain access to resources, reduce risks associated with seasonality of production activities and variation in price, and maintain community cohesion. In other words, they rely heavily on social capital — that is, the network of exchange that ensures benefits to everyone. These social networks are built on gift giving and exchange of resources among households across all social classes. Gifts include resources and products drawn from the natural resource base — such as food crops, vegetables, and fish — as well as items produced within the household, such as cooked meals, processed food, and mats. Exchange relationships involve direct trading of resources horizontally except for the absolute poor in the community. Gifts to the poorest members have always been perceived as charity or *hinabang*. Most exchanges are typically not written down, and strict accounts are not kept for future obligation. In other cases, trades are carefully negotiated, such as exchanging seed varieties for planting materials and labor. It is important to note that cooperative labor exchanges (*ayon-ayon*) do not form a fixed, clearly defined social network or group. The basis of a group's formation stems mainly from a current mutual need for each other's services.

The unequal value of traded goods facilitates compliance of the norm of reciprocity and serves as a mechanism to sustain it over time (Gouldner, 1960). Gifts and exchanges generate social capital of great importance, most notably to women and Class II members. As one woman said when we commented on the amount of fish that she was giving away, "If we don't worry about and take care of each other, who will?" Yet men are not excluded from exchange relationships with one another, which frequently occur in conjunction with fraternizing at the end of a day's work.

Gifts and exchanges make up the safety net for the village, and their ready availability gives each village member — particularly the most vulnerable — a sense of security and inclusion. But as the natural resource base deteriorates, social support mechanisms — such as gift giving — are threatened. This threat is particularly evident in the fishing enterprise.

Despite the increasing need to commodify fresh fish in order to generate cash and participate in the market economy, villagers still practice *mamarang* — the act of giving away portions of their catch to villagers who gather on the beach at the end of the day to greet the returned fishers. More than 70 percent of the fishers give away a portion of their catch. Villagers from all social classes go to the beach in time for the fish landings. Before docking their boats, the fishers make a separate pile of fish to be given away to the people. Male villagers who help carry the boat to the shore (*dahik*) also get a share. Free fish are prepared for home consumption and shared with neighbors. Some are processed either by salting or drying

and sold later. Although *mamirang* is still practiced as an important social support mechanism in Agbanga, fishers seldom give away declining catches of *quality* fish; rather, they offer the more inferior types. In the past, only adult villagers would gather to wait for the fishers. Now, even children are sent to participate in the activity. We observed that larger crowds gathered at the beach, especially when fishers returned from dynamite fishing trips. People at the beach received a handful or more of dynamited anchovy, garnering support for a destructive practice that accelerates the decline of the ocean ecosystem.

Fishing is an important source of social capital in the form of exchange relations. All classes across gender are connected to the fishing industry in different ways and to varying degrees. While men are the fishers, women trade, sell, and process the fish. Between 30 and 35 percent of the bottom three classes depend on fishing as one source of monetary income. Class III earns the most money from fishing, with 14 percent bringing home more than 200 pesos a week from fishing, and relies more on fishing than do the other classes for exchange relations.

VIII. Changes in Labor Arrangements: Labor as a Commodity and Resource Exchange

In response to the increasing commoditization of agriculture, a combination of traditional and modern labor arrangements are currently practiced in Agbanga. Labor practices in the village range from mutual labor exchange to a variety of ways by which labor is commodified. Mutual labor exchange (*ayon-ayon*) prevailed in the past. Yet with increasing competition for scarce employment and the growing need for cash as the economy shifts away from subsistence, the marketing of labor has expanded. Across all social classes between 52 and 72 percent of villagers hire labor on a daily basis, including the poorest. This transformation in labor patterns threatens the social infrastructure of Agbanga, which traditionally works for collective survival.

In lowland rice production, land preparation, uprooting rice seedlings from the seedbed, transplanting, weeding, and harvesting require precise timing and significant labor. In the upland systems, labor demand is highest in land preparation, planting, weeding, and harvesting. As in the past, landowners or cultivators still employ hired labor as extra hands for various production activities. The difference, however, is that in the past owners or cultivators themselves had to go outside the village in search of workers to hire because labor was scarce. One cultivator recalled rising early to make the trek to neighboring villages in order to solicit labor as the occasion warranted. Presently, the abundant supply of workers, consisting of both landless individuals and those who control small parcels of land, has resulted in local competition for jobs. Workers often use their social capital in the form of networks to seek employment. The poorest class uses exchange relations to secure labor more than any other class. They represent the group which has a larger percentage of household members in fixed pay labor arrangements (*pakyaw*), followed closely by Class III. Children, for example, seek employment from their godparents. Employers, on the other hand, respond to the social expectation by preferentially hiring relatives and ritual kin.

The system of mutual labor exchange, or *ayon*, the dominant labor practice for generations, consisted of a large group of approximately 20 members, including both males and females. Farmers organized labor exchange for land preparation, weeding, harvesting, and the uprooting of seedlings. This system has been down-scaled over the years to the present-day composition of small groups of three to five members. Currently only 30 percent or fewer of laborers in each class grouping participate in *ayon* labor exchange; as expected, the poorest class participates the most and the upper class the least. The system of *ayon* is fading as the emphasis shifts to forms of employment in which workers earn either cash or share from harvested crops, again threatening the social infrastructure that ensures harvest work for the lower classes and labor for the upper classes.

The dyad: Two-party labor exchange

Patron-client relationships are traditional dyadic relationships between those who own productive resources (patrons) and those who seek to gain access to these resources (clients). In Agbanga patron-client relationships develop between landowner and tenant, livestock owner and share breeder (*alima*), lender and borrower, financiers and fishers, suppliers of raw material and home-based manufacturers, employer and employee. As social differences have increased as a result of greater integration into the national economy, these relationships gain more importance within the community. As we shall see, a desire not to risk these linkages counteracts intentions to move toward more sustainable natural resource management. Yet these important social linkages can potentially contribute to a solution for better natural resource management.

Social support mechanisms, such as *ayon-ayon* and dyadic relationships, function to strengthen community bonds. Such mechanisms embody the notion of "obligatory voluntarism" (Shigetomi, 1992). Households feel an obligation to volunteer or give away their resources or assume the risk of damaging established dyads and community relationships and therefore jeopardizing their social capital. "Ex ante solidarity" (Fafchamps, 1992:157) or assistance provided to prevent households from experiencing a shortfall "minimizes costs in two ways: it reduces moral hazard, and avoids the waste of community resources." Clientelism, therefore, provides mutual insurance between patrons and clients (Fafchamps, 1992). By providing clients access to productive resources, patrons become a source of insurance against collective risk. Patrons, on the other hand, benefit from the relationship by utilizing it as an instrument for both physical and social capital accumulation. For instance, carabao owners who own rice fields in the lowlands frequently provide the opportunity for labor during harvest season to those in the uplands, who in turn permit the grazing of carabao on their land. Likewise fishers exchange their catch or opportunities to work on their boats for the grazing of carabao on neighbors' land. These relationships have important implications for natural resource management. Villagers do not organize to stop dynamite fishing or prevent carabao from trampling their land and its flora for fear of jeopardizing relationships that provide a source of food security. In other words, villagers in large proportions perceive losing social capital as an equal or greater threat to household security than the loss of physical capital in the form of natural resources.

Harvesting is one labor activity in Agbanga that demonstrates the ambivalent and limited success of some livelihood strategies. Characterized by both traditional and novel practices, harvest labor in the climate of this dual economy both provides at least minimal labor and food security to landless workers and marginal farmers by ensuring them a portion of the crop output at the same time that it deprives workers of cash income. Frequently laborers are forced into debt as they borrow under the system of *butang* (payment with rice grain) in order to survive until the next harvest.

Labor strategies in harvesting

In the past, the harvest season represented community festivity in celebration of abundance. At the end of the harvest, landowners hosted a banquet. The sharing arrangement was a healthy one-fourth or one-fifth, and harvesters received their portion in the form of bundles of unthreshed rice. According to the villagers, this activity stopped when food prices increased and landowners could no longer afford to finance festivities. Presently, harvesters use their share mainly for home consumption.

Current forms of participation in harvesting include *tabang* and *ambo*. In *tabang* workers harvest, thresh, and winnow. *Tabang* is especially important as a survival strategy to the poorest classes; nearly 72 percent of respondents from this class reported having household members who still rely on this form of labor exchange. In Class III there is also a high level of participation — in excess of 47 percent, the majority of whom are women and children. Under *tabang* the sharing arrangement between workers and cultivator is one-eighth (*winalo*), a decrease compared to previous arrangements under *tabang* of one-third. Workers get one share of unmilled rice (*palay*) for every seven shares that go to the cultivator.

Ambo was introduced into the village during the 1980s, bringing with it the security of labor but a decline in real wages (Carner, 1981). Under this system, workers who weed a certain plot are given exclusive rights to harvest the same plot. Harvesters also thresh and winnow the grain. The sharing arrangement between harvester and cultivator is a meager one-seventh. Households in the second and third class participate the most in *ambo*, at between 33 and 37 percent. Whereas in the past only adults harvested, all household members (including children) operate today as a working unit, under the *ambo* system, to increase the household's share of the harvest.⁴ Our survey revealed that women, men, and children are active participants in this exchange for labor security. The *ambo* system provides security for the laborer in that it assures workers access to a field for the coming harvest season. However, workers are not given remuneration until after harvest, depriving them of a cash income between weeding and harvest season. The system deprives workers, especially women who previously derived employment from weeding, of cash income, forcing them into a situation of debt to make it through to the next harvest. However, because it is based on pre-existing exchange networks, it is viewed as positive, rather than negative, by most of those who participate and must sell their labor in a highly competitive labor market at harvest.

New labor practices, such as *ambo*, are specters of traditional arrangements. Villagers, who necessarily rely on agricultural work as a means of diversifying household income, hold on to the relationships of exchange as a means of securing employment under these systems, especially during the harvest season when payment is in food.

⁴ Children are able to participate because modern rice varieties introduced into Agbanga grow to a lower stature, more accommodating to a child's height.

IX. Common Property Resources in Decline: Agbanga Fishery Enterprises

The Canigao Channel is a rich fishing ground. It is used jointly by fishers from the village and from neighboring villages and islands as a common property resource. Agbanga's fishery enterprises, like its agricultural system, are not solely economic. They are an important component of the social infrastructure that insures collective survival. In other words, fishers work cooperatively to produce a means of subsistence and economic gain from an open access resource. Relationships in the past have been characterized by sharing and exchange in much the same way that labor sharing arrangements are common in agriculture and carabao grazing.

Fishing is a full-time activity and a primary source of income for many small-scale fishers. Approximately 30-35 percent of all but the top tier of the socio-economic scale derive cash income from fishing. Fishing is also important as part of a diversification strategy for share harvesters who are without subsistence resources between planting and harvest season. Resource exchange is practiced throughout the village despite class. Recently, however, problems of stability in access to and control of this once-fertile fishing ground in the wake of declining fish yields threaten Agbanga's fishery enterprise and the social networks that characterize it. Increasingly, fishers tend towards maximization of benefits using short-run strategies at the expense of resource sustainability, long-term societal good, equitable access, and fishers' safety (Pomeroy, 1989).

The Canigao Channel is rapidly becoming a common property resource characterized by rival consumption and uncontrolled inclusive access. Multiple factors have contributed to this decline in a once healthy and thriving industry. An increasing number of people have come to depend on fishing for primary or secondary employment as job opportunity wanes in agriculture and the population pressures on natural resources escalate. Second, the absence of collective authority in Agbanga leaves indiscriminant exploitation of resources unchecked. No property boundaries exist to restrict access to coastal resources. Guidelines for fishing practices and licensing of fishers are not enforced. For instance, a local and a national ordinance have been enacted to direct users on how to exploit resources, yet strict enforcement vacillates. One consequence is that the use of explosives as a quick and successful (though destructive) method has grown quite popular.

From March until May, when anchovy is abundant, dynamite fishing — a male-dominated activity — is at its peak. Practiced in the area since the 1930s, it is the most destructive technology used in the Canigao Channel, obliterating coral reefs and unnecessarily killing schools of fish that travel with the target species. At the outset fishers secured explosives from the military, as did construction workers who used dynamite to level the ground. After the Second World War, dynamite fishing intensified as

Dynamite fishing

fishers found new supplies of unused explosives which they called "demolition dynamites." Residents say that dynamite fishing was controlled during the Martial Law period because of the imposition of the "shoot to kill" ordinance, which legitimized the Navy's shooting on sight anyone deemed to be engaged in illegal behavior such as dynamite fishing. As the use of explosives — mostly homemade dynamite — has once again intensified, many residents see the reimposition of such drastic measures as the only way to control this destructive and dangerous technology. Yet more than 50 percent of respondents in each class cited "easy and fast cash" from dynamite fishing as the primary motivation for the persistence of this destructive practice. Between 28 and 42 percent of all but the upper class said that they had no other equivalent means of livelihood.

Labor sharing arrangements

The fishery enterprise, despite the intensification of the market economy, has retained much of the traditional labor arrangements in the form of share systems to pay for labor and for use of fishing craft and gear. Labor practices in fishing have remained fairly constant, most likely because fish has been an established commodity for a much longer time than has agriculture, due to the more specialized nature of the job.

Second, the labor share arrangement is viewed as an effective means of addressing the problem of "labor-shirking" (Platteau, 1984) by encouraging cooperation and teamwork among crew members. For instance, one problem associated with the share system is "output-underreporting" (Platteau 1984). In other words, the quantity that harvesters or fishers report to the employer is frequently less than their actual catch. Employers remedy this problem by accompanying the crew on the boat, through conscientious monitoring of the harvest, by employing relatives, or by building strong patron-client relationships. They might, for example, provide loans or cash advances interest-free to crew members. Loans bind the employer and workers in a commercial relationship, and at the same time establish social ties. In one case, the patron encouraged socializing outside his *sari-sari* store, where fishing gear is stored next to his house. Every day the workers meet at the store before going on fishing trips and frequently socialize there at the end of the day. Employers are also expected to negotiate with authorities and to bail out their workers if they are arrested.

Commonly, one person, the financier, owns both the fishing gear and the craft. The financier, who may live in the municipal seat, also purchases gasoline, oil, kerosene lamp, and, in some cases, food. If the catch is abundant after a fishing trip, the crew makes a separate pile for home consumption (*pangkunsumu*) and sells the rest of the catch to the financier, who controls the price. If the catch is just enough, crew members and patron may decide either to keep their share or sell everything to the financier. At the end of the week or another period set by the financier and crew members, the financier pays the crew members, deducting expenses such as gasoline, oil, kerosene, and food.

X. Home-Based Enterprises: A Gender-Exclusive Livelihood Strategy

The fishery enterprise is heavily dominated by males. While women trade, process and market fish, they do not participate in the social system that characterizes the labor practices associated with fishing. On the other hand, women are significantly involved in agricultural activities. The division of labor in agriculture is fairly flexible, characterized by greater diversification in methods and crop selection, and therefore shared by both women and men. One livelihood strategy, however, is exclusively dominated by women: home-based enterprises.

Home-based enterprises are income-generating activities performed within the sphere of the household. Often with the assistance of other household members (i.e. children and live-in relatives), women operate home-based enterprises in conjunction with their reproductive work. Due largely to the rigidity of the division of labor when it comes to reproductive work, women have persistently governed this livelihood strategy and rely on it to augment their social capital. Home-based enterprises allow women to perform tasks related to childcare and household maintenance and at the same time earn income. Examples of such activities in Agbanga include share-rearing of livestock (*alima*), weaving mats, preparing and selling snacks and other foods, processing fish, making *nipa* shingles (*magpawod*), providing home and herbal medicinal services (*manambal*, *hilot*, and *manabang*), and operating general goods (*sari-sari*) stores.

Historically, home-based production activities depended largely on locally available natural resources traditionally acquired in part through exchange relations. As women are increasingly faced with declining availability of resources, these social networks have proven inadequate, forcing women to turn to sources outside Agbanga for raw materials, thereby causing them to rely increasingly on the market economy to create work and less and less on local social capital. This shift poses a serious threat to the perpetuation and stability of secondary incomes and women-centered work, with consequences for the continued transmission of locally-based knowledge (a significant aspect of reproductive work in Agbanga). A decline in women-controlled income and employment in turn threatens their economic autonomy and decision-making authority in the household. In this chapter we will examine some of these home-based enterprises, assessing their viability in relation to current economic transitions and natural resource decline.

Traditionally the *alima* system provides household members with opportunities to own livestock and generate income from sales. Through share-rearing arrangements, men typically gain access to draft animals, most notably carabao, and women to hogs. Women sell hogs and use the money for household subsistence or income-generating activities, keeping some hogs for annual celebrations, especially *fiestas*, to pay debts, or for breeding purposes. Hog production increased dramatically in 1992 as a

The *alima* system and hog breeding

means of diversifying livelihood strategies after a typhoon destroyed the local fishing industry. However, by mid-1992, fewer women raised hogs because of the costs involved and the subsequent drop in hog prices as fishing resumed. Less than a third of all households are currently engaged in hog raising. Hog raising, historically important for maintaining household subsistence in times of crisis, is at risk of being lost as an option for diversification

Hog raising, unlike other capital investments, does not serve as a source of savings. The type of hogs raised are finely bred and require expensive maintenance and fine feed. According to the women we interviewed, in the past they fed pigs with their own supply of surplus rice or corn bran, root crops, thinly sliced banana trunk, and other locally available crops — much of which is acquired through exchange relations. Due to a lack of agricultural surplus, hog raising is mostly undertaken by the upper classes. Approximately 56 percent of Class I households reported participating in this home-based enterprise, primarily because they can afford to purchase most of the feed from the local *sari-sari* store.

An old woman in the village told the story of how she had hoped to raise hogs as a secondary source of income but was forced to relinquish the scheme due to the expense of maintenance. She had asked her niece, who was secure in a full-time office job, if she could raise her pig, initiating a labor-sharing arrangement. The niece agreed, and the pig was transferred to her old aunt's house. That very same day the old woman returned the pig to her niece, because she found, after assessing her resources and making a trip to the *sari-sari* store, that she could not afford to purchase the feed and her own supply of sweet potatoes and banana trunk was insufficient.

The prohibitive costs of medicine to treat the hogs is another threat to this once viable home-based enterprise. Vitamin supplements, antibiotics, and deworming capsules are bought at the drug stores in the *poblacion*, replacing indigenous methods, called *binisaya*, to treat hog diseases, which have proven ineffective on the new breed of hogs. For instance, during the course of our study, women could easily enumerate modern medications used to treat hogs. One woman said that she learned to apply certain types of medications from the local extension agent. Most commonly, information is exchanged locally; villagers routinely self-prescribe medications to treat hog diseases.

Mat weaving

A second home-based enterprise in Agbanga is mat weaving. An activity predominantly undertaken by the bottom two classes, mat weaving is a skill that women have learned from their mothers or from elder village women. Mats are made out of dried leaves of *romblon*, which women plant and tend locally. In the past, *romblon* plants were abundant, and leaves were given away for free. Presently, because only a few *romblon* plants still grow in the area, the continuity of this home-based enterprise is threatened. Overgrazing of carabao in the uplands is partly to blame for the decline in *romblon*. However, grazing constitutes a form of exchange relations that remains unchallenged, as women do not want to risk this important source of social capital. As a result, many mat weavers are forced to buy *romblon* leaves, entering into a labor-sharing arrangement

whereby *romblon* owners get a share of the product. This arrangement, called *agsa*, represents a reduction in the amount of potential income a woman is able to earn from this craft.

Similarly women's work in village-level medicine, which relies on indigenous plant and tree species, is severely threatened. In every class fewer than 7 percent of households reported engaging in this activity as a home-based enterprise. The barks, roots, stems, leaves, and other plant and tree parts used to concoct medicinal drinks (*ilimnon*) and massage oils (*haplas*) are now found mostly in remote areas. Some plants and trees have been destroyed by slash-and-burn agriculturalists (*kaingineros*) as well as by overuse of the upland areas for animal grazing. Thus, collection of these materials has become increasingly inefficient, again leading to a decline in earned income and an added household expense as women are forced to buy more readily available modern medicine. The village midwife and massage therapist (*hilot*), for instance, now buy some herbal medicines from the *Antiques*, a dark-skinned, mountain-dwelling ethnic group in Leyte, during the market days in the neighboring municipality of Bato.

The making of nipa shingles is also a dying home-based industry. A few women in the village — mostly in the third class — traditionally used local natural resources to make nipa shingles, which are a common roof material for houses. However, the cash investment in raw materials required in this craft has increased as more and more land is privatized and access to past common property resources is restricted. In Agbanga, for instance, nipa trees grow in the coastal area, part of which is government property. Although residents seem to exercise free access to nipa fronds, not feeling secure in that access, they tend not to invest in the effort to maintain the trees.

Since harvesting nipa fronds is increasingly laborious, women shingle makers have begun to hire harvesters. From the nearby village of Tab-ang, they collect *huruag*, a vine used to hold together nipa fronds, and *baliisan*, a substitute for *huruag*, from remote mountain areas. An Agbanga resident supplies *baliisan* at five pesos per bundle. Women are forced to make larger and larger investments in their craft, reducing real wages earned. In this case growing privatization of land disproportionately disadvantages women engaged in building nipa shingles, threatening an historically important female industry.

Trading processed food is also an important income-generating activity for some Agbanga women. Cooking enables them to combine livelihood activity with necessary domestic activity, or reproductive work. Women prepare an assortment of snacks and main dishes using locally grown vegetables and crops as well as seafood sold by fishers or by fish traders. When local vegetables and other essential ingredients are scarce, making exchanges insufficient, they buy them at the *poblacion* and resell them at the village. Processed food is an item women sell in the markets or to laborers and is also frequently given away in exchange relations.

Indigenous medicine

Nipa shingles

Post-harvest activities

Women are especially involved in post-harvest activities in the fishery enterprise, which they conduct out of the home. They sort, process, and market fish and other seafood using informal networks that they have established over the years. Women whose husbands are fishers or who work with other fishers have direct access to the catch. They bring raw fish to the *poblacion* or to the fish market in the municipality of Bato to sell. Other small-scale traders sell fish to women processors by going door-to-door. The women then dry or salt it. Processed fish is a source of food for the family; it can be stored for a time or given away to neighbors in exchange for other foods or raw materials. Women also sell processed fish, providing the household with additional income, especially during seasons when the fish catch is low or when sales from raw fish are less. Although fishing is an important source of social capital for women and cash income for the household, many women expressed serious concern for their husband's safety. Some were instrumental in getting their husbands to stop this activity and were willing to risk losing a certain amount of social capital in order to cease this dangerous practice.

Sari-sari stores

Small general goods (*sari-sari*) stores, operated by women, are a common sight in Agbanga. Of the few scattered *sari-sari* stores owned by households in Agbanga, women — except in the poorest households — are exclusively responsible for managing the store with the help of their children. Since the store is annexed to the homes, women are able to manage small-scale trading activities while taking care of the household. The stores provide outlets for local products such as dried fish, coconut wine, vegetables, and fruits. In some cases store owners purchase the goods from villagers. In other cases store owners sell the goods for villagers without charging a commission. Residents make their daily purchases from *sari-sari* stores, and, since not all villagers have access to daily cash income, store owners commonly extend credit to customers. Thus transactions conducted at *sari-sari* stores are an important contribution to the accumulation of social capital.

“Outwork” and the new market economy

A new type of home-based enterprise that provides women with income is what is known as “outwork.” Outwork activities have multiplied as the market economy grows stronger and the availability of and access to natural resources has declined. Outwork includes activities that are a part of a large production or manufacturing process distributed to rural areas where labor is abundant and cheap. Since these activities are not seasonal, they provide continuous income for rural women, particularly those who do not have access to productive resources, the whole year round. *Monos*, which is one of the basic processes in the abaca (Manila hemp) industry, is the oldest example of outwork in the village. Women manually knot together abaca fiber (*escujedo*), which they buy from an outside supplier, into large rolls. The supplier purchases the knotted abaca fiber from the women in Agbanga to be woven by other women from neighboring villages. A large bulk of knotted abaca is sold to a middleman and shipped to larger cities (Pomeroy, 1989). The supplier ensures the commercial relationship by providing the women with interest-free credit.

The assembly of earrings, discussed above, operates in the same way. Yet outwork contributes little to the social capital of the community. Since the materials are merely processed in Agbanga and removed for completion or sale elsewhere, the products cannot be used in exchange relations. Women receive cash for their work, reinforcing the market economy and discouraging the gift economy.

In summary, women's home-based enterprises represent a struggling livelihood strategy that is increasingly important as means of diversification for the household and of economic power for women. Yet as pressure on the natural resource base escalates and the community's social infrastructure no longer meets their productive needs, women's activities are curtailed, their income is reduced, and because they are forced into commercial relationships with suppliers of raw materials outside Agbanga they must relinquish some economic autonomy and control over the diversification of livelihood strategies. As women's economic activity and productive work are historically essential to a household's livelihood strategy — both on a daily basis and in times of crisis, the loss of control over home-based work associated with the lack of access to local natural resources presents a serious threat not only to social capital but to the long-term prosperity and/or survival of the household in general.

XI. Conclusion: Local Action and the Power of Social Networks

Agbanga's natural resource base is declining. Agricultural productivity, especially in the upland areas, is marginal. Overgrazing of carabao thwarts residents' efforts to maintain vegetative cover. Dynamite fishing is gradually resulting in lower yields and loss of biodiversity in the ocean ecosystem. Significantly, local residents recognize this deterioration in their essential natural resource base. In our study, villagers were able to list the intuitive signs that their livelihood based on natural resources was in jeopardy — especially in the uplands and coastlands. They reported that the soil has become reddish in color and that lime (*anapog*) has surfaced on some farms, yet weeds are able to thrive. Plants do not grow well; the leaves are yellowish instead of vivid green. The fishers report a loss of coastal resource diversity evident in the lack of various fish and seashells once abundant in the area. Fishers are required to go further and further off-shore in order to bring in a sizable catch. Because simple hook-and-line fishing has become inadequate, the destructive practice of dynamite fishing is encouraged. Villagers were also able to identify some of the possible causes of these changes in the natural resource base. They reported the following problems: continuous cropping, soil erosion due to loss of trees, lack of grazing land for livestock, dependence on chemical input — especially in the lowlands, and the cessation of the use of organic and inorganic fertilizers.

Most Agbanga residents acknowledge that destructive fishing methods are the main culprit in coastal resource decline. Harvesting sea corals and selling them to buyers from the neighboring island of Cebu is another cause. Agbangans also blame typhoons and other natural disasters for the thinning of forests.

There is no question concerning local-level awareness about the problems related to resource management that beset Agbanga. However, the threat of losing social capital through important exchange relations prevents Agbangans from taking action against one another's destructive use of natural resources. Exchange relations have historically ensured the survival of all community members and, as such, make up the central seam of the community's social fabric. It is a risk — even at the expense of physical capital — most villagers across class boundaries are not willing to take. Therefore, despite the dire consequences that residents foresee if the problem is left unchecked, local action is minimal. There are only silent rumblings in the village.

For instance, a local ordinance has been passed prohibiting free grazing, but full compliance is yet to be realized. Most have given up planting trees because they do not want to risk the exchange relations that allow farmers to graze their carabaos freely on private farms and other neighbors to harvest tree products. A majority of the farmers do not live close to the plots that they cultivate, as many households have activities in the upland slopes, the lowlands, and the sea. Instead, residences are

concentrated close to the main road. Although several tree-planting programs were introduced in the past by government agencies, there was no proper implementation and follow-up. The conditions necessary for continued growth were not approached.

Addressing the problem in the fishery sector is even more complicated. Despite a national ordinance banning dynamite fishing, the practice persists in Agbanga as the most consistent means of bringing in a significant catch and thus cash income or social capital. For a period of time dynamite fishing ceased when outside organizations formed what is called the Local Resource Management (LRM) group in Agbanga. Members established fish sanctuaries, which were later destroyed by a typhoon. Since then there has been no effort to revive the organization.

Agbangan residents agree that dynamite fishing can only be stopped if laws are strictly enforced by the local government. Yet they feel strongly that the local government should also provide alternative sources of income to dynamite fishers.

The tight social networks through which most villagers — regardless of class or gender — benefit in some way from productive activities render local organizing to change certain practices problematic — especially when those practices contribute to livelihood strategies in a rapidly changing and therefore insecure economy. For instance, local people across social categories reap short-term benefits from activities such as dynamite fishing. When fishers dock their boats, they can give out handfuls of anchovies to the villagers waiting at the shore. Recipients can sell, give away, or prepare their share into a dish which can last for several meals. Yet these same strong relationships — whether through the gift economy, labor-sharing arrangements, or kinship ties — serve as a window through which local residents can recognize and understand each other's social and economic constraints in participating fully to determine their own future and that of the community. The potential for improving the quality of life of all villagers begins in the understanding of the centrality of these social networks in Agbanga's economy, how they are threatened by privatization as a derivative of the market economy, and how they therefore encourage maladaptive natural resource management. The potential for change and sustainable growth in Agbanga lies not, however, in the abatement of social networks but in their maintenance as a source of mutual concern and, therefore, their transformation to a source of strength.

XII. Policy Recommendations

The typical policy aimed at combatting the “tragedy of the commons,” where common access results in deterioration of the natural resource base, is privatization. Giving individuals sole responsibility for maintenance of a particular piece of land — and sole access to its resources — has been suggested and implemented in many circumstances. Yet the attention to enhancing physical capital while destroying social capital can decrease sustainability in that the safety net for the community, provided by the social infrastructure and exchange relationships, is undermined.

A more enlightened policy would recognize the multiple demands on common resources (even when they are nominally private) and provide alternatives before limiting access. For example, even with private property and ordinances against grazing, carabao roam freely through the area. Establishing a common grazing area, supplemented by a cut-and-carry system of feed generated by planting natural barriers to soil erosion, could enhance both social networks *and* the physical capital represented by the natural resource base. Further, facilitating female networks to manage the soil-restoring planting and cut-and-carry activities would enhance gender role complementarity, rather than the current competition between men’s and women’s enterprises. This practice would in turn enhance soil quality in the highlands and on the slopes, and forestall the yet unacknowledged threat to the lowland rice paddies of siltation from the upper parts of the landscape.

An important sidelight to our research in this area of the Philippines, where the majority of the population are tenants, is that the insecurity of tenancy does *not* discourage sustainable practices. In fact, the social networks that unsustainable practices keep in place also ensure long-term access to land. At least in areas where strong social networks exist, it is more productive to devote scarce governmental resources to providing profitable alternatives to destructive practices, rather than to engage in major land reform efforts, which in many cases results in even greater concentration in actual access to land (de Janvry, 1982; Goodman and Redclift, 1981). Central government efforts to increase tenurial security have backfired in many cases, displacing the informal social infrastructure that works in locations such as Agbanga, where there is not a single large landowner, no large parcels of land, and no local demand for land reform.

The suggestion that local control alone will solve the problem of the deterioration of common resources (Pomeroy, 1989) is equally flawed. If everyone benefits short term, simply turning over the enforcement of national laws on resource conservation to local jurisdictions will not change behavior. For example, making the community responsible for stopping dynamite fishing — if nothing else changes — will not reduce dynamite fishing. Many in the community see a potentially lethal outside force as the *ONLY* effective preventative measure — a solution Putnam suggests demonstrates a low level of social capital that is hierarchically organized (Putnam, 1993).

Economic development and land reform are other strategies based on an ethic of social justice suggested to combat natural resource deteriora-

tion (Cruz et al., 1992) While dynamite fishing is related to income generation, it is clear that it is not the very poorest in the community who engage in it. Further, many who participate also have access to land for farming. Economic development and equity strategies which take into account both the strengthening of social capital (particularly horizontal social capital) *and* the need to reduce risk through income and enterprise diversification of both men and women (while men are the fishers, women are often the marketers) are more likely to be successful.

A very important part of any policy aimed at improving system sustainability is that monitoring be implemented to see if the policy actually has the anticipated results (Walters and Holling, 1990). Thus, using existing local organizations, particularly those surrounding the school and agriculture, to monitor the environmental impact of changing policies and practices using the indigenous indicators previously identified, can help adapt and legitimize policy and the practices associated with it.

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