

Changing Landscapes of Local Livelihoods:
Forest Resource Management and Illegal Logging in the
Peruvian Amazon

MM

Dr. Salisbury

November 18, 2011

University of Richmond

Introduction:

Illegal logging in the Peruvian Amazon has become an increasingly complex problem for conservationists, governments, and local livelihoods. While there is a wide breadth of literature focusing on the general trends and practices of illegal logging, one main stakeholder is often ignored—those living within the forest itself. Much has been said of the situation from outside the forest boundaries, but little has been done focusing on the ‘inside’ and most directly affected level. Economies of scale are often discussed in this environment, yet the smallest economy is disregarded. The purpose of this paper is to focus on this smallest economic scale, surveying local uses of the forest and how the timber industry is altering this landscape.

This paper draws conclusions from case studies in two regions bordering Brazil in Western Amazonia, the Madre de Dios and Loreto regions of Peru. Madre de Dios is located in southeastern Peru, while Loreto is in the northeastern region. Within Loreto, case studies were conducted in two National Reserves where indigenous peoples reside and live off the land. Each location surveyed is remote and accessible only by river, making local people vulnerable to exploitation. Their remoteness is a ground level issue, where authorities cannot fully regulate logging because of the physical and geographic limitations. Because of this remoteness, locals must often police themselves and use the land and forest around them to maintain their livelihoods. The traditional uses of forest resources in the Peruvian Amazon have been greatly compromised due to illegal logging. These local people experiences include anyone with permanent residency in these regions, who have communal and social ties to a specific place within the forest. Assessing the forest management practices in Madre de Dios and the Selva Region of Loreto, illegal logging creates an atmosphere of resource and social exploitation which will be impossible to recover from and maintain sustainable livelihoods without pro-active and immediate intervention.



Literature Review:

I collected a concise scope of literature directly addressing forest management strategies on a local level. Little focus has been given to the local level, and I hope to shed light on the main issues evident in the Peruvian Amazon. I will make connections between several case studies and journal articles addressing this issue of illegal logging, demonstrating how they affect local livelihoods and their environment. This paper outlines local uses of the forest for subsistence living, economic viability, as well as demonstrating the link between usage and the phenomenon of the *Habilitado-Enganche* system.

Through case studies in Madre de Dios and Loreto, issues focusing on the likeliness of sustainability within the Peruvian Amazon on a local level are addressed, with a particular focus on the introduction of illegal logging. Oliver Coomes et al. (2004) address the general trends of forest resource management by local livelihoods in the Pacayo-Samiria National Reserve (Southwest of Iquitos), noting conservation is not possible without first observing the current ways those living within and relying on the forest operate. Resource decisions are based on household income and assets, according to both Coomes et al. (2004) and Pyhala et al. (2006), focusing in the Allpahuayo-Mishana National Reserve. Both authors discuss the dependence of poorer households on forest resources, leading to their vulnerability to the *Habilitado-Enganche* system as described by Sears and Pinedo-Vasquez (2011). ¹Wealthy or rich households and communities in this setting are described as those who have access (by chance of geographic location) to the most diverse forested areas. Wealth is based on the accessibility and heterogeneity of resources within the forests that surround individuals or communities. This access reflects the monetary wealth as well as resource wealth, where wealthy communities do not need to spend their income on supplemental resources. Wealthy communities are rich in both timber and non-timber resources, and do not always need to depend on outside sources of income, thereby allowing these communities to stay out of formal markets.

¹ The *Habilitado-Enganche* system, as described by Sears and Pinedo-Vasquez (2011), is an informal hierarchical system driving the Amazonian timber commerce chain. It is a system of exploitation that has become the norm in Peru, consisting of several tiers, from *Habilitador* to local/indigenous peoples. The *Habilitador* is furthest removed from on the ground localities, financing and providing resources needed for the chain to function. Financiers allocate money and capital to loggers within the forests, mandating which timber is to be extracted and at what capacity. Concessionaires provide timber concession documents, both legal and illegal to *Patrones* and loggers. *Patrones* work most closely with locals, obtaining concessions and directing logging practices. As the chain proceeds, locals are indebted to *Patrones*, and through the system *Patrones* are indebted to *Habilitadores*.

Subsistence living within the forest is a traditional and essential aspect of local livelihoods, who maintain their livelihoods through resources available to them by the forest. In general, as Coomes et al. (2004) shows, 66% of locals use forest resources for subsistence living, and those with lower incomes and fewer assets rely on timber extraction more to supplement their income. Overall, the wealthier a household is, the less damage they incur on the forest. Poorer households are more likely to be employed by loggers, specifically by small and medium forest enterprises (SMFE) (Cossio-Solano 2009), who exploit vulnerable locals under the *Habilitado-Enganche* system both legally and illegally. In most cases, the situation becomes illegal when patrones or locals are entrapped in a debt-peonage system, which will be explored further in this paper. While Cossio-Solano (2009) and Coomes et al. (2004) would disagree with each other as to the effectiveness of SMFEs, stating they only encourage exploitation and resource depletion; they are an important aspect in forest management and provide employment within the Peruvian Amazon. Because SMFEs are so remote and small, they rely on the informal funding of the *Habilitador*², leaving local laborers subject to the debt-peonage system. Locals are needed by these enterprises because of their knowledge of the landscape and resources within the forest. They are present and willing to work, and as such are taken advantage of while their ecosystem and source of livelihood is destroyed through extraction and destruction for camps and roads. Addressing direct extraction, Cossio-Solano's (2009) study reveals some areas of Madre de Dios where SMFEs did not extract nearly as much timber as they were allowed under their concession, consistent with studies conducted by Coomes et al. (2004) in Loreto and Furst's (2009) study of the Asheninka. Coomes et al. (2004) focuses on the individuality of extracting forest resources, where resources are only harvested when they are needed. Local peoples use of forest resources is not consistent across Loreto, some individuals extract high amounts of resources while others hardly use them. Furst's (2009) study of Asheninka also demonstrates resource extraction as a base-need process. Not all communities and individuals extract high amounts of timber, and in fact Furst (2009) discovered "timber forest resources are logged in a low intensity". These low numbers, however, may not reflect the high amounts of social and environmental damage.

² *Habilitadores* provide finances for logging enterprises, controlling timber extraction and movement within the Amazon. They are physically removed from extracted areas, only providing necessary materials for felling timber and employing locals (who fall victim to debt-peonage).

M. Salo's (2011) study supports that of Cossio-Solano's (2009) demonstrating the allocation of concessions, where more than half of the timber concessions were allocated to local peoples in his own case study. Both studies suggest the integrity of the forest concessions and concessionaires are weak and compromised; most are sold by locals to larger timber companies who they end up being employed by. In other cases, such as Salo's (2011), concessions are given to people with 'local knowledge', which could include true local peoples, but also includes illegal loggers who know the geographic and social landscapes as well. Looking at illegal timber concessions and selling real concessions, Caillaux and Chirinos (2003) found less than 10% of hectares belonging to indigenous peoples included logging rights. Locals are opening up their own forests to larger companies in exchange for monetary and material capital; however they soon become entrapped in a debt-peonage system. This 'capital', or sense thereof, is fabricated by patrones, who then demand more timber and labor. Locals' acceptance of these goods indebts them to the loggers and patrones. As locals begin to accumulate this debt, Coomes et al. (2004) and Cossio-Solano's (2009) studies demonstrate the likelihood of illegal timber extraction to supplement and pay off this debt. This desire for money compromises the chances for local forest management, making the forest socially and environmentally vulnerable.

The use of these concessions allows loggers to infiltrate the Amazon Rainforest, disrupting the livelihoods of locals. Studies by Cossio-Solano (2009) and Caillaux and Chirinos (2003) concentrate on the extraction of timber, ignoring the ripple effect of loggers on the ecosystem beyond timber. Schulte-Herbruggen's (2003) in-depth study reveals high amounts of non-timber forest resources being extracted and destroyed as a product of logging camps. From bush meat to fruit, increasing and encroaching logging populations create competition with locals for food sources in the Alto Purus Reservation Zone. Furst's (2009) study further reveals how this competition could affect local incomes, returning full circle to the issue of economic stratification within communities. Furst (2009), Schulte-Herbruggen (2003), and Pyhala et al. (2006) all describe local uses of the forest in both Madre de Dios and Loreto, which must be assessed in a climate of encroaching loggers, ecosystem destruction, and a growing formal market.

Method:

After assessing and researching some issues local livelihoods face in the Peruvian Amazon, I decided to focus on Local Forestry Management in the scope of the local economy and the Habilitado-Enganche system. My research comprises of several dissertations as well as scholarly and peer-reviewed articles focused within the Madre de Dios and Loreto regions of Peru. Focusing on local livelihoods, my research provides insight to local economies, contextualizing the shift from an informal to formal economy as highlighted in one group member's focus. Another group member is focusing on un-contacted indigenous peoples, some of whom demonstrate successful sustainable forest management, mentioned in this paper. Case studies were pertinent to this research subject, providing a clearer view of on the ground actions and processes within the timber industry.

Analysis:

Surveying these case studies in Madre de Dios and Loreto within the Peruvian Amazon, evidence of local and indigenous forest resource use is pertinent to understanding how sustainability, in the sense of maintaining natural resources and cultural practices for future generations, can be achieved socially, economically, and environmentally. Understanding how locals use the forest around them will shed light into the problems being faced and what solutions can be achieved. Subsistence living is one main way forest resources are important to local livelihoods (both indigenous and non-indigenous). Subsistence materials can be classed as food/nourishment, medicines, and building materials which are traditionally used to sustain livelihoods within the Amazon Rainforest.

An essential aspect to any subsistence livelihood includes nourishment resources, which in this region are found in the forest. While there are some families that partake in agriculture, cultivating manioc, yucca, and yams (Furst 2009), most local people "relate more to collection than production and their forest use is based on subsistence, not on generation of wealth (Rodriguez and Cuba 2010). This collecting includes fruits, seeds, fish, and perhaps most importantly, bush meat. Hunting and fishing are two main resource extraction practices contributing to a large part of the communal economy and diet of locals. Protein sources come mainly from bush meat, including peccaries and various primate species. These proteins are key parts of the diets of those living in communal cultures, where labor is shared and group goals are

placed before individuals. Other essential materials extracted for these indigenous lifestyles include medicinal roots and plants, important to both culture and health.

Timber is also used in subsistence livelihoods within the Amazon forest in Peru; however this timber extraction is used only for the individual or community which extracted it. Indigenous peoples of Calleria, the Shipibo-Conibo, in the southeast of Iquitos, obtain “materials to build their houses” (Rodriguez and Cuba 2010), extracting timber only to build necessary infrastructure. They are regarded as one of the most sustainable tribes living within the Peruvian Amazon and off its natural resources (Rodriguez and Cuba 2010). Furst’s (2009) assessment of the Asheninka compliments this idea, he states: “the utilization of forest products is fundamentally orientated to the needs for house building” (Furst 2009). Timber products are traditionally used in the Amazon as a means of shelter and transportation-not income. The introduction of the timber industry, however, is rapidly changing this lifestyle and attitude toward subsistence living by locals.

Resource uses are not consistent in every household and community, especially with an introduction to formal incomes and material goods in exchange for labor. Resource use varies within and across communities based on wealth. There is a stark contrast between poor and rich households and their forest management practices. The stratification between the rich and the poor in the Peruvian Amazon is directly reflected by the resource abundance and heterogeneity in the region. Pyhala et al. (2006) notes this relationship, adding “access to resources and markets determine the contribution NTFPs can make to livelihoods” (Pyhala et al. 2006), where resource use decisions differ based on household incomes. NTFPs, or non-timber forest products, are essential to the livelihoods of locals. They include resources such as fruits, medicines, bush meat, and various types of plants. The lack of local enforcement overseeing resource use and extraction also plays a key part in the vulnerability of poorer households and communities, allowing exploitation through the *Habilitado-Enganche* system.

Resource rich families and communities are reflected by the heterogeneity of forest resources. In biodiverse areas, there is less pressure on individual resources, allowing them to replenish and grow further. These people do not need to rely on agriculture as they are physically surrounded by all the necessary resources to sustain their traditional lives (including food, medicine, and building materials). More resources available directly mean less extraction of any

one resource, demonstrating a diversified diet and low reliance on timber products for supplemented income. It also allows the environment to recover and rebound from extraction and disturbances. In these richer communities, peoples do not need to participate in the formal economy to gain access to more goods (such as food or medicine). In Coomes et al. (2004) study southwest of Iquitos in the Loreto region, he found a negative relation to resource use and age/skill, where richer, larger, and older households did not extract more timber than needed for subsistence living. There is a direct relationship between wealth and exploitation, where wealthier communities experience less individual exploitation.

The issue of class difference in the Peruvian Amazon, and specifically Madre de Dios and Loreto, is demonstrated by the resource management of poorer households. Poorer households are defined here as those with fewer natural and material assets and less biodiversity in their forests. Studies show that resource exploitation is generally committed by few individuals in high volumes, namely poorer households extracting resources to supplement their own incomes, where 66% of income is derived from timber (Coomes et al. 2004). Poor households do not have the resources to sustain healthy lifestyles in comparison to wealthy households. With fewer resources to choose from and extract, they exhaust NTFPs and do not enjoy the benefits of a naturally diverse region. For example, if a household is poor in NTFPs, they may not have access to the medicine traditionally and culturally necessary to treat illness. Another issue with over-extracting households is the encroachment on others' land, where potential native clashes could occur (Schulte-Herbruggen 2003). As forest resources are depleted in one area, households move into new lands with more biodiversity. Poor households become vulnerable when there is an introduction to the formal economy; individuals can over-extract one forest resource to sell at local or regional markets to supplement their income and buy necessary goods that are not naturally available. This reliance on NTFPs for income makes locals vulnerable to illegal logging and becoming entrapped in the *Habilitado-Enganche* system. Patronos recognize the desire and need for goods to maintain livelihoods, and take advantage of the undiversified economy, where employment opportunities are scarce. Across the board in these two study areas, the reliance on timber and non-timber forest products is much greater among less poorer households and communities (Pyhala et al. 2006). Another often overlooked disparity between the wealthy and less wealthy communities is the outside aid from NGOs who

wish to conserve the biodiverse land. Resource rich communities are granted forest certification and financial resources, furthering this problematic economic gap (Cossio-Solano 2009).

The relationship between local livelihoods and outside markets also significantly alter the amount and type of extraction. Demonstrating how formal economies influence indigenous peoples and their survival in this changing landscape, the role of outside markets plays into the connection between poor households and the *Habilitado-Enganche* system and its exploitation. Poorer households are more likely to participate in outside markets due to a need of resources which cannot obtain from their natural surroundings. Excess resources, including timber, are sold to local and regional markets in order to gain capital and goods, and 70% of timber trade takes place in the regional market of Peruvian Amazonia (Rodriguez and Cuba 2010). Cossio-Solano's (2009) study demonstrates not all communities participate in this economy; however 65% of "economically active peoples" (presumably less wealthy individuals) take part in the extraction of timber. Pyhala et al. (2006) continues "households that are poor in both extractive and non-extractive capital are not only most active in NTFP commerce, but also the most reliant on NTFPs and other forest resources for their incomes" (Pyhala et al. 2006). Timber is the only resource that promises a solid income, though this may be an empty promise under the *Habilitado-Enganche* system. The market of NTFPs is also becoming problematic for wealthy communities who may experience encroachment from other local or indigenous peoples harvesting resources despite crossed territories. Commercial intrusion like this is likely to create tribal clashes and internal issues brought forth with a formal economy.

Through several case studies, this paper has surveyed how locals maintain their livelihoods both traditionally and in a changing economic landscape. In Madre de Dios and Loreto, the second aspect faced is illegal logging-the driver of this change. This role must be addressed to understand how the relationship between sustainable local livelihoods and forest management is affected by the ever increasing existence and interactions with illegal logging and timber companies. The presence of illegal logging has created a shift in culture and economy, with varying effects across the Peruvian Amazon. Their illegal encroachment on traditional lands in search of timber products has created a ripple effect that will be hard to recover from.

Encroachment is physically demonstrated by logging camps and the construction of roads, destructing forest resources that may or may not be on indigenous or local property. As resources

are exhausted from selective logging and camps are discovered by police and NGO officials, they move into more remote areas with more resources and fewer chances of being caught. This remoteness brings illegal loggers into contact with indigenous groups, including those un-contacted. This encroachment “has led to the destruction of a large part of the forest, this has driven the local indigenous peoples into more remote and less fertile areas” (Rodriguez and Cuba 2010), compromising their livelihoods and ability to live off the natural resources. Forced migration also leads to cultural changes, leaving locals in a vulnerable state with fewer resources and an introduction to new diseases. Wealthy communities no longer have biodiverse territories, and soon fall into a class of “poor” households and communities. Now, they too must supplement their incomes and are forced to take part in a more formal economy to gain necessary resources, sustaining their livelihoods. Creating a cycle of poverty, these households also become victims of the *Habilitado-Enganche* system and face the same issues we have previously encountered in poor households and communities. In areas where both encroachment and poor households are present, there is a very high chance of those individuals being entrapped in the *Habilitado-Enganche* system and subject to debt-peonage.

Higher amounts of illegal loggers and their encroachment on indigenous lands also lead to higher amounts of extraction of both timber and non timber forest products. Addressing the latter, Schulte-Herbruggen’s (2003) study in Las Piedras (in Madre de Dios) the 127 logging camps had high extraction rates of bush meat, creating competition between logging camps and local livelihoods relying on the meat as a necessary protein source. Of the 127 camps found inside the Alto Purus Reservation Zone, Schulte-Herbruggen (2003) recorded 2426.5 animals killed, with mammals making up 52.4% of these animals and birds the remaining 47.6% (Schulte-Herbruggen 2003). Not all of these animals were extracted for food however, and of the meat consumed, 90.5% came from mammals. Continuing with her research, Schulte-Herbruggen (2003) notes 84.3% of meat consumed by loggers was made up of only 4 species; the White Fronted Spider Monkey (an endangered species), the White Lipped Peccary, the Collared Peccary, and the Red Howler Spider Monkey. This extraction poses a major issue to local livelihoods competing for the same bush meat with potentially fewer tools and power to access them, as well as creating a major disruption in the ecosystem and potentially exhausting one species from a certain area.

Logging camps, however, are ultimately established for timber extraction despite the vast effects incurred on the surrounding environment as a result of sustaining their own lives within the camps. The same study by Schulte-Herbruggen (2003) demonstrating the extraction of bush meat shows Mahogany was the sole timber product desired and extracted by 39 camps. Not all timber felled is extracted because of rotting wood and lack of access to roads and transport of the timber, in fact about 50% of Mahogany felled was not extracted. Selective logging in these areas leads to further encroachment and the creation of gaps in forest canopies. When one area has been exhausted of Mahogany, loggers move on to the next resource rich area, ignoring the boundaries of their concessions and other demarcated lands (including National Parks, Reservation Zones, and other concession boundaries). In addition to encroachment, the devastated landscape left behind includes canopy gaps, compromising the integrity of the Amazon Rainforest. Canopy gaps allow for increased growth of softwood timber species, enabling the potential extinction of certain hardwood species such as Mahogany and Cedar (Vandermeer and Perfecto 2005). Logging camps also draw in those coming from poor households, joining a team of loggers and working under patrones. Logging camps are environmentally and economically disruptive and detrimental.

Most of the logging camps, described in Schulte-Herbruggen's (2003) study in particular, represent a physical by-product of legal and illegal forest concessions in the Peruvian Amazon. These concessions play a major role in the interactions between loggers and locals. The most common forest concession allocated is given to Small and Medium Forest Enterprises (SMFE), which are given to smaller groups and indigenous communities instead of larger timber corporations. Salo's (2011) study describes how locals win more than half the forest concessions available. While some of these SMFEs are held by locals and indigenous peoples for personal use, most are eventually sold to larger corporations. According to Cossio-Solano's (2009) study in Madre de Dios, enterprises can be beneficial to locals in search of employment as they work within communal cultures. While this has not been a consistent reality across Madre de Dios or Loreto, it does provide a means to the formal economy, whether it is beneficial or not. Most enterprises are headed by immigrants from urban areas, or patrones according to Sears and Pinedo-Vasquez's (2011) description of the Habilitado-Enganche system. Patrones make empty deals with locals, indebting them with goods and capital, forcing them to extract and destroy their own environment. The highest amount of timber extraction consists of Mahogany, Cedar,

and Tornillo. With most locals selling their concessions to timber industries, we must question who is actually managing the forests.

Cossio-Solano's (2009) assessment of forest concessions in Madre de Dios describes many attributes of timber concessions across the Amazon in Peru. In some regions, not all timber that was allowed to be extracted was in fact harvested due to the amount of higher value timber in the area. SMFEs that are located in resource rich areas, where Mahogany and Cedar can be easily found, enterprises do not need to extract much timber to pay off their fees, debt, and make a substantial profit. In areas like this, Cossio-Solano's (2009) study revealed only "18% of timber" was extracted on the allocated land due to the type of timber extracted (Cossio-Solano 2009). Mahogany alone sustains some of the SMFEs. One major issue these forest concessions bear is the legality of the situation on the ground. Local and indigenous property rights are not clearly demarcated and the practice of illegal concessions further complicates the matter, with "only around one million of the 13.6 million hectares belonging to indigenous communities include legal rights for timber" (Rodriguez and Cuba 2010). Many forest concessions are granted and forged illegally, yet they are not checked or changed. Indigenous peoples cannot defend themselves or their land without education and social capital. If they cannot read the concession documents, they cannot know what land is allocated or if the concessions even say what they are. Illegal loggers are aware of their power over local and indigenous peoples who know not have the knowledge, access, or means to combat unjustifiable land rights issues. The problem is not a public matter, and locals struggle to have the issues recognized on a national or international level.

These aspects are so intertwined in varying degrees of effects, the workings of the Habilitado-Enganche system become ever clearer. Illegal logging poses a threat to local livelihoods, leaving them vulnerable to exploitation economically and socially, with countless negative repercussions. The Habilitado-Enganche system, as describe by Sears and Pinedo-Vasquez (2011), comprises several tiers of power along the timber commodity chain. On the ground, the patrones play a key role in the actual exploitation of locals and indigenous peoples. Patrones include immigrants who head SMFEs and recruit locals to join logging expeditions. They become indebted to Habilitadors, and pass on the debt to locals who become entrapped in

the debt-peonage system. As we have discovered, these locals are most likely to come from poorer households who need a supplemented income and have a lack of a diversified economy.

In both Madre de Dios and Loreto, SMFEs rely on the Habilitado-Enganche system to provide funding. With financial restraints on these small and medium enterprises, felling fees are not always paid, indebting the enterprises to the Habilitador. This results in lost harvest and encourages higher extraction of timber than allowed and is sold illegally to pay off debts owed to the habilitador. There is not enough funding of SMFEs to be successful without the help of the Habilitado-Enganche system; however it often entraps locals and patrones in debt-peonage (Cossio-Solano 2009). Despite forest concessions that might be owned by locals, immigrants still impose on traditional lands and exploit locals by offering employment (Salo 2011). With few opportunities of formal employment and lack of literacy, the Habilitado-Enganche proves to be a dangerous intrusion on local livelihoods. Pyhala et al. (2006) argues local livelihoods cannot manage timber industries, small and medium, by themselves because they lack formal education and business management skills essential to survival within the Habilitado-Enganche system. Without these skills, their circumstantial knowledge will only be used to exploit them. Knowledge is power, and for local and indigenous people's knowledge and the ability to successfully use this knowledge is protection.

Within these complex conditions, driven by the Habilitado-Enganche system in the Peruvian Amazon, we must ask next whether sustainable forest management (SFM) is actually possible. Each case study taking place in Madre de Dios and the Loreto areas, authors suggest that SFM is not feasible under the current conditions. These case studies prove its improbability, providing room for growth and change to direct local livelihoods towards more sustainable uses of their forest. SFM is hard to assess due to the lack of information of individual communities, including resource inventories and the total resources used and extracted (Coomes et al. 2004). These studies are hard to generalize through the SFM scope as well because of the rapidly changing social and economic environment. Caillaux and Chirinos (2003) add "the physical and cultural survival of these indigenous peoples depends on the protection of the [Madre de Dios] forests" (Caillaux and Chirinos 2003)-the Amazon forest is a source of life to the indigenous and local populations living within it.

In one case study, the Calleria indigenous group is indicated as the most sustainably responsible indigenous group, however their practices will be compromised with increasing amounts of illegal logging and timber extraction (Rodriguez and Cuba 2010). If SFM is possible, it cannot be successful without the help of NGOs, who will play a crucial role in mitigation solutions within the Habilitado-Enganche system in order to maintain the least amount of disruption and most progress. Schulte-Herbruggen (2003) summarizes this point well: “The case of illegal logging in Alto Purus clearly shows that the conservation of Neotropical forests is unlikely to succeed without incorporating local people and respecting the local socio-economic situation” (Schulte-Herbruggen 2003). If SFM is possible, outside aid is necessary for locals to gain capital and knowledge of the system in which they are entrapped. Pressures from outside markets are too strong for poorer households specifically and locals in general to continue subsistence living and sustainable resource extraction.

Conclusion:

In the Madre de Dios and Loreto regions, evidence of illegal logging has greatly disrupted the social and environmental landscapes of local peoples, creating major issues for subsistence living. Traditional forest management, such as the extraction of food, medicines, and building materials, is compromised through the presence of loggers who create competition for resources and destroy the forest by constructing camps and roads. Loggings’ potentially most destructive trait, however, resides in the exploitation of locals through labor. Without a diversified market, education, or sound economic viability, loggers offer a source of monetary and material capital that would otherwise not be possible. This shift towards a formal economy is problematic in and of itself, however perhaps a more immediate issue is the destruction of resources local peoples rely on as sources of life.

The answer to sustainability of the Peruvian Amazon is not a clear one. There is very little chance of sustainable forest management under the current social and political climate, becoming a concerning reality, especially focusing on the importance of forests in local livelihoods. The social atmosphere within the forest is rapidly changing, creating violence and destruction. Sustainability is not possible under these circumstances; pressure from outside markets and the lure of capital is too great for locals to combat on their own. Resources are exhausted in concentrated areas until loggers move on to new territory, leaving local livelihoods

vulnerable. Their traditional subsistence ways are compromised, creating a situation where they must join loggers to earn food they used to just extract from the forest. Sustainability on a local level is not likely to occur, especially without the active, immediate, and conscious help of those with capital and power.

Solutions to issues in the Peruvian Amazon are just as complex as the issues themselves; there is no clear cut way to address them completely successfully. Concessions and property rights pose a major threat to local subsistence in the forest, and thus should be regulated more and checked by a third party. It would be ideal for authorities to set up posts within the forest, working with NGOs to ensure there is no corruption from authorities, to check the legality of forest concessions. This would, however, require relocating officials to areas with restricted access, contact, and regulation, leaving room for possible corruption. Forest concessions should not be transferrable, if locals purchase the concessions they must not legally be allowed to sell these directly to timber and logging companies. Third party checks will be essential across the board to eradicate exploitation and corruption on local and governmental levels within the Amazon.

As many authors suggest, detailed forest inventories will be an essential tool in assessing the impact illegal and legal logging has on local livelihoods. Proper action cannot begin without first understanding the issue at hand. Regulation and assessment of the impact deforestation of road building and camps incur is also necessary to combating the issue on a local level. Reforestation initiatives are imperative to restoring the health of the Amazon Rainforest, and should be enacted by timber companies who extract from and destroy the forest. One major issue with this is the remoteness and sometimes unknown areas of logging camps. This is where on the ground presence is completely necessary-the issue cannot be addressed from an office in Lima. The use of geographic information could be extremely helpful in regulating logging practices, though it is not a simple solution. Geographic information can be a powerful tool, and it must be used properly in order to effectively aid local communities. Despite strides in technology, human capital is indispensable if the issue of illegal logging is to be eradicated from the Peruvian Amazon.

After assessing local livelihoods and their relationship to forest resources, one evident solution include the establishment of Community Management Areas (CMAs), which will

empower local communities economically and socially. Community Management Areas can be very successful if used appropriately. Within a demarcated area of a community, resources are managed and regulated by a rotating cycle of 'officials' made up of locals from within the community. To ensure fair allocation of resources, there would need to be at least 2 'officials' regulating resources at a time, and each community member benefitting from the CMA is required to perform some type of task involving community development. If resources are to be extracted for market, it must be a decision reached by a community board. It is also important that each family or individual, despite wealth, is given a fair amount of resources. CMAs will discourage poorer families from over-extracting resources to sell to market by allowing them to partake in CMAs where resources will be monitored and managed with sustainable extraction. This will support traditional subsistence living, providing resources to families as they are needed. Addressing problems as a community will reinforce camaraderie and sense of place, allowing locals to value their resources and community as a whole. Maintaining a strong community relationship is essential in combating illegal loggers, who will attempt to break apart communal relationships. Without a diversified economy, locals do not have other options for income and employment. Unless education, business, and management skills can be taught quickly and used efficiently, locals will continue to be exploited. Communities must be empowered, if illegal loggers break communities apart, the survival of the Peruvian Amazon and its valued resources is not possible.

Work Cited

Caillaux, Jorge, and Carlos Chirinos. "El Caso Tahuamanu Cuado El Bosque Toca Madera." Sociedad Peruana de Derecho Ambiental (2003).

Coomes, Oliver T., Bradford L. Barham, and Yoshito Takasaki. "Targeting conservation–development Initiatives in Tropical Forests: Insights from Analyses of Rain Forest use and Economic Reliance among Amazonian Peasants." Ecological Economics 51.1-2 (2004): 47-64. .

Cossio-Solano, Rosa E. Capacity for Timber Management among Private Small-Medium Forest Enterprises in Madre De Dios, Peru. Ph. D University of Florida, 2009.

Furst, Reiko. "Financial Analysis of Forest Management by Native Communities of the Ethnic Group Asheninka in the Selva Central Peru." Bachelor University of Applied Science Van Hall Larenstein, 2009.

Putzel, Louis. "Upside-Down: Global Forestry Politics Reverses Directions of Ownership in Peru-China Timber Commodity Chains." World Forestry Congress (2009): 1-7.

- Pyhala, Aili, Katrina Brown, and Neil Adger. "Implications of Livelihood Dependence on Non-Timber Products in Peruvian Amazonia." Ecosystems 9.8 (2006): 1328-1341.
- Rodriguez, Alfredo and Carlos Cubas. "3.5: Forest Certification in Indigenous Communities in Peru." ETFRN News 51: Biodiversity Conservation in Certified Forests. Vol. 51. The Netherlands: European Tropical Forest Research Network, 2010.
- Salo, M, Helle, S, Toivonen T. "Allocating Logging Rights in Peruvian Amazonia-does it Matter to be Local?" 6.5 (2011).
- Schulte-Berbruggen, Bjorn. "Illegal Logging in the Alto Purus Reserved Zone Along the Las Piedras River in Madre de Dios, Peru. University of New York: 2003.
<<<http://www.savemonkeys.org/publications/altopurusengl.pdf>>>
- Sears, R.R., and Pinedo-Vasquez, M. (2011). Forest policy reform and the organization of logging in Peruvian Amazonia. *Development and Change*, 42(2), 609-631.
- Vandermeer H., John, and Perfecto Ivette. "The Rainforest is Neither Fragile nor Stable." Breakfast of biodiversity: the political ecology of rain forest destruction. 2nd ed. California: Food First Books, 2005. 16-34.