SOCIOECONOMIC EVALUATION OF INDIGENOUS COMMUNAL CARPENTRIES IN THE PERUVIAN AMAZON

By

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A THESIS PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

UNIVERSITY OF FLORIDA

2004

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ACKNOWLEDGMENTS

I wish to thank all the people that supported me in many ways to write this thesis. First I want to mention the invaluable contribution of the Asháninka for allowing me to gain the information required for this study, and for their kind hospitality.

I am sincerely grateful to my academic advisor, Dr. Karen A. Kainer, for her outstanding professional support during the entire process of writing this thesis, for encouraging me to do my best, and for her patience in helping me to improve every piece of this work. I would also like to thank Dr. Marianne Schmink and Dr. Peter Hildebrand for their constructive criticism that allowed me to sharpen my thesis.

I express gratitude to LASPAU and OAS for the financial assistance to carry out my graduate education. I acknowledge Tinker Foundation and Tropical Conservation and Development Program for their financial aid for my field work. I also give special thanks to the people at ACPC who supported me in this study with valuable information and logistics.

I also want to thank my parents and brothers for their support and love. I am especially thankful to my brother José Antonio for his extraordinary encouragement and assistance, helping me to achieve my master's studies.

Finally, I acknowledge the support of Jamey, my girlfriend, for all of her support and love, and especially for being my daily inspiration to be a better professional and a better person.

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Abstract of Thesis Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Master of Science

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August 2004

Chair: Karen A. Kainer
Major Department: School of Natural Resources and Conservation

For many, community forestry appears to be a promising way to meet poverty alleviation for rural communities and conservation of forests for a wider range of stakeholders. However, under some conditions community forestry may lead to negative consequences for the local population and their forest. Examining three Asháninka indigenous villages in the Upper Amazon in Peru, this thesis explores market integration at the village and household levels in relation to the current Asháninka livelihood system. This thesis also examines the socioeconomic effects of small-scale, communal carpentries on the villages and households nested within them.

Data were gathered using interviews of key informants, questionnaires, gender differentiated focus groups and participant observation. Kendall's measure of association was used to determine the level of association of carpentry benefits received at the household level and other studied variables. In addition, the comparative analysis among the three villages elucidated village level responses related to socio-cultural differences.

The construction and implementation of communal buildings, the main carpentry goal, was achieved. Regardless of the isolation and distance to the market, differences in socio-cultural background partially explained the presence of two trends in market integration at the household level: a basic market integration and a high market integration. Households with higher integration appeared more likely to receive benefits from the carpentries, such as furniture and house materials, than the households with basic market integration. This unequal distribution of benefits suggests that the carpentry operation increased socioeconomic differentiation among households. These inequities were found to be associated with social conflicts within villages that if unchecked could eventually undermine community involvement and the future of the carpentries.

The carpentries were considered to have at least partially achieved their secondary goal of initiating production of furniture for sale. While this exposure allowed villages to garner some experience in a community-based forest enterprise, it also raised villager expectations. In the future scenario that carpentries focus on production for the market, more technical and economic support from external actors such as non-governmental organizations and governmental agencies may be necessary to prevent negative effects on the people and the forest, and to take advantage of new opportunities for poverty alleviation.

CHAPTER 1
INTRODUCTION

For many, community forestry appears to be a promising way to meet poverty alleviation for rural communities and conservation of forests for a wider range of stakeholders. However, the lack of market access, a healthy forest, business skills or an appropriate policy environment may lead community forestry initiatives to fail economically. In addition, successful community forestry initiatives must also take into account the socio-cultural complexities of the communities –an aspect of community forestry that has too often been overlooked and can lead to substantial negative effects on the local population and the forest (Schmink, in press). Community forestry initiatives, such as the communal carpentries described and analyzed in this study, may become drivers for many social, economic and environmental changes. These changes are often more severe when community forestry initiatives integrate relatively isolated communities to the market economy (Godoy 2001).

This research explores the socioeconomic effects of three communal, small-scale carpentries in Asháninka indigenous communities in the Upper Amazon in Peru. In the next chapter the livelihood systems, in which the communal carpentries became an additional activity, are examined focusing on the productive activities, especially those that are market oriented. In the third chapter, the socioeconomic effects of the carpentry operation on the people are explored at both the household and village levels. This thesis has been organized such that the second and third chapters are two individual and fully

structured papers. Each one of these two chapters has its own conclusions, while chapter four summarizes the main findings of the entire study.

CHAPTER 2
MARKET INTEGRATION AND LIVELIHOOD SYSTEMS: A COMPARATIVE CASE OF THREE ASHANINKA VILLAGES IN THE PERUVIAN AMAZON

Market Integration of Indigenous Groups

There is a clearly defined tendency in indigenous societies towards integration into the market economy, while losing traditional elements of their culture especially in those groups for which the new cultural inputs appear more efficient (Yost and Kelley 1983, Alcorn 1984, Santos-Granero 1991, Beherens 1992, Rojas 1994, Forster 1995, Santos-Granero and Barclay 1995, Begosi 1998, Jodha 1998, Warren and Pinkston 2000, Godoy 2001). Market influences impact indigenous societies in many ways such as creating new expectations for Western commodities, while the opportunity cost of labor and commodity prices increasingly push villagers to become more involved in the market oriented production-consumption cycle. The Asháninka, the largest native indigenous group that inhabits the Peruvian Amazon, have also experienced increased relations with the global economy over the years. Indeed, Santos-Granero and Barclay (1995) reported that even in the sixteenth century, market forces were more effective than the military and the church in colonizing the Asháninka people.

Indigenous societies become involved in commodity exchanges as a means to obtain products not available locally (Sierra et al. 1999). Godoy (2001) identified four indicators of indigenous engagement in the market: (1) portion of the harvest of selected annual crops sold; (2) earnings from wage labor; (3) value of credit received; and (4) total cash received from the sale of goods and services. Godoy (2001) also described the

process of integration of indigenous societies into the market economy through three stages: (1) luxuries became necessities, and the influence of trading relationships disrupts native social organization, (2) government and outsiders pushed the indigenous to market, and (3) indigenous people made a conscious choice to became part of market economies.

The Asháninka

The Asháninka are an Arawakan-speaking people inhabiting the Upper Ucayali tributary valleys (Tambo, Perené, Pichis, Apurímac and Ene), the interfluvial Gran Pajonal area and the Upper Ucayali seasonal flooding lands in the Selva Central region in the Peruvian Amazon. According to the last national census (INEI 1993), the Asháninka population was 51,093 people among 359 communities located in the tropical rain forest in the departments of Junín, Pasco, Cuzco and Ucayali.

Within the Asháninka, six ethnic groups are identified according to their geographic distribution and some linguistic and cultural differences. The target communities of this research belong to the Campa-Asháninka group, the most numerous, with some 40,518 (INEI 1993) in the Lower Apurímac, Ene, Tambo, Lower Perené and Satipo valleys (Yáñez 1998).

The Asháninka traditional domestic unit consists of residential units of four or five nuclear families linked by kinship and affinity relations. These residential units have a leader and share a common territory or nampitsi. In the 1960s, these residential units were grouped into indigenous communities, within larger territories that comprise various nampitsi. Several factors caused the concentration of the dispersed population into grouped communities: colonist pressure over indigenous territories, the need to ensure land tenure rights, school influences, and the activities of churches and governmental

institutions (Rojas 1994; Santos-Granero and Barclay, 1995). This new form of concentrated settlement precipitated a different relation between the local population and the environment.

The traditional Asháninka society supports intergenerational knowledge transfer about the relations between people and their environment through myths and beliefs (Varese 1973, Rojas 1994). This mythical thinking led people to develop practices that have permitted group reproduction for thousands of years. By means of the oral tradition, this mythical thought spreads among the group through time, assuring the perpetuation of practices that have proven technically efficient for the Asháninka, while promoting social organization and control (Rojas 1994).

General History

Historically, Asháninka people have developed the ability to adapt to the upcoming changes while maintaining their ethnic identity and culture. Over several hundred years, the Asháninka have been in contact with different cultures and situations, having relations with diverse groups such as the Incas, Spanish conquerors and colonists. From 1742 to 1755 Asháninka joined the revolution led by Juan Santos Atahuallpa that expelled the Spanish conquerors. In the early XVIII century, during the rubber boom, the Asháninka, as well as other indigenous groups, were persecuted and captured as a labor force. In 1965, the Asháninka were in contact with the MIR (Movimiento de Izquierda Revolucionaria) guerrillas (Rodríguez 1993, Rojas 1994, Santos-Granero and Barclay 1995, Espinosa 1994, Yáñez 1998, Fernández and Brown 2001). Since the 1970s, hundreds of colonists from the Andes have arrived in the Ene river valley looking for land. These newcomers not only were a threat to the Asháninka territorial security, but also were linked with the presence and action of terrorists and drug dealers (Rodríguez

1993, Gagnon et al 1993, Rojas 1994, Espinosa 1994, Santos-Granero and Barclay 1995, Fabián and Espinosa 1997, Yáñez 1998, Fernández and Brown 2001, CVR 2003).

Indeed, during the last two decades of the 20th century, roughly seventy thousand people were victims of heightened social violence in Perú. The Asháninka were one of the most affected groups in this social conflict. Some ten thousand Asháninka were displaced in the Ene, Tambo and Perené rivers, approximately six thousand people were murdered, and another five thousand more were detained in Shining Path campsites. During the conflict, all 32 Asháninka communities in the Ene river valley disappeared as well as 15 communities in the Tambo river valley (CVR 2003).

Productive Activities

Over their documented 3,000-year existence as a defined group, the Asháninka have been developing strategies to sustainably exploit regional natural resources for both resource reproduction and Asháninka reproduction over time (Rojas 1994). Traditionally, Asháninka Indians subsist on a combination of hunting, fishing, gathering and horticulture (Varese 1973, Rojas 1994). Crops cultivated in slash and burn gardens supply most of the Asháninka's caloric intake (Rojas 1994). These small poly-cropped plots, maintained for only a few years before abandonment, produce primarily cassava, maize, and bananas, as well as other minor crops (Varese 1973, Rojas 1994, Santos-Granero and Barclay 1995). Currently Asháninka communities span a spectrum of productive systems ranging from those still practicing traditional livelihoods in the upper tributaries of the Ene and Tambo rivers, to those who experience near constant market contact near Satipo and Mazamari cities (Cárdenas 2001).

An important issue for forest dependent societies in their reproduction through time is the identification of the most suitable season for productive activities. Asháninkas,

based on a deep knowledge of the environment, linked the best period for different productive practices like agriculture, hunting, fishing and gathering with different astronomic, climatic and hydrologic factors, as well as biological cycles of animals and plants (Rojas 1994). In addition, cultural rules for increasing productive efficiency also exist, with the logic of these rules described in traditional myths and beliefs.

In indigenous societies that inhabit the South-American tropical rainforest, like the Asháninka, who have neolithic technology and limited control of the environment where they develop their productive activities, the satisfaction of household needs depends on the roles divided by gender such that men and women are specialized in different productive techniques (Levi-Strauss 1983). In the Asháninka case, the male is in charge of hunting, fishing with nylon lines and trade with other groups. Slash and burn activities, as well as planting "male plants" like cassava, corn, peanut and banana are male activities (Rojas 1994). Carrying logs for firewood is also a male household duty. Most of the utensils, including the ones used only by women, are produced by men.

On the other hand, catching small fish with baskets and gathering are female tasks as well as trading seeds, planting the "female plants," weeding, harvesting, and carrying male and female agricultural products (Rojas 1994). In addition, women make other processed items like cotton clothes, containers for food, baskets and clay pots for cooking. Most of the household duties, such as looking after children, cooking, carrying water and kindling, are also done by women (Rojas 1994, Fabian and Espinosa 1997). An important female activity is to produce piarentsi, a kind of beer made of cassava and sweet potato. With few exceptions, this beverage is the only liquid that the Asháninka drink. Different types of piarentsi exist for different purposes, varying in composition: for

refreshment, for work and for socializing. Children usually collaborate in the household activities from five or six years old (Rojas 1994, Fabian and Espinosa 1997). When the children become older they get more involved in these duties, as defined by gender.

Rojas (1994) has defined the male in the Asháninka culture as the peripheral part of their society, because they are hunters, travelers, traders and warriors. On the other hand, the same author defined the female as the internal part of the society, because she is in charge of the crops and livestock, and the making of clothes and handicrafts. In addition, the household economy is based on women, who are tied to the land, the daughters and the house (Varese, 1973; Rojas, 1994; Fabián and Espinoza, 1997). Furthermore, women are more related to tradition, while men are more linked with cultural changes (Rojas 1994).

Currently, Asháninka agricultural plots fluctuate in size from one to five hectares (Varese 1973, Rojas 1994). Two hectares or less are dedicated to household subsistence. The bigger plots are mostly dedicated to commercialized crops. Asháninka consider that a one hectare plot is enough to feed a four-to six-member family for one year (Holhouser 1975).

Currently, in the Asháninka communities in the middle of the Ene Valley the most common food crops for subsistence are cassava, maize, banana and papaya. The most common commercialized crops are sesame (*Sesamun indicum*), cacao (*Theobroma cocoa*), rice (*Oryza sativa*), coffee (*Coffea arabica*) and achiote (*Bixa orellana*). Cassava or kaniri (*Manihot esculenta*) is their most important food crop (Cárdenas 2000, Peralta and Huamán 2001, Carhuas 2002). This crop is present every day, almost in every meal, boiled or baked and in the cassava beer piarentsi, and Rojas (1994) reported 30 different

varieties of cultivated cassava in different Asháninka plots. Two different kinds of maize (*Zea maiz*) are also cultivated: a "traditional" and a hybrid. The "traditional" is consumed fresh while the hybrid is for poultry feeding, with the surplus sold at relatively low prices. Banana (*Musa paradisiaca*) and papaya (*Carica papaya*) are often present in plots, but in lesser amounts than the previously mentioned crops.

Sesame has become the most important commercialized crop since the late 1990s. It is a short-cycle crop which takes three months to produce and can be sown year round. During the rainy season (kiaronsti), sesame is produced only for seed which is then planted in the dry season (osarentsi). The local market demands the higher quality sesame that can only be cultivated in the dry season; in contrast the sesame produced in the rainy season usually carries fungus. Cacao (kemito) is a perennial crop harvested in the dry season for sale. Rice, coffee and achiote were also sold but cultivated in lesser amounts than sesame and cacao in this area.

Raising animals is a traditional seasonal practice for the Asháninka, and the most commonly raised are hens, ducks and turkeys. They also gather chicks of different wild birds in the forest to raise them until they reach the appropriate size to be eaten. Poultry is raised for food and for sale as a way of saving money for the future, and the main constraints for this activity are disease and predators.

Production for market

In colonial and pre-colonial times the Asháninka were not merely isolated hunters and horticulturalists scattered in interfluvial upland forests, but also traders involved in institutionalized partnerships for the exchange of cotton, cloth, monkeys, feathers, medicinal herbs, and other exotic products for bronze tools from the Andes (Veber 2003). Because the Asháninka group has been in contact with Western society since the XVII

century, there is an increasing dependence on manufactured goods whose production the group does not control (Rojas 1994, Santos-Granero and Barclay 1995). However, this dependence on external goods is often tempered by the Asháninka's limited accessibility to the market.

Study Site

This current study was carried out in the Ene river valley, in the district of Rio Tambo, province of Satipo, department of Junín (Figure 2-1). This area is located in the Selva Central region in the eastern flank of the Peruvian Andes. The Ene River is navigable year round and flows south to north from the confluence of Apurímac and Mantaro until merging with the Perené River to form the Tambo River. More than 40 rivers, including the seasonally navigable Cutivireni and Anapate, contribute to the Ene River along approximately 180 km. The climate varies from tropical warm humid to tropical warm very humid, average annual temperature is 25°C, and precipitation averages 2250 mm per year (AD-PER 1997; Cárdenas 2000).

The Asháninka in the Ene River valley are currently sharing their traditional territory with Quechua colonists who came mainly from the Junín, Ayacucho and Apurímac departments. According to the last national census (INEI 1993), of the total 6848 inhabitants in the Ene valley, 3200 (47%) are Asháninka and 3648 (53%) are colonists.

The commercialization of products from the communities is basically carried out by middlemen who navigate the Ene River from the communities to the closest roads. Products from the Ene River reach the market by two main ways: downstream to Puerto Ocopa on the Perené River, and upstream to Sivia and San Francisco on the Apurímac River (Peralta and Huamán 2001). Middlemen sell manufactured products to the

communities and also buy products from the communities to sell in the market. The products from the market that the communities consume most are steel tools like machetes and axes as well as fishing hooks and lines, shotguns, ammunition, aluminum pots, fabric and clothes, salt, medicines and school supplies. On the other hand, the products that communities sell most are agricultural products like sesame and cacao seeds, coffee beans, peanuts, rice, occasionally maize, hens, ducks and turkeys, and wild animals like monkeys and birds.

The Asháninka of the Ene River do not have many options to trade other than through middlemen. While this trade has often been described as unfair to the Asháninka (Peralta and Huamán 2001) these middlemen have legitimate expenses and take significant risks to reach the communities (Padoch 1992) . Their main expenses are gasoline, driver and navigator salaries, and engine maintenance; they also include a profit on the products they trade. Risks include the possibility of sinking in the river and losing the entire load, and in the Ene river, Shining Path members occasionally intercept their boats to take medicines, food and clothes. According to my informants, some middlemen are trading with Shining Path and drug traffickers, and for this reason, some Asháninka communities only allow the middlemen they trust most to come into the communities to trade with them (Peralta and Huamán 2001).

Three Communities

Within this geographic location, the target groups of this study are the Camantavishi, Cutivireni and Quempiri communities. These communities were consolidated from scattered Asháninka groups in the Ene Valley, and legally recognized in the 1960s. Asháninka migrants who joined the existing Asháninka residents in the Ene Valley, subsequently became the leaders of these newly founded communities. The new

leaders believed in the need to consolidate the population in order to have a school and defend themselves from the harmful effects of the increasing colonization pressures (Mayer 1971, Santos-Granero and Barclay 1995).

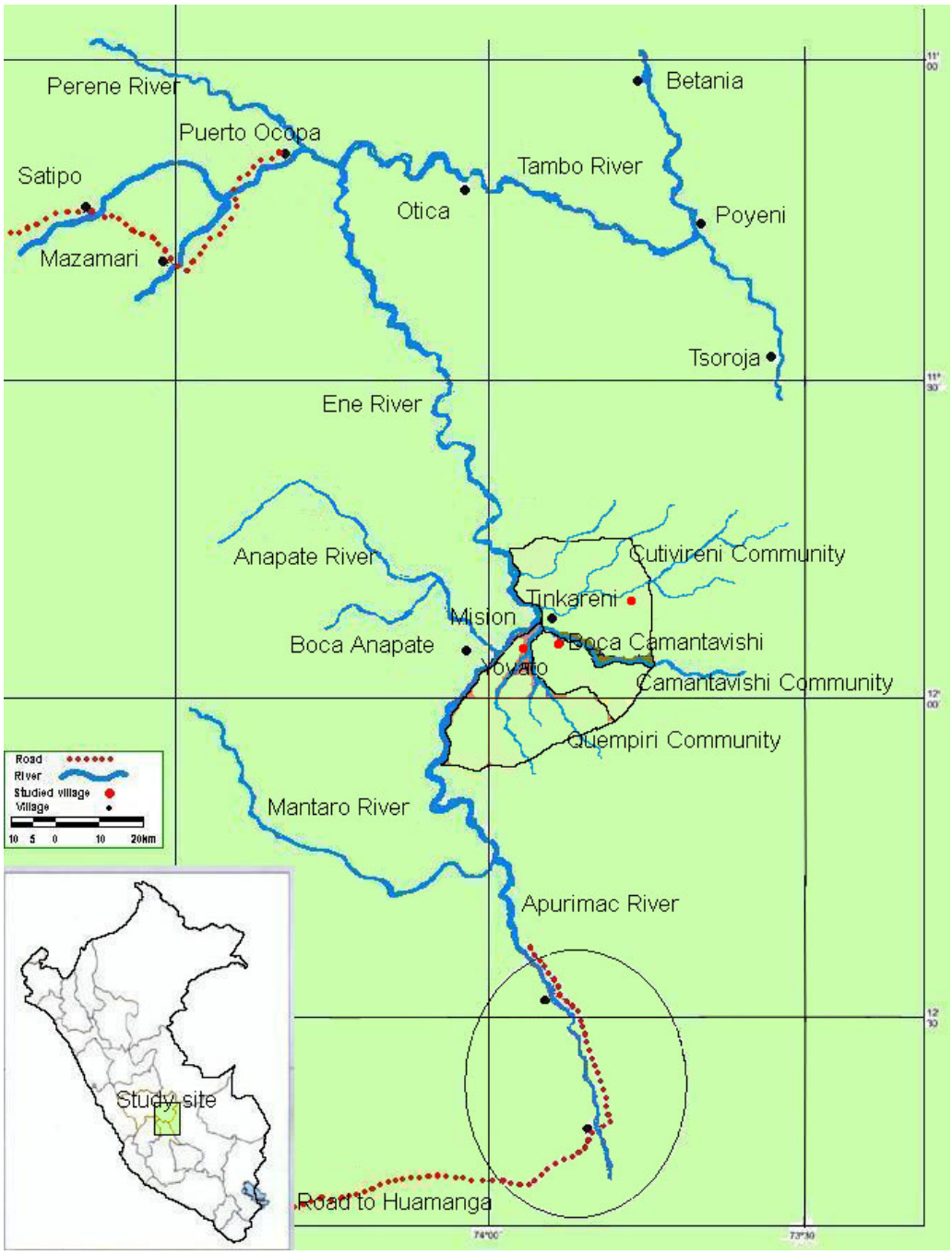

Figure 2-1. Study site map. (Adapted from IGN 1999)

For this study, one village was selected in each community: Boca Camantavishi in Camantavishi, Tinkareni in Cutivireni, and Yoyato in Quempiri. Even though these three village groups share a similar origin and customs, relevant differences exist. Yoyato is located a 30 minutes walk from the Ene River; Camantavishi is a one-hour walk; and Tinkareni is a two-hour walk. Yoyato and Camantavishi also share a larger presence of protestant churches (Santos-Granero and Barclay 1995, Heinrich 1997).

Yoyato people are originally from the Boca Anapate area, a former annex of the Centro Tsomaveni community located on the left shore of the Ene river. Due to the social violence during the 1990s these people were forced to move to different places. First, they were forced to join Shining Path, and moved to a terrorist campsite in the Upper Sanibeni river at the left margin of Ene river. They escaped from the terrorists in 1991, upon becoming aware of an anti-terrorist headquarter at Misión Cutivireni. They stayed at Misión Cutivireni as refugees until 1999, when they settled in the Yoyato creek area within the Quempiri community boundaries. They are not allowed to fully exploit the natural resources on this borrowed land, such as valuable timber species. Some of the Yoyato people are reluctant to establish large plots of perennial crops given the uncertainty of the long term ownership of this land. They are still waiting today for the required security conditions to return to their original homeland in the Boca Anapate area. Currently, Yoyato has a population of 200 inhabitants in 36 households.

In the 1980s, residents of Boca Camantavishi annex were also displaced due to social violence. As with the Yoyato people, Camantavishi people were forced to join the terrorist group. In 1991, the Peruvian Army, with the support of other Asháninkas, recovered the Camantavishi people. This group was held as refugees in Misión Cutivireni

until 1996 when they settled in the left margin of Cutivireni river, roughly two hours upstream. Since 2002 this group started resettling their original homeland in the Boca Camantavishi area. Currently, Boca Camantavishi has a population of 260 inhabitants in 48 households.

Tinkareni people had to escape to the mountains when terrorists tried to kidnap them in January 1990 (Gagnon et al. 1993). These people lived as nomads in the forest for 16 months until they joined the anti-terrorist headquarter at Misión Cutivireni (Rodriguez 1993, Espinosa 1994).They stayed as refugees at Misión Cutivireni until 1996, when they returned to their original homeland in the Tinkareni area. In contrast to the people from Boca Camantavishi and Yoyato, who were affected by the external cultural influence while living with Shining Path members, the people from Tinkareni strengthened their traditional knowledge of the forest in order to survive with no permanent agricultural plots. Currently, Tinkareni has a population of 235 inhabitants in 45 households.

Study Objectives

The purpose of this study is to examine market integration of three Asháninka communities and how this related to their livelihood system. The Asháninka communities of Camantavishi, Cutivireni and Quempiri have been selected for this research since they are located at different distances to the market, and offer the opportunity to study traditional indigenous groups that have been in contact with different levels of market integration for more than two decades.

Specific objectives of this research are as follows:

To describe and analyze the current livelihood system of three Asháninka indigenous communities in terms of their goals, activities and resources.

To analyze the livelihood system in relation to the external market in terms of distance to market, area under cultivation and market integration at both household and village levels.

Methods

Data Collection and Analysis

Data for the three villages were collected using three methods: (1) in-depth interviews of key informants, (2) questionnaires, and (3) informal interviews and participant observation. All data collection was carried out during an eight-week period in June/July 2003. Approximately equal time was spent in each of the three villages. This intensive eight-week research period followed upon a five-year experience in which I worked in this area as an extension agent for a non-governmental organization.

In-depth interviews with a key household at each of the three villages were carried out to have a broad understanding of the livelihood system. The male and the female were interviewed separately, and considered key informants to gather qualitative information.

Questionnaires were applied to a sample of households randomly selected within each of the three villages. Male and female adults nested within each of the 29 households were queried, representing an average 22% sample (Table 2-1). Quantitative and qualitative data were gathered about the livelihood strategies of each specific household, focusing on household composition as well as reproductive, productive and extractive activities.

Informal interviews and participant observation were carried out throughout the field research period. These methods were used to observe the daily activities in the house, the farm and in the forest to have a better understanding of the livelihood systems.

These methods were also used to validate information collected through the key informants and the questionnaires.

Table 2-1. Questionnaires were applied to males and females nested in 29 households.

VILLAGES	Distance to market (min)	Total households	Questionnaires	%
Yoyato	30	36	10	28
Boca Camantavishi	60	48	11	23
Tinkareni	120	45	8	18
Total		129	29	22

Livelihood Systems Description

The information by key informants provided the baseline description of the livelihood system for each village. In addition, participant observation of the daily activities in the house, on the farm and in the forests, coupled with informal interviews, completed the broad picture of the livelihood systems. Information gathered was organized into three main interconnected areas: household goals, available household resources, and activities, to facilitate analysis of allocation of available resources into different activities to meet the household goals (Feldstein and Poats 1990). Following Hildebrand (2003b), household resources included labor, land and cash. Natural resources were assumed to be equal between the three villages and between households.

Since sustaining the home and the family is typically the main concern of small-scale farmers in developing countries (Hildebrand 2003a), the line of questioning for this study began with subsistence activities. Questions focused on activities performed to reach household goals, with activities classified as reproductive, productive and extractive. Greater attention was paid to the productive activities oriented to both subsistence and market production. Next, information was gathered about the resources available in the household and how they were allocated to meet household needs and

goals. The description of the livelihood system was considered not only a list of components, but also an elucidation of the complex dynamic that makes these pieces flow in production-consumption cycles.

Market Integration

Virtually all indigenous groups, even the ones that inhabit isolated areas, have some participation in the market (Varese 1973, Padoch 1992, Rojas 1994, Heinrich 1997, Belcher 1998). These groups seek access to commodities that cannot be produced locally, ranging from very basic needs such as salt or iron tools, to more complex needs such as radio-cassette players or chainsaws (Padoch 1992). An analysis of market integration was applied to the data to describe and quantify the degree to which both households and villages participate in the market economy. Three variables were used to measure market integration:

1) Market Integration Score: Based on Heinrich's (1997) work in Machiguenga communities in the Peruvian Amazon, a market integration (MI) variable was developed to serve as an indicator of market integration for each household by surveying selected western possessions owned by each household. Five items of higher market value were selected (Table 2-2), each with a slightly different market score based on their relative market value. The sums of the scores for each household resulted in the MI score for that household. Following Heinrich's (1997) work, items of little market value were excluded from the scoring because they provide little explanation of the degree of market integration, while those of higher value are typically strong indicators. This measure of market integration is valid to the extent that households which spend more money on these western goods also maintained a higher degree of market integration.

Table 2-2. Market Integration Index items

Item used in MI calculation	MI score (sol)
tin roof	300
shotgun	250
wood siding	150
radio-cassette player	100
casting net	50

2) Distance to market: The distance from the village to the closest navigable river was measured in minutes walking. This variable was selected because the distance to market can be a constraint to market integration.

3) Area under cultivation: Each household within the survey was asked about the total area under cultivation designated to both household subsistence and external market. Since area under cultivation for subsistence depends mainly on household composition specifically for the Asháninka (Rojas 1994), any additional area under cultivation was assumed to be for market purposes. If this assumption is correct, the total area under cultivation less the area designated for subsistence production for a given household composition would be a measure of the level of market integration of a given household.

The level of market integration for each household was first assessed using the MI score, while village scores were developed by grouping the sampled households to show market integration trends within and between villages. Average area under cultivation per village was also assessed to look at the differences betweens means using a one-tailed t-test with unequal variances. Finally, the correlations between area under cultivation, distance to market and market integration scores were tested using the one-tailed Pearson's test.

Ethnographic Linear Programming Model

A linear program is a mathematical procedure that optimizes (maximizes or minimizes) an objective, subject to a set of constraints. Ethnographic Linear Programming (ELP) models are means of quantifying ethnographic data about how households are structured and operate. ELP models are developed to help outsiders understand the complexity and diversity of livelihood systems and the households that depend on them (Hildebrand 2003b).

In this study, the ELP model was developed using qualitative ethnographic information from the existing literature, from in-depth interviews of they informants, and through participant observation and informal interviews. Quantitative information was gathered from both questionnaires and in-depth interviews. To develop the ELP model, a "typical" household was elaborated using average values of household composition, number of members, age, and gender composition. The model was then run for a period of time, according to the life expectancy in the villages.

Based on the outcomes from the ethnographic linear programming model, distance to market, cash surplus, total cultivated area, area under cultivation for market, and cultivated area per crop were compared using one-tailed Pearson's bivariate correlation. Household resources were also assessed in order to determine those most limiting.

Results

Livelihood Systems Description

Livelihood strategies are those activities available in the livelihood system to which households allocate available resources to meet household goals. Although in all cases, sustaining the family was clearly the main household goal, resources available and their allocation into activities varied among households and among villages. A livelihood

system is comprised of all the potential activities that households in the system realistically have access to.

Figure 2-2 shows the main important livelihood activities available in the livelihood system by gender along the calendar year. These activities were selected for being the most discussed in the interviews and also for using the most labor. In addition to the main activities listed, the Asháninka also engage in other productive activities such as cultivating minor crops including tubers and fruits, gathering different medicinal plants, and manufacturing handicrafts.

Seasonality is critical to describe the livelihood system in Asháninka villages. The rainy season, from December to March is linked with scarcity, as articulated by one informant from Camantavishi: "...in the rainy season there are no products, there is nothing." With the only exception of sesame production for seeds and light weeding of cassava, no major agricultural activities are carried out in this season. Extractive activities like hunting and fishing are also limited by weather conditions since the expansion of river volume and the flooding of pathways make hunting trips more difficult. Also, increased river siltation makes most fishing techniques less successful. In part, because of the weather limitations imposed on the productive activities listed above, the rainy season is also a key time to gather extractive products in the forest such as wild fruits, shrimp and mushrooms (Figure 2-2).

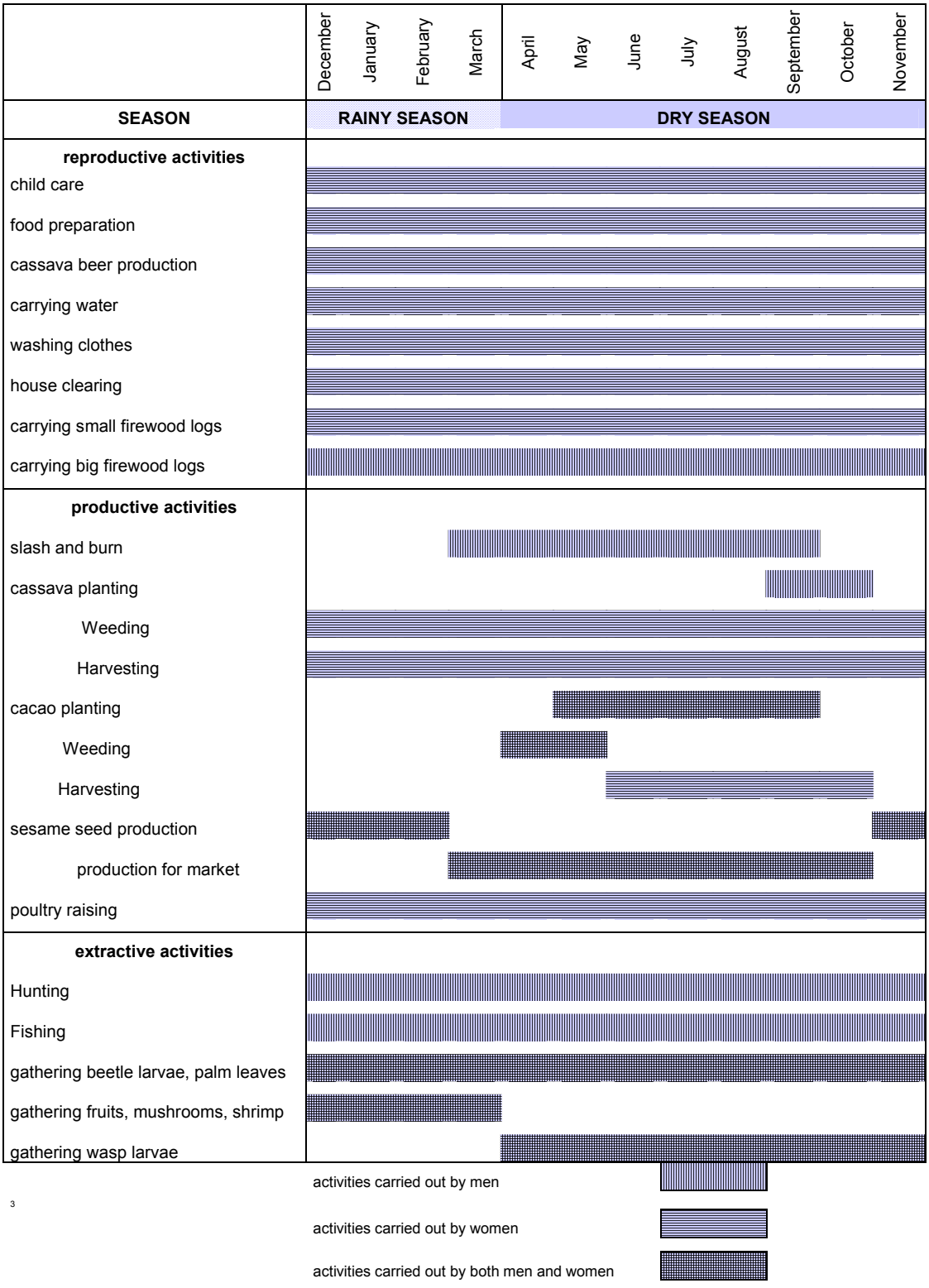

Figure 2-2 Calendar of main livelihood activities by gender.

The dry season, from April to November, is linked with abundance. Cacao and sesame, the most important products for sale, are harvested at this time. Fishing in creeks is the most important extractive activity in the dry season. In the dry season, hunting is more frequent and effective because it is easier to walk in the forest when the terrain is dry. Also in the dry season, game is more available.

Gender roles are clearly defined in traditional activities such as cassava cultivation and hunting, while more flexibility is observed in non-traditional ones such as sesame cultivation. Basically, women are charge of domestic tasks such as looking after children, preparing food and cassava beer, carrying water and small firewood, cleaning the house and washing clothes. The only domestic task done by men is carrying large logs for firewood due to the strength required.

Children's participation in household activities is commonly observed from the time they are about five years old. Initially, they learn their respective tasks, often defined by gender, by playing. However, once children became older, they spend more time on their work and have more responsibilities. As boys go with their parents to hunt, or to the garden, girls start taking care of their younger brothers and sisters. Usually twelve year old children are able to collaborate in almost any household task.

Slash and burn is carried out in the dry season. Slashing, or cutting, of the forest is carried out at the beginning of the dry season so that the cut material will be dry enough to burn after four weeks in the primary forest, and three weeks in secondary forest.

Slash and burn is traditionally a strict male activity, and according to their beliefs, simply the presence of a female while this activity is carried out is considered improper and dangerous. When asked about who participates in this task, in Yoyato and

Camantavishi they mentioned that women currently collaborate in slash and burn. In contrast, in Tinkareni, they responded that they have cultural reasons to restrict the female presence during slash and burn.

Cassava is the most important subsistence crop in the Asháninka culture, present daily in almost every meal and as the base for cassava beer. Traditionally males are in charge of cassava planting and the first weeding. Then, the next weeding, harvesting and carrying are female tasks. In Camantavishi and Yoyato, it is common that females participate in cassava planting and the first weeding, while in Tinkareni these tasks are restricted to males.

Cacao is the most important perennial cash crop in the Asháninka villages studied. Cacao produces fruit the third year after planting. Harvesting time is from May to September, and usually each plot is harvested twice a month. Planting, weeding and harvesting could be carried out by male or female. Post-harvest tasks such as carrying, removing the beans from the pods, washing, and drying are done by females.

The main problem that affects cacao production in the area is the widely spread fungal disease moniliasis (*Moniliophthora roreri*). In the villages it is called cacao's disease and causes a significant decrease in pod yield; at times, it results in complete loss of the harvest.

Sesame recently became the most important cash crop in the villages studied with the advent of cacao disease in the last decade. There is no strict definition of tasks by gender with sowing, weeding, harvesting, drying and thrashing carried out by all the household members, except small children.

Sesame is produced year round in the Ene river area. In the dry season, sesame is produced for sale. Before the sale, a small amount of seeds, usually a few handfuls, are kept for planting in the rainy season. A small plot of sesame is cultivated in the rainy season with the intent to produce enough seeds for the next dry season. According to my informants, the seeds produced in the rainy season have better viability than the ones produced the previous dry season. Producing sesame for sale in the rainy season is not a common practice due to the incidence of fungal diseases in the high humidity environment such that middlemen will not buy the seeds, or pay lower prices.

Use of pesticides to treat plant and animal diseases was queried in the studied villages. One producer from Yoyato mentioned his intentions to use a fungicide to treat moniliasis, but that its cost was currently prohibitive. In Boca Camantavishi some farmers mentioned that the only pesticides they occasionally use are against the ant "maniji". In Tinkareni the use of chemical pesticides was not mentioned. In the three villages some natural products are used to control animal diseases.

Poultry raising is the only livestock activity carried out in the studied villages. The most important species raised are chicken, turkey and duck. Fencing for these small animals is usually built by men using locally available materials, but as one woman from Camantavishi said, in the case that her husband cannot build the fence, she can do it. The women are in charge of feeding, watering, collecting eggs for poultry raising. The main purpose of raising poultry is for sale, but in some cases it is consumed in the household. The main constraints for raising poultry are diseases and predators.

Hunting is an exclusively male activity. Typically, young boys go with their fathers to learn how to hunt, and by the age of fourteen or fifteen, hunt without supervision.

Game is basically for subsistence, but in some cases live animals such as turtles, birds or monkeys are sold.

Fishing techniques vary depending on the season. In the rainy season, when the rivers increase in volume and muddiness, fishing with casting nets is carried out. In the dry season, fishing with line and hook, as well as collective fishing techniques are practiced. Fishing with a casting net, and with line and hook are exclusively carried out by men while collective fishing techniques are carried out by both men and women.

Gathering of products such as edible beetle larvae or palm leaves is carried out year round, while other products are dependent on season. Wild fruits, mushrooms and shrimp are gathered in the rainy season, and wasp larvae are gathered in the dry season. Both males and females participate in the gathering of forest products.

Handicrafts for sale are processed in the household on rainy days when other productive activities cannot be carried out. Women make cotton handicrafts and baskets. Men make bows and arrows, as well as traditional crowns. Raw materials for these handicrafts such as cotton (*Gossipum sp*.) are cultivated, while others are gathered in the forest, such as chonta palm (*Iriartea deltoidea*).

The most important products for sale are sesame and cacao, but also poultry, achiote, rice and handicrafts are sold. The male is in charge of selling the products to middlemen who come to the communities to buy and sell products year round.

In addition to the relation with the external market, Asháninka households rely on internal trade within the community. Reciprocal exchange is a traditional activity commonly observed in the studied villages, particularly between relatives. One informant

from Yoyato said “We are accustomed so that if I need and have no seeds or chickens, I have some from my brother in law or my nephew.”

Market Integration

Based on market integration (MI) scores, the degree to which the 29 Asháninka households were integrated into the market varied, based on the assumption that villages with lower MI scores are the less integrated in the market. Average village MI scores suggest that distance to market is an important variable in explaining market integration. Tinkareni households (located furthest from the market) were the least market integrated while Yoyato households (located closest to the market) appeared to have the greatest integration. Notwithstanding, standard deviations of average village MI scores revealed substantial deviation in market integration among households, regardless of how far the household was located from the market (Table 2-3). Aggregating individual household MI scores into 50 sol intervals to look for trends in market integration illuminated the extent of variation within villages as well as variation among villages (Figure 2-3).

Table 2-3 Distance to market, market incorporation score, total area under cultivation and area under cultivation for market for the three villages.

VILLAGE	distance to market (min)	MI score (soles)	AUC for market (ha)
Yoyato	30	163.6 ± 62.9	0.85 ± 0.85
Boca Camantavishi	60	133.3 ± 201.6	0.70 ± 0.63
Tinkareni	120	62.5 ± 64.1	0.06 ± 0.63

Eleven of the 29 households had a market integration score of zero, with almost half of the households in Yoyato and Boca Camantavishi (the two closest villages) in this category. Nonetheless, the majority of households in each of these close villages were integrated into the market while none of the Tinkareni households (the most distant to

market) had high MI scores. It is assumed that households with the minimal market integration have null MI scores. In contrast, eleven households have null MI score, though this null score did not preclude them having some minimal, basic market integration as described by Padoch (1992) and Heinrich (1997). However, the average area under cultivation for these eleven households was considered to be completely dedicated to subsistence production.

In Yoyato and Boca Camantavishi (the two closest villages to the market), nearly half of the households (45% and 44%) have a null MI score. In Yoyato, 36% of the households have intermediate MI scores (250 to 300 sol), while in Boca Camantavishi 33% of the households have low to moderate MI scores (50 to 100 sol). Finally, in Yoyato, 40% of the households have high MI scores (350 to 400 sol), while in Boca Camantavishi 22% of the households have the highest MI scores between 400 to 450 sol (Figure 2-3a-b). In Tinkareni (the furthest village from the market), most of the households (67%) have null or low MI scores (0 to 50 sol), while the rest of the households (33%) have moderate MI scores between 100 to 200 sol (Figure 2-3c).

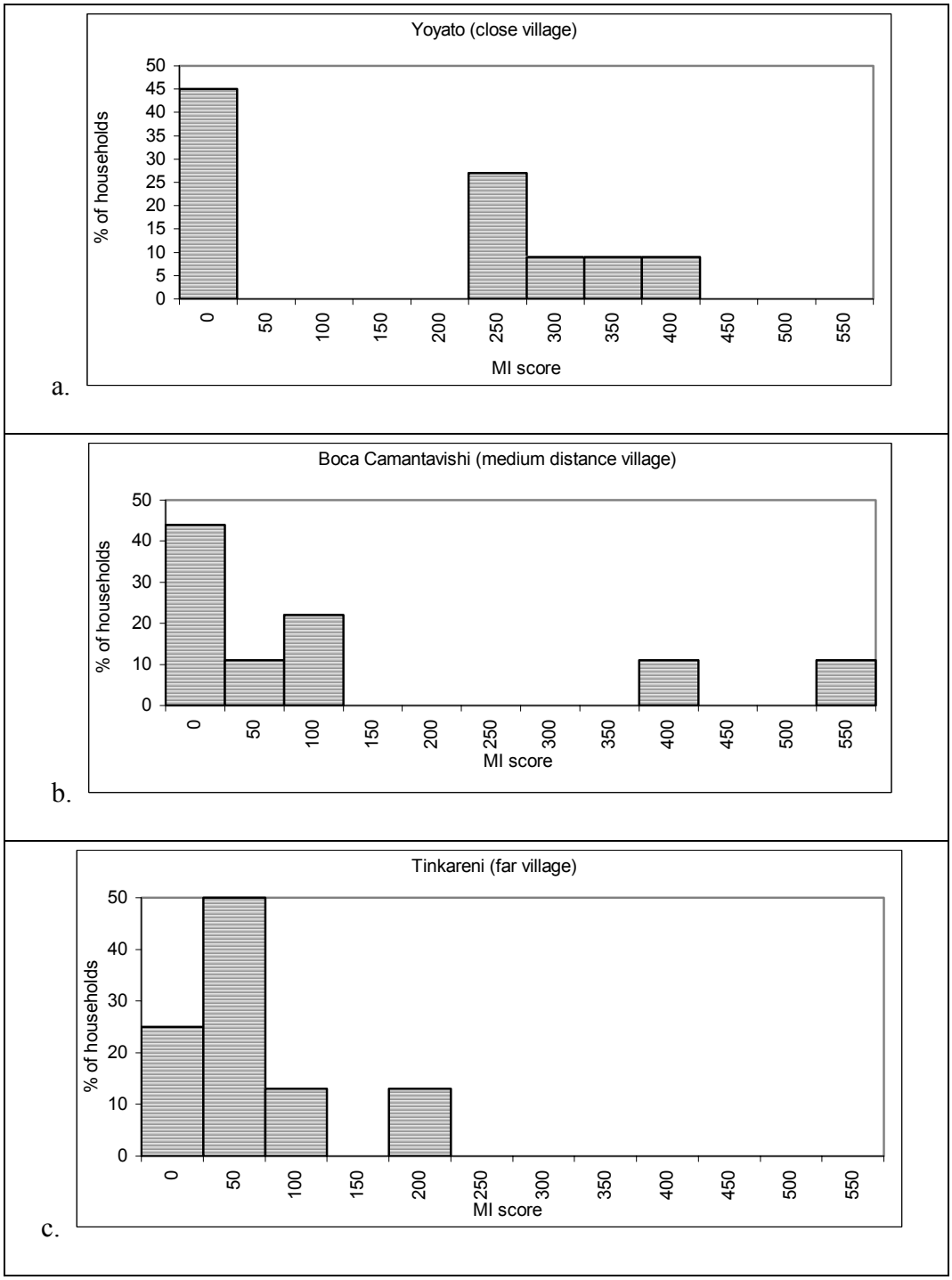

Figure 2-3 Market integration score for households located in the three villages: Yoyato (closest village), Boca Camantavishi (medium distance village), and Tinkareni (furthest village).

Area Under Cultivation for Market

The area under cultivation (AUC) for market per household was evaluated for each village to further explore market integration. These values were obtained by subtracting the area under cultivation for subsistence production from the total area under cultivation. The area under cultivation for subsistence production was assumed to be the average of the total area under cultivation from the eleven households that have null MI scores. The findings suggest that the area under cultivation for subsistence was 0.5 ± 0.5 ha.

Similar to the MI score, AUC for market for Tinkareni households (located furthest from the market) have lower values than Boca Camantavishi and Yoyato households, which are located closer to the market (Figure 2-4). In Yoyato and Boca Camantavishi (the two closest villages to the market), 30% of their households have null AUC for market, while another 30% of their households have a small AUC for market (0.5 ha). For both villages, 40% of the households have between a moderate to large AUC for market (1.5 to 2.5 ha) (Figure 2-4a-b). In the furthest village, Tinkareni, most of the households (88%) have no AUC for market, and the other 12% have a low AUC for market of 0.5 ha (Figure 2-4c).

Association between distance to market, area under cultivation for market and market integration score was measured using Kendall's tau-b measure of association test. Kendall's tau coefficients (τ) show that there is a moderate positive linear trend between MI score and AUC for market ($\tau = 0.471$). While there is a moderate negative linear trend between distance to market and AUC for market ($\tau = 0.408$), no significant association was found between distance to market and MI score (Table 2-4).

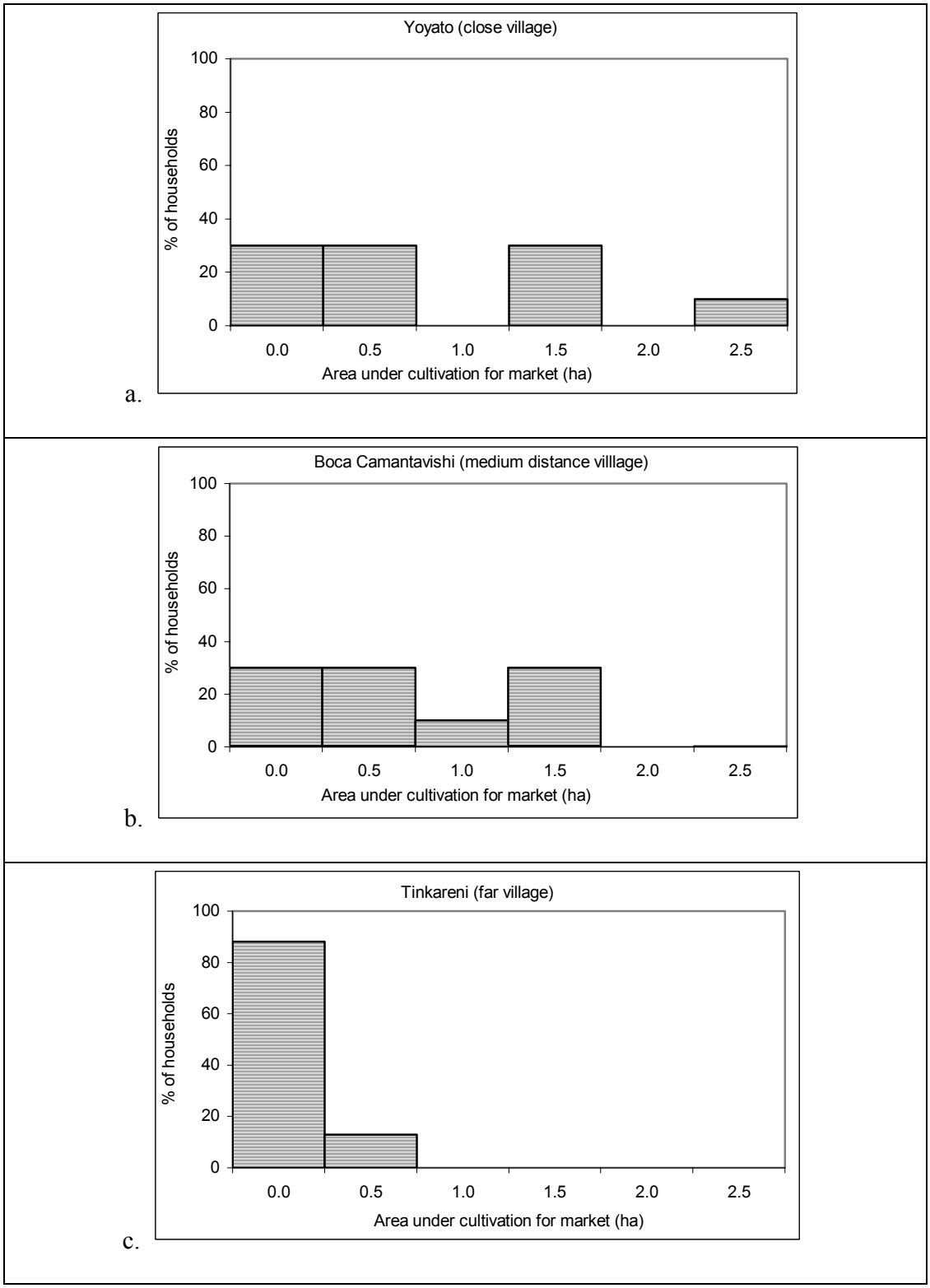

Figure 2-4 Area under cultivation for market for households located in the three villages: Yoyato (closest village), Boca Camantavishi (medium distance village), and Tinkareni (furthest village).

Table 2-4 Kendall's tau-b measure of association values for Market integration score (MIS), Area under cultivation (AUC) for market and distance to market.

Cross tabulation	τ – value	P-value
MIS * AUCM	0.472	0.000
MIS * Distance	-0.092	0.551
AUCM * Distance	-0.408	0.004

Ethnographic Linear Programming (ELP) Model

The ELP model was run to determine to what extent the effect of the distance to market in the three villages affected cash surplus, total area under cultivation, area under cultivation for market, area under cultivation for subsistence and area under cultivation per crop. Assuming that households are market oriented or increasingly becoming so, cash surplus was maximized.

Table 2-5 Distance to market, expected cash surplus and area under cultivation (AUC).

VILLAGE	distance to market (min)	average cash surplus per year (soles)	total AUC (ha)	AUC for Market (ha)	AUC for subsistence (ha)	AUC cacao (ha)	AUC sesame (ha)
Yoyato	30	2511	5.1	4.7	0.4	4.5	0.2
Boca Camantavishi	60	2084	4.4	3.9	0.4	3.8	0.1
Tinkareni	120	1487	3.3	2.9	0.4	2.7	0.1

Source: ELP

According to the model, if maximizing cash, labor is the limiting resource in the studied livelihood system. Specifically, labor in the dry season is limiting in each one of the 42 years, which was assumed to be the working life expectancy of an individual. Male labor in the dry season was the limiting factor in 39 out of 42 years, while female labor in the dry season was limiting in the other three years. During the rainy season, neither male nor female labor was limiting in any year. Initial cash was a constraint

when < 5 sol were available. This amount of cash is easily available for households, so initial cash was assumed not to be a limiting resource.

Discussion

Market Integration

The comparative analysis of the current strategies of different households in three indigenous villages was carried out to explore the effects of distance to market and other variables on market integration at the village and household levels. In this study, market integration was examined for each of three Asháninka villages (located at varying distances to the market) and for households nested within each of the villages.

Padoch (1992), in her research with indigenous communities in the Peruvian Amazon lowlands, found that virtually all households had some participation in the market economy. In my research, it was also found that virtually all households were integrated into the market, but in different proportions. For example, in all the studied villages, manufactured items such as tin pots, iron machetes and axes, and metal fishing hooks have totally replaced traditional clay pots, stone axes and bone fishing hooks. Although most villagers are still using traditional clothes, industrially manufactured clothes are increasingly used in villages located closer to market. On the other hand, traditional items such as bowls and containers made with bottle gourd (*Lagenaria sp.)* and calabash (*Crescentia cujete*), and palm leafs roofs are commonly seen in all the studied villages.

Thus, the premise of this study is that all households have some basic level of integration into the market economy, and the focus of this discussion is therefore on the different degrees to which villages and households were market integrated. These household-level differences were determined by calculating a market integration (MI)

score and by determining area under cultivation (AUC) for market; village differences were determined by averaging these household-level scores.

Distance to market is often used in research as a predictor of the level of market integration for any given indigenous village. Heinrich (1997), in his work with Machiguenga communities in the Urubamba basin in Perú, found that community location on the river system explained most of the variation in the market integration, such that the more remote the community, the less the market integration. This general negative association between distance to market and market integration was found at the village level when comparing the three Asháninka villages, such that both indicators of market integration (average MI score and average AUC for market) were higher for both Yoyato and Boca Camantavishi (the two villages located closest to market) than for Tinkareni (Table 2-3). Indeed, the average MI scores for Yoyato and Boca Camantavishi were more than twice as high as Tinkareni, and average AUC for market for these two proximate villages was more than ten times as high as that of Tinkareni.

However, when looking at the household level, this negative association between market integration and distance to market became confounded in some villages. Specifically, the bimodal distribution of households for Yoyato and Boca Camantavishi, both in the low and high values of MI scores (Figure 2-3) and AUC for market (Figure 2-4), suggests the existence of two different trends in market integration at the household level. A clearly defined trend for low market integration was characterized by null or low values of MI scores and AUC for market. These households were mainly addressing their needs through subsistence production and had no or very few Western possessions. Up to 45% of the households interviewed in all three villages fell within this minimal market

integration category. On the other hand, a high market integration trend was characterized by medium to high values of MI scores and AUC for market. Even though these households have some subsistence production, they have a substantial focus on production for the market and have more Western possessions. Households with high MI scores and high AUC for market were present in both Yoyato and Boca Camantavishi, the two closer villages to the market; whereas in Tinkareni, the furthest village, no households with the high market integration trend were found.

The presence of these two distinct levels of market integration supports the findings presented by Godoy (2001) in which he articulated two main trends in market integration for forest dependent indigenous economies: 1) autarky or traditional households that produce most of what they consume, and rely on hunting, horticulture, and reciprocity relations; and 2) market oriented or non-traditional households that produce little of what they consume, and rely on well-functioning markets and the local development of specialists. In this study, many households had little discernible integration with the market based on either MI score or AUC for market and appeared to be more traditionally oriented, while other households appeared to be more market oriented though still not highly dependent in the market as suggested by Godoy (2001). Attitudes toward strict adherence to traditional or non-traditional behaviors were based on various indicators such as the degree to which women participate in slash-and-burn and the use of purchased pesticides. Traditionally, slash-and-burn is only performed by males, whereas the use of purchased pesticides is an indicator of the influences of outside culture. Other observations used to indicate whether households were more traditionally- or market-oriented were the use of traditional clothes, use of indigenous language, and consumption

of traditional narcotics, such as ayahuasca (*Banisteriopsis sp.*). Based on these criteria, all households in Tinkareni (that village furthest from market) were more traditionally oriented with little market integration. However, in Boca Camantavishi and Yoyato, despite the relative proximity of these villages to market, both traditionally-oriented, less market-integrated households were found side by side with those that were more market-oriented and less traditional.

Thus, beyond distance to market, how might these two major trends in market integration for the Asháninka households studied be explained? Perhaps they could be partially explained by the different geographic and cultural origins of the people within the villages. As noted by Santos-Granero and Barclay (1995), whose target study communities overlapped with those in my study, there is one distinct group of Asháninka people who have been dwelling in the area for several generations, while a separate group of people came from areas of high colonization pressure in the1960s. Those who have been residing in the area for generations such as in Tinkareni, tend to have little market integration, while those who have recently arrived from the higher colonization areas have greater market integration. Still, Tinkareni is located furthest from market and this variable may be confounded with cultural or geographic origins.

Perhaps the observed difference in trends of market integration could also be partially explained by the different household goals and strategies. In many indigenous societies, Western-oriented households seek a better social status by accumulating wealth, while traditional households use sharing and reciprocity to gain more status (Varese 1973, Rappaport 1984, Rojas 1994, Bedoya 1995, Begosi 1998, Smith and Ward 2000, Godoy 2001, Gudeman 2001). Furthermore, Godoy (2001) states that people and

households consciously self select the extent to which they embrace an outside culture, and the amount of integration to market they wish to achieve. In the studied Asháninka villages, perhaps those households most integrated in the market have made a deliberate decision to draw upon both inside and outside cultures in a conscious effort to have a wider range of adaptive options from a broader base of cultural capital (Begosi 1998), while the households least integrated to market decided to rely on their traditional knowledge and subsistence production. Another factor that partially explains the dichotomous market integration trend is the number of widows that were heads of households, particularly in Boca Camantavishi. In this village, widowed heads of households were fairly numerous (three out of eleven households interviewed) because of the social violence this particular group of people had experienced in their recent past.

Labor Scarcity

Another possible reason for differences in market integration between households is availability of labor. For the communities studied, the option to become more integrated to the market is increasing. An ethnographic linear programming model was developed to explore what resources might be most limiting in those households choosing greater market integration. The ethnographic linear programming model employed in this study incorporated these distance-to-market differences to predict the effect of different conditions of the livelihood system at the household level. Considering the general trend of villages to increasingly become more involved in the market economy, the model described the effect of distance to market in a household highly integrated to the market. To predict responses of households with different levels of market integration, as most of the households in this study, a variable to link trends in market integration should be developed and adapted to the model.

For those households who might want to increase their cash surplus, presumably through greater market integration, the ELP model identified labor as the limiting resource. More specifically male labor is most limiting in the dry season. Cash surplus maximization was also affected by initial cash input when initial cash is lower than 5 sol ($ 1.60 per year). This cash input level could be easily covered by households in this study. Similarly, in all the villages studied, large areas of land for agriculture were available for any household who might want to increase area under cultivation, clearly indicating that land is not a limiting resource. Sierra et al. (1988) also found in their work with Huaorani communities in Upper Amazon that land was abundant. They also found that while labor was enough for subsistence production, it was a limiting factor for additional production oriented to the market.

Given that male labor is likely a limiting resource for productive activities, the Asháninka have developed strategies for increasing the male labor pool. For nearly one year after daughters are married, the new son-in-law is expected to contribute his labor to his in-laws household as a bride service. A second strategy for temporarily increasing the male labor is through the honoring of reciprocal labor days. In this system, relatives are invited to contribute their labor to specific tasks such as clearing forest or harvesting barbasco (*Lonchocarpus nicou*). In return, the host household provides food and cassava beer to the guests.

Sierra et al (1999) in their research with Huaorani Indians in the Upper Amazon, found that early, relatively weak market integration is compatible with subsistence production. In isolated areas, where markets are risky and transaction costs high, people tend to work a few hours just to meet a minimum supply of commodities purchased

through the market. After this point is reached, low marginal utility for extra labor discourages people from producing more for the market. Early market integration usually occurs in labor scarce environments, and production for market is possible by reallocating labor from subsistence activities (Chayanov 1966, Binswanger and McIntire 1987). Although the studied Asháninka villages are relatively isolated from the market, they maintain some level of market integration. Differences in market integration between households in each of the three villages studied could be partially explained by the different expectations for their relations with the market, especially in terms of the amount of felt needs for market commodities.

Finally, the indicators of market integration employed in this study (MI score and AUC for market) may be revealing somewhat different aspects of market integration. AUC for market may be a better indicator of the current level of market integration of a given household, while MI score was a better indicator of the wealth accumulation of a household over time. For example, households with older residents appeared to have accumulated Western goods over the years and therefore had a high market integration score. Thus, although these households are currently not producing much for the market, they have a high MI score. On the other hand, young villagers who are currently cultivating large areas oriented to the market, had not had enough time to accumulate enough western goods to have a high MI score.

Associated Livelihood Systems Changes

Godoy (2001) notes that increased market integration and trade usually favors some select people in a village, such as the most skilled and educated. Begosi (1998), Warren (2000), and Godoy (2001) add that men are more likely to have benefits from market relations than women, while younger people benefit more than older people.

In my study, some of these societal changes linked with increased market relations were also found. In the traditional Asháninka system, household activities are clearly defined by gender, in which women control reproductive activities, and men tend to have greater control over productive activities (Rojas 1994). As households became more involved in the cash economy, productive activities, especially those oriented towards the market, gain more importance. Although both women and men participate in productive activities for market, like in the non-traditional sesame crop (*Sesamun indicum*), usually men are the only household members who control the earnings (Rojas 1994). This change, from a system in which neither male nor female had cash access, often results in the loss of importance of the women and older people at the household level. Godoy (2001) also suggests that the changes may result in a diminished importance of the elderly, but I did not find this in my study.

Increased market integration affects the type of crops cultivated in the livelihood system. For example, in Tinkareni, where there is minimal market integration, no sesame was cultivated. However, in Boca Camantavishi and Yoyato, the majority of available labor for agriculture was dedicated to sesame production.

Those families that are more market integrated also require more outside hired or traded labor. In turn, this sometimes means that these families may need more cash to cover these addition labor requirements.

Conclusions

Although distance to market was inversely proportional to market integration, and directly proportional to the traditional practices at the village level, two different trends of market integration were found at the household level: (1) basic market integration, clearly

defined in the three villages; and (2) high market integration level, just found in the two closest villages.

The quantification of the value of Western goods at the household level was shown to be an indicator of the accumulated market integration over time, while the measure of the area under cultivation dedicated to commercial crops was shown to be an indicator of the current level of market integration at the household level.

The difference in market integration within villages can partially be explained by the different cultural background of households within villages, that lead to different household goals and strategies.

The market integration of Asháninka villages has affected the traditional livelihood system, increasing workloads on productive activities oriented to the market for both genders, but restricting the access of earnings only to men.

Male labor, especially during the dry season, is the most limiting factor for current increased market oriented production at household level, whereas land is abundant and initial cash needs are easily covered.

CHAPTER 3
COMMUNITY BASED CARPENTRIES IN THREE ASHANINKA VILLAGES

Community Forest Enterprises

Community forest enterprises appear to provide a promising way for forest dependent people to fight poverty while sustainably exploiting natural resources. Scherr et al. (2002), after analyzing several case studies with forest dependent people in the tropics, concluded that these enterprises have the potential to provide households significant opportunities for poverty alleviation. For indigenous people, they are considered one of the most promising alternatives for balancing forest conservation and economic development (Forster 1995).

However, several studies have shown that under certain conditions, community forest enterprises have negative effects on the population and on the forest. As indigenous communities became more involved in the market economy, villagers begin to extract more timber from the village common to sell to outsiders (Godoy 2001). Increased market dependency may also undercut food security by diverting energies from subsistence activities to activities subject to changes outside of community control (Godoy 2001). Many communities lack market access, good forest resources and other prerequisites to compete successfully with large industrial enterprises (Wunder 2001).

Community forest enterprises and subsequent market integration can exacerbate inequities within communities, favoring those directly involved over others (Schmink in press). Villagers who specialize in extracting may be the only ones who gain, while the others are negatively affected with the accompanying increase in purchased goods and

reduced timber volumes left over for local consumption. Increased socio-economic differentiation may undermine reciprocity relations, traditional leadership and relations of power within the community as well as group cooperation. Market integration also empowers some selected people, usually younger and more educated men, and causes a loss of power mostly of women, the elderly and those more traditionally oriented.

However, community forestry enterprises operate under diverse conditions that make some cases more successful than others (Forster 1995). Schmink (in press) states that for community forestry to achieve both poverty alleviation and forest conservation goals, some conditions must be met: healthy forests, market access, business skills, and a clear understanding of social systems. In the economically and ecologically successful forestry enterprise owned and run by the Menominee tribe in Northeastern Wisconsin in the USA, the strong organization, cultural commitment for conservation and an appropriate level of training in forestry enterprise management were crucial factors for this success (Rogers and Pecore 1995). However, in the case of the cooperative forestry enterprise run by Yanesha Indians in the Upper Amazon in Peru, the project was too large and complex for the population, and failed for not being adapted to the local realities (Benavides and Pariona 1995). For the forestry project of the Chiquitano Indians of Lomerío in Bolivia, the biggest problems were that forest management and subsequent marketing required external technical support and funding (Olivera 1995). In the multiethnic territory in Beni, Bolivia the governmental recognition and understanding of the indigenous reality was crucial for the success enjoyed by this community forestry operation (Lehm and Kudrenecky 1995). Little community involvement in Chemba

village forest area in Malawi was cited as the most important reason for the minimal success of their market oriented forestry initiatives (Coote et al 1993).

Isolated communities are especially vulnerable to harmful effects of market exposure. As community forest enterprises become more involved in the market, pressures on forest resources may increase beyond sustainable harvest levels. Socio-economic differentiation may erode local community interests and capabilities for sustainable resource use. Also traditional incentives for conservation could be weakened.

However, Sierra et al. (1999) found in their study in Huaorani indigenous communities in the Ecuadorian Amazon, that the initial stages of market integration do not seem to have relevant effects on the group and on the environment. In indigenous communities where forest resources are abundant, and labor is used extensively, early market integration brings benefits to community members with no major social and environmental costs. In this stage, labor surplus is shifted to trading activities without affecting the subsistence ones.

Although early stages in market integration appear to have no major impacts in the population and the environment, some drivers may lead to latter stages in market integration with different outcomes. Social, economic and environmental drivers appear to lead the changes toward an increasing market integration economy (Jodha 1998). The social drivers are the increase of population, change of gender roles and changing knowledge. The economic drivers are an increased requirement of cash, and cash producing activities from exotic species, timber, arable crops and land use change. The ecological drivers are the change from primary forest to secondary forest, introduction of cash crops, more extraction of timber, and replacing agroforestry by bush fallow.

The Asháninka

The Asháninka are an Arawakan-speaking people inhabiting the Upper Ucayali tributary valleys (Tambo, Perené, Pichis, Apurímac and Ene), the interfluvial Gran Pajonal area and the Upper Ucayali seasonal flooding lands in the Selva Central region in the Peruvian Amazon. According to the last national census (INEI 1993), the Asháninka population was 51,093 people settled among 359 communities located in the tropical rain forest in the departments of Junín, Pasco, Cuzco and Ucayali.

Within the Asháninka, six ethnic groups are identified according to their geographic distribution and some linguistic and cultural differences. The target communities of this research belong to the Campa Asháninka group, the most numerous, with some 40,518 (INEI 1993) in the Lower Apurímac, Ene, Tambo, Lower Perené and Satipo valleys (Yáñez 1998).

The Asháninka traditional domestic unit consists of residential units of four or five nuclear families linked by kinship and affinity relations. These residential units have a leader and share a common territory or *nampitsi*. In the 1960s, these residential units were grouped into indigenous communities within larger territories that comprise various *nampitsi*. Several factors caused the concentration of the dispersed population into grouped communities: colonist pressure over indigenous territories, the need to ensure land tenure rights, school influences, and the activities of churches and governmental institutions (Rojas 1994; Santos-Granero and Barclay 1995). This new form of concentrated settlement precipitated a different relation between the local population and the environment.

Historically, Asháninka people have developed the ability to adapt to the upcoming changes while maintaining their ethnic identity and culture. Over several hundred years,

the Asháninka have been in contact with different cultures and situations, having relations with such diverse groups as the Incas, Spanish conquerors and more recently, highland colonists. From 1742 to 1755 Asháninka jointed the revolution led by Juan Santos Atahuallpa that expelled the Spanish conquerors. In the early XVIII century, during the rubber boom, the Asháninka, as well as other indigenous groups, were persecuted and captured as a labor force. In 1965, the Asháninka were in contact with the MIR (Movimiento de Izquierda Revolucionaria) guerrillas (Rodríguez 1993, Rojas 1994, Santos-Granero and Barclay 1995, Espinosa 1994, Yáñez 1998, Fernández and Brown 2001). Since the 1970s, hundreds of colonists from the Andes have arrived to the Ene river valley looking for land. These newcomers not only were a threat to the Asháninka territorial security, but also were linked with the presence and action of terrorists and drug dealers (Rodríguez 1993, Gagnon et al 1993, Rojas 1994, Espinosa 1994, Santos-Granero and Barclay 1995, Fabián and Espinosa 1997, Yáñez 1998, Fernández and Brown 2001, CVR 2003).

Indeed, during the last two decades of the 20th century, roughly seventy thousand people were victims of heightened social violence in Perú. The Asháninka were one of the most affected groups in this social conflict. Some ten thousand Asháninka were displaced in the Ene, Tambo and Perené rivers, approximately six thousand people were murdered, and another five thousand more were detained in Shining Path campsites. During the conflict, all 32 Asháninka communities in the Ene river valley disappeared as well as 15 communities in the Tambo river valley (CVR 2003).

In 1997, the “Project of support of the resettlement of Asháninka communities in the Ene River” was initiated to support the resettlement the displaced communities in the

Ene River valley. Within this project, a carpentries component was intended to support the physical reconstruction of the communal buildings and secondarily, to start a wood processing enterprise through sustainable exploitation. This project, funded by "The Rainforest Foundation – United Kingdom," was carried out over a three-year period.

The carpentries project was executed by the Association for the Conservation of the Patrimony of Cutivireni (ACPC). ACPC has been engaged with the conservation and development of indigenous communities in the Selva Central region for 17 years, focusing on the conservation of the natural and cultural patrimony of the indigenous groups that inhabit the Vilcabamba Range area.

Study Objectives

The purpose of this study is to examine three of these small-scale community carpentries, analyzing socioeconomic effects at two levels: villages and households. This research was intended to provide insights about the positive and negative socioeconomic effects of the carpentry operation in the communities to help support regional decision making related to this alternative forest resources use. This study may also contribute to the growing body of literature on community forest enterprises and market integration of relatively isolated communities.

Study Site and Communities

The target groups of this study are the Camantavishi, Cutivireni and Quempiri communities settled in the Ene river valley, in the district of Rio Tambo, province of Satipo, department of Junín (Figure 3-1). This area is located in the *Selva Central* region in the eastern flank of the Peruvian Andes. The Ene river is navigable year round and flows south to north from the confluence of Apurímac and Mantaro until merging with the Perené river to form the Tambo river. More than 40 rivers, including the seasonally

navigable Cutivireni and Anapate, contribute to the Ene river along approximately 180 km. The climate varies from tropical warm humid to tropical warm very humid; average annual temperature is 25°C, and precipitation averages 2250 mm per year (AD-PER 1997; Cárdenas 2000).

The Asháninka in the Ene River valley are currently sharing their traditional territory with Quechua colonists who came mainly from the Junín, Ayacucho and Apurímac departments. According to the last national census (INEI 1993), of the total 6848 inhabitants in the Ene valley, 3200 (47%) are Asháninka and 3648 (53%) are colonists.

The three study communities were consolidated from scattered Asháninka groups in the Ene Valley, and legally recognized in the 1960s. Asháninka migrants who joint the existing Asháninka residents in the Ene Valley subsequently became the leaders of these newly founded communities. The new leaders believed in the need to consolidate the population in order to have a school and defend themselves from the harmful effects of the increasing colonization pressures (Mayer 1971, Santos-Granero and Barclay 1995).

For this research, one target village was selected for study in each community: Boca Camantavishi in Camantavishi, Tinkareni in Cutivireni, and Yoyato in Quempiri. Even though these three village groups share a similar origin and customs, relevant differences exist.

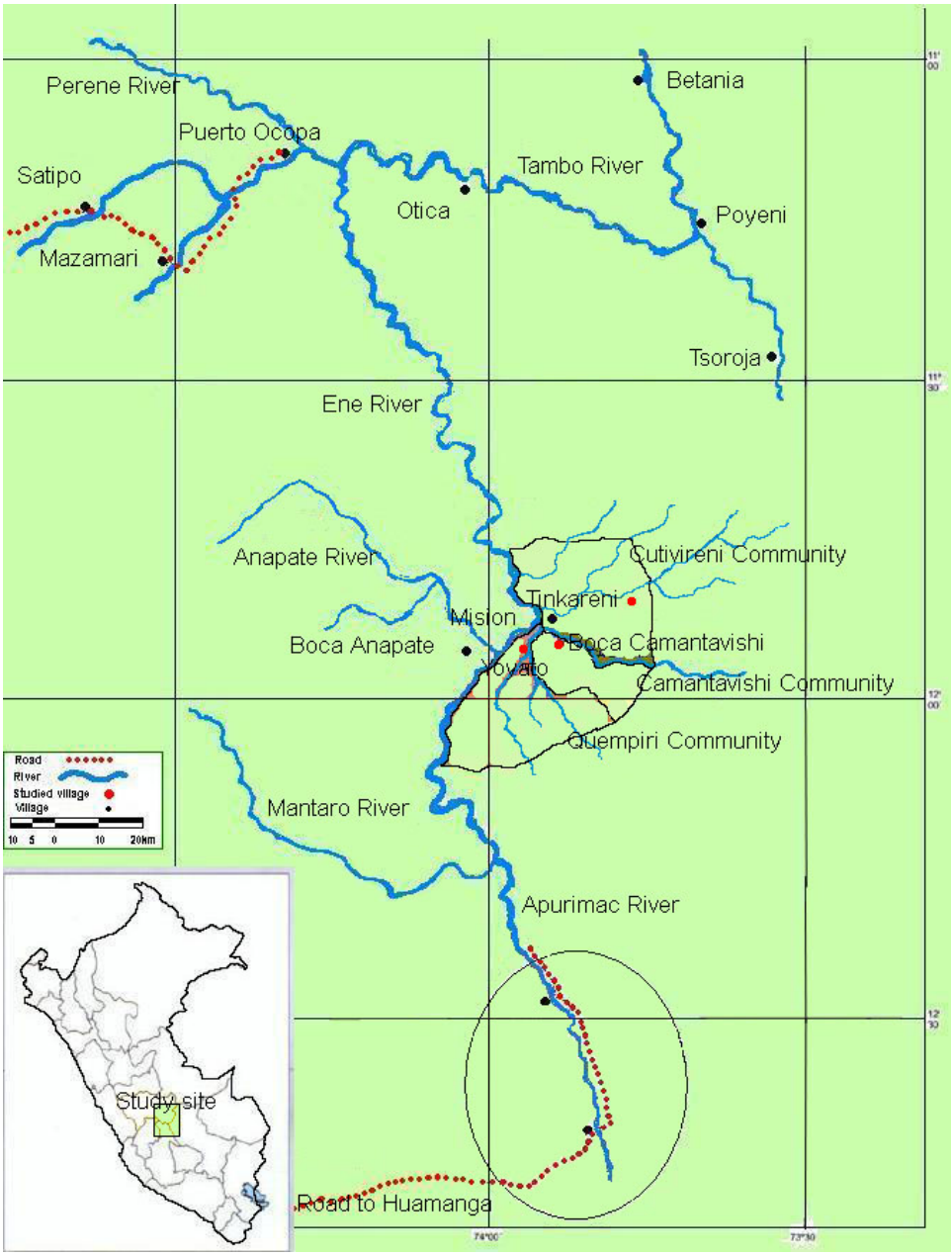

Figure 3-1 Study site. Adapted from IGN 1999.

Yoyato people are originally from Boca Anapate area, a former annex of the Centro Tsomaveni community located on the left shore of the Ene river. Yoyato is located a 30-minutes walk from the Ene River. Due to the social violence during the 1990s, these

people were forced to move to different places. First, they were forced to join Shining Path, and moved to a terrorist campsite in the Upper Sanibeni river at the left margin of Ene river. They escaped from the terrorists in 1991 upon becoming aware of an anti-terrorist headquarter at Misión Cutivireni. They stayed at Misión Cutivireni as refugees until 1999 when they settled in the Yoyato creek area within the Quempiri community boundaries. They are not allowed to fully exploit the natural resources on the borrowed land they now occupy, such as valuable timber species. Some of the Yoyato people are reluctant to establish large plots of perennial crops given the uncertainty of the long term ownership of this land. They are still waiting today for the required security conditions to return to their original homeland in the Boca Anapate area. Yoyato share a large presence of protestant churches. Currently, Yoyato has a population of 200 inhabitants in 36 households.

In the 1980s, residents of Boca Camantavishi annex were also displaced due to social violence. As with the Yoyato people, Camantavishi people were forced to join the terrorist group. In 1991, the Peruvian Army, with the support of other Asháninkas, recovered the Camantavishi people. This group was held as refugees in Misión Cutivireni until 1996 when they settled in the left margin of Cutivireni river, roughly two hours upstream. Since 2002 this group started resettling their original homeland in the Boca Camantavishi area. Boca Camantavishi village is located at a one-hour walk from the Ene River. As well as Yoyato, in Boca Camantavishi protestant churches are present in the village. Currently, Boca Camantavishi has a population of 260 inhabitants in 48 households.

Tinkareni people had to escape to the mountains when terrorists tried to kidnap them in January 1990 (Gagnon et al. 1993). These people lived as nomads in the forest for 16 months until they joined the anti-terrorist headquarters at Misión Cutivireni (Rodríguez 1993, Espinosa 1994).They stayed as refugees at Misión Cutivireni until 1996 when they returned to their original homeland in the Tinkareni area. In contrast to the people from Boca Camantavishi and Yoyato who were affected by the external cultural influence while living with terrorists, the people from Tinkareni strengthened their traditional knowledge of the forest in order to survive with no permanent agricultural plots. Tinkareni village is located a two-hour walk from the Ene River. In contrast to Yoyato and Boca Camantavishi, in Tinkareni there is no presence of any church. Currently, Tinkareni has a population of 235 inhabitants in 45 households.

Methods

Data Collection

To examine the socioeconomic effects of the carpentries, data for Yoyato, Boca Camantavishi and Yoyato villages were collected using four methods: (1) in-depth interviews of key informants, (2) questionnaires, (3) focus groups, and (4) informal interviews and participant observation. All data collection was carried out during an eight-week period in June/July 2003. Approximately equal time was spent in each of the three villages. This intensive eight-week research period followed upon a five-year experience in which I worked in this area as an extension agent for ACPC.

In-depth interviews of key informants were applied within each of the three villages. These in-depth interviews were applied to one village leader and one carpentry operator at each village. The village leaders were interviewed to gather information about

the carpentry organization. Carpentry operators were interviewed to explore for information about the carpentry operation.

Questionnaires were applied to a sample of households randomly selected within each of the three villages. Male and female adults nested within each of the 29 households were queried, representing a 22% sample (Table 3-1). Quantitative and qualitative data were gathered about the benefit and cost distribution from the carpentries at both household and village levels, impacts and limitations of the carpentry, as well as the respondents' perspectives of the future. Also current and potential social conflicts and impacts to the forest were queried.

Table 3-1. Questionnaires were applied to males and females nested in 29 households.

VILLAGES	Total households	Questionnaires	%
Yoyato	36	10	28
Boca Camantavishi	48	11	23
Tinkareni	45	8	18
Total	129	29	22

Six focus groups differentiated by gender were applied in each village. These focus groups were intended to clarify information gathered in the in-depth interviews and in the questionnaires. Gender differentiation of the focus groups was intended to identify differences between male and female concerns about the carpentry.

Informal interviews and participant observation were carried out throughout the field research period. These methods were used to observe the daily activities in the house, the forest, and in the carpentry to have a better understanding of the impacts of the carpentries in the villages and in the households. These methods were also used to validate information collected through the key informants and the questionnaires.

Lines of Inquiry

Five lines of inquiry were developed to analyze the socioeconomic effects of the carpentries at the village and household levels. These lines of inquiry are: 1) carpentry infrastructure, 2) carpentry goals and working strategies, 3) benefits and costs from the carpentry operation, 4) carpentry impacts, and 5) carpentry sustainability and local perceptions about the future.

Carpentry infrastructure

The line of inquiry explored the physical infrastructure of the three carpentries. Aspects such as the workshop hut and the machinery, selection of the operators, and machinery maintenance and fuel supply were queried.

Carpentry goals and working strategies

In this line of inquiry, the carpentry goals for the villagers were queried, as well as the working strategies carried out in the carpentry. Within the working strategies, specific information about wood needs, timber extraction and the production of furniture for sale was covered.

Benefits and costs from the carpentry operation

Benefits and costs of the carpentries were determined at both the household and village levels. Open ended questions were asked in order to consider a broad range of answers, focusing on people's perception about the distribution of benefits and costs.

Household level benefits included both house construction and furniture. In turn, household furniture benefits were classified into two main categories: 1) finished products, and 2) rustic products. Finished products refer to any furniture produced in the carpentry by the operators using newly sawn materials. This category comprises products of better quality that are more valued by households. Rustic products are made using

borrowed tools from the carpentry, left-over or used timber, and recycled nails. In these products, no lacquer, sandpaper or other finishing was used, and household members and relatives make this rustic furniture instead of the carpentry operators. Rustic products are considered secondary benefits for households because of their lower quality and because they do not require specialized labor to manufacture.

Households that had not yet received any product from the carpentry at the time of the questionnaires were classified into a no benefits category, and were assigned a value of zero. Households that have received at least one piece of finished furniture were assigned a value of two. The households that made some rustic furniture with carpentry by-products, but received no finished products, were assigned a value of one. At the village level, benefits were categorized post hoc into direct (i.e. construction and improvement of communal buildings) and indirect (i.e. training opportunities) benefits.

Six different variables were developed to assess whether carpentry benefit distribution depended on: 1) current level of household market integration, 2) household market integration accumulated over time, 3) level of formal education, 4) the political position held in the village, 5) the kinship relations with the leader and/or the operator, and 6) the contributions provided to the carpentry operation a costs variable. Kendall's measure of association test was used to assess the association between the benefits received at the household level and the six variables.

An area under cultivation (AUC) for market variable was developed to measure the extent of agricultural production that each household dedicated to the external market. The AUC for market is intended to be an indicator of the current level of market integration of households.

A market integration (MI) score variable was developed to serve as an indicator of market integration over time for each household. Five Western possessions of varying market values were pre-selected according to their market value as the basis for this indicator. Each possession was given a market integration score, and the sums of the scores for each household resulted in the MI score for that household. This measure of market integration is valid to the extent that households which spent more money on these Western goods also maintained a higher degree of market integration over time.

The level of formal education variable expresses the number of years that the household head (male or female) attended institutions of formal education. It is assumed that the time attending institutions of formal education is proportional to the level of contact and understanding of the external culture.

The political position variable indicates whether any household member holds a political position in the village such as leader, secretary, or village mayor. A value of one was given to households where at least one member held a political position in the village, whereas a value of zero was given to households where no members had positions in the village.

Kinship with the village leader and kinship with the carpentry operator are two variables developed to measure whether kinship affected distribution of carpentry benefits. A value of three was given to the leader or operator's household. Then, a value of two was given to households where at least one member had a second degree of kinship (brother/sister, son/daughter, father/mother, grandparent or grandson/granddaughter) with the leader or operator. A value of one was given to households where at least one member had a known third degree kinship relation with the

leader/operator such as cousin, uncle/aunt, or nephew/niece. A value of zero was given to households where no members had any known kinship relations with the leader or operator.

Finally, a cost variable was developed to measure the extent that households contribute to carpentry operations with labor, money and/or fuel. Households that had contributed labor received one point, and those that contributed either with fuel and/or money received one point. The cost score is the sum of all the points accumulated by each household, with a maximum score of two. Households that had not contributed with labor, or fuel or money received a score of zero.

Carpentry impacts

The impacts of the carpentry operation were gathered into two main categories: 1) impacts to the forest, and 2) social impacts. Impacts to the forest from the carpentry operation were queried in the questionnaires and the focus groups. In addition, respondents who considered that the carpentry operation had impacts to the forest were asked what were the specific causes of these impacts, whereas respondents who answered that there were no impacts to the forest were asked for their reasoning. Social impacts from the carpentry operation were also determined, focusing on conflicts between people within the villages as well as members within households.

Carpentry sustainability and perceptions about the future

Finally, questionnaire respondents and the focus groups were asked about their perception of sustaining the carpentry operation into the future. They were also asked about current problems and what they sensed might be potential problems of the carpentry in the future. Finally, it was asked what needed to be improved in the carpentry in order to bring more benefits to individual households and villages.

Results

Carpentry Infrastructure

Workshop

The three carpentry workshops were located close to the villages, but at enough distance to not disturb the households. The leader and operator of Yoyato said that the carpentry location was selected basically taking into account the safety of the children. Each workshop met the minimum required area of 16 X 4 m as dictated by the project. These huts were built in the Asháninka traditional way: a palm leaf roof supported by hardwood poles with no walls and a dirt floor. Each carpentry had machinery and tools with an estimated value of US $ 5,000 that included transportation from Lima to the three villages (Table 3-2).

Table 3-2. Carpentry machinery available at each village.

Machinery
One stationary 8 HP engine Briggs and Stratton
One five-Kilowatt generator
One electric engine 3.6 HP and 2410 RPM
One circular saw with 14 inch disk and drill
One 12” thickness wood planer
One chain saw
One bench grinder with 150 watt engine

Operators

At each carpentry, operators were selected according to their skills related to working with wood. One man from Yoyato said, “They (the operators) have been chosen because they know to measure wood, and besides they know reading.” In Camantavishi, one woman said that the operators were selected because they already knew how to saw wood. One man in Camantavishi also mentioned that the operators were selected because they were familiar with chainsaw operation, and knew about woods.

In addition, it was found that at least one operator in each village had the ability to organize the communal work related to the carpentry, and to coordinate external support. In Yoyato, the main carpentry operator was also the village leader, resulting in a good level of organization; in Boca Camantavishi each one of the four operators represented an important extended family within the village; and in Tinkareni, one of the operators quit after having a minor accident, but the main operator was a prestigious traditional leader with broad organizational skills. However in Boca Camantavishi, three of the original four operators were fired for taking tools with no authorization, and ultimately losing them. Only one operator was left to run the carpentry, and he did not have the ability to organize communal work or coordinate external support. At the time this study was carried out, no other villagers had expressed interest in jointly collaborating to operate the carpentry.

Machinery maintenance and fuel supply

From the carpentries installation until the time of this research, all the maintenance and repairs of the carpentry machines were exclusively carried out by ACPC. Villagers' responses varied when asked about future ways to afford maintenance and repairs. One villager from Tinkareni said, "After some time, for example ten years, some machine will break down, but we do not have money to repair it." Another villager from Tinkareni said, "We need another project to have more training and to buy new machines." One villager from Camantavishi said that ACPC must always pay all the repair and maintenance expenses. In Yoyato, one villager suggested that if a machine broke down, the village would pay half of the expenses by selling sesame, and ACPC should pay the other half. Another villager from Camantavishi said, "If a machine broke down, the village should save money to repair it by ourselves." The leader of Camantavishi said, "I

told the people that the time of support and projects has ended, so we have to work and produce to buy our own fuel, and to repair the machines." The school teacher of Camantavishi said, "The village should organize to produce crops such as sesame to have money to operate the carpentry." The leader of Tinkareni said, "We have to make furniture for sale, and with the earnings we can buy fuel, oil and nails."

The fuel for the carpentries is mainly supplied by the carpentry project, and to a lesser extent, bought in the market by community members. For primary school construction, the executing institutions (District Municipality – MDRT and the Governmental Agency of Resettlement Support - PAR) brought fuel as well as other inputs. The Evangelical Church at San Martin de Pangoa donated 15 gallons of fuel for the construction of furniture for the local church. Additionally, in some cases, individual villagers bought fuel from middlemen, or in another town. In Tinkareni, all the fuel used came from the carpentry project.

Donations were considered the most important source of fuel, currently, and in the future. One villager from Tinkareni said that they need another project to buy more fuel and to pay an incentive to the operators. In Camantavishi one villager said, "We have no money in the village, so we need some institution to support us with fuel." The leader of Yoyato said, "To build a communal building, we have to ask for support from some institution, but it normally takes more than three years." One man from Yoyato said, "To have fuel, we usually ask all the institutions that come to the village."

Carpentry Goals and Working Strategies

Carpentry goals

As defined within the project documents, the carpentries were installed in three Asháninka villages to support the physical reconstruction of Asháninka villages in the

Ene river valley after displacement due to the violent conflicts between Shining Path and the Asháninka people in the 1990s. Carpentry workshops were secondarily intended to provide a means for processing timber for sale or trade through sustainable wood exploitation.

When villagers were asked about carpentry goals, key informants did not diverge completely from the stated goals in the project document, responding that the carpentry operation was useful for improving the community. However, based on villager responses, reconstructing houses and supplying household furniture also figured as prominently in goals attained. The leader of Tinkareni stated, "The carpentry goal is to meet community and family needs for furniture." Another individual from Tinkareni said, "At the beginning, it (the carpentry) was a necessity. When we just resettled, our children had no chairs or tables at the school to attend classes. That's why we requested the carpentry from ACPC." In Yoyato, some villagers responded that the carpentry permits people from other communities to come and have training. This respondent was referring to the training workshop carried out in June 2003 and funded by the Evangelical Church of San Martín de Pangoa. The leader and operator of Yoyato said, "We have the carpentry to develop the community, to have tables at everyone's houses. If we buy tables from colonists, it would be too expensive." In addition to these two stated respondent goals of construction of furniture for communal buildings plus construction and furniture for individual households, some respondents articulated the secondary goal of the project documents: cash generation through furniture sale. Namely, some interest was expressed in income generation solely for maintaining the carpentry operation.

Working strategies

Wood needs. Decisions to improve a communal building with furniture or other carpentry work, were made in communal meetings across all three villages. Then, the operators would fell the trees and saw the wood into boards ready to carry. When all the boards were ready for carrying, the operator would communicate this to the leader, and he would convoke a communal meeting in which villagers would organize to carry the timber from the forest to the carpentry.

Communal work took precedence over household furniture needs such that only wood and fuel left over from communal work was available to make furniture for households. In most cases, furniture for households was made in the carpentry and simply given to villagers. However, in some cases in Yoyato and Boca Camantavishi, villagers had brought fuel to the carpentry and paid the operator to make their finished furniture. In other cases in the two villages, residents made their own furniture (rustic furniture), with wood by-products, recycled nails, and borrowed tools. In Tinkareni no rustic furniture was made.

In the male focus group in Boca Camantavishi, it was agreed that in order to receive furniture, a household must pay for fuel expenses and operator labor. In addition, household members must carry the wood from the forest to the carpentry. In the male focus group in Yoyato, it was noted that the people who wanted furniture from the carpentry must request it in a communal meeting, but recipient families are not required to pay because the wood belongs to all the villagers. The operator of Tinkareni complained that although everyone wanted furniture, they did not organize to buy fuel, waiting instead for a donation.

Timber extraction. In Boca Camantavishi, nine trees had been cut down to process in the carpentry: three zapote (*Matisia cordata*), two cedar (*Cedrela odorata*), two tornillo (*Cedrelinga cataeniformis*), one copaiba (*Copaifera officinalis*), and one moena canela (*Aniba javitensis*). Approximately 14.1 m³ of timber were processed from four mahogany (*Swietenia macrophyla*) and four tornillo (*Cedrelinga cataeniformis*) for the school construction. In Boca Camantavishi four of the nine trees were utilized by one family (the wealthiest) to support household and business wood needs (this family was running a small store). In Tinkareni, 19 m³ of timber were used in the carpentry from four trees: one shitiro (*Aniba duckei*), one cedar (*Cedrela odorata*), one requia (*Guarea guidonia*), and one lagarto caspi (*Calophyllum brasiliense*). In addition, for the school construction 14 m³ of timber of unidentified trees were processed. In Yoyato, four trees had been cut down for local use: two tornillo (*Cedrelinga cataeniformis*), one requia (*Guarea guidonia*), and one palo balsamo (*Myroxilon pereirae*).

In addition, due to the social tension caused by the presence of Shining Path members close to Yoyato, members of this village decided to buy more shotguns to protect their people. Ten shotguns were bought with money made from harvesting four mahogany trees that were cut down from the Boca Anapate area (the original homeland of current Yoyato residents). The resultant 13.2 m³ of lumber were sold to a local logger for 5,500 sol (US$ 1600). Approximately ½ m³ of this wood was left over and used by the carpentry. This was the only case of timber sold to the external market and was unrelated to the carpentry operation; however processed furniture for sale was slightly more common.

Furniture for sale. In Yoyato, the carpentry sold one mahogany table to colonists for 40 sol (US$ 11), a product valued at 260 sol (US$ 74) in the nearest city. Money from this sale was used to buy more fuel to sustain the carpentry.

In Camantavishi, one set of furniture consisting of two benches and one table was sold to a colonist for 80 sol (US$ 22). This money was distributed as follows: 18 sol to buy fuel for the carpentry, 20 sol for the village leader, and 42 sol for the carpentry operator.

Yoyato villagers expressed their intent to sell more furniture in the future when they become better trained in cost calculations. Camantavishi people expressed that they would like to make more furniture for sale upon improving their products. In Tinkareni, the carpentry has not produced any furniture for sale to date. The district municipality inquired about a furniture purchase from Tinkareni carpentry, but the village responded that the carpentry could not meet this demand because it lacked official registration as an enterprise. However, some Tinkareni villagers expressed interest in making furniture for sale.

Benefits

Benefits from the carpentry operation are classified into benefits at the household level and benefits at the village level. The higher frequency of responses of benefits at household level than at village level in open-ended questions suggests that for most villagers benefits at the household level are the most important. In all three villages, benefits received at the household level (74%) were more frequently cited than benefits received at the village level (34%) (Figure 3-2).

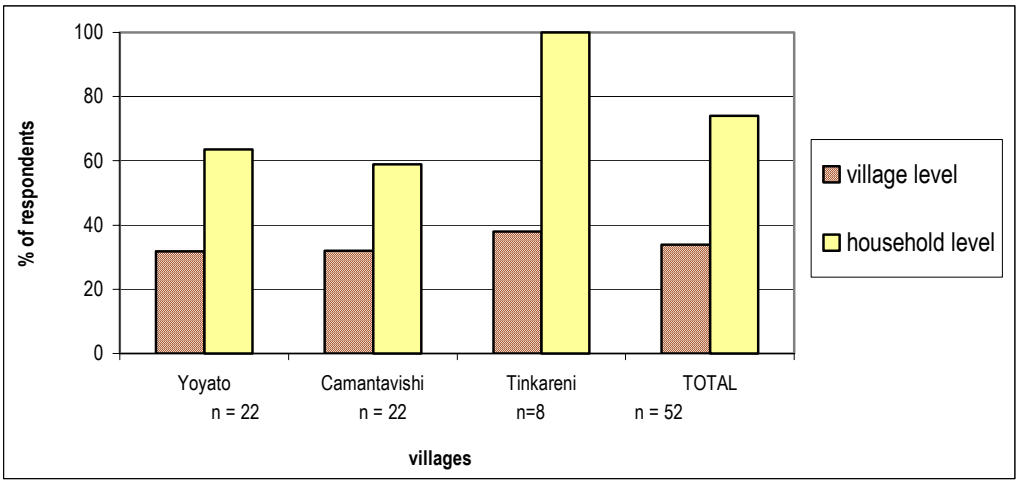

Figure 3-2 Responses of villagers about carpentry benefits.

Benefits at the household level

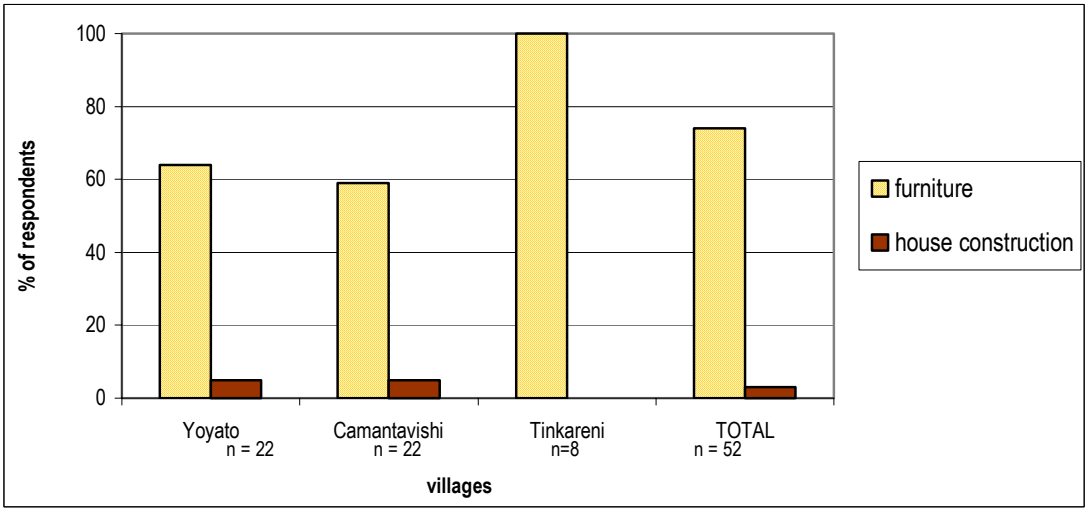

Figure 3-3 Benefits received at the household level for each of the three villages.

Furniture for households was the most frequent response in the three villages when asked about household level benefits (Figure 3-3). This finding suggests that a supply of furniture for households was the most important benefit as perceived by villagers. Having a table for eating instead of eating on the floor was mentioned as an indicator of quality

of life or status improvement, especially for the men with the most formal education. The carpentry operator and leader of Yoyato responded, "The carpentry is good because all community members will have their own table to eat. We will not have to eat on the floor anymore." The forestry promoter in Yoyato, said, "The carpentry is good for the people to eat in an orderly way, for not eating on the floor anymore. Sometimes we are eating on the floor and the chickens bother us taking our food and running. I am happy because the carpentry is developing the community." One villager from Yoyato also mentioned: "I am happy too, because I have my own table to eat. But my wife, she does not accustom to eat at the table. She still eats on the floor." One 65 years old widow from Yoyato said: "I think the carpentry is good because I see the people are happy when they receive their tables and chairs. The carpentry made nothing for me because I am a widow, there are no benefits for widows. But I do not need a table, I am fine eating on my mat on the floor."

Before the carpentries were installed, traditional benches were the only type of furniture encountered in the villages. These benches were made by nailing topa (*Ochroma pyramidale*) poles with pona (*Iriartea deltoidea*) sticks. The disadvantages of continued use of these traditional benches are their short durability and the long travel distance to retrieve the raw materials.

The benefits at the household level can be classified as finished and rustic products. Finished products are furniture completely made in the carpentry by the operators. In some cases it is required that villagers bring fuel and pay for the operator's work. Rustic products are furniture made by the villagers with no participation of operators in the manufacture. The rustic furniture is made using left-over wood, recycled nails and tools

borrowed from the carpentry. The only cost involved in these rustic products is the villagers' labor required for its manufacture.

Almost half of the interviewed households (49%) had received new furniture, while 26% had received rustic furniture, and 25% had received no furniture. Tinkareni's carpentry had produced furniture for 62% of the households, while Yoyato had produced furniture for 46%, and Camantavishi had produced for 40% of the households. In Camantavishi 50% of the households had rustic furniture, while 27% in Yoyato, and no households in Tinkareni. In Tinkareni 38% of the households had no furniture, 27% in Yoyato and 10% of the households had no furniture in Camantavishi (Figure 3-4).

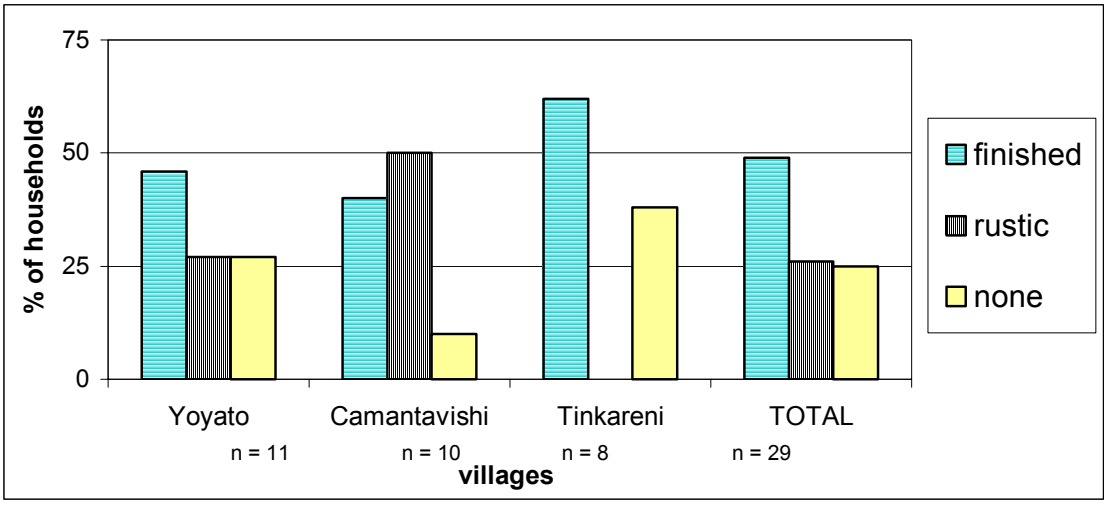

Figure 3-4 Furniture received at the household level.

Benefits at the village level

Responses about benefits at the village level were classified as the construction and implementation of communal buildings, the training of community members, and the carpentry operation as a job source. The construction, improvement and implementation of communal buildings were the most frequent answers in Boca Camantavishi (27%) and

in Tinkareni (25%) villages. The training opportunities that the carpentry operation brought to villagers were identified as the most frequent benefit at the village level (18%) in Yoyato village, where a training workshop was carried out at the time of this study. In Tinkareni village the training opportunities were the second most mentioned answer (13%), while in Boca Camantavishi no villagers considered training as a village level benefit. The carpentry was considered a beneficial source of employment for 9% of the respondents in Yoyato, the same proportion for Boca Camantavishi, and it was not mentioned in Tinkareni village (Figure 3-5).

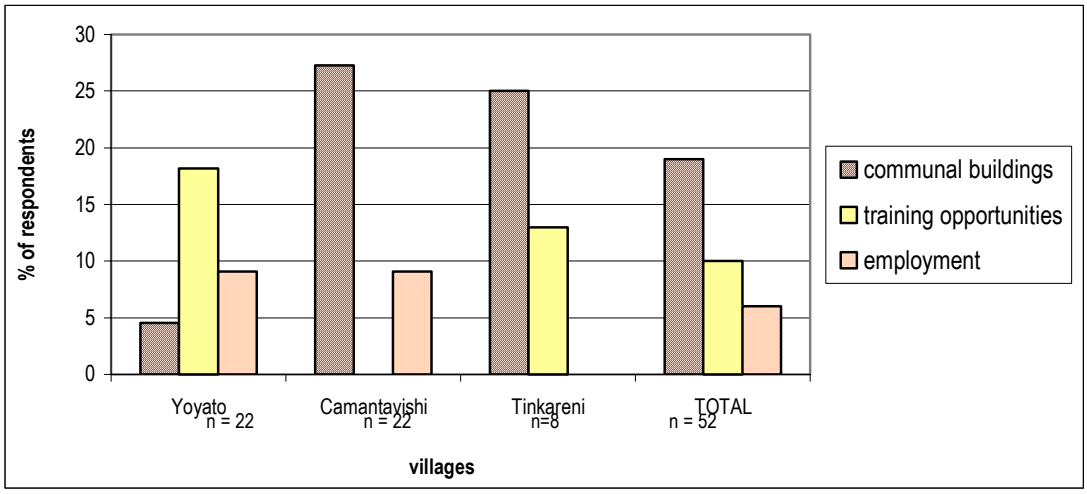

Figure 3-5. Frequency of responses of the carpentries benefits at the village level.

In Camantavishi and Tinkareni, the district Municipality (MDRT) with the Governmental Agency of Resettlement Support (PAR) executed the construction of primary schools. Communal carpentries partially contributed to school construction in Camantavishi and Tinkareni, whereas in Yoyato their school was just supplied with furniture because they are temporarily living in a borrowed territory. Skilled and unskilled labor from these villages, and some of the machinery and tools from the

carpentries were used to construct these schools. For each, approximately 6,000 square feet of timber were used.

In Yoyato, two tables and two benches were produced for a needlework house. In this village, the Evangelical Church of San Martin de Pangoa supported the local church hut with fifteen gallons of diesel for the production of ten benches and one podium. In Boca Camantavishi and Tinkareni the houses for the USB communication radio were built by the village carpentry; and both were supplemented with one table and one bench. Also in Boca Camantavishi, the health care center was built using the communal carpentry, and one table was produced for the communal meeting center. Additionally in Tinkareni, two tables and five benches were made for the communal meeting center, two tables and two benches for the women club, and twelve benches and three tables were made for the self-defense committee center.

In the three studied villages ten villagers had received training in wood processing during the carpentries project. This training was a village level benefit. In Yoyato one villager said, “Now we have carpenters in our village to make furniture for our households.” At the time of the study in June 2003, only six of these original ten operators were still working: three in Yoyato, one in Camantavishi and two in Tinkareni. In Tinkareni one operator left his work after having a small accident in the carpentry, and in Camantavishi three operators were fired for taking some carpentry tools home with no authorization from the leader. At the time of this study, a training workshop in furniture making was carried out in Yoyato funded by the Evangelical Church of San Martin de Pangoa. In this workshop five of the six operator were participating, as well as four villagers from neighboring villages.

The carpentries as a source of employment was mentioned as another benefit at the village level. Current employment opportunities as well as potential opportunities in the future were mentioned as benefits from the carpentry at the village level.

Costs

Costs of the carpentry operation were also divided into village and household levels. Labor is the most commonly mentioned cost in the three communities. Only one household of the 29 interviewed in all three villages did not participate with labor. All other households had contributed in different ways with labor to the carpentry.

Costs at household level

In the cases that the furniture was designated for individual households, household members provided the labor for carrying the wood and possibly cash or fuel. In Yoyato, one household provided money in exchange for furniture from the carpentry, and in Camantavishi two households provided fuel for the same purpose. As shown in Figure 3-6, 97% of the households contributed with labor, considered the most important cost, 10% provided cash or fuel, and 3% of the households had not participated in the costs.

One villager from Camantavishi said, “My friends and I put some money together to buy fuel. We gave this fuel to the operator to make furniture for us. We did not pay him, but he kept the left-over fuel.” The secretary of Camantavishi, said: “Because I have no money, I have received no furniture from the carpentry. But I asked the operator for some left-over timber, and straightened some used nails to make three tables by myself. It took two hours but I did not pay anything.”

In all three villages the informants reported that in order to receive household benefits from the carpentry, such as furniture or wood siding, villagers need to bring fuel or money, and carry the wood from the forest to the carpentry. According to the

households interviewed, only three out of 29 families brought some money or fuel in exchange for benefits. In Tinkareni, the carpentry produced more household furniture than any other carpentry yet no villager gave money or fuel in exchange. Only one villager (the operator's brother) supported the operator by providing labor in his garden as retribution. In Camantavishi, where the carpentry produced the least benefits for households, more villagers brought money or fuel to the carpentry.

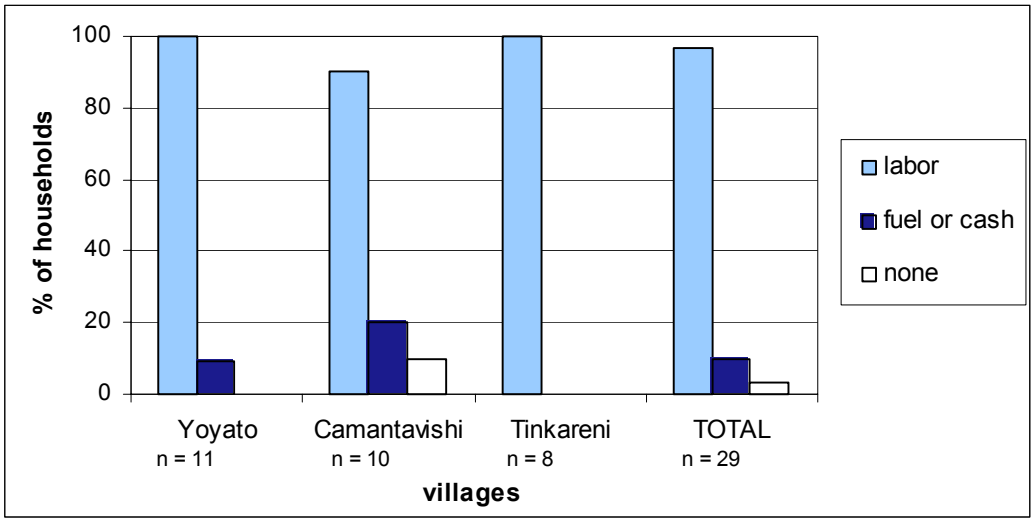

Figure 3-6 Costs of the carpentry operation at the household level.

Costs at the village level

As a requirement of the carpentries project, in order to receive the machinery and tools, each village had to build an appropriate hut for the workshop. The construction of these carpentry huts was carried out by men. Then, when the machinery and tools arrived men were again organized to carry them from the port to the village.

Cutting down trees and preparing the timber boards required operator labor and sometimes the help of two or three other men. When the wood was designated for communal buildings, the leader organized labor days in which men participated by

carrying boards. Women collaborated by cleaning the carpentry workshop periodically and preparing cassava beer for the men in charge of carrying the boards. For the construction of the Camantavishi school, women also participated by carrying boards.

Benefit and Cost Distribution

Benefit and cost distribution was queried at both village and household levels. The correspondence between the benefits received versus costs paid at village and household level was also explored, and whether the benefits and the costs were more concentrated for some groups within the villages than others.

Benefit and cost distribution at the household level

When asked if the benefits were equally distributed among households, 41% of respondents in Yoyato 67% in Camantavishi, and 71% in Tinkareni responded favorably (Figure 3-7). Based on Kendall's measure of association, it was more likely that men (rather than women) responded that there was an equal distribution of benefits among households ($P \leq 0.05$).

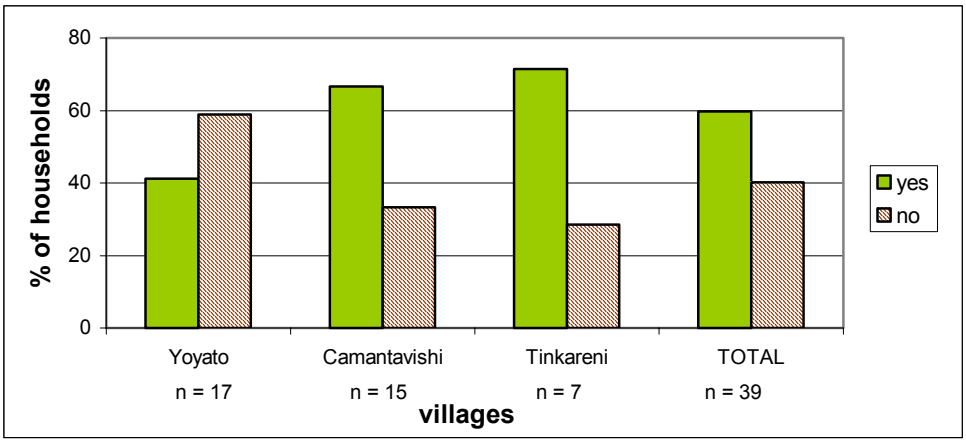

Figure 3-7 Responses of villagers when asked if carpentry benefits were equally distributed between households.

When asked about the benefit distribution among households, a common answer was that some households had received benefits, but that there was not enough fuel to make more furniture for everyone. The leader of Tinkareni said, “The carpentry has not make furniture for all households because we do not have enough fuel. I have not received any furniture yet, but I will receive some in the future”.

However, some respondents said that the carpentry only benefits the households that can afford to buy fuel. One woman from Camantavishi in her sixties, said, “Only the households that have money to buy fuel receive benefits from the carpentry. Households with no money have no benefits.” One 18 year-old male from Yoyato and brother of the leader and operator said, “Although I carried the machines and timber boards, because I have no money for fuel, I do not know if I will receive any benefit for my household.” Another villager from Tinkareni, referring to the benefits for his household said, “Households that have no money receive no benefits from the carpentry. The benefits are only for the wealthy households.”

None of the widows in any of the villages received furniture made in the carpentry. However, in some cases, their relatives made rustic furniture for them. One 65 year-old widow from Yoyato said, “Because I am ill I cannot work much. That is why I have received nothing from the carpentry. They do not support widows.” One 50 year-old widow from Camantavishi said, “Widows have no benefits from the carpentry because we do not have a husband who carries timber boards. As well as all villagers I own this timber too.” Another 50 year-old widow from Yoyato simply kept silent when asked if widows are having benefits from the carpentry. Another women from Yoyato said, “The deal was to make furniture for everyone, but the operator is just making it for his

relatives". One 25 year-old man from Yoyato said, "Although I got tired of carrying timber boards, I just have some left-over timber to make a rustic table by myself."

The benefit distribution was also assessed within households. Virtually all respondents agreed that adults and children, as well as males and females received equal benefits from the carpentry within any household. It was also unanimous that adult males were the household members that had more work related to the carpentry operation.

To explore if benefits from carpentries were more concentrated in some specific groups within the communities, the association between the benefits received at the household level and different variables was measured using Kendall's measure of association. For Yoyato village, the households that had more area under cultivation for the market, as well as those in which the household head had more years of study were more likely to have benefits from the carpentry at the household level than others (Table 3-3a). For Camantavishi village, there was a strong association between the area under cultivation for market and benefits received. In the same village, there was also a significant association between the benefits from the carpentry at the household level and the aggregated value of western possessions in the household (MI score) (Table 3-3b). This same association was found in Tinkareni (Table 3-3c). However, in no village, was there any significant association between the benefits from the carpentry at the household level and the following: households in which the household head had a political position in the village, costs expended by the household to the carpentry operation, kinship with the leader nor carpentry operators (Tables 3-3 a-c).

Benefit and cost distribution at the village level

Informants agreed that communal benefits received from the carpentry operation were worth the costs expended in labor. One woman from Yoyato said, "men carry timber boards, but women work periodically cleaning the carpentry workshop. We work but do not get tired because it is good for the community." One villager from Camantavishi also mentioned, "It has been a lot of work to carry these heavy machines, and also the timber from the forest. Almost everyone worked. Now we are happy because our children have a school to learn."

Social Conflicts

The presence of conflicts was explored in the communities and in the households. All households interviewed in Tinkareni said that there were no conflicts in the village related to the carpentry operation. However, in Yoyato, 5% of the respondents mentioned the presence of conflicts related to the carpentry operation, and in Camantavishi, 35% reported conflicts (Figure 3-8).

In Camantavishi some widows complained that they received no benefits from the carpentry. They blamed this on the operator's lack of skills in carpentry work, stating that he wasted timber and fuel and therefore could not produce furniture for all households. One widow from Camantavishi also said that the operator's relatives benefited the most from the carpentry. In Yoyato, one woman said that the operator was making furniture just for his relatives. These reports of perceived conflicts stand in contrast to the results of the Kendall's association test which revealed no association between operator kinship and benefits received at the household level in Camantavishi, and in Yoyato. In addition, the operator's household in Camantavishi had not received any benefit from the carpentry.

Table 3-3 Kendall's measure of association for benefits from carpentry at the household level and seven variables: market integration score, area under cultivation for market, position of household head in the community, costs at household level, kinship with leader and kinship with operator.

(a) Yoyato

	Value	Error	significance	
MI score	0.247	0.236	0.307	
AUC for market	0.586	0.214	0.007	**
level of formal education	0.471	0.143	0.001	**
Position	0.234	0.276	0.396	
Costs	0.304	0.150	0.264	
kinship with leader	-0.037	0.324	0.910	
kinship with operator	-0.063	0.253	0.803	

(b) Camantavishi

	Value	Error	significance	
MI score	0.542	0.219	0.013	*
AUC for market	0.712	0.130	0.000	**
level of formal education	0.315	0.200	0.103	
Position	0.223	0.340	0.501	
Costs	0.232	0.386	0.548	
kinship with leader	-0.131	0.306	0.665	
kinship with operator	-0.387	0.314	0.281	

(c) Tinkareni

	Value	Error	significance	
MI score	0.676	0.127	0.001	**
AUCM	0.293	0.162	0.273	
level of formal education	0.465	0.228	0.052	+
Position	0.067	0.349	0.849	
Costs	no association			
kinship with leader	-0.488	0.233	0.232	
kinship with operator	0.430	0.168	0.083	+

(*) association significant at 0.01 level
(**) association significant at 0.05 level
(+) association significant at 0.1 level

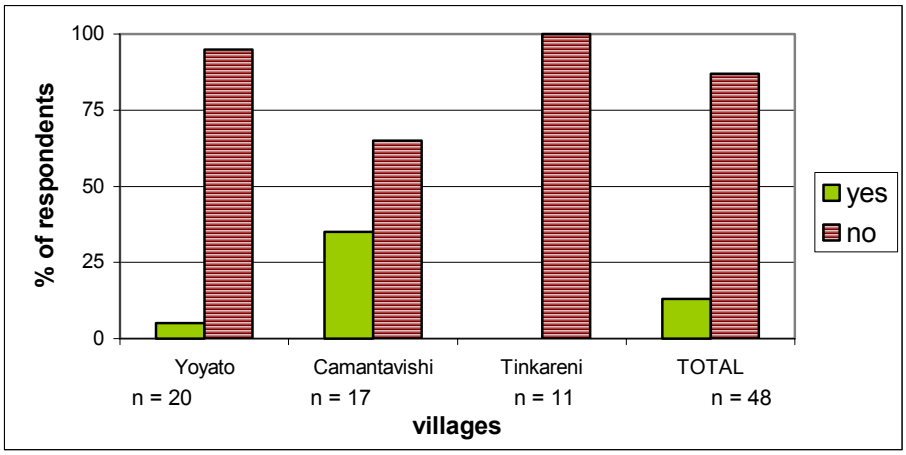

Figure 3-8 Villagers responses about conflicts due of the carpentry operation

Impacts to the Forest

Impacts to the forest related to the carpentry operation were also assessed. In Tinkareni, the most traditional of the three villages, respondents reported that there were no impacts to the forest related to the carpentry operation. In Camantavishi, 21% of the respondents said that there were forest impacts. In Yoyato, the village that had the greatest market integration, 33% of the respondents mentioned the presence of impacts to the forest related to the carpentry operation (Figure 3-9).

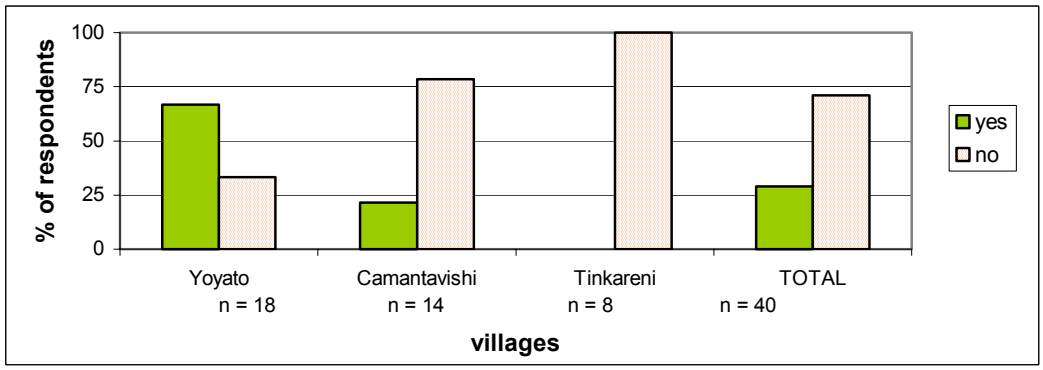

Figure 3-9 Villagers responses about threats to the forest of carpentry operation.

The respondents who did not consider the carpentry operation as a forest threat were asked for their reasons. Most of the responses (54%) centered on the fact that timber was only used for self-consumption. Others did not consider the operation a threat to the forest because they were not selling timber to loggers (14%), they are only cutting a few trees (4%), or because they have protection practices in place to prevent forest impacts (2%). These practices referred to protection of areas where medicinal plants were abundant. The use of timber only for self-consumption as a forest safeguard was mentioned more often in the most traditional village, Tinkareni (87%), less mentioned in Camantavishi (57%), and the least mentioned in Yoyato (17%), the village most integrated to market. Not selling timber to loggers was mentioned by 13% in Tinkareni, and 29% in Camantavishi. In Yoyato, the only village where they had sold some timber to loggers, selling timber was not mentioned as a forest threat (Figure 3-10).

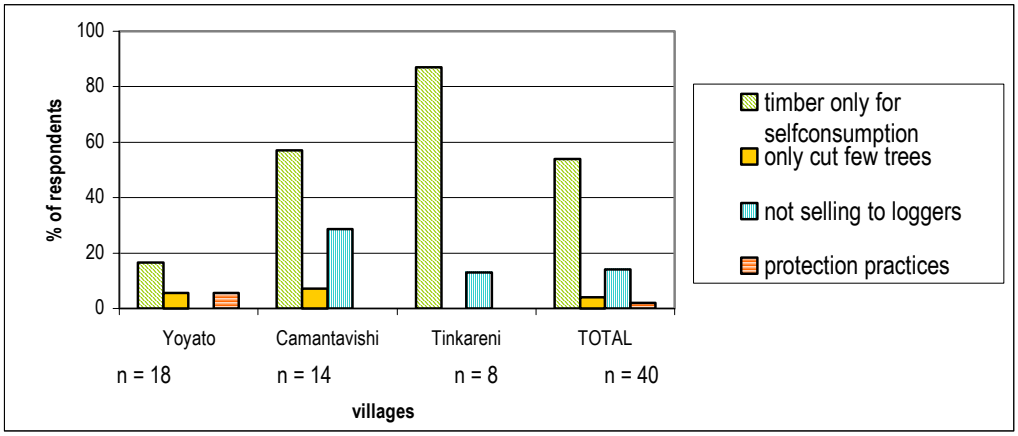

Figure 3-10 Villagers reasons why the carpentry operation is not a forest threat.

The respondents who did consider the carpentry operation as a forest threat were also queried about their rationale. In Yoyato, 33% of the respondents mentioned that the carpentry operation could lead to tree depletion, 22% said that cutting trees may result in

the loss of animal habitat, and 11% that wasting wood may have negative consequences for the forest.

One villager said: “When the operators cut down trees, they must use the wood. The wasted wood that remains in the forest will rot and affect the forest.” Another villager in Yoyato said, “When they (the operators) waste wood, there is an impact on the forest. If the Asháninka waste animals or plants that God gave to us, we are not going to have animals and plants for our families.” In Camantavishi, 21% responded that the carpentry could cause tree depletion, and 7% mentioned that the carpentry operation could result in habitat loss (Figure 3-11). In Camantavishi, a woman said, “In this forest are some trees produce fruits that are eaten by animals such as the deer. If we cut down all the trees all the deer will go to other places.” In Yoyato, a villager mentioned, “…if there are no more trees, there will be no more food for the animals.”

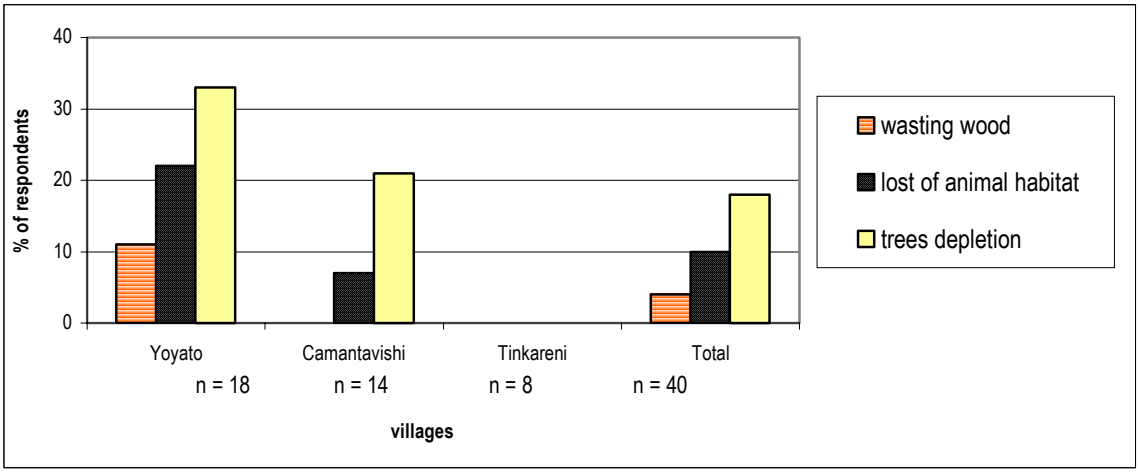

Figure 3-11 Villagers reasons why the carpentry operation causes forest impacts.

Carpentry Sustainability and Perceptions about the Future

When asked if the carpentry will work in the future, all respondents in Tinkareni, the most organized carpentry said yes; 95% responded favorably in Yoyato, and 87% in Camantavishi, the least organized carpentry (Figure 3-12).

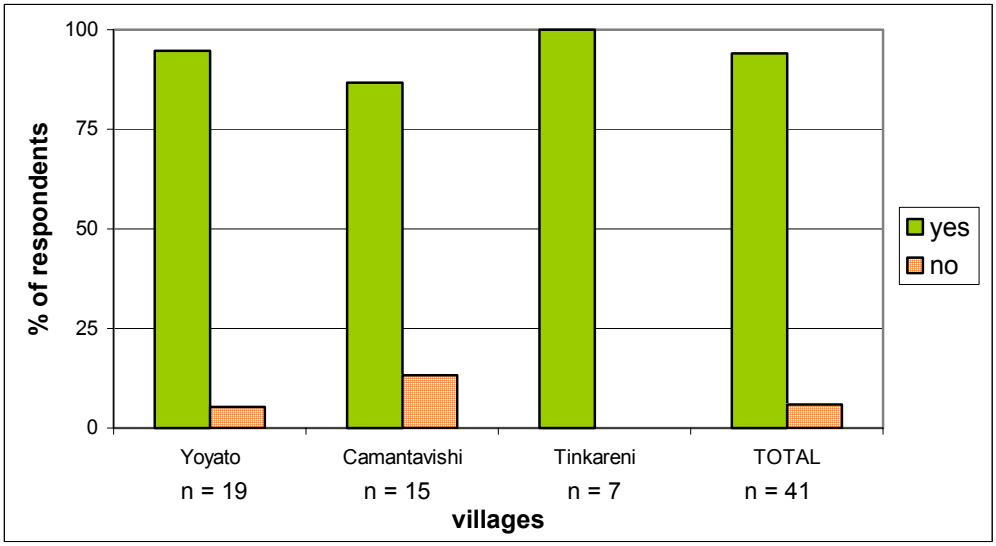

Figure 3-12 Villagers responses regarding carpentry sustainability.

Limitations of the carpentry

When asked about which problems could cause the carpentry to stop working, machinery breakdown was considered the most important limiting factor in Yoyato (76%), in Camantavishi (82%), and in Tinkareni (63%). Not having a continuous fuel supply to keep the carpentry working was considered the second most relevant problem for the carpentry future, in Yoyato (47%), in Camantavishi (47%), and in Tinkareni (38%). Insufficient training was not considered a limiting factor for the Yoyato carpentry, but it was for 18% of the respondents in Camantavishi, and 13% in Tinkareni. In Yoyato 12% stated that timber availability was a limiting factor for the future of the carpentry

(Figure 3-13). This may be because these people are living in a borrowed land and they are not allowed to fully exploit the forest resources, particularly most valuable wood species such as mahogany (*Swietenia macrophyla*) and cedar (*Cedrela odorata*).

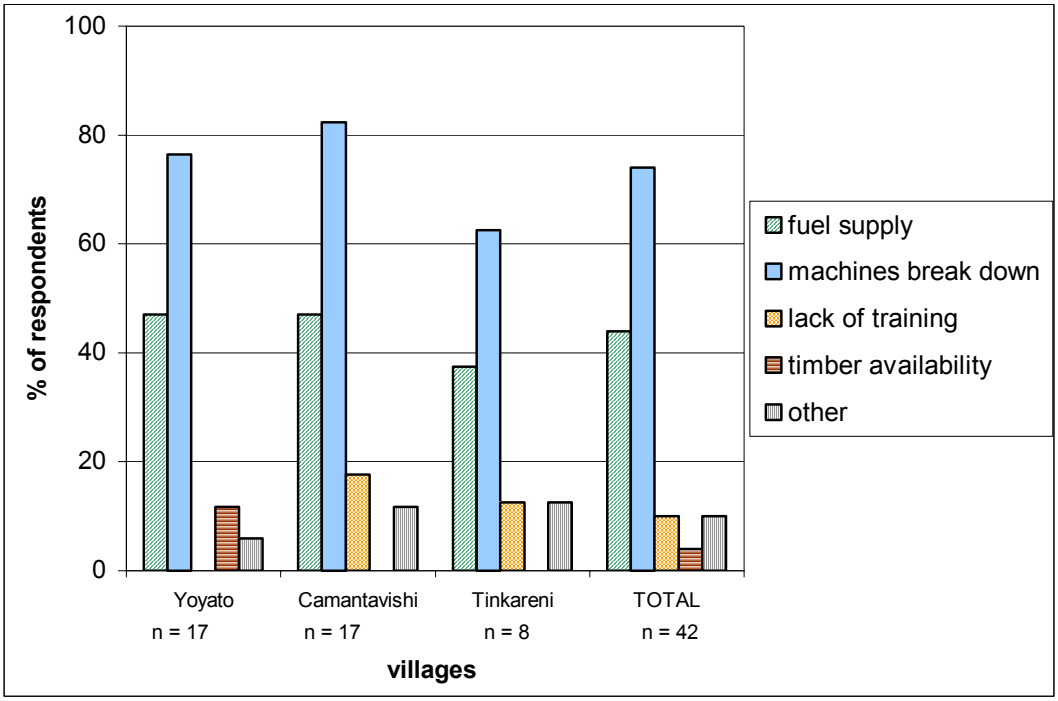

Figure 3-13 Problems for the carpentry sustainability.

How to improve the carpentry

When asked how the carpentry could be improved to bring more benefits for the village and households, having a constant supply of fuel was considered most important for respondents in Yoyato (67%), and in Camantavishi (60%); whereas in Tinkareni, it was the fourth most important improvement, mentioned by 29% of respondents. Improvements in the carpentry infrastructure such as changing the thatch roof for a tin one, or building a bigger hut for the workshop, or having more tools were considered the most important in Tinkareni (86%) However, only 27% in Camantavishi and 13% in Yoyato expressed this idea. More training for the operators was considered an important

improvement for the carpentry in Yoyato (27%), in Camantavishi (53%), and in Tinkareni (43%). Improving the organization of the carpentry was mentioned by 13% in Yoyato, 27% in Camantavishi and 57% in Tinkareni. Production of furniture for sale was mentioned as a needed improvement for the carpentry by 13% in Yoyato, 13% in Camantavishi and 14% in Tinkareni. Increasing the production of furniture in the carpentry was mentioned by 27% Yoyato, 13% in Camantavishi, and none in Tinkareni. Implementing a reforestation program to replace the logged trees was mentioned only in Tinkareni by 29% of respondents (Figure 3-14).

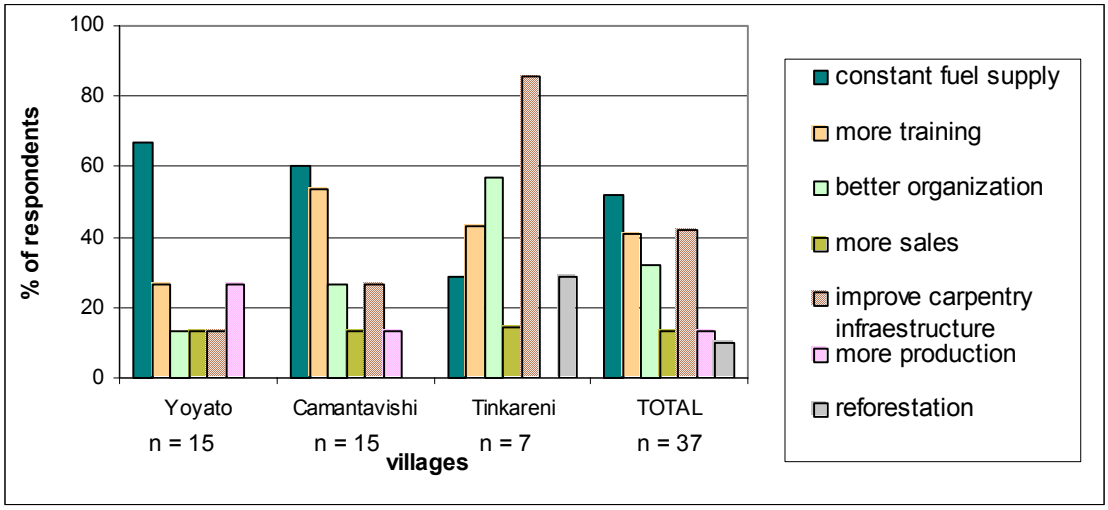

Figure 3-14 Villagers responses about how to improve the carpentry.

Discussion

Stated Goals and Perceived Benefits

The original objective of the communal carpentries, as stated in the project documents, was to support the physical reconstruction of the Yoyato, Boca Camantavishi and Tinkareni Asháninka villages. In order to achieve this objective, the main project goal was to provide benefits at the village level such as the construction of communal

buildings. The construction and implementation of primary schools and centers of health care, radio communications, and communal meetings in all three villages was a strong measure of success. In addition, initiating the production of furniture for sale was a stated secondary goal of the carpentries. In Yoyato and in Boca Camantavishi, a few pieces of furniture have been sold to nearby colonists; in addition, some respondents from all three villages expressed interest in pursuing this furniture goal further. Nonetheless, to date, furniture sales were not of a large enough magnitude to be considered a main activity of the carpentry project and certainly not to sustain the carpentries.

While the three villages expressed similar goals for the established carpentries, several village-level conditions differentially shaped which of these two project goals were emphasized in each of the villages. Specifically, the most important conditions that shaped carpentry options for Yoyato, Boca Camantavishi and Tinkareni were the distance from the carpentries to the market, the status of land tenure, the level of training of the operators and the level of organization of the village (Table 3-4).

Yoyato people are refugees in an area of roughly 34,000 ha. between the Ene and Quempiri rivers that is being borrowed from the Quempiri Community. They are not allowed to fully exploit forest resources, especially the most valuable timber species such as mahogany (*Swietenia macrophylla*) and cedar (*Cedrela odorata*). To obtain these precious woods, they must go to their still unsecured homeland at Boca Anapate area. Thus, although Yoyato is the closest village to the market, the limited availability of wood resulting from a lack of secure land tenure is a major constraint for the development of furniture sales.

Unlike Yoyato, Boca Camantavishi people have secure land tenure, and while their village is not located as close to the Ene River as that of Yoyato, they are still considered to be of reasonable proximity to market. However, this carpentry is constrained in its ability to achieve the two goals because of carpentry organization and operator training. Due to an earlier conflict, three of the four initial operators were fired, leaving only one operator to run the carpentry. This operator had the lowest level of training within the three carpentries and was ill suited to garner widespread community and external support for the carpentry operation.

In Tinkareni, the furthest village, two operators were currently working, and the level of training and organization of this carpentry was the highest within the three studied villages. Although the training organization of this carpentry was the best among the three villages, village isolation from the market severely limited the ability of this carpentry to pursue furniture sales. Thus, the degree to which each village carpentry was able to address the two stated project goals was shaped by varying factors.

Table 3-4 Three studied carpentries according to distance to market, land tenure, operator training level, and carpentry organization level.

Carpentry	Yoyato	Camantavishi	Tinkareni
distance to market	close	intermediate	far
land tenure	no	yes	yes
operator training	good	poor	best
carpentry organization	good	poor	best

In addition, villager perception of the carpentry benefits did not completely correspond with the goals stated in the project documents. Villagers concurred that community infrastructure support such as communal building construction and furniture for these communal buildings was achieved as planned in the project documents. In addition to these direct communal benefits, indirect benefits at the village level such as

training opportunities and employment were also listed by respondents. However, my findings suggest that the most important achievement of the carpentries, as perceived by the Asháninkas interviewed, was the provision of furniture for individual households. Even villagers who had not received any furniture or other household carpentry benefit stated that the provision of furniture for households was the most important benefit from the carpentry. These respondents recognized the substantial benefits received by other households and many indicated that they expected to receive such benefits in the future.

In the cases that the carpentry could not provide enough finished furniture for households, some villagers in Boca Camantavishi and Yoyato produced rustic furniture using carpentry by-products and borrowed tools. This innovation of resource use provided significant household benefits not anticipated in the original project design.

Cost and Benefit Distribution

Kendall's measure of association indicated that in all three villages, the carpentry benefits received at the household level were more concentrated in the wealthiest households, those with larger agricultural plots for market (AUC for market) and/or those with greater accumulated wealth (MI score). This wealth association was evident regardless of whether the village was more or less traditionally oriented. However, perhaps, how that wealth was utilized to access the benefits varied between villages, and was related to whether the village was more traditionally oriented or more market oriented.

Tinkareni is the most traditional and least market oriented village; it is located the furthest from the Ene River and its residents had fortified their traditional forest knowledge and cultural traditions during the 16-month period in the early 1990s when they were forced to live nomadically without permanent agricultural plots. Household

carpentry benefits in Tinkareni were mostly associated with households that had high MI scores (an indicator of accumulated wealth) (Table 3.5). Perhaps these households in which wealth had accumulated over time were more likely to have contributed more to the traditional reciprocity system over the years, and thus were more likely to receive more carpentry benefits in retribution. In the Asháninka society, the exchange of services and products within the reciprocity system is one of the most important forms of social interrelations (Rojas 1994).

In contrast, in Yoyato, the most market oriented village, carpentry benefits had accumulated more in households with larger agricultural plots dedicated to market crops (AUC for market) (Table 3-3). Likely, cash exchange is more prevalent in this village. Indeed, Yoyato residents reported contributing cash and/or fuel to the carpentry whereas Tinkareni residents did not report contributing any cash-based resources, only labor. Carpentry household benefits in the village of Boca Camantavishi which is of intermediate distance to the Ene River with both traditional and market oriented tendencies, were associated with both types of households - those that had accumulated wealth (high MI scores) and those that had larger agricultural plots for market (high AUC for market) (Table 3-3), perhaps suggesting that both reciprocity and cash availability may be contributing factors as to which households receive carpentry benefits. Some respondents from Boca Camantavishi (20%) also reported contributing cash and/or fuel to the carpentries.

Villager perceptions of carpentry benefits distribution amongst households partially supported the above analysis. The majority of respondents from Yoyato (59%) reported that benefits were not distributed equally amongst households. Several residents

expressed that wealthier households or those that could pay cash or buy fuel, received more benefits. Widows were particularly vocal about their lack of benefits received, and indeed, finished furniture was not provided to any widows in any village. However, only 34% and 29% of respondents from Boca Camantavishi and Tinkareni respectively, felt that benefits were not equally distributed, unlike their counterparts in Yoyato. In sum, despite the fact that household benefits were indeed distributed unequally in all three villages, villager perceptions of benefit distribution varied greatly. This discordance in perception between villages suggests that despite similarities in household benefit distribution between villages (wealthier households receiving more benefits), other factors are at work such as social conflicts. Finally, although some villagers from Yoyato and Boca Camantavishi perceived that the carpentry was providing more benefits to the households of the operator relatives, my data reject this association. Only in Tinkareni, where no villagers perceived that benefits were more concentrated in the household of the operator's relatives, was a weak statistical association between benefits and operator relatives detected.

Social Conflicts

In Boca Camantavishi 35% of the villagers interviewed reported the presence of conflicts related to the carpentry operation, whereas 5% in Yoyato and none in Tinkareni reported carpentry related conflicts. This difference in the occurrence of conflicts can be partially explained by the level of organization of the carpentries. The carpentry in Boca Camantavishi had the lowest level of organization among the three villages. By the time of this study, the carpentry was out of operation for more than six months, because it was to be relocated and the new carpentry workshop hut had not yet been built. Indeed in this village, three of the original four operators were fired, leaving the carpentry to be run by

only one operator. This operator had the lowest level of training among the three carpentries, and was not able to organize the carpentry or to coordinate communal work. Since this lone operator had been placed in charge of the carpentry, no major work had been produced.

In addition, an important part of the work of this carpentry benefited one household, the wealthiest in the village. For the production of furniture and house materials for this household, wood from six trees (from a total of nine in all the carpentry work) was used. The contrast among the substantial benefits received by the wealthiest households and the null benefits received by the poorest households, such as the ones in which widows are heads, is probably the most important reason for the reported presence of conflicts related to the carpentry operation. Lack of attention to widows, who are represented in large numbers in Boca Camantavishi in particular (widows were head of household in 27% of those interviewed), was a commonly reported cause of conflict.

Forest Threats

The intensity of tree extraction to supply the carpentries in the three villages (17 trees in the approximately 50,000 ha of the three villages combined) strongly suggests that there was little to no immediate threat to these Asháninka forests during the project period. However, respondent perceptions of whether the carpentries were a threat to the forest varied substantially by village, perhaps in response to their proximity and affinity to markets. Not one respondent from Tinkareni, the village located furthest from market and considered the most traditional, perceived the carpentry to be a threat to the forest, reportedly because they were extracting trees solely for self consumption and were not selling trees to loggers. In contrast, two-thirds of the respondents from Yoyato, the village closest to market considered to have the greatest market integration, expressed

that the carpentry was a threat to the forest. When asked for their reasoning, Yoyato residents expressed concern that intensification of the carpentry would lead to increased tree depletion which was also linked to loss of animal habitat. Still, despite these different perceptions of forest threats between respondents in Tinkareni and Yoyato, both villages extracted the exact same number of trees (four) for processing in the carpentries during the project period.

Favorable Conditions and Constraints to Carpentry Sustainability

Most villagers expressed optimism that the carpentries would continue to function into the future, and various study results indicate that to date, the carpentries have operated fairly smoothly. However, an analysis of favorable conditions and constraints to the sustainability of carpentry operations depends on two distinct, possible future scenarios: a first scenario of self-consumption, in which carpentries remain focused on production for villager needs; and a second commercial operation or forest enterprise scenario in which carpentries focus on furniture production for sale.

The forest from which the wood is extracted is in very good condition, capable of sustaining current levels of self-consumption. It also has bountiful quality wood resources, enough to support sustainable commercial exploitation (Cárdenas 2001). In contrast, the lack of market access constrains the carpentry operation in both scenarios, though much more significantly if villages pursue the forest enterprise scenario. For example, the limited availability and increased prices of fuel and other inputs due to distant markets would negatively affect the sustainability of the carpentries in both scenarios. However, the larger volume of needed inputs and the need to transport processed furniture would likely undermine the future of any commercial operation at this juncture. Moreover, those villages more distant from the Ene River would be more

susceptible to this constraint, taking into account that fuel, inputs and the produced items would require extra labor for carrying to and from the village to the Ene River.

A favorable condition to both potential future scenarios is the Asháninka cultural commitment to conserve the forest. In particular, Asháninka interviewed articulated their concern to conserve the forest for the Asháninka to come. This would favor rational levels of timber exploitation, but in the commercial operation scenario, market pressures and needs for cash could potentially divide villagers into those for conserving, and those for overextracting. Cultural commitment to forest conservation was a condition that was considered to be one of the keys to the successful forestry enterprise run by the Menominee tribe in Northeastern Wisconsin (Rogers and Pecore 1995).

A condition that has contributed to the carpentry success enjoyed by the villages is the high level of village participation in the project. The positive village involvement in the carpentry operation facilitated the achievement of important benefits that reached both household and village levels. Virtually all the adult villagers contributed with labor to the carpentry installation and operation. Coote et al. (1993) reported that community involvement was the most important reason for the success of the market oriented forestry initiatives in Chemba village in Malawi.

Though perhaps a minor issue at the time of the study, inequities (and the perception of inequities) in the benefits distribution should be addressed. As reported by Godoy (2001), “seeds of socioeconomic differentiation may lie dormant in simple economies,” and in the commercial operation scenario, increased market integration could exacerbate these initial inequities ultimately causing social conflicts that might undermine the future of the carpentries (Schmink, in press).

In the studied villages, livelihood systems had a strong subsistence orientation, even in the most market integrated households. At the current levels of carpentry production focused on self-consumption, the livelihood systems appeared to be compatible with the carpentry operation. However, if villages pursue the commercial operation scenario, the additional inputs required to meet these new male labor needs would be substantial. Increased market integration through community forest enterprises may undercut food security of subsistence-based communities by diverting energies from subsistence activities (Schmink, in press). In addition, it is more likely that communities could effectively manage a small-scale forestry operation, such as the self-consumption oriented, rather than a complex and large-scale forestry enterprise. This type of scaling up was one of the major difficulties documented in the unsuccessful forestry enterprise operated by the Yanesha Indians in the Upper Amazon in Peru (Benavides and Pariona 1995).

Insufficient organizational, business and forest management skills are additional limitations that would need to be supported by external actors such as non-governmental organizations or government agencies, particularly in the more complex commercial operation scenario. This type of technical support was considered a limiting factor in the community forestry enterprises run by the Chiquitano Indians in El Lomerío, Bolivia (Olivera 1995).

However, even in the self-consumption scenario, the carpentry operation clearly was unable to produce enough earnings to cover maintenance and fuel supply expenses, indicating that continued economic support may also be necessary. Most villagers stated that they would need to have a continuous supply of fuel and other inputs and machinery

maintenance to run the carpentry in the future. Some respondents articulated that the villages should organize activities (mainly agricultural production) to sustain the carpentry operations, although no initiatives of this type were carried out in any of the villages up through the study period. On the other hand, in the commercial operation scenario, some of the cash earned from sales may be utilized to cover machinery maintenance and fuel supply, contributing to the sustainability of the operation.

Nonetheless, concurrent with these villagers' ideas of how to sustain the carpentries, there was an underlying sense amongst villagers that the carpentries were a gift -and perhaps like many gifts is wonderful to use until it is used up. This sentiment seemed particularly strong amongst the more traditionally focused individuals. Some other respondents who expressed concern about the sustainability of the carpentry operation noted that furniture sales should be the main source of cash income for maintaining the carpentry operation, while continuing to provide benefits for the villagers.

As Schmink (in press) notes, "Community forest management is embedded inextricably within a social community, within a specific historical and ecological setting: it is not simply a forest enterprise." In the case of the Asháninka villages studied, these constraints and favorable conditions for carpentry sustainability highlight the multiple challenges of integrating external market realities with community values, skills, and institutions.

Conclusions

The main goal of the carpentries, the construction and implementation of communal buildings was achieved. Carpentries permitted the construction and/or implementation of primary schools, communal meeting centers, radio communication

houses, among other shared buildings. All the villagers interviewed considered that these village level benefits were equally distributed. However, according to most respondents in all three villages, the construction and implementation of communal building was not the most important benefit provided by the carpentries. According to the villagers, the most important benefit provided by the carpentries was furniture for individual households. Nearly half of the interviewed households had received finished furniture from the carpentries. These benefits received at the household level were more concentrated in the wealthiest households. In nearly one fourth of the interviewed households, rustic furniture was made by household members or other relatives using borrowed tools and carpentry by-products. This innovation occurred only in villages where the carpentries could provide finished furniture for a small portion of village households, providing significant household benefits not anticipated in the original project design.

The second goal stated in the project documents, initiation of the production of furniture for sale on a sustained basis, was partially achieved. Although only a few pieces of furniture were sold to nearby colonists, this exposure allowed villagers to garner some experience in a community-based forest enterprise. This experience allowed them to understand some of the challenges for a successful commercial operation including their own limitations in marketing, developing quality products, and accurately calculation of production costs. On the other hand, this experience also raised villager expectations about production of furniture for income generation.

Village level characteristics such as historic and cultural background, proximity to market, socioeconomic stratification, and livelihood systems influenced the effects of the

carpentries on the villagers. Positive village involvement in the project, having a healthy forest and a cultural commitment to conserve it, were enabling conditions that facilitated the achievement of stated goals and other benefits from the carpentry operation. However, the lack of market access, and the insufficient organizational, business and forest management skills were factors that could easily undermine the future of the carpentry, particularly if villagers decided to change the self-consumption nature of the carpentries to a more market-oriented project. Further technical and economic support from external actors may also be needed to help mitigate the negative impacts of such a commercial venture on the people and the forest, and possibly open up new opportunities for positively interacting with the market, and utilizing cash benefits for greater community gain. Under these conditions, perhaps community forestry could meet some of its promise to alleviate poverty of rural peoples while conserving the forest in which they live.

CHAPTER 4
CONCLUSIONS

Yoyato, Boca Camantavishi and Tinkareni are Asháninka indigenous villages located at different distances from the market in the Upper Amazon in Peru. Households rely on subsistence activities and demonstrate different degrees of market integration, revealing two main trends: a basic level of market integration (in the three villages), and a high level of market integration (in the two villages closest to the market). These differences in market integration can be partially explained by the different cultural backgrounds that may lead households to pursue their goals using different strategies.

Market integration has affected the traditional livelihood systems basically by increasing workloads on productive activities oriented to the market for both genders, but restricting the access of earnings only to men. The limiting factor for increased market oriented production is male labor, especially during the dry season. Current levels of market integration do not seem to affect subsistence activities.

Village level characteristics such as historic and cultural background, proximity to market, socioeconomic stratification, and livelihood systems influenced the effects of the carpentries on the villagers. Positive village involvement in the project, having a healthy forest and a cultural commitment to conserve it are enabling conditions that facilitated the achievement of stated goals and other benefits from the carpentry operation.

The operation of communal carpentries permitted improvements at the village level such as the construction and implementation of communal buildings. In addition, the wealthiest and most market integrated households were more likely to receive benefits

from the carpentry than the poorest and less market integrated ones. This unequal distribution of benefits suggests that the carpentry operations had increased the socioeconomic differentiation within villages. These inequities were found to be associated with the presence of social conflicts within villages, -a condition that could potentially undermine community involvement and the future of the carpentries.

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If, in the future the carpentries remain focused on production for self-consumption, strategies would need to be developed to cover operational expenses such as machinery maintenance and fuel supply. However, the lack of market access, and the insufficient organizational, business and forest management skills are factors that could easily undermine the future of the carpentry, particularly if villagers decided to change the self-consumption nature of the carpentries to a more market-oriented project. Further technical and economic support from external actors may also be needed to help mitigate the negative impacts of such a commercial venture on the people and the forest, and possibly open up new opportunities for positively interacting with the market, and utilizing cash benefits for greater community gain. Under these conditions, perhaps

community forestry could meet some of its promise to alleviate poverty of rural peoples while conserving the forest in which they live.

During this research, the study of the local and regional history, the review of ethnographies, the analysis of other related studies, as well as the experience of living and working closely with the studied communities enabled a better understanding of the complexities that affect the perception, changes, and impacts of the communal carpentries on the local population.

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BIOGRAPHICAL SKETCH

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