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by
Eric Minzenberg
to all of my teachers
ACKNOWLEDGMENTS

What seemed as an eternity when I first entered Gainesville several years ago is finally coming to closure. This dissertation could not have been completed without the love, guidance, patience, and support of numerous people. First, I thank my family for their continual help throughout my graduate school journey. My mother, Jean, although she may not have always understood what I was studying (and why), provided unconditional love and emotional support. Now she is hoping that I can market this degree. My brother, Mike, was the first person who suggested I pursue the PhD. Needless to say, I took his advice. Mike also helped me think through my research questions, methodology, and data analysis, in the process making my writing clearer and more succinct than it otherwise would have been without his input. My enjoyment with finishing this dissertation was enhanced by Laura Bird who provided tenderness, comfort, and love as this process reached conclusion. I regret that my father did not live long enough for me to present him with a copy of this work.

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HUNTING AND HOUSEHOLD IN PDS SÃO SALVADOR, ACRE, BRAZIL

By

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December 2005

Chair: Marianne Schmink
Major Department: Anthropology

Hunting is an integral part of the forest-based activities of peasant populations throughout the tropical forests in the Amazon region, yet the motivations of hunting by peasant households are not well represented in the literature. This study addresses the need to understand peasant hunting behavior and strategy in Amazonia as part of wider forest management strategies by peasant households. The principal objectives of the study are 1) to understand the influence of household organization and decision-making on peasant hunting strategy and behavior, and 2) to understand the effects of inter-household relationships on hunting practices.

Although hunting frequency has declined recently in PDS São Salvador, the overwhelming majority of households sampled in this study continue to hunt wild game. Men are the hunters, but women’s participation in insuring that the reproductive needs of the household are met, in the cooking of wild game, and the partitioning of game meat to other households in the community, is critical to the overall hunting performance of the household.
Multiple regression analysis indicates that the most salient influences on hunting output in PDS São Salvador are a household’s desire to continue with the hunting lifestyle and the social bonds that are produced with the performance of the hunt. Peasant households that are located at the periphery of the market, as occurs in PDS São Salvador, refrain from further market integration, in part, because of the non-market exchanges that are created and maintained between households with the hunt. Hunting, integrated within a forest culture, as an activity of fundamental importance within the repertoire of the household’s livelihood strategy, is thus vital to the construction of peasant livelihoods that have some agency in terms of their engagement with the market system.

The findings of this study are mixed in terms of their contribution to conservation and development in the region, although the domestication of livestock was shown to lessen the frequency of hunting. Small animal projects could provide an alternative source of meat for families, while also potentially raising the status of women of the household who are currently invested with the raising of these animals.
CHAPTER 1
INTRODUCTION

This project investigates the practice of hunting within peasant households and communities in the Brazilian Amazonian State of Acre. The principal objectives of the study are 1) to understand the influence of household organization and decision-making on peasant hunting strategy and behavior, and 2) to understand the effects of inter-household relationships on hunting practices. Additionally, this project considers the historical trajectory of resource use by residents in PDS São Salvador and the implications of hunting for other forest based activities and the sustainability of the forest resource base within the settlement. In the state of Acre, an area known for its “forest government,” this study aims to link the importance of hunting in the rural livelihoods of peasant households and communities to wider issues of forest management.

Past research on hunting in Amazonia has focused on the effects of hunting on wildlife populations, or hunting behavior and strategy by indigenous groups, but little is known about the social component of intra-household and inter-household influences on hunting by peasant groups in the region. Hunting is an integral part of the forest-based activities of peasant populations throughout the tropical forests in the Amazon region, yet the motivations of hunting by peasant households are not well represented in the literature. This study addresses the need to understand peasant hunting behavior and strategy in Amazonia as part of the wider forest management strategies of peasant households.
This study links theories of the peasant economy within the household, and across peasant households in the community, with the literature on hunting strategy and behavior by indigenous groups in Amazonia. This project presumes that hunting by peasants is not strictly utilitarian in the provision of protein and calories for peasant households, but takes on symbolic and social functions as well. The symbolic function is seen in an emotional commitment to hunting by men as a way to initiate their sons and nephews into the ways of manhood. The decision to hunt, and how much, is not made by men on their own, but is part of a larger effort, a negotiation at the household level, to allocate labor and other resources. Understanding this negotiation is essential for understanding peasant hunting behavior. Furthermore, the hunt takes on social functions across households in the community that help to join households together, thus insuring the survival of all members of the community.

The current government in the state of Acre, popularly known as the “governo da floresta” (forest government), is an important ally in the search for sustainable resource policies, and has incorporated a development philosophy that seeks ecosystem conservation, social equity, and cultural diversity (Kainer et al. 2003). Innovative approaches of conservation and development policy in the state of Acre have brought together concerned scientists and universities, state agencies, non-governmental organizations (NGOs), and local peoples to achieve socially and ecologically sustainable resource policies. As the state of Acre has taken the lead in the implementation of novel development policies in Amazonia, this research will provide useful information to increase the capacity of development planners to implement sustainable social and ecological resource policies.
Development planners must include local peoples in the management of wildlife in their efforts to protect game species from overuse, as “hunting issues cannot be separated from land use” (Wadley et al. 1997: 263), and therefore, they must understand the social dynamics of hunting and the use of wild game in the livelihood systems of peasant communities in Amazonia. An understanding of the social dynamics of the practice of hunting and the use of wild game in the livelihood systems of peasant communities in Amazonia will help conservation and development organizations, and the state of Acre, in their attempts to provide projects that account for both the cultural and biological diversity of the region.

This study builds upon the work of a Brazilian NGO from the State of Acre, PESACRE, that has worked with the communities of PDS São Salvador since 1998. The idea for this research began as a dialogue between a PESACRE biologist, Vângela Nascimento, and me during my initial visit to the area in the summer of 2002. I came to western Acre in that year to investigate the possibility of conducting research on a proposed non-timber forest product (NTFP) project in the Juruá Valley. As the NTFP project was having some difficulty taking off, I learned in conversation with Vângela and other PESACRE employees living in the town of Mâncio Lima that hunting by the residents that lived within the sustainable development settlement São Salvador (Projeto Desenvolvimento Sustentável (PDS) São Salvador on the Moa River), was a prime source of local conflict, and an area of concern for PESACRE.

An earlier study of wildlife populations within the area concluded that some wildlife species had become locally extinct as a result of hunting pressure by residents of the area (Fragoso et al. 2002). It was suggested that a research project designed to
investigate the hunting practices and motivations of the local residents of the area could help PESACRE in its attempt to maintain viable populations of wildlife in PDS São Salvador while also accounting for the importance of wildlife within the livelihoods and lifestyles of the residents in the region. My interests in the field of anthropology are critically centered on gender relations within the household, and wider community, in the broader context of natural resource use in the lowland tropics of Latin America. Therefore, this research topic combines an interest stated by PESACRE in hunting and the management of wildlife in PDS São Salvador with my own interests in the dynamics of household relations and relationships.

Animals and Tropical Forests

Meijaard et al. (2005) describe several important ways in which animals influence the tropical forest ecosystem. First, animals graze and browse on vegetation in tropical forests, affecting the structure and composition of the forest. Many animals that live in tropical forests feed on fruits that fall to the forest floor and “are involved in seed dispersal, seed predation, and the structuring of tropical forests” (Redford 1992: 418). Rodents frequently bury seeds, ultimately having a role in influencing the process of germination and eventual seedling establishment of certain plant species. Bodmer (1991, 1994) has described how tapirs play an important role in the dispersal and production of *Mauritia flexuosa* by spitting out seeds of the fruit from this palm. Other studies have also demonstrated the importance of animal species in the predation and dispersal of tree seeds and thus the structuring of tropical forests (Peres 1991; Wunderle 1997; Galetti et al. 2003).

Animals also have various secondary effects on the environment through “habitat engineering” (Meijaard et al. 2005: 5). This includes animals excavating holes, creating
pools, and turning and (thus) aerating the soil and litter layer on the forest floor. In the Amazon region, the paca (*Agouti paca*) and different species of armadillo (*Cabassous sp.*, *Dsaypus sp.*, and *Priodontes mazimus*) burrow into downed logs and create holes in the forest floor in search of their insect prey and as a means to escape predators, including man. Larger animals compact soils, which can locally increase erosion. White-lipped peccaries (*Tayassu pecari*) in neotropical forests can run in packs of from 50 to 300 individuals (Emmons 1999) following well-worn feeding trails that are frequently revisited by the pack. These feeding trails through the forest become mud-laden, compacted and devoid of vegetation. Sometimes hunters in PDS São Salvador will sling a hammock between two trees in the forest alongside one of these trails, lying in wait for a pack of peccaries to pass.

Often larger mammals that are close to settlement areas are the first species to show significant population decline as a result of subsistence hunting (Redford and Robinson 1987; Robinson and Bennett 2000; Meijaard et al. 2005). Larger-bodied animals occur at lower densities than do smaller-bodied animals (Robinson and Redford 1986) and hunters usually take the largest species in the forest (Redford 1992). Often the largest animals in tropical forests are frugivores (Redford 1992). One study conducted in the Peruvian Amazon indicated that forest fruits comprise 81% of the diet of red-brocket deer (*Mazama americana*), 66% for white-lipped peccary (*Tayassu pecari*), and 59% for collard peccary (*Tayassu tajacu*) (Bodmer 1989). All three of these species are commonly hunted in PDS São Salvador. Because these species play an important role in the structuring of tropical forests through seed dispersal of forest fruits, the removal of
these animals through hunting could change the ecological dynamics of the tropical forest environment.

Redford (1992) noted that in areas of tropical forest that are still largely intact (as is PDS São Salvador), hunting remains the greatest threat to tropical diversity. Several authors write that hunting poses a greater threat to large tropical forest mammals than does the loss of habitat through timber harvesting (Bennett et al. 2002; Linkie et al. 2003; Wilkie and Carpenter 1999). Some species of animals may have become locally extinct in PDS São Salvador as a result of hunting by the peasantry (Fragoso et al. 2002); five of these species are on the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of vulnerable, threatened, and extinct species (IUCN 2004). Peters (1996) cautioned that because the distribution and regeneration of forest tree populations are frequently controlled by the action of seed dispersal agents of which many are animals, the failure to conserve viable breeding populations of tropical forest animals could potentially be an irreversible management error. The loss of animal species in PDS São Salvador could have negative effects for the sustainable functioning and structure of the forest ecosystem, and subsequently further impoverish local inhabitants in the area that rely on hunted wild game as an important source of food.

### The Peasant Household

In the study of rural households, Chayanov’s (1986[1926]) classic Russian study stated that the peasant economy has its own internal logic that is not dictated by capitalist relations of production, but rather that the goal of the peasant household is simple reproduction. Household consumption takes precedent over household production, and is dependent on the life cycle of the household. Chayanov (1986[1926]: 78) writes, “The volume of a family’s activity depends entirely on the number of consumers and not at all
on number of workers.” As the number of individuals in the household increases through the birth of more children, the productive efforts of the household (hunting, fishing, agriculture) increase to accommodate the increase in the number of mouths to feed. If the peasant household cannot meet its customary consumptive needs, the collective members of the household “tighten their belts” and consumption momentarily decreases, or household labor is allocated to increase productive output to meet the increase in consumptive needs of the household. Production often fluctuates throughout the year for the rural peasant household, and as much of the productive output of the rural peasantry is consumed within the household, as production momentarily decreases, consumption correspondingly decreases for household members.

James Scott (1976) added to the theory of the peasant economy by proposing the idea of the moral economy of the peasant that entails the social right to subsistence, and the norm of reciprocity across households within the community. Reciprocity of goods, services, and labor across peasant households acts as a normative social and economic leveling mechanism within the community. Harris (2000) writes that in Amazonia, kin desire to reside in clusters of households within close proximity to one another, and that the reciprocal distribution of fish and wild game between households creates a sense of community and affirms the value of these relationships. Links between households are often maintained by women in the community who distribute the products of fish and game derived from the productive efforts of men. The reciprocal exchange of goods (meat, fish) and services (labor) in Kekchi Maya communities of Belize is similarly more frequent among household clusters that are densely grouped (Wilk 1997). Household
clusters that engage in a reciprocal system of exchange amongst households can cope with diversified subsistence systems better than can isolated households.

The peasantry diversify their productive efforts by engaging in hunting, fishing, agriculture, domestic livestock production, foraging, and wage labor. Domestic livestock production (pigs, cattle) is an important stock of potential income that can be sold in times of need by rural peasant households. Chibnik (1994) says that ribereño families (the peasantry living along rivers in tropical forests in Peru) prefer to sell their pigs to raise cash for medical emergencies rather than becoming encumbered with debt from a bank loan. As Gudeman and Rivera (1990: 86) explain for the peasantry in Colombia, “Hogs are true ‘piggy banks.’” In many areas in Brazil, the rural peasantry view cattle as an investment, and as such they are rarely slaughtered for household consumption, but are sold (and traded) to provide for other goods and services as the need arises within the household. Smaller domesticated animals including chickens and ducks are raised for consumption by rural households in Brazil.

The rural peasantry fundamentally diversifies their livelihood strategies to minimize risk, to adapt in order to survive, and as a means to create a brighter future for themselves and succeeding generations of household and community members (Ellis 2000). The Amazonian peasant combines market with non-market transactions in the diversity of its livelihood strategies. At the periphery, market activities tend to be less frequent as the maintenance of the household economy and its members takes precedent over increased integration with the market system (Gudeman and Rivera 1990).

Amazonian Peasantry

Peasant reproductive and productive strategies (including hunting) in Amazonia are critically dependent on, and created in conjunction with, the seasonal nature of the
environments that they inhabit (Chibnik 1994; Harris 1998, 2000). In tropical forest environments there are generally two seasons–when it is dry and when it is raining–that affect the productive strategies employed by peasant households, and the allocation of household labor.\footnote{During my visit to Acre in 2002, one elder resident of the community of Boa Vista in PDS São Salvador joked that the dry season is when it rains every day and the rainy season is when it rains all day. Wet years and drought years have tremendous influence on the yearly agricultural cycle.} Hunting is particularly important for the families living in the tropical forests of Amazonia during the rainy season when agricultural production is minimal. Beckerman (1994) says in most cases in the Amazonian environment, hunting is driven by fishing, as people hunt more when fishing resources are harder to obtain (in the rainy season when the forests are flooded). Furthermore, the activity of fishing by women who reside in the household critically influences the frequency of hunting by the men of the household. If women within the household are involved in fishing, and the household has a steady intake of food (and protein) from the catch of fish, then men in the household do not need to hunt to provide food for the table. As mentioned above, there are, though, other compelling reasons that men engage in the practice of hunting than solely as a function of the utilitarian necessity of providing food for the family.

Historically the peasantry in Amazonia (often referred to in Brazil as \textit{caboclos}) has been blamed for everything from the destruction of the tropical forest environments of the Amazon, to the death and extinction of indigenous groups and communities in the region. Nugent (1993: 32, 45) says that caboclos suffer because they were created in conjunction with the eradication of Amazonian indigenous peoples. Many in the developmental and environmental community saw caboclos as contaminating the traditional indigenous societies that had managed to maintain their “purity” from the
ravages of Western civilization. This overlooks the fact that no cultural or social group in
time has remained beyond the influence and touch of neighboring and/or distant ethnic
and racial groups (See Wolf 1982). Even the indigenous groups that have been
“discovered” in the past few decades in the remote corners of the Amazon are located
where they are today and have developed over the past few centuries largely as a result of
the attempt to flee to the interior, leaving in their tracks the advancing priests, colonists,
escaped slaves, conquistadors, and capitalists. Furthermore, culture and society and
practice are not static, but in a constant process of co-evolution and adaptation based on
the constraints and opportunities that present themselves to groups of people throughout
history. It has become increasingly difficult to ignore the patterns and practices of
resource use by caboclos in Amazonia, who comprise the overwhelming majority of the
population in the region, and whose use, and abuse, of natural resources in the Amazon
basin has tremendous impact on the present and future ecological and social/cultural
sustainability in these tropical forests.

The word *caboclo* has traditionally been used as a pejorative term to describe the
rural inhabitants of the Amazon region in Brazil.² Caboclos are generally described as
lazy, dirty, uneducated, uncivilized folk. Nissy (1966: 159) described the caboclo as
living “placidly, seemingly without ambition” and they were not to be trusted. The label
caboclo is applied in Brazil in much the same way as “redneck” or “country-bumpkin” is
used in the United States. No one desires the label of caboclo with its historical negative
connotations. The caboclo is also defined in terms of what he/she is not—not indigenous,

² The word *caboclo* is also frequently used by caboclos as a term of affection amongst themselves. In
nearly every one of the ten communities in PDS São Salvador, there is at least one individual who is known
by the nickname Caboclo.
not national—rather than in positive terms of what actually constitutes the caboclo (Nugent 1993). Throughout the modern development of the Amazon, the culture of the caboclo has become invisible because their livelihoods and priorities have not been accounted for in the paradigm of development (Wagley 1973[1953]; Ross 1978b; Parker 1985; Nugent 1993).

The Amazon caboclo has borrowed much from indigenous culture in the region and has developed production systems that are adapted to the physical and ecological environments of the tropical forests of the Amazon (Wagley 1973[1953]; Parker 1985). Generally the caboclo has striven for self-sufficiency, and the caboclo family usually lives in isolated single-family dwellings. Ross (1978b) believes that the extractive rubber economy beginning in the nineteenth century in Brazil created the Amazon peasant caboclo. The caboclo economy is a combination of basic subsistence activities combined with some marketing of surplus production in local and regional market centers. Caboclo production systems are characterized by their lack of technical sophistication and minimal use of credit or other inputs. Hunting, fishing, the gathering of forest resources, and small-scale agriculture centered on the planting of manioc organize the subsistence sector of caboclo life. Horticulture is of prime importance for some caboclo households, whereas other caboclo households rely on the extraction of non-timber forest products that dominate their socio-economic framework. Rubber, Brazil nuts, fish, farinha (manioc flour), forest fruits, and wood encompass the variety of the products produced and frequently sold by the caboclo household in the marketplace.

There exist many similarities between the livelihood strategies and cosmology of the Amazonian caboclo and indigenous inhabitants in the region. Both groups rely on
non-market transactions, including collective labor arrangements and the sharing of wild game and fish, as an integral part of the cultural-economic formation of the household and community. Both groups also frame their productive relationships in response to the consumptive needs and desires of the household rather than what is experienced in the purely capitalist system based on the maximization of production and the reinvestment of capital to increase future productive (and consumptive) desires. Both groups have also utilized their exit-option (Hyden 1980), meaning migration, as a means to resist the totalizing force of the capitalist system and the political goals of the State. Migration within the territorial patrimony and across nation states is a continual form of peasant resistance to the larger forms of domination that rain down upon the peasantry from the capitalist State.

In terms of hunting, caboclos have borrowed much from indigenous culture. Indigenous Amazonians have an elaborate set of ritualized practice and belief incorporated within the practice of hunting and people’s relationship with wild animals, and the rural peasantry in Brazil has correspondingly adopted many of the practices and belief systems (Wagley 1976[1953]; Parker 1985; Smith 1996; Melo 2000; da Cunha and Almeida 2002). Many of the animals of the forest that are classified as taboo to hunting and human consumption by Brazilian Indians are also taboo for the rural peasantry living within their midst. These taboo animals can temporarily cause the hunter to be unsuccessful in hunting wild game and further cause bodily pain if they are eaten by humans. The polluting effects of women in reference to the hunt and wild game are recognized in indigenous and peasant society. In many areas, pregnant and/or
menstruating women are removed from both hunter and game meat after a successful hunt.

Additionally, some animals are endowed with human characteristics, interacting with human beings beyond simply a predator–prey relationship. The classic example of this throughout the Amazon is with the *boto encantado*, or enchanted river dolphin (Wagley 1976[1953]; Slater 1994; Smith 1996; Melo 2000). Not only are these animals taboo to hunting, but also they are said to occasionally take human form, enticing humans into entering their world. Furthermore, there are a set of mythological creatures of the forest present in Amazonian folklore that protect wild game from humans, shaping the relationship of hunters with their prey in both indigenous and peasant communities in the Amazon region (Wagley 1976[1953]; Smith 1996; Melo 2000). Increasingly, though, as both of these groups of peoples, indigenous and peasant, are engaging in closer relations with the market, these cultural beliefs and practices are modified and many have been lost as a result (Smith 1996). Also, the decentering of the forest as a critical space of the construction of culture and livelihoods (often accompanied with a move from rural areas to the urban environment), as much of the peasantry shifts from the reliance on the extraction of forest products to swidden agriculture combined with the raising of livestock, has contributed to a break of tradition with the younger generation and a loss in much of the symbolic relationship of man with his/her environment.

**Hunting and the Peasantry**

Most of the literature on hunting in Amazonia has investigated the hunting practices of indigenous peoples (Siskind 1973; Gross 1975; Hawkes et al. 1982; Hurtado et al. 1985; Stearman 1989, 1991; Alvard 1995; Alvard et al. 1996) in spite of the fact that non-indigenous peasant populations make up the overwhelming majority of the
population in Amazonia. Redford and Robinson’s study (1987) is a notable exception that compares the effects of hunting on wildlife populations by indigenous and colonists in the neotropics. Little is known, though, of the social dynamics of hunting practices, hunting strategy, and the importance of hunting in the rural livelihoods of peasants in Amazonia. Nugent (1993) attributes this to the scant attention paid by both researchers and the State to the forest management practices of peasant Amazonians, historically “invisible” because of their non-exotic nature.

Hunting is an integral part of the forest-based activities of peasant populations throughout the tropical forests of the world, a “subsidy from nature” (Hecht et. al 1988), and without it, “many other so-called sustainable activities such as rubber tapping, would not take place” (Redford 1992: 421). Cross-culturally hunting has been important for rural households and communities for several reasons. The first, and often most compelling, reason for peasant populations throughout the world is the hunting of wildlife as a source of food for the household. In many poor peasant households (especially those lacking domesticated animals or the means to purchase meat), wild game serves as the most important, and cheapest, source of locally available protein. Meat provided from the hunting of wild game is an important source of food security for many rural households throughout the world (Bennett 2002; Rao and McGowan 2002). It has been estimated that the value of wild game harvested from the Amazon basin exceeds US$175 million per year (Tratado de Cooperacion Amazonia 1995, cited in Rao and McGowan 2002). Some researchers believe that the hunting of wild game for food (rather than habitat loss) is the most important threat to the conservation of biodiversity in
the tropics worldwide in the next couple of decades (Robinson and Bennett 1996; Wilkie
and Carpenter 1999).

Hunting also holds symbolic gender significance in rural communities, both in the
developed and underdeveloped world. Within the household economy, adolescent boys
are taught by their fathers how to hunt and are socialized into hunting as an important
attribute of becoming a man (Stedman and Herbelein 2001). This symbolic function is
seen in the dedication to hunting by elder men in the household as a way to initiate their
sons and nephews into the ways of manhood. “Fathers who participate in hunting view
the activity positively and would like to pass it down to their offspring, and the traditional
‘maleness’ of hunting makes sons the most reasonable targets of socialization” (Stedman
and Herbelein 2000: 606). This dedication to hunting varies with the presence or absence
of adolescent boys and young men in the household, if the household is male-headed or
female-headed, and if kin is living in the community. In her studies of the Yuquí in
Bolivia, Stearman (1989; 1991) reports that the prestige earned by hunting prowess and
the social standing of men in the community derived from hunting takes precedent over
the pursuit of fish by men, even though the later is a better strategy to optimize protein
acquisition. In the United States, Kellert and Berry (1987) write that gender is one of the
most important factors in determining attitudes and behavior towards wildlife and
hunting. Simply stated, the act of the hunt is defined as an activity reserved mostly for
men, and men tend to have more positive attitudes towards wildlife and hunting than do
women.

Some authors state that subsistence resource strategies are based on the sexual
division of labor that strives to account for offspring survival (Hurtado et al. 1985;
Jochim 1988). Women, as the primary caretakers of children, engage in resource procurement activities that are risk averse as a means of enhancing the survival of their offspring. Women’s activities are performed in close proximity to their children (and the household), allowing for continuous and uninterrupted childcare. Men, who are not encumbered with childcare and many other domestic duties, specialize in household food provision. Therefore, men are free to hunt, but women do not. Women pursue foods that are sub-optimal, supplying the reliable portion of the diet (gathering and agriculture), while men pursue resources of greater efficiency (higher protein content such as wild game), but lower reliability (Jochim 1988). Women stay closer to the settlement, avoiding energy demanding tasks that require much travel, and emphasize reliable production to assure a stable energy and nutrient intake.

A persistent feminist critique of household gender relations is related to women’s subordination through the sexual division of labor. Bouquet (1984: 155) writes of rural England that it is “…through the sexual division of labor within the farm household, whereby women are responsible for reproducing the conditions necessary for men to engage in specialist production.” The focal point of women’s productive activities is seen as based on their special role in the reproduction of the (household and community) labor force. Male domination develops around the need to control reproduction (Benería 1979; Goldelier 1986) and “It is in the reproductive sphere of the household that the primary relations of subordination/domination between the sexes are located” (Benería 1979: 209-210). Women are seen as relegated primarily to the domestic realm of the household with the household reproductive functions of mothering, caring, and nurturing, whereas men are free to pursue productive endeavors that accrue higher individual status.
As prestige is often displayed in peasant and indigenous communities through hunting prowess (Stearman 1989, 1991) the most prolific hunters are awarded with reproductive benefits in the community including decreased infanticide of their offspring, increased access to extramarital affairs, and increased access to women in the community as potential wives (Kaplan and Hill 1985; Thiel 1994). The resource procurement strategies and activities of women are not afforded similar status in the household or larger community.

Many individuals also hunt because they enjoy it. For some, hunting is a form of recreation as an opportunity to escape the pressures of creating a livelihood, or as a means to find solitude within the forest environment (Kensinger 1981; Fine 2000). Some households are more emotionally committed to hunting as a result of the household members’ desire to continue with the practice of hunting as an integral part of the livelihood strategy of the household. These households may continue to hunt even if they have other readily available sources of food and protein as a substitute for the meat of wild game.

Poor rural households devote a lot of attention to the maintenance of kin networks in the community (Ellis 2000). These households may be deficient in stocks of economic and political capital, but the social capital that they create through kin living in other households in the community is vital to their survival. The exchange of meat from wild game across households is an important social mechanism that binds households together within the community. It has been suggested that men hunt large animals and share the meat with others in the community primarily for the social benefits received in the exchange (Hawkes 1993; Kent 1993). The reciprocal sharing of meat from the hunt
across households fits within the moral economy of obligations in the community in peasant and indigenous societies (Scott 1976). This non-market form of peasant and indigenous exchange helps to insure the survival of community members (Ellis 1993), and thus the community as a whole (Anderson 1994).

Harris (2000) notes that, in the Brazilian Amazon, it is often the women of the household who redistribute the meat from wild game brought into the household by their husbands and sons to other households (usually kin related) in the community. The reciprocal distribution of meat from wild game remains an important mechanism in the creation of social cohesion between households in indigenous and peasant communities in the tropics, although the distribution of wild game is context specific and depends on such things as the costs of storage and the defense of wild game from others (Hegmon 1991; Hawkes 1993), the size of the family (Aspelin 1979; Kaplan and Hill 1985; Stearman 1989), and the obligations to kin and other social norms of sharing between households in the community (Aspelin 1979; Kensinger 1983; Speth 1988). Meat sharing in Amazonia across households is normally kin based. Thus, though not participating in the act of hunting, as do men, women in the household and community are important actors in the system of hunting through their function in meat exchange across households within the community, and in the preparation and cooking of the game meat that is brought into the household.

Wild game carries special status in many peasant and indigenous communities in Amazonia. Women in Sharanahua society in eastern Peru are said to “cry for meat”, sending their men out to hunt and withholding sexual favors in the exchange for meat (Siskind 1973). The Yuquí of Bolivia have a word to designate “meat hunger”
(Stearman 1989) as do the Achuar in Ecuador (Descola 1996). In many rural communities worldwide, “meat and its acquisition tend to have a value disproportionate to their economic and nutritional contribution compared to plant and fish resources” (Kent 1989: 7). In PDS São Salvador, households desire to have at least a small portion of meat (or fish) with every meal. Women in the household though, are often the most obvious targets of inequalities in food sharing. Women receive smaller shares of meat, and taboos often prohibit women from consuming meat at certain times throughout the year (e.g. during menstruation and/or pregnancy) (Speth 1988). Within the peasant households of PDS São Salvador, at meal time, men choose the meat and fish they wish to consume prior to women choosing the food they will eat.³

Some authors (Jorgenson 2000; Lee 2000; Bennett 2002) have suggested that the domestication of animals by the household is a viable alternative to the consumption of meat from wild game. Furthermore, the availability of fishing resources lessens the reliance on hunted wild game as a source of protein (Ross 1978a, 1987; Stearman 1989). It has been stated that governments can also work towards reducing the need of meat from wild animals for rural peoples by providing alternative sources of protein including domesticated animals, reared fish, or plant products (Meijaard et al. 2005: 183). The increased income of households has also been suggested to decrease the consumption of wild game in Latin America as households frequently substitute the meat from wild game for meat of domesticated animals (Stearman and Redford 1995; Bennett and Robinson 2000). As incomes increase, many households replace wild foods with foods they purchase with money.

³ In addition, in some of the households I stayed with, men and adolescent boys ate at the dinner table, while women and younger children ate their meals sitting on the floor.
Ironically, though, wild game often holds the double connotation of stigma for the lower class diet, yet a status symbol for the elite gourmet (Wilk 1997). The middle class, that does not want to be lumped together with the lower class, identifies their superiority with the ability to pay for items (including meat); therefore the consumption of wild game signifies poverty and the inability to pay for market items. The elite show their superiority from the middle class by paying high prices for foods that the middle class do not eat. An example of this occurs with the consumption of squab (pigeon) in expensive restaurants in the United States. Pigeons are raised for home consumption by some poor households, yet also comprise part of the diet of the elite.

Diagram of Peasant Hunting

Decision-making on resource use and livelihood strategy in all households is based on a combination of factors originating from within the household, as well as beyond the individual household. Households do not exist in isolation from one another, as cultural and social norms of appropriate behavior are enacted in the relationships between households within the community. Households are also critically affected by their relationship with the market. A distinguishing feature of peasant households, though, is their partial, or incomplete, integration with the market (Ellis 1993) where production is often simultaneously prepared for the market and home consumption. Furthermore, peasant households located at the periphery of the market (as are those in PDS São Salvador) show less market integration than peasant households that are encaptured by the market system (Gudeman and Rivera 1990). Finally, the natural environment plays a role in the use of resources by peasant households.

Hunting by the peasantry reflects combined processes and relationships that occur within the household and outside of the individual household. As hunting is integral to
the livelihoods of peasant households, this study measures hunting output at the level of
the household. Figure 1, below, diagrams the factors that influence hunting by the
peasant household in PDS São Salvador.

![Diagram of Peasant Hunting in PDS São Salvador](image)

**Figure 1: Diagram of Peasant Hunting in PDS São Salvador**

Within the peasant household, there are three sets of variables that critically
influence the output of hunting: material, gender, and symbolic. Poor peasant households
often rely on wild game to supply a large portion of the protein intake for household
members. As such, hunting is critical in providing food security for the household.
Hunting is also defined as a male activity within peasant households and communities.
The process of boys becoming men in the community is integrally tied to their learning
the ways of hunting. Finally, the livelihood strategy of some households reflects an
emotional commitment by household members to persist with hunting as a way of life.
This reflects the desire of individual households to continue to hunt because they enjoy this activity, maintaining this practice in their repertoire of livelihood practices.

Across households, hunting plays a part in the creation and maintenance of social bonds. This is clearly seen in the reciprocal exchange of wild game. Community obligations are met through the exchange of meat amongst households as households are joined together with the performance of meat exchange. The reciprocal exchange of wild game also insures that all households in the community have some meat to eat. Meat exchange is a non-market transaction that is an essential aspect of the peasant socio-economic system.

As stated above, market integration is incomplete in peasant households (indicated in Figure 1 with a dashed arrow), especially so at the periphery of the market. In PDS São Salvador, market influence on hunting output is minimal in comparison to other factors. The natural environment plays a role mostly in the timing of hunting, and with the techniques used by hunters in the pursuit of wild game in the settlement. The seasonal nature of the tropical forest environment, evenly divided between a wet and dry season, influences resource use and livelihood strategy, and how hunters search for wild game.

**Intra-household Hypotheses on Hunting**

In this study, I argue that the hunting practices and beliefs of households in PDS São Salvador can be measured and tested by investigating the influence of the combination of material conditions of the household and gender relationships within the household, and social obligations and relationships across households in the community. As wild game is a critical source of protein and calories for residents of the area, the number of individuals residing within the household, if a household has domesticated
animals or not, the availability of outside sources of income for household members, and if women of the household fish or not, should be factors in determining how hunting is practiced. Therefore, I hypothesize that:

H1: Households with lots of children hunt more often than households with fewer children.

H2: Households that lack domesticated animals hunt more often than households that have domesticated animals.

H3: Households that lack an outside source of income (wages, retirement checks) hunt more often than households that have an outside source of income.

Hypothesis 1 is based on the idea that the more mouths to feed within the household, the greater the effort needed to secure food to feed household members. This is based on the Chayanovian thesis that household consumption drives household production. Hypotheses 2 and 3 reflect the substitution of wild game by other sources of meat. Households that raise animals do not have as great a necessity to enter the forest in the pursuit of wild game as do households that do not entertain this activity. Also, households that have a secure source of income may be able to purchase meat instead of having to hunt to obtain meat for the household.4

In addition to the material realities of the household, gender is a key variable in the practice of the hunt in peasant households. First, hunting is frequently defined as a male role and responsibility, throughout most peasant and indigenous communities worldwide. Second, the emotional commitment of the household tied with the practice of hunting

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4 Wilk (1997:156) writes that the substitute effect of rural households purchasing domestically raised meat instead of relying on the meat of wild game is not determined solely by economic considerations, but also by the status assigned to wild foods and food purchased in the market economy. The consumption of wild game by rural peoples is often stigmatized as characteristic of lower class diets. Thus, the ability to purchase market produced foods (in this case domesticated meat) signifies increased status for the consumers of these products. These are demand driven responses by rural households as poor rural peoples replace wild foods with foods that they purchase with cash.
reflects the socialization process of boys becoming men within the household and community. Just as women are defined as the domestic caretakers of the household and instilled with the majority of the responsibility for childcare, hunting encompasses part of the definition of adult male status, with men invested in primarily productive pursuits (including hunting) within the household. Third, gender roles and responsibilities of household members critically affect the output of hunting by the household. It is argued here that the decision to hunt, by whom, and when, does not reside with the individual hunter alone, but is based on the combined productive and reproductive efforts of all household members. Therefore, I hypothesize that:

H4: Male-headed households hunt more often than female headed households.

H5: Households that have adult males and hunting age adolescent boys hunt more often than households that do not have adult males and hunting age adolescent boys.

H6: Households in which women do not fish hunt more often than households where women do fish.

Hypotheses 4, 5, and 6 result from gender defined roles of men and women in the peasant household. Hunting practice of household members is, in part, the result of the coordination of household activities by the men and women that are members of the household. Hypothesis 6 reflects a combination of the substitution effect described above (H2, H3), but in this case the exchange of fish for wild game instead of purchased meat for wild game, and the productive and reproductive responsibilities of women within the household.

The practice of hunting within the household is also dependent on the emotional commitment of the members of the household to hunting. This cultural component of hunting reflects the desires of household members to continue with the practice of
hunting as an integral part of the collective livelihood strategy of the household. This partially is a result of the household’s gender dynamics, as hunting is associated with male status within the household and community, and men may feel compelled to hunt due to cultural norms, yet it is also dependent on whether hunters within the household enjoy hunting and wish to continue this practice. Therefore, I hypothesize that:

H7: Households that are more emotionally committed to hunting hunt more often than households that are less emotionally committed to hunting.

Inter-household Hypotheses on Hunting

The practice of hunting is not solely explained by intra-household processes, but also reflects how relationships across households within the community come into play in the dynamics of hunting. Community norms, rights, and responsibilities shape how hunting is practiced by households. Frequently, “the internal composition and division of labour [sic] within productive households…are largely determined by the external relations of households to each other and to other social groups” (Friedman 1980: 159). Social obligations tied to reciprocity between households are important in maintaining healthy and happy communities. Peasant households in the Amazon have been characterized by the clustering of familial units in the creation of community (Harris 2000). These reciprocal bonds across households, though, are stronger with households tied together by kin relations than with those households lacking such bonds. Therefore, I hypothesize that:

H8: Households that are grouped together in clusters within the community hunt more often than households that are not grouped together in clusters within the community.

H9: Households that have family living within the community hunt more often than households that do not have family living within the community.
Hypotheses 8 and 9 are influenced by the sharing of resources across peasant households in the Amazon. In addition, we would expect to find that blood ties between households are stronger than other forms of inter-household bonds within the community.

Dissertation Layout

In the following chapter I begin with a presentation of the history of PDS São Salvador. A historical political ecological framework is used to understand the transformation of resource use in the area and its effect on household livelihoods. I will first trace the importance of rubber in the development of the state of Acre and its subsequent influence on the social-economic framework of peasant households and livelihoods in PDS São Salvador. The layout of the ten communities in the area reflects the history of rubber exploitation in Acre and the history of the development of PDS São Salvador as will be explained in the next chapter. Finally, the transformation from livelihoods based on extraction of forest products (rubber) to ones based on small-scale agriculture (farinha) is explained. This is an important shift in socio-cultural practices of resource use by local residents, with potentially important consequences for the resource base of the forest environment.

Following the historical description of the area I will introduce the current state of affairs in Acre, and the research site, PDS São Salvador. The state of Acre and PDS São Salvador are described in terms of their biophysical and geographical characteristics. The seasonal nature of resource use in PDS São Salvador is discussed, an important constraint in the timing of hunting in the area. The chapter concludes with a discussion on the importance of travel and the gender specific nature of hunting travel.

Chapter 3 presents the methodology (both research design and methods) used throughout this study. Quantitative methods were used to test research hypotheses, and
qualitative methods were used to describe hunting practices and as supporting material towards hypotheses testing. The research design and methods used in this project investigated both the effects of intra-household and inter-household (between households) relationships on the practice of hunting in the area.

Chapter 4 will examine hunting within the household of the peasantry in the study site, specifically, how the material realities of the household, gender relationships of household members (intra-household), and the emotional commitment of household members to hunting critically affect the practice of the hunt. The roles and responsibilities of men and women in the household are examined in light of their effects on the practice of the hunt. The timing of resource use and the seasonality of resource use are also reviewed. A description of hunting practice is given and the intra-household hypotheses enumerated above are tested.

Chapter 5 focuses on relationships amongst households in the community (inter-household) and how this influences hunting in the seringal. The practice of the hunt is one of the key ways in which households are tied together across the community, insure the survival of all households in the community as a whole, and acting to create a sense of community amongst the often widely dispersed households of the community. The practice of group hunting involving members of different households within the community and the exchange of wild game between households is discussed. Kin relations across households play a key role in the nature of group hunts and meat exchange across households. Inter-household hypotheses are also tested in this chapter.
Finally, chapter 6 presents my summary of findings and conclusions. I will also discuss the implications of this project for anthropology, for conservation and development in the area, and the implications of the study findings for gender studies.
CHAPTER 2
THE HISTORY OF PDS SÃO SALVADOR AND THE RESEARCH SITE

This chapter begins by tracing the historical development of the state of Acre since the late nineteenth century and that of PDS São Salvador since the 1930s. A political ecological approach is used to view the transformation of resource use by local inhabitants. Changes in subsistence strategies by local resource users over time can lead to significant modifications of the local environment. This understanding is essential in the implementation of effective environmental policies that respect both the natural environment and the livelihood strategies of rural peoples whose daily sustenance is dependent upon the use of natural resources.

Communities in PDS São Salvador have undergone dramatic, often rapid, change in socio-political structures that have transformed household livelihoods. Though still marginalized from the benefits of the capitalist system, residents of PDS São Salvador maintain active engagement with the market system. Whereas for the majority of the past century, the livelihoods of the peasantry were based on the extractive rubber economy, by the 1990s swidden agriculture centered on the production of farinha for market, combined with the raising of livestock, dominated the household economy. Household livelihood strategies have passed from the culture of rubber to the culture of farinha in this part of western Acre.
Since its incorporation into Brazil in the early 1900s, Acre has existed on the margins of Brazil and held little importance in the political-economic development of the country until the end of the nineteenth century when rubber suddenly became a valuable commodity on the world market. The development of the rubber economy has defined Acre more than any other Amazonian state in Brazil. Bakx (1988) stated that Acre was colonized by Brazilians with the sole intent to extract latex from the forest to produce rubber. After the collapse of the rubber economy in Brazil by the 1920s, Acre returned to its historical state of isolation from the hearts and minds of the nation for several decades. The 1970s witnessed the infusion of cattle interests in the state of Acre (and the rest of Amazonia) and the emergence of the rubber tapper (seringueiro) movement spearheaded by Chico Mendes and other leaders. The international conservation and development community embraced the seringueiros and their resistance to the conversion of tropical forestlands to pasture, even if their fellow countrymen were less likely to do so. Even today very few people in Brazil have ever ventured to Acre and further, most have little desire to.

If Acre as a whole is isolated from the rest of the country, then western Acre where PDS São Salvador sits, is even further removed from the nation. The political sensibilities of the seringueiro movement within Acre have been largely limited to the eastern portion of the state, resulting in increased national and international attention directed towards the East at the expense of the West. The lack of infrastructure, critically a paved highway connecting the West with eastern Acre, has severely limited communication and supplies, and separated individuals and families from the benefits of

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1 The area that today comprises the state of Acre was ceded by Bolivia to Brazil with the Treaty of Petrópolis in 1903 (Nissy 1966).
development projects concentrated in the eastern portion of the state. As of 2005, western Acre had only 150km of paved roads (Campbell 2005).

The research site, PDS São Salvador, is located on the western fringe of Brazil bordering the countries of Peru and Bolivia. The state of Acre, a small state in terms of land base and population of the state of Acre, is isolated from the rest of the country. In the very western portion of the state, about as far west as one can go and still be within the territorial limits of Brazil, sits PDS São Salvador. I will describe where PDS São Salvador is located as well as the biophysical characteristics of the settlement, along with a brief discussion of the infrastructure development (or lack thereof) in the area. Following, comes a description of the yearly calendar of household resource procurement activities. Livelihood strategies are significantly affected by climatic conditions in the seringal.

Finally, the importance of travel for the residents in PDS São Salvador is mentioned. Travel in time and through space is a highly gender regulated activity in the seringal. Hunting travel is an important mechanism in creating alliances across households within the community. Men, who are the hunters, are afforded the advantages that the hunter-traveler creates in the construction of these socio-political bonds, whereas women, who are limited in their traveling, are thus limited in their participation with the hunt and the corresponding creation of bonds with other households. Women, though, are afforded other opportunities in the creation and maintenance of social networks across households. In terms of hunting, the reciprocal sharing of wild game between households in the community is often performed by women of the household.
The History of Rubber in the Development of the State of Acre

In order to understand the history of PDS São Salvador and the socio-cultural practices and beliefs, and resource practices of its residents today, it is first important to understand the importance of the history of rubber in the socio-cultural milieu of Acre. Throughout the past century, the extractive forest economy centered on the production of rubber has dominated socio-political and economic structures and livelihoods throughout the state of Acre. This legacy continues in the state’s political system with the current “forest government” of Governor Jorge Viana that seeks to prevent conversion of forestland through the protection and support of extractive forest activities (other than rubber).

Charles Goodyear discovered the process of vulcanization in 1839 that allowed latex to maintain its consistency despite changes in temperature (Dean 1987). This process transformed rubber into a valued commodity on the worldwide market and the scramble for Amazonian rubber took off beginning in the 1850s. In the late 1800s, rubber was exported from Brazil to supply the bicycle craze that had swept Europe. By the early twentieth century, the production of Ford’s Model-T redirected rubber exports from Brazil to the burgeoning market for tires in the United States.

The Amazonian rubber economy was based on the avialmento system of supply, credit, and control of peasant labor (Dean 1987; Barham and Coomes 1994; Coomes and Barham 1994). In this system seringueiros (rubber tappers) many of them poor, landless migrants from the drought-plagued Northeastern seríao, existed in a merciless system of debt slavery to the local barracão (trading post) usually operated by the local owner of the rubber estate concession (dono de seringal). Each seringueiro lived within his colocação, the expanse of land within the seringal that contained the rubber trees that he
worked and was expected to tap for latex, in order to pay the annual rent to the dono de seringal for use of the piece of land. The seringueiros would transport their latex to the local barracão where they would be extended credit and supplies of basic necessities at vastly inflated prices, payable with the next installment of latex from the forest. The local barracão would then transport the smoked latex by river downstream to one of the larger Amazonian cities for eventual export out of the port of Belém at the mouth of the Amazon.

The donos de seringais often prohibited the seringueiros from engaging in any subsistence activities that competed with their rubber tapping activities. They preferred to recruit and hire single, poor men from the impoverished Northeastern region of Brazil to tap rubber, and women were scarce in the state of Acre during this first rubber boom. When these single male rubber tappers demanded that they be supplied with women, the large trading companies in Manaus and Belém sent women (many from the cities’ brothels) to the seringais in Acre (Campbell 1996). These single, male seringueiros lived in dispersed dwellings in the tropical forests of the Brazilian Amazon, which hindered the development of any collective political strategy within the class of seringueiros. Wages were unknown in the aviamento system, and a few rubber barons at the top of the rubber pyramid in Manaus and Belem profited mightily at the expense of the thousands of marginalized and frequently starving seringueiros in the Amazon.

The present Brazilian state of Acre was annexed from Bolivia in 1903\(^2\), an area that in 1899 supplied 60% of all the rubber produced in Amazonia (Hall 1989: 2). From 1900 to 1913, rubber accounted for one-third of Brazil’s exports (Skidmore and Smith 1992:

\(^2\) See Church (1904) and Tambs (1966) for an explanation of how Acre was acquired by Brazil from Bolivia.
The heyday of the Amazonian boom lasted from 1870 until 1912 when Asian production of cultivated rubber surpassed that of Brazilian production. Brazilian rubber production experienced a brief reprise during the Second World War as the Axis powers controlled rubber production in Asia, and the United States was forced to look to its neighbors to the south to supply its rubber needs for the war effort. Following the termination of World War II, the Asian rubber plantations in Malaysia and Ceylon resumed their place as the centers of worldwide rubber production.

When the rubber economy in Brazil collapsed by the 1920s, many donos de seringal simply abandoned their rubber estates as the economic value of these landholdings essentially ceased to exist. The population in the state of Acre fell by fourteen percent from 1920 to 1940 (Bakx 1988: 150). The seringueiros that remained behind, poor and without the means to migrate to other areas, were free to engage in a variety of subsistence activities including swidden agriculture, hunting, fishing, and the small-scale extraction of forest products, including rubber. These caboclos, a mixture of the culture of the migrants from the Northeast with the decultured descendents of Amazonian indigenous communities, were largely ignored by the State until after World War II.

The collapse of the rubber economy in Amazonia by the 1920s transformed gender relations in the seringal and in the state of Acre as a whole. As the donos de seringais

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3 The collapse of the Amazonian rubber economy has sometimes been credited to the Englishman Sir Henry Wickham who “smuggled” rubber seeds out of Brazil in 1876 to be planted in Kew gardens for later establishment in the British colonies in Malaysia and Ceylon (Dean 1987).

4 The price per pound of Brazilian rubber was US$1.91 in 1910, falling to US$0.20 by 1922 (Bakx 1988: 149).
abandoned their rubber estates\textsuperscript{5}, an autonomous rubber tapping strategy emerged, replacing the traditional debt-peonage aviação system of rubber extraction. The single, solitary man tapping rubber became a thing of the past as more women moved to Acre and seringueiro families became established. The family replaced the patrão as the organizational center of life in the seringal (Wolff 1999). Rubber extraction began to decline in relative importance for the seringueiro family as other subsistence productive activities gained in importance. These subsistence activities included hunting and fishing\textsuperscript{6}, swidden agriculture, the collection and extraction of other forest products such as Brazil nut (\textit{Bertholletia excelsa}), fruits (açai–\textit{Euterpe precatoria}, cupuaçu–\textit{Theobroma grandiflorum}), palm hearts (\textit{Euterpe edulis}), and small-scale animal husbandry.

Consequently, the socio-economic life of the peasantry that had been deeply integrated with the market (though marginalized from its benefits) during the heyday of the production of rubber, transformed, lapsing to a subsistence mode of production, and becoming a “traditional population” (Wolff 1999: 106) – a shift to livelihoods based on production for subsistence, rather than for market. Additionally, for many rural peasant households in Acre, the dependence on the forest as the critical site for the economic well-being of the family decreased as households increasingly turned away from extraction of latex to produce rubber, and increasingly towards swidden agriculture and the raising of domestic livestock.

\textsuperscript{5} Land was seldom bought and sold on the market in Amazonia during the rubber boom of the nineteenth and twentieth centuries as land ownership was de facto, based on living on, and working, a piece of land. Many of the donos de serginas did not live within the bounds of the seringal, but financed the operation of production of rubber in the seringal.

\textsuperscript{6} Hunting and fishing by the seringueiros in the seringal were traditionally tolerated by the patrão as long as they did not interfere with the production of rubber.
Post - World War II Amazonian Development

With the fall of the rubber economy post-World War II, the cultural practices and livelihood strategies of indigenous peoples and the rural peasantry based on the extraction of forest products were looked upon as backward by the Brazilian government. The Amazon region was viewed as a vast, empty space full of natural resources, that was in dire need of modernization if the nation was to reach its full potential. Furthermore, this “empty land” could be used to settle the landless peasantry, thus diffusing tension based on the gross inequality in land ownership throughout the country. Indigenous peoples and the rural peasantry suffered due to the development drive by the State and other elites in the tropical forests of the Amazon. Amazonian development from the 1950s onward witnessed the increasing concentration in land ownership, increasing violence directed at indigenous and caboclo communities as the elite gobbled up their parcels of land, and the increased use of a monetary economy with the introduction of consumer goods (Moran 1981; Moran 1983; Hall 1989; Schmink and Wood 1992; Little 2001).

In 1953, the Superintendency for the Economic Valorisation of Amazonia (SPVEA) was created to stimulate the socio-economic development of the Amazon region (Moran 1981; Hall 1989; Schmink and Wood 1992). The development drive was to be carried out through a series of five-year plans. The three top priorities of SPVEA included agricultural development to make the region self-sufficient in the production of food and to increase production of raw materials (wood, fish, game) for export and domestic consumption, to improve river transport and port facilities, and lastly to pay attention to the region’s health problems (Hall 1989). As part of the scheme to encourage the development of the interior of the country, the capital was moved from the coast in Rio de Janeiro to the interior of Brasília. SPVEA also financed the construction of the
2000-kilometer highway that linked the city of Belém at the mouth of the Amazon to the new capital of Brasília. Thousands of poor, landless settlers in search of a better life followed the road as it was constructed. Through the industrial incentives initiated by SPVEA, local elites were able to obtain large swaths of land that were used for cattle ranching or industrial agriculture. Indian lands were frequently encroached upon (Goodland and Irwin 1975; Davis 1977; Branford 1985; Treece 1990) and many other subsistence landholders lost their land as merchants began to seize property in lieu of payment for outstanding debts (Schmink and Wood 1992). Frequently the land that was seized was rented back to the previous landowner, who continued his subsistence activities, yet without title to the land.

The militarization of the Amazon began with the military coup in 1964 that overthrew the left leaning government of João Goulart. The military leaders instituted an aggressive policy to occupy and colonize the Amazon frontier, as there was a shared vision within the military of the need to permanently settle the Amazon. SPVEA was replaced with the Superintendency for the Development of Amazonia (SUDAM) in charge of instituting ‘Operation Amazonia’, the government’s development plan for the Amazon basin (Moran 1981; Lisansky 1985; Hall 1989; Almeida 1992; Schmink and Wood 1992). The government’s goals of Amazonian development were threefold: to improve Brazil’s foreign exchange with the increased exploration and exploitation of the Amazon, to promote national integration, and to reduce social tensions in the Northeast by providing a settlement option for the poor and landless of this region (Hall 1989).  

Brazilian president Emílio Médici stated in 1970 that the primary motive of Amazonian development was, “to give men without land [northeasterners] a land without men [Amazon]” (Moran 1981: 75). Thus, the government conveniently bypassed the issue of land reform.
Credit from the Bank of Amazonia (BASA) subsidized land acquisition schemes, as cattle ranching was aggressively promoted. The World Bank encouraged the Brazilian government’s cattle mode of development with increasing loans for livestock production in the Amazon.\(^8\) By 1973, Brazil was estimated to have the third largest herd of cattle in the world, surpassed only by the United States and the Soviet Union (Davis 1977: 128). Land was increasingly in the hands of an elite minority, and the Gini coefficients for land ownership in the 1960s and 1970s increased in all Amazonian states except one (Rosenblatt 1992: 9). Small peasant farmers increasingly lost their land (often violently) and were forced to move deeper into the Amazon to stake out a living. They worked as agricultural laborers on the large cattle ranches and agricultural estates, or they migrated to cities. There was a clear correlation in Amazonia between the increase in deforestation, the increase in the concentration of landholdings by rural elites, and rural violence (Schwartzman 1992). Furthermore, high national inflation led to Amazonian land holding speculative value, causing money to pour into the region from the industrialized South, pushing the price of land beyond the means of the caboclo peasantry. Overall the military’s development efforts in the Amazon caused the peasantry to be increasingly removed from their lands while pushing them further westward into remote corners of the Amazon such as the state of Acre that borders Peru and Bolivia.\(^9\) The pace of environmental destruction escalated especially during the 1970s, the decade that Almeida (1992) labeled the “Decade of Colonization.” By 1997, it

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\(^8\) The military regime in Brazil was able to finance its policies through the generous lending practices of the international financial sector in the developed world. By 1983, Brazil had acquired the largest foreign debt in the world - between US$87 billion and US$100 billion (Skidmore and Smith 1992: 182).

\(^9\) Although the government initiated a series of directed settlement schemes for the peasantry in Amazonia, the overwhelming majority of peasant colonization was spontaneous, often as a result of landless migrants following roads as they were constructed throughout Amazonia (Smith 1982; Lisansky 1985; Hall 1989).
was estimated that approximately 13 percent of the Brazilian Amazon rainforest had been destroyed (Hall 2000: 100).

Violence also became an increasing part of the social fabric in the Amazon as conflict intensified between the caboclo and large-scale development interests. *Pistoleiros* (hired gunmen) were ordered by the large landowners to drive small farmers off the land that they occupied. Diegues (1992: 24) estimates that around 1,100 rural workers were killed in land conflicts in Brazil during the 1970s and 1980s. Peasant resistance movements from below increasingly challenged the developmental paradigm of the government and elite interests (Schmink and Wood 1992). The return of democracy in 1985 allowed a space for these movements to articulate their competing claims for the resources of the nation. The Movement of the Landless (MST) demanding land reform acquired national attention by engaging in a series of well publicized land occupations.

In 1985, the National Council of Rubber Tappers was created to protect seringueiros from the demands and desires of the ranchers who were interested in the conversion of forestland to pasture. Their leader Chico Mendes, a caboclo seringueiro from eastern Acre, gained international recognition and the support of environmental and human rights organizations worldwide as the seringueiros strove to protect the forest that they had traditionally inhabited. Unfortunately, cattle ranchers assassinated Mendes in 1988, but the movement of seringueiros continued its mission. The concept of extractive reserves proposed by seringueiros was signed into law by the Brazilian government in 1990 and has been advocated as an appropriate developmental model that respects social and environmental sustainability in tropical forests throughout the world.
Due to the rubber tapper movement engineered by Chico Mendes (and other leaders), and the national and international attention that it garnered, Acre became a site of interest in environmental policy and a frame of reference in the fight to protect tropical forests from destruction and conversion to other land use types. International and national interest in the social movement of the rubber tappers spurred increased developmental aid to the state as well as a flood of researchers intent on investigating how sustainable forests and sustainable livelihoods could co-exist. Furthermore, Jorge Viana, trained as a forester, was elected governor of the state of Acre in 1998 and labeled his administration the “forest government” signifying his commitment to protecting the state’s forests and the people who reside within them. The goal of the Viana government has been to emphasize the importance of the forest environment in the social, cultural, and economic history and practice of the peoples of Acre. Policies were directed at generating wealth through the maintenance of standing forests throughout the state. Additionally, Marina da Silva, who played a pivotal role in the social-environmental movement of rubber tappers in the state of Acre, and who represented the state as a senator, was hand picked in 2002 by the president of Brazil, Lula da Silva, to head the national Ministry of the Environment. Although isolated geographically from the rest of Brazil, over the past two decades the state of Acre regained the attention of the national and international community.

Rubber in the Development of PDS São Salvador

Prior to being named the first sustainable development settlement within Brazil in 2000, Projeto de Desenvolvimento Sustentável (PDS) São Salvador was commonly referred to as Seringal São Salvador in deference to its use and designation as a rubber tapping estate. The word *seringal* is used in Brazil to designate a current, or former
rubber estate. Even today, the residents of PDS São Salvador commonly refer to the area as Seringal São Salvador rather than the name designated by the State in the year 2000.

The rubber system developed slightly differently in PDS São Salvador. Although the mechanics of the aviamento rubber system were much the same, rubber production began much later in the area, well after the initial peak of rubber activity throughout Acre at the turn of the past century, commencing only in the early 1930s. Possibly the process occurred later as a result of the difficulty of reaching the area, which lies on the extreme western border of the county with Peru. Even in 2005 there was not a highway that linked eastern Acre and the capital city of Rio Branco with western Acre. Few of the residents of PDS São Salvador had ever ventured to the capital of their state, or much beyond the city of Cruzeiro do Sul which lay some eighty kilometers from the seringal. Because of its relative isolation, the political movement from below that defined the seringueiro movement of Chico Mendes in eastern Acre, had not had as far reaching an impact in western Acre.

According to documents from the federal land agency responsible for the development of settlement areas in Brazil, Instituto Nacional de Conização e Reforma Agrária (INCRA 1979), in 1933, Pedro de Morais (also spelled Pedro Morães) the owner of the seringal named São Salvador that included the colocações of São Francisco, Santa Luzia, Foz de Breguesso, Itacolomy do Norte and Aracoyaba, hired Luiz Gomes de Souza, or Seu Duda, to clear rubber tapping trails in the forest. There is no mention of how Mr. Morias came to acquire this tract of 37,532 hectares of land. It is possible that this land had been part of the homeland of the indigenous group, the Nukini, that currently occupies a reserve that borders PDS São Salvador. In 2005, the Nukini and the
residents of PDS São Salvador lived side-by-side in relative peace, although there was little mixture between the two communities.

One of the frequent complaints that the Nukini had with outsiders regarded hunters entering their territory and encroaching on their lands. This was also a complaint of community members in PDS São Salvador who stated that sometimes hunters came from the city centers of Mâncio Lima and Cruzeiro do Sul to illegally hunt within their communities in order to sell wild game in these cities - a further violation of Brazilian law. There has been a cautious, recent movement of proposed meetings between the cacique and other leaders of the indigenous Nukini with the Conselho Gestor of PDS São Salvador, the elected council with members of each of the ten communities in the settlement, to entertain discussions on how to address problems, opportunities, and management concerns that are common to both groups of peoples.

The rubber system installed by Pedro de Morais was apparently not as harsh as it was elsewhere, as most of the older generation that currently reside in PDS São Salvador, who spent some of their adult years tapping rubber, spoke fondly of him. The individuals that were recruited to tap rubber in the seringal were mostly born in western Acre, although many of their parents were part of the wave of immigrants to the state that came from the northeastern Brazilian state of Ceará. A few of the grandparents of the 2005 residents of PDS São Salvador came from the state of Amazonas that lies just to the North of Acre. Another key difference with the earlier established rubber system was that the establishment of seringueiro families within Seringal São Salvador was not prohibited, as was customarily in other seringais. Each seringueiro family worked two
rubber trails and was required to pay an annual fee of 50 kilograms of rubber to the Morais family.10

As Mr. Morais became too old to run the daily operations of rubber production in the seringal, he turned the operation over to his sons in the 1980s. Things deteriorated rapidly through careless management, and residents say that working conditions for the seringueiros became stricter, and eventually as the operation proved less and less profitable, the Morais family abandoned the seringal in the mid 1980s. The price of rubber in the nearby Alto Juruá in western Acre fell from US$1.80/kg in 1982 to US$0.40/kg in 1991 (Pantoja 2004). By the late 1980s, the residents of Seringal São Salvador were left to their own accord, free to pursue whichever livelihood strategies best suited their households and families.

An autonomous rubber system briefly developed in the seringal for a few years that was quickly eclipsed when the subsidies for rubber were increasingly relaxed by the Brazil government in the 1980s, and effectively abandoned in the early 1990s. Rubber lost its central importance in the socio-cultural and economic livelihoods of the residents of the area, and by 2005 few, if any, residents of PDS São Salvador tapped rubber as a means of procuring a livelihood for their families. (None of the households interviewed in this study reported that they tapped rubber, although a few adult men wished to return to the rubber economy of the days of old.) Some households suffered in the transition from livelihoods based on the production of rubber to other forms of subsistence economy. One ex-rubber tapper mentioned that the patrão (Pedro de Morais) was

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10 Carneiro da Cunha and de Almeida (2000) estimate that in the Juruá Valley in western Acre in the 1970s, each seringueiro household produced, on average, 600 kilograms of rubber annually. Rubber tappers were charged 30 kilograms per rubber trail, per year, (60 kilograms rubber/year), as payment to their patrão. This represented 10% of a household’s yearly rubber production.
reasonable and not exceedingly harsh to him or his family; he knew what was expected of him, and he did not mind walking through the forest collecting latex to make rubber.

The shift in household livelihoods from rubber to small-scale agricultural production left some of the older residents of PDS São Salvador at a loss as to how to effectively engage with a new economic system that had broken from the patron-client relationship of the aviamento rubber system. The overwhelming majority of the residents of the settlement, though, enjoyed the autonomy they had acquired since the end of the rubber economy. Some residents stated that in the rubber system of old, they felt as if they were always working for someone else (their patrão), but now, they were working for themselves and their families, with household production based on the skills and needs of household members, not on the necessity of meeting production quotas set by outsiders.

Some authors state that the aviamento system persists today in the seringal, transfigured throughout the region (Raffles 2002). Though the rural producer was not as intimately tied to buyers of their product as occurred in the rubber system in the past in Amazonia, buyers continue to purchase goods from the rural caboclo at below market value, while selling them manufactured items at above market price. An example of this is reflected in a conversation I had with an elder resident of PDS São Salvador. He remarked that nowadays the economy of farinha in the seringal in many respects resembled the rubber economy of the past. Whereas regatões (river traders) collected rubber from the seringueiros in the past, now they came from the cities of Mâncio Lima and Cruzeiro do Sul in their boats seeking farinha (manioc flour) produced by the rural caboclo. These river traders knew that the residents of PDS São Salvador frequently did
not have money to pay for gasoline for the journey into town to sell their agricultural product, yet had farinha ready for market, and thus, the traders were able to purchase farinha at below market value while simultaneously selling manufactured goods sold in urban areas at inflated prices. Just as in the past when the rural producer was not able to come to the market, the market came to him/her.

Post-rubber Political-economy in PDS São Salvador

In the post-rubber rural economy in Seringal São Salvador in the early 1990s, the rural peasantry in the seringal went through a quick succession of household livelihood strategies. First, households relied principally on the harvest of timber, then moved to the sale of wild game and animal skins, and finally to reliance on small-scale, family based agriculture centered on the production of farinha for market (Câmara 2002). Farinha is the staple of Amazonian diets, and the main source of cash income for the majority of the residents of PDS São Salvador. Farinha served the dual purpose of a crop for eating, and a crop for sale. Whereas farinha was the principal cash crop in the summer months, it became the primary household staple in the lean winter months in PDS São Salvador.

In 1993, the Sociedade de Produtores Agrícolas do Rio Moa (Society of Agricultural Producers of the Moa River) was created by the household producers that lived along the Moa River as a means to insure that their interests were protected and accounted for, but principally as a means to potentially acquire future credit. A few years later, the organization proposed to INCRA that a settlement be created along the Moa River. With the establishment of a settlement comes (agricultural) credit for the settled

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11 One resident stated that during the years of the trade in animal skins, some individuals would hunt wild game, remove their skins at the site of the hunt, then simply leave the meat to rot in the forest and return to the city centers with animal pelts to sell.
families. By 2005, though, membership in this rural producer’s organization was largely symbolic, as the group did not engage in political advocacy for its members. In 1994, the indigenous reserves of the Nukini and the Poianawa were established along the Moa River in close proximity to Seringal São Salvador.

The 1990s saw a critical shift in the livelihood strategies for the residents of Seringal São Salvador, from rubber tapping to small-scale agricultural production with some livestock production. Increasingly the standing forest lost its central importance as the critical space for the survival of the household. Forested lands were cleared as agriculture became the economic center for most households in the seringal. Also, land was increasingly cleared for pasture to raise cattle, as the rubber system collapsed in the area. Cattle often serves as a reserve of value for rural peasant households in the event of a quick need for cash for the household. Potentially the increase in this activity would lead to further deforestation, with the subsequent loss in habitat for animals that dwell in the forest, thus, decreasing the take of wild game from hunting and the consumption of meat by the residents of the seringal.

Women within the household and community may have benefited from this shift to agriculture from rubber tapping, as their resource procuring activities gained in importance for the rural household. Women are key actors in the production of farinha, and many are critically involved in the supply of food for the household through their participation in fishing. Fish may be a substitute for wild game, and if women of the household participate in this activity, men may forgo hunting. As men in the household turned their attention away from the forest and rubber tapping, the hunting of wild game decreased, and the importance of women in the provision of protein and food for the
household was heightened through their practice of fishing. Therefore, women’s productive activities had become more prominent for the rural households in the seringal, whereas traditionally, rubber tapping dominated by men defined the rural household in the area.\footnote{Conversely, a drawback for women in the transformation of household livelihoods from rubber to the production of farinha was that they may have had to spend more hours working as a result of their greater participation in fishing and farming in the household economy.}

In 1989, the Parque Nacional Serra do Divisor (PNSD) was created on the western border of Seringal São Salvador, abutting the frontier with Peru. The socio-diagnostic and ecological studies that resulted in the mid to late 1990s concluded that there were many species of plants and wildlife that were potentially at risk due to the inhabitants that currently resided within the boundaries of the newly created park (Zoneamento Ecológico-Econômico, ZEE 2000a). Brazilian law did not permit human residence in a national park. The federal government, along with the state government of Acre and non-governmental organizations (NGOs), began the process of looking for other lands where the inhabitants of PNSD could be moved. Discussion, often heated, still continued in 2005 with residents living within the bounds of the National Park, with residents vowing not to move and the government insisting that they must be resettled elsewhere.

Seringal São Salvador was acquired by the Brazilian colonization agency, INCRA, in 1999 to be used as a resettlement project for peasant families living within the national park (PESACRE 1998). The abandoned seringal contained nearly 28,000 hectares of forest bordering the national park, and consequently this area was an important link into the overall scheme of the buffer zone management of the national park. INCRA’s original plan was to resettle families living within the border of the PNSD to Seringal São...
Salvador, into family owned small farms (PESACRE 1998). The year-long study conducted by a local Brazilian non-governmental organization, PESACRE, with the collaboration of the University of Florida and other organizations, concluded that the resettlement project was not advisable, and could potentially have negative environmental and social impacts on the land and the families that already lived there. Thus, at last estimate (ZEE 2000b: 252), PNSD was home to 5785 residents with a population density of 0.68 inhabitants/km², slightly higher than the 0.67 inhabitants/km² that has been suggested to limit hunting pressure on wildlife (Bodmer et al. 1988; Peres 1990; Vickers 1991; Calouro 1995).

The latest plan of INCRA was to resettle the residents of the PNSD within the Projeto de Assentamento Hawái, in the municipality of Rodrigues Alves in western Acre. Park residents had fiercely resisted this development, and negotiations had remained tense between residents of the park and government representatives from INCRA and IBAMA. An added development was in 2004 granting part of the southern portion of PNSD as a reserve of the Náua indigenous people. The caboclos living within the bounds of the newly declared indigenous reserve were now required to resettle. Most moved north (or were planning to) to land occupied by family members living in PNSD.

The socio-diagnostic survey of the communities of Seringal São Salvador in 1999 found seventy-six families, with a total of four hundred twenty three inhabitants living within nine loosely grouped communities (Câmara 2002). Moving more families into this area from PNSD was not deemed ecologically or socially appropriate, yet now the State had to reckon with the residents that did live in this area, as the management practices of these families, especially those of hunting and fishing, critically affected the
stocks of wild game and fish within the bounds of the national park itself. Wildlife roamed freely across the border of the park with the seringal, and residents of PDS São Salvador living on the border of the two areas occasionally crossed into PNSD to hunt. PDS São Salvador was still a critical site in the overall plan of buffer zone management for PNSD.

Anxious residents of Seringal São Salvador, fearing that the government would move more families into the seringal, an area of land that many had called home for at least two or more generations, were brought into dialogue with INCRA with the help of PESACRE, to discuss resource management options within the 28,000 hectares of tropical forests. In the process of negotiation that resulted between residents of the seringal and INCRA, Seringal São Salvador became Projeto de Desenvolvimento Sustentável (PDS, Sustainable Development Project) São Salvador on July 14, 2000. Thus, a new form of settlement was created in Brazil. Not only was it the first sustainable development settlement in Brazil, but a settlement was created not with families that were transplanted to the area who had no history of working the land that they were settled upon, let alone a knowledge of the resource base, but with the residents that had already created their livelihoods and raised their families for at least the past several decades.

Colonization projects in Brazil have historically led to dire environmental outcomes for the resource base, as poor families typically were settled on land that was foreign to them (Fearnside 1984; Hall 1989: Chapter 1; Schmink and Wood 1992; PESACRE 1998). The immediate necessity of poor families raising crops to support their households, often without technical support, led to destructive agricultural practices
and the further conversion of forestlands. Additionally, agricultural credit programs often forced poor migrant peasants into planting annual food crops (rice, soy beans) whose long term production was ill-suited for the soils and climate of Amazonia (Smith 1982; Smith et al. 1995). The principal goal of the State in the overwhelming majority of these projects was to settle the landless peasantry, with secondary concern for the resulting effects on the ecosystems and land base of these sites (Fearnside 1984; Schmink and Wood 1992). Unfortunately, there has been a large degree of land ownership turnover in Brazilian colonization projects, often leading to increased deforestation (Cronkleton 1998). In contrast, PDS São Salvador was envisioned and created in dialogue with INCRA, NGOs with a sustained history of working with local peoples in the area, PESACRE and SOS Amazônia, and local residents who had a history of raising families in the proposed colonization site, as part of a scheme for regional management of resources in the area (buffer zone) intimately tied to the conservation of the forest ecosystem of PNSD (Câmara 2002).

Integrally tied within the conservation of the resource base in this larger unit of land management is the concern for the sustainable management of fauna. Animals do not stop at the borders of the arbitrary land classifications of humans, and hunting pressure from poor residents outside the national park can severely limit the species and genetic range of animals, limiting the future stock of animal life in, and around, the protected national park. As mentioned above, animals are important disseminators of the seeds of tree species throughout the Amazon, and the loss of critical stocks of wildlife

13 Although manioc is well suited to the ecological conditions of Amazonia and has been cultivated by indigenous peoples for centuries throughout the Amazon basin, “a biased system of fiscal incentives” (Smith 1982: 73) insured that credit was not available for colonists to plant this crop.
can have dire consequences for the structure and functioning of tropical forests, with potentially negative environmental and socio-cultural outcomes. Furthermore, areas in and around PNSD have been identified as areas of high human hunting intensity in the state of Acre (ZEEa 2000: 164). Therefore, the use of wildlife by the residents of PDS São Salvador and the wise management of faunal resources by these inhabitants in this area was of critical importance in the conservation and development agenda and planning regionally, and in the creation of the new settlement (Câmara 2002).

Within this new settlement, the federal government retained title to the land and residents were given leases to use the land that they occupied within PDS São Salvador. User rights were given to the households of PDS São Salvador for twenty years, renewable if the rules and regulations set forth by the State were observed by local residents. One key area of debate early in the negotiation process between the government and the residents of the settlement centered on how the land was to be operated and managed by the residents of the settlement. In the initial stages of the process the government was proposing that land be co-managed collectively by communities, without individual title to land, whereas the inhabitants of the newly created settlement were opting for individual household lots. Additionally, there was much heated debate centered on how much land each household was to be given to use to sustain their livelihoods. Eventually each household was given title to usage of a one hundred hectare lot of land, although by law only twenty percent could be cleared for agricultural use and/or livestock production. Provisions were made for future generations (future lot grantees) within the settlement, as long as deforestation did not reach more
than twenty percent of the total area of the settlement. It was estimated in 1999 that current deforestation within the settlement was less than five percent (Câmara 2002).

The communities of Timbaubá to the northwest of the settlement, as well as the northern part of the community São Pedro, were incorporated by INCRA within the settlement after the initial talks began between residents of the seringal and the government. In 2003, INCRA added an additional 25,000 hectares to PDS São Salvador in the far northwestern portion of the settlement bordering the community of Timbaubá with the Nukini Indigenous Reserve. The Nukini had earlier petitioned state and federal officials to incorporate this land within their territory, to be reserved as an area solely for hunting purposes. One hundred seventeen families in the newly named settlement registered with INCRA in 2000 to receive the credit offered by the federal government to settlement residents. Although the declaration of the new settlement on July 14, 2000 did not permit entry beyond this date, families previously living outside the bounds of PDS São Salvador continued to move into the area. The map commissioned by INCRA dated January 2003, listed one hundred fifty agricultural lots, ranging in size from a high of 35.8 hectares to a low of 17.3 hectares (see Figure 2.1). The overwhelming majority of lots were within twenty one to twenty hectares in area. Recently residents had become much more vigilant in enforcing the rule that no new households were permitted to be established within the bounds of the settlement. Complaints were registered with IBAMA, the agency within the Brazilian government charged with the management of the environment. IBAMA shared a post with the military within the settlement, that

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14 When word spread that INCRA was offering easy credit to households in the newly created settlement, some poor individuals from the closest town of Mâncio Lima scrambled to set up shelter in the seringal so as to acquire money and a piece of land to live and work.
Figure 2-1: Map of PDS São Salvador
Adapted from INCRA 2000.
Figure 2.1 Continued
## Communities

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**Figure 2.1 Continued**

Commas under area (ha) heading signify decimal points.
monitored boat traffic along the Moa River, checking for suspicious cargo including
drugs smuggled over the nearby border from Peru\textsuperscript{15}, while also insuring the
environmental regulations of the federal government were met by residents and other
visitors to the settlement.

Prior to declaring Seringal São Salvador a sustainable development settlement, as a
necessity to receive the credit offered by INCRA, households were required to group
themselves within named communities. Historically, households were grouped within
small family clusters, as was common for many rural peasant households in the Brazilian
Amazon (Harris 2000), from as few as two households to ten households, but in the
resulting process, ten communities were established, most taking the old names of the
colocações of the rubber era. The process of shifting from a familial based social-
political structure to a community-based one was a difficult transition for most
households in the settlement, with frequent community disputes (and resolution) defined
on the basis of familial association. Lingering disputes within individual communities
over hunting territory and practice often pitted one family group against another. The
bounty of the hunt, wild game, frequently served as the catalyst for the intensification of
animosity between competing family groups when meat was not exchanged across these
boundaries.

Each registered family with INCRA was promised a line of credit in the amount of
$R3,900: $R2,500 for construction of a house (and well if need be), $R400 for food, and

\textsuperscript{15} Prior to the establishment of the military post within the settlement, residents of the seringal reported that
it was not uncommon to see Peruvians hiking through the forests (transporting cocaine) attempting to evade
the Brazilian authorities.
$R1000 for tools.\textsuperscript{16} Unwittingly the credit given to inhabitants of the seringal would quicken the pace of deforestation, as several households purchased chain saws with the monies they received from INCRA. Interest payments were set at six percent, with twenty years allowed to pay in full. For the overwhelming majority of the beneficiaries, this was the first time that they had been extended credit during their lifetimes. Few of the residents understand this requirement to repay the credit, as each household upon receipt rapidly spent most of this money, and it was doubtful that repayment will occur.

PESACRE took the lead in developing management goals with the residents of PDS São Salvador in the years following the declaration of the settlement. The area of most contention with the ten communities pertained to hunting and the management of wildlife in the seringal. Fragoso et al. (2002) had found that the current level of hunting by the communities in PDS São Salvador was not sustainable, and that some animal species, including threatened ones, might have become extinct in the area as a result of hunting pressure on wildlife.

It has been noted by other researchers in Latin America that “the presence of healthy populations of wild game generally attests to healthy, sustainable land” (Shaw 1991: 30). In 2005, residents in PDS São Salvador remarked how it was rare to see monkeys and other larger animals close to the communities, as they had just a decade before, when they often wandered in close proximity to the settlement areas, and hunters lamented the fact that they must walk further and further into the forest to encounter wild game to hunt. This was due to the fact that critical habitat for wild animal species was

\textsuperscript{16} The exchange rate of the Brazilian Real with the US dollar was around US$1 to $R2.85 at the end of October 2003 when the majority of the households of PDS São Salvador had finally received the credit promised them by INCRA.
increasingly lost in the conversion of forest to agricultural fields close to human
settlement areas, and because many large game species had been over-hunted in the
forestlands that did remain standing close by the communities of the area.

In a series of meetings lasting well over a year, PESACRE in conjunction with the
residents of the ten communities of the settlement created a series of regulations and
management goals in regards to the use of natural resources within the settlement
(Comunidade do Projeto de Desenvolvimento Sustentável São Salvador 2003).
Community regulations set guidelines for residents in regards to hunting, fishing, timber
exploration, animal husbandry, and the clearing of forestland. It was decided that if a
resident of any of the ten communities within PDS São Salvador violated these
regulations three or more times, the Conselho Gestor would ask INCRA to remove this
person from the settlement. As of 2005 this had not occurred, although there had been
denunciations to INCRA of the practices of some members of the settlement by other
residents. Many residents though, were willing to overlook many of the violations of
community regulations as long as they did not directly impact their livelihoods. In late
2003, an INCRA representative visiting the settlement threatened to remove one resident
from the settlement for his failure to plant his assigned lot, and due to the fact that he had
recently taken work in the town of Mânio Lima and had not lived on his assigned lot for
several consecutive months.

The area of the management of resources of the settlement that drew the most
attention was that of hunting, with nineteen regulations documented to regulate the
practice of hunting within the settlement (Comunidade do Projeto de Desenvolvimento
Sustentável São Salvador 2003). (See Table 2-1.) Several of the regulations were
successful in modifying hunting practices within the settlement, including reducing the number of individuals that hunted with dogs, but other such regulations had not been as closely followed. A common trigger point of animosity between households within communities in PDS São Salvador remained the practice of hunting, and the use of wildlife within the settlement.

Table 2-1: Community Hunting Regulations in PDS São Salvador

<table>
<thead>
<tr>
<th>Regulation</th>
<th>Details</th>
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<tbody>
<tr>
<td>Hunting porquinho [also commonly called cutia] (<em>Tayassu tajacu</em>) with dogs is prohibited.</td>
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<td>Hunting with dogs is prohibited.</td>
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<td>Dogs are permitted to accompany residents to keep wild animals from attacking residents’ domesticated animals.</td>
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<td>Hunting for food for a trip is permitted. Only 1/2kg per person per day up to a maximum of 20kg.</td>
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<td>Hunting the offspring of deer is prohibited.</td>
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<td>If you see a track of offspring of deer you are not permitted to shoot at the offspring.</td>
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<tr>
<td>If you see tracks of the offspring of deer or armadillo, do not kill the mother.</td>
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<td>Hunting to feed oneself is permitted.</td>
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<td>Hunting animals threatened with extinction is prohibited.</td>
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<td>Minors can only hunt with permission from their parents.</td>
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<td>You must advise your neighbors when setting a trap [<em>armadilha</em>].</td>
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<td>Traps are permitted only from 5pm until 7am the next morning.</td>
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<td>Traps must be accompanied with a warning sign advising of their use in the vicinity.</td>
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<tr>
<td>A fence must be put up around an armadilha.</td>
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<td>Traps are to be set up in the buffer of one’s community.</td>
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<td>Hunters that do not live in the settlement are not permitted to hunt.</td>
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<tr>
<td>Hunting to raise the offspring of wild animals is not permitted.</td>
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<td>Hunting to sell the meat of wild game is not permitted.</td>
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<td>Hunting turtles is permitted.</td>
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* Translated by the author (from Portuguese) from Comunidade do Projeto de Desenvolvimento Sustentável São Salvador (2003).

Another serious problem within the settlement in regards to the hunting of wild game is the threat from outsiders who are not residents of PDS São Salvador. Under Brazilian law, hunting for subsistence is permitted by residents of a settlement, but it is prohibited by individuals who do not reside within the bounds of the settlement. Because there is little presence of the government bodies that regulate hunting practices in the
area, it is not difficult for outsiders to come to these areas and hunt, carrying their cargo of wild game with them to the city centers where they live. Furthermore, residents of the seringal are afraid to confront illegal hunting in their lands because of the fear of bodily harm at the expense of these illegal hunters. Several residents of PDS São Salvador informed me that they had been threatened with “a bullet in the back of their head” if they denounced these illegal hunters with IBAMA.

Finally, one additional problem that must be addressed in regards to hunting in PDS São Salvador, was the selling of wild game in the nearby city centers. One resident of the settlement told me that during the rubber era along the Moa River, everyone hunted to sell the meat of the animals they hunted. Although illegal, at the end of 2003 wild game was selling in the city of Mâncio Lima for around $R5 per kilogram. Many species of wild animals were considered delicacies in the region including paca (*Agouti paca*), white-lipped peccary (*Tayassu pecari*), and red brocket deer (*Mazama americana*), and there were willing buyers of the meat from these animals in the cities. The selling of wild game occurred mostly by hunters from outside the settlement, but unfortunately also, (less frequently) by residents of PDS São Salvador.

Peer pressure was unlikely to solve these problems with the practice of hunting and the management of wildlife within the settlement; instead IBAMA and INCRA must be vigilant with their patrolling of the resource practices that occur within the settlement. A major limitation for these agencies was their lack of funding, and lack of staff, to adequately manage the thousands of hectares that fell under their jurisdiction. PESACRE had worked tirelessly over the past several years to educate the residents of PDS São Salvador to the dangers of over-hunting the animal resources of the settlement, while also
attempting to strengthen the Conselho Gestor, the advisory council comprised of residents of the ten communities of the settlement, that had some governing capacity. PESACRE had also attempted to act as an intermediary between the Conselho Gestor and INCRA and IBAMA. As the residents of PDS São Salvador had little experience with “self governance”, undoubtedly the process would be slow with many setbacks, yet it was crucial for governmental and non-governmental agencies to continue to work closely with local residents whose resource practices had a major impact on the sustainability of the resource base for themselves and future generations.

The State of Acre

The state of Acre is located in the far western portion of the Brazilian Amazon bordering the countries of Peru and Bolivia to the west and south, the Brazilian state of Amazonas to the north, and the state of Rondônia to the east. Acre is about the size of Georgia (153,149 square kilometers) and contains less than two percent of the total area of Brazil. Nearly ninety percent of the state’s total area is classified as tropical forests. The total population of the state was around 550,000 (Souza 2002). The area that comprises the state of Acre was ceded by Bolivia to Brazil with the Treaty of Petrópolis in 1903. After over one-half of a century of classification as a territory in Brazil, Acre was elevated to the level of statehood on June 15, 1962.

The state of Acre’s relative isolation from outside markets and the rest of Brazil made the large-scale colonization projects that characterized Amazonian development elsewhere challenging to implement (Kainer et al. 2003). It was not until very recently, in 1992 when the final stretch of highway BR- 364 was paved, that Acre became

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17 In 2002, Acre’s population comprised less than ½ of one percent of the total population of Brazil.
accessible year-round by land to other states in Brazil besides Amazonas and Rondônia. The result of this was that deforestation was limited to less than 10% of the total area of the state, and Acre attracted researchers and planners intent on practicing novel ideas of sustainable development. The current government in the state of Acre, popularly known as the *governo da floresta* (forest government), was an important ally in the search for sustainable resource policies and had incorporated a development philosophy that sought ecosystem conservation, social equity, and cultural diversity (Kainer et al. 2003).

The economy of the state of Acre, more so than any other region in Brazil, was based on the extraction of forest products. Several products were extracted and marketed from the state’s forests including fruits (*açaí, cupuaçu*), Brazil nuts, honey, heart of palm, and to a lesser extent wood, but the tapping of rubber defined the socio-economic relations of the state until recently. The Amazon rubber boom beginning in the late nineteenth century and lasting until just prior to World War I, put Acre on the map. In 1995, the rubber economy produced around US$43.5 million for Brazil, of which 59 percent was generated in Acre (Allegretti 1995: 167).

Three distinct socio-cultural groups lived within the forest environment in Acre: agricultural colonists, seringueiros [caboclos], and indigenous peoples (Kainer et al. 2003). The colonists were relatively new migrants to Acre coming to the state within the past three decades, and did not have the same ecological sensibility as did the seringueiros and indigenous communities. The origin of these new migrants differed from the first wave of immigrants to the state at the turn of the twentieth century that came largely from the drought-plagued sertão region in the Northeast of Brazil18, in that

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18 The current inhabitants of PDS São Salvador were mostly descendents from migrants who came to Acre from the northeastern Brazilian state of Ceará.
they were largely from the southern Brazilian states, enticed to the Amazon region not by the rubber trade, but by the opportunities to work in the cattle industry that sprang up in the region in the 1970s, as well as the promise of open land that they could work to raise their families. Whereas in 1971, three-fourths of the land in Acre was classified as terra *devoluta* (unoccupied public land), by 1975, 80% of the land in Acre was owned by investors from southern Brazil (Branford 1985). The 1970s in the state of Acre was described as “paradise for large and medium size producers of cattle” (Souza 2002: 99). The climate and vegetation in southern Brazil bore little, if any, resemblance to the ecological conditions of the humid tropical forest environment found in Acre, and combined with the poverty of these new immigrants necessitated bringing land quickly into agricultural production to feed their families. Their survival strategy was predicated on slash-and-burn agriculture that necessitated the removal of forest cover in order to produce food crops in combination with small-scale livestock production.

On the other hand, the seringueiros [caboclos] and indigenous groups had a long-term, sustained, intimate relationship with the forest that until recently was based on the extraction of forest products for their livelihoods. Weinstein (1985: 105) notes that the seringueiros had “…developed a common world view and mode of resistance that had greater significance than the obvious differences in ethnic or cultural backgrounds.” Their strategy for survival was based on the protection and preservation of the forest. Thus, the ecological experience of the seringueiros based on the knowledge of how to sustainably manage the tropical forests in Acre, gained from decades of rubber tapping activities in the forest, led them to the political arena to stake their competing claims for the resources of the state. These claims were based on the survival and needs of the
family (Popkin’s [1979] rational actor model), that were intertwined with the survival and needs of the forest and the community at large (Scott’s [1976] moral economy model). Neither peasant family, nor the community, existed in isolation, and the overlap between individual and community goals led Chico Mendes and the seringueiros of eastern Acre to seek political action in the “fight for the forest” (Heckt and Cockburn 1989). Even after the assassination of Chico Mendes in 1988, the movement of the seringueiros of Acre persisted, as among other rural peasantry in Latin America, “because of their capacity to translate ecological interdependence into political power” (Anderson 1994: 15).

However, resource use by the caboclo peasantry in PDS São Salvador (and other areas throughout Acre) shifted beginning in the early 1990s from livelihoods based on the extraction of forest products (rubber) to other land uses including small-scale agriculture and the raising of livestock. This transformation necessitated deforestation in the conversion of forestland for crop and livestock production. Some evidence suggested that the rural peasantry in PDS São Salvador and elsewhere in Acre was increasingly turning towards the domestication of cattle as a livelihood strategy (Gomes 2001; Salisbury 2002). As tropical forests were cut, habitat for wildlife was increasingly lost.

Western Acre, where PDS São Salvador is located, has always existed in relative isolation from the more populous eastern portion of the state. Because as of 2005 a paved, year-round passable road still did not connect western with eastern Acre, western Acre had remained much less connected to other states in Brazil (except the state of Amazonas) than eastern Acre. Western Acre historically had closer ties to the state of Amazonas to the north, connected via the Juruá River, than to eastern Acre. The Juruá
River was the route for the export of rubber during the rubber economy, serving today as the method of transportation for farinha produced by the peasantry of western Acre. The lack of communication with the outside world limited the politically unifying force of the seringueiro movement in the western portion of the state. Furthermore, whereas eastern Acre had been heavily influenced by the liberal politics of the Workers Party (PT) over the past several decades, western Acre had not been as embracing of their liberal agenda, and tended towards electing conservative politicians to state office.

The result of this isolation for peasant households in western Acre was that they tended to be poorer than members of their class in the East, and they tended to have greater autonomy from the market than did the peasantry in eastern Acre. It was reported that the standard of living of the peasantry in PDS São Salvador was lower than their rural counterparts in similar areas in the other major watersheds throughout the state of Acre (Shaef? 2002). The peasantry [of PDS São Salvador] were not (yet) solely commodity producers pertaining to a transitory social stratum as described by linear models of the historic march of capitalism (Deere and de Janvry 1979). In agreement with Bernstein’s (1982) proclamations for the peasantry in general, because the rural residents of PDS São Salvador had retained control over the organization of production – principally land and labor - they had not become part of the proletarian class. As some sectors of the Brazilian peasantry were only partially integrated into the market system they were able to continue to produce goods and services for use-value by household members, as opposed to production solely for exchange-value (goods bought and sold in the marketplace), in the subsistence household economy, relying on numerous forms of non-market transactions to reproduce social/economic relations.
Hunting by the peasantry in PDS São Salvador was an integral part of a household’s livelihood strategy that was beyond the scope of the market. First, animals in the settlement were not a private resource, but a common property resource.19 The bounty of wild animals in the forest was open to everyone in the community to exploit, free from a monetary cost. Second, because the product of the hunt (wild game) was freely exchanged in non-market transactions between rural peasant households, the peasantry was not totally encaptured by the system of capitalist relations. Game meat was not bought and sold in the marketplace, but given, received, and reciprocated by peasant households. These reciprocal transactions were not based on an equivalence of the amount of the product (meat) exchanged, but on an equivalence of the exchange of relations (kin) between households. Therefore, it would be inaccurate to label the peasantry in its entirety as proletariats subject to the whims of the capitalist system that minimizes their contribution to the market (as important producers of cheap goods and labor), while pushing (firing)/pulling (hiring) their labor power in and out of the system.

Hunting, as currently practiced by residents of PDS São Salvador, was important in the reproductive regime of individual households and communities in the settlement. Subsistence production intimately tied to the reproductive needs of the household was further, a form of resistance to the encapturement of the peasantry by the capitalist system. Harriet Friedman (1980: 163) writes: “…if household reproduction is based on reciprocal ties…for renewal of means of production and subsistence, then reproduction resists commoditisation [sic].” Hunting performance in PDS São Salvador was joined

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19 Wild game was a common property resource within PDS São Salvador, but its use was contentious which is reflected in the larger number of community rules and restrictions regarding its use. See Table 2.1 above.
with reciprocal relations between households, allowing for households to resist the end point of commoditization, simple commodity production, and thus, full integration into the market system.

Hunting and the sharing of wild game across households were key forms of peasant non-market exchange. This reciprocal exchange likely would continue to occur in peasant communities in PDS São Salvador (and elsewhere throughout Amazonia) as long as there remained an adequate stock of wild animals in the tropical forests where these groups of peoples hunt and live. But, if hunting practice were to continue on its present course, and the population continue to increase in the seringal, the future of the forest might reach the “empty forest” that Redford (1992) spoke of, devoid of critical stocks of wild animals, and ultimately threatening the ecological sustainability of the tropical forest, as well as threatening the livelihoods of the inhabitants of these forests.

The Municipality of Mâncio Lima

PDS São Salvador is located in the municipality of Mâncio Lima in the far western portion of the state of Acre in the Brazilian Amazon, the westernmost municipality within Brazil. A large percentage of the total landmass within the municipality is under the jurisdiction of the federal government. PNSD (267,000 hectares), the Nukini (27,000 hectares) and Poianawa (21,000 hectares) Indigenous Reserves, and PDS São Salvador (53,000 hectares) account for [well over] two-thirds of landmass of the municipality of Mâncio Lima (470,000 hectares) (Toni 2003: 168). There are also two smaller settlement projects administered by INCRA in the municipality, the Projeto de Assentamento (PA) Rio Azul with 6,800 hectares, and PA São Domingos with 1665 hectares (Cunha dos Santos 2003). In 2004, the Náua indigenous group was successful in their claim to the
legitimacy of land rights in the southern portion of PNSD and was granted 45,000km² of land (Campbell 2005).

The municipality of Mâncio Lima contains 4,692km², a little more than three percent of the landmass of the state of Acre (Government of Acre 2004). The population of the municipality was estimated to be 11,069 in 2002 (Souza 2002) with 46% living in rural areas and 54% in city centers (Government of Acre 2004). About 60% of the economy of the municipality was based on the public sector- the federal, state, and municipal governments - with the remaining 40% in family agriculture, small-scale animal production, and small commercial establishments (Cunha dos Santos 2003). The major commercial establishments in Mâncio Lima (food markets, distributors of gas) were controlled by the political leaders of the region. This monopolistic control over the consumer sector combined with the isolation of the municipality of Mâncio Lima resulted in higher prices for consumers living in the municipality compared to other residents throughout the state of Acre.

Subsistence agriculture centered on the production of farinha dominated the productive sector for the majority of small farmers in the area. The majority of the production of farinha, sold in 50km sacs, was brought to the cities of Mâncio Lima and Cruzeiro do Sul for eventual export to the capital of the state of Acre, Rio Branco, or to the city of Manaus in the state of Amazonas to the north of Acre. A large percentage of the consumer goods found in Mâncio Lima were imported from other municipalities via the city of Cruzeiro do Sul. The period near the end of the dry season in October and early November was a time of a dearth of many consumer goods in the region, as the highway BR-364 that seasonally connected the cities of Mâncio Lima, Cruzeiro do Sul,
and Rodrigues Alves with eastern Acre was oftentimes too wet for large trucks to pass, and the water level of the Juruá River (a critical mode of transportation for goods, people, and information from Western Acre to the outside world) was too low for large boats to transport products.

The Research Site—PDS São Salvador

PDS São Salvador is located between the coordinates of latitude South 07°22'14" and 07°18'14", and 73°08'41" and 73°22'14" longitude West (INCRA 1998). When PDS São Salvador was declared a settlement in 2000, it contained 282km² - slightly more than 28,000 hectares. Around 18% of this area (52km²) was considered varzea (seasonally flooded land) and the rest terra firme (land that is above the highest rise of the rivers and streams) (Câmara 2002). The varzea contains the most productive agricultural land deposited with topsoil, and other nutrients that erode from the terra firme during the winter rains. The alluvial deposits of the varzea were planted with corn and beans during the dry summer months prior to their submerging by the rising waters brought on by the rains of winter. The majority of the homes of residents of the settlement were perched on the restingas, the ridges that overlooked the varzea.

In 2003, an additional 25,000 hectares were added to the settlement. As of 2005, this area was uninhabited, designated as a reserve for hunting by the residents of PDS São Salvador, and there were no plans to provide lots for additional families to settle in this area. This land on the northwestern end of the settlement was land that the Nukini had petitioned INCRA and IBAMA to incorporate into their reserve. This no-man’s land with unclear boundaries had been a source of conflict with hunters from PDS São Salvador, and hunters from outside the settlement encroaching onto land held by the Nukini.
The settlement was located 40km from the municipal seat of the municipality of Mâncio Lima, which also went by the name Mâncio Lima, and 80km from the city of Cruzeiro do Sul, the second most populous city in the state of Acre. The settlement was bordered by PNSD and the Nukini Indigenous Reserve to the west, Fazenda Monte Bello to the east, the Brazilian state of Amazonas to the north, and Seringal Valparaiso to the south. Both Fazenda Monte Bello and Seringal Valparaiso had large herds of cattle, which was the principal income generating source for the owners of these two properties. The owner of Fazenda Monte Belo occasionally hired residents from PDS São Salvador (men only) when the seasonal needs of the farm could not be met by the labor of family members alone.

The vegetation of PDS São Salvador was characterized as belonging to the dense tropical forest type that is a combination of hardwood tree species, mixed with assorted palms and bamboos (Câmara 2002). Commercial timber species were widespread and not found in dense concentrations anywhere within the settlement. Several palm species were used locally to produce beverages for the household including açaí (*Euterpe precatoria*), bacaba (*Oenocarpus bacaba*), buriti (*Mauritia flexuosa*), and patauá (*Oenocarpus bataua*). Brazil nut (*Bertholletia excelsa*) which was found in significant quantities in eastern Acre and was an important non-timber forest product (NTFP) for many households in that portion of the state, was not found in PDS São Salvador. In 2005, residents of the settlement did not market NTFPs.

The climate of the area was characterized by two seasons, each lasting about six months: the rainy season that ran from early November through April, and the dry season
Figure 2-2: Map of Acre
Adapted from Salisbury 2002
that occurred from May until the end of October. In a conversation with one long-time resident of the seringal, he explained to me how the climate had changed in the area:

Paolo: Before there were two seasons: when it was wet, and when it was dry. Now there are more times when it is dry than when it rains.

Eric: Why is this so?

Paolo: I think it is because the forest is being cut.

He also went on to explain that it was important to cut down only as much forestland as you planned to plant with crops in that year. If you cut more than you would use, he said, you wasted the land. Then after a few years when you needed to let the earth rest, you had to go further and further into the forest to cut trees to have land to plant your crops. The result was that you ended up cutting more of the forest, and faster, because you wasted land. As more land was deforested for agriculture, habitat was increasingly lost for the animals that lived in the settlement. Animals retreated deeper into the forest and hunters were thus forced to walk further and further from their houses to encounter wild game within the settlement.

The average annual precipitation fluctuated between 1750mm to 2300mm, with the humidity from 80% to 90% monthly throughout the year (INCRA 1998). Temperatures in the settlement were relatively stable, with an average high temperature of 26ºC and an average low temperature of 24ºC (INCRA 1998). Dry season friagens (cold fronts), usually two or three days of below normal cold temperatures occasionally swept across the state of Acre along the mountains of the Andes from the south, and temperatures in the seringal fell to around 10ºC. As might be expected, most activity within the settlement came to a standstill as residents huddled together within their houses waiting for the friagem to pass.
Development within the settlement was minimal at best, as residents lived without running water and electricity. Infrastructure was almost non-existent; there were no paved roads within, or to, the settlement, and there were no stores where supplies could be purchased. Several of the ten communities that comprised the settlement had grade schools\(^\text{20}\) (none offered secondary education), but the schools lacked adequate supplies and qualified teachers to give instruction to the students. Many of the schools were taught by a resident of the community that was literate. As might be expected, the quality of education the children of the settlement were receiving was suspect. Having schools at all was a relatively new phenomenon within the settlement, as during the epoch of the rubber economy within the seringal, schools did not exist. As a result, the adult illiteracy rate was high- around 53% (Câmara 2002).

Health care was also severely lacking within the settlement. There was a health post within the community of Sede, but it was operated by a local resident of the community. As one resident said, “The health post gives shots and pills. If you need anything else you have to go to Mâncio Lima.” Frequently the health post of the settlement lacked even these basic necessities. Malaria was a persistent problem for residents of the settlement. Other common ailments included hepatitis, stomach problems resulting from contaminated water, snake bites, flu and the common cold, and infections from cuts and bruises that did not heal readily in the humid tropical forest environment. Once per year the federal government transported nurses via military helicopter to a central location within the settlement (the community of Sede) to distribute vaccinations free of charge to the residents of the settlement and nearby areas.

\(^{20}\) Those children in communities lacking schools had to walk up to one hour, or row in canoes, to achieve an education in the nearby communities that had a school.
Common shots that were administered included vaccinations for yellow fever, measles, mumps, and rubella, tetanus, and hepatitis.

The Moa River cut through the heart of PDS São Salvador and was the principal mode of transport into, and out of, the settlement. Most of the households in the area were situated on the banks of the Moa or the streams that run off the Moa. Only one community, Vai Quem Quer, was not located along a waterway, but rather a thirty-minute walk (during the dry season) inland from the Moa River. Because of this lack of access to the principal waterway of the settlement, this community had great difficulty in transporting its agricultural products to market for sale in the cities of Mâncio Lima and Cruzeiro do Sul.

There were ten named communities within PDS São Salvador. As stated previously, residents were required to group themselves within communities to obtain the credit that the government offered during the establishment of the settlement. This was a difficult process for many households that were accustomed to political alignments within the seringal that historically were based along familial ties. Tension within communities frequently revolved around differences between family groups living in the same community. This was clearly seen in disputes between households regarding the use of wildlife and with the practice of hunting.
Peasant reproductive and productive strategies in Amazonia are critically dependent on the seasonal nature of the environments that they inhabit (Chibnik 1994; Harris 1998, 2000). The yearly calendar of activities and responsibilities of the members of the household in PDS São Salvador reflected the change in seasons (see Figure 2.4 below). The rainy season (inverno), started in November and lasted into April. Generally the wettest months were January through March. This was also the period of the year that residents called mau de rancho—bad for food.

During these several months, agricultural production was minimal, the catch of fish decreased due to the swift currents of winter runoff, and the rivers had flooded the forests, giving fish plenty of area to hide and making food resources difficult to acquire. Since most residents of the settlement did not have sufficient income to purchase food,
Figure 2-4: Seasonal Calendar of Activities
they ‘tightened their belts’ (Chayanov 1986[1926]) and subsequently decreased their food intake during these months of difficulty. The dry season (verão) began in May, continuing through October. The warmest months were those of July, August, and September. The school year began in late February or early March and ran into early December.

Although most respondents indicated that hunting was an on-going activity throughout the year, they also stated that the peak season for hunting occurred during the rainy season, especially in the months of February and March. Beckerman (1994) says in most cases in the Amazonian environment, hunting is driven by fishing, as people hunt more when fishing resources are harder to obtain (in the rainy season when the forests are flooded). Descola (1996) has also shown that hunting by the Achuar in Ecuador drops dramatically in response to increased availability of fish resources. This fishing-hunting strategy could be predicted based on rainfall. Hunting was particularly important for the families of the seringal during inverno when agricultural production was minimal and food resources in the seringal were scarce. The lack of available sources of food in the seringal during the wet winter months encouraged hunters in groups of normally two to five men, to make overnight extended hunting trips into the areas of the settlement that were devoid of human settlements, where presumably there was a greater concentration of wild animals. These extended group hunts were seasonal in nature, as they came to a halt with the dry season and when the demands of agriculture for the household were at its peak.

Fishing was another activity that occurred throughout the year. The peak time of the year when fish were most abundant was near the end of inverno (April) into the
warmer summer months. The Moa River was also at its fullest normally in the month of April, facilitating faster transport along the waterways of the seringal. The Moa reached its low point in the year as the dry summer months came to a close in October. The low water level in the settlement in late summer made it difficult to reach some of the communities that lay along the streams that feed from the Moa. The low water levels also prohibited these communities from transporting their product to market.

The collection of NTFPs in the forest such as açai, buriti, bacaba, and patauá was at its peak during the wetter months of the year from January through March. Households made a beverage from the fruit of these palms to which sugar and farinha were added. These NTFPs were consumed within the household and were not marketed in the city centers.

Agricultural production began in earnest as the rain subsided and hot days of summer prevailed. In the months of June and July, men and adolescent boys were in the planting areas (roçado and quadra)\(^1\) preparing these areas for the planting of the summer crops. This was a time of intense physical labor as brush and weeds were cut by hand with machetes in the summer heat. Some members of the community, generally single mothers or retired individuals that had a regular source of income coming from outside the community, hired other individuals in the community to work for them, preparing land to plant at the daily rate of R$10.00. In this way, outside income was circulated amongst the community members, passing from the hands of those that had, to those that had not, a sort of economic leveling mechanism in the community (Scott 1976). This money, though, passes from the hands of the older married men or older single women in

\(^1\) The roçado refers to the area planted with manioc. The quadra is the area where other seasonal crops (rice, beans, corn) are planted. A quadra is further broken down into tarefas- \(\frac{1}{4}\) of a quadra.
the community to the younger adult men and adolescent boys in the community. Although women were reported to assist in agricultural work and production in the community, they were not hired as daily wage laborers. Many members within each community trade days of labor (*troca dias*) with other members in the community, first working together in one of the quadras or roçados belonging to one of the two community members, and then when this work was completed, both working together in the fields of the other. Often these same individuals that traded labor days would hunt together as well.

After the quadra or roçado was weeded, the cut brush was burned in late August or early September. Planting begins several weeks after the brush was burned, in late September into early October. Rice, corn and beans took three months to mature and were sold beginning in January. Generally, though, these crops were consumed by the household, with corn being an important source of food for domestic livestock. Manioc took nine months to mature. In each community there existed at least one small *casa de farinha*, where manioc was processed into farinha. Farinha was the principal income generating source for the majority of the families throughout the PDS São Salvador. Farinha was processed and sold throughout the year, although production slowed during the wet winter months. Because of this, income decreased for households in the settlement during the winter months. Farinha was also an important food source in the seringal, and no meal was complete unless it is accompanied by farinha. A quadra or roçado was planted for two to three years in succession and then left idle to recuperate, normally for five to seven years. *Capoeira nova* referred to land that had been left idle for less than seven years. *Capoeira velha* was designated for land that had been left
unplanted for more than seven years. Generally in any year, a household would have two
or three quadras or roçados in production.

**Travel in PDS São Salvador**

In her work with the indigenous Meratus Dayaks in Indonesia, Anna Tsing
explained how travel was an essential ingredient in the socio-political construction of
individuals and households. Furthermore, travel was “part of the ordinary way of making
a living…” (Tsing 1993: 154). Travel was also highly gender stratified, with men
enjoying the benefits that the ability to travel offered in terms of status and political clout,
and women restricted via their lack of movement. Women were restricted in their travel
due to their domestic responsibilities, which limited their participation in the market and
their ability to forge political connections.

Travel was similarly important in the construction of self and in the well being of
households in the seringal throughout Brazil. In Amazonia, traditional subsistence
lifestyles were lifestyles of traveling. Traveling within the seringal was necessarily
integral to the livelihood systems of the rural peasantry, and one’s availability to procure
resources for the household was heightened through travel. The peasantry traveled from
their households to their agricultural fields, the rivers and streams where they fished and
collected water for household use, and the forests where they hunted and collected non-
timber forest products. They also traveled from the seringal to the city to sell their
product and to purchase goods that they did not produce themselves. Individuals and
households that were tempered in their ability to travel faced threat to their livelihoods.

Resource users in the seringal were forced to travel to obtain the dispersed
resources that are integral for human survival. Tropical forests are very heterogenous
ecologically, and the botanical and faunal resources that are needed for human survival
are highly dispersed, necessitating that humans wander within the forest to obtain these resources (Peters 1994). The slash-and-burn agricultural system typical of the indigenous and rural peasantry in Amazonia, an agricultural system adapted to the climate and soils of the tropics (Posey and Balée, eds. 1989; Anderson ed. 1990; Redford and Padoch, eds. 1992), is an agricultural system of travel, as fields are cleared, planted, worked and then fallowed, necessitating a movement to the succeeding agricultural site where the process is repeated every few years. These mobile fields of agriculture entail a cyclical movement through the system as the fallowed fields (capoeira) are returned to production in a renewal of the process of agricultural production.

Travel is necessary in the construction and maintenance of livelihood systems of households, and further, is critical in the creation of social-political bonds and alliances across households in PDS São Salvador. Men’s travel was often more flexible and varied in time and space than was woman’s travel, reflecting the greater status accrued by male members in the household and larger community. The nature of travel in the seringal afforded men greater opportunity than women to forge alliances and accrue socio-political power. Women’s travel was centered on the house and its maintenance, especially that of its members, whereas men’s travel tended to be out in the world, engaged in productive and socio-political pursuits. Furthermore, the travel of men was also frequently free of surveillance by household and community members, as opposed to the travel of women that was accomplished under the watchful eye of the men (and communities) in their lives.

One way in which men engaged in creating alliances across households by traveling within the seringal is through the hunt. Group hunting practiced among men
from different households within the community strengthened alliances across households. Often these group hunts entailed extended-stay, overnight hunting outings that required men to be absent from their households for upwards to a week at a time. Women of the settlement did not participate in this type of hunting activity.

The meat from the hunting of wild animals was an important source of food for the rural inhabitants in the seringal. Animal meat has also been shown to hold special significance in the food preferences of rural peoples in the Amazon region and is said to incur elevated status to the providers of meat for the household and community (Siskind 1973; Kensinger 1983; Stearman 1989, 1991; Hill and Kaplan 1993; Theil 1994; Wolff 1999: 177). Additionally, the reciprocal distribution of wild game from a successful hunt between households further aligns households in the community. Hawkes (1993) argued that the principal benefit in the sharing of resources, such as wild game, between households, comes not from the food that is received, but in the development of social bonds between different households within the community.

Women were restricted in their ability to participate in the hunting of wild game through a set of cultural and linguistic practices that reserved this activity for men. The hunting of wild game normally (though not exclusively) occurred within the forested areas of the seringal, a space that traditionally had been reserved for use by men. Both men and women spoke of the dangers of the forest environment, that was deemed unsuitable for the presence of women. Men were also the owners of the shotguns that were used in the hunt, and often women in the household did not know how to fire a gun. These beliefs and practices acted as barriers to the participation of women in the hunt of
wild game, and thus, limited their ability to create alliances across households in the seringal.

Although women rarely participated in the killing of wild game in the forest, they were often involved in the partitioning of game meat to other households in the community once the hunted animal had been brought into the household. In this manner, women were afforded a space to build bonds with other members and households in the community, although the division of game meat was viewed as a subsidiary activity to the actual killing of the wild animal by the male hunter. In chapter 5, I explore in depth women’s participation in meat exchange between households. Other researchers have also noted that a gender defined task assigned to women in peasant households in Amazonia entails the division and sharing of game meat between households in the community (Harris 2000).

Women’s spaces were critically involved with the domestic and reproductive functioning of the household. A critical space reserved for women was the house. Women’s travel in the seringal could be said to radiate from the centrality of the house. Here women were responsible for the cleaning of the home, cooking of, and cleaning after, meals, and maintaining the area close-by the house where women cared for small animals that were domesticated and consumed by the household\(^2\). The school, where mothers took the lead in the education of their children and where women were the teachers of the children of the community, and places involved with the health of the

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\(^2\) Generally men cared for the larger animals of the household (pigs, cattle) and women cared for the smaller animals of the household (chickens, ducks). These larger animals were frequently viewed as potential sources of income for the household, whereas the smaller animals raised by the women of the household were consumed by the members of the household and as such, were infrequently sold to neighboring households or in the markets in town.
members of the household such as the health outpost and hospital, were also considered feminine sites.

Shared spaces between the genders tend to be centered around water, such as the rivers and streams where both men and women fished, bathed, collected water for the household, and traveled into, and out of, the seringal. Riverbanks were important areas where women across households could gather to converse and share their lives with each other. Waterways were also open areas where women could easily be observed by their male family members and the larger community.

Travel in the seringal was normally accomplished on land by foot, or by boat in the rivers and streams that ran throughout the seringal. Paved roads were unheard of in the seringal, and the majority of the forest trails that ran throughout the seringal were the remnants of the dirt paths that seringueiros utilized during the epoch of the rubber economy. These forest trails connected households within the community as well as joining neighboring communities. Residents had to tread knee-deep in mud to traverse these trails during the winter rainy season. Households in the settlement did not own horses or mules.

Hunters traveled by land and via water in their pursuit of game. Most often, though, hunters traveled by foot from their homes into the forest when hunting wild game. Hunters travel by themselves or in small groups of men (frequently not more than two people per group) when hunting in the forests near settlement areas. Sometimes hunters would travel by canoe one-half hour or more from their households on the waterways that flowed near their communities, to seek new hunting grounds. This
generally occurred if the hunter had not successfully captured wild game in his last several consecutive hunting trips.

The necessity of traveling in the performance of the hunt afforded men and women of the household some free time from one another. While men engaged in the masculine defined activity of hunting and socialized with other men in group hunts, women pursued their gender defined tasks (childcare, cleaning, fishing) while also having the opportunity to mingle with other women in the community. An aspect of the enjoyment of the hunt for men was the ability to escape the women in their lives through the practice of hunting. Correspondingly, for women, they were free from the demands of the men in their lives while their husbands and sons were in the forest pursuing wild game. A household’s desire to continue hunting (their emotional commitment to hunting) was partly tied to the necessity of traveling to hunt the wild animals that lived in the seringal, which allowed both genders some freedom from the other.

Most long distance travel within the seringal, and to communities outside of the seringal, was accomplished by motorized canoe. Canoes transported people, products, animals, and information within the seringal. Frequently a familial cluster of households grouped within a community would share in the cost and maintenance of a canoe and its small motor. Households without a canoe, or the resources to purchase gasoline for the canoe, had to rely on their canoe-owning neighbors for transportation on long-distance journeys. Passengers in the canoe owned by others normally paid a small fee for travel, dependent on the distance to be traveled. These households lacking ownership of a canoe were among the poorest households in the community and their accessibility to markets outside of the seringal to sell their product, or to information that is often passed by word
of mouth, was hampered. Furthermore, the cost of passenger travel for individuals in poor households lacking a canoe of their own frequently prohibited all members of the household from traveling to the world outside the seringal. Often women in the poorest households had to sacrifice their travel for the travel of men, as the family’s budget could not support the travel of all members in the household. This helped to reinforce the notion of the house being a woman’s place and the outside world as the place of men.
CHAPTER 3
METHODS

This chapter examines the methods used throughout this study. There were two principal sets of objectives of this research project. The first set of objectives was 1) to understand the influence of household organization and decision-making on peasant hunting strategy and behavior, and 2) to understand the effects of inter-household relationships on hunting practices. Additionally, this project considered the historical trajectory of resource use by residents in PDS São Salvador (explained in the previous chapter), and the implications of hunting for other forest based activities and the sustainability of the forest resource base within the settlement. The quantitative and qualitative methodology used in this project, as well as the research design of the study, were designed to not only test hypotheses of inter-household, and intra-household, relationships that influence hunting behavior, but further to understand how material, social, and symbolic realities and behaviors construct the practice of hunting with peasant households and communities in PDS São Salvador. Participant observation of productive and reproductive activities by residents of households within the community enriched this ethnography of hunting by the peasantry of PDS São Salvador.

The unit of analysis in understanding the practice of hunting in PDS São Salvador was the household. Throughout much of Latin America it is at the level of the household that the practices of livelihood are carried out (Gudeman and Rivera 1990). It is argued here that the household is the appropriate unit of study in reference to the practice of hunting, as the decision to hunt or not to hunt, with whom, where, and how to hunt, is
rarely left solely with the hunter himself/herself. There always exist a range of intra-
household, as well as inter-household, culturally appropriate obligations that influence
the practice of hunting. The household resource procurement strategies and practice of
all household members critically affect the practice of hunting. The hunter as a producer
of wild game is not separate from, and cannot function without, his household and
community, and the hunting household is not separate from, and does not function
without, the hunters that reside within the household.

Households are different from businesses in that the household is primarily
interested in supporting and maintaining itself, whereas the businesses’ outlook is
focused towards expansion of the unit (Gudeman and Rivera 1990). Furthermore, rural
households in the seringal produce the means to reproduce themselves whereas
corporations purchase the inputs necessary to produce their output. Because of this, the
household “is never fully engaged with the market or dependent on it” (Gudeman and
Rivera 1990: 10). In PDS São Salvador, this was especially true in the wet winter months
when household production for market was low, or non-existent for some households,
and the energy of members of the household is directed at maintenance of the household
unit rather than production for market. Often the means to insure the reproduction of the
household was through “belt-tightening” (Chayanov 1986[1926]), necessitating a drop in
consumption by household members.

The concept of the household is a useful analytical tool because it allows us to
investigate economic, social, cultural, and political life at a microcosmic level one step
above that of the individual. The household is a rather small grouping of individuals
where one can view how processes are contested, negotiated, and resolved between
individuals with often competing interests. As human beings are social creatures, the exis
tent relationships amongst household members can serve to inform local-micro processes that build models to explain more complex human relationships that exist in communities, counties, or countries. In addition, the household is frequently a microcosm of societal symbols, practices, and behaviors. The study of the household therefore allows for an understanding of relationships at the local level and can act as a link to how policies that are designed and governed at a larger level of human complexity influence, and are acted upon, by the household and its members.

Households, though, are always embedded in wider social and economic networks. Kin and other social obligations between households affect livelihood strategies and how resources are procured, distributed and used. In the seringal, the reciprocal obligations between households in the community were necessary for the survival of individual households and the collective survival of the community as a whole. Labor units comprised of members of two or more households sharing in agricultural work or hunting, and the reciprocal distribution of food resources between different households including principally wild game and fish resources, are examples in which the practice of constructing and maintaining one’s household was embedded within inter-household relationships.

The Household

The productive and reproductive activities of men and women within the household, and across households, influence hunting practice. Gender plays an often defining role in the rights, rules, and responsibilities of household members and in the assignment within the household of these productive and reproductive activities by
household members. Gudeman and Rivera (1990) state that the household’s connection to the material world is marked by gender.

Production is defined as activities that increase, or have the potential to increase, the assets, capital, and/or income of the household. Men’s production has been seen as primary to that of women’s production, which is viewed as supplemental in the realm of the household’s productive activities. Feminists have commented on the cultural myth of the male breadwinner (Safa 1996) that elevates the productive role of men in the household while simultaneously devaluing women’s roles in insuring the productive strength and survival of the household.

Reproductive activities are those that do not directly increase the income or wealth of the household, but include the range of functions that insures the health, survival, and well being of all household members. Household reproduction occurs at three simultaneous levels: biological reproduction, generational reproduction, and daily reproduction (Ellis 1993). Biological reproduction entails the birth and nurturing of infants. The care, upbringing, socialization, and education of children in the household falls under the rubric of generational reproduction. Children are socialized in the framework that is practiced within the household and that is consistent with the social and cultural norms where they are raised. Finally, daily reproduction includes all of the other domestic tasks such as cooking, cleaning, care for the house, and caring for household gardens and/or domesticated animals that are necessary for household members to create and sustain livelihoods.

Historically and cross-culturally, women in the household have been charged with ensuring that the overwhelming majority of the household’s reproductive needs are
satisfied, and mothers have been defined in accordance with their roles as the reproductive providers for the household. Furthermore, women are often encumbered with both reproductive and productive household responsibilities, while men typically have been free to concentrate in productive pursuits. Men, on the other hand, have generally been free of the reproductive care of the household and its members and have concentrated on ensuring that the productive needs of the household are met.

As the productive and reproductive activities of all household members shape the resource strategies of the household, it is best not to investigate these practices in isolation from one another, but a more fruitful approach evaluates how the intersection of the activities of both genders within the household critically affects the practice(s) of the other, thus, critically affecting the practice of the household as a whole. Furthermore, in many instances these activities are not self-contained by the members of an individual household, but are routinely operated and managed across many households. Group hunting by residents of more than one household within the community, and the resulting sharing of wild game from a successful hunt, are two obvious examples of coordinated resource procurement strategies by more than one household within the community.

House and Household in Movement

The house and household (residents of the house) were critical spaces of movement and travel within the seringal. Neither the actual structure of the house, nor the members who reside within the four walls of the house, were fixed entities within the settlement. This problematizes the definition of the house as a fixed structure, and the household as a set of regular, defined members (Grinker 1994; Augé 1995; Rapport and Dawson 1998).

A house has been described as a dynamic space that entails movement within and through this place, and is “both a concrete physical place and a personal space of
identification” (Olwig 1998: 225). In the process of movement that is a search for identity (Rapport and Dawson 1998), houses, homes, and households expressed the interrelationship between “a conceptual space of identification” and “a nodal point in social relations” (Olwig 1998: 236). The physical placing of the house, and the members of the house that move into, within, through, and out of, the structure of the house, were both highly fluid in the settlement.

Although families in the Amazon region desire to live in loosely-grouped settlements of relatives (Harris 2000), households are constantly on the move in search of a better locale for the home (da Cunha and de Almeida 2002: 230). Houses in PDS São Salvador were constructed with wood from trees that was available locally in the forests nearby the house, and the roof was commonly made of palm leaves, or increasingly, from sheets of aluminum purchased in town. Climatic factors of high humidity and lots of rain, combined with insect and fungal pests, led to the rapid natural deterioration of the structure of the house within five to ten years, necessitating locating another site for the construction of a new dwelling. The new house might be built next door to the old, abandoned house, or built far from the old house on another piece of land within the domain of the household. The older house, if located close to the new house, was frequently left standing, and was used as storage, or sometimes as a temporary house for a newly married son or daughter and his or her spouse, as the new couple built up a stock of resources to eventually construct their own house.

During the epoch of the rubber system, houses in the seringal were widely dispersed, each located within the household’s *colocação* - the area of forestland that contained the rubber trees that each household tapped to produce rubber. Because of the
heterogeneous nature of natural stands of *Hevea brasiliensis*, the common rubber producing tree in the Amazon, that are not spaced closely to one another, the colocação was a relatively large expanse of forestland and houses were often located thirty minutes walk or further from one another. When the rubber system collapsed in the late 1980s, and rubber lost its central importance in the socio-cultural and economic livelihoods of the residents of the settlement, the residents of the seringal began to move out from the forest and towards the riverbanks and streams that ran through the seringal, and houses began to congregate within small family settlements of often only two or three houses, to as many as ten to twenty houses. Households increasingly diversified their livelihood strategies as hunting, fishing, and the gathering of forest products gained in importance for the survival of the household and its members. Recently though, as agriculture gained increasing economic significance for the caboclo household, some houses were in a process of retreat from locations along the main river-ways, and were moving back to the forestlands that were then cleared to become fields for cash-crop agricultural production. As was the case during the rubber epoch, once again increasing engagement with the market had led to the isolation of houses and households within the seringal.

One male resident in the community of Rio Azul stated that he moved his house from the riverbank into the forest to be closer to better hunting grounds. Prior to this movement, his home was located in a grouping of six other houses that lacked edible fauna right next to the settlement grouping. As his household was one of the poorer of this household group (and fell towards the poorer end of the spectrum for all households within PDS São Salvador), wild game was a critical source of food for his family. Moving his house into the forest meant easier access to wild game, less competition with
other households for the game resources that exist within proximity of the community, and less travel time for himself during hunting outings to secure food for the household.

Locating the house within fields of agriculture benefited men of the household. It was men who took the lead in clearing land, planting, and maintenance of the household’s cash crops, and in the transport and sale of these crops, and thus the location of the house within these fields of production prioritized the productive activities of men in the household. Women who were responsible for the majority of the household’s reproductive duties, including gathering water for household use and the cleaning of clothes and cooking supplies, were forced to walk longer distances to accomplish these tasks when the house was moved from the riverbank to the roçado (agricultural field).

Household membership was also in flux. Generational change in households occurred with the addition of new household members through births, and the loss of its members through deaths and marriage. In the seringal, adolescent boys and girls became available for marriage in their middle to late teens, and new houses and households were established as these adolescents married and moved out of their parent’s house. Generally people in the seringal married others that resided within their own community, or close by their communities - people that they had known since their early childhood years. They established new households within the community of the parents of the husband or bride, depending on the residential rules of the cultural group, and if there was sufficient land and opportunity for the new couple to create a livelihood.

Family members frequently traveled from households in the city to the seringal or vice-versa, residing in different households for periods of time from days to weeks, to months to years. Some of these mobile individuals shifted their location of residence in
cyclical movements throughout the year, depending on work, familial, and personal obligations and desires. Often a household in the seringal would request labor help from family members living in the city during critical times in the yearly agricultural calendar, when the work regime was greater than what could be accomplished by members residing in the household. Individuals lacking steady and secure employment in the city had the freedom to accommodate the labor demands of their families that lived in the seringal, and the household in the seringal received a laborer that was trusted, could work with little guidance or supervision, and was usually knowledgeable of the terrain and work assignments that were expected of him or her (Netting 1989). Separated and divorced mothers would travel to, and from, the seringal, to reside with family members who could give them emotional and material comfort and support during their time of need. Jilted lovers would also “escape” to, or from, the seringal, sometimes for several months at a time to lessen the pain of lost love and to attempt to forget their past lovers.

Although there was frequent movement in terms of the structure of the ‘house’, and the members of this structure that collectively form the ‘household’, in this study, the household is conceptualized as members who shared a common roof, generally ate from the same pot, and who collectively shared the productive resources of the household. Only permanent (year round), or semi-permanent members who lived within the house, and shared in the productive and reproductive work regimes within the household for half of the calendar year or more, were counted as members of the household. The critical distinction for membership within a household was the sharing and/or pooling of productive assets. In several instances in the settlement, teachers from the cities of Mâncio Lima or Cruzeiro do Sul lived with a family in the community where they taught,
the family provided them with shelter and food, but income earned from teaching was kept separate from the wealth accrued by the peasant household. Accordingly, the peasant household kept their productive assets separate from the teachers that they provided with a roof over their heads, and food.

Fieldwork

Field research began in late July 2003, lasting until early June 2004. Data collection within the communities of PDS São Salvador lasted for ten consecutive months from August 2003 to May 2004. Data was collected by myself and two local research assistants who lived in two of the ten communities of PDS São Salvador. Several different methods were used in this study, including household surveys, a list of productive and reproductive activities of household members, time allocation analysis of daily activities of household members, and surveys of hunting outings by selected households in two communities. Participant observation within households and communities was also used throughout the fieldwork portion of this study. Each of these methods is described in more detail below.
Sampling within each community was conducted in consecutive periods of from one to three week visits to a community. All necessary supplies for each data collection visit to a community were transported in motorized canoe up the Moa River to reach the community where research was conducted. During my stay in a community, I resided with a family in one of the households in the community where data were to be collected. Research assistants living in the communities of Boa Vista and Vai Quem Quer were responsible for collecting spot sampling surveys of daily activities of household members within their communities. The research assistant living in the community of Boa Vista also collected hunting outing data in her community. All other data were collected by myself. Frequently, data from several different methods were collected in each visit to a particular community. Table 3.1 shows the field research schedule of data collection.

Table 3-1: Field Research Schedule

<table>
<thead>
<tr>
<th>Method</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>July</td>
<td>A</td>
</tr>
<tr>
<td>Household Surveys</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Productive/ Reproductive Activities</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Time Allocation</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hunting Outings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participant Observation</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Methodological Considerations

The methods used throughout this study were employed in the investigation of two sets of objectives. The first set of objectives was to test hypotheses related to the influence of household (inter-household) organization and decision-making on peasant
hunting strategy and behavior. Second, was to understand the effects of inter-household relationships on hunting practices. Hypotheses were focused on the understanding of material, gender and symbolic relationships within each household that influenced the practice of hunting in PDS São Salvador, and social obligations across households in the community that affected hunting practice of households.

Methods used to test intra-household (H1 – H7) and inter-household hypotheses (H8, H9) on hunting output were derived primarily from household surveys. Productive and reproductive household surveys, and time allocation surveys provided important supplementary data to conclusions reached through hypothesis testing. These methods were critical in assessing the relationship of gender in the behavioral output of adult members of the household in terms of livelihood strategy and labor use by the household, as well as the seasonal nature of hunting in the settlement. Ethnographic material resulting from hunting outing surveys, participant observation, and taped interviews with hunters supplemented methods used to test inter-household hypotheses (H8, H9). These methods contributed to understanding the social nature of the hunt as a means of joining households in the community. Each of these methods is described in further detail below.

**Household Surveys**

Household surveys were collected in six of the ten communities of the settlement: Boa Vista, São Francisco, Vai Quem Quer, Girassol, Conceição, and Rio Azul. A sampling frame of all of the households that exist within PDS São Salvador was not available, and the possibility of constructing one was beyond the scope of this project. Several of the communities were virtually inaccessible at the end of the dry season (São Pedro, Timbaubá) when the small streams that drain into the Moa River flow to a trickle, preventing even the smallest of motorized canoes to pass. The entrance to another
community located within the forest in PDS São Salvador (Vai Quem Quer) floods at the height of the rainy season, with the water level too high to walk through with supplies on one’s back, yet too low for boats to pass. Therefore, it was decided that a random sample of all households within the settlement was not feasible in this study.

It was decided to select several communities to sample, based on several criteria. First, community leaders and other members of the community were asked if they wished to participate in the study. Although I had originally intended to conduct household surveys in four different communities, it quickly became apparent that the small sample size (n) would have severely limited the running of statistical analysis on the basis of the samples collected solely in these four communities. Two additional communities were therefore sampled with household surveys. Six of the seven communities that were approached by me agreed to participate in this study.

Another criterion used in the selection of which communities to sample was the geographical layout of the community. One critical factor was if the houses within the community were grouped together in a central area (in clusters), or if they were spread along the banks of the rivers that run throughout PDS São Salvador. This was important in testing the effect of inter-household relationships on hunting, based on whether households had regular, daily contact with other households in the community, and if households had a clear line of sight to other households in the community. Additionally, it was desired to select communities based on the distance, and time, one must travel by motorized canoe to reach the city of Mâncio Lima - the principal market where residents of the settlement sell their agricultural products and purchase supplies. The communities of Boa Vista and São Francisco were the two closest communities to the city of Mâncio
Lima, about a five hour boat ride downstream, whereas the community of Rio Azul, on the far western end of the settlement bordering the Serra do Divisor National Park, lay from eight to twelve hours by boat from Mâncio Lima depending on the time of year one was traveling, and the size of the boat in which one was traveling. It was thought that communities further removed from the market centers might have a different relationship with the natural resource base than those communities that had easier access to market their household products. Households that were located on the periphery of the market system might exhibit market avoidance (livelihood strategies relying heavily on non-market transactions including meat sharing and trading labor days with neighboring households) and therefore production might be directed at sustaining household consumption needs rather than increased market integration.

Finally, another important criterion in the selection of communities was accessibility. One community was not favorable to participating in this research project and was therefore, inaccessible. Two other communities were difficult to reach for several months of the year, and furthermore, the households in these communities were widely spread along the banks of small streams that run to the Moa River, making the logistics of reaching these households very difficult. Lack of time, money, and manpower prevented me from working within these communities. Unfortunately, the resource use by households within these communities that lay on the margins of the settlement, and are difficult to access (São Pedro, Timbaubá), might yield interesting results that are different from the patterns of resource use by households in other communities in the settlement.
Due to the small number of households that exist within the communities of PDS São Salvador, an attempt was made to sample all of the households within each of the six communities sampled in the study. Unfortunately, this was not always possible. The households that were not interviewed within the six communities sampled in the study were each visited on more than three occasions, but the members of these households were traveling outside of the community when I visited their houses. Repeated visits to these households during different months of the fieldwork calendar yielded similar results.

Household surveys were conducted with all adult members that resided within the household present at the time when the survey was given. An adult member of the household was defined as someone fifteen years of age or older who lived and shared in the productive and reproductive assets of the household for six months or longer of the year. At age fifteen, adolescent boys within the community begin to be hired as daily laborers at a rate of R$10 per day\(^1\) by other households in the community and many begin to hunt without supervision by elder male members of their family. Adolescent girls become marriage eligible at around fifteen years of age. Often, one or more adult members of the household were not present when I was in the community. Repeated efforts to conduct surveys with these households were unsuccessful because adult household members were traveling for various reasons. Therefore these households were not sampled in the study.

Table 3.2 below shows the communities where sampling of households occurred and the number of households sampled in each community. It should be noted that the

\(^1\) This was the equivalent in late 2003 of about US$3.30 for an eight-hour day of agricultural labor.
number of households in each community may have changed since fieldwork was
completed in June 2004, as new residences evolve through the creation of new
households via marriage within the community, or by the movement of family members
from the city centers of Mâncio Lima, Cruzeiro do Sul, and other nearby urban areas to
PDS São Salvador.

Table 3-2: Household Sampling

<table>
<thead>
<tr>
<th>Community</th>
<th>Total No. of Households</th>
<th>Number of Households Sampled</th>
<th>Percentage of Households Sampled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boa Vista</td>
<td>13</td>
<td>13</td>
<td>100</td>
</tr>
<tr>
<td>São Francisco</td>
<td>6</td>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>Vai Quem Quer</td>
<td>7</td>
<td>7</td>
<td>100</td>
</tr>
<tr>
<td>Girrassol</td>
<td>10</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>Conceição</td>
<td>10</td>
<td>8</td>
<td>80</td>
</tr>
<tr>
<td>Rio Azul</td>
<td>18</td>
<td>18</td>
<td>100</td>
</tr>
<tr>
<td>TOTAL</td>
<td>64</td>
<td>59</td>
<td>92</td>
</tr>
</tbody>
</table>

Household sampling occurred in six of the ten communities that exist in PDS São Salvador.² A total of fifty-nine households were sampled in these six communities. This represented ninety-two percent of the total number of households (sixty-four) in the six communities as of June 2004. All of the households were sampled in four communities, with seventy percent of the households sampled in the community of Girrassol, and eighty percent of the households sampled in the community of Conceição.

Household surveys collected basic socio-economic data of all household members. In addition, the questionnaire asked specific questions that pertained to the hunting behavior and beliefs of adult household members. An attempt was made to collect information from both men and women of the household, although in many instances it

² The most recent map of the settlement (completed by INCRA in January 2003), listed a total of 150 numbered lots corresponding to 150 different households. Therefore, the 59 households sampled in this study represented 39% of the total number of known households in the settlement.
was the senior male of the household who gave the majority of responses. The household survey was used to collect information as to how different independent variables affected the dependent variable, frequency of hunting (measured in terms of number of hunting outings by household members per month). Additionally, open-ended questions in the household survey were designed to uncover attitudes and beliefs important in the construction of the practice of hunting by households in the settlement. See Appendix A for an example of the household survey used throughout the study.

**Productive and Reproductive Household Survey**

The productive and reproductive household survey measured typical daily work activities that were the responsibility of adult members of the household. An attempt was made to ascertain the household work regimes of men and women within the household. These data were used in support of the analysis of hunting behaviors and patterns of the household as a whole. This survey was an important tool in measuring the impact of gender on the practice of hunting with households in the settlement. Clearly delineating the productive and reproductive activities that men and women within the household were engaged in, gives clues as to how hunting practices and beliefs were constructed within the household. See Appendix B for an example of this survey.

The productive and reproductive household survey was constructed with the same households where the general household survey was completed. As with the household survey explained above, an attempt was made to capture the responses of all adult members of the household. This was the case in all but a few instances. In total, fifty-nine of these surveys were recorded.
Time Allocation Surveys

Time allocation methods have been used by researchers in Amazonia to measure hunting practice and activity. Hames (1979) used time allocation surveys to estimate the amount of time Yanomamo men spent hunting. Yost and Kelley (1983) collected data for nearly one year on hunting by the Waorani of eastern Ecuador. These data were used to suggest the hunting superiority of the shotgun over native weaponry (blowgun, spear).

Time allocation surveys are used by social scientists to measure how individuals spend their time throughout the typical workday, season, or year. By directly recording activities as they occur in the field, the researcher is able to empirically measure “the behavioral ‘output’ of decisions, preferences, and attitudes” (Gross 1984: 519) of individuals as they perform their normal daily routines. Seasonal variations in productive and reproductive tasks can be quantified through the use of time allocation surveys. This is important in Amazonia as seasonal variations have a tremendous effect on patterns of resource use by indigenous and peasant groups (Chibnik 1994; Beckerman 1994; Descola 1996; Harris 1998; Harris 2000). Beckerman (1994) writes that the cyclical seasonal change in rainfall is the critical variable in the Amazonian environment that determines hunting (and fishing) strategy. People hunt more when fishing resources are harder to obtain in the wet winter months as the tropical forests of Amazonia flood, allowing fish more areas to hide within the tangled forest understory. Time allocation surveys can measure the amount of time individuals devote to hunting, fishing or other productive tasks, and the seasonal effects on the use of time by individuals.

The effects of gender on the work regimes within the household can further be analyzed using time allocation surveys. Critically, the amount of time men and women engage in reproductive and productive activities can be quantitatively estimated through
the use of time allocation methods. Feminists have long argued that the reproductive functions that women perform within the household such as cooking, cleaning, and childcare, allow men to engage in productive pursuits that bring greater prestige to individuals involved in these productive pursuits (Benería 1979; Bouquet 1984; Dwyer and Bruce 1988; Moore 1988; Kabeer 1994; Leach 1994; Safa 1995; Rocheleau et al. 1996; Sachs 1996; Deere and León 2001). Of importance in this study was to measure how much time men and women were devoting to productive and reproductive activities (and leisure), and to attempt to quantify the amount of time that the household participated in hunting. Gender was a key variable in the performance of the hunt in peasant households and women’s engagement in productive and reproductive household activities critically affected the hunting output of men in the household. Therefore, an empirical measurement of the behavior output of men’s and women’s daily productive and reproductive activities allows the researcher to see how household decisions and preferences on resource use and labor assignment are carried out in practice.

In this study, spot sampling of households was used as a proxy to estimate the amount of time adult men and women engaged in productive and reproductive activities, as well as leisure. Spot sampling entails unannounced randomized visits to households recording observations of behavior as they naturally occur. The researcher attempts to record behavior as it happens before the observed individual is aware that he or she is being watched. If the house is empty when the researcher arrives to record behavior, then he/she can search for household members in the community to discover what activities they are engaged in, or if this is not possible, one can ask neighbors in the community what the individuals of the household in question are doing at that point in time.
Spot sampling of household members’ behavior in PDS São Salvador was conducted for a period of nine consecutive months from August 2003 through May 2004 in the community of Boa Vista, and for eight consecutive months (September 2003 through May 2004) in the communities of Rio Azul and Vai Quem Quer. Samples were recorded by myself in the community of Rio Azul, one research assistant living in the community of Boa Vista, and another living in the community of Vai Quem Quer. Research assistants were trained over a period of two days on how to observe and record behavior, prior to conducting these samples without direct supervision. Behavior was recorded only for adults of the household and was taken for all adult individuals in the house. If no adults were present at the house when samples were scheduled to be taken, children of the household that were present were asked what their parents and older siblings were doing and this was recorded as behavior of the adults of the household at that time. Often, though, if a sample was scheduled to be taken later in the day and adult household members were known ahead of time to be away from the community center for most, if not all of the day, engaged in activities such as hunting, fishing, or processing of farinha for example, these behaviors were recorded at the time of the sample. If no members of the household were present and I, or the two research assistants, did not know what activities the adult members of the household were doing at the time of the scheduled spot sample, it was noted that no one was present at the time of the sampling.

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3 The first three months of the dry season in 2003 (May through July) were missed in the spot sampling exercise.

4 Although the work of younger children (less than fifteen years of age) is often essential to the productive, and reproductive, maintenance and output of the household, it proved difficult to track their activities as often children accompanied their parents and older siblings in their daily work activities (for example, the making of farinha), but the work activities of these younger children in these ventures were sporadic and inconsistent.
Appendix C shows an example of the behaviors that were observed and recorded in the three communities throughout this exercise. These behaviors mirrored the activities that were explored in the productive and reproductive household survey described above. In addition to these activities, leisure activities, travel, eating, sleeping, and resting were recorded of adult participants. Although individuals were often engaged in several activities simultaneously, it was left to the researcher’s discretion to record only the principal behavior as it was observed. It is not uncommon especially for women of the household to be involved in several daily activities at once (often involving childcare) as a time saving stratagem, but the decision was made to prioritize, and note, one behavior as primary. This allowed for one to place a percentage on the amount of time individuals were engaged in specific behaviors, entailing that the sum of all of the observed behaviors added to one hundred percent, although it might underestimate activities that are frequently combined.

All spot sampling household visits were randomized, visits to randomly selected households (using a random number table). Spot samples were conducted four times per day, between 6am and 6pm. It was reasoned that we could comfortably visit households four times per day given the other daily obligations of the study and with minimal interference in the daily livelihoods of the two research assistants, both mothers, whose typical day required them to participate in the reproductive and productive maintenance of their households. Furthermore, samples were recorded only during the daylight hours for two principal reasons: 1) as a means to avoid unnecessary intrusion in the lives of individuals and families in the communities where the sampling occurred, to respect the household’s privacy, and 2) sampling at night was potentially dangerous, walking by
flashlight often through forests where animals and other hazards awaited unsuspecting travelers. Spot samples also noted if it was raining or not.

Spot samples were recorded on consecutive days, Monday through Saturday only. Sunday was generally a day of rest in the seringal and therefore, it was decided that sampling on this day would not adequately capture the typical daily reproductive and productive work regimes of adult household members. The number of days of continuous sampling within one community, the day of the week, which week in the month to begin sampling, and the time of day of sampling, were chosen using a random number table. Samples were taken for five to seven consecutive days in the communities of Rio Azul and Vai Quem Quer, and for seven to fifteen consecutive days in the community of Boa Vista. All households were in the potential pool of sampled households in the communities of Boa Vista and Vai Quem Quer, and a subset of seven houses in the community of Rio Azul were sampled. With the exception of one household in the community of Boa Vista, all other households were within a thirty-minute walking distance from the researcher. The attempt was to avoid approaching households by motorized canoe, as it is customary for individuals in the seringal to halt what they are doing to observe approaching boats as they travel along the waterways in the seringal. Spot sampling necessitates capturing behavior unexpectedly as is occurs naturally, and because households in the community of Rio Azul are widespread along the banks of the Blue River (Rio Azul), requiring one to travel by motorized canoe to visit all households in the community, this precluded spot sampling of all households in Rio Azul.
Hunting Outings

The hunting outing survey was designed to investigate the actual practice of hunting by hunters in the settlement and the social interaction of hunters from different households in the community. The output of the hunting party was captured in terms of the number and kind of prey that was captured, as well as the makeup of the hunting party. In addition, the location of the hunt, period during the day (or days) that the hunt occurred, and the number of shots fired during the hunting outing were all recorded. It was also noted if it was raining or not the day of the hunting outing survey.

This methodology followed hunting practices of hunting households in two communities over a period of four months (January 2004 through April 2004). Four hunting households were sampled in the community of Boa Vista and three households in Rio Azul. The households that were selected to participate in this exercise were based on the results obtained from the household survey explained above. Hunting households were followed for seven consecutive days per month for four consecutive months. The day of the week and the week of the month that sampling occurred were randomly selected using a random number table. At the end of each of the seven consecutive days hunters were interviewed, after they had returned to their households, about their hunting outing. Hunters that made extended-stay, overnight hunting trips were interviewed when they returned to their households and communities, following the conclusion of their hunting activity.

A drawback to this methodology was the relatively short duration of time over which the samples in this exercise were captured. Hunting outing data was measured for only four months of the year and should not be extrapolated over twelve months to estimate yearly hunting activity of hunting households in the settlement. Furthermore,
hunting outings were only measured in one season. To adequately measure if hunting activity does indeed fluctuate seasonally in Amazonia, sampling should occur both during the wet and dry seasons. Unfortunately, it was not possible to collect hunting outing data during the dry season in 2003, as this time was devoted to visiting and meeting communities, presenting the proposed research to residents of PDS São Salvador, capturing household survey data of the households selected to participate in this project, along with time allocation surveys used throughout the duration of fieldwork. In spite of this, the four months of hunting outing data gave some clues about hunting activity by hunting households during one season and the interaction amongst hunting households in the community.

Participant Observation

The ten months of continuous fieldwork in western Acre allowed me to participate in the regular daily activities of the peasant households in PDS São Salvador. I ate, slept, bathed, conversed with, and lived side-by-side with the members of the households that I stayed with throughout my fieldwork in the settlement. I accompanied residents of the settlement during their daily work regimes in the roçado and other agricultural fields, as they hunted in the forests and fished in the rivers that run throughout the seringal, and as they prepared farinha for market. I watched and noted social interaction of household members and between residents of the different households in the community. I also visited schools, traveled with local residents attending meetings and workshops organized by NGOs and state government officials in the seringal and in the cities of Mâncio Lima and Cruzeiro do Sul, and visited with residents of the settlement as they traveled to visit their families living in nearby urban areas. I accompanied residents to parties in nearby
communities, played soccer with my hosts, and traded life stories with them, sharing our pasts and dreams for the future.

Participant observation afforded me the opportunity to capture residents’ livelihoods in motion, thus enriching this ethnography of hunting beyond purely the results captured from quantitative methodology. Conversations over dinner, while traveling by land or water in the seringal, and in the urban environment provided different environments in the dialogue of this ethnographer and the subject(s). Qualitative methodology throughout this project complemented quantitative data collection, improving the accuracy and quality of the information collected. The research design of this project necessitated the marriage of quantitative and qualitative methodology throughout the fieldwork, analysis of data, and writing of this dissertation.
CHAPTER 4
HUNTING WITHIN THE HOUSEHOLD (INTRA-HOUSEHOLD)

This chapter traces hunting practices from the perspective of the individual household. Later chapters will discuss inter-household influences on hunting and their effects on hunting within the settlement. A description of the practice of hunting as well as how household relationships affect hunting practice and behavior, are included in this chapter. We will also look at how gender roles within the household play a critical role in the assignment of the household’s productive and reproductive activities. The differences in frequency of hunting across households, as well as differences across communities are analyzed in this chapter. The seasonal nature of hunting in PDS São Salvador will also be explored.

One key research question of this study was to understand the influence of household organization and decision-making on peasant hunting strategy and behavior. We tested hypotheses pertaining to the material realities of the household, the gender relationships of household members, and the emotional commitment to hunting of household members that influence hunting practice by household members. Hypotheses testing included T-tests of mean values for material variables (H1-H3) and gender variables (H4-H6). The variable “emotional commitment to hunting” (H7) was analyzed with Pearson’s Correlation (r). In addition, a linear regression equation was used to model the frequency of hunting dependent on the material and gender variables analyzed in hypotheses testing.
The Hunt in PDS São Salvador

The overwhelming majority of households surveyed in this study were hunting households. The average number of times all households surveyed in the study hunted per month was 2.08 (sd = 1.85) with a median of two hunting outings per month. Forty-nine of the fifty-nine households interviewed (83.1%), had at least one household member that hunted wild game in PDS São Salvador. Households varied in their frequency of hunting activity, though. Almost one-half of the households surveyed in this study either did not hunt, or hunted one or fewer times per month (n = 28; 47.5%). Only eight households reported that they hunted more than three times per month (13.6%). Figure 4.1 shows hunting frequency (in terms of hunting outings per month) by household.

![Figure 4-1: Frequency of Hunting](image-url)
Note that the frequency of hunting is skewed to the left and does not approximate a normal distribution with the skewness of the distribution 1.68 and Kurtosis 4.79. Skewness shows the symmetry of the distribution while Kurtosis indicates how peaked, or flat, the distribution is (Pallant 2001). A normal population distribution has a skewness and Kurtosis of less than 1.0. The decision was made here to transform the dependent variable, frequency of hunting, using the logarithm of the responses of the dependent variable measured in the survey, so that it conformed to a normal population distribution.\(^1\) This transformation of the variable gave a skewness of -.225 and a Kurtosis of -.398. This allowed for the use of parametric statistics (eg. Pearson correlation) that are a more powerful form of statistical analysis than non-parametric statistics (Spearman’s rho) that do not assume normal population distributions. All predictive statistics used in subsequent analysis in this dissertation including students t-tests, Pearson’s correlations, and multiple regression utilized the logarithm transformation of the dependent variable, frequency of hunting.

Many hunters stated that they hunted more in the past (early to middle 1990s) when their livelihoods depended on the sale of wild game, and when additionally, the seringal was seldom patrolled by the governmental bodies that are responsible for enforcing the prohibition on the sale of wild game throughout Brazil. One hunter who sold meat from wild game in the past said that he stopped hunting when the area was declared a settlement and he was no longer able to sell the meat from the animals that he had hunted in the forest. As agriculture became the dominant form of livelihood for households in

\(^1\) There are several techniques that can be used to transform variables (mathematically modify) so that they conform to a normally-distributed curve, including using the square root, logarithm, or inverse of the variable to be transformed. Pallant 2003 suggests using the logarithm to the base 10 transformation for population distributions that resemble the one in Figure 5.1.
the area in the past decade, hunting frequency waned, and many residents turned to the substitution of domestic animals for meat for their households.

Over half of the households interviewed stated that they did not enjoy hunting (n = 31; 52.5%). These households hunted primarily because they were obligated to provide food for their families\(^2\) (see Table 4.1). Others cited that hunting interfered with their agricultural work, particularly the production of farinha that was the main source of income for households in the settlement. These hunters stated that their agricultural responsibilities (*serviço*) did not afford them adequate time to hunt. Many hunters complained that because of past hunting, animals were no longer close to their communities and they had to walk several hours to *matar um bicho* (kill an animal). Older men in the settlement said that the physical demands necessary to be a successful hunter were beyond their capabilities, and that hunting was restricted to younger men who had the stamina to pursue wild game throughout the forest.

Table 4-1: Households that Enjoy Hunting

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>No Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Households that enjoy</td>
<td>24*</td>
<td>31</td>
<td>4 (6.8%)</td>
</tr>
<tr>
<td>hunting</td>
<td>(40.7%)</td>
<td>(52.5%)</td>
<td></td>
</tr>
</tbody>
</table>

*Numbers refer to number of households (n = 59).

Some hunters stated that they enjoyed hunting and would not cease this activity even if they had another reliable source of food for their families (e.g. domesticated animals, fish, or purchasing meat). Men also said that they walked the forest in pursuit of game, sometimes, to escape the *barulho* (noise) of the household.\(^3\) Another hunter

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2 A study of peasant hunters in the Peruvian Amazon similarly found that hunting was primarily for subsistence meat, with economic returns from meat sales in urban markets a secondary concern (Bodmer 2004).

3 Women also commented that they preferred to “escape” to their work in the *roçado* (field of manioc) to forget the daily pressures they had in their lives. The *roçado* though, was usually located close to the
replied that “the forest helps people” because it is “calm in the forest”. Still another hunter said that hunting is part of “the culture of the region”, and that he hunts because “it is the jeito⁴ I have.”

Adolescent boys frequently said they liked to hunt because they liked to fire their guns and kill wild animals. Prior to beginning to be educated in the ways and means of hunting with firearms by their fathers, older brothers, or other adult relatives in the community, it was common to find boys, individually or in small groups, with slingshots taking aim at birds that were close to their houses. This early hunting experience was invaluable for these future adult hunters and heads of households, to learn the habits of the wild animals that lived within their midst, and the terrain that these animals inhabited. Adolescent boys began to accompany their adult male relatives on hunting outings into the forest in their early teen years, and began to hunt alone usually by the time they reached their late teenage years.

There was a marked similarity in the age at which the household head and his son(s) began to hunt in the seringal. Table 4.2 shows that on average, both fathers and sons began to hunt at age 14. There is more variability though, in the age at which the household head began to hunt (sd = 4.61) with a range of from 8 to 30 years of age as opposed to the age their sons began to hunt (sd = 2.65), ranging from 8 to 18 years of age. This partially reflects that all of the sons who at that time engaged in the practice of hunting were born in the seringal, whereas several of the hunters who were heads of

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⁴ Jeito has a variety of English meanings that may include some of the following: ‘way’, ‘manner’, ‘knack’, ‘skill’, ‘appearance’, ‘personality’, and/or ‘style.’
households were born in urban areas, moving as adults to the seringal in search of land to work and an area to raise a family, therefore learning to hunt as adults after they migrated to the seringal. An additional difference between hunting fathers and their hunting sons was that all of the sons interviewed who hunted reported that their fathers taught them how to hunt, whereas their fathers stated that they were trained to hunt (in addition to their fathers) by their uncles, older brothers, neighbors, or in a few cases, taught themselves how to hunt.

Table 4-2: Age that Hunters Began to Hunt

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Mean</th>
<th>Minimum</th>
<th>Maximum</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household head</td>
<td>49</td>
<td>14.08</td>
<td>8</td>
<td>30</td>
<td>4.61</td>
</tr>
<tr>
<td>Sons</td>
<td>9</td>
<td>14</td>
<td>8</td>
<td>18</td>
<td>2.65</td>
</tr>
</tbody>
</table>

There was some minor variability in the hunting output of households as compared across communities in the settlement. One might expect to find differences in hunting frequency based on the relative access to the market in each of the ten communities. Studies have shown that the market is a significant factor in influencing resource use and livelihood strategy of peasant and indigenous households (Godoy et al. 1997; Henrich 1997; Godoy 2001; Wallace 2004). One way that market access can be measured is by the travel time required to go from community to market centers where household products are sold. It is possible that communities closer to market centers may prioritize income generating pursuits (in this case agriculture, primarily the production of farinha) because they have easier access to these markets, over other activities that do not bring income to the household (such as hunting). Here we investigated hunting frequency within the community as a function of the travel time by motorized canoe required to reach the city of Mâncio Lima, the closest to, and principal urban center from, the settlement where household products were marketed.
Table 4.3 shows average hunting frequency, per household, per month in the six communities where household interviews were conducted. Also shown are average travel times by motorized canoe from the communities in PDS São Salvador to the city of Mâncio Lima.5

<table>
<thead>
<tr>
<th>Community</th>
<th>Travel Time (hours)*</th>
<th>Households Interviewed (N)</th>
<th>Hunting Households</th>
<th>Mean</th>
<th>Stan. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boa Vista</td>
<td>7.5</td>
<td>13</td>
<td>10</td>
<td>1.62</td>
<td>1.61</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>São Francisco</td>
<td>7.75</td>
<td>6</td>
<td>6</td>
<td>2.13</td>
<td>0.75</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Girrassol</td>
<td>8.5</td>
<td>7</td>
<td>6</td>
<td>2.71</td>
<td>1.80</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Conceição</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>2.13</td>
<td>1.96</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Vai Quem Quer</td>
<td>9 (+ 20min walk)</td>
<td>7</td>
<td>6</td>
<td>1.86</td>
<td>1.68</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Rio Azul</td>
<td>10</td>
<td>18</td>
<td>14</td>
<td>2.22</td>
<td>2.37</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>59</strong></td>
<td><strong>49</strong></td>
<td><strong>2.10</strong></td>
<td><strong>1.85</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Travel time was from the community (downstream) to the city of Mâncio Lima during the high-water summer months. Travel times upstream might add several hours to the journey. From Guerra (2002).

Hunting frequency in the communities of PDS São Salvador was somewhat responsive (though slightly) to the distance from market. The community of Boa Vista which lies the closest to the city of Mâncio Lima had a mean frequency of hunting, per

5 Although all communities in the settlement were far from urban markets, travel times could vary greatly depending on the rise and fall of the waterways in the settlement. Near the end of the dry season in the months of September and October, large boats were not able to pass on the Blue River (Rio Azul) and even small boats frequently got stuck on the bottom of the shallow river requiring boat operator and passengers to climb out of the boat, pushing and pulling the boat free from obstruction. This could add several hours to one’s journey to, and from, the city. Near the end of the dry season in the month of October, the low water levels of Rio Azul did not permit the passage of large boats. Therefore, residents of the community of Rio Azul were restricted in the amount of their product (farinha sold in 50-kg sacks) they were able to transport to market. Often residents of the farthest communities from the city of Mâncio Lima (Rio Azul, Timbaubá) would spend two days in travel time returning to their community, spending a night in one of the closer communities (usually Boa Vista or Sede) on their return trips back to their community. The community of Vai Quem Quer had the opposite problem in that because the community was situated a 20 to 30-minute walk inland from the Rio Moa, the rising waters in late winter prevented individuals from walking sacks of farinha on their backs to their waiting boats on the Moa for transport to urban markets. Some individuals chose not to travel out of their community during the months when river transport became increasingly difficult.
month, per household of 1.62 outings/month (sd = 1.61) whereas the furthest community from Mâncio Lima where households were interviewed in this study, Rio Azul, had a mean of 2.22 hunting outings/month (sd = 1.85). The mean for all six communities combined was 2.10 hunting outings/month (sd = 1.85). The other four communities that lay between the communities of Boa Vista and Rio Azul had varying degrees of mean hunting frequency, ranging from a low of 1.86 hunting outings/month (sd = 1.68) for households in Vai Quem Quer, to a high of 2.71 hunting outings/month (sd = 1.80) within the community of Girassol. Distance to market appears not to be an influence on whether or not a household engages in hunting activity. There was a negligible difference in the percentages of hunting households in Boa Vista (76.9%; 10 of 13 households), the closest community to market within the settlement, with Rio Azul (77.7%; 14 of 18 households), the furthest community to market measured in this study.

Randomized, spot sample visits were made to households in three communities, Boa Vista, Rio Azul, and Vai Quem Quer, to measure the productive and reproductive activities of all adult household members. Samples taken between 6 am and 6pm, four times per day, monthly, over a nine-month, consecutive period were used as a proxy to account for the percentage of time household members engaged in productive and reproductive pursuits, personal care and hygiene, leisure activities, and travel outside of the community. A total of 1585 observations were recorded from August 2003 through April 2004: 893 (56.3% of all observations) in Boa Vista, 393 (24.8%) in Vai Quem Quer, and 299 (18.9%) in Rio Azul. Table 4.4 below shows spot sampling data for households, by community.
### Table 4-4: Spot Sampling of Adult Activities by Community

<table>
<thead>
<tr>
<th>Activity</th>
<th>Boa Vista</th>
<th>Rio Azul</th>
<th>Vai Quem</th>
<th>Total all 3 comm.</th>
<th>Cat. total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farinha</td>
<td>71 (8.0)</td>
<td>31 (10.4)</td>
<td>26 (6.6)</td>
<td>128 (8.1)</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>77 (8.6)</td>
<td>20 (6.7)</td>
<td>13 (3.3)</td>
<td>110 (6.9)</td>
<td></td>
</tr>
<tr>
<td>Clean/clear land</td>
<td>66 (7.4)</td>
<td>4 (1.3)</td>
<td>17 (4.3)</td>
<td>87 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Hunt</td>
<td>29 (3.2)</td>
<td>13 (4.3)</td>
<td>22 (5.6)</td>
<td>64 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Plant</td>
<td>24 (2.7)</td>
<td>2 (0.7)</td>
<td>17 (4.3)</td>
<td>43 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Teach</td>
<td>23 (2.6)</td>
<td>0</td>
<td>0</td>
<td>23 (1.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>290 (32.5)</td>
<td>70 (23.4)</td>
<td>95 (24.2)</td>
<td></td>
<td>455 (28.7)</td>
</tr>
<tr>
<td><strong>Reproductive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child care</td>
<td>48 (5.4)</td>
<td>13 (4.3)</td>
<td>46 (11.7)</td>
<td>107 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Cook</td>
<td>83 (9.3)</td>
<td>14 (4.7)</td>
<td>6 (1.5)</td>
<td>103 (6.5)</td>
<td></td>
</tr>
<tr>
<td>Wash dishes/clth</td>
<td>61 (6.8)</td>
<td>4 (1.3)</td>
<td>21 (5.3)</td>
<td>86 (5.4)</td>
<td></td>
</tr>
<tr>
<td>Collect firewood</td>
<td>23 (2.6)</td>
<td>1 (0.3)</td>
<td>7 (1.8)</td>
<td>31 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Care animals</td>
<td>8 (0.9)</td>
<td>6 (2.0)</td>
<td>7 (1.8)</td>
<td>21 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Collect NTFP</td>
<td>6 (0.7)</td>
<td>0</td>
<td>14 (3.6)</td>
<td>20 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Saw timber</td>
<td>4 (0.4)</td>
<td>5 (1.7)</td>
<td>7 (1.8)</td>
<td>16 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Collect water</td>
<td>8 (0.9)</td>
<td>0</td>
<td>3 (0.8)</td>
<td>11 (0.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>241 (27.0)</td>
<td>43 (14.4)</td>
<td>111 (28.2)</td>
<td></td>
<td>394 (25.0)</td>
</tr>
<tr>
<td><strong>Personal care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest</td>
<td>107 (12.0)</td>
<td>27 (9.0)</td>
<td>14 (3.6)</td>
<td>148 (9.3)</td>
<td></td>
</tr>
<tr>
<td>Eat</td>
<td>57 (6.4)</td>
<td>9 (3.0)</td>
<td>14 (3.6)</td>
<td>80 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>7 (0.8)</td>
<td>13 (4.3)</td>
<td>6 (1.5)</td>
<td>26 (1.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>171 (19.1)</td>
<td>49 (16.4)</td>
<td>34 (8.7)</td>
<td></td>
<td>254 (16.0)</td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meet friends</td>
<td>8 (0.9)</td>
<td>26 (8.7)</td>
<td>11 (2.8)</td>
<td>45 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Play sports</td>
<td>8 (0.9)</td>
<td>4 (1.3)</td>
<td>5 (1.3)</td>
<td>17 (1.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>16 (1.8)</td>
<td>30 (10.0)</td>
<td>16 (4.1)</td>
<td></td>
<td>62 (3.9)</td>
</tr>
<tr>
<td><strong>Travel outside community</strong></td>
<td>78 (8.7)</td>
<td>79 (26.4)</td>
<td>78 (19.8)</td>
<td>237 (15.0)</td>
<td>237 (15.0)</td>
</tr>
</tbody>
</table>

*First number is the total number of observations.

^Second number in parenthesis is the percentage of observations/community.
Table 4 – 4: Continued

<table>
<thead>
<tr>
<th>Activity</th>
<th>Boa Vista</th>
<th>Rio Azul</th>
<th>Vai Quem Quer</th>
<th>Total all 3 comm.</th>
<th>Cat. total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other activity</td>
<td>46 (5.2)</td>
<td>19 (6.4)</td>
<td>36 (9.2)</td>
<td>101 (6.4)</td>
<td>101 (6.4)</td>
</tr>
<tr>
<td>Whereabouts unknown</td>
<td>58 (6.5)</td>
<td>2 (0.7)</td>
<td>21 (5.3)</td>
<td>81 (5.1)</td>
<td>81 (5.1)</td>
</tr>
<tr>
<td></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Total observations</td>
<td>893 (56.3)</td>
<td>299 (18.9)</td>
<td>393 (24.8)</td>
<td>1585</td>
<td></td>
</tr>
</tbody>
</table>

The comparison of spot sampling data in the communities of Boa Vista, Rio Azul and Vai Quem Quer, showed some differences between the three communities. Similar to what was shown with the mean hunting frequency for households in Table 5.3 above, the communities that were further from urban markets (Rio Azul, Vai Quem Quer) hunted slightly more often than in the community of Boa Vista that is closest to the city of Mâncio Lima. Overall, hunting occupied 4% of adult time in the three communities together, a little less than the average in Boa Vista (3.2%), and slightly more in Rio Azul (4.3%) and Vai Quem Quer (5.6%). In contrast, fishing occurred more frequently in Boa Vista than in the other two communities. A possible explanation for this is that whereas households in both Rio Azul and Vai Quem Quer line the riverbanks, the community of Boa Vista has an ox-box lake that forms during the dry season right at the feet of the community, capturing a stockpile of fish that are easily accessible to fishermen/fisherwomen in the community. In total, adults spent much more time occupied with productive pursuits in Boa Vista (32.5%) than they did in either Vai Quem Quer (24.2%) or Rio Azul (23.4%). Adults also spent a greater percentage of their time
traveling in the two communities that lay furthest from urban centers, Rio Azul (26.4%) and Vai Quem Quer (19.8%), than did adults in Boa Vista (8.7%).

**Hunting Techniques**

There were four primary techniques that hunters in PDS São Salvador used in the pursuit of wild game. Daily, often solitary, hunting excursions into the forest; pastorar; hunting with the use of an armadilha; and extended-stay group hunts comprised the four methods of hunting by residents of the settlement. The first three mentioned hunting techniques are described here. Group hunts, which normally involved hunters from two or more households in the community, will be explained in the following chapter on hunting between households (inter-household) in the community.

The most common form of hunting was when hunters walked into the forest and returned to their households in the same day. Often an individual from the household would leave for a hunting outing into the forest if the household lacked fish or meat. These daily hunting excursions were usually accomplished by a solitary hunter who left in the early morning hours, around 6:30am to 7:30am, and returned to his household in the early or late afternoon. Hunters would often head back to their communities soon after killing a large animal such as a veado (*Mazama americana*) or queixada (*Tayassu pecari*), but would frequently stay in the forest in the attempt to capture additional wild game if they had only killed an *embiara*⁶ (small animal) or bird.

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⁶ Animals that are classified as *embiara* were those that were hunted for food that were small bodied, and were eaten at one sitting by members of the household. If an *embiara* animal was seen early in the hunting outing, some hunters would not fire their guns at them, preferring to save their few shells of ammunition that they carried with them (normally from five to ten shells) for larger game that they might encounter later in the day. *Embiara* animals that were hunted in PDS São Salvador included small monkeys such as parauacu (*Pithecia monachus*) and zogue-zogue (*Callicebus cupreus*), cutia (*Dasyprocta fuliginosa*), quatipuru (*Sciuridae sp.*), paca (*Agouti paca*), and smaller species of tatu (*Dasypus sp.*). These animals were generally consumed solely by members of the household of the hunter who killed the animal, as there was not sufficient meat from these animals to share with other households in the community.
Sometimes two, or rarely three, other individuals would enter the forest to hunt together. Almost always these small groups of men and adolescent boys were relatives by blood or marriage. If adolescent boys were part of these groups, they would normally not venture far from the sight of the lead hunter. If skilled adult hunters entered the forest together, they usually broke off from each other at some landmark in the forest (a forest trail or a large tree) and then regrouped at some agreed upon time later before they returned to their communities.

Generally hunters had a few select areas, within a few hours walk from their houses that they searched when they walked the forest in the pursuit of game. Hunters rotated their visits to these hunting locations, spreading their kill over a wider geographical area so as to not overhunt any one area, or simply to change their luck. Experienced hunters used the sunlight shining through the forest canopy as their guide during hunting outings. Sometimes an unexpected rainstorm would disorient a hunter, who usually resorted to seeking shelter from the rain until the downpour passed, until he decided to resume pursuing wild game, or return to his community. Less experienced hunters hunted within the sight of well worn trails in the forest, fearing that they would become lost if they ventured far from these forest paths. Hunters in one community utilized a compass as a guide when hunting within the forest. Arboreal game (monkeys, birds) was located by sound, whereas ground game was located by sight, including animal tracks and plants broken by animals in the forest.

Another common practice in the repertoire of hunting techniques was to *pastorar*. Pastorar generally meant to lie in wait for a wild animal to pass by where the hunter was stationed. Hunters differentiated between a hunt (*caçar*), which (usually) implied
walking through the forest to pursue wild game, and pastorar, which meant to stalk game, normally from a perch in a tree or a hammock slung between trees in the forest. Hunters would sometimes pastorar in, or near, a tree that was in fruit in the forest, that attracted wild game.

Pastorar was also the term used when the residents of the settlement carried their guns with them to the roçado (land where manioc was planted). Residents did so either as an opportunistic way to hunt while chiefly engaged with agricultural work, but more often, to rid their fields of animal pests that were eating the household’s crops. They said that they would pastorar in the roçado if the paca (*Agouti paca*) or cutia (*Dasyprocta fuliginosa*), *offenda o roçado* (bothered the roçado). Hunting within one’s agricultural fields has been termed “garden hunting” (Linares 1976) and is also a common hunting technique used by indigenous peoples in Amazonia.
Usually, though, pastorar occurred close to the house, done in the late afternoon to early evening after other work obligations had been met. Animals that were frequently pursued in this manner are birds whose habitat was the forest floor including jacu (*Penelope jacquaou*) and jacamim (*Psophia leucoptera*), or monkeys such as parauacu (*Pithecia monachus*) and zogue-zogue (*Callicebus cupreus*) that climbed in the trees near the houses of the community. Adolescent boys would frequently grab the gun on their return to the house after completing their daily agricultural tasks, and join with another friend or two to pastorar in the forests near their houses. These young hunters went through an informal apprenticeship, having already passed from the slingshot, to pastorar and accompanying older experienced hunters on hunting excursions, to eventually hunting alone in the forest.

A third way that hunters engaged their prey was with the *armadilha*. An armadilha was a trap made of the sawed-off barrel of a rifle, with the trigger being tripped by small animals that commonly burrowed into downed, rotted logs, or directly into a hole in the forest floor. The two animals most commonly hunted with the armadilha were the paca (*Agouti paca*) and different species of tatu (*Dasypus sp.*). Both of these animals were nocturnal, and it was not uncommon to hear the blast of a rifle from one’s bed in the middle of the night, signifying that one of these animals had been shot by an armadilha set in the forest.

Armadilhas were commonly placed a few meters off walking paths in the forest where the tracks of a paca or tatu had been seen, late in the afternoon, and then checked early the next morning to see if an animal had been shot. Sometimes armadilhas were placed in agricultural fields to kill small animals that were eating the household’s crops.
Armadilhas were commonly set the day following a rain, when the tracks of the paca and tatu were easily visible in the mud of the forest floor, announcing their presence close by in the forest. Thus, armadilhas were more frequently used in the rainy season. One hunter in the community of Rio Azul said he only sets an armadilha after it had rained, where animal tracks are visible, because it was a waste of time to do so otherwise. It was not uncommon for a hunter to set out an armadilha after he had returned from a day of hunting walking through the forest. Commonly this was the task of adolescent boys in the household. Sometimes more than one armadilha was set at sunset along a path where the tracks of a paca or tatu had been spotted.

**Material Realities of the Household and Hunting**

Wild game was an important source of food, and protein, for the residents of PDS São Salvador. This was especially true for households in the wet winter months from February into April, known locally as times of *mau de rancho* (bad for food) when the catch of fish is drastically reduced and agricultural food sources are diminished. Although the majority of hunters interviewed in this sample stated that they did not enjoy hunting, they hunted to provide meat for their families. Wild game did hold elevated status in the food preferences of residents of the settlement. For example, one adult resident from the community of Conceição replied that “*carne é o melhor rancho*” (meat is the best food). Frequently when I enquired what a particular household was having for dinner, a common response if they did not have any meat (or fish) to eat was “nothing, just farinha.” Farinha was the staple of the diet of households in PDS São Salvador, and no meal was complete without it, but wild game holds special significance within the dietary preferences of the household. Animal meat was served during *festas* (parties) for the inaugurations of schools, churches, or during other congregations of households and
communities in the area. No one would consider serving just fish and farinha to their guests. Hunters in the hosting household(s) would often hunt in the days preceding the festa in order to have game meat to serve to their guests. Hunters would also hunt the day preceding a planned trip by household members to urban areas, to provide food for family members to eat during the long journey by boat into town.

In Chapter 1, a set of hypotheses was stated related to the effect of material conditions of the household on the practice of hunting. Frequency of hunting was the dependent variable hypothesized to be dependent upon the set of material conditions, including number of children living within the household, domesticated animals raised by the household, and outside sources of income, which were each independent variables. Three different hypotheses were said to account for the material reality of each household sampled in the study as it related to hunting by each household. Hypothesis 1 stated that households with lots of children hunted more than households with fewer children. This reflects the necessity to provide food for members of the household and one would expect that the more mouths to feed in the household, the greater the frequency of hunting (measured as hunting outings per month) by household members.

In order to test hypothesis 1, it was first necessary to determine how many children resided within each household. Throughout much of Brazil, there is the interesting child rearing phenomena known as *criar*, meaning ‘to raise’, wherein a child lives with, and is cared for, someone else other than his or her biological parents (Schepers-Hughes 1992). These children are frequently, but not always, biologically related to household members where the additional child will be raised and live. This frequently occurs when households with older, established parents raise the children of their offspring (their
grandchildren). The grandparents’ household usually has more resources at their disposal than does the parents’ household, and thus, the movement of children from parent to grandparent places less burden on the parents’ household while also directing more resources to the grandchildren. In addition, these children help their grandparents with daily household tasks that become cumbersome to elder couples in the seringal.Nearly every community in the seringal has households where grandchildren are being raised with their grandparents (Pantoja 2001). Frequently these filhos de criação (children by rearing) (Scheper-Hughes 1992: 104) are registered with the State by their adoptive parents as their own children. This may occur in locales where grandparent and parent reside within the same community or in communities where they do not live together.

In this study, one of the areas we were concerned with was resource use by households (hunting frequency) as dependent on the material conditions of the household as a whole. It was important to accurately capture how many children resided within each household. Therefore, here, the children of the household included only those children that were permanent residents of the household (six months or more per year), including both the biological offspring of a man and woman of the household, and the adopted children (criar) as described above. These adopted children living within the household of their adoptive parents were not counted as members of their biological parents’ household.

Also of importance to address hypothesis 1, was to determine what was meant by “households with lots of children.” Figure 4.3 shows the number of children residing within a household by the number of households measured in the study. It shows that the number of children living within a household ranged from a low of zero to a high of
seven. The mean number of children per household measured in this study (n = 59) was 2.54 (sd = 1.92). Adding one standard deviation (1.92) to the mean number of children per household (2.54) equals 4.46 children/household. Since it is not possible to have less than whole numbers of children residing within a household, for our purposes here, a household with five or more children was considered a household with a lot of children.

![Figure 4-3: Number of Children Living in a Household](image)

A students-t test was used to test for statistical significance of hypothesis 1 that households with lots of children hunted more than households with fewer children. There was a statistically significant difference, at the 90% level of probability, in the frequency of hunting per month of households with lots of children (≥5 children) as compared with hunting frequency by households with fewer children (n = 15, p = .077; df = 57). Levene’s test for equality of variances of the two sample populations (households with lots of children, households with fewer children) showed that equal variances could not be assumed (F = 5.821; p = 0.19; df = 57).

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7 The socio-diagnostic report of the settlement completed in 1999 found that 59% of the residents of 79 families surveyed in ten communities (total population = 423) were eighteen years of age of less (Câmara 2002:19). This gives a mean of 3.28 children per family.
Hypothesis 2 stated that households lacking domesticated animals would hunt more than households that had domesticated animals. This was based on the substitution effect that domesticated meat (chicken, pigs, cattle) would have as a replacement for the meat of wild game hunted in the settlement. One young hunter in the community of Rio Azul specifically stated that he was required to hunt to provide for his family because he did not raise animals. Households that did not domesticate animals (n = 7) hunted 3.71 times/month in comparison to the hunting output of 1.87 times/month of households that did have domesticated animals (n = 52). This suggests that the meat from domesticated animals may be a substitute for the meat of wild game. Hunting frequency of households with cattle almost reached statistical significance in comparison with households that did not have cattle (n = 30, p = .101; df = 57). Equal variances were assumed between the two sampled populations.

The majority of households surveyed had domesticated animals (52 = 88%), but there was variability in the number and kind of animals that households owned. Table 4.5 demonstrates that less than half of the households had cattle (29 = 49%) or pigs (19 = 32%), whereas the overwhelming majority of households had domesticated chickens and/or ducks (52 = 88%). In addition, households tended to have small herds of cattle, but large numbers of chickens and/or ducks. The distribution of cattle and pigs per household was highly skewed, reflecting that a few households tended to have a large number of cattle and pigs and the rest had fewer than five (see Table 4.6.). This was not

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8 Inferential statistics (t-test) were not used in the comparison of mean values of households that did and did not domesticate animals because of the very small sample size of households without domesticated animals (n = 7).
the case for chickens and ducks, though, with the distribution of these two animals per household showing a normal population distribution.

### Table 4-5: Domesticated Animals by Household

<table>
<thead>
<tr>
<th>#Animals/household</th>
<th>Households w/ Cattle</th>
<th>Households w/ Pigs</th>
<th>Households w/ Chickens and/or Ducks</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>30</td>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>&lt;5</td>
<td>17</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>&gt;5</td>
<td>12</td>
<td>14</td>
<td>46</td>
</tr>
</tbody>
</table>

*29 households had cattle, 19 households had pigs, and 52 households had chickens and/or ducks.

### Table 4-6: Mean, Standard Deviation of Domesticated Animals/Household

<table>
<thead>
<tr>
<th>Animal</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>3.83</td>
<td>9.48</td>
<td>4.41</td>
<td>22.65</td>
</tr>
<tr>
<td>Pigs</td>
<td>3.27</td>
<td>6.50</td>
<td>2.31</td>
<td>5.27</td>
</tr>
<tr>
<td>Chickens/Ducks</td>
<td>19.63</td>
<td>15.03</td>
<td>.622</td>
<td>-.369</td>
</tr>
</tbody>
</table>

This may reflect the fact that chickens and ducks were consumed within the household, rarely being sold (but frequently bartered amongst neighbors in the seringal), yet cattle and pigs were held as a reserve of value, sold in the marketplace, and as such were infrequently consumed by the household. The population of the settlement was quite young, without having had many years to acquire and store income, and very poor, and these elements combined with the higher cost of purchasing cattle and pigs as opposed to chickens or ducks, had limited many households’ ability to raise larger domesticated animals. In this study, the twelve households that had larger herds of cattle (> 5 cows) have all lived in settlement for over fifteen consecutive years, and twelve of the fourteen households that had larger herds of pigs (> 5 pigs), had lived in the seringal for ten or more consecutive years. These households with larger herds of cattle and pigs also tended to be the wealthiest households in the settlement, largely as a result of their investment in domesticating animals.
The third hypothesis related to the material condition of the household stated that households that lacked an outside source of income (wages, retirement checks) would hunt more than households that had an outside source of income. Retirement checks paid individuals one or two minimum salaries if the retiree was over 60 years of age, or physically incapable of working. These checks were an important source of income for some elder couples living in the settlement. The assumption was that households with an outside source of income might have money available to purchase meat for the household instead of being required to hunt to obtain meat for the household. Of the 59 households surveyed, 14 had an outside source of income (mainly monthly retirement or disability checks). The lack of an outside source of cash income did not show a statistically significant increase in hunting output in comparison to households that did have receive cash income (n = 45, p = .924, df = 57).

Wild game continued to be an important source of food for the residents of the settlement. The data confirmed that a household’s material realities significantly affected the hunting output of individual households. Households with five or more children hunted more frequently to feed the members of the household than did households that had fewer than five children. The productive pursuits of the household increased as the number of consumers in the household increases (Chayanov 1986[1926]). Additionally, those households lacking domesticated animals, that did not have a substitute for wild game, hunted with greater frequency than households that did raise domesticated animals. Households that did have domesticated animals generally had larger numbers of ducks and chickens that were raised for home consumption than they did of pigs and cattle, used

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9 The minimum wage in Brazil at the end of 2003 was $R180/month (about $US62.94).
as investments for future needs. Households within the settlement invested in domesticated animals (specifically cattle) to enhance their future livelihood (Ellis 2000). Households that had the largest herds of pigs and cattle tended to be households that had lived along the Moa River for one or more decades.

Two studies in Acre, including one in the community of São Pedro in PDS São Salvador (Salisbury 2002) concluded that small land holders were increasingly turning to cattle production as a form of livelihood (Gomes 2001). This does not bode well for the conservation of Amazonia environments, as increasing cattle production has been linked with increases in deforestation (Hecht and Cockburn 1990; Loker 1993; Fearnside 1997). As Loker (1993) wrote, there is an inherent rationality for poor peasant households to turn to cattle production, due to the reserve of value of cattle (insurance value), the low labor input required in maintenance of cattle, and production of simultaneous use value (milk) and market value (beef) of cattle. For poor rural households frequently restricted in their ability to pay for hired labor, cattle raising with its low labor input and high monetary returns is an attractive livelihood strategy (Homma et al. 1992 sited in Smith et al. 1995). Furthermore, Wallace (2004) found in his study of rubber tappers in the Chico Mendes Extractive Reserve in eastern Acre that households invested a greater portion of their wealth in cattle as they became wealthier. (It is beyond the scope of this project to determine if indeed cattle production is on the rise within the settlement or if increasing wealth translates into an increase in cattle production.)

Whether or not a household member had an outside source of income as a means to purchase meat did not affect a household’s hunting output. This may reflect first that there were few opportunities to purchase meat in the settlement. Small domesticated
animals were infrequently sold, usually consumed by the household that raised them. Larger animals were infrequently butchered, selling meat by the kilo, but rather when sold, were usually purchased as a live animal, at a cost prohibitive to the overwhelming majority of households in the area. Wild game was rarely sold in the settlement, and as we shall see in the next chapter, the exchange of game meat between households was an important social mechanism that joins different households. Second, the income that residents of PDS São Salvador received in the form of retirement checks or as teachers in the settlement schools was minimal, and after the purchase of manufactured goods in urban areas that were not produced by rural households there was little money left over to purchase meat for the household. Generally households used the precious little cash that they acquired to purchase items that they could not produce themselves or could not find substitutes for.

Household Gender Relationships and Hunting

The forest has traditionally been associated as a masculine space since the days of the rubber economy, and although the collection of latex to produce rubber had ceased to define the livelihoods of the residents of PDS São Salvador, both men and women continued to think of the forest as a man’s space. Men, who used the forest to hunt wild game, said that the forest holds unexpected dangers including snakes, wild animals, and mythological figures that protected the forest.10 Women remarked that the forest was

10 Some of these mythological figures include the Mapinguari, a Big-foot like creature that is said to protect the animals of the forest (Wagley 1976[1953]; Smith 1996; Melo 2000). Others include the Mãe da Mata (Mother of the Forest), and Pai da Mata (Father of the Forest), who similarly protect the animals and other resources of the forest environment. These creatures are all said to be ferocious, foul smelling, and mysterious in their habitats and ways of being. Many of the older generation (greater than forty years of age) that spent the majority of their working years within the rubber system of the days of old in the seringal, believed that these creatures were real and still existed within the forests, while the younger generation that had greater freedom of movement within, and without, the seringal, and for whom the forest was not the critical space of making a living, yet just one more place in the range of spaces that comprised
dark and scary, often difficult to traverse, and that they lacked experience with the ways
and means necessary to negotiate the forest space. One woman from the community of
Boa Vista told me, “É fea a mulher anda na mata.” (It is ugly for women to walk in the
forest.) Another man in a different community stated, “O homem tem serviço na mata. A
mulher na casa.” (Men work in the forest. Women in the house.) Both men and women
stated that pursuing wild game within the forest was a tiring chore that women were not
equipped to handle.

Table 4.7 shows a partial listing of the productive and reproductive activities of
adult household members in the fifty-nine households that were interviewed in this study.
Productive household activities are defined as activities that could potentially generate
income, or could be a step in the process of generating income, for the household in the
seringal. The first three household activities listed in Table 4.7 – hunting, fishing, and
producing farinha - were considered productive activities, as were the activities of care
for cattle, care for pigs, the sale of the household’s marketable products, and daily work
as a paid laborer. Although Brazilian law prohibits the sale of wild game for profit,
allowing for the use of wild game resources as a source of food for the household, hunted
game (and fish) was normally exchanged between households within the community,
ocasionally bartered amongst households, and very infrequently sold in the local
markets in the towns of Mâncio Lima or Cruzeiro do Sul. Reproductive household
activities were defined as those activities that did not have the potential to generate
income for the household in the seringal, yet were essential in the day-to-day sustenance
of household members. The last four items in Table 4.7 – cooking, childcare, washing

the livelihood systems of the peasantry of the seringal, tended to distrust the belief in such creatures of the
forest.
clothes and dishes, and care of the household’s chickens were reproductive household activities.

The care of a household’s domesticated animals served both productive and reproductive functions. Cattle, for example, provided milk for household members and cash income when these animals were slaughtered. Cattle were also a reserve of value for the household in times of need such as a medical emergency. Chickens were usually consumed by the household, but were also infrequently sold or bartered with neighbors for such things as gasoline for passage into town, manufactured foods purchased in urban areas, or cigarettes and alcohol.

Table 4-7: Productive and Reproductive Household Activities by Gender

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunting</td>
<td>48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Fishing</td>
<td>27</td>
<td>4</td>
<td>27</td>
</tr>
<tr>
<td>Farinha</td>
<td>7</td>
<td>0</td>
<td>47</td>
</tr>
<tr>
<td>Care cattle</td>
<td>22</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Care pigs</td>
<td>19</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Daily paid labor</td>
<td>34</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sell products</td>
<td>46</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Reproductive</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooking</td>
<td>5</td>
<td>49</td>
<td>4</td>
</tr>
<tr>
<td>Childcare</td>
<td>2</td>
<td>46</td>
<td>4</td>
</tr>
<tr>
<td>Wash</td>
<td>4</td>
<td>52</td>
<td>2</td>
</tr>
<tr>
<td>clothes/dishes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Care chickens</td>
<td>10</td>
<td>30</td>
<td>11</td>
</tr>
</tbody>
</table>

*Numbers indicate the gender of the household member(s) engaged in this activity.*

Many work activities were gender specific, yet would sometimes be accomplished by the ‘other’ gender if the need arose. This often occurred in households that were female-headed (lacking a husband) where the adult woman took a greater involvement in productive household activities, and in male-headed households lacking a wife where the adult man was forced to invest more time and energy in insuring the household’s reproductive needs were met. In male-headed households lacking a spouse or other adult
female, often some of the reproductive needs of the single man (and the other members of his household if he has small children) such as clothes washing or cooking were met by his married daughters living in other households in the community.

Historically cross-culturally, women of the household have been responsible for taking care of the reproductive household activities, while men and women in the household share some of the productive household activities (Boserup 1970; Dwyer and Bruce 1988; Leach 1994; Slocum et al. 1995; Rocheleau et al. 1996; Schmink 1999; Deere and León 2001). In this regard, PDS São Salvador was not exceptional, as men and women shared in the activities of fishing and in the production of farinha (the main source of cash income for the majority of residents in the seringal), while women were overwhelmingly responsible for insuring that the household’s reproductive tasks were met, including caring for children, washing clothes/dishes, and cooking. Predominately male productive activities included hunting and the care of large domesticated animals, including cattle and pigs, while a predominately female productive activity was the care of the household’s chickens. Men also took the lead in the sale of the household’s agricultural products, and predominately men in the settlement were hired as daily laborers (diáristas). Therefore, generally a household’s cash income passed through the hands of the men (usually the senior male) of the household before it reaches the rest of the household members. In her study of rubber tappers in the Chico Mendes Extractive Reserve in eastern Acre, Campbell (1996) found similar results, with men in control of

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11 A diárista was usually hired by his neighbor in the community on a daily basis to clear an area of primary forest or capoeira (fallowed agricultural land) for planting. These informal contracts generally ran for less than two consecutive weeks. Although women were not hired for such work in the settlement, the wife of the husband of the contracting household was usually required to provide a cooked meal as part of the daily payment to the diárista.
the household’s finances and the distribution of the household’s cash income. Within PDS São Salvador, frequently wives complained that their husbands journeyed to town to sell farinha, and ended up drinking some of the household’s profits that could be better spent on needed household items, or spent money on their girlfriends (imagined or real) in town.

The spot sampling data analyzed by gender (Table 4.8) generated many of the same conclusions raised above, that men concentrated in productive pursuits, while women were responsible for making sure that the household’s reproductive needs were met. In this sample, men spent 40% of their time engaged with productive activities, while women were occupied with productive pursuits only 14.5% of their time. Hunting was overwhelmingly a masculine activity with men involved with this activity 7.1% of their time, and women negligibly participated in hunting outings (0.1%). A Pearson correlation indicated that the association between hunting and gender is highly significant ($r = .174, p \leq .01$). A hunter stated, “O homem é chefe da família. Tem que dar alimentação a família.” (A man is the head of the family. He has to provide food for the family.) One productive activity in which women were important actors was the production of farinha, spending 5.8% of their time dedicated to this activity. Women also fished about one-third of the time (3.9%) that men (9.3%) did. The only productive activity in which women invested more of their time than did men was teaching, with men’s participation in this activity negligible (0.1% of their time).

The amount of time adult men and women in the household focused in reproductive work varied between the genders even more than that of productive work. Women spent fully 40% of their time with reproductive work and men only 13.5% of their time. Time
devoted to personal care and leisure was about the same for men (16.1%, 4.3%) and women (15.9%, 3.5%). Interestingly, the data showed that women traveled a slightly greater percentage of their time (16.0%) than did men (14.1%). This was unexpected as men had more opportunities to travel than did women, including the pursuit of wild game.

Table 4-8: Spot Sampling of Household Activities by Gender

<table>
<thead>
<tr>
<th>Activity</th>
<th>Men</th>
<th>Women</th>
<th>Item total</th>
<th>Category total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farinha</td>
<td>88 (9.9)</td>
<td>40 (5.8)</td>
<td>128 (8.1)</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>83 (9.3)</td>
<td>27 (3.9)</td>
<td>110 (6.9)</td>
<td></td>
</tr>
<tr>
<td>Clean/ clear land</td>
<td>84 (9.4)</td>
<td>3 (0.4)</td>
<td>87 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Hunt</td>
<td>63 (7.1)</td>
<td>1 (0.1)</td>
<td>64 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Plant</td>
<td>36 (4.0)</td>
<td>7 (1.0)</td>
<td>43 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Teach</td>
<td>1 (0.1)</td>
<td>22 (3.2)</td>
<td>23 (1.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>355 (40.0)</td>
<td>100 (14.5)</td>
<td>455 (28.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Reproductive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child care</td>
<td>16 (1.8)</td>
<td>91 (13.2)</td>
<td>107 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Cook</td>
<td>16 (1.8)</td>
<td>87 (12.6)</td>
<td>103 (6.5)</td>
<td></td>
</tr>
<tr>
<td>Wash (dishes/clothes)</td>
<td>4 (0.4)</td>
<td>82 (11.8)</td>
<td>86 (5.4)</td>
<td></td>
</tr>
<tr>
<td>Collect Firewood</td>
<td>30 (3.4)</td>
<td>1 (0.1)</td>
<td>31 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Care Animals</td>
<td>17 (1.9)</td>
<td>4 (0.6)</td>
<td>21 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Collect NTFP</td>
<td>15 (1.7)</td>
<td>5 (0.7)</td>
<td>20 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Saw timber</td>
<td>15 (1.7)</td>
<td>1 (0.1)</td>
<td>16 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Collect water</td>
<td>8 (0.9)</td>
<td>3 (0.4)</td>
<td>11 (0.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>121 (13.5)</td>
<td>274 (40.0)</td>
<td>392 (25.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Personal care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rest</td>
<td>83 (9.3)</td>
<td>65 (9.4)</td>
<td>148 (9.3)</td>
<td></td>
</tr>
<tr>
<td>Eat</td>
<td>47 (5.3)</td>
<td>33 (4.8)</td>
<td>80 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>14 (1.6)</td>
<td>12 (1.7)</td>
<td>26 (1.6)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>144 (16.1)</td>
<td>110 (15.9)</td>
<td>254 (16.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meet friends</td>
<td>22 (2.5)</td>
<td>23 (3.3)</td>
<td>45 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Play sports</td>
<td>16 (1.8)</td>
<td>1 (0.1)</td>
<td>17 (1.1)</td>
<td></td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>38 (4.3)</td>
<td>24 (3.5)</td>
<td>62 (3.9)</td>
<td></td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other activity</td>
<td>126 (14.1)</td>
<td>111 (16.0)</td>
<td>237 (15.0)</td>
<td>237 (15.0)</td>
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<tr>
<td>Whereabouts unknown</td>
<td>61 (6.8)</td>
<td>40 (5.8)</td>
<td>101 (6.4)</td>
<td>101 (6.4)</td>
</tr>
<tr>
<td></td>
<td>48 (5.4)</td>
<td>33 (4.8)</td>
<td>81 (5.1)</td>
<td>81 (5.1)</td>
</tr>
<tr>
<td><strong>Sub-total</strong></td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Total observations</strong></td>
<td>893 (56.3)</td>
<td>692 (43.7)</td>
<td>1585 (100)</td>
<td></td>
</tr>
</tbody>
</table>
in the forest, working as day laborers on other land owners properties, and the selling of the household’s agricultural products in urban areas all of which women seldom participated in (see Table 4.7).  

Although hunting has been traditionally viewed as a male resource procuring strategy (Siskind 1973; Hurtado et al. 1985; Kaplan and Hill 1985; Jochim 1988; Stearman 1989, 1991; Robinson and Bennett 2000; Stedman and Heberlein 2001), hunting practice and behavior is best viewed as a negotiation of the productive and reproductive rights and responsibilities of household members. The hunting of wild game is one of the varied activities that rural households engage in to sustain their families, and is dependent on the collective livelihood strategies of all household members. The men of the household would not have time to hunt if their reproductive needs were not met by the women of the household, and the decision to hunt or not to hunt is frequently based on the food resources accrued by all members of the family- both men and women. As one woman in the community of Rio Azul told me, each person in the household does their part to help maintain the family: men hunt and clear the forest to plant, and women fish. One male hunter stated, “When there are no fish [fishing being a shared activity between men and women in the seringal], one must hunt.” As Table 4.7 shows, women were important contributors in insuring the household had a steady supply

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12 The fact that spot sampling data collection covered all six months of the wet season (November into April), but only three months of the dry season (August into October), may have accounted for the lower travel percentage of men in comparison to women in the study. The dry season offered many more opportunities for men to travel in the pursuit of productive household activities than were available for women. Therefore, the data analyzed here probably underestimated the percentage of time men traveled, and overestimated the percentage of time women traveled. In addition, women in the settlement frequently traveled with their younger children to urban areas during the rainy season (when schools in the seringal were not in session), and stayed with relatives for several weeks at a time. In part, this was a mechanism to lessen the number of mouths to feed during the wet, winter months when food resources were more difficult to capture in the seringal.
of food based on their work in the production of farinha, the catching of fish, and the care of chickens which were generally raised for home consumption. Though women of the household did not partake directly in the physical act of hunting, their productive and reproductive work activities within the household livelihood system were essential to the overall hunting strategy of the household.

**Gender Hypotheses and Hunting Practice**

Hypothesis 1 stated that male-headed households would hunt more often than female headed households. Hunting was defined as a masculine activity in the seringal, one in which women infrequently partook (see Table 4.7). As such, hunting was a culturally coded activity for men in the household and wider community. Therefore, in male-headed households we would expect to find a greater frequency of hunting than in female-headed households that 1) might lack an adult male, and 2) where hunting was not an fundamental part of the gender defined activities of household members.

A total of 54 households sampled were male-headed, with 5 households having a female head. There was a difference in the mean frequency of hunting outings per month between the two groups (2.22 for male-headed .60 for female-headed). This is suggestive of differences in hunting output resulting from which gender is the head of household. As hunting was a male activity in the settlement, we would expect that households with a male head were inclined to hunt with greater frequency than in households where the tradition of hunting was not part of the repertoire of livelihood activities of the household head (i.e. female headed households).

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13 Inferential statistics (t-test) were not used in the comparison of mean values of male-headed and female-headed households because of the very small sample size of female-headed households (n = 5).
The second hypothesis related to the gender dynamics within the household stated that households with adolescent boys and/or adult men would hunt more often than in households lacking adolescent boys and/or adult men. Part of the socialization process of growing into manhood in the peasant households in PDS São Salvador required that boys learn how to hunt. The elder males in the household (fathers and older brothers) took on the role of tutelage of the younger males, teaching them the ways and means of the animals of the seringal and how to stalk and hunt them in the forest. One man who did not hunt stated that when his young sons grew older, he would resume hunting to teach them this important skill. Women also desired, as partners, men that were successful hunters. Lau, a prolific hunter in the community of Rio Azul, said women knew a good hunter would always be able to sustain (feed) them.

A comparison of the mean values of households with adolescent boys (n = 12) and those lacking adolescent boys (n = 47) proved to be slightly significant at the 90% level ($p \leq .099$, df = 57). Levene’s test showed that equal variances could not be assumed between the two groups ($p \leq .020$).

Finally, hypothesis 6 stated that households where women did not fish would hunt more than in households where women do fish. This partially reflected the substitute effect of fish replacing wild game as a source of food and protein for the household. In addition, the gender responsibilities of household members came into play as the productive activities of women living within the household affected the practice of hunting by household members.

Women fished in thirty-four of the fifty-nine households surveyed. There was, though, no statistical difference in the number of times per month household members
hunted, with respect to whether or not women of the household engaged in fishing (n = 34, p = .674, df = 57). Equal variances were assumed between households where women did fish and those where women did not fish (F = .269, p ≤ .606, df = 57).

The gender dynamics within a household played an important role in the household’s hunting output. Hunting was an activity that is highly gender stratified, reserved for men, although women did play a role in the practice of the hunt which will be explored in greater depth in the following chapter. Hunting was part of the productive household activities that men specialized in. Women were responsible for maintaining the reproductive needs of household members while also participating in the productive output of the household. Men’s reproductive needs were satisfied by women of the household allowing them the opportunity to hunt wild game.

Beyond purely the work regimes of household members, the performance of the hunt was wrapped up in the process of becoming a man within the household and community. Men wished to teach their sons the practice of hunting as their fathers had earlier taught them how to hunt. Men were seen as the providers for household members (even though as we see, from the data above, women were important parts of the productive process of the household) and hunting prowess was an important method of demonstrating this.

The forest, where most hunting activity occurred in the seringal, was also a highly gendered space. This was the environment of men as opposed to the house that was the domain of women. Linguistic devices were used by residents of the settlement that mark the forest as a space of hidden dangers, including snakes and mythological creatures that
only men were capable of confronting. Both men and women said that hunting within the forest environment was man’s work.

Male-headed households did hunt more often than did female-headed households, although the findings of difference in hunting frequency were at best suggestive due to the small sample size of the female-headed household group. This is not surprising, as hunting activity was a culturally coded behavior for men in the community and thus, we would expect that households lacking a senior male would not attach similar importance to hunting as households that were male-headed. Further, households that did have adolescent, hunting-age boys hunted at a significantly greater frequency than households that did not have adolescent boys living in the household. Hunting was a key process of bringing adolescent boys into manhood, and a household’s hunting output increased with the presence of adolescent boys in the household. Whether or not women of the household participated in fishing did not prove to influence a household’s hunting output.

Emotional Commitment to Hunting

A household’s emotional commitment to hunting is a measure of the household’s satisfaction with hunting as an integral part of the livelihood strategy for the household. Whereas some hunters begrudgingly partook in the practice of hunting due to necessity or because of cultural or social obligations, for other households, hunting was more than merely a part of the overall subsistence strategy of the household. The emotional commitment to hunting measures the household’s enjoyment with hunting and its willingness to continue with this practice even if the household has available alternative sources of meat and protein for household members.

For some individuals, hunting was a form of relaxation or a means to escape to the solitude of the forest, leaving behind one’s daily pressures and problems back in the
community. As mentioned above, one hunter stated that hunting allowed him the opportunity to escape the “noise” of the community. “A mata ajuda a gente” (The forest helps people) says Manuel, and “sozinho na mata, eu passo o dia todo sem que sentir riava.” (I spend the entire day in the forest without getting angry.) One hunter in the community of Vai Quem Quer would routinely grab his gun and wander into the forest in the late afternoon hours just prior to sunset after spending the day preparing farinha. He said that hunting was his break (descanso) after working the entire day. Adolescent boys would also frequently pastorar in the forests close to their houses with their friends, after finishing an exhausting day of agricultural work.

As the overwhelming majority of households did not have the funds to pay for labor, many daily activities in the settlement required that both men and women work together throughout the day. The preparation of farinha, which almost every household in the settlement partook in, was one such activity that husbands and wives engaged in together throughout the work day.\textsuperscript{14} The practice of hunting allowed both husband and wife some freedom from each other. Hunters throughout the world express the sentiment that hunting offers an opportunity for men to escape their wives (Fine 2000). While their husbands were off in the woods hunting, often it was an opportunity for wives across households to socialize. When hunters returned to their households late in the day, their wives resumed their work activities, including preparing the wild game that was brought back to the household by their husbands, and fixing a quick snack (coffee with farinha) for their tired hunter- husbands.

\textsuperscript{14} In this study, 54 of the 59 households interviewed (92%) produced farinha. Of these 54 households, in 47 of them (87%), men and women of the household worked together. See Table 4.7.
Other hunters said that they liked to hunt because they enjoyed walking within the forest. For them, hunting was (additionally) a form of recreation. These were generally hunters that were born and raised in the seringal (*criado na mata*) who viewed agricultural activity and the raising of livestock as ‘work’, and hunting as ‘pleasure’. One hunter mentioned the *sensação* (sensation) that he got when he was hunting in the forest.

Many of the newer male migrants to the seringal did not hunt, while some replied that they hunted purely out of necessity to provide food for their families.

The emotional commitment to hunting was measured with a scale of a series of eight statements scored with a 3-point Likert-scale – 1) never/no, 2) sometimes, and 3) always/yes. All adult members of the household together were read each of the eight statements listed below. Where there was disagreement between household members on a particular question, the answer was scored with the middle value in the Likert-scale.

The eight statements rated by all adult members of the households sampled in the study were:

1. We like to hunt.
2. Hunting is easy.
3. Hunting is not a waste of time even if we return home without killing any wild animals.
4. We like to hunt more than do any other work activity.
5. We will continue to hunt even if we do not need the meat from the hunt to feed our household.
6. We prefer to hunt rather than purchase meat.
7. Hunting does not interfere with our other work responsibilities.
8. We hunt to socialize with our sons, friends, and neighbors.

A reliability analysis was used to determine if the scale used to measure the emotional commitment to hunting was internally consistent, in fact measuring the construct emotional commitment to hunting. Cronbach’s alpha coefficient is commonly used to measure the internal consistency of a scale. The closer the alpha coefficient is to
1.0, the more reliable the scale. The Cronbach’s alpha coefficient for the eight questions listed above in the scale, emotional commitment to hunting, was .5416.

During questioning I noticed that the majority of responses to statement 6 listed above, appeared to base their answers on the desire to have money (to purchase meat), rather than on the intent of the question to measure if hunting activity would continue if they did in fact have the means to purchase meat for the household. It seemed that this question was not measuring an emotional commitment to hunting, but the desire for money. Cronbach’s alpha coefficient showed that by removing question 6 from the scale, the overall alpha coefficient for the scale increased to .6087. Therefore, question 6 was removed in the calculation of a household’s emotional commitment to hunting.

A Pearson’s correlation (r) was used to determine the strength of the relationship between the independent variable, emotional commitment of hunting, and the dependent variable, frequency of hunting. These are not causal relationships, but merely indicate an association between variables. Pearson correlations take on values ranging from -1 to +1 with the size of the absolute value of the relationship (ignoring the sign before the value) indicating how strong the relationship is between the two variables in question. A perfect correlation gives a value of -1 or +1, and a value of 0 indicates no relationship between the variables. Pearson’s r for the two variables measured here, emotional commitment to hunting with the frequency of hunting, was statistically significant (r = .435, p ≤ .001) showing a positive relationship between the variables. This indicates a strong correlation between these two variables.

**Seasonality and Hunting**

Although hunting was an activity that occurs throughout the year, residents of PDS São Salvador said it peaked during the wet months of January through April when fishing
resources were harder to obtain due to the rising rivers that allowed fish to hide in the flooded forests, and the swift moving currents that hindered the successful catch of fish. The rivers in the seringal in winter were also cloudy, filled with soil that had eroded from the riverbanks and therefore, fish were difficult to see and catch.

Hunters stated that the wet forest floor during the rainy season allowed them to stalk their prey without drawing undue attention to themselves and thus, scaring away the animals they were hunting. They said that the leaves on the dry forest floor of summer crackled underneath their feet, alerting animals to their presence in the forest. Animal tracks were also visible in the mud of the forest floor during the rainy season. Several hunters mentioned that the trees and palms that fruited during winter months provided a food source for animals, a meeting place for animals in the forest, and thus, serve as a focal point for hunting activity. One member of the community of Rio Azul stated that it was necessary to conserve these fruiting trees and palms so as to have a food source for the animals that inhabited the forest. Furthermore, agricultural activity slowed drastically during the rainy season which normally ran from the end of November to the beginning of May, affording hunters more freedom to pursue prey in the forested areas of the seringal. Residents also said that the months of February into April were mau de rancho (bad for food), as fishing was poor, and agricultural food production was low during this period, meaning that hunters were often reconciled to pick up their gun and walk the forest (dar uma volta) in the hopes of killing wild game to provide food for their families. As Maria of Rio Azul said, “Nosso mercado é a mata.” (Our market is the forest.)

Table 4.9 shows spot sampling data on household activities as a function of the weather – if it was raining or not when the observation was recorded. A total of 114
(7.2%) samples were recorded when it was raining, and 1471 (92.8%) on clear days when it was not raining. Several patterns emerged from the data. First, productive activities were drastically reduced when it was raining in comparison to when there were clear skies. The percentage of time devoted to productive activities when it was raining (11.4%) was less than one-half of the time spent in productive activities when it was not raining (30.2%). Fishing and agricultural work (planting and land preparation) were all substantially lower when it rained (0%, 1.8%) than when it was dry (7.5%, 6.9%). Hunting activity was also lower when it was raining (2.6% compared to 4.1% when dry), but not by as great a percentage drop as occurred with other productive activities. The production of farinha, though, only dropped slightly when it rained (7.0% compared to 8.2% when dry). Farinha was the anchor of income for most households in the settlement during the summer months, and the most important food source during the wet months when supplies of food were difficult to come by in the seringal.

Second, the amount of time devoted to reproductive activities remained fairly constant regardless of the weather, except for childcare which increased substantially from 6.4% to 11.4% of adult daily activity when it was raining. This was largely a function of the school year, which had vacation during two to three months of the rainy season (dependent on the community’s school calendar year); thus, parents invested more time in childcare when their children were not in school. Third, as may be expected, adults spent much more time resting when it was raining (17.5% = twice as much time), than when it was not raining (8.7%).

Finally, travel outside of the community was slightly increased when it was dry (15.1%) as opposed to when it was wet (13.2%). One woman in the community of Vai
Quem Quer mentioned that she did not venture outside the community during the rainy season because travel into, and out of, the area was difficult and not worth the effort. Many people in the seringal escaped to urban areas during the wet winter months when productive activities slowed dramatically, spending weeks up to months visiting with relatives that lived in Mâncio Lima and Cruzeiro do Sul. Summer travel, though, was based on the household’s productive activities: the household’s labor requirements (primarily agricultural), and the sale of household products (farinha) in urban areas.

Table 4-9: Household Activities as a Function of Rain or Sun

<table>
<thead>
<tr>
<th>Activity</th>
<th>Rain</th>
<th>Dry</th>
<th>Item total</th>
<th>Category total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Productive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farinha</td>
<td>8 (7.0)</td>
<td>120 (8.2)</td>
<td>126 (8.1)</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>0</td>
<td>110 (7.5)</td>
<td>110 (6.9)</td>
<td></td>
</tr>
<tr>
<td>Clean/ clear land</td>
<td>2 (1.8)</td>
<td>85 (5.8)</td>
<td>87 (5.5)</td>
<td></td>
</tr>
<tr>
<td>Hunt</td>
<td>3 (2.6)</td>
<td>61 (4.1)</td>
<td>62 (4.0)</td>
<td></td>
</tr>
<tr>
<td>Plant</td>
<td>0</td>
<td>43 (2.9)</td>
<td>43 (2.7)</td>
<td></td>
</tr>
<tr>
<td>Teach</td>
<td>1 (0.9)</td>
<td>22 (1.5)</td>
<td>23 (1.5)</td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>13 (11.4)</td>
<td>444 (30.2)</td>
<td>455 (28.7)</td>
<td></td>
</tr>
<tr>
<td><strong>Reproductive</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child care</td>
<td>13 (11.4)</td>
<td>94 (6.4)</td>
<td>107 (6.8)</td>
<td></td>
</tr>
<tr>
<td>Cook</td>
<td>7 (6.1)</td>
<td>96 (6.5)</td>
<td>103 (6.5)</td>
<td></td>
</tr>
<tr>
<td>Wash (dishes/clothes)</td>
<td>5 (4.4)</td>
<td>81 (5.5)</td>
<td>86 (5.4)</td>
<td></td>
</tr>
<tr>
<td>Collect Firewood</td>
<td>2 (1.8)</td>
<td>29 (2.0)</td>
<td>31 (2.0)</td>
<td></td>
</tr>
<tr>
<td>Care Animals</td>
<td>3 (2.6)</td>
<td>18 (1.2)</td>
<td>21 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Collect NTFP</td>
<td>2 (1.8)</td>
<td>18 (1.2)</td>
<td>20 (1.3)</td>
<td></td>
</tr>
<tr>
<td>Saw timber</td>
<td>0</td>
<td>16 (1.1)</td>
<td>16 (1.0)</td>
<td></td>
</tr>
<tr>
<td>Collect water</td>
<td>0</td>
<td>11 (0.7)</td>
<td>11 (0.7)</td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>32 (28.1)</td>
<td>363 (24.7)</td>
<td>392 (25.0)</td>
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<tr>
<td><strong>Personal Care</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eat</td>
<td>6 (5.3)</td>
<td>74 (5.0)</td>
<td>80 (5.0)</td>
<td></td>
</tr>
<tr>
<td>Sleep</td>
<td>11 (9.6)</td>
<td>15 (1.0)</td>
<td>26 (1.6)</td>
<td></td>
</tr>
<tr>
<td>Sub-total</td>
<td>37 (32.5)</td>
<td>217 (14.8)</td>
<td>254 (16.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Leisure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meet friends</td>
<td>3 (2.6)</td>
<td>42 (2.9)</td>
<td>45 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Play sports</td>
<td>1 (0.9)</td>
<td>16 (1.1)</td>
<td>17 (1.1)</td>
<td></td>
</tr>
<tr>
<td>Travel</td>
<td>4 (3.5)</td>
<td>58 (3.9)</td>
<td>62 (3.9)</td>
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</tr>
<tr>
<td></td>
<td>15 (13.2)</td>
<td>222 (15.1)</td>
<td>237 (15.0)</td>
<td>237 (15.0)</td>
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</tbody>
</table>
Modeling Intra-household Effects of Hunting Frequency

Intra-household effects on a household’s hunting frequency were theorized in Chapter 1 to be the result of three sets of independent variables: 1) material (lots of children, domesticated animals, outside source of cash income), 2) gender (male or female-headed household, hunting age boys/adult men in the household, women fish) and, 3) the household’s emotional commitment to hunting. After normalizing the dependent variable, frequency of hunting, using the log base10 transformation, T-tests of the statistical significance for the mean values of each of the independent material and gender variables were computed. These results are summarized in Table 4.10 below.

Table 4-10: T-test for Significance of Intra-household Material & Gender Variables

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Lots of children</td>
<td>.077*</td>
</tr>
<tr>
<td>Domesticated animals</td>
<td>---^</td>
</tr>
<tr>
<td>Outside income</td>
<td>.924</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male-headed</td>
<td>---^</td>
</tr>
<tr>
<td>Hunting age boys</td>
<td>.099*</td>
</tr>
<tr>
<td>Women fish</td>
<td>.674</td>
</tr>
</tbody>
</table>

*Significant at ≤0.10. ^T-test not computed.

Statistical significance at p ≤0.10 was found for the independent variables “lots of children”, “domesticated animals”, and “hunting age boys” in the household. A Pearson correlation found a high degree of statistical significance of an association of the household’s emotional commitment to hunting with the frequency of hunting (r = .435, p ≤ .001). The data indicate that the most salient variable influencing a household’s
frequency of hunting was a household’s “emotional commitment to hunting” – the desire to continue with hunting as an important part of the household’s livelihood strategy.

Second, the importance of game meat to the household’s food security influenced hunting output by the household as those households with lots of children (increased consumers within the household) and those lacking domesticated animals (minus substitutes for wild game), hunted more often than households with fewer children or those that domesticated livestock. Third, gender appeared not to be as important a variable in the determination of a household’s hunting output.

Here we use multivariate linear regression to model the combined effects the independent variables categorized as material, gender, and emotional commitment to hunting have on the dependent variable, frequency of hunting. First, a Pearson correlation was run to uncover if any of the independent variables were highly associated with each other. Multicollinearity occurs when two independent variables are highly associated with one another and therefore, leaving both variables in the regression model usually does not add much explanatory power to the model. Only the two independent variables, “lots of children” and “hunting age boys” indicated a high (positive) association with one another (r = .661, p ≤ .001). T-tests run on mean values of these two variables showed statistical significance at p ≤ .10; therefore, regression models were tested with these variables in separate models.

Multiple regression was used to model the relationship of the independent variables with the dependent variable, frequency of hunting. The material variables were entered in the first model. The gender variables and the variable, “emotional commitment to hunting”, were run in Model 2. Finally, Model 3 includes only those independent
variables that proved to be statistically significant in either Model 1 or Model 2. Table 4.11 presents the results of these regression models.

Table 4-11: Multivariate Regression Modeling of Intra-household Influence on Frequency of Hunting

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1 β-coefficients</th>
<th>Model 2 β-coefficients</th>
<th>Model 3 β-coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lots of children</td>
<td>.178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domesticated animals</td>
<td>-.249*</td>
<td>-.122</td>
<td></td>
</tr>
<tr>
<td>Outside income</td>
<td>-.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male-headed</td>
<td></td>
<td>.237*</td>
<td>.219*</td>
</tr>
<tr>
<td>Hunting age boys</td>
<td></td>
<td>.300**</td>
<td>.313**</td>
</tr>
<tr>
<td>Women fish</td>
<td>.077</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional commitment hunting</td>
<td>.462***</td>
<td>.429***</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Adjusted r²</td>
<td>.031</td>
<td>.241***</td>
<td>.249***</td>
</tr>
</tbody>
</table>

*Significant at p ≤ 0.10; **significant at p ≤ 0.05; ***significant at p ≤ 0.01.

Model 1 incorporated the material hypotheses H1 – H3. The model indicated a very weak fit in explaining the dependent variable (adjusted r² = .031, F = 1.611). Of the three independent material variables, “domesticated animals” was weakly significant (p ≤ 0.10). The coefficient of -.249 for the “domesticated animals” variable indicated that as a household’s domesticated animals decreased by 24.9%, hunting frequency increased by a factor of 1.

Model 2 tested the gender variables (H4 – H6) combined with the variable “emotional commitment to hunting” (H7). The model proved to be highly statistically significant with the independent variables of the model explaining a little of 24% of the variance in the dependent variable, “frequency of hunting.” The exploratory Model 3 was only a slightly better fit than Model 2. Of the three regression models, Model 3, incorporating of the independent variables that achieved statistical significance in Model
The multiple regression models indicated that the most important variables influencing a household’s hunting output were those of the “emotional commitment to hunting” (cultural) and “hunting age boys” (gender) in the household. The variable “male-headed households” (gender) also was slightly significant, but due to the small sample size in this study of households that were not male-headed (i.e. female headed households, n = 5), this result can only be suggestive of its influence on the dependent variable “frequency of hunting.” The material variable “lots of children” that reached statistical significance in a comparison of mean values with a t-test, did not achieve significance when modeling this variable combined with the other material variables (Model 1). In addition, the variable “domesticated animals” that was also statistically significant with a t-test and in Model 1, was not significant in the regression Model 3.

The regression coefficients of the rest of the intra-household variables with the exception of the variable “women fish,” moved in the direction that was expected.\(^{15}\) Apparently, fish was not a substitute for game meat in PDS São Salvador.

Taken as a whole, the material variables had much less explanatory power than did cultural and gender variables in influencing a household’s hunting frequency. This suggests that hunting in PDS São Salvador is primarily motivated by reasons other than securing food for the household. Hunting output, then, reflects a livelihood choice of the

\(^{15}\) The variables “lots of children” and “male-headed” household showed a positive influence of hunting output, and the variables “domesticated animals” and “outside income” showed a negative influence on hunting output.
household, yet is also dependent on the importance of this activity as a marker of male identity in the settlement.

**Conclusion**

In this chapter we examined the influences of intra-household relationships on the output of hunting. A variety of methods including in depth household questionnaires, productive/reproductive household surveys of adult activity, spot sampling of adult behavior, hypothesis testing, and multiple regression were used to explore these relationships and how they affected a household’s frequency of hunting. Intra-household independent variables were grouped into three sets: material realities of the household, gender dynamics and relationships within the household, and a household’s emotional commitment to hunting. We also briefly investigated the seasonal nature of hunting and other productive and reproductive activities of adults within the settlement.

The first part of this chapter focused on understanding the material needs of households in PDS São Salvador. The majority of the households sampled in this study were hunting households, although it is significant that over one-half of these hunting households stated that they did not enjoy hunting. Hunting output has waned for most households as livelihood strategies have rapidly shifted in the last ten to fifteen years from rubber tapping to small-scale agriculture centered on the production of farinha. The extraction of rubber necessitated adults (mostly men) walking within the forest to tap rubber, placing them in close contact with the animals of the seringal, whereas agricultural work entails clearing forestland for crop production, and thus, the clearing of animal habitat in the seringal. Therefore, one of the results of deforestation for agricultural production is less daily contact with the animals of the seringal, which
lessens hunting opportunity. Furthermore, many hunters were unwilling to sacrifice their agricultural output for the prospect of hunting.

As much of adult activity in the settlement is based on fulfilling the consumptive needs of household members, the material realities of the household played a critical role in a household’s hunting output. The more mouths to feed in the household necessitated an increase in hunting output by the household. Households that had five or more children hunted with greater frequency than households that had fewer than five children. Most hunters indeed stated that they hunted primarily to supply food for their families.

The domestication of livestock was shown to be a potential meat substitute for wild game for households in the settlement. Those households that did not raise animals hunted with greater frequency than households that had domesticated animals. One hunter even specifically said that he was forced to hunt because his household did not raise animals. Smaller animals including chickens and ducks were raised for home consumption whereas larger animals such as cattle and pigs were domesticated as a reserve of value for households. Cattle did, though, also provide use value for households, seen in the production of milk for home consumption.

As stated above, increasingly small landholders are turning to cattle production in Amazonia. Salisbury (2002) found that this is also occurring within one of the ten communities of the settlement PDS São Salvador. Generally, cattle implies deforestation in Amazonian environments that are ill suited for long-term cattle production. The prospects of increasing cattle production may not fit within the management framework of a sustainable development settlement as was envisioned by INCRA and NGOs in the creation of PDS São Salvador. In spite of this, households in this study who raised cattle
were less likely to hunt than households that did not have cattle. The paradox is that while plant diversity decreases with conversion of forestland to pasture, wild animal resources in the area may be protected (not hunted as frequently) as households domesticate cattle. It is unlikely though, that increasing cattle production for residents in the area is a strategy that resource managers are likely to (or should) pursue.

Next, gender relationships within the household were investigated. Hunting was found to be overwhelmingly a culturally-coded male activity within the seringal. The forest environment where most hunting activity occurred in the settlement had traditionally (since the rubber era) been reserved as a space for men. Men were said to work in the forest; women in the house. Both men and women spoke of the dangers that the forest held, including snakes and mythological creatures that women were supposedly incapable of confronting. For their part, women seemed content to let their men wander around the forest in the pursuit of wild game, an often physically draining all-day activity.

An integral aspect of the gender-defined roles of men in the household and community was wrapped into hunting activity. Part of the socialization process of becoming a man meant that adolescent boys were taught the ways and means of hunting by their elder kin in the household and community. Hypothesis testing showed that households that had adolescent boys hunted with greater frequency than those households that did not have adolescent residents. Boys progressed from firing slingshots at birds near their houses, to pastorar close to their houses with their elder brothers or adolescent boys from other households in the community, to accompanying their fathers, uncles or older brothers on hunting outings, to finally hunting alone in the forest by their late
teenage years. This progression coincided with the progress of a boy becoming a man in the eyes of the community, as adolescent boys became marriage eligible around the time that they began to hunt on their own.

Men specialized in productive pursuits and women took care of the household’s reproductive needs while also participating in productive household activities. Men took the lead in hunting, the care of the household’s large animals (cattle, pigs), the sale of household products, and were hired as laborers in the seringal. Women cooked, washed clothes/dishes, cared for children, cared for chickens, and also engaged in the productive activities of fishing, and making farinha that was the main income source for the majority of households in the settlement. The spot sampling data showed that men spent 40% of their time in productive activities and 14.5% in reproductive activities, whereas for women the numbers were almost the exact opposite: 40% in reproductive work and 13.5% in productive work.

The practice of the hunt elevated the status of men in the household, as the product of hunting, wild game, held a special place in the food preferences of residents in the settlement. Game meat was the most appreciated food in the seringal (Wolff 1999). Residents of PDS São Salvador often stated to me if they lacked meat to eat that they had “nothing” to eat. Animal meat was required at all festas in the settlement, with men of the hosting households hunting one or two days prior to celebrations in order to provide meat for their guests. Women’s work did not afford similar opportunities to acquire the special status that men achieved through the performance of the hunt.

Some households hunted because they were more emotionally committed to hunting as an important part of the overall livelihood strategy for the household. A
Pearson correlation showed a high degree of statistical association between the independent variable “emotional commitment to hunting” and the dependent variable “frequency of hunting”. Many hunters derived satisfaction from hunting in the forested areas of the settlement that allowed them to escape the daily pressures of their households and community. Hunting for these men was much more than a means to provide food for the dinner table or a social obligation related to their manhood, but a form of recreation and relaxation. Some hunters stated they would not cease the practice of hunting even if they had substitute sources of meat available for their family. It is unclear if these households would lessen their hunting output if they raised domestic livestock.

Finally, we investigated the seasonal nature of hunting in the settlement. Most hunters replied that they hunted more often in the wet, winter season (late November to early May) than in the dry season. Animal tracks were visible in the mud of the forest floor in winter, and agricultural activity dramatically slowed in winter affording men more opportunity to hunt. Along the Moa River, several months in winter (February through April) are known as mau de rancho (bad for food), with both fish and agricultural food sources declining, requiring men to pursue wild animals to feed household members. In addition, many trees fruit in winter attracting animals, thus serving as a focal point for hunting activity.

The environment played a key role in the yearly cycle of livelihood strategies of households in the settlement. In general, households were concerned with production (farinha) in the summer months, and consumption in winter. In the study spot sample data, adults spent almost three times as much time devoted to productive activities in dry
weather as they did when it is raining, yet more time in reproductive activities when it was wet outside (28.1%) than they did when there were clear skies (24.7%).

Hunting output by households in PDS São Salvador reflected multiple intra-household influences. The importance of wild game as a food source for rural households cannot be overstated, yet as we see above, there were other factors that critically affected hunting behavior by peasant households. Hunting and gender roles and relationships were interwoven within the household and as such, reflect a negotiation by members of the household. Yes, men in the aggregate were the hunters, but women’s work in insuring that the reproductive needs of household members were met was critical in the opportunity men have to hunt. Women were also important producers of food resources for the household. Men and women of the settlement said that men hunted while women fished. One male resident from the community of Rio Azul stated specifically that he did not have to hunt because his wife fished. He, himself, concentrated in the production of farinha and other agricultural pursuits because his wife participated in supplying other food resources for the households.

Some men hunt because it was an enjoyable activity for them. These are the men that had hunting in their blood\(^{16}\) (*jeito*), satisfied with their hunting lifestyle. It would be interesting to question these men in the future to see if their hunting output did change, and if it did, the reasons for this change. Maybe increasing agricultural work, or an increase in animal domestication, leads to a decrease in hunting frequency, or conversely, more children leads to increased hunting activity?

\(^{16}\) Hell (1996) reports that European hunters also refer to hunting as being in the blood. Some of these hunters use the metaphor of ‘black blood’ related to ‘hunting fever’.
The regression models indicated that cultural and gender variables had a much greater effect on a household’s hunting output than did material variables. This indicated that the performance of the hunt satisfied other desires and preferences of the household than simply capturing the product of the hunt (game meat) to feed the household. Hunting is a cultural practice in the settlement that brought satisfaction to those individuals that engaged in this activity while also conferring the status of manhood on these practitioners of hunting. Furthermore, the product of the hunt, game meat, not only tastes good, but has elevated importance in the food preferences of residents of the settlement. Plant foods and fish do not infer the same dietary status as does animal meat. Therefore, households hunt primarily as a matter of choice because they desire to do so, because it is a masculine defined activity, and because “game meat is the best food,” rather than out of necessity to feed the members of the family.
CHAPTER 5
HUNTING ACROSS HOUSEHOLDS (INTER-HOUSEHOLD)

The previous chapter explored hunting as a function of intra-household relationships. In this chapter, we will investigate how relationships between different households within the community (inter-household) affect the practice of hunting. This will include an examination of group hunting by individuals from several different households in the community. Hunting outing data from two communities, Rio Azul and Boa Vista, will be explored to uncover the nature of group hunts by members of different households. We will also look at meat exchange amongst households and the symbolic and social importance that it holds for peasant households.

Here we will also test hypotheses raised in Chapter 1 that were posed to explain inter-household hunting behavior. Hypotheses testing will include T-tests of mean values for inter-household variables. Finally, linear regression will be used to model the dependent variable, frequency of hunting, explained by the inter-household variables analyzed in this chapter.

Hunting Across Households

In the previous chapter the three hunting techniques that individual hunters use in the settlement were discussed. Here we look at the fourth common technique of hunting that hunters employed in their pursuit of wild game in PDS São Salvador, that of group hunts which included hunters from several households in the community.

Hunters in PDS São Salvador infrequently used extended, overnight hunting outings lasting several days to about a week. Hunters spoke of walking six to ten hours
to reach *o centro* (the center)\(^1\), an uninhabited area in the southern part of the seringal that had been deemed a hunting reserve by the residents of PDS São Salvador. Hunters that lived in the northern part of the settlement (communities of Timbaubá, Conceição, and São Pedro) made these trips to the forested area of the settlement that bordered the Nukini Indigenous Reserve. This area was rife with tension as the boundary between indigenous reserve and settlement was not marked, and occasionally both indigenous and peasant hunters accused the other of treading on their territory. This is also an area where outsiders from urban areas (principally Mâncio Lima) came to hunt. Residents of PDS São Salvador had denounced this practice of non-resident hunting to IBAMA, but it was difficult for the authorities to intercept illegal hunting activity as it was occurring, and few of these illegal hunters were ever prosecuted. Inhabitants of the settlement had also been threatened with retaliation by these illegal hunters if they were summoned to the offices of IBAMA in Cruzeiro do Sul, resulting from complaints lodged by settlement residents.

Hunters from the settlement indicated that in the past when the population density in the area was not as great, there was little need to trek deep into the forest to capture wild game, as a short distance from one’s house a hunter would invariably encounter a potential meal for his family. Seu Paolo of Boa Vista, pointing to an area around 100 meters from his front porch, lamented the fact that just a decade ago, bands of queixada would sometimes run through the area, and residents of the community would quickly grab their guns to kill their meal for the next few days. Hunters would invariably shoot

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\(^1\) The term *o centro* is a generic phrase used in Amazonia indicating an area that is in the interior away from the river (as distinct from *a beira*, the riverside), but not necessarily in the center of anything. In this case, though, when hunters in PDS São Salvador spoke of walking to reach *o centro* they were, in fact, walking to the southern center of the settlement.
as many animals as they had bullets available, providing a feast for the entire community. A study conducted by Fragoso et al. (2002) of wildlife and hunting practices in the area suggested that some animal species had become locally extinct as a result of hunting pressure exerted on wild game by the residents of PDS São Salvador. Trekking to these far away hunting areas widened the range in the seringal where game was harvested and might help replenish stocks of wild animals close to settlement areas that were being rapidly depleted through excessive hunting. Conversely, hunting within a greater geographical range also increased the area where wild game was hunted, which might deplete animal resources throughout a wider area.

These extended hunting trips normally occurred during the rainy season (especially January to early May) when the demands of agricultural work were minimal, and men could afford to leave their families for several days at a time. Also, during the late winter months of February through April, food was harder to procure for households in the seringal, and many trees in the forest were fruiting, attracting wild animals, thus making hunting an attractive alternative for households in the seringal. In the months of February and March in 2004, hunters in the community of Boa Vista told me that they were preparing to make overnight hunting trips because there was no food available in the community.

Generally several hunters would join forces on these overnight hunting trips into the forest. Most hunters in a group walked along paths that they are familiar with to hunting sites where they camped for several days. Hunters from the community of Boa Vista, though, used a compass as a guide during these outings. A base camp was erected by the group, from which these men ventured out during the day, returning before
nightfall. Hunters generally hunted individually during the day, joining for a lunch break, and returned to the base camp as daylight fell. Hunters packed farinha to eat, and salt for their kills, during these hunts. Hunters would also sometimes bring an armadilha with them to set at night in the forest when they were sleeping.

Some hunters, although it is illegal according to community rules, brought their dogs with them on these hunting outings. Frequently hunters would capture prey with dogs in instances where they might not have otherwise, as a result of their dogs chasing and confining animals in the forest. Dogs can corner prey such as paca and tatu, preventing them from burrowing into a downed log or hole in the ground. In one community in the settlement there was anger from one familial group directed at another, with strong accusations of hunting with dogs levied towards the offending family. A hunter from the community of Girrassol blamed the paucity of animals in the settlement on the use of hunting dogs. He said that after the fall of the rubber economy in the area by the early 1990s, households turned to the sale of wild game as the principal means of renda familiar (household income), with hunters principally using their dogs in the seringal. As a result of the success in hunting prey with dogs, there were fewer animals in the forest in 2005. The hunting of wildlife with dogs was a long-standing practice within the seringal (Melo 2000), but was slowly waning through the education program directed at conserving wildlife in the area, under the auspices of PESACRE, a Brazilian NGO operating within the state of Acre.

Group hunts almost always consisted of men from different households within a community that were related by kin. Often these were brothers or brother-in-laws from

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2 Other hunters said that dogs scare away (espanta) prey and therefore, they did not use them when hunting.
two or more households. Generally elder men of the household (over 40 years of age) did not participate in this type of hunting outing. This manner of hunting required the strength and stamina of younger men who were required to carry on their backs all of the material needed to sustain themselves for several days to a week, and then return to their households with their prey on their backs. Hunters cut off the heads of large animals captured during these trips, and gutted their prey, leaving the heads and entails in the forest to lighten the load they had to carry back to their households.

These hunting trips afford the opportunity for binding friendships amongst men of different households within the community. Often men who traded days of labor in agriculture with one another (troca dias) were the same ones who made these extended hunting trips together. Households that trade days of labor with one another were family related. A Pearson correlation shows that there was a statistically significant (positive) relationship between hunting frequency and trading labor days with other households in the community (r = .309, p ≤ .017). These trips also importantly provided food for the families of the hunters for several days during a time when food resources were difficult to attain in the seringal. Generally when hunters returned to their communities after several days of overnight hunting, they brought with them enough wild game to feed their families (and those of relatives in the community with whom they exchanged meat) for several days.

These extended hunting trips were a chance for both husband and wife to have individual time separate from their spouse (and the community). Wives of the hunters

---

3 None of the households in the settlement have burros or horses.

4 Male hunters in Michigan also stated that an added benefit of hunting was that they were able to escape the women (mainly their wives) in their lives (Fine 2000).
would frequently travel to the city while their husbands were hunting in the forest, returning to their homes in the settlement when their husbands were scheduled to arrive from the forest.

Several hunting households in two communities, Boa Vista and Rio Azul, were sampled for seven consecutive (randomly selected) days per month over a consecutive four month period from January 2004 through April 2004, to measure their hunting activity – hunting frequency, hunting method (solo, group, extended over-night), and number and kind of animal kills. Four hunting households were followed in Boa Vista, and three hunting households were sampled in Rio Azul. Figure 5.1 shows the number of hunting outings per household by community for this four month period.

Hunting activity peaked in March for both communities and was lowest in April for both communities. Mid-way through the sampled week of April 2004 in the community of Rio Azul, the community members suddenly caught a large quantity of fish on a daily
basis, and subsequently all hunting activity stopped during this period. The fishing take was much greater than the wild game from the forest that hunters had been returning with to their households, so the hunters joined their wives in pulling fish from the Moa River.

Six of the seven hunting households reported that they hunted more frequently in the winter months than during the dry season. Hunting activity overall for this four month, winter period was greater than the yearly, monthly averages reported by each of these seven households. This is consistent with what has been reported for peasants in the Juruá Extractive Reserve in western Acre, where hunting activity also peaks during the rainy season (da Cunha and de Almeida 2002). One hunter (household #2 in Boa Vista) stated that he only hunts in the winter when he is not burdened with agricultural work.

Hunting output was different between these hunting households in the two communities of Rio Azul and Boa Vista (see Table 5.1). The three hunting households in Rio Azul hunted more during the four month period (34 total hunting outings) and showed a much greater projected frequency of hunting/month than did the four hunting households in Boa Vista (14 hunting outings).

<table>
<thead>
<tr>
<th>Table 5-1: Frequency of Hunting per Household by Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>Boa Vista</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(sub-total)</td>
</tr>
<tr>
<td>Rio Azul</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>(sub-total)</td>
</tr>
</tbody>
</table>

* Only hunted in winter.
# Hunted more in winter.
The method of hunting also varied between the two communities as shown in Figure 5.2. Hunters in Boa Vista hunted more often with members of other households (8 hunting outings) than they did solo (6 hunting outings), whereas the opposite was true in Rio Azul (25 solo hunting outings and 9 group hunting outings). Only hunters in Boa Vista made overnight, extended stay hunting trips. Group hunts in both communities and overnight hunting trips in Boa Vista were more frequently made with kin from other households in the community than with non-kin hunting partners (groups hunts = 12 of 17 hunting outings with kin, 70.6%; over-night = 4 of 5 hunting outings with kin, 80%).

Figure 5.3 shows hunting success per hunting household by community over the four month period. The trend was for hunting success to decline over the four month period in both communities, with the month of April the least successful hunting month in both. April though, was also the month with the lowest frequency of hunting activity, so one would expect hunting yields to decline as hunting activity was declining. The
The greatest success of hunting kills occurred in the months of January and February in both communities.

Another trend was that the overwhelming majority of successful hunting outings entailed the kill of small animals (*embiara*) in both communities: Boa Vista = 34 of 43 kills (79.1%); Rio Azul = 53 of 57 kills (93%). See Figure 5.4 below.

There was a difference in the type of animal that was successfully hunted in each community. In the community of Boa Vista, 31 mammals (72.1% of all kills), 11 birds (25.6%), and one reptile (2.3%) were hunted. The opposite situation occurred in Rio Azul with hunters taking more birds (30 = 52.6% of all kills), than mammals (26 = 45.6%), and one reptile (1.8%).

Figure 5-3: Hunting Success per Household by Community

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The difference in the types of animals hunted between the two communities may be explained by the difference in the method of hunting. Hunters in Boa Vista that made overnight, extended-stay hunting journeys saved their bullets for larger animals, often refusing to shoot at smaller prey birds that they encountered while away from their households for several days. These extended-stay, hunting journeys were taken with the idea to return to the community with enough wild game to feed the hunters’ households for several days, so using the few bullets that hunters carried with them hunting birds defeated this hunting agenda. On the other hand, hunters in Rio Azul did not take overnight hunting trips, instead making opportunistic single day hunting trips, shooting at the first animals that they encountered (whatever the size of the animal). They were more focused on returning with that night’s meal for the household rather than on capturing several days worth of food.
Overall, the hunters in Boa Vista had better success measured by kills/hunting outing (43 kills/14 hunting outings = 3.1 kills/outing) than did hunters in Rio Azul (57 kills/34 hunting outings = 1.7 kills/outing). Hunters in Boa Vista also took a much greater percentage of larger animals (9 of 43 kills = 20.9% of all kills) than did hunters in Rio Azul (4 of 57 kills = 7% of all kills). Only two hunting households in this sample successfully hunted large animals: house #3 in Boa Vista and house #6 in Rio Azul. In addition, over-night, extended stay, group hunters brought a much larger bounty of game meat/hunting outing (31 kills/5 hunting outings = 6.2 kills/outing) than did day hunts (65 kills/43 hunting outings = 1.5 kills/outing).

Differences in the success and size of game successfully hunted in the two communities probably were a function of the location of hunting and method of hunting used by hunters from the different communities. As mentioned above, hunters in the community of Boa Vista that made overnight, extended-stay hunting trips hiked six to ten hours to an uninhabited area of the settlement called o centro- an area that had greater stocks of large game than did areas closer to community centers where the majority of hunting occurred for hunters in the community of Rio Azul. These multi-day hunting trips afforded hunters the opportunity to come into contact with larger animals for longer periods of time. This, combined with their intent to capture large animals to provide meat for their families for several days, meant that hunters in Boa Vista returned to their households with a greater percentage of large animals than did hunters from the community of Rio Azul. In addition, these hunting trips lasting several days were taken with the sole objective of returning to the community with a large quantity of game meat, and hunters were unencumbered with other work and social obligations. With single day
hunting outings, hunters would sometimes leave their homes in the early morning, returning by mid afternoon to resume other work obligations (agriculture or fishing). Therefore, the amount of time per day devoted to hunting was less in the community of Rio Azul than in Boa Vista over the sampled time period.

Table 5.2 shows hunting success by household. Household #2 of Boa Vista was the most successful hunting household in the sample based on the number of animals killed/hunting outing (5 kills/outing). Household #3 in Boa Vista had the most kills (22) of all of the hunting households in the two communities. Household #6 was the most successful hunting household in Rio Azul in terms of number of animals killed (21) and hunting kills/outing (21 kills/8 outings = 2.6 kills/outing). Lote, of household #6, was the acknowledged best hunter in the community; another adult male from another household in the community told me it was rare for him to return from a day of hunting in the forest empty handed.

Table 5-2: Hunting Success/Household

<table>
<thead>
<tr>
<th>Community</th>
<th>Household</th>
<th>No. of Kills</th>
<th>No. of Outings</th>
<th>No. of Kills/outing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boa Vista</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>.67</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>15</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>22</td>
<td>5</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>(sub-total)</td>
<td>43</td>
<td>14</td>
<td>2.8</td>
</tr>
<tr>
<td>Rio Azul</td>
<td>5</td>
<td>15</td>
<td>12</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>21</td>
<td>8</td>
<td>2.6</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>21</td>
<td>14</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>(sub-total)</td>
<td>57</td>
<td>34</td>
<td>1.8</td>
</tr>
</tbody>
</table>

Meat Exchange

Meat exchange was an integral part of the set of social relations that existed between households in the community. This form of exchange extended, and helped maintain, a household’s social contact with neighbors in the community. This form of
non-market exchange is a public spectacle that is contrasted with the often secret exchange found in the marketplace (Gudeman and Rivera 1990). Market transactions that entail the transfer of money for goods and/or services, frequently involve only the buyer and seller, whereas the exchange of game meat between rural households is an open transaction that many different actors from different households view and partake in. The ability of a household to give meat to other households signifies first, prestige to the producer of the wild game (the hunter and his household), second, that social obligations between households have been met by the giving household, and third, that the receiving household has publicly received a “gift” and must reciprocate at some future date to the giving household. Further, as Douglas (1990) states, these informal exchanges operate where the market is absent. This was the duality of peasant existence in PDS São Salvador that integrated non-market and market transactions within the livelihood system of peasant households.

As Marcel Mauss (1990) wrote of the exchange of gifts between households, the exchange of meat between households involves a three-part process – to give, to receive, and to reciprocate. Participants in this revolving process are first obligated to give game meat to kin or other households in the community. Households are required to share their bounty of wild game with other members of the community, and the hording of meat is despised by neighbors.

Households in PDS São Salvador were also expected to accept wild game that is offered to them by others in the community. It is considered an offense to the offering party if a “gift” of meat is refused. Refusing an offering of wild game from another household in the community signifies that one is refusing to engage in social interaction
with other members of the community. This is looked upon as a breach of community trust, and the offending party is viewed as appearing to stand outside of the cultural norms of the community. This very infrequently occurs, though, as the receiving household is generally happy to accept a tasty reward of wild game from their neighbors.

The receiving household, in a sense, is consuming the material rewards of the other. Game meat is given to households that are expected to reciprocate in the partitioning of wild game in the future. Failure to reciprocate is a breach of this informal contract, as is the failure to receive, mentioned above. Therefore, the system operates with both households acting in all roles (giving, receiving, and reciprocating) within this social system of exchange. Meat exchange helps to insure the survival of all members of the community as this rotating system of consumption feeds different households within the community. This system also fits within Scott’s moral economy of the peasant (1976) that acts as a leveling mechanism in wealth and consumption between households in the community.

If a wild game receiving household in PDS São Salvador was not a hunting household, there were other means by which this non-hunting household could reciprocate its obligations to hunting households. This might include returning fish resources, or giving part of the meat from a domesticated animal (normally chickens or ducks) to the hunting household that earlier gave part of its hunt to the non-hunting household. A household’s marketable agricultural products were rarely exchanged

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5 Larger domesticated animals such as pigs and cattle were generally viewed as a type of investment by the household and as such, the meat from these animals was normally not distributed to other households as payment of a household’s obligations. Cattle and pigs were usually slaughtered for sale, or during festas (parties) for the church, a school, a wedding, or a birthday.
between households, signifying the division that existed between market and non-market products and transactions.

Most households partitioned game meat to other households in the community based on three factors: 1) individuals involved in the hunting party, 2) the size of the kill, and 3) kin relationship between households. Any successful kill from a hunting outing was first equally divided amongst the hunters in a hunting party if there was sufficient meat to spread around. Then, if there was enough meat left to give to other households in the community, meat was further subdivided to selected households that were nearly always related by blood or marriage.

Most hunting households stipulated that the amount of meat they gave to other households *depende do tamanho do bicho* (depended on the size of the animal). If a single individual hunter returned to the community with a small animal (called *embiara*) such as cutia (*Dasyprocta fuliginosa*), pacu (*Agouti paca*), or quatipuru (*Sciuridae sp.*), or one of the commonly hunted birds in the seringal, including jacu (*Penelope jacquaou*), jacamim (*Psophia leucoptera*), papagaio (*Psittacidae sp.*), or nambu galinha (*Tinamus guttatus*), his family would keep the entire hunt. These hunts provided a single meal for the family, but often the hunter had to return to the forest to hunt on the following day to put food on the table. With larger animals including queixada (*Tayassu pecari*), veado (*Mazama americana*), catitu (*Tayassu tajacu*), and capibara (*Hydrochaeris hydrochaeris*), the household of the successful hunter would either keep *uma banda* (one-half of the animal) or *um quarto* (one-fourth of the animal). Whether the household kept one-half, or one-fourth, of the meat of the hunted animal depended upon how many households in the community were connected to the meat-giving household within the
system of reciprocal exchange of wild game. Several households replied that they kept
the same amount of meat that they partitioned to other households, so that every
household had the same amount of meat. One household stipulated that they gave the
same quantity of meat to other households that they received in return.

Kin were usually the channel of meat exchange and thus, an important part of the
channel of social relations within the community. Table 5.3 shows which household’s
game meat was exchanged within the community. Eighty percent of households that
hunted in the survey (39 of 49 hunting households) exchanged meat with households that
were related through kin. Only 7 hunting households (14.3%) reported that (in addition
to exchanging with kin related households) they shared wild game with households that
were not related by kin. The one hunting household that did not share game meat did
not have kin residing within the community.

Table 5-3: Meat Sharing by Relation to Giving Household

<table>
<thead>
<tr>
<th>Kin Related</th>
<th>Any Household</th>
<th>Not Share</th>
<th>No Response Given</th>
</tr>
</thead>
<tbody>
<tr>
<td>39 (80.0%)</td>
<td>7 (14.3%)</td>
<td>1 (2%)</td>
<td>2 (4.1%)</td>
</tr>
</tbody>
</table>

Women in peasant Amazonian communities are important actors in this system of
inter-household relationships (Harris 2000). Although it is men who hunt wild game and
bring it back to their household, women cut, clean, cook, and partition meat to theirs, and
frequently, other households in the community. Of the 49 households that hunted in the
sample data, women participated in the sharing of wild game to other households in the
community in 35 (71.4%) of the hunting households. Table 5.4 shows the gender
breakdown of meat division within hunting households interviewed in the study. Only

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6 Three of these seven households did not have kin of either the husband or wife that lived in the
community, yet they still exchanged wild game with their neighbors.
one hunting household (2% of hunting households) did not share game meat with other households.

Table 5-4: Sharing of Wild Game by Gender within Hunting Households

<table>
<thead>
<tr>
<th></th>
<th>Men Only</th>
<th>Women Only</th>
<th>Both</th>
<th>Does not Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>13 (26.5%)</td>
<td>12 (24.5%)</td>
<td>23 (46.9%)</td>
<td>1 (2.0%)</td>
</tr>
</tbody>
</table>

Some individuals in PDS São Salvador complained that other households did not share wild game with them. In one community in PDS São Salvador, the two different family groups, though related through inter-marriage, were feuding and did not reciprocate in the partitioning of wild game with the other family. One woman in this community said that the other family group sometimes hid their successful hunt from her family group (thus a breach of the public spectacle of meat exchange within the community) so as to not be burdened with sharing meat with their neighbors. In another community, a sister from one household, and a brother from another household, had been arguing for a period of a few days. One evening the brother returned from a hunt with a few birds and a small monkey. Meat was given to the households of his other sister and three brothers who lived in the community, but not to the household of his sister with whom he was feuding. The spouse of the brother who hunted the birds and monkey, in support of her husband, said of her sister-in-law, “Ela não vai comer hoje.” (She is not going to eat today.) A common manner of showing displeasure and of punishing another household (or individual) was to refuse to share hunted game with the offending household (or individual).
Figure 5-5: Woman Cleaning Paca (*Agouti paca*) Hunted by Her Husband.

It has been reported elsewhere in Amazonia that men from different households would sometimes give meat to their female lovers living in other households within the community (Chagnon 1968; Siskind 1973; Kensinger 1981). Siskind (1973) called this the reciprocal exchange of meat for sex. In one community in PDS São Salvador, residents complained that this occurred between a married man of one household and his married female lover from another household. Family of the spouses of the adulterous couple stated that the adulterous man would only hunt when his female lover requested that he bring her meat. They said that he was generally lazy, but quickly responded to the demands of his female lover. The adulterous couple was eventually forced out of the community by the families of the jilted wife of one household and jilted husband of the other.
Inter-household Hypotheses on Hunting

As is seen above, the practice of hunting in the settlement was not only determined by relationships within individual households, but in addition was critically affected by inter-household community norms, obligations, and relationships. Group hunts joined men from several different households in the community, and overnight hunting activity necessitated men from several households being away from their communities for up to a week at a time. Most of the men participating in these types of hunting activity were linked by relations of kin across households in the community. Further, meat exchange between households was based on cultural responsibilities of community, informally enforced by members of the community. An acknowledgment of these practices was critical to understanding how relationships between households influenced the practice of the hunt within the peasant communities of the seringal.

Here we test the two hypotheses stated in Chapter 1 to account for the influence of inter-household relationships on the practice of hunting in PDS São Salvador. Both hypothesis 8 and 9 were based on the assumption of cultural norms that join households together, as were reflected in the practice of the hunt. Hypothesis 8 stated that households that were grouped together in clusters within the community would hunt with greater frequency than households that were not grouped together within the community. This is based on the sharing of resources (specifically game meat) between households within the community that is the norm for Amazonian peasant households (Harris 2000). Households that are in close, daily contact interact with greater frequency in the public display of hunting and reciprocal meat exchange, encourage hunters to repay their obligations to other households in an effort to maintain their standing within the community.
During the rubber era along the Moa River, houses were widely spaced, situated in the interior of each household’s colocação, and often members of different households did not come into contact on a daily basis. With the collapse of the rubber economy in the area, households moved out of the forest to the margins of the waterways that cut through the seringal, and within close proximity of other houses (normally kin related to one another). Households began to cluster into small single-family groups which only very recently coalesced into communities of several family groups. In this study, houses that had a clear line of sight to other houses in the community were considered to be clusters of households.

Thirty-five of the 59 households sampled in this study were situated within eyesight of another house in the community. A T-test was performed to test the mean values of clustered houses in relation to houses that were not grouped together. The relationship indicated that houses that were not grouped together actually hunted with a greater frequency/month (2.25 times/month) than did houses that were clustered together (1.97 times/month). The relationship of clustered houses did not prove to be statistically significant (n = 35, df = 57, p ≤ .399) and Levine’s test showed that equal variances were assumed between the two populations (F = 1.104, p ≤ .298).

Hypothesis 9 affirmed that households that had family living within the community will hunt more often than households that did not have family living within the community. As we have seen above, group hunting and meat exchange were frequently kin based; therefore, having family reside in the community should exert increased influence on the output of hunting by individual households in order to maintain and nourish these inter-household relationships. Hunting is a form of non-market exchange
between households that joins family from different households, as opposed to market transactions that increasingly fall within the realm of individual households. Non-market products (wild game, fish, small domesticated animals) are exchanged between households, whereas market products (farinha, large domesticated animals) generally are not.

A T-test was run to test whether or not a household had family residing in other households in the community affected their output of hunting. Since it was men who hunted together in the settlement, the mean values of households having kin of the men of the household were used in the comparison of hunting frequency. Thirty-six households fit this criteria (having male kin in other households), but the relationship showed that non-kin households hunted more often (2.30/month) than households that have kin living in the community (1.94/month). The relationship was not statistically significant (n = 36, df = 57, p ≤ .276) and equal variances within the two populations were assumed (F = .147, p ≤ .702).

It is possible that because of the reciprocal exchange of wild game between households that is centered on kin relationships within the community, isolated households (not in clusters) and households that did not have kin living close by were further removed from the transaction of sharing meat between households and therefore, had to hunt with greater frequency to supply meat for their families. In conclusion, although neither hypotheses 8 or 9 proved to be statistically significant, there were other indicators of inter-household influences that affected an individual household’s output of hunting that did hold statistical significance. Some households in the seringal hunted with men from other households in the community, while others chose not to. We might
expect that households that hunted together would do so with greater frequency due to inter-household bonds that were sustained between households in the community (partly through inter-household hunting relationships) as well as reciprocation between these households such as occurred in meat exchange explained above. Households that did hunt with members of other households did prove to be highly significant in predicting hunting frequency (n = 35, df = 57, p ≤ .000).

In addition, as stated above, often households that traded work days in agricultural labor were households that also hunt together. The mean values of the 41 households trading labor days confirmed that households who did trade labor days hunted with greater frequency/month (2.39) than did households that did not trade labor days (1.54). Further, the comparison was highly significant (n = 41, df = 57, p ≤ .017).

Modeling Inter-household Hunting Relationships

As was the case in the previous chapter, multivariate linear regression was used to model the affects of inter-household variables on the dependent variable, frequency of hunting. Tests for multicollinearity of the independent inter-household variables (“see houses”, “kin in community”, “trade work days”, and “hunt with others”) were run before preceding with the regression models. A Chi-square test showed a high degree of association between the variables “trade work days” and “hunt with others” ($\chi^2 = 10.681$, p ≤ .001). T-tests run on the mean values of both of these variables also showed high statistical significance. I theorize that kin relationships between households in the community that involve trading labor days between different households in the community lead to households hunting more frequently with other households. Trading labor days and hunting with others are examples of social exchange between households and both are forms of non-market transactions. It is also possible, though, that this
relationship works in the opposite direction with households that hunt together influencing labor exchange.

Multiple regression was used to model the effects of the inter-household variables on the dependent variable “frequency of hunting.” The variables “see houses”, “kin living in other households”, and “hunt with others” were entered in Model 1. Model 2 included the variables “see houses”, “kin living in other households”, and “trade work days.” Table 5.5 presents the results of the regression models.

Table 5-5: Multivariate Regression Modeling of Inter-household Influence on Frequency of Hunting

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: β-coefficients</th>
<th>Model 2: β-coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>See houses</td>
<td>-.219**</td>
<td>-.127</td>
</tr>
<tr>
<td>Kin in community</td>
<td>-.150</td>
<td>-.209</td>
</tr>
<tr>
<td>Hunt with others</td>
<td>.594***</td>
<td></td>
</tr>
<tr>
<td>Trade work days</td>
<td></td>
<td>.333**</td>
</tr>
</tbody>
</table>

Observations 59 59
Adjusted $r^2$ .351*** .101**

Significant at $p \leq 0.10$; ** significant at $p \leq 0.05$; *** significant at $p \leq 0.01$.

In Model 1, the independent variable, “hunting with others” proved to be highly significant ($p \leq .01$). The variable “see houses”, measuring the clustering of households within the community, was significant, but in the opposite direction that was hypothesized. The β-coefficient value of -.219 for the variable “see houses” means that as this variable decreased by 21.9%, the frequency of hunting increased by a factor of 1. The variable “kin in community” also showed a corresponding negative relationship with the independent variable, likewise the opposite of what was hypothesized in chapter 1. Model 1 did prove to be highly significant with 35.1% of the variance in the independent variable, “frequency of hunting,” explained by the independent variables that comprised the model ($r^2 = .351$, $p \leq .01$). Model 2, interchanging the variable “trade work days” for
“hunt with others,” had much less explanatory power of the variance in the frequency of hunting ($r^2 = .101, p \leq .05$) than did Model 1.

Overall, it appears from the data that inter-household hunting relationships are highly influenced by whether or not households hunt with other households (social) in the community. The variable “hunt with others” was the only variable that indicated a high degree of statistical significance ($p \leq .01$) while also greatly influencing the overall fit of the model. The high degree of association of the variable “trade work days” with the variable “hunt with others”, might indicate that this effect was largely due to households that hunted together rather than households that traded labor days. The two variables “see houses” (measuring the clustering affect of households in the community) and “kin living in the community” (in other households) proved to have the opposite influence (negative) on the frequency of hunting than was expected. As explained above, this may be the result of meat exchange patterns between households whereby households further removed from this reciprocal transaction (isolated households and households without kin in the community) were forced to hunt with greater frequency to provide meat for the household.

**Modeling Intra-household with Inter-household Effects on Hunting**

The hypotheses introduced in chapter 1 predicted that a household’s frequency of hunting was the result of the effects of relationships and processes occurring within the individual household joined with the influence of other households in the community. Here we combine the intra-household independent variables tested in the regression models of the previous chapter with the inter-household variables test in the regression models above.
Model 1 from the inter-household linear regression models (see page 186) explained 35.1% of the variance in the dependent variable, whereas the best fit of the intra-household regression models (model 3 – page 154) explained only 24.9% of the variance in a household’s frequency of hunting. Here we combined inter-household independent variables with intra-household independent variables in multivariate regression modeling. The multivariate models tested here included only those variables that consistently attained statistical significance throughout the range of intra-household and inter-household regression models previously tested. To avoid the problems of multicollinearity, the variables “trade work days” and “hunt with others” were measured separately in Models 1 and 2. Model 3 included those variables from Models 1 and 2 that reached statistical significance of at least \( p \leq 0.05 \). Table 5.6 presents the results of these regression models.

Table 5-6: Multivariate Regression Models (Intra-household and Inter-household)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1: β-coefficients</th>
<th>Model 2: β-coefficients</th>
<th>Model 3: β-coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male-headed</td>
<td>.181</td>
<td>.184*</td>
<td></td>
</tr>
<tr>
<td>Hunting age boys</td>
<td>.254**</td>
<td>.115</td>
<td>.053</td>
</tr>
<tr>
<td>Emotional commitment to hunting</td>
<td>.435***</td>
<td>.315***</td>
<td>.315***</td>
</tr>
<tr>
<td>Trade work days</td>
<td>.170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunt with others</td>
<td></td>
<td>.442***</td>
<td>.462***</td>
</tr>
<tr>
<td>Observations</td>
<td>59</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>Adjusted ( r^2 )</td>
<td>.263***</td>
<td>.396***</td>
<td>.375***</td>
</tr>
</tbody>
</table>

*Significant at \( p \leq 0.10 \); **significant at \( p \leq 0.05 \); ***significant at \( p \leq 0.01 \).

The output of the regression models that combined intra-household with inter-household independent variables as shown above in Table 5.6 was consistent with the models tested individually of the intra-household variables (Table 4.11) and inter-

7 These variables included “male-headed household”, “hunting age boys”, “emotional commitment to hunting”, “trade work days”, and “hunt with others”. 
household variables (Table 5.5). It appears that a few of the variables had a large impact in explaining the variance of a household’s frequency of hunting. Within an individual household, the “emotional commitment to hunting”, and between households in the community, the variable “hunting with other households,” had highly statistically significant effects on the dependent variable. Whether or not a household had domesticated animals or hunting age boys showed minor effects in explaining the variance in the dependent variable. The $\beta$-coefficient values for the variables “male-headed household” and “trade work days” indicated that these variables also had a positive influence on a household’s hunting frequency.

Regression modeling lends support to the suggestion that households in PDS São Salvador hunt primarily because that enjoy the activity of hunting (ie. they are “emotionally committed to hunting”) and because of the social relationships between households that are created and maintained with the practice of the hunt (“hunting with other households”). This is an important finding indicating that the livelihood systems of poor rural households are not predicated solely on the necessity of meeting the material needs of household members, but reflect the agency of rural households (that choose to participate in the practice of hunting) within the repertoire of possible livelihood options. While many households in PDS São Salvador are increasingly turning away from hunting as the culture of farinha takes hold in the area, other households continue to actively engage in the practice of hunting as the personal enjoyment and social relationships between households derived from this livelihood activity are integral elements of the cultural identity of these rural people.
Conclusion

Hunting is a key method of maintaining a household’s kin networks in the community. Although others report that kinship contact across households is women’s work (Di Leonardo 2000), within PDS São Salvador, both men and women of the household participated in the maintenance of kin relationships through the hunting ritual. Men fostered links with men from other households in the community through the practice of hunting wild game in the forested areas of the settlement. This was largely accomplished through group hunting efforts (single-day hunts or overnight, extended-stay hunts) comprised of men from two or more different households in the community. As shown above, the majority of these group hunts joined men related by familial ties. Women also maintained kin networks through the partitioning of game meat to other households in the community. Though the roles of men and women were gender stratified in the performance of the hunt, hunting as practiced within the settlement allowed both men and women to actively engage in the creation and maintenance of kin networks vital to a household’s (and community’s) survival.

Refusing to share wild game and play a role in the reciprocal obligations between households was an affront to cultural norms in the community. Households were chastised for being stingy if they did not reciprocate wild game with others in the community. Further, since the majority of households shared wild game with other households with which they were joined together through familial ties, the unwillingness to partake in the role-playing of meat exchange signified a transgression of kin relations. Kin relations were vital to the sustenance of households in the seringal as hunting and other forms of non-market exchange amongst households (i.e. trading labor days) are
integrated within the socio-economic framework of peasant livelihoods. Therefore, alienating familial bonds with other households was a risky venture.

The multiple regression models indicated that a household’s hunting frequency reflected the influences of both intra-household and inter-household variables. The more salient of these variables were those of the “emotional commitment of hunting” of the individual household, whether or not households “hunted with other households” in the community. The inter-household variable “trading work days” also had a positive influence on the variance of a household’s hunting frequency, as did the intra-household variables “hunting age boys” and “male-headed households”. The variables “see houses” and “domesticated animals” had a negative effect on the frequency of hunting, indicating that hunting frequency dropped as the number of a household’s domesticated animals increased.
In 1989, Parque Nacional Serra do Divisor (PNSD) was established along the border with Peru in western Acre. This area contains Brazil’s third highest diversity of primates, the greatest variety of palms in the world, and has been designated an area of highest biological value in the Amazon region, yet in 2004 was populated by 522 families with a population of around 3100 people (IEB 2004).¹ Brazilian Federal Law 9985/2000 prohibits people living within areas designated by the conservation category of National Park and therefore, an attempt was made to relocate residents of the area outside the bounds of the National Park. A multidisciplinary team of researchers from Brazil and the United States conducted fieldwork in 1999 along the Moa River (the current site of PDS São Salvador) that borders PNSD, looking for a potential site to move families that resided within the park. The State “discovered” that the Moa River was already settled with peasant families and that there was not sufficient land to support additional families from PNSD. This area was deemed a critical site in the buffer management of PNSD. Projeto Desenvolvimento Sustentável (PDS) São Salvador was thus established in 2000 in an attempt to conserve the natural resources of PNSD.

The agenda of the newly created sustainable development settlement project (PDS São Salvador), the first of its kind within Brazil, was to manage natural resources in order to enhance the ecological and social sustainability of the region. The management of

¹ The Government of Acre in 2000 (ZEE 2000b) estimated the number of inhabitants living in PNSD to be approximately 5785 people. The lower population estimate of IEB might be accounted for by migration of individuals out of PNSD.
fauna, which has a critical function in the livelihood strategies of residents of PDS São Salvador, was recognized by policy makers and local inhabitants as crucial in meeting the goals of sustainability for present and future generations within the settlement and in the surrounding areas including PNSD. Animal resources must be managed sustainably in order to meet ecological needs of the forest ecosystem as well as human needs derived from wild game. Furthermore, wildlife will only be conserved if hunting is sustainable.

Millions of peasants in the Amazon basin rely on wild game to supply a large percentage of the protein intake in their diets. Rural households often do not have substitutes for the meat from wild game and therefore, must rely on their hunting prowess to supply the necessary calories and protein intake for their families. Hunting continues to be an integral part of the livelihood strategy of rural peasant households throughout Amazonia, yet there is a paucity of literature pertaining to hunting by the peasantry in Amazonia.

This dissertation grew out of an attempt to understand the motivations of hunting by peasant households living along the Moa River in western Acre. The household is the appropriate locus of hunting by Amazonian peasants as the practice of the hunt does not reside with the individual hunter himself/herself, but results from a negotiation of interests and needs by family members. Furthermore, it is here, at the level of the household, that livelihoods are created and maintained by rural peoples. It is argued here that the practice of hunting by the peasantry in Amazonia reflects the nature of relationships amongst individuals within the household (intra-household) and between households in the community (inter-household). Intra-household relationships reflect the material realities of the household, gender dynamics within the household, and the
emotional commitment to hunting by the household. Inter-household effects on hunting result from social obligations between households in the community, often joined by kin relations.

Working with 59 households in PDS São Salvador, in six different communities, I employed a variety of methods in the attempt to understand the practice of the hunt by households in the settlement. Household surveys, productive/reproductive surveys of the work of adult household members, spot sampling of adult activities, hunting outing surveys, and participant observation were the tools used to uncover hunting practice by households sampled in the study. This dissertation began with a review of how the livelihoods of residents of the settlement have rapidly changed within the past two decades. The movement from rubber tapping to small-scale agricultural production centered on the production of farinha combined, with the near simultaneous designation of the land base as a sustainable development project, have had important implications for the practice of the hunt by households in the area. Next, I tested hypotheses to examine intra-household and inter-household effects on hunting practice by households of the settlement. In this chapter, I summarize the principal findings of this study, discuss their implications for conservation and development in PDS São Salvador, and the implications of the study findings for gender studies.

Summary of Key Findings and Conclusions

In Chapter 2, I examined the history of the Moa River in the past century and the changes in livelihood that have taken place for residents of PDS São Salvador over the past several decades. I noted that household livelihood strategies in this part of western Acre have passed from the culture of rubber to one based on the culture of farinha. This change from livelihoods based on the extraction of the NTFP, rubber, necessitating the
maintenance of the forest ecosystem, to one based on small-scale agriculture and the conversion of forested land for crop production, has had important implications for the practice of hunting in the region.

The output of hunting by households in PDS São Salvador has decreased during this livelihood transformation in the past two decades. Household livelihood strategies, increasingly centered on small-scale agricultural production, entailed the clearing of forestland where the majority of hunting activity occurred in the settlement. Therefore, agricultural pursuits removed men, the hunters, from the spaces in the settlement where animals congregated and hunting activity previously transpired. The work and time demands of agricultural production have further limited the ability of most men to pursue the activity of hunting in the forested areas of the settlement.

Habitat for animals of the seringal has also been increasingly lost as trees are cut, land is cleared, brush is burned, and crops are planted. Animals were forced to retreat further from agricultural areas deeper into the forest to seek ecosystems that were favorable to their existence. Hunting necessitated wondering throughout the forest in the search of wild game. Hunting increasingly became a tiring, all-day pursuit, instead of a quick little jaunt close by one’s house to capture food for the family.

Probably though, the biggest change for the inhabitants of PDS São Salvador has been the social and political changes resulting from the change in livelihoods from rubber to farinha. During the rubber era, households were widely scattered throughout the forest located on each household’s colocação. As farinha took hold as the prominent livelihood strategy for inhabitants of the area by the 1990s, households began to move out from the forest environment to locations along the waterways of the seringal. Households grouped
together in tight familial clusters as is the norm for peasant communities in Amazonia. With the establishment of the seringal as the settlement PDS São Salvador in 2000, communities were created as a means to receive credit offered by INCRA.

The social relations between households contained in the performance of the hunt may have also witnessed a transition as households moved together to create communities. Households that were in close proximity to each other (measured in this study by their visibility with one another with the variable “see houses”) may have decreased their hunting output as the result of the increase in the sharing of wild game between these households. The reciprocal nature of meat sharing, which was culturally inscribed in the settlement, potentially afforded clustered households the opportunity to decrease their frequency of hunting because their neighbors would supply them with meat on days when they did not hunt. The grouping of households in the settlement as a political strategy to obtain governmental credit combined with the breakdown of the rubber system of isolated houses scattered throughout the forest has increased the social exchange between households through the practice of hunting. Members of the household desire meat to eat, and the sharing of the product of the hunt, wild game, cements important social bonds between households.

The grouping of households into communities has also led to a decrease in the number and size of animal encountered by hunters close by the communities. Residents of the settlement remarked how just a decade or so ago, animals would sometimes wander through their communities and men would grab their guns from their homes to kill their meals for the night (or next several nights), but that today hunters must hike several hours to capture wild game. As noted in the previous chapter, some hunters
turned to extended-stay, overnight hunting outings in response to the lack of wild game nearby settled areas. By 2005, larger game was mostly absent from close contact with settled areas, although this was not always the case, with most daily hunting excursions, if successful, resulting in the take of small animals (embiara) only.

With the declaration of the PDS São Salvador as a sustainable development settlement, the federal government granted lease of the land base and use of its resources (within the appropriate federal laws and guidelines) to the residents of the settlement. The abandonment of the area by the previous land owners in the late 1980s (the Morais family) created a vacuum of uncertainty in terms of ownership of the land and the rights to the natural resources contained within this territory. When the federal agencies INCRA and IBAMA stepped in to formally designate and manage the natural resource base, a new political system was installed. Thus, in the decade and a half from the late 1980s to the early 2000s, the rural inhabitants that had lived along the Moa River for several generations experienced not only the rapid transformation of their livelihoods from ones based on the extraction of rubber to small scale agriculture centered on the production of farinha, but in conjunction, a political transformation in the area from the patron-client relationship of the aviamento rubber system, to a leadership vacuum in the seringal, to ownership and management by the State. Not surprisingly, there have frequently been hotly contested debates over the appropriate use of natural resources within the area amongst settlement residents themselves, between residents and INCRA and IBAMA, and within these different federal agencies as well. The issue of hunting and the use of wildlife by residents of PDS São Salvador has been one of the most contentious and important issues to settlement inhabitants.
Rules were established for the management of natural resources in the sustainable development settlement with the joint participation of the federal agencies INCRA and IBAMA, the Brazilian NGO PESACRE, and local residents. The management of fauna was the most hotly contested resource and continues to be a flashpoint of tension within many of the ten communities of the settlement. Regulations outlawing hunting with dogs have been mostly successful in limiting this traditional hunting technique, yet the practice continues with some hunting households. Non-residents of PDS São Salvador hunt wild game in the area, and the threats to residents of the settlement from these individuals continue to be a serious problem.

There is also the uncertainty of the boundary and hunting territory between the Nukini Indigenous Reserve and the community of Timbaubá in the northwestern portion of the settlement. The issue of territoriality and the ownership of (hunting) spaces and natural resources (including wild game) are integral to the friction between different cultural groups that live along the Moa River. The northwestern part of PDS São Salvador, an uninhabited 25,000 hectare region of the settlement, borders the Nukini Indigenous Reserve and was an area of land that the Nukini had sought to have incorporated within their indigenous reserve. INCRA, though, added this piece of land to the previously existing land base of PDS São Salvador. The boundary between the land ownership of these two groups was not marked on the ground resulting in frequent disputes between the Nukini and residents of PDS São Salvador regarding the ownership and use of resources in this area. In addition, the hunting of wildlife in this area by outsiders from the urban centers in the region has led to third-party conflicts over
resource use. There has been, though, a cautious movement between leaders of the two communities to reconcile differences in use rights of wildlife.

Further, the fact that wildlife is a “mobile resource” that freely crosses political boundaries adds to the uncertainty of management of this resource. Both the Nukini and the residents of PDS São Salvador have federal protection for their claims to the ownership of the land base that they each occupy, and the use of the resources within these land bases. A key difference is that the Nukini were granted ownership of their territory through the Brazilian federal agency responsible for indigenous affairs, Fundação Nacional do Índio (FUNAI), whereas the residents of PDS São Salvador were granted renewable 20-year lease rights from INCRA. This would seem to suggest that the Nukini have a stronger supporting federal legal statute protecting their land rights than do the inhabitants of PDS São Salvador. This may have implications for hunting and the use of wildlife along the Moa River. In future hunting disputes between these two groups will these federal agencies (and potentially the courts) lean towards supporting the claims of the Nukini, or those of the residents of PDS São Salvador?

Herein lies an opportunity for state and federal agencies in tandem with the NGO, PESACRE, which has worked with settlement residents for nearly a decade, to participate in an ongoing dialogue with these diverse rural communities to efficiently manage resource conflicts while effectively managing the region’s resource base.

In Chapter 4, I investigated intra-household effects on the practice of hunting in PDS São Salvador. Although the overwhelming majority of households interviewed hunted, less than one-half of households reported enjoying hunting as part of the
household’s repertoire of livelihood activities. Most hunters reported hunting for utilitarian reasons to supply meat for their families.

Most hunters reported that they hunted with greater frequency in the wet winter months (November into May) than they did in the dry summer months. This can be explained by three factors. First, a household’s agricultural obligations, which peak in the dry season, preclude men from wandering the forest in search of wild game. As agricultural output drastically slows during the rainy season, men have more time to devote to hunting. Second, the winter months of February through April are described as *mau de rancho* when food resources are increasingly scarce in the seringal, forcing men to hunt with greater frequency to provide food for their families. Third, hunters stated that the wet forest floor in winter allowed them to stalk their prey in the forest without drawing undue attention to themselves and scaring away the animals they were pursing. Time allocation of adult behavior revealed that households are primarily preoccupied with productive pursuits in the dry, summer months, and with insuring that their reproductive needs were met in the wet, winter months. Production did not increase in the settlement during winter to accommodate the decrease in food resources, but as Chayanov’s model predicts, household consumption dropped.

A household’s material realities played an important function in hunting output. Hypothesis 1 stated that households with lots of children would hunt more than households with fewer children. A t-test indicated statistical significance for greater hunting frequency of households with five or more children. Hypothesis 2 also proved to be statistically significant as households without domesticated animals hunted more frequently than households that did have domesticated animals. This indicates that the
meat of domesticated animals may act as a substitute for the meat of wild game. I did find however, that an outside income source (wages, retirement checks) for the household did not have a statistically significant effect on hunting output, and therefore, hypothesis 3 was rejected.

Gender relationships within the household also had a critical role in the performance of the hunt in PDS São Salvador. The forest environment, where most hunting activity occurs, has traditionally been defined as a masculine space. Part of the socialization process of boys becoming men in the community was tied to learning how to hunt. Adolescent boys were taught how to hunt by their fathers and older brothers in the household, and by their uncles residing in other households within the community. Cultural norms of behavior limited women in the settlement from engaging in this activity.

I argue that the decision to hunt does not rest solely with the hunter himself, but is dependent on the combined productive and reproductive efforts of both men and women in the household. First, the reproductive needs of men are cared for by women in the household, allowing men the opportunity to participate in the performance of the hunt. Second, the work activities of men and women in the household are affected by the behavior of the other. Women make important contributions to the food supply of the household, as is demonstrated by their participation in fishing and agricultural production. Women’s role in providing fish for the household influences the hunting output of men in the household. A hunter of the settlement remarked that when his household did not have fish, he was forced to hunt to provide food for his family. In
addition, in one community when residents suddenly started pulling large quantities of fish from the river, all hunting activity momentarily ceased.

In 49 of the 59 households surveyed in this study men hunted, whereas in only one household did a woman report that she also hunted. Men spent 7.1% of their time devoted to hunting while women’s participation in the pursuit of wild game within the forest was negligible (0.1% of their time). In general, men focused on productive pursuits (hunting, agriculture, care of large animals) and women took care of the reproductive necessities of the household (childcare, cooking, cleaning, care of small animals) while also helping with productive activities (production of farinha, fishing). Men were said to work in the forest, and women within the house.

Hypothesis testing of the influence of gender on hunting output was based on the fact that hunting was defined as a masculine activity in the seringal, one in which women infrequently partook. A set of three hypotheses (H4 – H6) were predictors of the influences of gender on a household’s hunting frequency. Whether or not the household head was male or female (H4) did not prove to statistically influence the household’s hunting output. Households with hunting age adolescent boys (H5) were a slightly significant indicator of a household’s frequency of hunting. Finally, whether or not women of the household participated in fishing (H6) did not prove to be a statistically significant influence on hunting frequency.

The practice of hunting continued to hold strong cultural ties for many hunters in the settlement. For some, hunting was more than just a means to provide a meal for the family, but was in addition, a means of relaxation from the daily pressures of the household and larger community. Hunters spoke of the calming nature of the forest as
they pursued wild game and how hunting allowed them to escape the “noise” of the household. Others said that hunting allowed them to pass the entire day without getting upset and that hunting was “a break” from work (in the roçado producing farinha). Hunting also afforded husband and wife time to “escape” from one another, allowing each an opportunity, uninterrupted by their spouses, to socialize with members of their own gender.

The variable “emotional commitment to hunting” was used as a proxy to measure a household’s willingness to continue to hunt as an integral part of the livelihood strategy for the household. Hypothesis 7 predicted that as a household’s emotional commitment to hunting increased so would the household’s frequency of hunting. A Pearson correlation confirmed hypothesis 7 indicating a statistically significant relation between a household’s emotional commitment to hunting and hunting frequency.

In addition to intra-household influences on hunting behavior, in Chapter 5 I explored the relationships between households in the community that critically affected the performance of the hunt. Group hunts with members of different households created bonds between men from different households in the community. These hunting outings were normally organized along the lines of kin relationships between households.

Community norms of behavior and obligations between households were intertwined with the hunting ritual. Meat exchange of wild game with other households in the community was a culturally coded responsibility for households in the settlement. The sharing of meat was a public display of meeting one’s obligations with other community members. The failure to participate in the three-part reciprocal process of sharing meat across households was an affront to cultural norms of behavior of
community. Because households in the community gave, received, and reciprocated wild
game, this rotating system of consumption fed different households within the
community, helping to insure the survival of all members of the community.

Both men and women actively engaged in creating and maintaining kin
relationships across households through the performance of the hunt. Men did so through
their actions in pursuing wild game with kin from other households in the community, and
in the killing of wild game that was brought back to the household for redistribution to
kin-related households. Women were the loci of the reciprocal sharing of wild game as
they were the ones who partitioned the animals captured by their husbands and sons to
other households in the community.

Although hunting activity was a highly gender stratified activity with men in the
seringal defined as the hunters, women of the household were integral to the system of
hunting of the peasantry. As we have seen above, the reproductive and productive roles
of women helped to transform the practice of the hunt by men of the household. Hunting
also afforded both men and women the opportunity to play their roles in the shaping of
kin relationships through meat exchange between households in the community. The
decision to hunt was not, thus, made by men on their own, but reflected the negotiation of
men and women of the household in the allocation of labor and other resources.

Inter-household hypotheses on hunting frequency (H8 and H9) were based on the
obligations and ties between households within the community that are reproduced in the
performance of the hunt. Neither hypothesis 8, predicting that households that were
clustered together would hunt with greater frequency than households that were not
grouped together, or hypothesis 9, stating that households that had kin living in other
households within the community would hunt more often than households lacking kin in the community, proved to be significant. In fact, in both cases the exact opposite of what was predicted proved to be true: isolated households hunted with greater frequency than clustered households, and households lacking kin hunted with greater frequency than households that did have kin living in the community. It is possible that isolated households and households that did not have kin living close by hunted more often because they are further removed from the transaction of sharing meat between households and therefore, had to hunt with greater frequency to supply meat for their families.

Two other inter-household variables, though, proved to be highly significant predictors of hunting behavior. Households that hunted with members of other households in the community hunted with statistically significant greater frequency than did households that did not hunt with members of other households. Also, households that traded labor days (troca dias) with other households hunted with greater frequency than did households that did not participate in trade work days with other households. Both of these variables reflect the nature of kin relationships between households within the community.

Multivariate regression models joining the set of intra-household variables with inter-household variables indicated that two variables in particular explained much of the variance of a household’s hunting output. The variable “emotional commitment to hunting” within the household, and between households in the community, the variable “hunting with other households” had highly statistically significant effects on the dependent variable, “frequency of hunting.” Whether or not the household was male-
headed, if the household had hunting age boys, and if the household traded work days with other households showed minor positive influence on a household’s hunting frequency. The variable “domesticated animals” had a slight negative influence on hunting output by households in the study, signifying that households with domesticated livestock hunted less than households than lacked domesticated animals.

In areas where wild game is mainly hunted for subsistence use and not for sale in the market as occurs in PDS São Salvador, hunting persists in peasant economies not only because of the influence of material necessities of the household (although food security is important), but primarily because of other factors. The results of this study indicate that the greatest influences on the hunting output of the household were due to the desire to continue with hunting as a key component of the household’s livelihood strategy (emotional commitment to hunting), and because of the social bonds that were produced with the performance of the hunt. The hunting lifestyle, on one hand, reflects the choice of individual households in the repertoire of livelihood possibilities. Some households hunted because they like to hunt and desired to continue with this practice. Hunting, further, reflects upon the social nature of relationships between households, specifically the practice of hunting in kin groups, and the clustering of linked households. Peasant hunting, then, also persists because of the inter-household relationships that it produces in the community.

Peasant livelihoods reflect the mixture of market with non-market transactions and as such, are fundamentally different from capitalist livelihoods that are predicated on the market. Hunting plays an important role in the creation of non-market exchanges of the peasantry. Meat sharing, hunting with other households, and trading labor days are all
non-market transactions between households that are an essential part of peasant hunting strategy in PDS São Salvador.

Whereas the market often involves individual household livelihood strategies, peasant hunting in PDS São Salvador entails communal livelihood strategies joining several households in the community. The performance of the hunt helps to reinforce familial bonds across households as the social engagement of hunting between households (almost always) joins households linked via kin relationships. The cultivation of kin networks is extremely important in peasant communities that are marginalized from political and economic benefits that exist for other actors in society. These linkages act as safety valves in times of need, such as occurs with meat sharing during the winter months known as *mau de rancho* in PDS São Salvador when food resources are difficult to acquire, helping to sustain individual households, while simultaneously creating a sense of community.

Peasant hunting may also lead to a lessening of further market integration and thus the “proletarization” of the peasantry. The ability of the peasantry in PDS São Salvador to substitute non-market exchanges (meat sharing, trading labor days) for market transactions (purchasing meat) allowed them to refrain from further integration with the market that marginalized their contribution and role within the system. The practice of the hunt as a key form of non-market exchange was thus, vital to the construction of peasant livelihoods that had some agency in terms of their engagement with the market system.

**Implications of Findings for Anthropology**

This study indicates the diversity that exists within peasant communities in western Amazonia. Even within communities that consisted of just a few households closely
joined by kin relationships in PDS São Salvador, there was a range of livelihood choices that reflected the different options of livelihood strategies and resource use that peasant households chose to employ. Diversity occurs not only across wide social, political, and cultural boundaries and communities, but also within relatively small geographical and cultural spaces.

Some rural households in PDS São Salvador continued to move towards closer integration with the market system, seen in the production of products for sale, notably farinha and livestock. The culture of rubber based on the extraction of forest products within a standing forest had been replaced by the culture of farinha that necessitated increased deforestation, with the removal of individuals from the intact forested areas in the seringal in the transition from rubber tapping to agricultural production, therefore, decreasing their hunting output as the frequency of contact with animals in the forest was similarly decreased. Other households in the settlement retained a forest culture that integrated hunting as an activity of fundamental importance within the repertoire of the household’s livelihood strategy, in the process avoiding the necessity of increased market transactions. It is not that these hunting households were proactively resisting the market system, but that they avoided the market because of the non-market exchanges that were reproduced and reciprocated, often contained within the practice of the hunt, between different households in the community. The social exchanges comprised in the performance of the hunt in PDS São Salvador, including sharing of wild game between households (mostly aligned through relationships with kin in the community) and hunting with kin in other households, were essential features of the culture of the residents of the settlement.
Another result of this study, which was alluded to above, revolves around the peasantry’s claims to ownership of territory, and the natural resources that lay within and that move through (wildlife) this land base. Along the Moa River in western Acre, there are four groups of peoples or institutions that lay claim to land and the management of resources contained therein: the peasants in PDS São Salvador, the inhabitants of the Nukini Indigenous Reserve, federal government agencies (INCRA, IBAMA, and FUNAI), and private landowners. The agendas of each of these groups, although not inherently mutually exclusive, were also frequently in competition.

If the ownership of land and the use of its resources are determined in terms of historical longevity of residence on a piece of land, the Nukini’s claims supersede those of the other actors in the region. The Nukini were further protected by the State with the designation of their (current) land base of 27,000 hectares as an Indigenous Reserve in 1994. The rural inhabitants of PDS São Salvador had lived along the Moa River for several generations, the area that was declared a sustainable development settlement in 2000. Their land ownership rights were contained with the 20-year renewable lease that was granted to individual households. The federal government’s first major impact in the debate over land tenure in the region occurred in 1989 with the declaration of Parque Nacional Serra do Divisor (PNSD). Residents who lived within the park boundaries prior to its designation as a national park have continued to resist their removal from this land that they claimed prior ownership of. Since this time, INCRA, IBAMA, and FUNAI had become important players in the system of land tenure and resource use in western Acre.

For the residents of PDS São Salvador, agricultural plots were operated on an individualized household tenure system, whereas the resources of the settlement that were
not contained within these household plots were managed on a collective (community wide) basis. The sustainable management of natural resources including wildlife thus required the participation of the diverse households that comprised the ten settlement communities. As previously mentioned, the transition from familial-based political groupings of kin related households in the region to INCRA imposed community-based political units that united two or more kin groups, had led to numerous conflicts. Infighting over resources within the settlement, combined with boundary and resource disputes across political boundaries (Nukini with settlement residents, settlement residents with neighboring private landowners, settlement residents with “visiting” urban hunters, residents of the national park with federal agencies), has increased tension within and between different cultural groups including the State, while increasing the need for a clear understanding of the ownership of land and resource use rights by all actors in the region.

The “forest government” of Acre has been proactive in its commitment to integrating sustainable resource management policies while acknowledging the cultural, social, and economic contributions of rural dwellers of the forest environs throughout the state (Kainer et al. 2003). The peasantry has been a key player in the agenda of the forest government that sought to encourage rural Acreanos to continue to create sustainable and prosperous livelihoods, and refrain from migrating to urban areas. The rural residents of PDS São Salvador have staked their claim to the land and resource base along the areas of the Moa River that they have occupied for several generations with state and federal

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2 To further complicate matters, in many instances, the maps that marked the boundaries of land tenureship in this region of western Acre were geographically inconsistent with what actually was the case on the ground (Salisbury 2002).
government support. Now is the opportunity for increased partnership with federal, state, and local organizations to manage land and natural resources in a sustainable manner as was the intent with the declaration of Brazil’s first sustainable development settlement, PDS São Salvador.

**Implications of Findings for Conservation and Development**

PDS São Salvador was created in the search for alternatives to stem the tide of destructive land-use practices that have plagued much of Amazonia in the past. In doing so, a new strategy that joined governmental agencies with Brazilian NGOs and local residents of the settlement sought to account for the ecological diversity of the region while also respecting the cultural and social histories and livelihoods of the inhabitants of the area. Community meetings lasting several years established rules for the use of water, botanical, and animal resources in the settlement. Today the challenge is in the implementation of these regulations while continuing to search for ecological and social sustainability for future generations. This is a daunting task given that the inhabitants of the settlement are among the poorest in the poor state of Acre, relying on the bounty of nature for their sustenance, and are a young population with population pressure only to increase in the years to come.

This research project unfolded as an attempt to provide information to a Brazilian NGO, PESACRE, to help the organization in the provision of conservation and development projects within the settlement. Wildlife was a critical resource for the rural poor that live along the Moa River in western Acre (and throughout Amazonia), yet prior to this study little was known about the motivations of peasant households in terms of their hunting and the use of wildlife. Animals of the seringal played a key role in the structure and functioning of the forest ecosystem, and the removal of animal species
through hunting might have negative consequences for the environment. As wild game was an important source of protein and food resources for the inhabitants of the settlement, the loss of animals might further impoverish an already marginalized and poor group of people. Wildlife will only be conserved if hunting is sustainable, and hunting output must be monitored.

The findings of this study are mixed in terms of their contribution to conservation and development in the region. Some of the results of the study are suggestive of a resistance to changing hunting practices that may be detrimental to ecological sustainability of wildlife use in the settlement, while other results indicate possible substitutes exist for the hunting of wild game. Hunting in the settlement was principally motivated by the livelihood preference of the household and the social bonds that were created across households. These factors may contribute to the resistance of hunting households to alterations in their hunting practice. As mentioned in Chapter 4, some hunters stated that they would continue with hunting even if they had other sources of meat available to feed their families. These hunters were largely resistant to decreasing their hunting output. Second, the hunting of wild game strengthens communal relations across households, and limiting hunting output may lead to more individualistic livelihood strategies, lessening the importance of inter-household social bonds that hunting helps to create and maintain in the community. Inter-household networks were critical to the survival of individual households and the community as a whole, and chipping away at these bonds created in the performance of the hunt may change the socio-economic framework in the seringal. There may be, though, some alternatives to the use of wild game by households in the settlement.
The domestication of livestock was shown to lessen the frequency of hunting, as presumably households substituted home-grown meat for that of wild game. Generally it was the smaller animals (ducks, chickens) that are raised for home consumption while larger animals (pigs, cattle) are kept as household investments. Women of the settlement were largely responsible for the care and maintenance of ducks and chickens that were critical food sources for the household, especially in the winter months when food resources were more difficult to obtain. Small animal projects could provide an alternative source of meat for families while also potentially raising the status of women of the household who are invested in the raising of these animals. Because meat was a more highly valued source of food than were plant foods in the seringal, if women of the household had a greater stake in the provision of meat for the household, then the status of women in the household might rise as well.

Another potential alternative is to increase the stock of fish in the settlement as a substitute for the meat of animals of the forest. Providing opportunities to capture more fish could limit the necessity to hunt by residents of the area. This could be accomplished through the promotion of small household fish ponds that would supply a year-round, easily accessible supply of fish for the household. While I was conducting my research in the settlement, two households were experimenting with constructing small fish ponds (acudes) next to their houses. They had done so without any assistance from the governmental and non-governmental agencies that work in the area. I also

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3 Although the participation of women in the activity of fishing in this study did not prove to influence the hunting frequency of men, this measured participation only, and not the catch of fish. In Rio Azul, when community members suddenly stated pulling large quantities of fish from the river, all hunting activity momentarily ceased. Therefore, if sufficient fish resources were available to the household, hunting frequency might decrease.
witnessed several households in the city of Mâncio Lima that had açudes providing fish for the whole family. This promotion of açudes is potentially an important tool in limiting the hunting pressure on wildlife in the settlement.

Anxious residents of the area, who were largely ignored by the state for decades, were initially preoccupied with the status of their lands, fearful that families from the Serra do Divisor National Park would be moved to São Salvador. When studies deemed that it was not wise to move additional families to the area, the first several years of the settlement process were devoted to creating a management framework for the area through a participatory process of dialogue between government agencies and local inhabitants. The Conselho Gestor, consisting of representatives from the ten communities that comprised PDS São Salvador, was established to promote and disseminate information and knowledge amongst residents of the settlement. Community regulations for the use of natural resources within the settlement were established, and PESACRE took the lead in education programs for residents.

As each household was assigned agricultural lots of around 20 hectares by INCRA, and credit was extended to these designees, the emphasis on the management of resources waned within the communities and amongst the governmental agencies invested with the management of natural resources. Wildlife education programs for the residents of PDS São Salvador must, though, continue if wildlife in the settlement is to be managed sustainably. The settlement had reached the next stage in its development as land tenure issues receded and management issues took center stage. The challenges that lay ahead entailed how to manage the resources of the area in the face of growing population pressure to provide safe, sustainable and healthy futures for the environment and the
peoples that live in the region. Wildlife will continue to play an important role in the creation and maintenance of livelihoods for residents of the settlement, and creative management alternatives must be developed to avoid the “empty forest” syndrome.

Implications of Findings for Gender Studies

Traditionally, in hunting studies the role of men has held prominence, while that of women has largely been overlooked (Service 1966; Lee and Devore 1968). In the evolution of human culture, men were depicted as the hunters of wild game while women were classified as gatherers of plant foods. The productive work of men in the provision of food resources for their families was held to be primary, with women’s role in food production seen as supplemental to the effort of men in the household. Women writers challenged this notion, with some arguing that gathering by women, not hunting by men, played a more important role in the development of human society (Dahlberg 1981).

I have argued throughout this study that the roles of men and women of the household are both important in the performance of the hunt in peasant societies. Although the roles of men and women in hunting are highly gender stratified, the practice of the hunt results from the negotiation between male and female members at the level of the household. The productive efforts of men in the pursuit of wild game are dependent on the productive pursuits of women in procuring food for the household and vice-versa. Women’s role in fishing often determined whether men of the household would pick up the gun to hunt wild game or not. As one male hunter from PDS São Salvador remarked, “When there are no fish, one must hunt”. Another man in the settlement had given up hunting altogether because his wife was such a successful fisherperson who provided ample quantities of fish on a regular basis for the household.
The end point of the hunt, wild game, is tied to the ritualized performance of reciprocity between peasant households that requires the participation of both men and women. Men bring wild game to their wives who distribute the product to (other households in) the community. The practice of the hunt provides a space for both men and women of the household to actively create and maintain relations with kin in the community through the reciprocal division of game meat with other households. In areas largely devoid of social services, the maintenance of kin relations is critical in insuring the survival of peasant households.
APPENDIX A
HOUSEHOLD SURVEY

Data:______________
Entrevistador:__________

Comunidade:__________
Casa#:_________________
[Condição da casa:
Pintada?_____  
Telhado de alumínio?_____  
Pode ver outras casas na comunidade?_____  
Localizado na beira do rio/dentro na mata/na capim?_________]

QUESTIONÁRIO

1. Onde nasceram vocês? (Estado…)
   Ele:_____________________
   Ela:_________________
   Seus filhos?______________

2. Onde nasceram seus pais? (Estado…)
   (Ele) Pai:_________________  (Ela) Pai:_________________
   Mãe:_____________________
   Mãe:_____________________

3. Quantos anos vocês moram no seringal?
   Ele:________
   Ela:________
   Quantos anos vocês moram nesta comunidade?
   Ele:________
   Ela:________
   Moram aqui o ano todo?
   Ele:________
   Ela:________
   Filhos:________

4. Quantos anos vocês tem? Ele:_____; Ela:________
   Quantos filhos vocês têm na casa? (Marcar as idades de cada um…)
Filhos: _____ Filhas: _____

5. Têm família morando próximo a vocês? (Quem, e onde?)

   Em Mâncio Lima? _____ (Quem?)

   Em Cruzeiro do Sul? _____ (Quem?)

6. Têm filhos ou família morando fora do seringal que manda dinheiro a vocês? 

   Você mandam dinheiro a eles? 

7. Você têm criação de animais domésticos? _______ (Quantos?)

   Boi: _______
   Porcos: _______
   Galinhas: _______
   Pato: _______
   Coelho: _______
   Outros: _______

8. Você vendem estes animais as outras famílias na comunidade? ____________

   Vendem nos mercados de Mâncio Lima? _______

   Cruzeiro do Sul? _______

9. Trabalham com diárias na terra das outras famílias no seringal? (Quem na casa?…)

   Você têm emprego fixo em Mâncio Lima ou Cruzeiro do Sul?

   (Quem?) ____________

10. Recebem cheques de aposentadoria, deficiência, dinheiro para ensinar no seringal,
    agente de saúde, salário maternidade, ou soldado de borracha? (Quem e qual das
    coisas?…)

11. Alguém na casa tem conta no banco em Mâncio Lima ou Cruzeiro do Sul?
    (Quem?) _______

    Motoserra? _______
    Barco com motor? _______
    Radio? _______

12. Você trocam dias de trabalho com outras casas na comunidade? ____________(Com quem?)
13. Vocês caçam animais silvestres?__________Por que sim ou não?

14. Vocês caçam sozinhos?_________________
   Caçam com outras pessoas da casa? (Quem?)_________________
   Caçam com outras pessoas na comunidade? (Quem?)_________________

15. Têm cachorros?_________Caçam com cachorros?_________
   Outras casas da comunidade caçam com cachorros?_________________

16. Têm espingarda?_________Quantos têm?_________

17. Quantas vezes por mês vocês saem para caçar?_________________
   Já houve época no passado que vocês caçavam mais do que hoje?_______(Quando?)

18. Vocês gostam de caçar?__________Por que sim ou não?

19. Como decidem quando é a hora de sair para caçar?

20. Caçar é algo que vocês gostam de fazer ou é uma coisa que vocês fazem porque é necessário? (Explica…)

21. Vocês pensam que caçar é mais difícil do que trabalhar na agricultura?____________
   Mais difícil do que a venda do produto?_________________
   Mais difícil do que cuidar dos filhos?_________________
   Mais difícil que a pesca?_________________
   (*Por cada um, indica porquê sim ou não é mais difícil…)

22. Caçam durante o ano todo?_________
   Caçam mais durante a estação de chuva ou seca?__________(Por que?)

23. Você acham que a caça faz parte da responsabilidade do homem para com a família?_______
   (Por que sim ou não?)

24. Você acham que só os homens devem caçar?_____________(Por que sim ou não?)

25. Que idades vocês começaram caçar no seringal?
   Pai:_________
   Filhos:_________

26. Quem ensinaram vocês a caçar?
   Pai:_____________
Filhos:________________

27. Se vocês tivessem outras carnes disponíveis para comer e não precisassem caçar, seguiriam caçar ou não?______________ (Por que?)

28. Onde caçam no seringal?
   Na floresta?_______
   No roçado?_______
   Na beira do rio e os igarapés?_______
   Outros lugares?_____________________

29. Tem gente que mora fora do seringal que vem ao seringal para caçar?________
    Para pescar também?____________________

30. Se vocês voltam a casa com carne da mata, dividem a carne com outras casas da comunidade?____________
    Com quem?

31. Tem outras casas na comunidade que dar a carne da mata a vocês?________ (Quem?)

32. Como decidir a quantidade de carne da mata que vocês dividem com outras casas na comunidade?

33. Quem na casa decide repartir a carne da mata com as outras casas?

34. Vocês vendem carne da mata as outras casas na comunidade?________
    Vendem em Mâncio Lima ou Cruzeiro do Sul?____________
    Tem outras casas na comunidade que vendem carne de mata as outras casas na comunidade?____________
    Eles vendem em Mâncio Lima ou Cruzeiro do Sul?____________

35. Vocês compram carne da mata das outras casas na comunidade?________
    Compram a criação dos animais domesticados, como a galinha, pato, coelho, o porco, das outras casas na comunidade?____________

36. Vocês compram carne de lata em Mâncio Lima ou Cruzeiro do Sul?________
    O que carne compra?

37. Quem na casa pesca?

38. Vocês vendem o peixe que vocês pescam, dentro da comunidade?________
    Vendem em Mâncio Lima ou Cruzeiro do Sul?____________

39. Vocês dividem peixe que vocês pescam com outras casas na comunidade?________
(Com quem?)

40. Tem outras casas na comunidade que dar peixe que eles pescam a vocês?______________
   (Quem?)

41. De quanto é quanto tempo vocês baixam para a cidade? Baixam juntos?
   Ele:__________
   Ela:__________
   Filhos:__________________

42. Vocês receberem o credito do INCRA?

<table>
<thead>
<tr>
<th>A. Gostamos de caçar?</th>
<th>Não</th>
<th>As vezes</th>
<th>Sempre/sim</th>
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<td>B. A caça é fácil?</td>
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<td>C. Caça não é uma perda de tempo mesmo se voltar para casa sem care da mata?</td>
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<td>D. Gostamos de caçar mais de fazer outro trabalho?</td>
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<td>E. Continuam caçar mesmo que não precisse?</td>
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<td>F. Prefeririam caçar do que compra carne?</td>
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<td>G. A caça não mexe/atravilha com nossa outro trabalho?</td>
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<td>H. Caçam para socializar com os filhos, amigos, e vizinhos?</td>
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**APPENDIX B**  
**PRODUCTIVE/REPRODUCTIVE HOUSEHOLD SURVEY**

Data: ____________  
Entrevistador: ____________

Communidade: ____________

Casa#: ____________

Casados/Viudo(a)/Soltero(a): ____________

Persoas na casa (com idades):
- Filhos: ____________
- Filhas: ____________
- Outras pessoas: ____________

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<tr>
<th>ATIVIDADES DA GENTE DA CASA</th>
<th>Marido</th>
<th>Esposa</th>
<th>Filhos</th>
<th>Filhas</th>
<th>Outra pessoa (Avô, Avó)</th>
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## APPENDIX C
### TIME ALLOCATION

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<th>Data:</th>
<th>Hora:</th>
<th>Sol/Chuva:</th>
<th>Entrevistador:</th>
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Communidade: 
Casa#: 

### AMOSTRA NA HORA

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APPENDIX D
HUNTING OUTINGS

Comunidade: ___________
Etrevistador: ___________

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<th>Sol/Chuva</th>
<th>Saía Caçar (Onde?)</th>
<th>#Casa</th>
<th>Caça Sozinho/Com Outras</th>
<th>#Tiros</th>
<th>Animais Matados</th>
<th>Quem Matou (Onde?)</th>
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BIOGRAPHICAL SKETCH

Eric Minzenberg was born in Los Angeles, California. He attended St. Bernard High School in Playa Del Rey, CA, graduating in 1981. In 1986, he graduated with a Bachelor of Science degree from the University of California at Berkeley, majoring in forestry and natural resource management. A few years after the completion of his BS degree, he opened a garden design, landscaping and maintenance business in the San Francisco Bay area. After four years of successfully operating his own small business, Eric entered the Peace Corps in 1995 spending 2+ years working with rural communities promoting sustainable conservation and development projects in the western tropical forests of Ecuador.

Upon his return to the United States, Eric entered the master’s program in Latin American Studies at San Diego State University. In 2000, he graduated, magnum cum laude, with a Master of Arts in Latin American Studies. Later that same year, he entered the doctoral program in anthropology at the University of Florida. Eric pursued an interdisciplinary course of studies with a focus on peasant and gender studies in the lowland tropics of South America integrating anthropology curriculum with the tropical conservation and development program housed in the Center for Latin American Studies at UF. In the future, Eric plans to continue his work with peasant communities in western Acre.