RIVER TRADING IN THE PERUVIAN AMAZON:
MARKET ACCESS AND RURAL LIVELIHOODS AMONG RAINFOREST PEOPLES

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ABSTRACT

Access to markets is increasingly regarded in development circles as a critical factor in determining livelihood choices in peasant economies. In the northeastern Peruvian Amazon, a multitude of river transporters and market intermediaries based in the central city of Iquitos provide essential services and market opportunities for remote peasant producers across the region. Using a multi-scalar, multi-method approach involving extensive fieldwork in the Peruvian Amazon, this research (re)assesses the meanings and implications of "remoteness" and "connectedness" for rural peasants. At the regional scale, I examine the functional heterogeneity of river trading networks and marketing agents. Given the high-risk/high-transaction-cost environment, river trading is found to be expensive for producers and traders alike. High costs are exacerbated by the low gross returns of rural production (mainly food and natural building materials). Thin or missing markets for credit, labour, land and insurance increase the hardships associated with limited access to product markets. Regional findings are complemented with a comparative livelihoods analysis in two remote communities of the Alto Tigre River that benefit from differential access to oil-labour. My study reveals that differential access to labour has significant impacts on the livelihood strategies of working households. However, given limited access to external markets, cash-income from oil-labour is found to offer limited opportunities for growth. In sum, the research proposes insights for advancing the debate on livelihoods and poverty in the Peruvian Amazon.

RÉSUMÉ

L'accès au marché tient un rôle déterminant dans le mode de vie des populations paysannes. C'est le cas dans le nord-est de l'Amazonie péruvienne, où, pour les producteurs riverains venant de villages écartés, l'accès au marché et aux services sociaux dépend de multiples réseaux de transport fluviaux qui relient la périphérie à la ville centrale d'Iquitos. La présente étude adopte une approche multivariée pour (ré)évaluer la signification et les implications de l'« éloignement » et de la « connectivité » chez les paysans riverains de l'Amazonie péruvienne. À l'échelle régionale, j'examine la diversité des transporteurs fluviaux et des agents économiques intermédiaires. Je décris un environnement où les risques et les coûts transactionnels sont élevés, et où les échanges commerciaux sont dispendieux autant pour les producteurs que pour les commerçants, d'autant plus que les produits transigés (surtout de la nourriture et des matériaux de construction) rapportent déjà un maigre profit brut. L'absence de marchés stables pour le crédit, l'emploi, l'assurance et les terres ne sert qu'à exacerber le problème. La recherche se poursuit à l'échelle locale avec une étude comparative dans deux communautés écartées de la rivière Alto Tigre, où les habitants héritent d'un accès inégale à l'emploi dans une compagnie de pétrole. Mon étude révèle que les stratégies de revenu diffèrent considérablement entre les deux villages, parmi les foyers qui ont été employés par la compagnie. Malgré les revenus d'emploi considérables, j'explique que l'accès limité aux marchés externes n'offre que des opportunités limitées pour le développement local. En somme, l'étude propose de nouvelles voies pour l'avancement de la recherche sur les modes de vie et la pauvreté en Amazonie péruvienne.

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As I put the finishing touches on my thesis – sitting on the porch in Tadoussac, Quebec, overlooking the confluence of the mighty St. Lawrence and Saguenay Rivers – I reflect on the unifying character of water that keeps me 'connected' to the friends and acquaintances I made during my fieldwork in the Peruvian Amazon.

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CHAPTER 1. INTRODUCTION

Growing concern in development circles over the fate of tropical forests and the welfare of forest-dependent people has highlighted the importance of understanding the diverse circumstances of forest dwellers and of identifying the variables that determine their livelihood opportunities. Such is the case in the Peruvian Amazon where "a fundamental problem for conservation and development lies in the lack of knowledge about the factors that drive the choices made by forest households among traditional activities" (Coomes and Barham, 1997: 184). Contemporary research in the Peruvian Amazon has begun to focus on the specific local conditions at the household level that may affect the range of livelihood alternatives available to rural producers.

Arguably the most significant contribution of this body of research has been to broaden the debate on livelihoods, by recognizing that the productive activities people engage in depend not only on their local resource endowments but also, perhaps more importantly, on a set of socio-economic conditions that determines how these resources can best be exploited. These conditions include the physical and social assets, skills, markets and alternative income sources that households have at their disposal (Bebbington, 1999). Increasingly, researchers are finding that differential access to such assets and local resources leads to contrasting livelihood strategies and varying degrees of welfare between and even within rural communities of the Peruvian Amazon (Coomes and Burt, 1997; Takasaki *et al.*, 2001; Tschakert *et al.*, 2007).

Given that this conceptualisation of livelihoods has spawned new directions for research, it is perhaps surprising that very little work to date has examined the nature of markets in the Peruvian Amazon or their implications for livelihood choices. Rather, research has tended to acknowledge the grave marketing difficulties associated with informal long-distance river transport, without necessarily qualifying or quantifying them as researchers have done with other aspects of livelihoods. As a result, we find that rural communities are commonly characterized as being "remote" without having a sense of what this remoteness really implies.

An improved understanding of how rural producers in the Amazon interact with regional and local markets, and how these, in turn, can determine local livelihood

opportunities and choices is much needed. This examination must consider the different markets at play in the region, as well as the socio-economic effects of missing markets, while recognizing that markets are not only the loci of economic exchanges, but also the focal point of social life. Finally, for the broader study on rural livelihoods, a market study based in the Peruvian Amazon – where the movement of people, cargo and information depends entirely on a natural network of rivers, rather than roads – contributes to the field of market studies that has traditionally focused on more densely-settled regions.

1.1 Purpose and objectives

This thesis uses complementary approaches at different social, spatial and temporal scales to examine how access to markets can influence the livelihood opportunities and choices of riverine peasants in the northeastern Peruvian Amazon. Specifically, the objectives of the study are:

1. to describe the structure of river trading networks within the Department of Loreto, Peru, in terms of their geographic extent, their functional heterogeneity and their economic logic;
2. to explore the regional and sub-regional conditions within river trading networks that determine rural households' access to regional product markets in Loreto; and,
3. to assess the livelihood implications of contrasting access to labour markets in highly remote rural communities on the Alto Tigre River, in Loreto.

1.2 Literature review

This study bridges the concepts of livelihoods and market access in the northeastern Peruvian Amazon. The literature review focuses primarily on the regional level, in function of three distinct perspectives. First, since this study adopts a livelihoods approach which focuses on the diversity and determinants of rural livelihood strategies observed in the Peruvian Amazon, a review of the regional literature on rural livelihoods was critical for informing approaches for field research and analysis. The regional literature on rural livelihoods was complemented by readings on important theoretical concepts in livelihood studies. Second, I examined the literature on market access,

particularly on the multiple meanings and livelihood implications of 'access' and 'markets' for rural producers. Finally, I explored the concept of missing markets, particularly in relation to the current situation in the Peruvian Amazon, in order to gain a more complete perspective on the economic situation facing rural producers and urban traders.

1.2.1 Rural livelihoods

In its simplest form, the concept of "livelihood" refers to the means by which a distinct social unit (typically an individual or a household) makes a living and secures the food, income and assets necessary to survive and prosper (Chambers and Conway, 1991). Typically, these 'means' have been equated to the primary productive activities in which the person or household engages. Because understanding livelihoods is critical to development studies, the concept has been widely debated over the years. First and foremost, livelihoods should be interpreted as a set of diverse strategies, rather than looking at activities independently from one another (Scoones,1998; Ellis, 2000a; Barrett and Swallow, 2006). Moreover, livelihoods correspond not only to the activities households engage in, but also to the capabilities and the material and social assets upon which they depend (Scoones, 1998). Thus, studying livelihoods is much more complex than simply observing the productive activities of a household; rather it requires an understanding of how people and groups use their assets and capabilities to secure their standard of living.

People diversify their livelihood 'portfolios' either by necessity or by choice; the outcome is dependent upon many factors, including seasonality, risk, labour and credit markets, asset strategies and coping strategies (Ellis, 2000b). Although it can be maintained that there is diversity in all livelihoods, it is likely that within each household or community certain core activities are practiced more prominently, while others are more complimentary (McCabe, 2003). The livelihoods approach is useful in recognising the diverse activities of households and examining the relationships between them. As Ellis and Biggs (2001) suggest, the advantage of the livelihoods approach lies in its 'cross-sectoral' and 'multi-occupational' character.

In rural agrarian settings, livelihood activities are typically tied to the land, more specifically the resources that can be managed and harvested by individuals or

households. Whereas differences in local resource endowments will necessarily bring about different livelihood activities in different areas, it has become increasingly clear, from research conducted across many locales, that livelihoods are dependent not only on available natural resources: Bebbington (1999) argues that livelihoods are dependent on *access* to a variety of different resources including natural resources, physical assets, social and cultural capital, alternative income sources and product and labour markets. Thus, livelihoods not only incorporate multiple strategies, but are also dependent on the specific conditions that determine access to key resources and assets. The implication is that livelihoods may vary substantially between households endowed with the same natural resource base. Moreover, livelihoods can vary significantly over time, as households adapt their activities to ever-changing conditions (Godoy *et al.*, 1995; Coomes and Burt, 2001; Takasaki *et al.*, 2001).

In the Peruvian Amazon, livelihood diversity has been well documented. Hiraoka (1985) dissected the heterogeneity in resource endowments within the region, identifying distinct micro-environments and growing conditions and acknowledging the complementarities in floodplain agriculture, shifting cultivation and forest and river extraction. Looking beyond natural resources, subsequent research has focused on other factors that may determine livelihood choices. Field studies by Coomes and Burt (1997), Coomes and Barham (1997) and Takasaki *et al.* (2001) have identified the importance of wealth as one of the key determinants of resource use. Based on empirical evidence, these studies have shown that differences in land and non-land asset endowments are critical in determining households' relative ability to distribute their time and resources among different subsistence and income-producing activities. Similarly, other studies have demonstrated the significance of specific skills and knowledge in determining the range of viable livelihood strategies available to a household (Coomes *et al.*, 2004; Moreau, 2004).

The inherent diversity in livelihood portfolios is also derived from the diverse potential outcomes of productive activities. Indeed, livelihood strategies in the Peruvian Amazon must satisfy both subsistence and income needs. Given the thinness of labour markets, the majority of cash-income across the region is generated from the sale of produce. Padoch *et al.* (1985), Padoch (1987), Coomes (1992), Coomes and Burt (1997)

and de Jong *et al.* (2001) have highlighted the importance of market-oriented production in the income portfolios of rural producers. These studies have demonstrated that market income is not only derived from specialized ventures; rather, it is generated through the entire spectrum of production, so that no clear distinction exists at the onset between subsistence and income-generating production (cf. Arnold, 1995). In other words, a crop or an extractive product is not necessarily designated *ex ante* to a particular purpose; rather, it can serve for subsistence and/or it can be sold in the market, depending on the needs and opportunities of the producer. Two households with access to similar resources and similar assets may still have contrasting livelihoods if they use these resources differently. It is important then, to recognize the "disjuncture between the nature of the rural economy (agricultural, traditional, limited use of modern inputs) and the character of rural livelihoods (increasingly diversified ... and linked to the market)" (Bouahom *et al.*, 2004: 610). Ultimately, these studies stress the importance of conceptualizing livelihoods as diversified, fluid, and constantly being renegotiated over space and time.

1.2.2 Market access

Access to product markets is largely dependent on networks of trade. Such networks have been studied from a variety of theoretical approaches in the development literature. The "commodity chains" perspective emphasizes the importance of understanding the specific roles and diverse contributions of the "interlinked, socially situated actors" involved at every step of the marketing chain (Long and Villarreal, 1998). Though at the onset, the theory lacked applicability in the field of geography, Leslie and Reimer (1999) spatialized commodity chains in order to analyse them in a geographical context. The applicability of this approach for our purposes remains constrained, however, as it is intended to analyse a single commodity and the multiple transformations (in form and meaning) that it undergoes, whereas the present study focuses on the trading system as a whole, in which a multitude of products are traded. Nevertheless, the commodity chains approach is useful in drawing attention to the multiple exchanges and negotiations that take place at each node within marketing chains; i.e. in breaking down networks of trade into smaller components, each with its own significance and influences. Moreover, it is possible to interpret trading networks as a series of commodity chains intersecting at common nodes along the way.

Bush (2004) proposes overlaying a commodity chain approach onto a network typology in order to broaden its perspective. Actor-network theory (ANT) can serve to conceptualize trade networks by emphasizing the interaction of social and material processes and by highlighting the importance of understanding the aggregate effects of multiple actors within the network (Law, 1992; Murdoch 1998; Bush, 2004). This approach is helpful in informing the assessment of regional marketing chains in this study. However, it is less relevant to the broader purpose of this research, that is, to examining the impacts of market access on rural livelihoods. Aside from ANT, the influence of social actors is recognised in the actor-oriented school (Long, 1992). Benediktsson (2002) explains how the changing relations of actors to one another leads to a continual social (re)construction of markets.

Much research in developing areas has identified market access as a key determinant of livelihoods and resource use (Plattner, 1989a, 1989b; Reardon and Vösti, 1995; Dercon and Krishnan, 1996; Barham *et al.*, 1999; Barrett *et al.*, 2001; Escobal, 2001; Takasaki *et al.*, 2001). However, the concept of 'market' is often loosely defined, and assessments of market integration are conducted with different definitions of markets (Godoy, 1997a), without a systematic approach or a common understanding of the full range of effects that market access has on livelihoods.

The livelihoods approach emphasizes the importance of *access* to vital resources, assets, income sources and product and labour markets (Chambers and Conway, 1991; Bebbington, 1999; Ellis, 2000). Ribot and Peluso (2003) contend that access consists not only in ownership, but rather in the ability to derive benefits from diverse resources (as much through the ownership of assets as through processes of extraction, product transformation, exchange, transport, distribution or consumption). Whereas research in the Peruvian Amazon has begun to explore differences in access to natural resources and physical and human assets, few studies have focused on access to markets. Padoch (1987) was one of the first to acknowledge the networks of trade for forest products around Iquitos. Chibnik (1994) expanded the study of regional markets in his exploration of the many risks involved with long-distance trading along rivers and within informal product markets where reliable information is hard to come by. It is only in the historical assessment of the regional rubber trade of the late 19th century, by Barham and Coomes

(1994), that we begin to analyse the economic rationale behind traditional and contemporary marketing networks in the Peruvian Amazon.

Few studies to date specifically examine the effects of market access on rural livelihoods, even though improving access to markets in remote areas is widely recognized by development practitioners as an effective strategy for improving welfare (Escobal and Ponce, 2002). Given the absence of market research in riparian environments, the literature on rural roads can serve as a corollary for the implications of diversified market access. Many studies in rural areas have highlighted the importance of accessible product markets. Shanley (2002) explains that shorter distances to reliable product markets give producers more opportunities to sell their produce at competitive prices. Gannon and Liu (1997) describe the complementary benefits of improved transportation in rural India, where better roads significantly decreased transaction costs for producers while increasing the profitability of their assets. Guimaraes and Uhl (1997) show how, in the province of Para, Brazil, more efficient transport modes, better roads and shorter distance to markets decreased transaction costs to producers. Similar findings were made in rural areas of Peru by Escobal (2000) and de Jong *et al.* (2001). Focusing more broadly on livelihoods, research in Ethiopia by Blocka and Webb (2001) revealed that better access to product markets could promote specialisation into more intensive agriculture.

Complete assessments of market access, however, must look beyond product markets exclusively. Indeed, improved transport also has important social impacts, such as facilitating access to vital services like health and education (Porter, 2002; Escobal and Ponce, 2002). Moreover, labour, credit, land and insurance markets must be considered as well (Godoy *et al.*, 1997b). The next section explores these other markets and describes their nature and scope in the Peruvian Amazon.

1.2.3 Missing markets

Much theoretical debate has focused on the concept and meaning of the *market.* Certainly, the interest is warranted, given that the market, in its many forms and scales, is undeniably a fundamental pillar of social interaction. Far from proposing a renewed interpretation of the neoclassical concept of perfect and imperfect (or complete and incomplete) markets, the following assessment of markets in the Peruvian Amazon rests

on the simplified assumption that in order for an economy to function optimally, there must be markets for all goods and services, and transactions must be accessible to all [1] – with limitations on transactions costs, information asymmetries and prohibitive barriers to entry (Yonekura, 1995). In situations where certain markets have failed to evolve or a weak, transactions will be thwarted as the costs of exchange will tend to outweigh the benefits (Davidson and Weersink, 1998). In the Peruvian Amazon, markets for credit, labour, land and insurance are thin or lacking and access even to product markets is difficult for many.

Research on poverty in developing areas points to the importance of market access for income generation, insofar as access to markets can facilitate non-farm opportunities and the accumulation of productive capital (Escobal, 2000; World Bank, 2000; Barrett *et al.*, 2001; Ellis *et al.*, 2003; BASIS CRSP, 2004). In the Peruvian Amazon, research on rural livelihoods confirms that differences in wealth (in land and productive assets) are an important determinant of livelihood choices and opportunities for income generation (Barham *et al.*, 1999; Takasaki *et al.*, 2001). Together, these studies point to the importance of asset accumulation as a potential pathway out of poverty, a process that is severely impeded by incomplete markets (Ellis *et al.*, 2003).

1.2.3.1 Credit

With the closing of the Agrarian Bank in Peru, as part of the macroeconomic stabilization package implemented by the Fujimori government in the early nineties, riverine peasants in the Peruvian Amazon lost access to public agricultural credit and were left to rely exclusively on an informal credit system know in the Peruvian Amazon as *habilitación* (Kjöllerström, 2002). *Habilitación* consists of interlinked credit-output contracts, similar to the debt-merchandise contracts that emerged during the nineteenth-century rubber boom (Barham and Coomes, 1994), whereby urban moneylenders advance credit to rural producers/extractors in exchange for the guaranteed delivery of a product, typically rice, fish, game meat or timber. Thus, credit and product markets are effectively interlinked into a single mutually beneficial transaction.[2]

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[1] Even in subsistence economies, people usually depend on a limited amount of trade (e.g., salt, clothes, etc)

[2] While some critics and governments have argued that *habilitación* is exploitative and places unfair burdens on its recipients at the expense of unscrupulous moneylenders (Norgaard, 1994), most recent studies have convincingly demonstrated that more likely than not, the informal system of *habilitación* in the

For rural peasants, *habilitación* represents not only a source of credit to help finance costly extractive activities, thereby opening up new market opportunities: it also provides a guaranteed market outlet for their produce, thereby mitigating some of the risks and transaction costs (mainly search and transport costs) typically associated with river trading. Ultimately, the primary benefit of *habilitación* for rural households resides in the fact that interlinked credit-output contracts – through this dual process – facilitate access to important product markets in Iquitos.

Despite its benefits, the informal system of *habilitación* in the northeastern Peruvian Amazon has two significant drawbacks. First, *habilitación* only exists in areas endowed with key resources, leaving a large proportion of rural households without any form of access to credit. Second, and more importantly, the credit dispensed in the context of *habilitación* is very limited in its applicability. Whereas research on rural poverty has suggested that the most beneficial impact of credit markets for the rural poor lies in their capacity to open up new opportunities for rural households beyond the realm of own-production – demonstrating that livelihoods constrained to the farm are unlikely to generate the necessary means to raise a household out of poverty (Reardon *et al.*, 1998; Barrett *et al.*, 2001) – the credit dispensed in the context of *habilitación* is restricted to highly specific agricultural and extractive activities, i.e., rice production, timber, game meat and aquarium fish collection. In other words, although *habilitación* is certainly beneficial, it is not a form of credit that can serve as startup capital in order to diversify income generation. Therefore, just as Escobal (2001) warns of the ineffectiveness of policies that focus exclusively on increasing farm productivity as a means of augmenting rural income, it is important to understand the limited scope of *habilitación*, which, by tying down capital to specific resources, essentially restricts the potential benefits of the credit it provides, thereby perpetuating an economy of extraction.

Although the credit provided by *habilitación* may not facilitate income diversification, the informal system of interlinked credit-output contracts of the northeastern Peruvian Amazon nevertheless remains effective at doing what it is meant to do – that is, to link producers with buyers in urban markets within mutually beneficial

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Peruvian Amazon was and continues to be an efficient system that benefits both moneylenders and recipients while facilitating resource extraction (Chibnik, 1994; Barham and Coomes, 1994; Kjöllerström, 2002).

trading relationships that improve market access. Further improvement of market opportunities for rural households, however, is contingent on more open and accessible credit markets.

1.2.3.2 Labour

Many studies have highlighted the positive correlation between improved transport and access to labour markets (Smith *et al.*, 2001; Lanjouw *et al.*, 2001; Corral and Reardon, 2001; de Janvry and Sadoulet, 2001; Escobal, 2001). In the context of thin or missing credit markets, earnings from non-farm employment can be a crucial means for overcoming working capital constraints (Reardon *et al.*, 1994; Pietola *et al.*, 1998; Reardon *et al.*, 1999). Income from wage labour typically facilitates income diversification by allowing rural households to invest in productive assets (such as seeds, fishing nets, a shotgun or a motor), to improve access to product markets or to overcome substantial barriers to entry into other non-farm income generating activities such as the informal trading sector (e.g., buying produce in bulk from local households to sell in the urban market, opening a shop or engaging in petty trade with nearby villages). If diversification into wage-earning labour is possible, it is assumed that rural households have a fair opportunity to lift themselves out of poverty by generating new market opportunities for themselves (Barrett *et al.*, 2001).

The potential for off-farm income generation in the northeastern Peruvian Amazon, however, is very limited (Chibnik and de Jong, 1989). Outside of the city of Iquitos (capital of the Department of Loreto) and a few secondary urban centers, namely Requena, Nauta, Tamshiyacu and Yurimaguas (see Figure 1.1), labour markets are thin and opportunities for wage employment are sparse and temporary at best (Takasaki *et al.*, 2001). In rural villages, where large workforces are often needed to accomplish labour-intensive tasks (such as clearing land, weeding and harvesting), households usually resort to communal work parties (*mingas*), since few households can afford hired labour (Chibnik and de Jong, 1989). With missing labour markets (as well as missing credit markets), most rural households must rely solely on product markets for their income needs, making capital accumulation very difficult.

1.2.3.3 Insurance

Formal markets for insurance are also absent in the Peruvian Amazon (Chibnik, 1990). For traders, this means that they must manipulate the terms of trade in order to self-insure against losses. Given that long-distance river trading entails a substantial amount of risk (Chibnik, 1994), and that these risks are exacerbated by wildly fluctuating market prices in Iquitos (Padoch, 1987), traders must generate significant surpluses for self-insurance, which inevitably inflate costs for producers (Barham and Coomes, 1994). Ultimately, the brunt of insurance is born by rural producers who must either pay a high premium to sell their produce in the market or limit their level of engagement in the regional market economy. In this way, the absence of regional insurance markets directly affects access to urban product markets, especially for more remote rural households who depend on long-distance itinerant river traders.

1.2.3.4 Land

The Peruvian Amazon is a land-abundant region with low population density. Land is mostly privately owned, held in usufruct and transferred along kin lines (Chibnik, 1994, Takasaki *et al.*, 2003).[3] Moreover, rural land markets are thin. Even though land holdings are considered an important component of wealth for rural households (Takasaki *et al.*, 2001), their value lies in their productive potential since, never being sold, they hold no inherent monetary value. With no reliable market at hand, the valuation of land is problematic. Faced with a similar situation in rural Nepal, Jacoby (2000) proposes that if farmland were to behave like any other asset, its value should equal the net present market value of the products it generates. A more accurate measure would consider not only market prices but also the transaction costs associated with marketing. The result would likely demonstrate that, aside from areas endowed with natural resources, land values would effectively decrease with distance, as transaction costs rise. However, Padoch and Pinedo-Vasquez (1995) warn that such valuation methods are inherently flawed in their assumption that benefits are derived only from product markets. Rather,

[3] During the rubber era, markets for land were vibrant as they passed through the hands of wealthy rubber barons (Barham and Coomes, 1994). As large landowners dispensed land to rubber tappers in exchange for the guaranteed receipt of the rubber they collected, markets for land were essentially interlinked with labour, credit and rubber markets in the context of a profitable extractive economy.

land has many uses from which it can derive value, such as satisfying subsistence consumption needs or for its *ex ante* and *ex post* insurance role (Hiraoka, 1985).

The lack of a functional land market in the Peruvian Amazon has direct implications on rural livelihood choices. First, because land holdings have no clear monetary value, they cannot serve as collateral for accessing credit even though they often represent a large portion of a household's wealth. Furthermore, missing land markets can lead to a sub-optimal use of resources (Barrett *et al.*, 2001). For instance, given the hypothetical situation in which a rural household holds a comparative advantage in an off-farm livelihood activity such as say fishing, functional land markets would allow them to rent out or sell their land in order to concentrate on their more productive trade. In the absence of land markets, however, this fishing household may choose to devote scarce time to less productive agriculture, if only to better divide their time between their different productive assets.[4]

For peasant households in the Peruvian Amazon faced with costly and often irregular access to product markets, the dearth of regional markets for credit, labour, insurance and land only serves to exacerbate the challenges surrounding market access and impede potential pathways out of poverty – missing markets for credit, labour and land restrict asset accumulation, and missing insurance markets drive costs up.

In sum, understanding the socio-economic context on which rural livelihoods in the Peruvian Amazon are based will lead to a more complete assessment of the important influence of market access in shaping the livelihood choices and opportunities of riverine producers and urban traders alike.

1.3 Study context

1.3.1 Geographic area

This study is based in the northeastern Peruvian Amazon, in the Department of Loreto (379,900 km^2). More specifically, the study area corresponds to the range of trading networks extending from the Department's capital city of Iquitos. Figure 1.1 displays a map of the region around Iquitos, characterized by a dense and diversified

[4] This example is adapted from an example in Barrett *et al.* (2001) that describes the diversification behaviour of a blacksmith in conditions of missing land markets.

system of rivers. Iquitos is situated near the confluence of the Ucayali and Marañón rivers which draw their waters from the Andes to form the Amazon River that flows through Brazil into the Atlantic Ocean. Besides these large rivers, the watershed consists of many smaller tributaries, floodplains, meandering streams and oxbow lakes.

Rivers are arguably the primary defining feature of the region. Not only do they serve as a valuable source of aquatic resources, they represent the natural infrastructure upon which all transportation in the region depends. Moreover, seasonal flood cycles largely affect the distribution of aquatic and forest fauna[5] and are integral in providing different types of land for agriculture. Land types are typically distinguished by their relation to rivers. As such, uplands (*altura*) are never flooded, high levees (*restinga alta*) are flooded in certain years, low levees and backslopes (*restinga baja/bajeal*) are flooded every year and mudflats (*barreal*) and sandbars (*playa*) appear only temporarily in periods of low water. Each land type is ideal for different types of crops (See Hiraoka 1985 for a detailed assessment).

Flood waters can rise and fall as much as ten meters every year. This cycle, described by McGrath (1989: 81) as "the heartbeat of the Amazon" announces the seasons: high waters come in winter (December to March) whereas receding waters are characteristic of the summer months (June to October). On the larger rivers, flooding occurs once a year (monomodal cycle) with considerable amplitude, whereas on smaller rivers, flooding is more unpredictable (polymodal cycle) and usually less intense (Kvist and Nebel, 2001). On smaller rivers, low waters can also restrict the passage of trading vessels for indeterminate periods of time (up to two months).

1.3.2 Local inhabitants and livelihoods

The population of the Peruvian Amazon is comprised primarily of mestizo peasants, locally referred to as ribereños. These Spanish-speaking rural residents are descendants of mixed unions between detribalized Amazonian natives and migrants who came to the area seeking employment during the Amazonian Rubber Boom (Chibnik, 1991). This period, which lasted roughly from 1870 to 1920, was vital in shaping the regional economy (Barham and Coomes, 1994) and was a determining factor in the

[5] In periods of low water, game is hard to come by as it is dispersed over a greater area of land, whereas fish are more concentrated. The opposite is true in periods of high water.

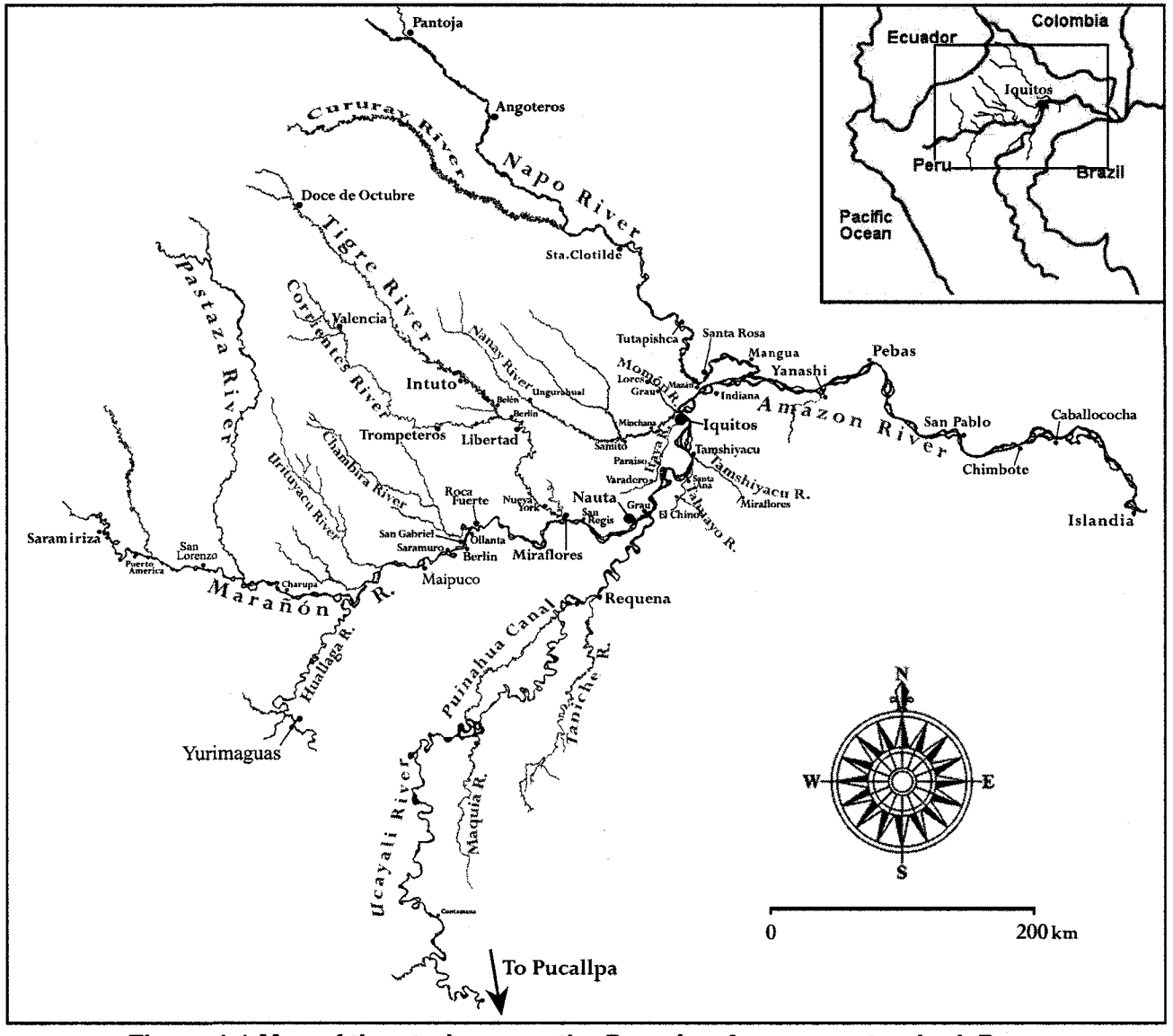

Figure 1.1 Map of the study area – the Peruvian Amazon watershed, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

settlement patterns we observe today (Chibnik, 1994). After the decline of the rubber trade in the 1920s, many *mestizo* peasants turned to the land and rivers for their livelihoods, while the rest settled in Iquitos or smaller rural towns. Today, *ribereño* communities live alongside a small number of indigenous communities that have managed to preserve certain traditions – namely their language, though most will also speak Spanish – but have largely abandoned outward expressions of earlier cultural identity (Kvist *et al.*, 2001). Native communities make up only 8% of the population of Loreto (INEI, 2005).

Ribereño and Amerindian villages are sparsely distributed along the rivers of the Peruvian Amazon (population density is low: 2.5 inhabitants per km^2). Households from both groups generally depend for their subsistence and income needs on a mix of floodplain and swidden agriculture, fishing, hunting, the raising of small livestock and the extraction of a variety of forest products through the careful management of fallows (Hiraoka 1985, 1986; Denevan and Padoch, 1988; Chibnik, 1994; Padoch and Piñedo-Vasquez, 1995; de Jong, 2001). In certain villages, alternative income sources include wage-labour, the sale of handicrafts, and tourism. Figure 1.2 shows two typical riverine villages on the Tigre River.

When they are not directly satisfying their subsistence needs, households sell products from the rivers and forests in the markets of Iquitos or in secondary rural towns. Trade is dependent on river transport and transactions take place either within the boundaries of urban markets, as producers travel to Iquitos, or within rural villages, as merchants travel to the periphery. The nature and distribution of marketing opportunities vary significantly across the region and rural producers must adapt their livelihoods to changing conditions.

1.4 Research methods

The research process was divided into three successive phases: the review of literature, field research and data analysis. The project began in September 2004 and ended in August 2007. The literature review, presented above, served to define the conceptual and geographical area of research. A survey of the local literature on the Peruvian Amazon was critical in informing research methods in the field.

Photo © Jean-Michel Cohalan, September 2005.

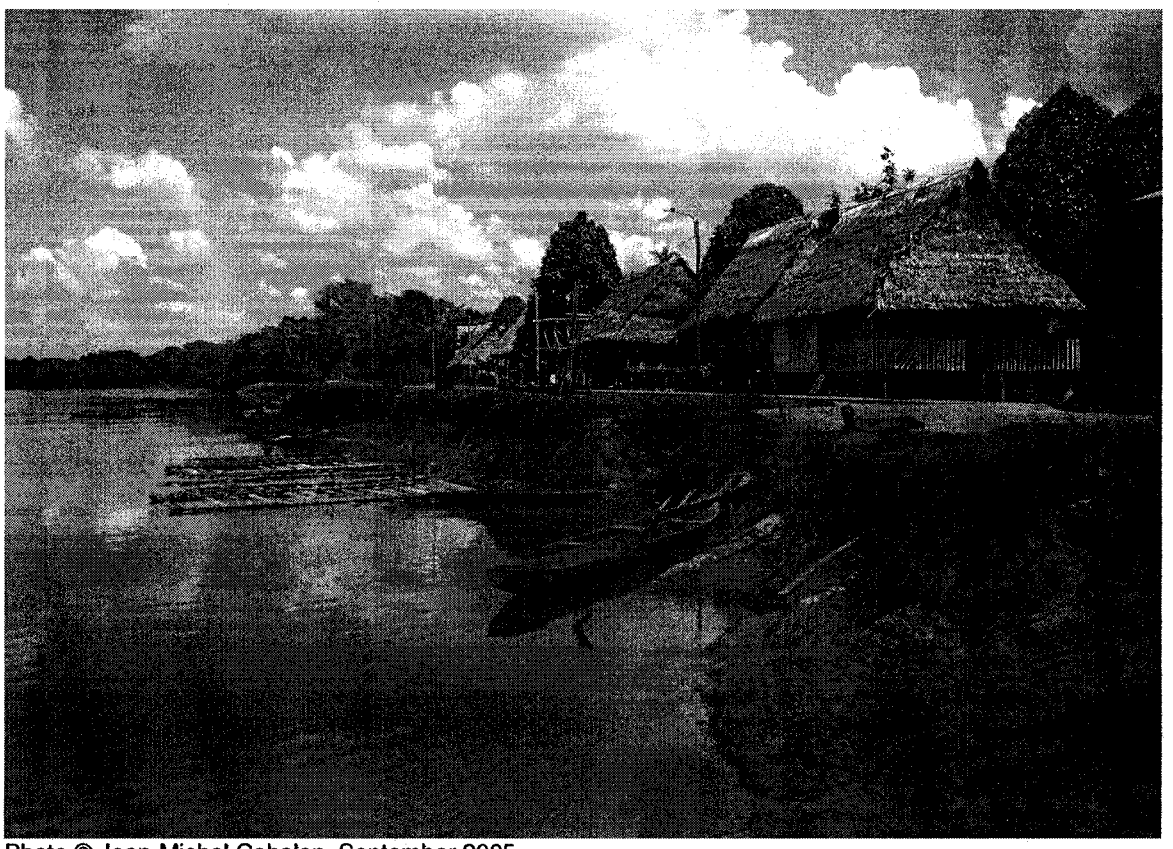

Photo © Jean-Michel Cohalan, September 2005.

Figure 1.2 Villages of Nueva York (top) and Libertad (bottom) on the Tigre River in Loreto, Peru.

Fieldwork in Peru was conducted from June 13 to September 30, 2005. Specific details on research methods are presented at the beginning of each results chapter in the thesis. Research was conducted primarily in the city of Iquitos, aboard various service boats, and in dispersed riverine villages within the Department of Loreto. Data were collected through a multi-method approach combining participant observation, informal discussions, focus groups, semi-structured interviews and socio-economic household surveys.[6] Field methods were approved by the Research Ethics Board at McGill University (see Appendix 3).

All fieldwork was conducted by the author, with the support of Carlos Rengifo Upiachihua, a secondary school teacher and experienced research assistant from Iquitos. Although I conducted the majority of Spanish-language interviews and focus groups with traders and rural producers myself, Carlos' presence was critical, especially at the stage of introductions, when his local status lent much-needed credibility to a young and obviously foreign companion. Moreover, the fact of his being a schoolteacher made it easier for us to convey the academic motivations of my research, since locals could relate much more easily to the role of a schoolteacher in Iquitos than to that of a graduate student from Canada. Explaining the motivations of the research was especially critical in the ports of Iquitos, where traders are typically reluctant to divulge their trading practices. With time, people in the ports became more accustomed to my presence and our relationship, as researcher and researched, flourished into a more open exchange of ideas.

Throughout the research, I encouraged people to ask me questions about my own livelihood in order to foster a dialogue in which the lines between researcher and researched are blurred (see England, 1994 on 'reflexivity'). I believe that being male helped me to interact more openly with boat operators and traders, as the realm of river trading is dominated by men. Conversely, my gender may have had the opposite effect during interviews conducted with women in rural communities. Finally, throughout the field research, I made it a point to continually learn and become more familiar with local vocabulary and expressions, which helped demonstrate my genuine interest in the region. The use of local terms was also beneficial in lightening the atmosphere during interviews

[6] Russell (2002) *Research Methods in Anthropology: Qualitative and Quantitative Approaches* was a valuable resource.

and informal exchanges, as people were very amused and impressed that a foreigner was comfortable with the local dialect. Whereas I was first recognized on sight by the locals as a *gringo* (a white foreigner), I quickly became referred to, primarily, as a *sacha-charapa* (local slang for 'quasi-local').

Upon returning from the field, data analysis was conducted in Montreal, Canada, and in New York City, USA. Detailed methods of analysis are described at the beginning of each results chapter. Data on transport and trading networks were compiled for analysis in Excel spreadsheets. Conceptual maps were constructed using Adobe Photoshop. Qualitative and quantitative responses from the socio-economic survey were coded and entered in Excel. The thesis was drafted concomitantly with data analysis.

1.5 Thesis structure

The thesis is organized into five chapters, including the present introduction, in the format of a manuscript-based thesis.

Chapter 2 describes the organisation and geographic distribution of river trading networks around the city of Iquitos and outlines the diverse roles and motivations of the many actors involved (the first objective of my study).

Chapter 3 considers the socio-economic implications of river trading on access to product markets. Research at the regional and sub-regional scales dissects the principal variables that determine market access (the second objective of my study).

Chapter 4 consists of a comparative livelihoods analysis of two indigenous communities of the Alto Tigre River that diverge considerably in their access to wage employment. A socio-economic household survey is used to detect the impacts of contrasting labour markets on livelihoods (the third objective of my study).

Chapter 5 summarizes the main findings of the thesis and discusses the principal contributions of the research.

CHAPTER 2. RIVER TRADING IN THE PERUVIAN AMAZON

2.1 Introduction

Trading is closely intertwined with economic and social life. As people engage in trade, they come in contact with others, create social links and share information; they move in and out of economic relationships seeking different anticipated outcomes; some look for security, others try to accumulate capital, and all are vulnerable to losses. In each locality, the way in which trade is practiced reflects peoples' opportunities and their environment, shaping livelihood choices and the social and economic dynamics affecting them.

In economic development, the issue of trade is especially significant inasmuch as trading practices reflect the degree and manner in which small-scale producers can engage in the market. The question of market access is receiving increasing attention in development literature with regard to its impact on livelihoods (Escobal, 2001) and the environment (Bush, 2004) as well as its significance in combating persistent poverty by improving the productivity of assets (BASIS CRSP, 2004). Despite much of the mainstream contemporary discourse on markets that focuses increasingly on globalisation, continued research at the local and regional scales is critical to informing policies affecting trade, since market access remains, fundamentally, a local phenomenon.

The Peruvian Amazon is a developing region in which the issues of trade and market access have received little attention. With its incomplete and ephemeral markets, the virtual absence of roads and the many risks and high transaction costs associated with long-distance river trading, this area is often characterized as being plagued by grave marketing problems (Padoch, 1987). Trading, for small-scale producers, is seen as prohibitively expensive and their poverty is often attributed to the difficulty getting products to market (Chibnik, 1994). While these difficulties in trade pose an important barrier to the region's development, very little research in the Peruvian Amazon has focused directly on the regional river trading system which, by ensuring the transport of virtually all the marketable produce in the region, is the backbone of the local economy.

This chapter provides a comprehensive description of river trading in the northeastern Peruvian Amazon. The objective is to dissect the mechanics of local river

trading networks and to identify the socio-economic parameters that guide trade relations. By filling gaps in our understanding of the way in which river trading is organized and conducted, this overview lays the groundwork for further research on market access in the region (see subsequent chapters). Advancing our knowledge of the trading environment around Iquitos is crucial to informing the regional debate on local livelihoods and poverty.

The chapter is organized as follows. After a description of the study area and research methods, I present my results in four sections. First, I identify the principal agents of river transport and describe their geographical distribution around Iquitos. Second, I distinguish secondary and tertiary trading zones within the centralized river trading system of Loreto. In the third section, I focus on the multiplicity of market intermediaries involved in trade. Trading agents are described in terms of their roles and distribution within marketing chains, emphasizing their functional specialization within the trading sector and the ensuing heterogeneity of marketing chains. The fourth section explores the nature of trading relations within the informal river-trading system of the Peruvian Amazon. Important geographical and socio-economic features of the trading environment, namely risk and uncertainty, transaction costs and competition, are discussed with regard to their influence on the conduct of trade. The chapter ends with a reassessment of my main findings and concludes that the river-trading system in the Peruvian Amazon is structured in such a way as to mitigate the high-risk, high-transaction cost nature of the regional trading environment.

2.2 Study Area

Studying the river trading networks of the Peruvian Amazon requires a preliminary understanding of the drainage system that provides the natural infrastructure on which all transport is based (cf. Figure 1.1). The reliance on rivers for short and long-distance trade in the Amazon certainly predates the arrival of European explorers. The convergence of regional trading routes toward Iquitos observed today, however, is a legacy of the Rubber Boom, a period of intensive rubber extraction in the late 19th century that saw Iquitos rise from a small indigenous hamlet to the commercial center of an extensive Peruvian export trade (Barham and Coomes, 1994). Chibnik (1994: 37) notes

that at that time the "practice of travelling to small communities along rivers to buy and sell goods expanded and long-distance trading became an occupational specialty". By the end of the 1920s, the boom which had attracted a large number of settlers in the region collapsed, and many rubber tappers and extension workers that had settled the banks of the many rivers in Loreto in search of rubber resigned themselves to more subsistence-based livelihoods. Meanwhile, the itinerant traders that ensured the efficient collection of rubber from distance estates continued to service the dispersed population, effectively maintaining a centralized system of trade, focused around the city of Iquitos.

Today, given the impracticable forests, meandering watercourses, and limited investment by the national government, rivers rather than roads continue to serve as the basic infrastructure for transport. The largest rivers in the watershed are the Marañón, the Ucayali and the Amazon. Population and transport are both typically denser along these three rivers than along their tributaries. The tributaries included in this study are the Napo, Nanay, Momón, Itaya, Tamshiyacu and Tahuayo rivers which flow into the Amazon; the Tigre, Corrientes, Pavayacy, Nahuapa, Chambira, Urituyacu and Huallaga rivers whose waters flow into the Marañón; and the Tapiche and Maqui rivers, both tributaries of the Ucayali (see Figure 1.1).

Unlike in Brazil, the Peruvian Amazon shows little sign of heavy deforestation. This is due in part to a shortage of industry and colonization in the region, as well as a very scattered population base – the overall population density is 2.5 inhabitants per km^2 (though in reality, the population is clustered into small rural villages and larger rural towns). The population of the department of Loreto is approximately 885,000 (INEI census, 2005) and is made up of two main groups, namely native Amazonians – who represent 8% of the population and are divided into many subgroups – and *mestizo* peasants (often referred to as *ribereños*, or *loretanos*) – who make up the bulk of the population, speak only Spanish and are the descendents of multiple generations of mixed unions (Padoch, 1988). Almost half the population of Loreto (approx. 400,000) lives in the capital city of Iquitos (Peru's sixth largest city and the world's most inland port). The rest of the population lives either in smaller regional urban centers such as Nauta, Yurimaguas, and Requena, in smaller rural towns or in riverine villages scattered along

the banks of navigable rivers in the drainage basin (with populations typically ranging from twenty to several hundred).

Rural peasants practice a mix of floodplain agriculture, swidden agroforestry, fishing and hunting to satisfy both subsistence and income needs (Hiraoka, 1985, 1986; deJong, 2001). Their degree of reliance on product markets varies across the region; nevertheless, every community maintains a certain link with the city. Production for sale is usually destined for Iquitos, the principal market node of the entire region. Virtually every type of product from the Amazon can be traded there, from game meat to tropical fruits to turtle eggs and medicinal plants. Because of the nature of production in the region – mostly perishable foods and natural building materials – very little produce is designated for export. Rather, regional production is geared toward filling consumption needs in Iquitos or in secondary towns.

The city of Iquitos is situated on the Amazon River near the confluence of the Ucayali and the Marañón. Five ports in Iquitos provide river access in all directions (Figure 2.1).[7] At the north end of the city, the Masusa (1) public port is used by independent river launches that service destinations on the Napo, Amazon, Marañón, Tigre, Corrientes, and Ucayali rivers (Figure 2.2). Launches typically follow regular schedules and pay docking fees. The large Pucallpa- and Yurimaguas-bound vessels dock in Puerto Henri (2), a private port nearby. Smaller river boats (*colectivos*) that service the Amazon, downstream from Iquitos, depart from Puerto Productores (3); and Requena-bound river launches dock at the nearby Puerto Pescadores (4). At the west end of the city, puerto Nanay (5) offers access to the Nanay and Momón rivers. Finally, the Belén (6) market at the south end of the city is an important junction for the myriad small river boats that service the Itaya and all destinations upstream from Iquitos on the Amazon and its tributaries, as well as for itinerant river traders that travel long distances to the most remote villages in the region (Figure 2.3).

Besides being the principal focus of regional production, Iquitos is also the administrative capital of Loreto. Its two hospitals, two universities and many government offices provide essential social services for the region. Iquitos is also the main source of

[7] The city of Iquitos used to sit on the banks of the Amazon, but the river has changed its course over time and the city now lies at the mouth of the Itaya River. It will be interesting to observe the changes that take place as access to the Amazon – the main artery of the region – becomes increasingly restricted over time.

important factor markets – for credit, productive assets and agricultural inputs. Consumer goods and construction materials sold in Iquitos are imported from Brazil (transported from the port of Islandia on the Amazon River) and from inland Peru (shipped via the ports of Yurimaguas and Pucallpa, which are both connected by road to Lima). Figure 2.4 shows the three principal entry and exit points of the river trading system in Loreto.

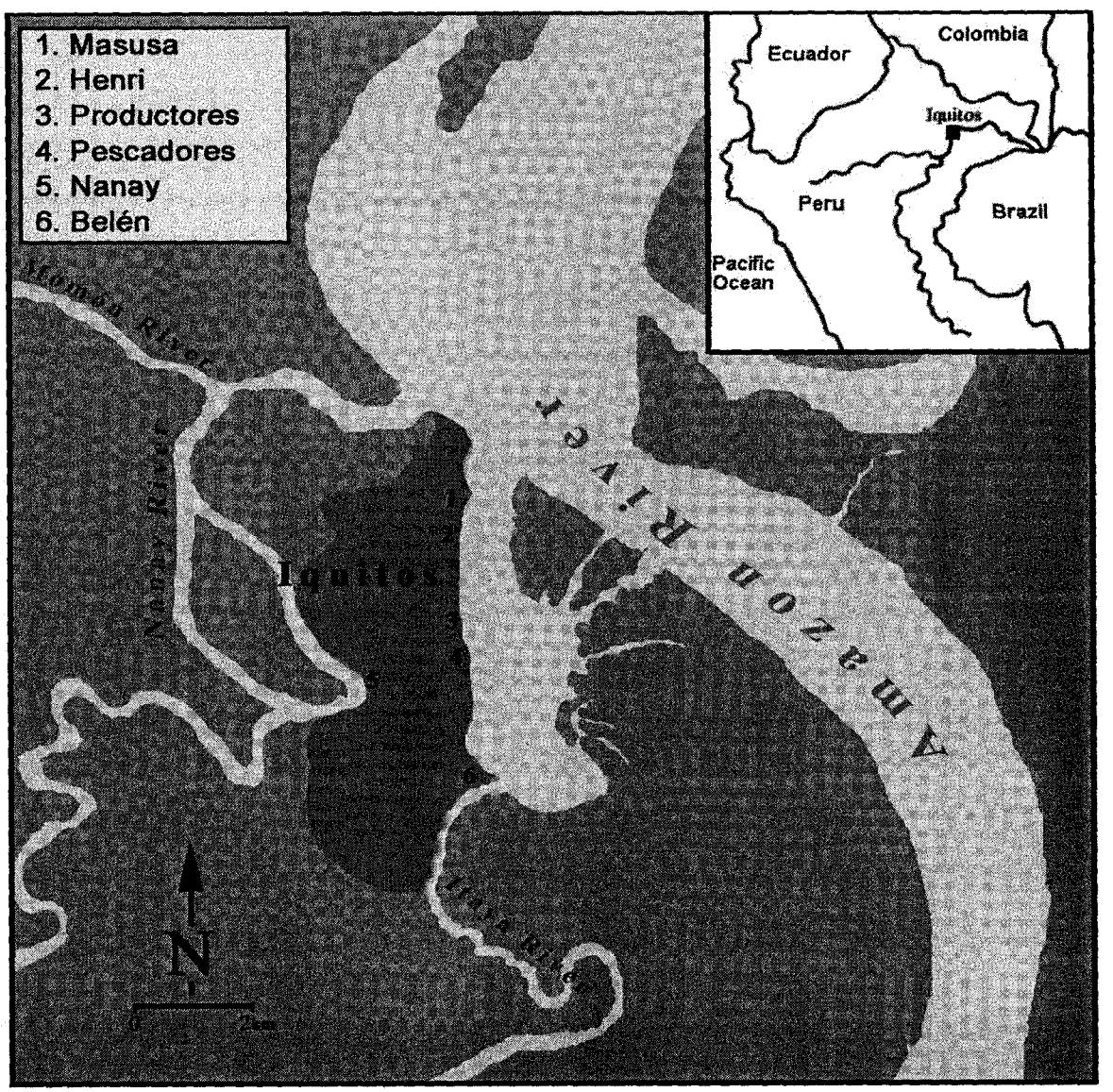

Figure 2.1 Map indicating the location of the ports of Iquitos.
Source: Adapted from satellite imagery on www.maps.google.com.

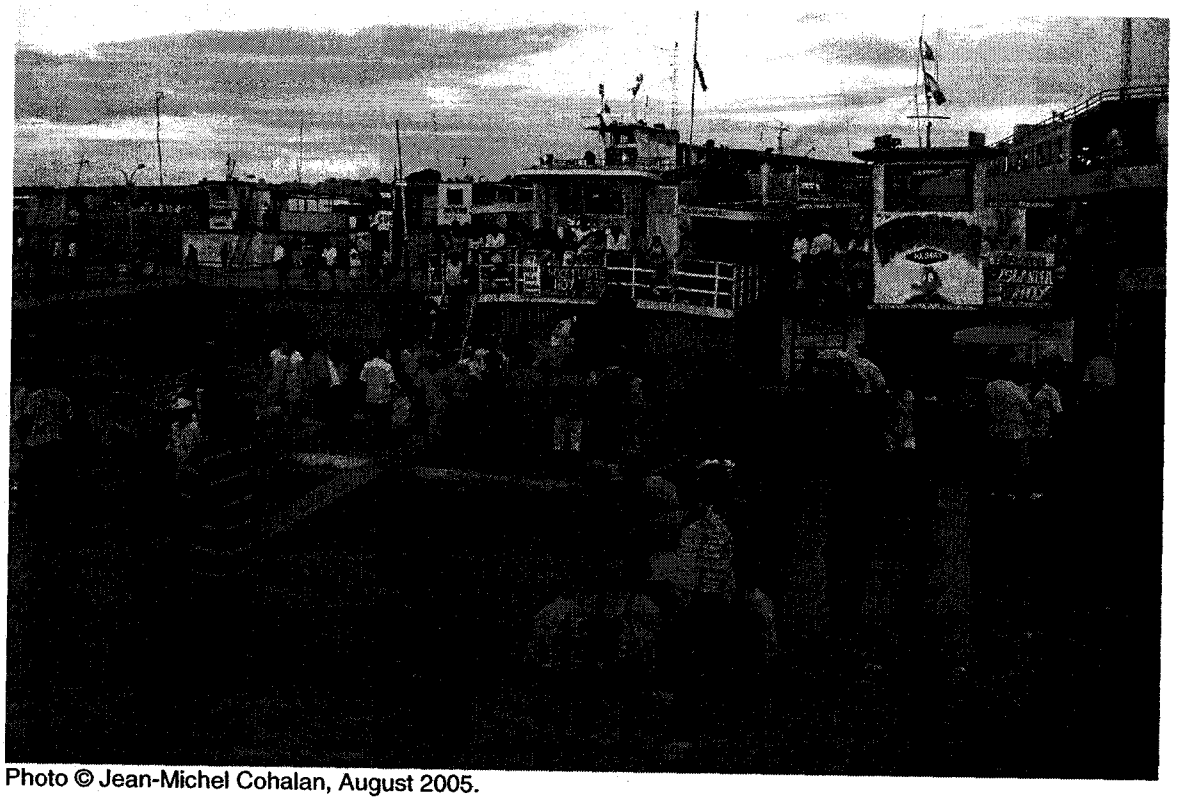

Photo © Jean-Michel Cohalan, August 2005.

Figure 2.2 River launches loading in the port of Masusa, Iquitos, Peru.

Photo © Jean-Michel Cohalan, August 2005.

Figure 2.3 The busy port of Belén, Iquitos, Peru.

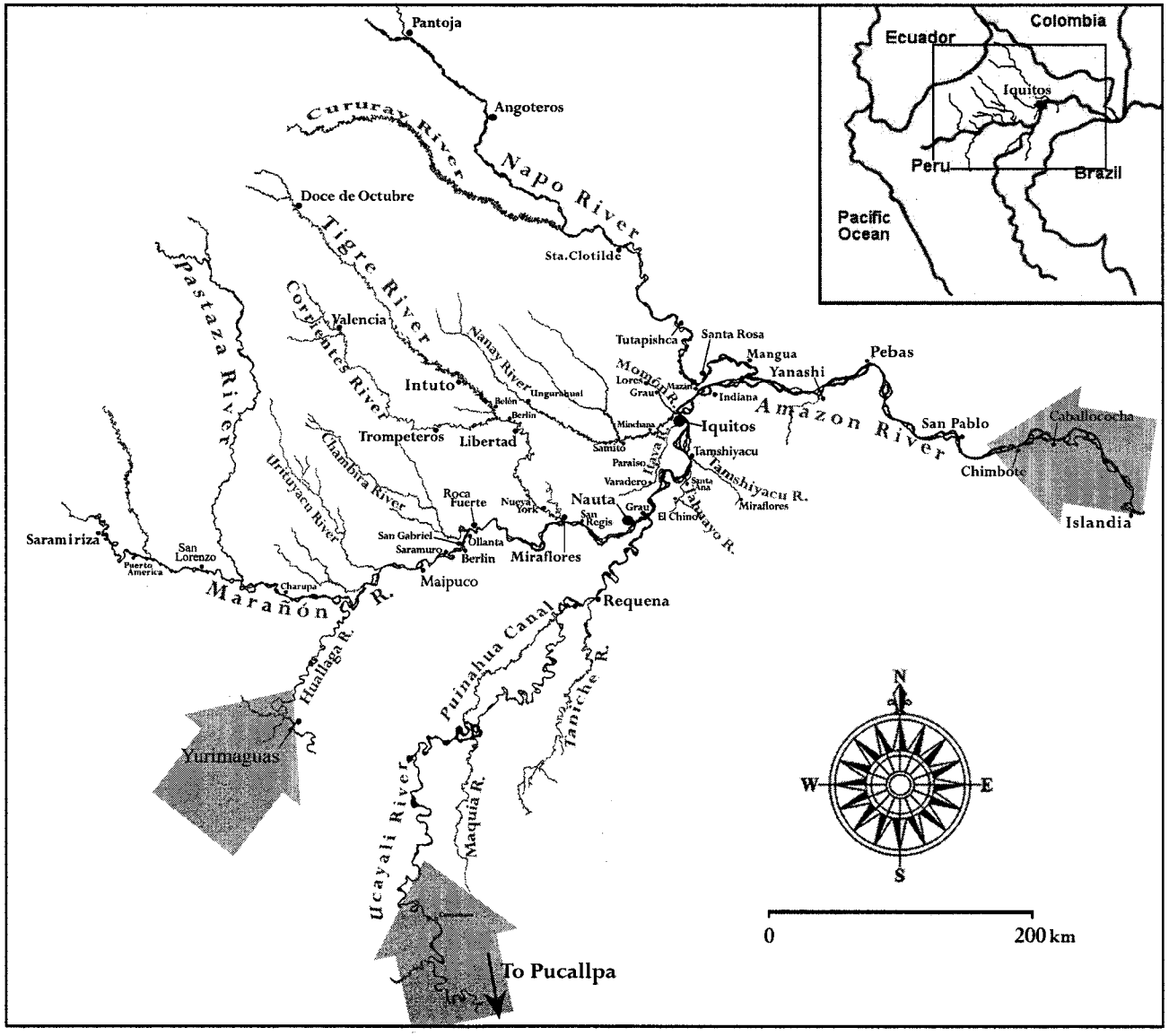

Figure 2.4 Principal entry/exit points of the river trading system of Loreto, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

2.3 Methods

Fieldwork was conducted aboard river boats and in the ports of Iquitos, Nauta and Requena over four months between June and September of 2005. The research was designed to ascertain the diversity of trading routes and marketing agents that make up the river trading system in Loreto. Initial reconnaissance of the basic geography, market dynamics and extent of the regional trading network around Iquitos was conducted upon arrival in the city, through participant observation and informal exchanges with port workers and boat operators. This process allowed me to construct a preliminary database of trading routes in the region and identify all the ports that needed to be explored. Information from the Peruvian Coast Guard was also sought but proved to be very limited, reflecting the informal character of river trading in Loreto. Once the basic foundation was established, the interviewing process began.

Fieldwork focused first on transportation networks. For each river upon which trade is conducted (twenty rivers in total), trading routes were identified based on the final destinations of boats. Altogether, 54 distinct trading routes were identified around Iquitos. For each trading route, two boats were selected for interviews in order to allow for cross-referencing.[8] In certain cases, it was only possible to interview one boat operator, rather than two. The selection of boat operators to be interviewed on each route was made by convenience sampling. Semi-structured interviews were conducted with boat operators aboard their docked vessels in order to gather data on distances travelled, the frequency of trips, the capacity of boats, the main products traded, and the nature and diversity of fares and fees (see Appendix 1- A).

All interviews were conducted by the author, in Spanish, with the help of Carlos Rengifo Upiachihua, an experienced local research assistant. When informants were less pressed for time, interviews would turn into more informal exchanges about personal histories, trade difficulties, different types of transactions and business strategies. Often, interviews helped reveal new trading routes that had not previously been identified. Finally, in several cases, after the semi-structured interviews were over, other workers, passengers, merchants and clients were engaged in informal conversations about river

[8] In situations where final destinations were very close to one another, most notably on small rivers, the river itself was considered a trading route (rather than each destination), thereby substantially reducing the number of overlapping interviews.

trading. The same identification and interviewing process was conducted in the ports of Nauta and Requena, both of which are considerably smaller than the ports of Iquitos.

The next step in field research was to identify and conduct informal interviews with the many types of market intermediaries that facilitate economic transactions in the river trading system. This process was conducted simultaneously with boat operator interviews since both took place in the ports and nearby markets of Iquitos, Nauta and Requena. Informal interviews were conducted with as many different actors as possible in order to faithfully represent the diversity of agents of trade in the system. In-port research about boats and market agents was complemented by research aboard traveling ships. Here, participant observation was essential in identifying agents, transactions and forms of exchange that had not been revealed during in-port research. River travel was also vital for understanding the minute mechanics of river trading and revealing the other side of trade, that is, at the village interface. Over the research period, three day-trips aboard small river boats and three overnight trips aboard large river launches were completed.

Whether in ports, markets or aboard boats, the solicitation of information was done in such a way as to reflect and maintain a reflexive and neutral demeanor with research participants. Before interviews, whether semi-structured or informal, I explained the nature and motivation of my interest in people's trading habits. Because the threat of competition is always in the back of traders' minds, some individuals were understandably less forthcoming than others. Most participants however, were keen on explaining their work and contributing to the research project.

The principal limitation of the field research is the period during which fieldwork was conducted, that is the summer, which corresponds to the dry season in the Peruvian Amazon. Most interviews were conducted in the month of June, when water levels are still relatively high. However, toward the end of the research, in August, it was found that many boats were having difficulties entering and exiting the ports of Iquitos, due to the receding of the Itaya channel. Moreover, the limited time-span of field research could not account for seasonal variation in the number of boats operating throughout the year. Because there is a constant shuffle of trading routes, a yearlong log of boats would be the only way to ensure accurate results and even then, such an approach would fail to account for continual variation from one year to the next.

2.4 Results

The ports of Iquitos never sleep. An endless bustle of boats and cargo, negotiations, deals made and deals broken serve as a constant reminder that this city is at the centre of an extensive, informal regional trading network. Every transaction in Iquitos reflects a multitude of related transactions completed elsewhere in the region. Indeed, the many boats arriving in Iquitos every day (and at all hours of the night) carry produce originating from virtually every inhabited river bank and tributary in the department of Loreto; upon their departure from Iquitos, these same boats distribute myriad consumer goods to the riverine peasants scattered in villages across the region (Table 2.1). Thus, Iquitos represents the primary interface for regional trade, but by no means is trade practiced exclusively in its ports.

Table 2.1 Range of rural and manufactured products transported on rivers around Iquitos, Peru.

Crops	**Orchard fruit**	**Forest products**	**Processed food**
Plantain	*Guayaba*	Game meat	Rice
Banana	*Guava*	Fire wood	Bread
Manioc	*Mamey*	Roof thatch	Sugar
Manioc meal	*Pijuayo*	Timber	Salt
Rice	*Macambo*	Moriche Palm fruit	Oil
Maize	*Caimito*	*Ungurahui*	Crackers
Chiclayo	*Shimbillo*	*Umari*	Tuna
Frejol	Mango	Charcoal	Soda
Tobacco	*Sachamangua*		Beer
Cilantro	Coconut	**Aquatic products**	
Onion	Orange	Edible fish	**Commodities**
Cucumber	Toronja	Aquarium fish	
Tomato	Lemon	*Taricaya* (turtle)	Diesel fuel
Avocado		*Taricaya* eggs	Gasoline
Potato	**Livestock**	Tortoise	Kerosene
Sweet potato	Chickens	Caiman	Motor oil
Zapallo	Ducks		Mosquito nets
Zapote	Pigs		Flashlight
Melon	Chicken eggs		Batteries
Watermelon	Cattle		Hygiene products
Sugarcane			Clothes
Peanuts			Cooking utensils
Heart of palm			Machetes, axes
Medicinal plants			Motors

2.4.1 The spatial distribution of commercial boats around Iquitos

The vast area surrounding the city of Iquitos can be divided into three concentric zones of transport which constitute the physical and contextual backdrop upon which the entire regional system of trade is based. Each zone is distinguished by the type of boat that provides the primary mode of transport: small river boats (*colectivos*), large river launches (*lanchas*) and long-distance itinerant traders (*regatones*). The system can be conceptualized as a series of concentric rings extending outward from Iquitos.[9] Besides their distributional differentiation, each class of boat has unique characteristics and engages in specific types of transactions adapted to the niche they service.

2.4.1.1 Small river boats

Colectivos are long wooden river canoes ranging between five and forty metric tonnes capacity (Figure 2.5). They are usually covered with a thatch or wooden roof and are powered by long-shafted[10] or standard outboard motors ranging between three and forty horsepower, making them rather slow, especially when travelling against strong currents. Small river boats are usually privately-owned and serve commercial purposes; that is, the owner's profession and primary source of income are based on the operation of the boat. They typically travel once to five times a week between Iquitos and a final destination village no more than one day's travel away, stopping in villages whenever they are flagged down (Table 2.2). The spatial distribution of river buses around Iquitos is represented in Figure 2.6. As we can see, their range is restricted to an area immediately surrounding the city of Iquitos, on the Amazon, Itaya, Momón, Nanay, Tamshiyacu and Tahuayo rivers.

(i) Transactions

Colectivos are primarily a private-sector service, providing transport for passengers and their cargo to and from Iquitos. Operators (*colectiveros*) seldom buy or sell produce directly. Certain operators, however, do take advantage of their mobility, the liquidity of their capital and their many contacts in order to engage in the buying and selling of specialized products, notably cane liquor (*aguardiente*), which they sell in the

[9] This conceptualization is similar to von Thünen's theory on the spatial distribution of agricultural production in relation to the market (Nelson, 2002).
[10] Long-shafted motors are locally referred to as *peque-peque* because of the sound they make.

port of Belén.[11] Such enterprises provide a complementary source of income for transport operators, at little cost.

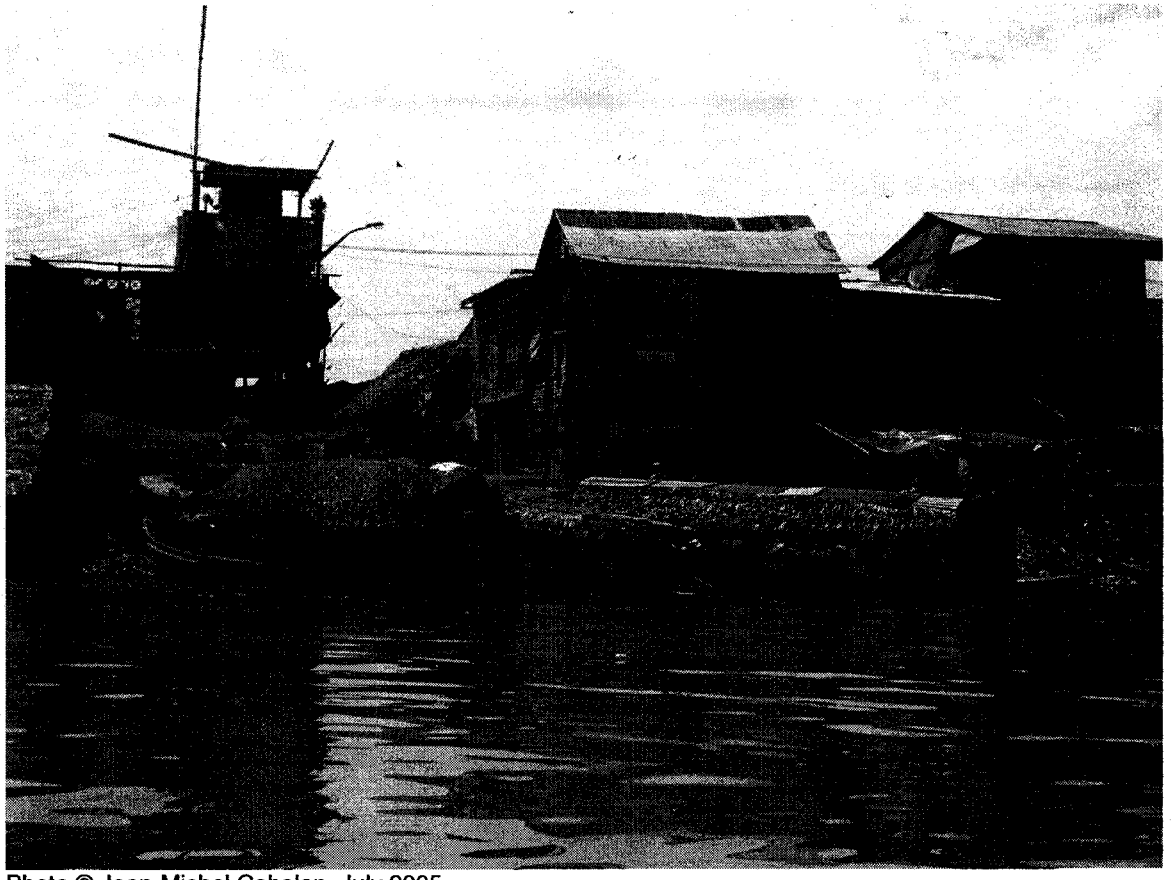

Photo © Jean-Michel Cohalan, July 2005.

Figure 2.5 Small river boats (*colectivos*) in the port of Belén, Iquitos, Peru.

Producers usually have the choice either to board the boat with their produce in order to sell it themselves in Iquitos, or to entrust their produce to the boat operator for delivery to Iquitos. This latter type of transaction is referred to as *encomienda*. Specific arrangements vary from boat to boat. Some river bus operators charge a flat fee for the service while others take a commission; some will only deliver produce and packages to port for them to be picked up by a person designated by the sender. Others will take charge of selling the produce themselves in Iquitos and buy certain items for the client in exchange, keeping a certain commission as compensation for time spent. This depends on the boat operator, but also on the relationship between him/her and the client.

[11] This practice is common among *colectiveros* on the Itaya River.

Table 2.2 Frequency and distribution of small river boats (*colectivos*) operating around Iquitos, Peru, 2005.

River	Destination (distance*)	Boats/week**	Tonnes/week***
Amazon, downstream of Iquitos	Varadero de Mazán (2.75)	12	120
	Indiana (3.5)	9	189
	Nuevo Paraiso (4.5)	4	40
	Vainilla (7)	3	32
	Yanashi (12)	12	260
Napo	Yarayacu (13)	4	80
	Santa Rosa (17)	8	200
Momón	Lores (9)	8	40
Nanay	Nearby (45 mins)	9	24
	Ungurahual (18)	4	36
Itaya	Sta. Barbara (3)	3	12
	Buena Esperanza (4)	3	12
	Limon (5)	6	30
	Paraiso (6)	6	36
	Varadero (10)	4	18
Amazon, upstream of Iquitos	Muyuy (6)	15	132
	Aucayo (6)	6	72
	Tamshiyacu (7)	12	177
	Ayacucho (9)	6	156
	Yacapana (9)	6	72
	S.J. Puritanía (12)	6	280
Río Tamshiyacu	Miraflores (13)	2	18
Río Tahuayo	Esperanza (10)	6	81
	El Chino (12)	6	72

* Distance is calculated in hours of travel. Values are obtained by adding up the travel times up and down river and dividing by two to get an average, one-way distance.

** Boats/week is calculated by multiplying the number of boats to one destination by the number of trips each boat does per week. One boat does not necessarily make the same number of trips as another.

*** Tonnes/week is calculated by multiplying the capacity of each boat by the number of trips per week and aggregating.

(ii) Fees

Colectivos cover their costs and derive their profits from fees charged to clients. Passengers must pay a fare (*pasaje*) ranging from 0.50 to 8 Nuevo Soles (1 USD = 3.16 Nuevo Soles, or Soles, or S/.), depending on the boat and destination. On certain boats, fares also depend on the direction of travel, as strong currents can make an important difference in fuel consumption. In addition to passenger fees, a cargo fee (*flete*) is also charged, based on the type and bulk of the products being transported, as well as the distance travelled. These fees are set by the boat operator, with little room for bargaining.

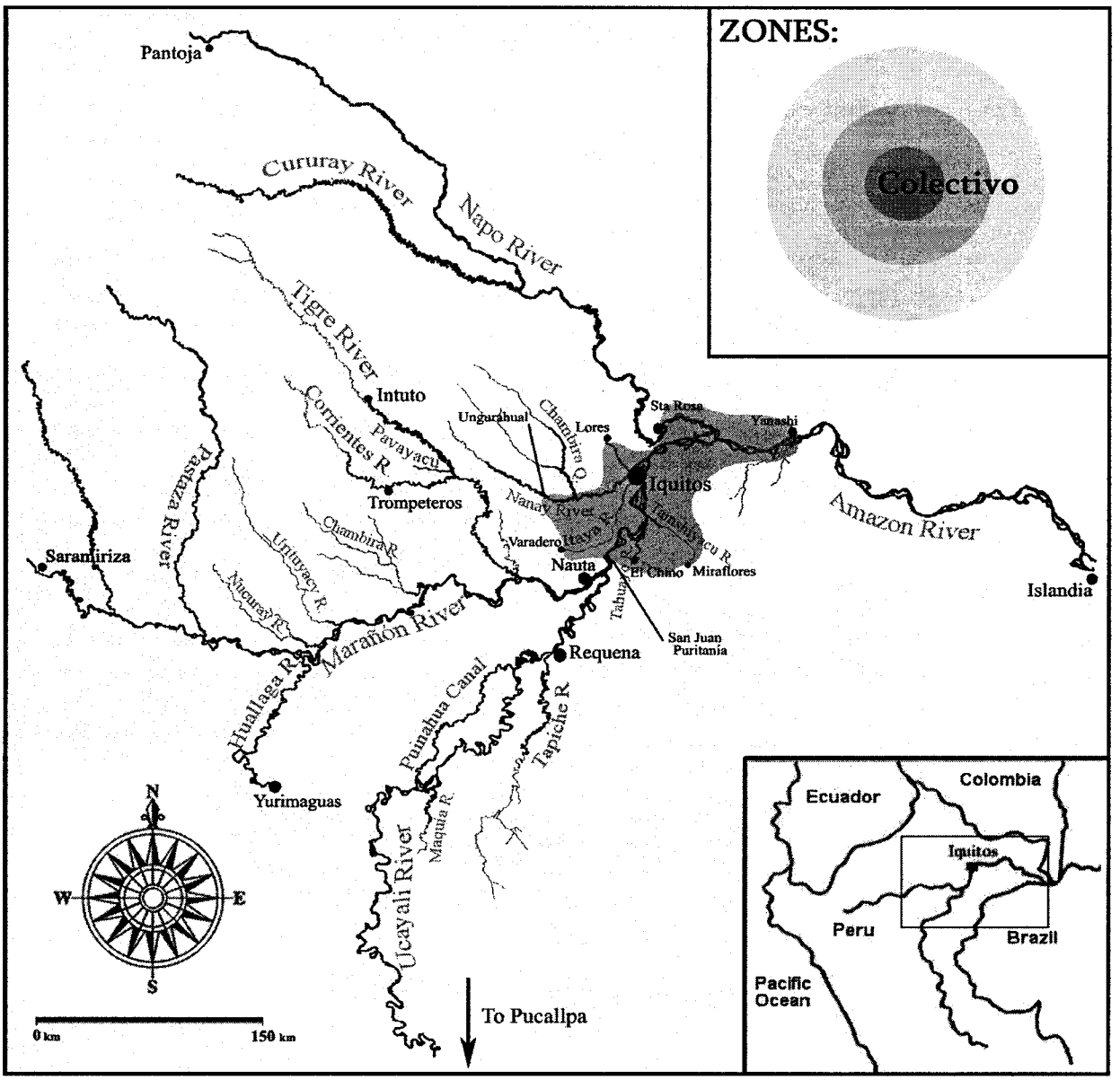

Figure 2.6 Range of small river boats (*colectivos*) operating around Iquitos, 2005.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

Given the diversity of products transported (the majority of products listed in Table 2.1) and the fact that cargo fees are not standardized across boats, it would be infeasible to compile cargo fees for all products on all trading routes. Rather, comparing the fees for standard products leads to a better assessment of the range of cargo fees around Iquitos. Passenger fares and cargo fees for two standard products are listed in Table 2.3. The cargo fees for plantains were found to range between 0.30 and 1.5 Soles, using the raceme (*racimo*) as a standard unit of measure, whereas the cargo fees for a

standard burlap bag – usually filled with manioc, various orchard fruit or plantains – range from 1 to 2 Soles.

Table 2.3 Small river boat fares (*pasaje*) and cargo fees (*flete*) to Iquitos, Peru, 2005.

RIVER	DESTINATION (distance*)	Fare**	Cargo fee - plantain	Cargo fee – burlap bag
Amazon, downstream of Iquitos	San Rafael	3	0.5	1
	Santa Maria	3 - 4	0.5	1
	Varadero de Mazán (2.75)	4 - 5	0.5	1
	Indiana (3.5)	4 - 5	0.5	1
	Nuevo Paraiso (4.5)	5 - 6	0.5	1
	Vainilla (7)	7 - 9	1	2
	Yanashi (12)	12	1	2
Napo	Orellana	6	1	2
	Mangua	8	1	2
	Yarayacu (13)	10	1	2
	Santa Rosa (17)	10	1	2
Momón	Porvenir	2	1	1
	Santa Rosa	2.5	1	1
	Centro Fuerte / Kenken	3	1	1
	Polis	3.5	1	1
	Grau	4	1	1.5
	Union / San Luis	5	1	2
	Lores / Maynas (9)	6	1.5	2
Nanay	Nearby (45 mins)	1	0	1
	Mishana / Porvenir	5	0	2
	Samita / Lagua	6	0	2
	Anguilla	8	0	2
	Santa Maria	10	0	2
	Diamante Azul	11	0	2
	Ungurahual	12	1	2
Itaya	Sta. Barbara (3)	2	0.5	1
	Buena Esperanza (4)	2	0.5	1
	Limon (5)	2.5	0.5	1
	Paraiso (6)	3	0.5	1
	Varadero (10)	5	0.5	2
Amazon, upstream from Iquitos	Santa Rosa	2.5	0.5	1
	Pihuichu	3	0.5	1
	Freide (6)	4	0.5	1.5
	Gallito	3	0.5	1
	Aucayo (6)	4	0.5	1
	Tamshiyacu (7)	4	0.7	2
	Yacapana / Ayacucho (9)	4	1	2
	Justicia (9)	5	1	2
	San Joaquin de Omaguas	6	1	2
	S.J. Puritanía (12)	8	1	2
Río Tamshiyacu	Destino 1	5	0.5	1
	Destino 2	6	0.5	1
	Libertad	7	0.5	1
	Miraflores (13)	8	0.5	1
Río Tahuayo	Santa Ana / Esperanza (10)	5	1	2
	Chorro	6	1	2
	El Chino (12)	7	1	2

* Distance indicated in average travel time (upstream + downstream / 2).

** In the case of routes on which *pasaje* changes whether one is traveling upstream or down, the downstream price is indicated first, followed by the upstream price

(iii) Range

Small river boats (*colectivos*) are restricted within a one day radius from Iquitos (the furthest destination is Santa Rosa on the Napo, 17 hours away). They constitute the first zone in the concentric ring model (as shown in the upper corner of Figure 2.6). It is a combination of their limited carrying capacity and their relatively slow motors that keeps them from travelling longer distances. However, with a greater population concentration around Iquitos, there is a great demand for short-distance travel and since small river boats have relatively low operating costs (as compared to larger river launches), they manage to keep a healthy balance between costs and returns. As such, they are the best suited embarkations for the short-distance market.

2.4.1.2 River launches

River launches (locally referred to as *lanchas* or *motonaves*) are steel-hulled boats ranging from 35 to 600 metric ton capacity (Figure 2.7).[12,13] They are powered by large diesel engines and typically travel faster than *colectivos* despite their bulk. Launches provide regular transport beyond the reach of *colectivos*, travelling from twice a week to twice a month, to distances ranging from 14 hours to 5.5 days away from Iquitos (Table 2.4). Figure 2.8 shows the range of river launches around Iquitos. *Lanchas* ensure constant commercial traffic along the Napo, Amazon, Marañón, Tigre, Corrientes, Huallaga and Ucayali rivers. The largest of river launches typically carry shipments of manufactured products and construction materials to Iquitos from Islandia in Brazil, Pucallpa on the Ucayali, and Yurimaguas on the Huallaga. Along the way, they will also stop in riverine villages to collect passengers and produce.

(i) Transactions

Like *colectivos*, launches specialize in the transport of passengers and cargo, and generally do not engage in the buying of produce. However, certain launch operators will engage in cash transactions with riverine villagers – either selling commodities from urban markets in their onboard general stores, or buying specific produce which they know will fetch a good price in Iquitos or which they will use in the preparation of meals for passengers. Many of the larger launches on the Amazon, Marañón and Ucayali rivers

[12] In the summer of 2005, the Henri Company was building a new 800 metric ton *lancha* to add to its fleet.
[13] Certain river launches that service smaller markets, such as on the Tigre River, are still made of wood.

also have lucrative transportation deals with industry and large importer/exporters from Iquitos, Brazil and Lima.

Photo © Jean-Michel Cohalan, July 2005.

Figure 2.7 River launch on the Amazon River, Peru.

Table 2.4 Destination and frequency of river launches around Iquitos, Peru.

RIVER	DESTINATION	DISTANCE (hrs)	boats/week	tonnes/week
Amazon	Islandia	30	9	1560
Napo	Boca del Curaray	84	0.75	26
	Pantoja	132	1.5	195
Alto Marañón	Roca Fuerte	27	2	200
	Ollanta	29	2	400
	Saramiriza	132	0.5	50
Tigre	*Quebrada Nahuapa*	39	1.5	58.5
	Intuto	55	2	75
Corrientes	Trompeteros	42	2	200
Huallaga	Yurimaguas	60	10	2400
Ucayali	Requena	14	6	1260
	San Ramón	50	2	250
	Pedrera	50	2	350
	Pucallpa	84	9	2535

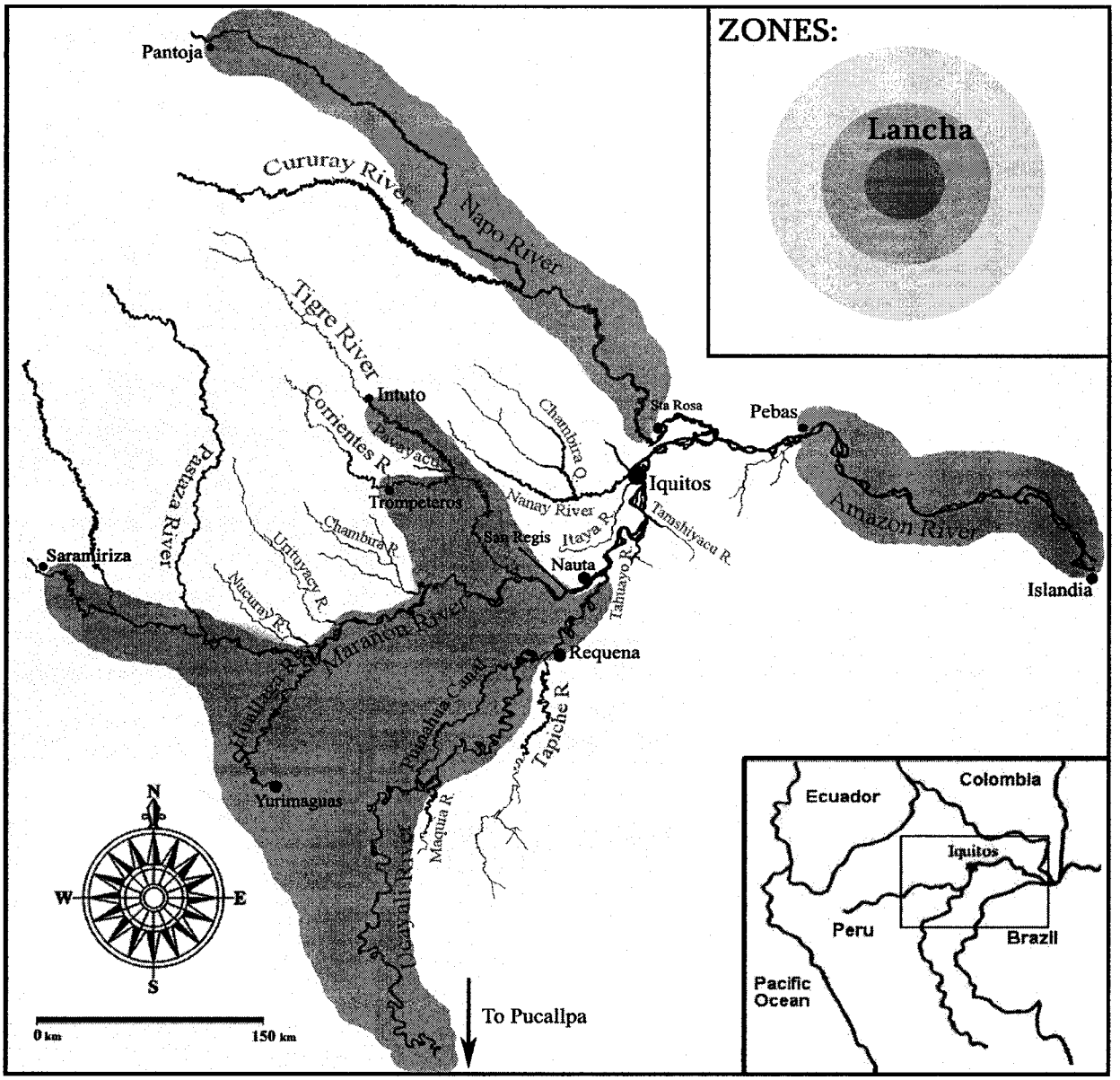

Figure 2.8 Spatial distribution of river launches (*lanchas*) around Iquitos, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

(ii) Fees

River launch operators charge a passenger fare (*pasaje*) and a cargo fee (*flete*), and fees are generally higher than on *colectivos*, in order to account for higher operating costs. Fares range from 8 to 90 Soles ($2.50 to $28.50 USD), whereas the cargo fee for plantains ranges between 0.50 and 1.50 Soles; the fee for a burlap bag ranges between 1.50 and 4 Soles (Table 2.5). Fees tend to vary mainly with distance, as on *colectivos*, and are set by the boat operators, with little room for bargaining. Because there is a greater

range of distances in the river launch zone, there is also greater variation in fares. Per unit cargo fees vary little with distance, but with large quantities, price variations can be significant, once again making distance an important factor in determining transport costs.

Table 2.5 River launch fares (*pasaje*) and cargo fees (*flete*) to Iquitos, Peru, 2005.

RIVER	DESTINATION (distance*)	Fare	Cargo fee - plantain	Cargo fee – burlap bag
Amazon, downstream from Iquitos	Pebas	10	1	1.5
	San Pablo	20	1	1.5
	Chimbote	25	1	1.5
	Caballo Cocha	35	1	2
	Islandia (30)	50	1	2
Napo	Tutapishca	15	1	2
	Sta Clotilda	35	1	2
	Boca del Curaray (84)	40	1	2
	Ango Terro	65	1	2
	Pantoja (132)	90	1	3
Tigre	Quebrada Nahuapa (39)	15	1.5	3
	Nueva York (28)	20	1	2
	Libertad (35)	25	1	2
	Berlin (42)	30	1	2
	Belén (50)	35	1	2
	Intuto (55)	40	1	2
Corrientes	Nueva York (24)	15	1	2
	Libertad (32)	20	1	2
	Boca del Corrientes (37)	25	1	2
	Trompeteros (42)	35	1	2
Alto Marañón	Miraflores (21)	10	1	2
	Roca Fuerte (27)	10	1	2
	Ollanta (29)	15	1	2
	San Lorenzo	70	1	2
	Puerto America	75	1	2
	Saramiriza (132)	90	1	3
Huallaga	Yurimaguas (60)	40	1	3
Ucayali	before Requena	8	0.5	2
	Requena (14)	12	0.5	2
	San Ramón (50)	35	1	3
	Pedrera (50)	40	1	3
	Contamana	60	1	3
	Pucallpa (84)	70	1	3

* Distance indicated in average travel time (upstream + downstream / 2).

(iii) Range

River launches operate beyond the reach of *colectivos*. They constitute the second zone in the concentric ring model (compare Figures 2.6 and 2.8). Their range is considerably broader that that of small river boats, with the launches to Requena traveling 14 hours whereas those bound for Pantoja and Saramiriza travel 132 hours. Given this larger span, the range of products transported aboard launches varies considerably due to perishability. Thus, nearby launch destinations may trade the same range of products traded on *colectivos*, whereas further destinations may be restricted to less perishable products. Chapter 3 assesses the implications of perishability on market access (refer to Table 3.2).

The success of river launches in making long distance travel affordable is attributed to their reliance on economies of scale. Whereas it is only profitable for smaller river boats to travel within one day's reach from Iquitos, larger ships can carry more passengers and more cargo. Therein resides the competitive advantage of river launches.

2.4.1.3 Itinerant river traders

Long-distance itinerant traders (locally referred to as *regatones* or *plataneros*) are the most elusive of the river boat operators in the Peruvian Amazon, as they spend most of their time outside the ports of Iquitos. This is because the *regatones* service the most remote sectors of the region and can leave for several weeks at a time before returning to port. Their boats are made of wood with a capacity that ranges between 15 and 80 metric tonnes (Figure 2.9). Table 2.6 presents the distribution and frequency of itinerant traders across the region. *Regatones* service remote villages on the Tigre, Corrientes, Pavayacu, Marañón, Chambira, Nucuray, Urituyacu and Maquia rivers as well as on Quebrada Chambira, a small tributary of the Nanay River. Their range is graphically represented in Figure 2.10.

(i) Transactions

The word *regatón* derives from the Spanish verb *regatear* (to spread). Unlike *colectivos* and launches that specialize in the transport of passengers and cargo, long-distance itinerant traders engage directly in barter transactions with riverine villagers, exchanging commodities from the city for produce from field, forest and river.

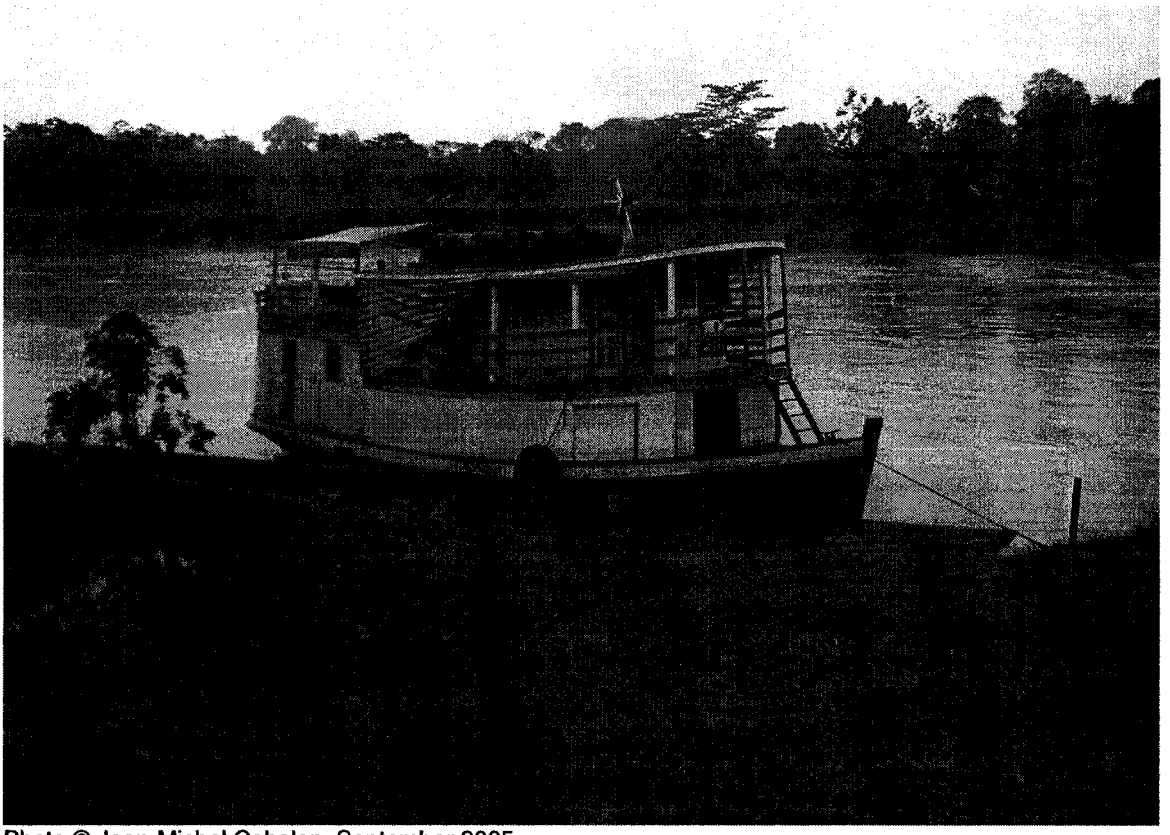

Photo © Jean-Michel Cohalan, September 2005.

Figure 2.9 Itinerant trader (*regatón*) on the banks of the Tigre River, Peru, 2005.

Table 2.6 Distribution and frequency of itinerant river traders, Iquitos, Peru, 2005.

RIVER	DESTINATION	No. of boats	Mean travel time*	boats/week	tonnes/week
Alto Marañón	Berlin to Charupa	3	12 days	1.5	52.5
	San Gabriel to Maipuco	1	10 days	0.63	22
	Berlin to Saramuro	2	10 days	1.25	46.9
Pavayacu	Furthest village**	1	9 days	0.75	22.5
Tigre	12 de Octubre	2	20 days	0.5	11.25
Corrientes	Valencia	2	12 days	0.75	23
Río Chambira* **	-	4	-	-	-
Queb, Chambira	Nueva Esperanza	1	9 days	.75	19
Nucuray* **	-	1	-	-	-
Urituyacu	San Juan de Abeico	1	9 days	1.25	80
Maquia	Furthest village**	1	15 days	0.5	10

* Mean travel time of an entire trip (upstream and down).
** Failed to record the name of the last village.
*** Missing data on these routes.

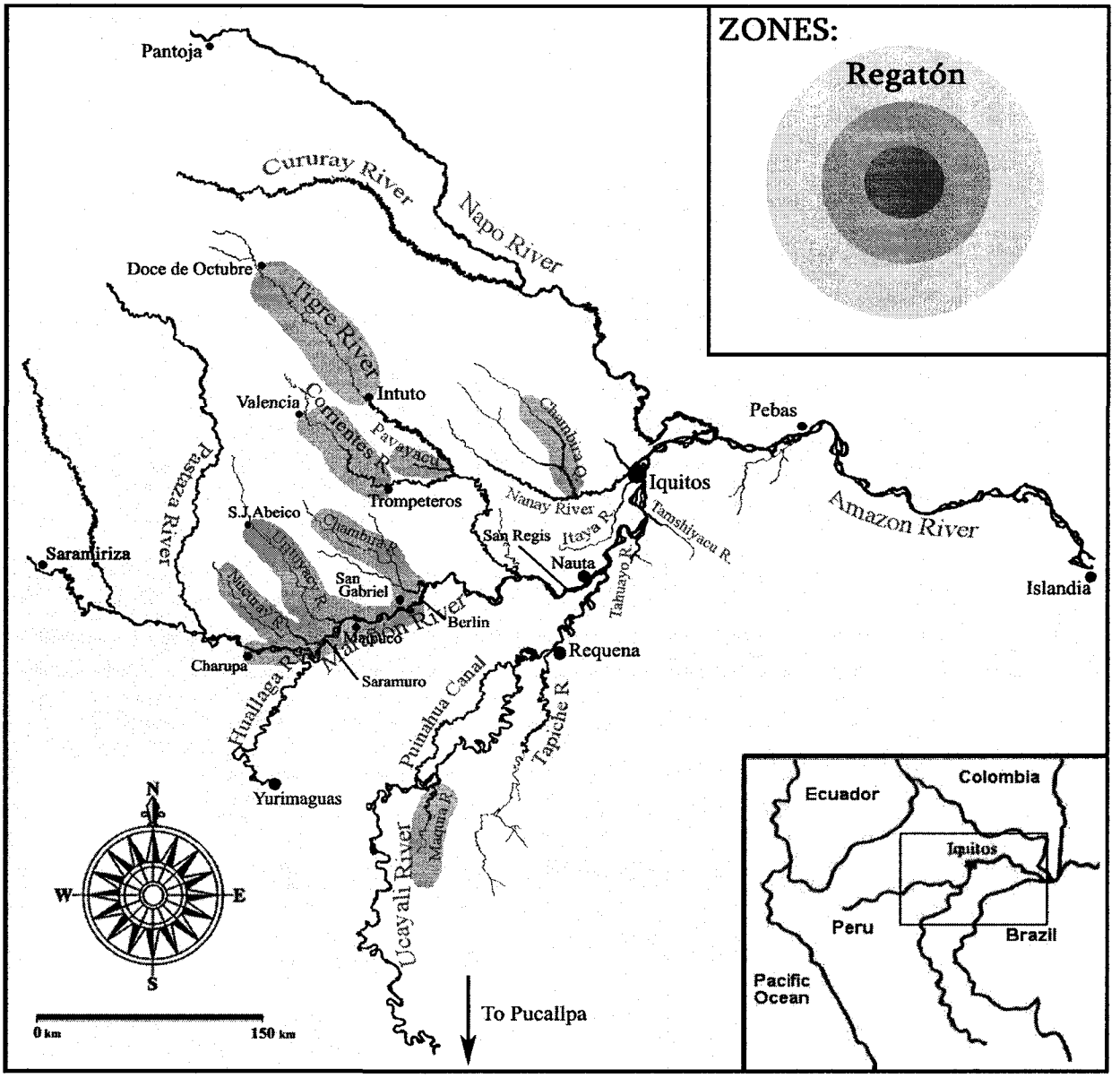

Figure 2.10 Range of itinerant trades (*regatones*) around Iquitos, Peru, 2005.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

Itinerant river traders seldom accommodate passengers; when they do, fares are discouragingly high. Indeed, the business of itinerant river traders is only profitable in areas where regular commercial transport does not exist. In these remote parts, *regatones* spread goods across the region and gather produce for sale in Iquitos – their boats resemble mobile general stores. These often colourful characters are also vital for transmitting information (and spreading rumours) from village to village.

Typically, once they have reached their trading zone, beyond the reach of river launches, itinerant traders will stop in every village on their way upriver, selling commodities such as sugar, rice, milk, soap, clothes, batteries and shotgun shells to villagers who request them. Because money is scarce in these villages, the transaction usually consists of a barter exchange for the city commodities. The villager is expected to supply the *regatón* with the agreed-upon produce when he makes his way back downriver to collect his dues. Such transactions resemble a delayed-barter arrangement wherein the producer is given a few days to pay for purchased goods.

If the producer cannot provide the *regatón* with the agreed-upon produce upon his return, a variety of arrangements can be made between the two parties. Much depends on the credit history of the producer and his or her relationship with the trader. An important part of these transactions is therefore to maintain good relations and remain in good standing with one another. For the producer, a bad reputation or a weak credit background can make future dealings very difficult. For the itinerant trader, in cases where there are competing traders, maintaining good relations with producers ensures regular access to the produce the trader desires.

(ii) Range

Itinerant traders typically operate beyond the zone serviced by river launches. They constitute the third zone of the concentric ring model (compare Figures 2.8 and 2.10). Because of the long distances they travel, the range of products they transport is limited by perishability. Indeed, the product most commonly transported by *regatones* is plantain, hence their appellation of *plataneros*. On the upper Tigre River, itinerant traders specialize in game meat, given its abundance in this remote area. It must be salted however to survive the long journey to Iquitos. Other common products transported include bananas, salted fish, manioc meal, maize, rice, coconut, citrus fruit, peanuts, small livestock (live), and turtles and turtle eggs.

Historically, *regatones* were more ubiquitous in Loreto. Barham and Coomes (1994) describe their role in the rubber trade, effectively ensuring the timely collection and transport of semi-processed rubber from various estates to Iquitos where it was processed and exported. In that era, itinerant river traders were found on every waterway in the region. Since the arrival of steel-hulled launches powered by diesel engines,

however, they have seen their numbers decline dramatically. As a growing number of launches extend their reach outward from Iquitos, and their range of travel expands, itinerant river traders are loosing their place in long-distance trade. Today, fewer than 20 *regatones* operate out of Iquitos, conducting their business on the highest reaches of rivers far removed from Iquitos, or on small tributaries that are not navigable for larger launches.

Several itinerant river traders still manage to thrive on the Marañón River between the Chambira and Huallaga rivers, well within the river launch zone. These few *regatones* exploit a particular pocket on the Marañón where launches coming from Yurimaguas, on their way to Iquitos, have already filled up with produce and therefore cannot stop to load more goods. Meanwhile, the launches that trade specifically on the Marañón only travel until Ollanta and Roca Fuerte, leaving *regatones* a small stretch in which they can practice their trade. With the construction of new river launches, it is likely that these *regatones* will soon be out-competed in these parts.

2.4.2 Secondary and tertiary market nodes

Although Iquitos is the primary centralized trading node in the Peruvian Amazon, smaller urban centers and rural towns across Loreto serve as secondary and tertiary market nodes, in that they exert a certain influence on and attract a certain amount of produce from their surrounding region. Given that they are population hubs, albeit much smaller than Iquitos, they create a demand for produce (whether or not they have a formal marketplace) and offer certain social and administrative services as well. Secondary nodes correspond to urban centers that have their own independent networks of *colectivos* ensuring the transport of passengers and produce from the surrounding area, namely Yurimaguas, Nauta and Requena.[14] They also have defined, physical marketplaces where products are exchanged. Beyond the reach of these localized trading zones, people transit directly to Iquitos aboard larger river launches. The range of small river boat traffic around Yurimaguas, Nauta and Requena is shown in Figure 2.11.

[14] Some *colectivos* around secondary nodes differ from those around Iquitos in that they do not serve purely commercial purposes. Rather, they are communal boats owned by villages or they are private boats belonging to villagers who are primarily producers rather than traders.

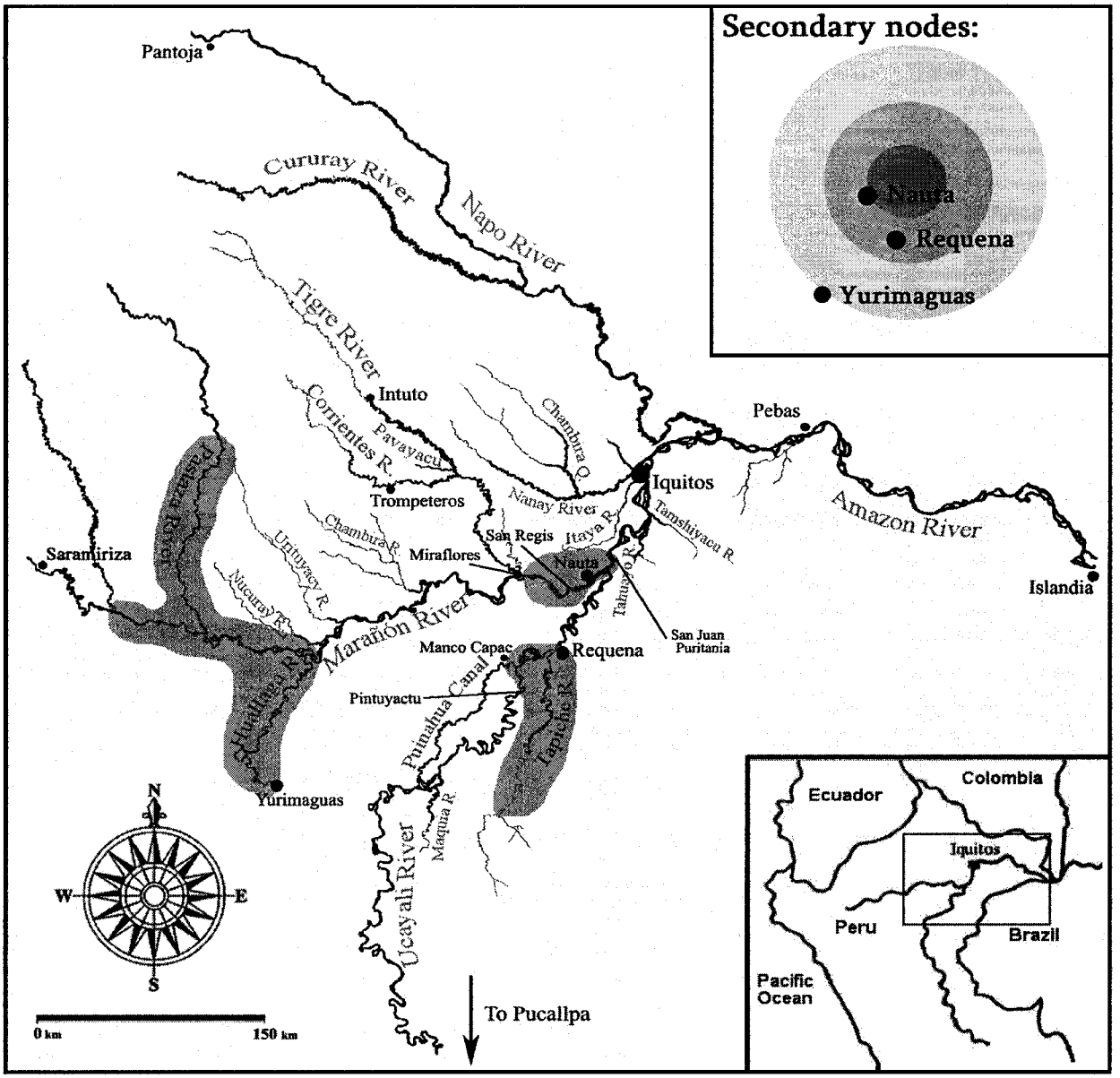

Figure 2.11 Range of *colectivos* around secondary market towns in Loreto, Peru, 2005.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

The city of Yurimaguas, situated near the south-western border of Loreto, is connected to the national road grid of Peru. As such, it is a pivotal junction (an entry and exit point) for river trading in the Peruvian Amazon. Yurimaguas is the second largest city in Loreto (approx. 40,000 inhabitants) and the largest secondary trading node. River launches provide regular service to Iquitos and smaller river boats travel to destinations nearby on the Pastaza and upper Marañón rivers.

The town of Nauta, situated on the Marañón River near the confluence of the Ucayali, has significantly increased the scope of its river trading zone since the completion of a 100km paved road connecting it to the city of Iquitos.[15] With a population of nearly 12,000 inhabitants (INEI, 2005), and new communities and businesses developing nearby on the roadside, the demand for produce in Nauta is considerable. Moreover, for producers and traders alike, access to Nauta now signifies fast, affordable road access to Iquitos within 90 minutes (for $2.50 USD), rather than six hours by boat. As a result, new commercial trading routes serviced by local *colectivos* have developed around Nauta, reaching as far as Miraflores on the Marañón River (Table 2.7). Essentially, by connecting Nauta so efficiently to Iquitos, the road has served to extend the sphere of one-day access to the product markets of Iquitos.

Table 2.7 Data on *colectivos* around the town of Nauta, Peru, 2005.

Destination	Distance (hours)	Frequency (Boats/week)	Capacity (Tonnes/week)	Fare (Soles)	Cargo fee (Plantain)	Cargo fee (burlap bag)
Villa Canan	2.5	18	106	1 to 3	0.3	1
San Regis	6	3	24	5	0.5	1.5
Miraflores	8	6	54	5	0.5	1.5

Finally, the city of Requena is a busy regional hub situated on the Ucayali River. Given its population of just over 20,000 (INEI, 2005), Requena is an important product market for nearby rural producers. In addition, the city has a small hospital, a vocational college and a small service sector. *Colectivo* service around Requena extends upstream along the Ucayali River to the village of Pintuyactu (8 hours) and on the Puinahua canal to the village of Manco Capac (7 hours). Downstream from Requena, producers can travel directly to Iquitos. For the most part, the boats around Requena are operated communally by village groups rather than by commercial transporters in Iquitos Figure 2.12. Nonetheless, fares and cargo fees still apply. Commercial traders also travel regularly on the Tapiche River.

[15] The road had been under construction for over 40 years; paving was finally completed during the summer of 2005.

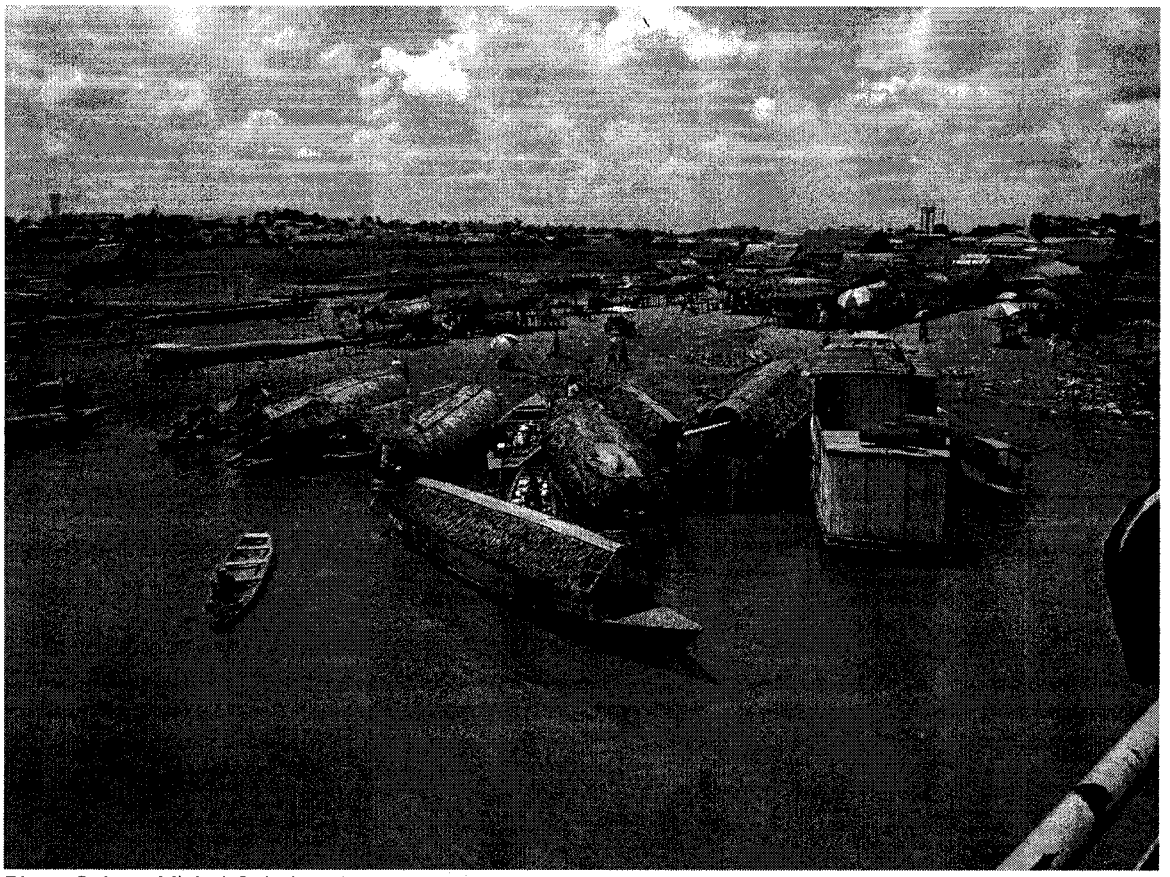

Photo © Jean-Michel Cohalan, August 2005.

Figure 2.12 Small river boats in the port of Requena, Peru.

In addition to these secondary nodes, even smaller population hubs attract a limited amount of produce from surrounding villages. These rural towns include Intuto (on the Tigre), Trompeteros (on the Corrientes), Andoas (on the Pastaza), Tamshiyacu, and Pebas (on the Amazon), Lagunas (on the Huallaga), San Lorenzo and San Regis (on the Marañón) and Contamana (on the Ucayali). These towns constitute tertiary market nodes, in that they receive produce from their surroundings, but unlike the secondary nodes, there is no regular transport organized around them, and they do not all have specific marketplaces designated for commercial exchanges.

Although the influence of secondary and tertiary trading nodes is limited compared to that of the Iquitos market, their recognition remains important as it demonstrates that despite the centralized nature of the river-trading network in Loreto (as depicted by the concentric rings model), localized market opportunities continue to exist, conferring greater access to product markets for rural producer. Figure 2.13 depicts a

general concentric-ring model of river trading in Loreto that accounts for secondary and tertiary market nodes.

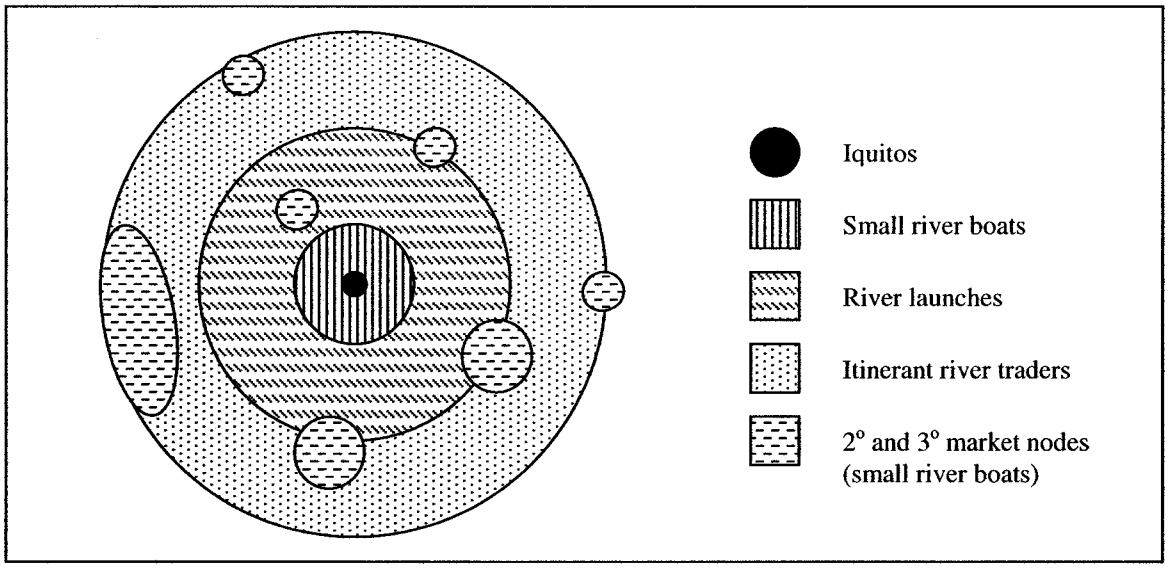

Figure 2.13 Concentric ring model of the spatial distribution of commercial boats around Iquitos, showing secondary and tertiary nodes.

2.4.3 The multiplicity of agents of trade

River boats are the basis of mobility in the river trading system of Loreto, ensuring the necessary physical link between scattered rural producers and the central market. Indeed, the trading routes of river buses, launches and itinerant river traders define the primary network of transport and trade in the region. However, much of the trade in produce and commodities that takes place around Iquitos is dependent on a multitude of other market intermediaries. These ancillary agents each have their own role in connecting Iquitos and the rural periphery, thereby creating diversified and fluid marketing chains. Simply put, products pass through many hands on their way to their final destination.

Independent market intermediaries are active at every interface of trade, i.e., in rural villages, aboard river boats and in urban ports and markets. Some specialize in the trading sector whereas others are involved only temporarily; nevertheless, each fills a specific niche within regional marketing chains. The roles and distribution of the principal agents involved in trade in Loreto are summarized in Table 2.8.

Table 2.8 The roles of agents in commercial trade in Loreto, Peru.		
	Agent	**Role**
LOCAL	**Resident Buyer**	A local resident (often a producer him/herself) who buys produce from other villagers in the community to sell directly to large scale buyers in urban markets. They depend on *colectivos* or launches for transportation.
	Resident moneylender	A local resident who receives credit from urban moneylenders and distributes credit in the community in exchange for the guaranteed receipt of extractive product (fish, timber, etc.).
	Shopkeeper (*Bodeguero*)	Buys commodities in the city to sell at a profit in the village. May also buy produce from villagers before travelling to the city, effectively acting as a resident buyer.
	Alternative buyer	An entity in the vicinity of a rural community that buys produce from villagers. Examples: an oil base, or a military outpost.
ITINERANT	**River raft (*Balsa*)**	A makeshift raft built for the purpose of transporting one's produce over long distances from a rural village to the city. In doing so, travelers often buy products from producers along the way.
	Itinerant merchant (*Mercachifle*)	Itinerant merchants travel to villages aboard commercial launches and stay for several days selling petty commodities in exchange for cash or produce. In many ways, their trade is similar to that of itinerant river traders except that they do not have their own transport. Moreover, itinerant merchants are usually occasional rather than full-time traders, i.e., they travel to rural communities at specific times in the year, such as during local festivities, when the chance of selling trinkets is highest.
	Specialized buyer	Buys specific goods from rural villages, such as rice, timber or aquarium fish. Is hired by or involved directly in wholesale, transformation and/or export of products. Will often engage in an interlinked credit-output contract which consists in providing advances in cash or other in order to secure receipt of the desired product.
IQUITOS	**Small-scale wholesaler (*Rematista)***	A very common market intermediary in the ports of Iquitos. Buys produce in bulk directly from producers on incoming boats and resells in the market to shopkeepers or individual consumers.
	Large scale wholesaler (*Mayorista*)	Buys and stores large quantities of produce for later resale. Often involved in the transformation and distribution of products. Because of storage capability, can sell products in times of high prices and hoard in times of low market value.
	Urban store (*Tienda*)	Buys produce from small- and large-scale wholesalers for sale to individual consumers. Sell commodities to itinerant traders for resale in rural communities.

This multiplicity of trading agents leads to a diversity of alternative marketing chains, each of which is beneficial to both producers and traders under different circumstances. For producers, the choice of marketing pathway depends on the availability and affordability of transport, the time and desire to travel, and the weighing of risk and transaction costs. For traders, success is ensured by identifying a niche wherein he/she holds a certain competitive advantage in offering a beneficial service from which positive returns can be derived. The following case-study describes the mutual benefits derived from alternative marketing pathways.

Myriad site- or context-specific niches are most often established by short-circuiting conventional marketing chains, thereby mitigating transaction costs. For example, a standard marketing chain in Loreto is:

Rural Producer (→ *lancha*) → **Small-scale urban wholesaler** → **Large-scale urban wholesaler** → **Urban store** → **Urban Consumer**

During the study period, small-scale urban wholesalers (*rematistas*) were buying rice from incoming boats in Iquitos at 400 Soles ($127 USD) per tonne. For a rice producer in the village of Roca Fuerte (situated on the Marañón River, 28 hours from Iquitos by river launch), the transport costs of selling one tonne of rice to a *rematista* in Iquitos are 50 Soles of cargo fee (*flete*) and a 30 Soles fare (*pasaje*) – fifteen Soles each way – for a total of 80 Soles ($26 USD), in addition to the costs associated with sojourning in Iquitos (food and shelter). The net return for a producer selling one tonne of rice is therefore **S/.400 - S/.80 = S/.320 ($101 USD)**.

A rice producer from Roca Fuerte, whom we will refer to as Antonio,[16] has identified a trading niche whereby he can shortcut the standard marketing chain, represented above, by taking advantage of economies of scale and personal connections. By buying directly from fellow producers in his community, transporting the rice in bulk to Iquitos by river launch and selling directly to a large-scale wholesaler (*mayorista*), thereby avoiding small-scale urban wholesalers (*rematistas*), he can offer greater net returns for rice producers in Roca Fuerte and generate a considerable profit for himself.

[16] Based on an interview with a resident buyer from Roca Fuerte aboard the M/F San Jose. Although the name is an alias, data represent his personal experience.

Antonio offers 350 Soles ($111 USD) per tonne of rice to rural producers (less than the *rematista* offers, but more than the net returns from trading with a *rematista*). He typically buys five to seven tonnes of rice at a time from different producers within and nearby Roca Fuerte. He pays the same fare and cargo fee as any producer would. He then sells his rice to a *mayorista* he knows in Iquitos for 500 Soles ($158 USD) per tonne, who in turn will process the rice and sell it at a profit.

For a given trip, let us say Antonio buys six tonnes of rice. At 350 Soles per tonne, his initial outlay is 2100 Soles. His transport costs are 300 Soles for cargo (still S/.50 per tonne) and 30 Soles passenger fare, for a total of 330 Soles. His total expenditure is S/.2100 + S/.330 = 2430 Soles ($769 USD), plus any costs associated with staying overnight in Iquitos. His gross returns from the sale of six tonnes of rice to a *mayorista* at 500 Soles per tonne are 3000 Soles ($949 USD). Therefore, his net profit from the transaction is 570 Soles ($180 USD). If he were to have brought with him a tonne of his own rice (since he himself is first and foremost a producer), the net returns from his voyage would rise to 920 Soles (he would make 450 Soles net from his own tonne of rice). Antonio is also involved in the fish trade, buying in bulk from fellow villagers and selling in the town of Tarapoto,[17] near Yurimaguas.

By engaging in trade, a resident buyer like Antonio offers a beneficial alternative to rural producers by short-circuiting the marketing chain, which becomes:

Rural Producer → Resident buyer/producer (→ *lancha*) → Large-scale urban wholesaler → Urban Store → Urban Consumer

Not only does this arrangement increase producers' net gains, it allows them to remain in the village and work rather than losing time had they traveled to Iquitos (i.e., it eliminates the opportunity costs of traveling). Further, this alternative marketing chain keeps more profits in the village (and in the hands of the resident buyer), thus contributing to the village's overall wealth, rather than profits being concentrated in Iquitos (in the hands of urban wholesalers).

The feasibility and profitability of such a venture for a resident buyer such as Antonio depends on two essential criteria. First, one must have access to enough financial

[17] Fish often fetches a better price in Tarapoto than in Iquitos, as supply there is lower.

capital to buy rice in bulk and pay for transport; in this case, 2430 Soles ($769 USD; equivalent to 12 months of work for a day labourer). This financial barrier alone limits the number of people who can engage in such a venture.[18] In lieu of financial capital, social capital, defined as relationships that carry certain benefits, can be an alternative, where the resident buyer is entrusted with produce and only pays producers upon returning from Iquitos. Such trust-based transactions are important for first-time traders who have not built up enough capital to pay for produce in advance. Second, the trader must have a stable relationship with a large-scale wholesaler in Iquitos. According to most interviewees, the competition in Iquitos is fierce, making it hard to establish a direct link with large-scale buyers, who usually prefer to deal with small-scale urban wholesalers with whom they are familiar. An alternative for small-scale resident buyers is to sell directly to a specialized buyer in Iquitos, for example a heart of palm (*chonta*) canning factory.

River trading represents a key sector of the regional economy, not only because of the services it provides, but also because of the employment generated. For rural producers throughout the developing world who derive their livelihoods from agriculture and extraction, working in the trading sector is often the only available source of off-farm income (Barrett *et al.*, 2001). For urban residents in Iquitos, faced with limited employment and educational opportunities, it follows that anyone with an entrepreneurial spirit and the right skills will try their luck in the market. In both cases, the potential for upward mobility in the trading sector is a promising avenue for the poor (cf. Barret *et al.*, 2001; BASIS CRSP, 2004). For all aspiring traders who often have little or no financial capital to work with, getting started is the hardest step to make.

The following case study, based on an interview, describes the successful entry and upward mobility of a small-scale trader in Iquitos. Laiche is the owner of the M/F San Jose, a river launch that travels twice a week between Iquitos and the village of Roca Fuerte on the Marañón River. He first got involved in trade as a small-scale buyer of *cocona* (a jungle fruit) in villages near Iquitos. Since he had very little financial capital, he relied on river launches for transport and had to gain the trust of his clients in order to

[18] *Bodega* owners in villages often act as local buyers. Their situation is opportune since they have access to capital and they have to travel to the city anyway to stock up on commodities for their shop.

receive their produce on consignment, as he could not afford to pay in advance. Once he sold the *cocona* in Iquitos, he would return to his clients in order to pay them.

His good business practices and close relationship with his clientele allowed him to slowly accumulate capital until he was buying a variety of products from his clients in bulk, including rice, a valuable crop. In 2001, Laiche invested his savings into the purchase of a small storehouse in Iquitos where he could store non-perishable products (mostly rice) in order to sell them when prices were high. By 2003, with the gains from the storehouse, he invested in a rice mill, with which he could husk the unprocessed rice and accumulate the value-added gains from the sale of processed rice. By 2005, he had enough financial leverage to invest in his own river launch and established a new route between Roca Fuerte and Iquitos. This route quickly became successful. First, strategically, it is a zone in which the large launches from Yurimaguas are often full and cannot stop to load more produce. The M/F San Jose therefore provides reliable service to the communities between Roca Fuerte and Iquitos. Second, he maintains a familiar relationship with villagers along this route since this is where he conducted most of his previous business. With a storehouse, a rice mill and now his own transportation (which is subsidized by the fares and cargo fees of his passengers), Laiche continues to buy produce from villagers as well as offer reliable transport to and from Iquitos. His success is contingent on continued hard work (he is on the river five days a week), thoughtful planning in the acquisition of complementary assets and a keen sense of the markets of Loreto.

With the absence of institutional barriers to entry in the trading sector of Loreto, access to financial capital represents the most important barrier to trade. For newcomers, small-scale trading activities requiring limited financial inputs (often trust-based, relying on social capital) are the only way in. For those with the proper skills, upward mobility is made possible by the accumulation of enough financial capital to invest in a more profitable venture, as increasingly profitable enterprises require increasingly significant investments. For both rural and urban areas, this ladder of trade represents a potential way out of poverty and an important vehicle for regional development. It also brings much diversity to the trading relations in Loreto.

2.4.4 The nature of trade relations

The previous sections offered a description of the functional organisation of river-trading in Loreto, emphasising the spatiality of trade, the geographic distribution of transport and the functional diversity of market agents. This overview revealed a multiplicity of actors, marketing chains and economic transactions all coexisting within a coherent network of trading relationships. Considering that the trading sector functions informally, i.e., without any formal control from an official governing institution, the question is raised as to how these intersecting networks of trading relationships are managed. What are the parameters that guide trading relations? Does the river-trading system in Loreto provide an effective market outlet for riverine peasant-producers?

It is often assumed (by producers in Loreto as well as by researchers) that the multiplicity of intermediaries in informal trading is symptomatic of a lack of institutional control over trade. This view holds that with limited barriers to entry, a redundancy of actors has imposed itself within marketing chains, thereby artificially increasing the transaction costs of river-trading. As a result, riverine peasants are faced with disadvantageous terms of trade, whereby the produce they sell will tend to be undervalued while the commodities they buy will be artificially overvalued.

A more in-depth analysis of the trading environment in Loreto suggests that the multiplicity of actors involved in trade, far from being responsible for the high cost of trading, is rather a reaction to the phenomenon. In their article on the microeconomics of extraction during the Amazonian rubber era, Barham and Coomes (1994) point to the fact that long-distance trading in Amazonia at the turn of the century was characterized by high transaction costs and a high level of risk. The findings of this research corroborate historical accounts and suggest that the contemporary river-trading system of the Peruvian Amazon, despite certain technological advancements, functions much like that of the rubber era, inasmuch as households and traders continue to face a high risk, high transaction cost environment.

The following discussion begins by defining the basic geographic and economic features of river trading, namely risk and uncertainty, transaction costs, and competition and examines how they constitute key parameters in understanding trade relations in the Peruvian Amazon.

2.4.4.1 Risk and uncertainty

River trading is fraught with uncertainty. Natural phenomena such as low waters or riverbank erosion can cause rivers to be temporarily inaccessible to boats; low water levels in Iquitos can confine boats in port indefinitely. Uncertainty for traders also lies in the sometimes sporadic nature of peasant production, whereby traders cannot count on consistent or guaranteed access to the produce they desire. Moreover, because there are few institutional controls over transport and trade, sudden changes in the trading environment, such as the arrival of a new competitor, can dramatically affect an established trader's practices and force him or her to redefine trade relations. Indeed, each trip a boat completes and each deal that is made in the market began in uncertainty.

River trading also entails clearly definable risks. Boat operators, itinerant traders and urban wholesalers alike struggle with the risk of value-loss due to perishability, mishandling and exposure to sun and rain. Transactions involving deferred payment – as in the case of interlinked credit-output contracts – carry the risk of desertion.[19] Finally, one of the most significant risks for traders is that of unexpected price fluctuations in the market of Iquitos. In her article *Risky Business*, Padoch (1987) reports a 100% increase in the price of rice in Belén, from one day to the next.

Price fluctuations in Iquitos have much to do with sudden shifts in the supply of a given product. Considering the often irregular schedules of boats, the coinciding arrival of several boats loaded with large amounts of the same product can immediately devalue the sale price in the market, given that demand remains constant. Conversely, limited supply of a given product will send its price soaring. During fieldwork, it was observed that during one week, the streets of Belén were filled with plantains (Figure 2.14). Small-scale wholesalers were struggling to sell their stock, asking as little as 2.50 Soles per raceme and barely breaking even. The next week, at the peak of the dry season, the waters of the Itaya River had gotten so low that boats were unable to enter or leave the port. Plantain was hard to come by in the market and *rematistas* were asking 7 to 8 Soles per raceme of

[19] Besides itinerant traders and moneylenders who specialize in deferred-payment transactions, certain lenient boat operators may also accept deferred payments. They inevitably run the risk of being avoided by the client if other forms of transportation are available.

similar quality and size. In the span of a week, the price of plantain had essentially risen by 300%.[20]

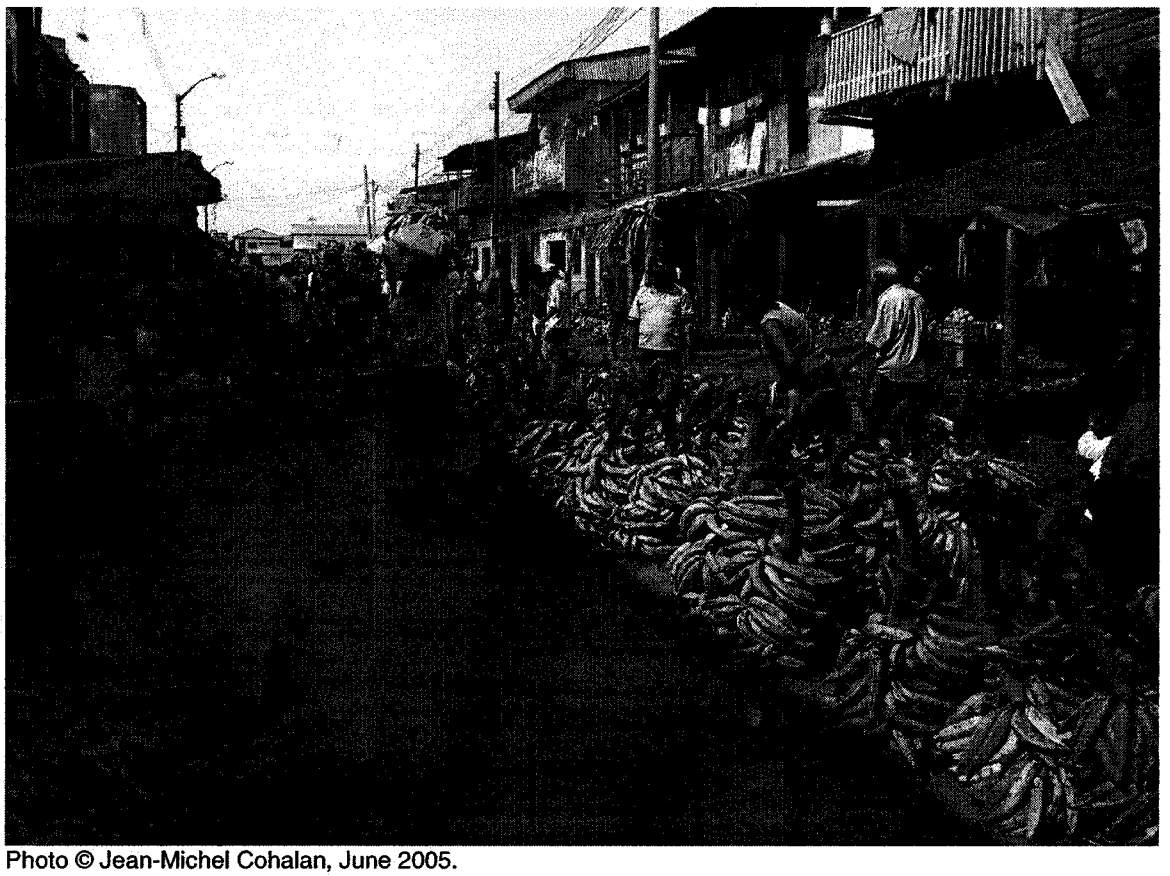

Photo © Jean-Michel Cohalan, June 2005.

Figure 2.14 Plantain racemes in the market of Belén, Iquitos, Peru.

In order to mitigate losses due to adverse price fluctuations, traders must keep a close eye on market dynamics, relying on access to information in order to adjust their prices according to varying levels of supply and demand. In the case of certain trade practices that extend over large distances and/or span extended periods of time, staying one step ahead of shifting market dynamics is virtually impossible. For these traders, incomplete access to information greatly increases their vulnerability to price fluctuations. Long-distance river traders, for instance, must negotiate prices in villages with little or no information about current market values in Iquitos. Even with radio

[20] The effect of fluctuating prices of plantain is particularly significant since the crop is used as a virtual currency in many parts of the region (because it is easy to grow and has a constant demand).

contact,[21] price fluctuations between the time of purchase and the time of arrival in Iquitos cannot be anticipated. The same holds true for moneylenders who are vulnerable to price fluctuations between the time credit is advanced and the moment the debt-merchandise contract is concluded (Kjöllerström, 2002). In interviews with multiple traders in the ports of Iquitos, the consensus was that uncertainty is the norm: success is not guaranteed and losses often occur. Nevertheless, trading must be profitable enough to remain afloat.

Uncertainty and risk have a tremendous impact on trade relations in Loreto, most importantly in the way they affect pricing. In the absence of insurance markets and with restricted access to credit, risk must be managed by the individual (Takasaki *et al.*, 2001). For traders, this means incorporating a risk premium within their pricing structure. By adopting a risk-averting pricing strategy, traders can count on the high returns derived from successful transactions to compensate for expected yet unforeseeable losses arising from detrimental price fluctuations in the market. Accounting for risk thus entails a cost to the trader, the bulk of which is accounted for by manipulating the buying and selling price of products.

As a general rule, the more a transaction is spread over space or time, the greater the risk is of losses (because of product loss, perishability or price fluctuations). It follows that risk premiums are higher in such transactions. Such is the case for itinerant traders, who travel long distances and engage in trade in remote areas with no means of anticipating price fluctuations in the markets of Iquitos. In order to counter the risk of a sudden devaluation in the price of a product, say plantain, itinerant traders will indiscriminately buy at the lowest possible price, usually between 1.50 and 2.50 Soles per raceme (or the equivalent in bartered goods). This way, depending on the buying price of plantain in Iquitos, traders can hope to make a certain gain while minimizing potential losses should plantain prices drop. In order to guarantee their gains, *regatones* will inflate the cost of the commodities they sell in villages. Since prices for most of these commodities are less volatile that those of agricultural and extractive produce, it is easier to guarantee a consistent margin of return on investment. Therefore, the meagre,

[21] Long-distance traders sometimes rely on radio contact to access price information in Iquitos, but contend that the information does little to limit the chances of losses in Iquitos. Until recently, a church-sponsored radio transmission (*Voz de la Selva*) served to inform dispersed producers of market prices in Iquitos, in the aim of aiding them in negotiating prices with traders. The project is no longer running and little is known of how much it benefited producers.

uncertain returns (or potential losses) engendered from the sale of plantain are subsidized by higher, more secure returns from the sale of commodities such as soap, milk, rice, clothing and shotgun shells.

This pricing strategy is similar to the pyramid pricing scheme of the rubber era described by Barham and Coomes (1994), whereby prices change as products move along a marketing chain (Figure 2.15). Essentially, the pricing structure of river-trading is closely associated to the level of risk involved in transactions – the greater the risk, the greater the price. In much the same way as itinerant traders are vulnerable to price fluctuations, small-scale wholesalers in Iquitos are subject to their own high level of risk. Indeed, by buying produce in bulk from incoming producers and traders, wholesalers offer a risk-mitigating service by essentially taking on the risk of getting stuck with a perishing surplus. The cost of this service is built into their pricing strategy, whereby incoming produce is undervalued and gains are derived from an inflated sale price.

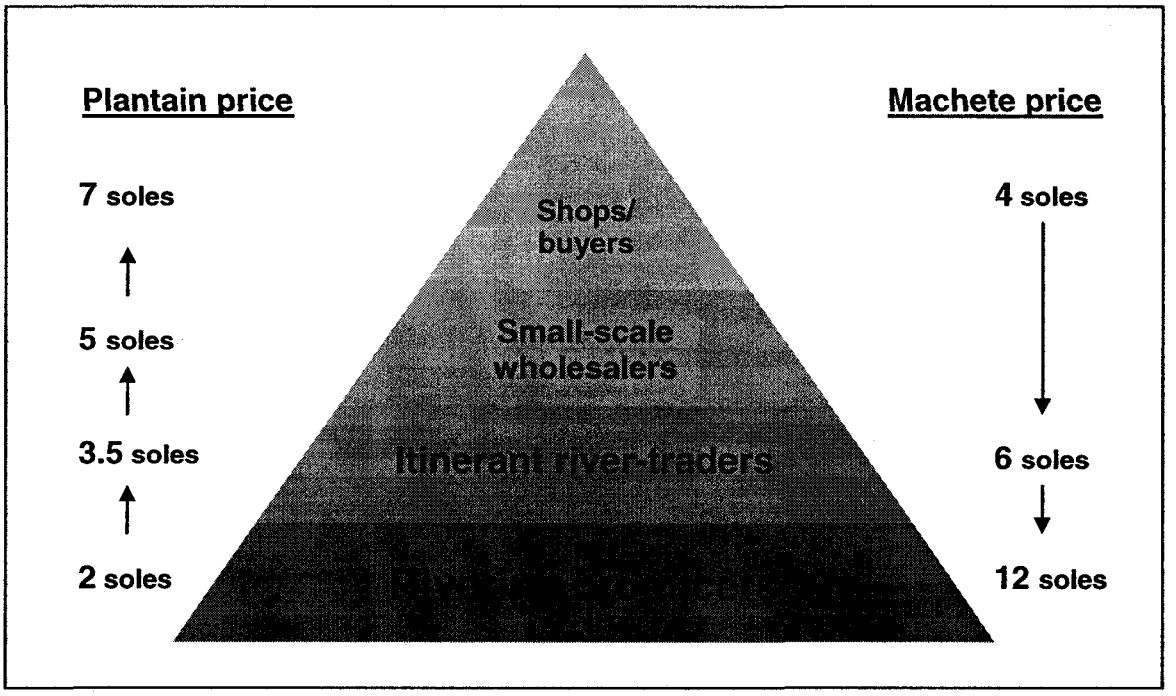

Figure 2.15 Example of pyramid pricing for producers on the Alto Tigre River and the market in Iquitos.

Although producers and consumers alike are quick to criticize the business practices of *rematistas*, the continued reliance on their services tells a different story. For rural peasants travelling to Iquitos, selling to these small-scale wholesalers in the ports of

Iquitos represents a guaranteed and quick sale, the value of which is substantial for time-constrained, risk-averting producers.

In conclusion, the high-risk, high-uncertainty environment of river trading in the Peruvian Amazon has an important impact on the pricing structure of trade, especially given limited information and the absence of reliable and complete insurance and credit markets. Indeed, the sheer multiplicity of traders in marketing chains is a testament to the risk-spreading character of river-trading.

2.4.4.2 Transaction costs

Besides risks and uncertainty, river-trading also entails substantial costs. Transaction costs consist of the many expenses incurred in completing an economic exchange and typically include search costs (money and time spent seeking out a potential sale or purchase), bargaining costs (the costs associated with negotiating a trade contract), and monitoring costs (the costs of ensuring the rightful completion of an agreed-upon transaction), all of which must be assumed by different actors in marketing chains (Omamo, 1998). Given the informal nature of trading and the vast distances involved in transporting produce to market, transaction costs represent a considerable factor in shaping the price environment and influencing trading relations in the Peruvian Amazon.

The existence of market intermediaries in the river trading system of Loreto is a reflection of prohibitively high transaction costs. Just as boat operators make mobility more affordable by spreading the cost of transport among multiple passengers, so in Iquitos, small-scale wholesalers effectively serve to reduce search and bargaining costs for sellers by acting as guaranteed buyers.[22] In the case of long distance trade, itinerant river traders reduce transport and search costs for rural producers by bringing market opportunities directly to them. In each of these cases, transaction costs are not simply taken on by the trader; rather, they are built into the cost of their services, much in the way that risk premia are incorporated into traders' pricing schemes. Therefore, boat operators cover their operating costs by charging fares and cargo fees, whereas small-

[22] Whereas quick sales represent certain savings for sellers (in the form of time and opportunity costs), it is likely that the high pressure tactics of *rematistas* lead many rural peasant to accept lower-than-market-value prices for their produce. It is not clear, however, if producers would fare any better in bargaining with other urban buyers.

scale wholesalers and itinerant traders account for their various transaction costs by manipulating their pricing schemes.

Ultimately, the burden of high transaction costs in river trading still falls on the producer, whereby the difference between the price he/she receives for a good and the final price at which it is sold to a consumer reflects the aggregation of transaction costs (and risk premia) accrued by each intermediary in the marketing chain. This has led many producers and external critics to view market intermediaries as exploitative – free to exact unreasonable fees for their services through backhanded pricing schemes. While it is clear that the terms of trade often leave producers with small returns, understanding the high-risk, high-transaction cost environment of river trading highlights the fact that costs are high and gains are limited for everyone involved, not only producers. Furthermore, the notion of unfair exploitation would imply the existence of a monopoly in which no external limits exist to place a cap on traders' profits. The reality, however, is that a limit does exist – in the form of competition.

2.4.4.3 Competition

Less perceived in the literature on river trading is the role of competition in regulating trade relations. The omission is perhaps the result of most studies in the Peruvian Amazon having focused on producer-oriented issues (such as high transaction costs), rather than trader-specific issues (such as competition). This approach has served to reinforce, albeit unintentionally, the view that traders are exploitative. Instead, a closer look at the regional trading environment of Loreto reveals that open competition among market agents and boat operators acts as a regulatory pressure on traders' pricing structures, thereby limiting the potential for exploitation and bringing balance to local trading relations.

The argument often proposed is that exploitative terms of trade are contingent on trade monopolization in which producers have no better option but to conduct business with a profit-maximizing trader. Two features of river trading in Loreto, however, severely restrict the existence and/or persistence of monopolized trade. First, since transport is a private sector service in which there are no formal institutional barriers to entry, successful trading niches consistently attract multiple traders, thereby restricting the possibility of holding a monopoly. Second, the economic opportunities granted by the

trading sector continually attract newcomers attempting to forge their place in the system. The shifting base of traders and the constant reshuffling of trading routes virtually eliminate the possibility of establishing a successful monopoly. Indeed, seasoned traders are unanimous in highlighting the importance of maintaining good trade relations with their clients.

2.5 Conclusion

In order to understand the implications of river trading on livelihoods and the regional economy of the Peruvian Amazon, it was necessary first to examine the structural organisation of trade. This chapter began with a systematic look at the diversity of trading arrangements that serve to maintain a persistent link between rural producers and urban consumers (as well as between rural consumers and urban distributors). At the base of this regional trading interface lie overlapping networks of transport routes which create the physical 'backbone' of trade. The reach and distribution of different types of boats are closely dependent on the physical geography of the region as well as economic, demographic and resource-type considerations. The concentric-rings model introduced in this chapter served to illustrate the distribution of transport, emphasizing important spatial differentiation.

The study further emphasized the heterogeneous nature of river trading by identifying the multiple agents implicated in regional and localized trade. In doing so, it became clear that the river trading system in the Peruvian Amazon consists of a diversified network of interrelated marketing chains which effectively extend to the most remote rural areas. While the ports of Iquitos remain the central hub of regional economic activity, by no means is trade restricted within the realm of urban ports; rather, this marketing structure extends the interface of trade over the entire region.

Having examined the structural organisation of river trading, I turned to investigate how relations of trade are established and maintained, in order to reach a more complete assessment of the effectiveness of the regional trading network. I started from the common perception that trade in Loreto is expensive (often sufficiently so as to severely restrict satisfactory levels of market integration for rural peasants) and considered the critiques that suggest that the high costs of trade for producers result from

the exploitative practices of traders. Strategies to bypass intermediaries by bringing producers in direct contact with buyers, and vice versa, have been proposed as ways of generating higher returns for producers and catalyzing economic development – such is the idea of a farmers' market (Chibnik, 1994). While such projects have shown to be beneficial in certain places, their benefits are highly context-specific. Considering the monetary and time expenditures associated with travel and owning a private boat, such approaches of direct-trade are clearly not feasible in Loreto.

Trading relations in Loreto were analyzed from a context-based approach that took into account important geographic, social and economic features of the region. This assessment revealed that the multiplicity of marketing agents and the nature of their pricing schemes, rather than being the cause of high transaction costs, is actually the result of the high-risk, high-transaction cost trading environment in Loreto. Indeed, I found that traders themselves are subject to high costs, which they must account for in their pricing structure. Furthermore, given the high levels of risk involved in river trading, the multiplicity of marketing agents serves to spread these risks across a wider base of individuals, thereby mitigating the impact of shocks. By doing so, market intermediaries are essential to trade's very existence as well as to making it more affordable in the context of long distances, high transaction costs and high uncertainty.

Nonetheless, it is clear that transaction costs are high in the Peruvian Amazon. Considering that the daily wage in rural areas amounts to ten Soles ($3.16 USD),[23] fares and cargo fees alone can be insurmountable for many. However, instead of producers' low net returns from marketing being uniquely symptomatic of high transaction costs, it is important to consider the other side of the equation, whereby low gross returns are also a significant contributor to low net returns. Indeed, a key problem in the Peruvian Amazon lies in the low market values of regional products. Without an export market, products are designated chiefly for consumption needs in Iquitos. Given that the purchasing power in this urban center is limited, it follows that the prices urban dwellers can afford will remain low. Consequently, high transaction costs only serve to decrease producers' limited potential returns.

[23] In rural areas, few are the households that actually receive a daily wage. However, its value usually corresponds to the approximate average daily earning of a household working in subsistence activities, hence its usefulness in contextualizing the true cost of river trading.

In sum, this study described the functional distribution of trading networks around Iquitos and highlighted the principal features that guide the regional economic framework of Loreto. The findings and discussion serve to lay the groundwork for further analysis of the implications of the river trading system on market access and livelihoods in the Peruvian Amazon.

CHAPTER 3. RIVER TRADING AND MARKET ACCESS: THE ROLE OF DISTANCE AND 'REMOTENESS'

3.1 Introduction

Significant research in developing areas has pointed to market access as a key determinant of livelihoods and resource use (Plattner, 1989a, 1989b; Reardon and Vösti, 1995; Dercon and Krishnan, 1996; Barham *et al.*, 1999; Barrett *et al.*, 2001; Escobal, 2001; Takasaki *et al.*, 2001). Indeed, access to markets can affect the way in which a given resource is exploited, confer new values to common resources and broaden the range of livelihood activities available to peasant producers who would otherwise focus uniquely on satisfying subsistence needs.

In the Peruvian Amazon, where peasant households, in order to satisfy both their subsistence and cash income needs, derive their livelihoods primarily from a combination of floodplain agriculture, shifting upland cultivation, and resource extraction (namely fishing, hunting and agroforestry), different levels of access to product markets in Iquitos or in secondary towns are likely to have a significant influence on the relative contributions of different productive activities in the income portfolio of rural households.[24] For example, access to a market for pineapple may influence a household to focus part of its production on pineapple harvesting for sale. Essentially, access to product markets can condition the choices of livelihood activities available to households and influence the viability of market-oriented production, dependent on such factors as perishability and transaction costs.

Whereas the previous chapter described the structural, functional and spatial heterogeneity of river trading in Loreto, this chapter assesses how diversified river trading networks and agents affect market access for producers. In doing so, I explore the features that determine accessibility, connectedness and isolation. In a place where riverine communities are so often described as "remote", this analysis offers an exploration of the meaning of remoteness and proposes measures that will help better define the term.

[24] Although much of the research in the Peruvian Amazon has acknowledged the importance of market access for livelihoods, very little work has focused on the topic exclusively, tending rather to allude to it within the context of other research questions.

A multi-faceted approach is taken to study market access, recognising the compounding influence of regional, sub-regional and local conditions on accessibility to product markets. Initially, a regional analysis examines the three key parameters of river trading that affect market access – distance, frequency and cost. Then, a sub-regional approach is employed that examines site-specific observations from a long-distance transect study of communities along an important tributary of the Amazon. In Section 3.2, I describe the area of study in northeastern Peru. Section 3.3 details the research methods used in each approach and Section 3.4 presents the findings of the research. Finally, Section 3.5 concludes by discussing the key findings of the study.

3.2 Study Area

3.2.1 Regional analysis

This study of market access and river trading covers a large geographical area that corresponds to the entire scope of marketing networks centered on the city of Iquitos, in the Department of Loreto, Peru. The area was outlined in the previous chapter, which focused on the distribution of trade around Iquitos, whereby a multitude of boats and merchants extend the influence of product markets in Iquitos to even the most remote communities in the region. The sphere of influence of Iquitos is indicated in Figure 3.1, which recalls the concentric trading zones described in Chapter 2.

The region is characterized by dense tropical vegetation and scattered peasant communities that populate the banks of the more important rivers and tributaries. Here, riverine peasants, locally referred to as *ribereños*, rely on a diversified array of agricultural and extractive livelihood activities in order to satisfy both their subsistence and income needs. The local peasant ethos would have it that all households have similar livelihoods, are relatively poor and struggle to gain access to product markets in Iquitos (Takasaki *et al.*, 2001). A growing body of research in the Peruvian Amazon, however, has uncovered considerable heterogeneity in the livelihoods of peasant households both between and even within communities (Coomes and Burt, 1997, 2001; Barham *et al.*, 1999; Takasaki *et al.*, 2000, 2001). Although most of this research has focused on differences in physical asset wealth as a key livelihood determinant, little attention has been given to the role of markets.

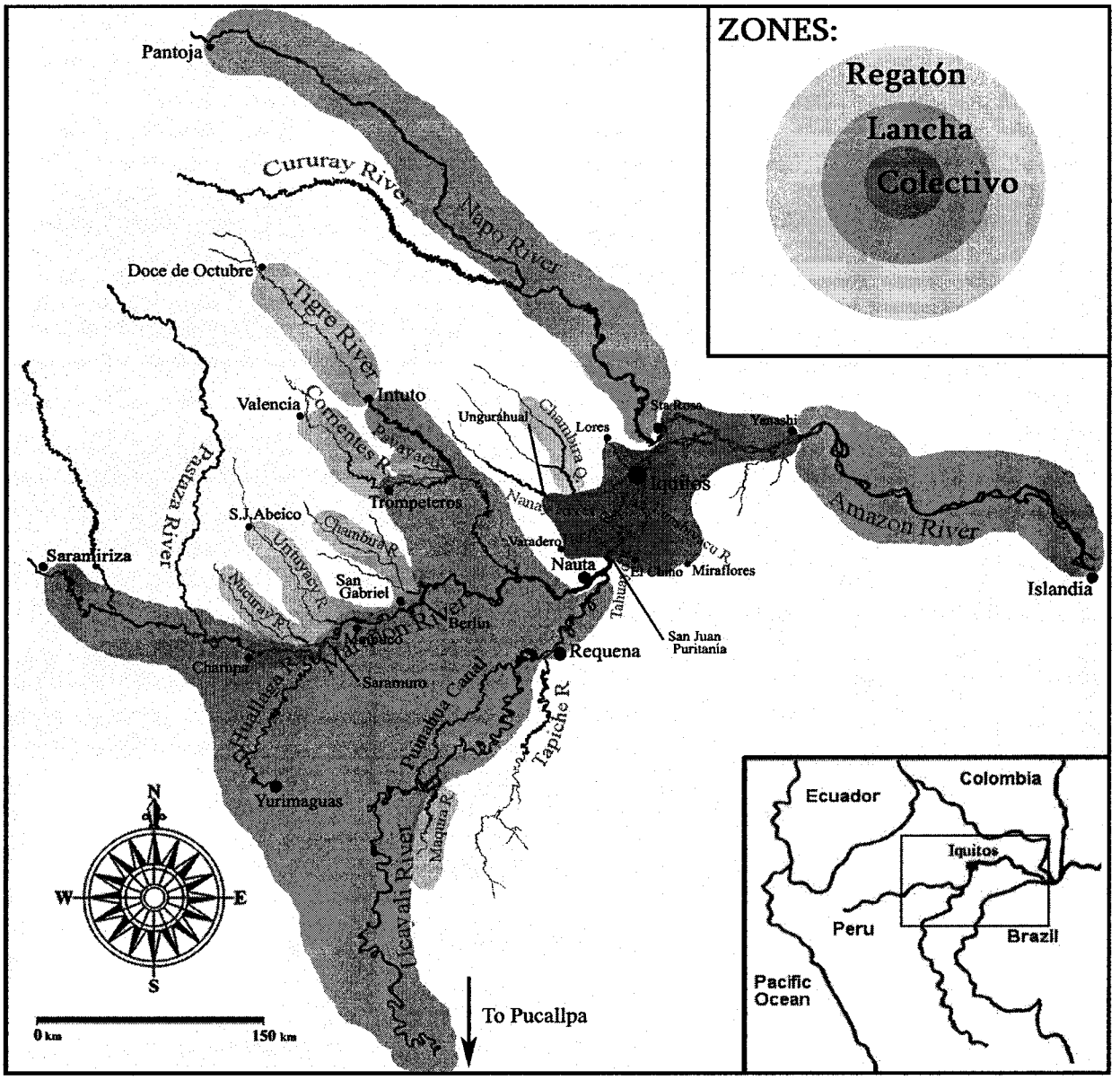

Figure 3.1 The extent of river trading networks around Iquitos, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

Note: The Nauta trading zone is displayed here because of its inherent connectedness to Iquitos by road. Though it is not indicated on the map (for the sake of clarity), the Iquitos-Nauta road runs several kilometres inland along the Amazon River.

Chapter 2 described a remarkably diversified system of river trading routes and agents around Iquitos; a system that forms the backbone of the regional economy. For rural communities, river trading networks provide a much needed outlet for the sale of produce as well as an opportunity to move beyond subsistence production by engaging in the regional economy. The potential for market access derived from diverse river trading opportunities is clearly a key element in the study of livelihoods in the Peruvian Amazon.

The regional analysis in this chapter focuses on the same study area as in Chapter 2. Research was conducted in the six ports of Iquitos: Belén, Masusa, Productores, Pescadores, Henri and Nanay (see Figure 2.1), as well as in the ports of secondary market nodes, namely Nauta and Requena, and aboard various commercial boats. By their nature as convergence points for regional trade, these ports represent a microcosm of the dispersed and diversified transactions that take place across the region.

3.2.2 Sub-regional analysis

The sub-regional analysis in this study is based on a continuous transect along a river system of Loreto where river trading is conducted. The challenge was to select an appropriate river that, first, would best represent the diversity of conditions in the region and, second, would be practical and achievable, given the cost and time constraints of the research.[25] The "Tigre-Iquitos transect" incorporates every town and village that lies between Iquitos, on the Amazon, and Doce de Octubre, the most upstream community on the Tigre River (Figure 3.2). There are 96 villages in all: 36 on the Tigre, 32 on the Marañón and 28 on the Amazon.

Selection of the transect was designed to incorporate all three principal transportation zones – *colectivo*, *lancha* and *regatón* – so as to capture the diversity of trading conditions that exist in the region. Moreover, the transect runs along different types of rivers in order to capture different zones of resource endowment – indeed, the flood cycles on the Tigre contrast starkly with those of the Marañón and Amazon rivers in timing and magnitude.

[25] Time constraints were an important factor. This transect was designed to gather pertinent localized data for sub-regional analysis, but also to serve as a reconnaissance survey for the fourth chapter of this thesis.

3.3 Methods

3.3.1 Regional analysis

The regional assessment of market access in this chapter is based on data on the river trading routes around Iquitos, namely distances traveled, the frequency and capacity of boats, and their fares and cargo fees. Field research was conducted in the ports of Iquitos and Nauta over a four month period, from June to September, 2005. The analysis used the same data set as in the previous chapter. Field research methods are described in detail in Section 2.3 of the thesis. Data analysis consisted of a spatial comparison of each variable. Four maps were constructed using Photoshop to represent the amplitude and directionality of fluctuations in the frequency and capacity of boats and the distribution of fares and cargo fees.

3.3.2 Sub-regional analysis

The transect survey was conducted over three weeks during the month of August 2005. Ninety-six communities were found along the transect and sampling was necessary in order to make the research feasible; in the end, I visited thirty-four communities along the transect. Village selection was purposive, rather than random, in order to capture the regional heterogeneity in village size and composition, resource endowments, production practices, and market opportunities. Moreover, the selection was geographically skewed toward distance in order to remedy the lack of information on more remote communities. Hence, six out of the eight villages on the Alto Tigre (upstream from Intuto) were studied, whereas below Intuto, stops were made in every third of fourth village. On the Marañón and Amazon Rivers, where more research has been conducted and trading conditions are generally more consistent, stops were made on average in every sixth village. The names of the sample villages appear in Figure 3.2.

Upon arrival in each sample community, a focus group was assembled either in a *bodega*, a local school or a private residence.[26] Group size varied between eight and

[26] Ultimately, gatherings were assembled in such a way as to limit inconvenience to individuals. Since my arrivals took place at different times of the day, the setting for focus groups changed accordingly, as did the individuals that took part in the groups. Focus group discussions often took place in private residences where *mingas* were assembling. *Mingas* are a community-based form of reciprocal labour, usually used to carry out labour-intensive work (Chibnik and deJong, 1989). They are typically preceded by an informal gathering in which the host household offers food and refreshments.

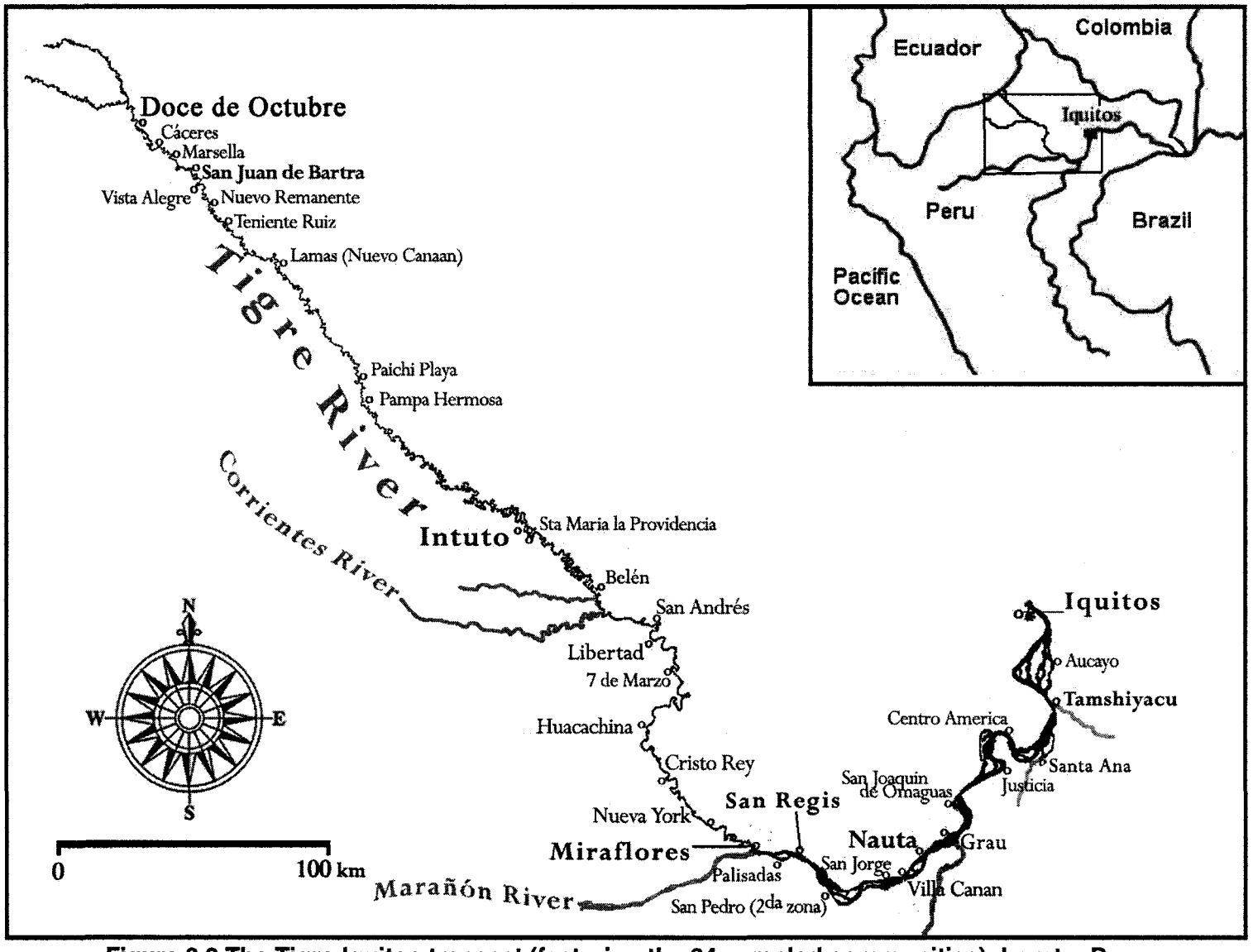

Figure 3.2 The Tigre-Iquitos transect (featuring the 34 sampled communities), Loreto, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

twenty individuals and group selection was based on convenience, though efforts were made to include a diversity of participants. Focus group discussions typically lasted between thirty and ninety minutes. After explaining the research objectives and seeking approval from the participants, each focus group was asked questions about transportation, trading practices, local prices, means of production, welfare and local needs (see Appendix 1-B). Exchanges were kept relatively informal and discussions were allowed to freely digress toward local or regional issues before being redirected to the specific objectives of the research.

For the collection of data on prices, a standard set of products was presented in each village. The set was conceived in order to reflect the values of a short list of products that are typically bought and sold by rural households (Table 3.1). Each focus group was asked what price they typically paid and what price they typically received for the products in question, and specifically where these goods were typically traded.[27] Contrasting responses among communities along the transect provided the basis for studying the diversified price environment across the region.

Table 3.1 Standard schedule of items bought and sold by rural producers in Loreto, Peru.

Items typically purchased	Items typically sold
Salt	Plantain
Sugar	Manioc
Rice (processed)	Maize
Milk	Rice (unprocessed)
Soap	Heart of palm
Shotgun shells	Fish
Batteries	Chickens
	Game meat
	Timber

Relative levels of market access were assessed using the quantitative and qualitative data collected from regional and sub-regional analysis. The information gathered during the transect complemented regional data, essentially filling in the gaps that arose in the first part of the study. The use of multiple methods, especially given the

[27] Certain product prices were hard to compare because market values fluctuate intensely over time (e.g., plantain, rice). Moreover, certain product categories like fish display such variety in type and bulk that prices are also hard to compare (these are aspects that should be improved upon in further studies).

complementarities in the respective scales of analysis, offered valuable insight into the distribution of market opportunities within the context of the river trading system of Loreto.

3.4 Results

3.4.1 Regional analysis: river trading and access to the marketplace

In his book *Risky Rivers*, Chibnik (1994:79) writes: "the closer a community is to Iquitos (or, to a lesser extent, other urban centers), the more likely residents are to sell products at the market." Similarly, in the broader literature on market access, distance is often regarded as a determining factor, access to the product market tending to decline as the distance between household and marketplace grows (Guimaraes and Uhl, 1997; Rasul and Thaba, 2004). The approach taken in this research recognizes the relevance of distance in understanding market access in the Peruvian Amazon. However, it emphasizes the role of two other factors, both of which are closely associated with distance, namely the frequency of boat traffic and transportation costs. Indeed, findings suggest that frequency and cost are the primary determinants of market access at the regional scale. Though these three parameters of river trading – distance, frequency and cost – are interconnected at many levels, this study examines each parameter individually and evaluates their respective influences and distribution across the region.

3.4.1.1 Distance

The first direct relationship between distance and market access pertains to the opportunity cost of trading faced by producers, whereby time spent traveling to the marketplace represents a forgone opportunity for productive work. As travel time increases with distance, opportunity cost becomes a greater factor in the decision to travel to the marketplace and engage in direct trade with the city. Consequently, as opportunity costs rise, producers may react by traveling less often to the market, or opting for alternative forms of trading that require less time.

Secondly, distance has an immediate impact on rural households' access to specific product markets in Iquitos, due to the perishability of harvested or extracted

produce.[28] Indeed, many of the products that are regularly traded along the rivers of the Peruvian Amazon, such as fruit, plantains, manioc, heart of palm and fresh fish and game meat, are vulnerable to rapid spoilage. Product perishability therefore places a limit on the distance from which such products can be transported. The most marked example is the cut flower industry near Iquitos, where a rapid deterioration rate combined with a strong premium for freshness mean that cut flowers can only be harvested within a few hours from Iquitos (Caillon and Commes, n.d.). Beyond this zone, producers cannot feasibly participate in the cut flower trade, even though growing conditions might be ideal. Fresh fish and game are also highly perishable; beyond a day's travel, they must be preserved with salt, which reduces their market value considerably. Access to markets for perishable products is therefore highly dependent on distance (Table 3.2).

Table 3.2 Perishability (in hours) of certain marketable goods in Loreto, Peru.

Time	Product
Under 4 hours	Cut flowers
12 hours	Fresh fish and game
36 hours	Most orchard and jungle fruit (pineapple, moriche palm fruit, *umari*, *ungurahui*, *cocona*.
60 hours	Heart of palm Manioc Citrus fruit
4 days	Plantain
> 1 month	Maize Rice Manioc meal Salted meat and fish Livestock (live)

[28] Bush (2004) highlights the importance of perishability in his study on market access in the Siiphandone fishery in Lao PDR.

Finally, distance can affect the availability of valuable forest resources such as game meat and timber, which are found principally, if not exclusively, in regions further removed from Iquitos, where population is less dense and prized species have not been overexploited. Rural households in these remote areas, though they face many challenges relating to market access, do benefit from access to game and timber that households in the villages closer to Iquitos do not have. Most often, however, there are more benefits to be found in proximity than in remoteness.

(i) Measuring distance

In considering the impacts of distance on access to product markets, a fundamental distinction needs to be made with regard to the way in which distance is measured. In a hypothetical linear road system wherein access to transport is evenly distributed and transport costs vary singularly with distance, the measure of the *physical* distance between points will produce data that are both representative and comparative. For research on river trading in the context of the Peruvian Amazon, however, it is better to measure distance in time, as measures of physical distance may be misleading.

First, time is a more relevant parameter, considering that the principal effects of distance described above relate to perishability and opportunity cost, both of which are time-dependent. Second, given the dynamic conditions of transport in the Peruvian Amazon – boat speeds can vary considerably with different motors and contrasting currents – time is better suited to capture and adapt to irregularities. For instance, large steel-hulled launches that travel on the Amazon, Marañón, and Ucayali rivers are typically much faster than *colectivos* and small wooden launches that travel on tributaries, making travel times on these tributaries increase more rapidly with distance than on larger rivers. Such irregularities are not captured by measures of physical distance.

Table 3.3 lists the mean upstream and downstream travel times between Iquitos and villages across the region, as well as an overall distance value for each village, corresponding to the average of mean upstream and downstream travel times (refer to Figure 1.1 for village locations). The destinations that figure in bold in Table 3.3 highlight certain inconsistencies between time and physical distance. For example, traveling downstream from Iquitos to the town of Pebas is much faster (10 hours) than traveling to Yanashi (16 hours) even though Pebas is further, since *colectivos* to Yanashi

Table 3.3 Travel time to Iquitos from riverine villages in Loreto, Peru, 2005.

RIVER	DESTINATION	Time* upstream	Time* downstream	DISTANCE**
Amazon, downstream from Iquitos	Santa Maria	2	1	1.5
	San Rafael	2.5	1.5	2
	Varadero de Mazán	3.5	2	2.75
	Indiana	4	3	3.5
	Nuevo Paraiso	5	4	4.5
	Vainilla	6	8	7
	Yanashi	**20**	**12**	**16**
	Pebas	**11**	**9**	**10**
	San Pablo	20	16	18
	Chimbote	24	20	22
	Caballo Cocha	28	22	25
	Islandia	33	27	30
Napo	Yarayacu	16	10	13
	Santa Rosa	20	14	17
	Boca del Curaray	96	72	84
	Pantoja	144	120	132
Momón	Porvenir	3.5	2.5	3
	Santa Rosa	4.5	3.5	4
	Centro Fuerte	5.5	4.5	5
	Grau - Santo Tomas	8	6	7
	Union	9	7	8
	Lores, Maynas	10	8	9
Nanay	Nearby	0.75	0.75	0.75
	Mishana, Porvenir	7.5	6.5	7
	Samita, Lagua	9.5	8.5	9
	Sta. Maria	13	11	12
	Anguilla	15	13	14
	Diamante Azul	17	15	16
	Ungurahual	19	17	18
Itaya	Sta. Barbara	3	3	3
	Buena Esperanza	4	4	4
	Limon	5	5	5
	Paraiso	6	6	6
	Varadero	10	10	10

RIVER	DESTINATION	Time* upstream	Time* downstream	DISTANCE**
Amazon, upstream from Iquitos	Santa Rosa	3.5	2.5	3
	Pihuichu	4.5	3.5	4
	Muyuy	7	5	6
	Aucayo	7	5	6
	Tamshiyacu	8	6	7
	Justicia	8	7	8
	Ayacucho	10	8	9
	Yacapana	10	8	9
	San Joaquin de Omaguas	12	10	11
	S.J. Puritanía	14	10	12
Río Tamshiyacu	Miraflores	14	12	13
Río Tahuayo	Esperanza	11	9	10
	El Chino	13	11	12
Nauta zone*	*Villa Canan*	*3*	*2*	*2.5*
	San Regis	*7*	*5*	*6*
	Miraflores	*9*	*7*	*8*
Alto Marañón	Roca Fuerte	30	24	27
	Ollanta	32	26	29
	Saramiriza	144	120	132
Tigre	*Queb. Nahuapa*	48	30	39
	Intuto	**60**	**50**	**55**
Corrientes	Trompeteros	48	36	42
Huallaga	**Yurimaguas**	**72**	**48**	**60**
Ucayali	Requena	16	12	14
	San Ramón	60	40	50
	Pedrera	55	45	50
	Pucallpa	90	78	84

* mean time (in hours), ** mean of mean upstream and downstream times (in hours), *** travel time to Nauta.

are slower and make many more stops that the launches that travel to Pebas. Likewise, travel times to Intuto (55 hours) on the Tigre River and Yurimaguas (60 hours) on the Huallaga are similar despite a significant difference in physical distance from Iquitos.

An additional benefit of time-distance is that it can adapt to changing physical conditions. For instance, the recently completed road connecting the secondary town of Nauta to Iquitos has had a tremendous impact on nearby communities. Since the road represents significant time savings for traders and producers traveling from upstream villages to Iquitos, it has become a distinct advantage to travel to Nauta by boat and then take the highway, rather than taking a boat all the way to Iquitos. Upstream communities have since seen their connection to Iquitos improve considerably – they benefit from a newfound proximity to Iquitos – even though the physical distance separating them to the city has remained constant. Finally, the measure of time-distance also effectively expresses changes in market access due to seasonality. In the village of Arica Viejo, for instance, on the Ucayali River, a natural canal offers direct access to the river in times of high water. However, in the dry season, people have to get to the river by canoe or by foot (Manzi, 2005).

In conclusion, distance has direct impacts on market access. By measuring distance in time, the true impacts of distance can be compared without having to account for a myriad local or sub-regional disparities in geography (winding rivers, currents) or boat speed (horsepower). A direct correlation between distance and degree of market access is not as apparent as are the indirect influences of distance analyzed in terms of frequency of boat traffic and transaction costs.

3.4.1.2 Frequency

The frequency of boats traveling to rural villages from Iquitos varies significantly across the region of Loreto. Indeed, weekly boat service can vary from as many as 40 boats per week in certain areas to under one boat per week, depending on the location of a village and its proximity to Iquitos – whether it is situated on a major river or on a smaller tributary, whether it is serviced by *colectivos*, *lanchas* or *regatones*, or whether it is relatively isolated or situated in or near a transportation hub where many routes intersect. The frequency of boat traffic is an essential parameter for determining market access

since it affects the regularity, and by extension, the overall ease with which rural producers can access the product markets of Iquitos, whether directly or indirectly.

(i) Measuring the frequency of boats

The process by which the frequency of boat traffic was measured across the region began with identifying the destination of every commercial boat that left Iquitos on a regular basis.[29] For every route, the typical departure frequency (gathered from interviews) was multiplied by the number of boats servicing the same destination. Travel frequencies were then standardized using a week as the common denominator (which explains non-integer values). Once each boat destination was allotted a frequency value, overlaps had to be accounted for, since boats traveling to and from further destinations usually service all or many of the villages along the way, thereby overlapping with more proximate trading routes.[30] Aggregate frequencies were then calculated based on the overlap of trading routes. Boat frequencies across the region – expressed in boats per week and aggregate frequencies – are listed in Table 3.4, whereas Figure 3.3 offers a graphical representation of the frequency of boats servicing each destination in the region. The width of the band at any given point is based on aggregated frequency values and corresponds to the number of Iquitos-bound boats that make stops in a typical week.

These regional data on the aggregate frequency of boat traffic are an effective proxy for quantifying access to product markets as well as access to information and general integration in market life, if only on a comparative scale. It is interesting to note that most villages situated near Iquitos, in the *colectivo* zone, benefit from daily boat service. This represents a reasonable potential for market integration, where access to transport would likely be a negligible barrier to trade. In the *lancha* zone as well, most notably along the major rivers – the Amazon, Marañón and Ucayali – boat traffic remains

[29] Trips to Nauta and Requena helped identify the boats that left from these secondary ports.

[30] Determining areas of overlap required careful attention. First, distinctions had to be made between the boats that simply pass by a village and those that actually perform regular stops. Generally, river launches do not service any villages in the *colectivo* zone, so frequencies for these different forms of transportation were kept separate. Second, determining overlap required an understanding of the local geography of certain rivers since the presence of islands and multiple navigation routes can influence the frequency of boats servicing a given village. Finally, certain zones of overlap are hard to define and vary according to the point at which boats reach their carrying capacity and can no longer provide any service. Given the uncertainty and irregularity regarding this last point, there is likely a degree of error in the calculations of overlap. However, a substantial effort was made to remain as faithful as possible to the reality in the field.

Table 3.4 Boat frequencies and aggregate frequencies of travel from Iquitos, Peru, 2005.

RIVER	DESTINATION	Boats/ week	Aggregate Frequency
Amazon, downstream from Iquitos	Varad. de Mazán	12	40
	Indiana	9	28
	Nuevo Paraiso	4	19
	Vainilla	3	15
	Yanashi	12	12
	Islandia	9	9
Nanay	Nearby	9	13
	Ungurahual	4	4
Napo	Yarayacu	4	12
	Santa Rosa	8	8
	Boca del Curaray	0.75	2.25
	Pantoja	1.5	1.5
Momón	Lores	8	8
Itaya	Sta. Barbara	3	22
	Buena Esperanza	3	19
	Limon	6	16
	Paraiso	6	10
	Varadero	4	4
Amazon, upstream from Iquitos	Muyuy	15	15
	Aucayo	6	36
	Tamshiyacu	12	30
	Ayacucho	6	12
	Yacapana	6	6
	S.J. Puritanía	6	6
Río Tamshiyacu	Miraflores	2	2
Río Tahuayo	Esperanza	6	12
	El Chino	6	6

RIVER	DESTINATION	Boats/ week	Aggregate Frequency
Marañón	Villa Canan	18	18
	San Regis	3	13
	Miraflores	6	10
	Roca Fuerte	2	4
	Ollanta	2	2
	Saramuro	1.25	3.85
	Maipuco	0.6	2.6
	Charupa	1.5	2
	Saramiriza	0.5	0.5
Nahuapa	last village	1.5	1.5
Tigre	*Corrientes river*	-	*4*
	Intuto	2	2
	Doce de Octubre	0.5	0.5
Corrientes	Trompeteros	2	2
	Valencia	0.5	0.5
Río Chambira	last village	2	2
Río Urituyacu	S. Juan de Abejico	1.25	1.25
Río Nucuray	Nueva Creación	0.75	0.75
Ucayali	Requena	6	6
	Ucayali		*4*
	Canal Puinahua		*9*
	San Ramón	2	13
	Pedrera	2	11
	Pucallpa	9	9
Queb. Maquia	last village	0.5	0.5

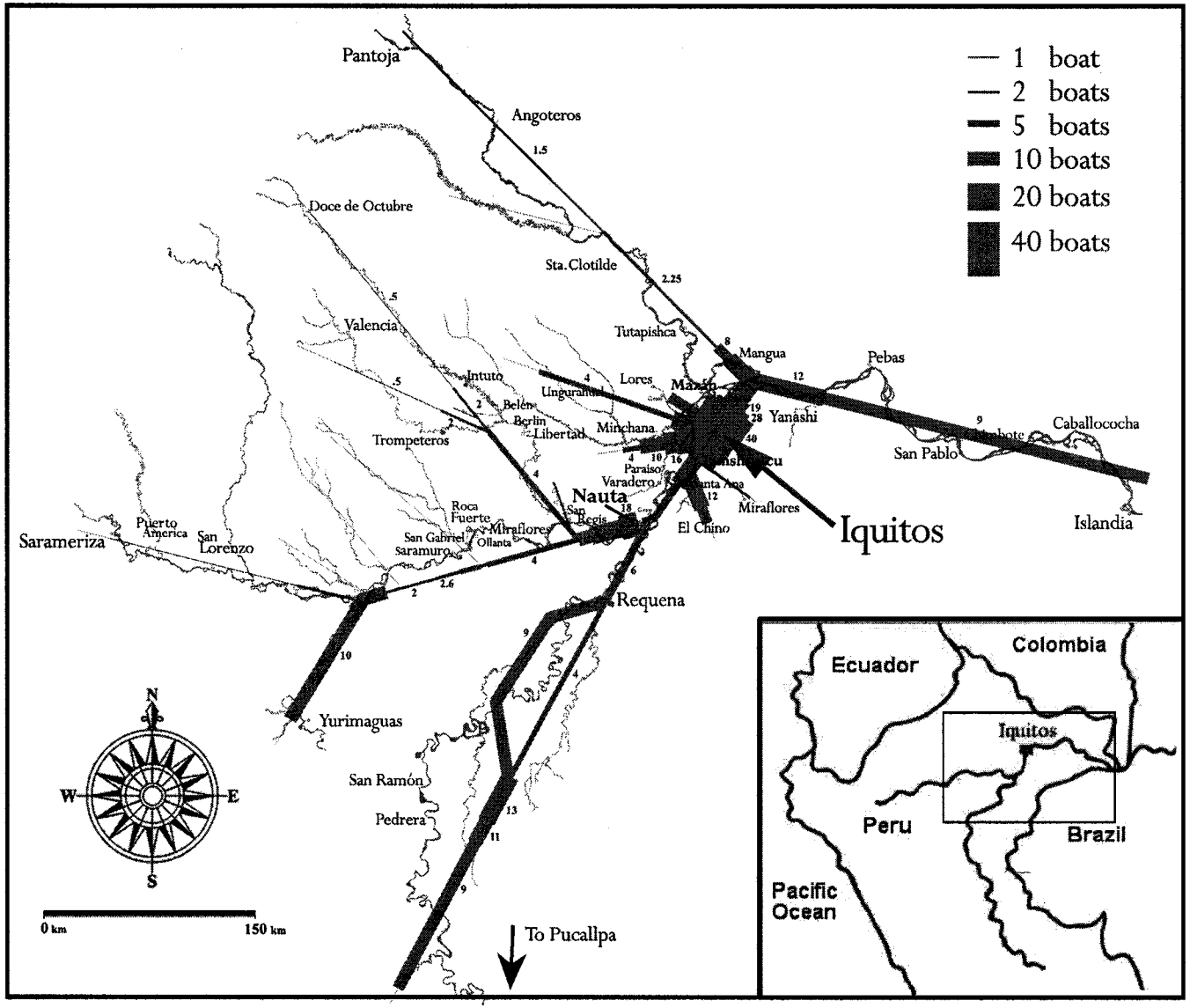

Figure 3.3 Frequency of river boats per week around Iquitos, Peru, 2005.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

relatively frequent. In fact, it is only as one travels up smaller tributaries, especially beyond the river launch zone, that boat frequency drops substantially and access to product markets likely becomes increasingly restricted. In these areas, people depend mostly on itinerant traders (*regatones* or *balsas*) whose frequency of travel is much lower. On certain tributaries where commercial transport is lacking, riverine producers may travel by canoe in order to reach regional transportation routes.

(ii) Measuring carrying capacity

Whereas the findings on boat frequency serve as a preliminary indicator of market integration for rural producers – at least with regard to the frequency of access to information and product markets in Iquitos – aggregate boat frequencies do not necessarily inform us of the volume of trading that takes place across the region. Therefore, a second measure of frequency was developed, based on the carrying capacity of boats. This measure is useful for estimating the potential volume of trade at different points in the system. It also serves to correct a potential misconception that arises from the first measure, wherein more boats would suggest more trade. Rather, the second measure reveals that many small boats may have less capacity, and therefore offer less opportunity for trade, than fewer boats of greater capacity. This measure is calculated similarly to the first. Site-specific and aggregate carrying capacities are listed in Table 3.5, while Figure 3.4 offers a graphical representation of frequency in terms of aggregate carrying capacity per week.

By comparing Figures 3.3 and 3.4, we see that the two measures of frequency clearly tell different stories about access to the product markets of Iquitos – most notably in the areas serviced by the large river launches from Islandia, Pucallpa and Yurimaguas. Indeed, the measure of boat capacity in Figure 3.4 reveals that the potential volume of trade in areas serviced by launches is considerably higher than the tapering boat frequencies in Figure 3.3 would suggest. Moreover, Figure 3.4 further indicates that the potential volume of trade in areas serviced by large river launches is many times greater than in areas serviced by *colectivos*, even though boat frequency is lower.

There are, however, two important effects to consider in the measure of boat carrying capacity, the influence of which should significantly reduce the apparent

Table 3.5 Carrying capacities of river boats around Iquitos, Peru, 2005.

RIVER	DESTINATION	Capacity of boats	Aggregate Capacity
Amazon, downstream from Iquitos	Varad. de Mazán	120	641
	Indiana	189	521
	Nuevo Paraiso	40	332
	Vainilla	32	292
	Yanashi	260	260
	Islandia	1560	1560
Nanay	Nearby	24	60
	Ungurahual	36	36
Napo	Yarayacu	80	280
	Santa Rosa	200	200
	Boca del Curaray	26	221
	Pantoja	195	195
Momón	Lores	40	40
Itaya	Sta. Barbara	12	108
	Buena Esperanza	12	96
	Limon	30	84
	Paraiso	36	54
	Varadero	18	18
Amazon, upstream from Iquitos	Muyuy	132	132
	Aucayo	72	757
	Tamshiyacu	177	685
	Ayacucho	156	228
	Yacapana	72	72
	S.J. Puritanía	280	280
Río Tamshiyacu	Miraflores	18	18
Río Tahuayo	Esperanza	81	153
	El Chino	72	72

RIVER	DESTINATION	Capacity of boats	Aggregate Capacity
Marañón	Villa Canan	106	106
	San Regis	24	678
	Miraflores	54	654
	Roca Fuerte	200	600
	Ollanta	400	400
	Saramuro	46.9	171.4
	Maipuco	22	124.5
	Charupa	52.2	102.5
	Saramiriza	50	50
Nahuapa	last village	38.5	38.5
Tigre	*Boca Corrientes*	-	275
	Intuto	75	75
	Doce de Octubre		
Corrientes	Trompeteros	200	200
	Valencia		
Río Chambira	last village	52.5	52.5
Río Urituyacu	S. Juan de Abejico	80	80
Río Nucuray	Nueva Creación	22.5	22.5
Ucayali	Requena	1260	1260
	Ucayali		600
	Canal Puinahua		2535
	San Ramón	250	3485
	Pedrera	350	2885
	Pucallpa	2535	2535
Queb. Maquia	last village	10	10

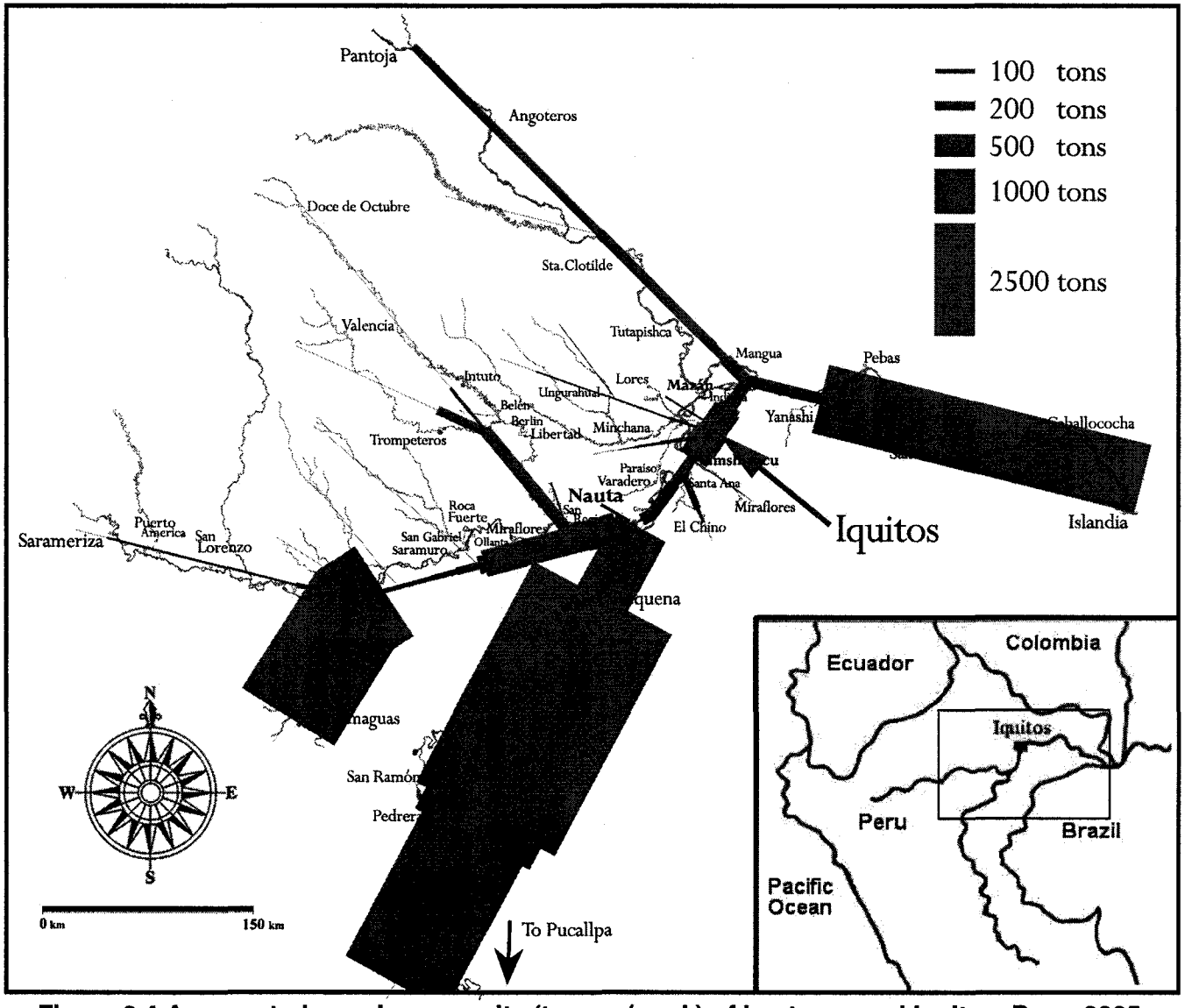

Figure 3.4 Aggregated carrying capacity (tonnes/week) of boats around Iquitos, Peru, 2005.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

overvaluation of the carrying capacities of large river launches depicted in Figure 3.4. First, the launches traveling from Islandia, Yurimaguas and Pucallpa carry significant loads of imported construction materials and manufactured goods from Brazil and inland Peru, thereby reducing considerably the capacity for passengers and their cargo. Second, each boat has a diminishing capacity as it accumulates cargo. Therefore, the step-like changes in capacity depicted in Figure 3.4 should actually be tapered to reflect diminishing capacity. Figure 3.5 graphically represents the diminishing capacity of boats on a stretch of the Amazon River based on the hypothetical tapering of boat capacities.[31]

(iii) The 'thickness' of trade

The graphic representations of boat traffic and carrying capacity presented above offer insights into the 'thickness' of trade across the region, whereby the width of the bands on the maps is a useful proxy for the relative level of integration in regional markets. In villages where boat traffic occurs on a daily basis, producers can easily maintain a steady and constant stream of communication with markets in Iquitos. Access to information and regular travel mean these producers are well integrated in the market; in other words, the marketplace forms a part of their daily lives and there is no feeling of seclusion. Conversely, for villages that receive limited boat traffic, access to transport can represent an important barrier to trade.

In terms of carrying capacity, a heavy thickness of trade signifies the potential for a large volume of produce to be transported to the market on a regular basis. This is the fundamental condition for market integration. In areas where the potential volume of trade is restricted, producers are likely to rely less on the market and focus more on subsistence. Finally, a high frequency of boat traffic further contributes to the reliability of market access since many boats share the load of transport, thereby minimizing the impact of a boat missing a trip. In areas where boat traffic is scarce, one missed voyage can mean the loss of potential earnings from the sale of cultivated produce. Thickness of trade is therefore a good preliminary indicator of market access.

[31] Data for diminishing capacity were not collected during fieldwork. Neither were data on the actual carrying capacity of large river launches once industrial cargo was considered. Therefore the tapering depicted in Figure 3.5 is based on hypothetical values.

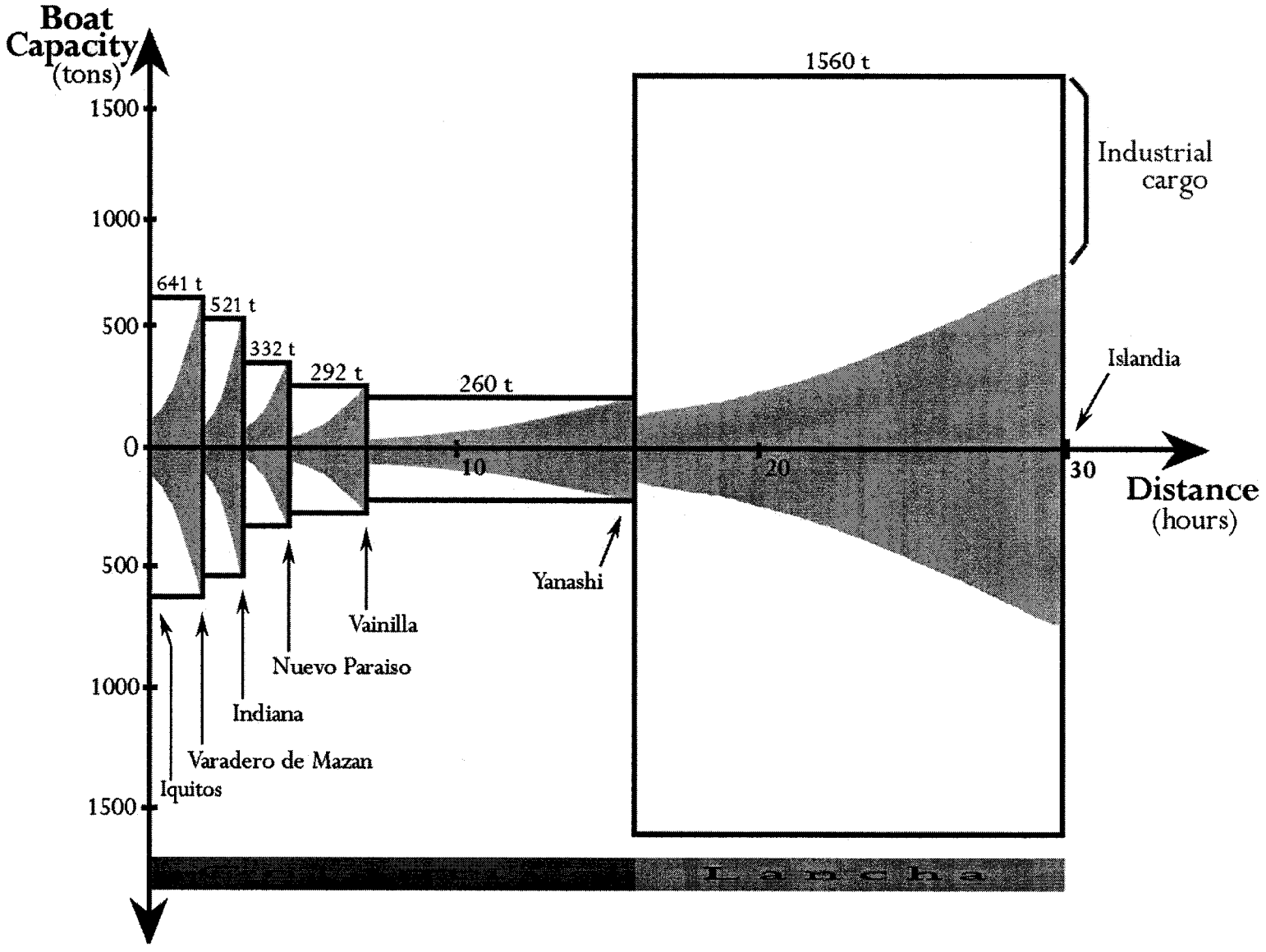

Figure 3.5 Diminishing capacity of boats on the Amazon, downstream from Iquitos (hypothetical).

3.4.1.3 Cost

The cost of trading is another important parameter for assessing market access since it immediately influences the feasibility of trade. By evaluating transport costs and transaction costs and weighing the net returns from the sale of their produce against the premium paid for the purchase of commodities in the markets, rural producers can determine whether or not certain transactions are worthwhile. If the costs associated with trading are so high that they outweigh the returns, then we can say that access to product markets is considerably hindered by cost.

The costs associated with trading typically fall into two categories, namely transport costs and transaction costs. Transport costs are expenses directly associated to moving people and goods to and from the marketplace, while transaction costs typically refer to the various expenditures of time and money spent seeking out potential buyers and negotiating and monitoring the terms of exchange (Barham and Coomes, 1994). Oliver E. Williamson (1985:18) described transaction costs as "the economic equivalent of friction in physical systems". In this sense, any expense, whether direct or indirect, monetary or not, that is inexorably connected to marketing, and thus inevitably reduces returns, can be considered a transaction cost. In river trading, producers can incur these costs directly, in the form of transportation fees, room and board in Iquitos and the opportunity cost of time spent traveling, or they can be incurred indirectly, through the price markups that traders incorporate in their fees and pricing schemes in order to self-insure their business and make a profit (Chapter 2). In either event, they represent a significant expense that must be considered in every decision to participate in market exchanges.

(i) Measuring cost

In the Peruvian Amazon, transaction costs typically increase with distance and the nature and distribution of trading costs deserve close attention, as many subtleties arise across the region. The first step in comparing transaction costs is to distinguish between direct trade, which relies on passenger ships (*colectivos* and launches), and indirect trade, which relies on itinerant traders (*regatones*). The following analysis begins by comparing the costs of direct trading, and then proposes a method for measuring and comparing the transaction costs associated with indirect trading.

In direct trading, where producers travel to the marketplace aboard passenger boats (*colectivos* and launches), the two principal costs are the passenger fare (*pasaje*) and the cargo fee (*flete*), both of which are set independently by boat operators according to distance. Other expenses also occur, but since these are commonly assumed by all producers, they are not relevant for the purpose of comparing the spatial distribution of transaction costs around Iquitos. With the exception of certain areas at the boundary between *colectivos* and *lanchas*, both passenger fares and cargo fees tend to increase with distance.[32] They differ, however, in the degree to which they vary.

Table 3.6 lists one-way fares for every destination serviced by passenger boats leaving from Iquitos and the port of Nauta.[33] The geographical distribution of fares is then graphically represented in Figure 3.6. While the graphic supports the notion that costs increase with distance, it also reveals that they tend to increase faster on tributaries. The most striking example is found at the junction of the Tigre and Marañón rivers (denoted in the Figure 3.6 by a circle), where the fare to the village of Roca Fuerte on the Marañón is ten Soles (1 USD = 3.16 Nuevo Soles, or soles, or S/.), whereas the fare to Nueva York, the first community on the Tigre rises to 20 Soles over a short distance. This phenomenon reflects the rapid fall in boat traffic observed on smaller rivers and further suggests that access to the product market is more constrained in remote areas. Finally, it is important to note that the fares depicted in Figure 3.6 represent only a <u>one-way</u> voyage. Inevitably, producers must pay a fare in both directions when they travel to and from Iquitos, thereby doubling transport costs at every increment (the rise in cost would then look more exponential along the tributaries).

The second immediate cost associated with trading is the cargo fee (*flete*). Like the fare, the cargo fee generally tends to increase with distance. Increases in cargo fees, however, only occur over much larger intervals; in such a way that *flete* may be the same over the entire length of a river, while *pasaje* may have increased ten-fold. Further, increases in per unit cargo fees over distance are minimal; across the entire region, the

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[32] On the Amazon River, for instance, *pasaje* to Yanashi by *colectivo* costs 12 soles, whereas the *pasaje* aboard a *lancha* to the town of Pebas, which is considerably farther, costs only 10 soles. Lower costs per passenger on *lanchas* are attributable to economies of scale that *lanchas* can benefit from, given their larger carrying and passenger capacities.

[33] The port of Nauta is included in this analysis because of its direct link with Iquitos by road. In doing so, we propose that access to Nauta implies easy access to the product markets in Iquitos.

Table 3.6 Passenger fares (*pasaje*) by river boat to and from Iquitos, Peru, 2005.

RIVER	DESTINATION (distance*)	*Pasaje***
Amazon, downstream from Iquitos	San Rafael	3
	Santa Maria	3 to 4
	Varadero de Mazán (2.75)	4 to 5
	Indiana (3.5)	4 to 5
	Nuevo Paraiso (4.5)	5 to 6
	Vainilla (7)	7 to 9
	Yanashi (16)	12
	Pebas (10)	10
	San Pablo	20
	Chimbote	25
	Caballo Cocha	35
	Islandia (30)	50
Napo	Orellana	6
	Mangua	8
	Yarayacu (13)	10
	Santa Rosa (17)	10
	Tutapishca	15
	Sta Clotilda	35
	Boca del Curaray (84)	40
	Ango Terro	65
	Pantoja (132)	90
Momón	Porvenir	2
	Santa Rosa	2.5
	Centro Fuerte / Kenken	3
	Polis	3.5
	Grau	4
	Union / San Luis	5
	Lores / Maynas (9)	6

RIVER	DEST. (distance*)	*Pasaje***
Nanay	Nearby (45 mins)	1
	Mishana / Porvenir	5
	Samita / Lagua	6
	Anguilla	8
	Santa Maria	10
	Diamante Azul	11
	Ungurahual	12
Itaya	Sta. Barbara (3)	2
	Buena Esperanza (4)	2
	Limon (5)	2.5
	Paraiso (6)	3
	Varadero (10)	5
Amazon, upstream from Iquitos	Santa Rosa	2.5
	Pihuichu	3
	Freide (6)	4
	Gallito	3
	Aucayo (6)	4
	Tamshiyacu (7)	4
	Yacapana / Ayacucho (9)	4
	Justicia (9)	5
	S. Joaquin de Omaguas	6
	S.J. Puritanía (12)	8
Tamshiyacu	Caserio 1	5
	Caserio 2	6
	Libertad	7
	Miraflores	8
Tahuayo	Sta Ana/Esperanza (10)	5
	Chorro	6
	El Chino (12)	7

RIVER	DEST. (distance*)	*Pasaje***
Nauta zone	*Villa Canan (2.5)*	*1 to 3*
	San Regis (6)	*5*
	Miraflores (8)	*5*
	Quebrada Nahuapa (39)	15
Tigre	**Nueva York**	**20**
	Libertad	25
	Berlin	30
	Belén	35
	Intuto (55)	40
Corrientes	Boca del Corrientes	25
	Trompeteros (42)	35
Alto Marañón	**Miraflores**	**10**
	Roca Fuerte (27)	10
	Ollanta (29)	15
	San Lorenzo	70
	Puerto America	75
	Saramiriza (132)	90
Huallaga	Yurimaguas (60)	40
Ucayali	before Requena	8
	Requena (14)	12
	San Ramón (50)	35
	Pedrera (50)	40
	Contamana	60
	Pucallpa (84)	70

* Distance in parentheses is indicated in hours, ** When two fares are indicated, the lower fare (first) corresponds to the downstream fare.

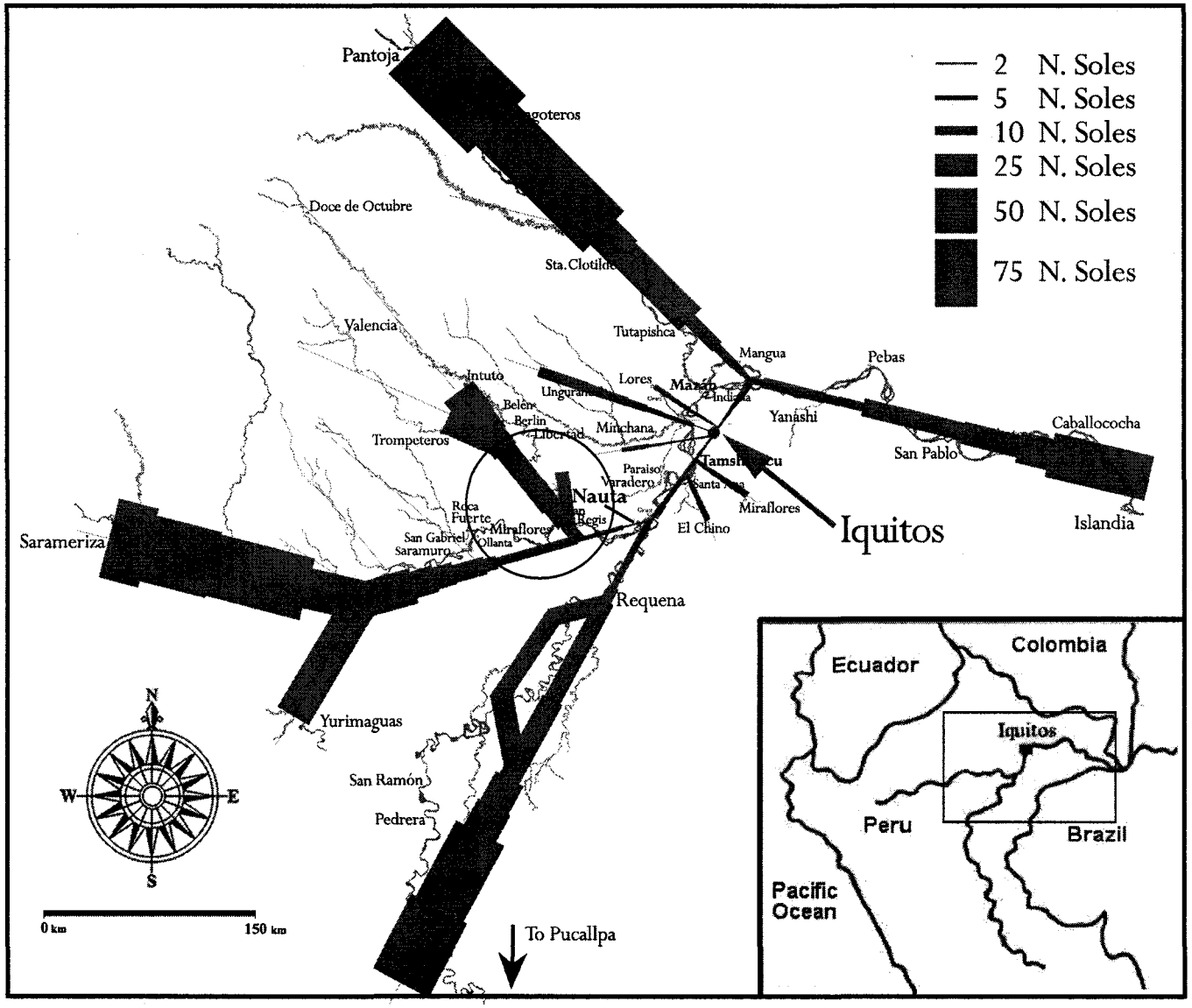

Figure 3.6 Geographical distribution of passenger one-way fares (*pasaje*) around Iquitos, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

cargo fee for plantain only varies between 0.30 and 1.5 Soles. At first glance, it would seem that there is much less disparity in cargo fees than in fares. However, since the cargo fee is a per-unit fee, small increases can represent significant expenditure as the bulk of cargo increases. For instance, the cost of transporting 20 plantain racemes at a *flete* of 0.50 Soles is 10 Soles, whereas the cost when *flete* rises to one Sol per raceme is 20 Soles. In this way, cargo fees are a significant contributor to transaction costs and have important consequences for the net returns from trade.[34]

Table 3.7 presents cargo fees across the region for both a plantain raceme (*racimo de platano*) and a standard burlap bag of produce (*saco*).[35] Although different cargo fees are charged for every product traded in the region, from coal to cattle, these two items were selected because of their ubiquity. The third column in the table represents the total *flete* for a hypothetical cargo comprised of 20 *racimos* and 20 *sacos*. This value is derived in order to better represent the changing value of cargo fees across the region, as well as to better perceive their impact on cost. Figure 3.7 graphically depicts the distribution of cargo fees using the agglomerated values from Table 3.7.

In order for a trading voyage to be worthwhile for a producer, the returns from trade must necessarily surpass the costs. The decision to travel to the marketplace is therefore contingent on a careful evaluation of costs and returns, wherein returns are derived from the sale of produce in the market and costs are an amalgamation of fare, cargo fee and myriad other transaction costs. As these costs increase, depending on the origin of producers, the net returns from trade decrease, given a constant price in the product markets of Iquitos.

Figure 3.8 illustrates the decreasing margin of return from the sale of plantain in the market of Iquitos, based on the point of origin of the product on the Tigre River. The calculation is based on the hypothetical sale of 20 *racimos* sold in the market at a price of 3 soles per *racimo*. Costs are calculated by adding the fare in both directions and the total

[34] It remains unclear why cargo fees do not increase at the same rate as passenger fees and tend to stay flat over longer distances. Perhaps it is a matter of competition between transporters.

[35] Plantain racemes typically hold 50-70 plantains; the standard burlap bag measures 28 inches by 43 inches. Passengers can carry a variety of products in burlap bags, from manioc to fruits and vegetables to consumer goods. Rice and maize, though transported in the same bags, carry their own cargo fee per kg or per metric ton.

Table 3.7 Cargo fees (*flete*) to Iquitos, Peru, 2005.

RIVER	DESTINATION (distance, hrs)	*Flete* (racimo)	*Flete* (saco)	*Flete* (20+20)
Amazon, downstream from Iquitos	San Rafael	0.5	1	30
	Santa Maria	0.5	1	30
	Varadero de Mazán	0.5	1	30
	Indiana (3.5)	0.5	1	30
	Nuevo Paraiso (4.5)	0.5	1	30
	Vainilla (7)	1	2	60
	Yanashi (16)	1	2	60
	Pebas (10)	1	1.5	50
	San Pablo	1	1.5	50
	Chimbote	1	1.5	50
	Caballo Cocha	1	2	60
	Islandia (30)	1	2	60
Napo	Orellana	1	2	60
	Mangua	1	2	60
	Yarayacu (13)	1	2	60
	Santa Rosa (17)	1	2	60
	Tutapishca	1	2	60
	Sta Clotilda	1	2	60
	Boca del Curaray (84)	1	2	60
	Ango Terro	1	2	60
	Pantoja (132)	1	3	80
Momón	Porvenir	1	1	40
	Santa Rosa	1	1	40
	Centro Fuerte/Kenken	1	1	40
	Polis	1	1	40
	Grau	1	1.5	50
	Union / San Luis	1	2	60
	Lores / Maynas (9)	1.5	2	70
Nanay	Nearby (45 mins)	0	1	20
	Mishana / Porvenir	0	2	40
	Samita / Lagua	0	2	40
	Anguilla	0	2	40
	Santa Maria	0.5	2	50
	Diamante Azul	0.5	2	50
	Ungurahual	1	2	60
Itaya	Sta. Barbara (3)	0.5	1	30
	Buena Esperanza (4)	0.5	1	30
	Limon (5)	0.5	1	30
	Paraiso (6)	0.5	1	30
	Varadero (10)	0.5	2	50

RIVER	DESTINATION (distance, hrs)	*Flete* (racimo)	*Flete* (saco)	*Flete* (20+20)
Amazon, upstream from Iquitos	Santa Rosa	0.5	1	30
	Pihuichu	0.5	1	30
	Freide (6)	0.5	1.5	40
	Gallito	0.5	1	30
	Aucayo (6)	0.5	1	30
	Tamshiyacu (7)	0.7	2	54
	Justicia (9)	1	2	60
	S.J. Puritanía (12)	1	2	60
Río Tamshiyacu	village 1	0.5	1	30
	village 2	0.5	1	30
	Libertad	0.5	1	30
	Miraflores	0.5	1	30
Río Tahuayo	Santa Ana (10)	1	2	60
	Chorro	1	2	60
	El Chino (12)	1	2	60
Nauta zone	Villa Canan (2.5)	1	1	40
	San Regis (6)	1	1.5	50
	Miraflores (8)	1	1.5	50
Tigre	Rio Nahuapa (39)	1	2	60
	Nueva York	1	2	60
	Libertad	1	2	60
	Belén	1	2	60
	Intuto (55)	1	2	60
Corrientes	Boca del Corrientes	1	2	60
	Trompeteros (42)	1	2	60
Alto Marañón	Miraflores	1	2	60
	Roca Fuerte (27)	1	2	60
	Ollanta (29)	1	2	60
	San Lorenzo	1	2	60
	Saramiriza (132)	1	3	80
Huallaga	Yurimaguas (60)	1	3	80
Ucayali	before Requena	0.5	2	50
	Requena (14)	0.5	2	50
	San Ramón (50)	1	3	80
	Pedrera (50)	1	3	80
	Pucallpa (84)	1	3	80

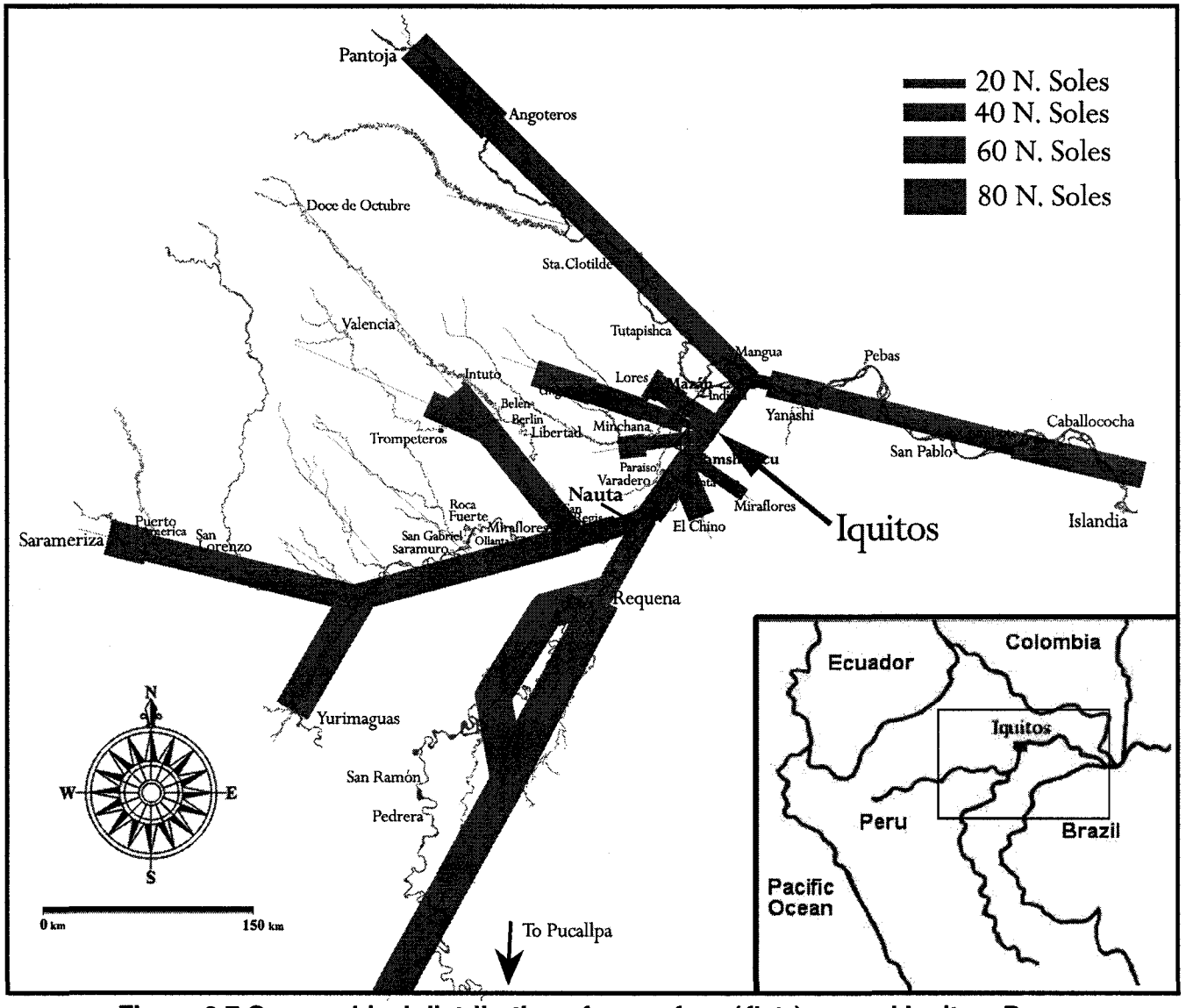

Figure 3.7 Geographical distribution of cargo fees (*flete*) around Iquitos, Peru.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

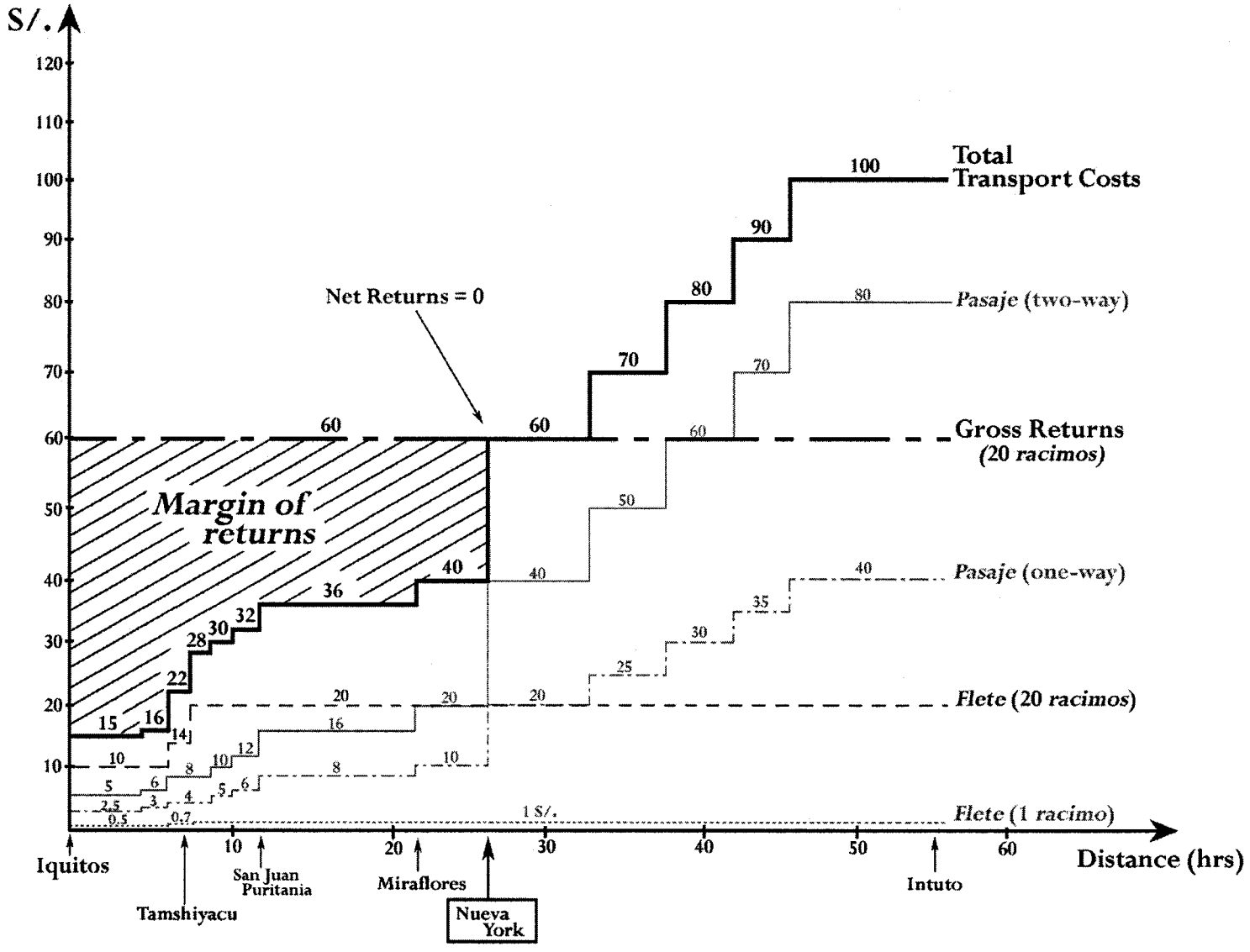

Figure 3.8 Decreasing margin of return to plantain producers on a transect from Intuto (Río Tigre) to Iquitos (20 *racimos*).

cargo fee in one direction.[36] The margin of returns corresponds to the difference between the gross returns from the sale of plantain and the total transaction costs. As costs increase, we can observe that at a certain point in the graph (corresponding to the village of Nueva York), the direct sale of 20 *racimos* in the market of Iquitos is no longer a worthwhile venture, as it yields zero net returns. However, if the producer were to transport 30 *racimos* to the market instead of 20, the calculation of net returns would look quite different. This situation is depicted in Figure 3.9, where net returns fall to zero at the village of Berlin, further upstream.

By comparing these two graphs, we observe that the point at which trade is no longer profitable shifts further away from the marketplace as the bulk of produce increases. In other words, as the passenger fare and cargo fee increase with distance, the quantity of produce required to make direct trade worthwhile increases as well. This product threshold is determined by the difference between total costs and returns. It follows that in areas where this threshold is relatively high, the likelihood and frequency of rural producers engaging in direct trade will tend to decrease, since marketing opportunities will require more careful planning and more bulk. Conversely, where fares are more affordable, the product threshold is lower and the decision to travel is made easier; producers in these areas will therefore tend to benefit from greater market integration. These results were corroborated by subsequent research along rivers, during the transect study (see section 3.4.2), where it was found that more distant producers required larger bulks of produce in order to justify traveling to Iquitos.

In addition to focusing on the point of zero net-returns in Figures 3.8 and 3.9, it is also vital to consider the proportion of transport costs versus gross returns. In both cases, it is observed that beyond the village of San Juan de Puritanía – which corresponds to the outer limit of the *colectivo* zone – total transport costs represent over 50% of gross returns. Thus, these graphs reveal not only that producers must attain certain product thresholds in order to receive any returns, but that for many, the returns received are modest in comparison to the price they pay for marketing.

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[36] For the purpose of a clearer representation, the calculation excludes the cost of room and board in Iquitos, the opportunity cost of traveling and the cargo fee paid upon return for products purchased in Iquitos. Their exclusion is based on the fact that these costs can vary independently of distance and would therefore only add unnecessary uncertainty to the calculation. However, it should be noted that real costs will typically be higher than those depicted in the graph, thereby diminishing net returns at every step.

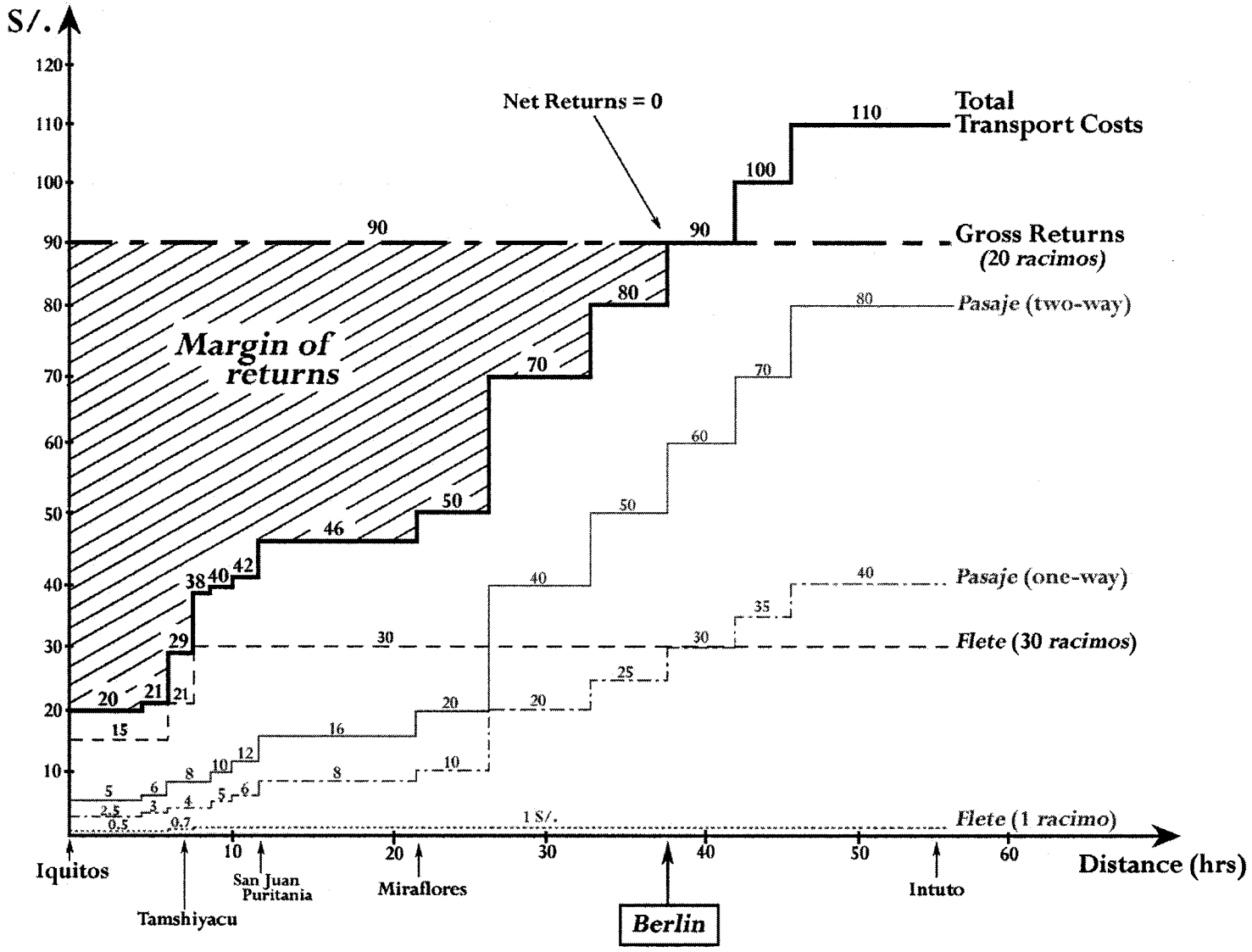

Figure 3.9 Decreasing margin of returns to plantain producers on a transect from Intuto (Río Tigre)to Iquitos (30 *racimos*).

In response to high thresholds that place a limit on direct access to product markets, certain alternatives have arisen that improve the likelihood of trading for producers who cannot afford to wait to ship sufficient cargo (and risk product loss). *Encomienda* is a type of transaction that reduces transport costs, whereby producers ship their produce to Iquitos without traveling themselves to the city. Rather, cargo is entrusted to the boat operator and collected in Iquitos by a friend who is responsible for selling the produce and purchasing commodities to ship back to the village.[37]

Furthermore, in many areas where transport costs are substantial enough to restrict market access, many itinerant merchants (*mercachifles*) rely on the mobility of river launches to bring them in direct contact with rural producers. These merchants essentially act as alternative market outlets for households that do not have enough produce to warrant a trip to Iquitos. While producers avoid some direct costs by dealing with itinerant merchants, transaction costs still exist. The following section explores the nature of transaction costs in indirect trading.

(ii) Indirect trading

In remote areas where direct trade is not be feasible because of substantial transport costs, indirect trade is practiced through the intermediary of long-distance itinerant traders. Historically, *regatones* ensured access to trade in most areas of the region, but their numbers have dropped considerably since the growth of river launches, which have made long-distance travel more affordable. In areas where launches still have not been introduced, *regatones* continue to provide the primary means for accessing product markets in Iquitos, albeit indirectly.

Calculating the costs associated with trading in areas serviced by *regatones* is markedly different from the previous analysis since in indirect trading, producers have no explicit fees to pay such as fares and cargo fees. Rather, transport and other transaction costs are assumed *a priori* by itinerant traders who subsequently factor them into their pricing schemes. Ultimately, transaction costs (including the profit margin of traders) are passed on to the producer, but only after having been fragmented into a multitude of

[37] *Encomienda* relies most often on the presence of a friend or family member in Iquitos. Otherwise, produce can be entrusted to the boat operator, or many households can entrust their produce to one single villager who will travel with the bulk, thereby paying only one fare. In either case, a commission is usually granted in the form of produce or cash for services rendered.

different transactions and price markups. Given that indirect trade typically takes the form of barter, the price markups of *regatones* can come from both the sale side and the purchase side of a transaction.[38] The only way to determine the transaction costs of producers in the context of indirect trade then, is to compare farm-gate and market prices for the different products and commodities exchanged within a given barter transaction.

Given a hypothetical barter transaction between a rural producer and an itinerant river trader in which only one product is traded for another, transaction costs accrued to the producer ($\mathbf{TC_{(total)}}$) can be calculated using the following formulae, where **TCs** is the transaction cost of the sale of produce by the producer, **TCp** is the transaction cost of purchasing a commodity from the city, **price(V)** is the price of a product in the village and **price(Iq)** is the price of the same product in Iquitos:

$$\mathbf{TCs = price(Iq) - price(V)}$$

$$\mathbf{TCp = price(V) - price(Iq)}$$

$$\mathbf{TC_{(total)} = TCs + TCp}$$

Using average price data collected during fieldwork in areas serviced by *regatones*, let us assume that a producer sells 30 racemes of plantain to a *regatón* at two Soles per raceme; and that the same plantains would sell for three Soles per raceme to a small-scale wholesaler in Iquitos. Similarly, in exchange for his/her produce, the producer buys 20 kg of rice at three Soles per kilogram while the price of a kilogram of rice in Iquitos is 1.50 Soles. Using these values, we find that:

$$\mathbf{TCs = 30 \times 3 - 30 \times 2 = 90 - 60 = 30\ Soles}$$

$$\mathbf{TCp = 20 \times 3 - 20 \times 1.5 = 60 - 30 = 30\ Soles}$$

$$\mathbf{TC_{(total)} = 30 + 30 = 60\ Soles}$$

The total transaction cost accrued by the producer in this hypothetical barter exchange is 60 soles ($19 USD). Considering that the producer would have received 90

[38] In his study on the long-distance river traders (*regatoes*) of Brazil, McGrath (1989) explains how the use of barter is significant not only because rural producers have little access to cash, but primarily because it allows the traders to better manipulate the terms of trade to their advantage. Because barter combines sale and purchase into one transaction, the trader can more easily inflate the value of goods sold and purchase forest products at prices below market value.

Soles ($28 USD) for his/her produce in Iquitos, transaction costs in this exchange correspond to 2/3 of potential gross returns. This is a very high proportion; though it is important to keep in mind that the services offered by *regatones* encompass all search, transport and marketing costs in addition to eliminating the opportunity cost of travel. Since actual barter transactions usually involve a variety of products traded, each with their own markups and margins, it is difficult to calculate the transaction costs associated with indirect trading. Moreover, these methods do not illustrate the distribution of transaction costs within the regions serviced by itinerant river traders. Nevertheless, this example indicates that the transaction costs paid by producers who rely on *regatones* for market access are high, and their net returns are low.

Whether transaction costs are incurred directly by producers, or whether they are transferred indirectly to them through the pricing schemes of itinerant traders, they nevertheless have an immediate effect on the net returns from trading. As transaction costs increase, access to product markets becomes restricted. Similarly, as the thickness of trade declines, whether in terms of boat frequency or capacity, the connectedness with urban markets and regional networks of information declines as well. Ultimately, as the above regional assessment of market access suggests, both these trends are closely associated with distance from the market.

3.4.2 Sub-regional analysis: using transect data

Through fieldwork conducted in the ports and markets of Iquitos, it was possible to develop a macro-assessment of access to product markets across the entire region, where distance and the frequency and cost of transport are critical factors in the decision to engage in trade. In order to complement these findings and move toward a more complete assessment of market access, the focus must shift away from Iquitos and toward the sub-regional and local conditions that affect market access. Here, the interest lies in the many different ways that people interact with and engage in regional product markets.

This sub-regional analysis is based on a transect survey that was conducted in 34 communities situated along a continuous segment of the Tigre, Marañón and Amazon rivers (Figure 3.2). The rationale for the selection of this particular transect is described in Sections 3.2 and 3.3 above. For each transect village, data were compiled on local assets, prices and boat access (Appendix 2). These data reveal distinct sub-regional and local

differences in market access, discussed below. The transect study also served to guide the comparative analysis in Chapter 4.

3.4.2.1 Sub-regional reaches of market access

Up to this point, distinctions in the marketing zones around Iquitos have generally followed the regional distribution of boat types (*colectivo*, *lanchas* and *regatones*). In this sense, it was assumed that trading conditions are similar within each zone and contrast between zones. However, findings from the transect survey indicate that certain sub-regional pockets, or river reaches, display unique conditions of market access that differ from adjacent areas, regardless of the type of transport. This finding brings a new level of detail to the study of market access around Iquitos.

Along the Tigre-Iquitos transect, seven distinct reaches were identified, each representing a differentiated zone of market access (Figure 3.10). In general, these reaches are delimited according to boat frequency, though other characteristics affecting direct marketing pathways can serve as markers or dividers as well. A variety of quantitative and qualitative features can be identified within each reach, notably with regard to the price environment, trading opportunities and access to services. Thus, these reaches serve as useful units of comparison for sub-regional diversity in market access. The information gathered from these reaches serves to complement regional analysis with direct observations from the field.

Reach #1: Alto Tigre (Doce to Nuevo Remanente)

The most distant reach from Iquitos is made up of the six Amerindian communities (*Quichua*) on the Alto Tigre that have entered an agreement with Pluspetrol, a foreign oil company that engages in oil exploration and extraction in the region. The agreement stipulates certain obligations by the oil company regarding the provision of employment opportunities, free transportation to Iquitos and free health services for inhabitants as a means of satisfying a requirement of corporate responsibility.[39] These communities are distinguished by product and labour market benefits that accrue from their association with the oil company, such as employment opportunities, a direct though limited market outlet for local produce (with no defined marketplace *per se*), free air

[39] Chapter 4 examines the agreement more closely.

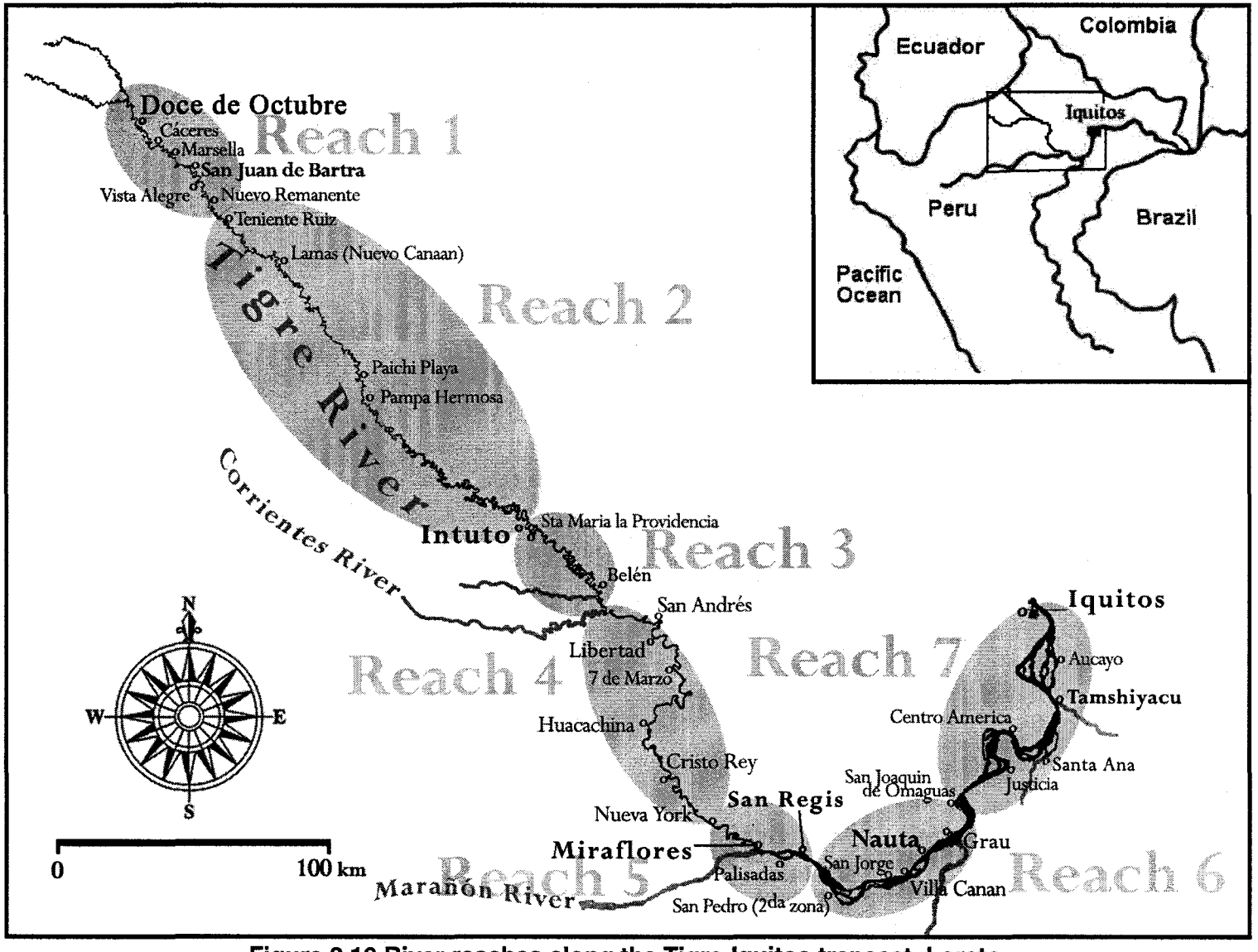

Figure 3.10 River reaches along the Tigre-Iquitos transect, Loreto.
Source: Adapted from *Mapa político de Loreto*, IIAP (2005).

travel to Iquitos, the provision of free diesel fuel, as well as relatively reliable access to free health services. Apart from the amenities provided in the agreement, producers generally rely on long-distance itinerant river traders for access to urban product markets. Most exchanges are barter-based and transaction costs are very high. Moreover, the majority of production is destined for subsistence and products traded consist mostly of game meat and hides, plantains, and aquatic products (fish, turtles and turtle eggs).

Reach #2: Alto Tigre (Teniente Ruiz to Pampa Hermosa)

The four Amerindian communities (*Quichua*) that compose the second reach differ from the first in that they do not benefit from the oil agreement. Producers must rely solely on *regatones* for access to the product markets of Iquitos, as well as small, irregular traders who come from Intuto, the capital of the Tigre district. Interestingly, unlike their upstream neighbours, these communities often resort to timber extraction in the rainy season for income generation. Timber extraction is a labour intensive activity and it is believed that the upstream communities avoid it simply because they can afford to, given the benefits from the oil company.[40] Meanwhile, people must travel to Intuto for basic health services. For more serious illnesses, patients will be required to travel to Iquitos by river launch from Intuto.

Reach #3: Tigre (Intuto to Corrientes River)

In the five villages that comprise this reach, producers rely on two weekly Iquitos-bound river launches for their trading and transportation needs. Alternatively, for small purchases or for basic medical attention, people travel by canoe to Intuto. The latter, apart from being the capital of the Tigre region, also acts as a divider between Amerindian and *mestizo* communities. Downstream from Intuto, although villages still display remnants of their Amerindian past and livelihoods are similar, the population of the Tigre is *mestizo.*

Reach #4: Tigre (Corrientes to Nueva York)

Below the mouth of the Corrientes River on the Tigre, river launch service doubles to four weekly boats, given the addition of two launches that service the Corrientes tributary. The added boats provide more regular service to the area, thereby

[40] The communities in both reaches share a common cultural heritage. Therefore, it is more likely than not that is it economic conditions that are determining resource draw.

improving access to market information, trading opportunities and health services. Nevertheless, prices remain similar to those in the previous reach (see Appendix 2).

Reach #5: Marañón (Miraflores to San Regis)

Moving onto the Marañón River, the situation changes dramatically, both in terms of river traffic and landscape. Although boat traffic increases substantially on the Marañón, the villages in this reach receive relatively little boat traffic compared to most villages on the Marañón. This is because most launches coming from Yurimaguas are already full when they pass this reach, and few *colectivos* venture this far away from Nauta. Only two biweekly launches ensure transport to Iquitos while two smaller river buses traveling to Nauta have recently inaugurated their daily service. Nevertheless, transport costs are significantly lower than on the Tigre River. In terms of production, villages on the Marañón can rely more on cash crops such as rice and maize, as well as fish, given their access to seasonal mudflats and fish stocks in oxbow lakes.

Reach #6: The Nauta Zone

Between San Regis on the Marañón and Santo Domingo on the Amazon, a myriad of *colectivos* and private boats travel daily to Nauta, their frequency increasing as one approaches the rapidly growing market node of Nauta. Transport costs are low in this *colectivo* zone. The villages in this reach are the only ones to lack any regular form of direct transport to Iquitos. Instead, they rely on Nauta for their market needs. Since the completion of the Iquitos-Nauta road, Iquitos can be reached in less than two hours for as little as eight soles ($2.50 USD). This road has substantially improved market access for producers in this reach. Moreover, given the growing market in Nauta, in many cases, reaching Iquitos is not necessary.

Reach #7: Colectivos to Iquitos

From San Juan de Puritanía to Iquitos, regular transport is ensured by myriad *colectivos* and private boats destined for the port of Belén in Iquitos, the most vibrant marketplace in the region. Transport costs are lowest in this reach and the frequency of boats is highest, especially as one approaches Iquitos. Multiple opportunities for trade on a daily basis, consistent access to information as well as a familiarity with the marketplace in Iquitos gives producers in this reach an upper hand in market integration.

Inhabitants of the villages nearest Iquitos can meet subsistence needs by buying food staples in the marketplace while they concentrate the bulk of their productive efforts toward higher income-producing activities, such as fishing, producing cut flowers, or the harvesting of timber-based construction materials.

The purpose of dividing the transect into distinct reaches was to identify patterns and locate significant sub-regional contrasts in market access. The most notable distinctions among reaches were found in the upper reaches of the Tigre River. First, between the communities situated immediately upstream and downstream from Intuto, there was a notable shift in people's perception of the needs of their villages. When asked what the village needed to improve their welfare, the emphasis above Intuto was on the need for better access to markets for their produce, whereas below Intuto, where access to product markets is more frequent and regular, consensus lay more toward the need to improve agricultural production in order to increase the yields of marketable crops. The second important distinction lay between the communities of the Alto Tigre who benefit from the presence of the oil company and those who do not. The significant differences in access to product and labour markets within these remote communities are examined in Chapter 4.

Despite the distinguishing features of each reach, it remains that the majority of villages along the transect receive a minimum of four boats per week. In other words, most villages benefit from relatively consistent and regular access to transportation, even though the range varies considerably. This baseline would suggest that despite the many warnings concerning the limited availability of transport in the Peruvian Amazon (Padoch, 1987; Chibnik, 1994), the actual distribution of transportation in most of the region does not seem to be such a limiting factor on trade. In fact, it is only in the most remote areas, where *regatones* provide the only physical link with Iquitos, that boat frequency is likely to restrict market integration. Rather, the difficulties in marketing observed across the region are more likely contingent on high transaction costs and the low gross returns of marketing than on limited access to transportation.

3.4.2.2 Local conditions of market access

Recent research on livelihoods in the Peruvian Amazon reveals that significant heterogeneity in livelihood and market-oriented activities exists not only across regions

and communities, but also within communities and even households over time (Padoch *et al.*, 1985; Anderson and Ioris, 1992; Godoy *et al.*, 1995; Coomes and Burt, 1996, 2001; Takasaki *et al.*, 2000, 2001). These studies suggest that *intra*-village disparities in assets, land holdings, skills, household size and age, productive and social capital and access to credit and employment clearly influence livelihood opportunities, and by extension, would have profound effects on a household's ability to engage in profitable trade relations compared to other households in the same village. Likewise, *inter*-village disparities in resource endowments, local credit and employment opportunities, village size and age, leadership and communal assets can play an important role in determining market access in different villages regardless of whether they are situated in the same river reach and are subject to similar regional conditions.

Research conducted in villages along the Tigre-Iquitos transect revealed significant heterogeneity at the local level. The following two cases, drawn from field notes, demonstrate how local socio-economic conditions can have profound effects on market access within and between communities. The comparative study in Chapter 4 further emphasizes this point. Findings from research at the local scale suggest that market access is fundamentally influenced by context.

Libertad, Río Tigre

Situated halfway between Intuto and the mouth of the Tigre River, the village of Libertad is a relatively large community (135 households) that displays a high standard of living compared to most riverine communities on the Tigre, i.e., having electricity, well-maintained paved sidewalks and small footbridges and a very orderly and tidy town square. Moreover, houses are all made of wooden planks, unlike most houses in the region that are built of lighter round wood. This is because, apart from displaying signs of good leadership and community enterprise, Libertad has a communal sawmill. Besides its direct contribution to improving local welfare through better constructed houses, the sawmill has also created new market opportunities for local households. Whereas a typical log (*troco*) would sell for around 40 Soles ($13 USD) to itinerant timber traders from Iquitos, the same log can yield 22 boards that can be sold to traders from the nearby town of Trompeteros on the Corrientes River at five Soles each, for a total of 110 Soles

($35 USD).[41] The sawmill therefore confers an added-value of 70 Soles ($22 USD) per log, minus the expenses associated with operating the sawmill.[42] The demand for sawn lumber in Trompeteros exists because people there receive a regular income from the oil company.

However, the benefits from the sawmill are highly localized[43] and demand consistently outweighs the machine's capacity, as many logs anchored to the riverbanks of Libertad await processing. Given the long wait times, households strapped for cash will often resort to selling logs to itinerant timber traders, foregoing the eventual returns from sawn lumber. Nevertheless, the contributions of the sawmill in Libertad reflect the potential for communally-managed productive assets to improve market access for communities in the Peruvian Amazon.[44]

San Regis, Río Marañón

The Marañón River, downstream from the Tigre River, is an area of intense boat traffic where all the launches from Yurimaguas, the Tigre, the Corrientes and the Alto Marañón converge. Yet despite the high frequency of boats, only a limited number of *lanchas* and *colectivos* provide transportation to Iquitos and Nauta, the others having reached their capacity, traveling directly to Iquitos at this stage. Nonetheless, every boat makes a point of stopping in San Regis, where hoards of local women await to embark and sell food to hungry passengers. Whether it is because of an opportune location, the above-average cuisine, or its historic significance – founded in 1720, it is one of the oldest settlements in Loreto – San Regis residents can derive a significant amount of income from the incidental creation of a demand for prepared foods. The high frequency of boats also gives local producers easy access to Iquitos, while neighbouring villages must settle for less frequent transport.

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[41] The calculation is based on data collected in Libertad. A typical log is 208 sq.ft. (20 inches in diameter). Logs are sold at 0.20soles per sq.ft. for a total of 41.6 soles.

[42] The mill is managed by a communal board that collects a 30% tax for maintenance and repairs.

[43] Although the mill was conceived by the regional government as a project for regional development, communities downstream cannot get their timber to Libertad, regardless of their proximity, as logs are transported by drifting them with the current. Furthermore, the nearby upstream communities that float their logs to the mill often get second priority behind Libertad logs.

[44] Other communal projects aimed at improving livelihoods exist in certain villages of Loreto, for instance, fish farms in San Jorge, on the Marañón.

In the two cases presented above, we can observe specific local conditions that engender unique opportunities for market access, beyond the influence of regional parameters such as boat traffic and transaction costs, and significantly enhance a household's ability to engage in the market. By (re)directing the focus of the research, away from the regional dynamics of the urban marketplace, toward the more localized trading realm of rural households, the transect study offered a renewed perspective on the determinants of market access.

3.5 Conclusion

The Peruvian Amazon is a region that has consistently been described in the literature as remote; an environment where trade is risky and market access is significantly restricted. Though this assessment is widely accepted, it appears to be based more on a general perception than on any concrete data. In this regard, the research conducted in this chapter conveys the first measures of what 'remoteness' really implies for rural producers in this region of the Amazon.

In the regional analysis, I examined the overarching conditions and determinants of access to urban product markets. The key variables explored were distance, frequency and cost. I found substantial differences in time to market, which greatly affects the range and value of products that can be marketed because of perishability. Moreover, significant differences in boat frequency were noted which affect the overall connectedness of rural producers and determine their degree of access to vital market information and economic opportunities. Finally, the analysis of transport costs revealed significant differences in the potential returns of trading.

Overall, it was found that although physical distance is generally considered to be a sufficiently reliable indicator of access to urban product markets, it is actually the 'thickness' of trade (represented by the frequency of boats) and the transaction costs associated with river trading, both of which vary with distance, that directly affect the accessibility of product markets. In areas with greater 'thickness' of trade, rural producers benefit from more regular and frequent contact with the market, thereby benefiting from opportunities to market their produce and better access to information than in areas with less traffic and significantly fewer trading opportunities. Similarly, as transaction costs

rise (generally with distance), net returns from trade decrease and the likelihood of worthwhile transactions declines, especially since gross returns are limited to begin with. In this way, the nature and reliability of the link between rural producers and urban markets has a significant impact on market integration and determines to what extent livelihood choices are geared toward urban markets. The regional analysis provided relevant quantitative measures that can be used to assess to what extent producers are removed from markets and information.

Findings from the regional analysis were complemented with sub-regional and local findings that were captured through a transect study. Here, I found that many localized conditions such as proximity to small rural towns, access to productive communal assets, or specific local endowments can affect market access regardless of regional trading conditions. Moreover, considering that many income and wealth disparities exist among households within a same village, as several local studies have shown (Coomes and Burt, 1997; Takasaki *et al.*, 2001; Tschakert *et al.*, 2007), it is likely that access to markets diverges within as well as between communities.

In sum, a widely diversified regional market exists in the Peruvian Amazon that, despite many physical and economic constraints, manages to reach even the most remote locales in the region. Rural peasants across the region who derive their livelihoods primarily from floodplain agriculture, shifting cultivation and forest and river extraction, all rely to a different extent on the income opportunities conferred by urban markets. However, the situation remains that product markets represent only a portion of livelihood strategies and that most households continue to rely on own-production to satisfy subsistence needs. Further, even though urban product markets may have become more accessible with improvements in transportation, the economy is still based primarily on traditional agriculture and extraction, sectors that have little potential for substantial income generation. Significant strides to broaden the livelihood choices of rural households and improve welfare in communities across the Peruvian Amazon are dependent on improving market conditions and opportunities for non-farm employment. Most importantly, this means not only improving physical access to urban product markets but also creating more diverse and accessible opportunities in labour and credit

markets. The next chapter examines the livelihood effects of labour markets in remote communities of the Alto Tigre.

CHAPTER 4. LABOUR MARKETS AND LIVELIHOODS: A COMPARATIVE STUDY OF TWO REMOTE VILLAGES OF THE ALTO TIGRE

4.1 Introduction

Increasingly, research on peasant livelihoods indicates that nonfarm income opportunities offer a 'way out' of poverty for the rural poor (Barrett *et al.*, 2001; deJanvry and Sadoulet 2001; Carter and May, 1999). Depending on how the returns from nonfarm labour are harnessed – whether they can be invested in productive assets, in education or in the trading sector – they can enable a rural household to gradually accumulate assets and significantly improve its welfare.

This chapter focuses on how people make a living in two nearby but remote villages with very different access to labour markets. The interest in these two villages rests both in their similarities and their differences, whereby similar geographic conditions (remoteness, boat access), access to product markets, natural endowments and cultural background facilitate comparison and allow me to assess the impacts on livelihoods of differential access to product and labour markets.

Specifically, I examine how peoples' livelihoods in these communities are affected by working for the oil company. I ask:

1- How do households generate cash-income in these two communities?
2- How do wage labour opportunities with the oil company affect the income-formation strategies of households?
3- Are there differences regarding the impacts of wage labour between villages?
4- What are the impacts, if any, of oil wage labour on wealth?

The chapter is divided into five sections. Section 4.2 describes conditions in the study area – the Alto Tigre region –, the activities of the local oil concession, the demographic profiles of Doce de Octubre and San Juan de Bartra, and market conditions in each village. Section 4.3 provides a description of the methods used in collecting field data and in data analysis. Section 4.4 presents the results of the study and answers the questions set forth above. Finally, Section 4.5 offers a discussion and concluding remarks.

4.2 Study Area

4.2.1 The Alto Tigre

The Alto Tigre, or Upper Tigre, corresponds to the headwaters of the Tigre River that descend from the Ecuadorian border toward the town of Intuto (Figure 4.1). Encompassing ten indigenous communities, this is a remote area of Loreto situated beyond the reach of commercial river launches from Iquitos. Whereas the population downstream from Intuto consists primarily of *mestizo* peasants (i.e., of mixed European and indigenous heritage), communities along the Alto Tigre are primarily of indigenous *Quichua* descent; communities on the nearby Corrientes River are of *Achuar* descent.

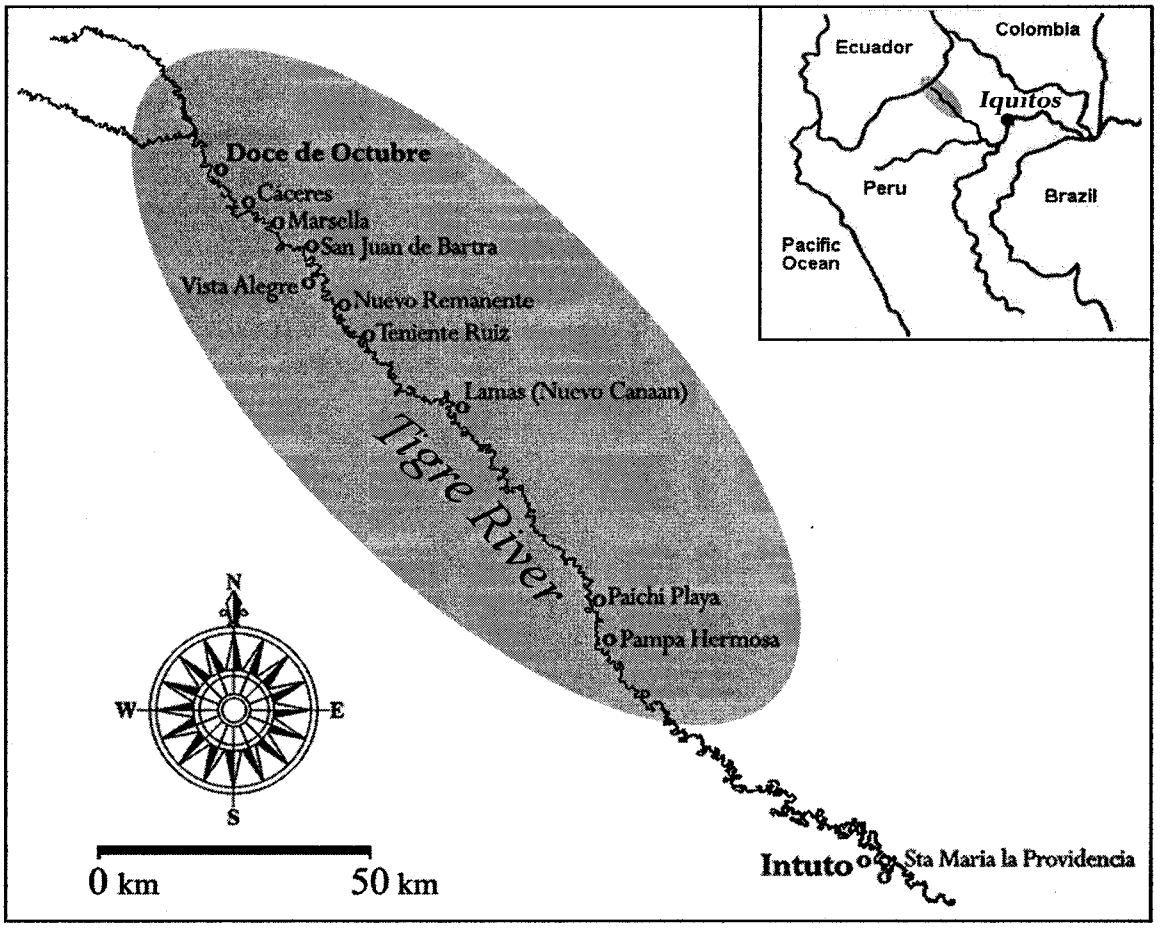

Figure 4.1 Map of the Alto Tigre region, northeastern Peru.
Source : Adapted from *Mapa político de Loreto*, IIAP (2005).

Though people in these Amerindian communities continue to speak their native *Quichua* language, most women and nearly all men and children are fluent in Spanish. Similarly, while a traditionally appointed leader (locally referred to as *Apu*) maintains a primary role in the decision-making structure of the community, each village also follows regional structures of governance.[45] External influences have increased dramatically with the onset and ensuing growth of oil exploration and extraction in the region.

Livelihood activities along the Alto Tigre consists primarily of a combination of agriculture, hunting, aquatic and forest extraction and the raising of small livestock. Shifting cultivation is practiced on upland (*altura*), high levee (*restinga*) and low levee and backslope (*bajeal*) where a range of staples and tree crops are grown (see Hiraoka 1985 for more detailed classifications). Unlike other areas in Loreto, the Tigre River does not have significant mudflats (*barreal*) and sandbars (*playa*) for agriculture. Hunting is a prominent and widespread activity, considerably more so than in the more frequented areas of Loreto where game populations have been severely depleted by over-hunting (Bodmer *et al.*, 1994; Bodmer and Lozano, 2001). Aquatic extraction and livestock complement hunting as sources of animal protein.

Although households along the Alto Tigre rely primarily on subsistence production to sustain themselves – given their remote location and relatively limited access to product markets – they still manage to generate cash income from the sale of a portion of their production to *regatones* from Iquitos or occasional itinerant traders from Intuto. Table 4.1 presents a list of the products harvested on the Alto Tigre; products marked with an asterisk are those that are also sold to merchants; the printer's dagger designates the most commonly sold products. Besides the sale of produce to *regatones*, households in certain villages engage sporadically in the timber trade with itinerant timber collectors (*madereros*). In certain villages, men may find part-time wage-labour in the oil sector as an alternative source of cash income.

Most commercial exchanges with *regatones* take the form of barter transactions, though cash is used from time to time when available. Because merchants and traders depend on the river to reach the remote communities, access is dependent on navigability.

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[45] Each village in Loreto has a Lieutenant Governor (*Teniente Governador*), appointed by the Prefect of Loreto, who represents the community in the regional government (based in Iquitos), and an elected Municipal Agent (*Agente Municipal*) representing the link with the municipal government.

In periods of low water, several rapids develop along the course of the Alto Tigre. Though the primary period of low water on the Tigre comes during June to September, flood cycles on secondary rivers such as the Tigre are not as regular as they are on the larger rivers of the Peruvian Amazon, and unexpected lows throughout the year can lead to unpredicted market isolation for considerable periods of time (up to 3 months). The precariousness of river access heightens both the importance of subsistence production and of access to alternative markets for the inhabitants of the Alto Tigre.

Table 4.1 List of agricultural and other products, Alto Tigre, Peru.

Game	Crops			Aquatic products	Forest products
*Huangana**†	Plantain*†	Tomato	*Mamey*	Various fish*	Fire wood
*Venado**†	Banana*	Avocado	*Pijuayo*	*Taricaya* (turtle)*	Thatch (roofs)
*Majas**†	Manioc	*Sachapapa*	*Macambo*	*Motelo* (tortoise)*	House wood
*Sachavaca**	Manioc meal*	Sweet potato	*Sachamangua*	*Taricaya* eggs*†	Moriche palm fruit
*Sajino**	Rice	*Zapallo*	*Shimbillo*	Caiman	*Unghurahui*
Añuje	Maize*	*Zapote*	Mango		*Umari*
Ronsoco	*Chiclayo*	Melon	Coco*	**Livestock**	*Caimito*
Monkeys*	*Frejol*	Watermelon	Orange	Chickens*†	
Birds*	Tobacco	Sugarcane	*Toronja**	Ducks*	
	Cilantro	Peanuts*	Lemon	Pigs*	
	Onion	*Guayaba*	Heart of palm*	Chicken eggs	
	Cucumber	Guava	Medicinal plants		

* products that are sold to *regatones*, † most commonly sold products

4.2.2 The impacts of oil exploration

Oil exploration began in the upper reaches of the Pastaza, Corrientes and Tigre rivers in 1971 when a concession was granted by the Peruvian government to the US-based firm Occidental Petroleum (OXY). In 1996, after decades of oil field development, the 497,027 ha concession known as *Lot 1-AB* was transferred to Pluspetrol Norte, a local subsidiary of Argentine-based Pluspetrol, which continues to manage exploration, extraction and processing activities today. The largest oil base on this lot is situated in Andoas on the Pastaza River, whereas on the Tigre River, the San Jacinto base operates near Doce de Octubre. Together these bases form the extremities of a string of operational oil concessions that span from the Pastaza to the Tigre, through the Corrientes, each connected by a well-maintained dirt road and bridges (Figure 4.2).

The growth of the oil industry in the region has had contrasting effects on local communities. On one hand, the Amerindian population of the Alto Tigre has tended to

gravitate upstream over the past decades, attracted by the prospective labour and product markets associated with the new oil concessions.[46] On the other hand, these same local communities argue that the byproducts of oil exploration, extraction and processing have severely contaminated the watershed, thereby posing immediate threats to the health of local inhabitants and the resources on which they depend.[47] In a sense, the local oil boom can be seen as a mixed blessing.

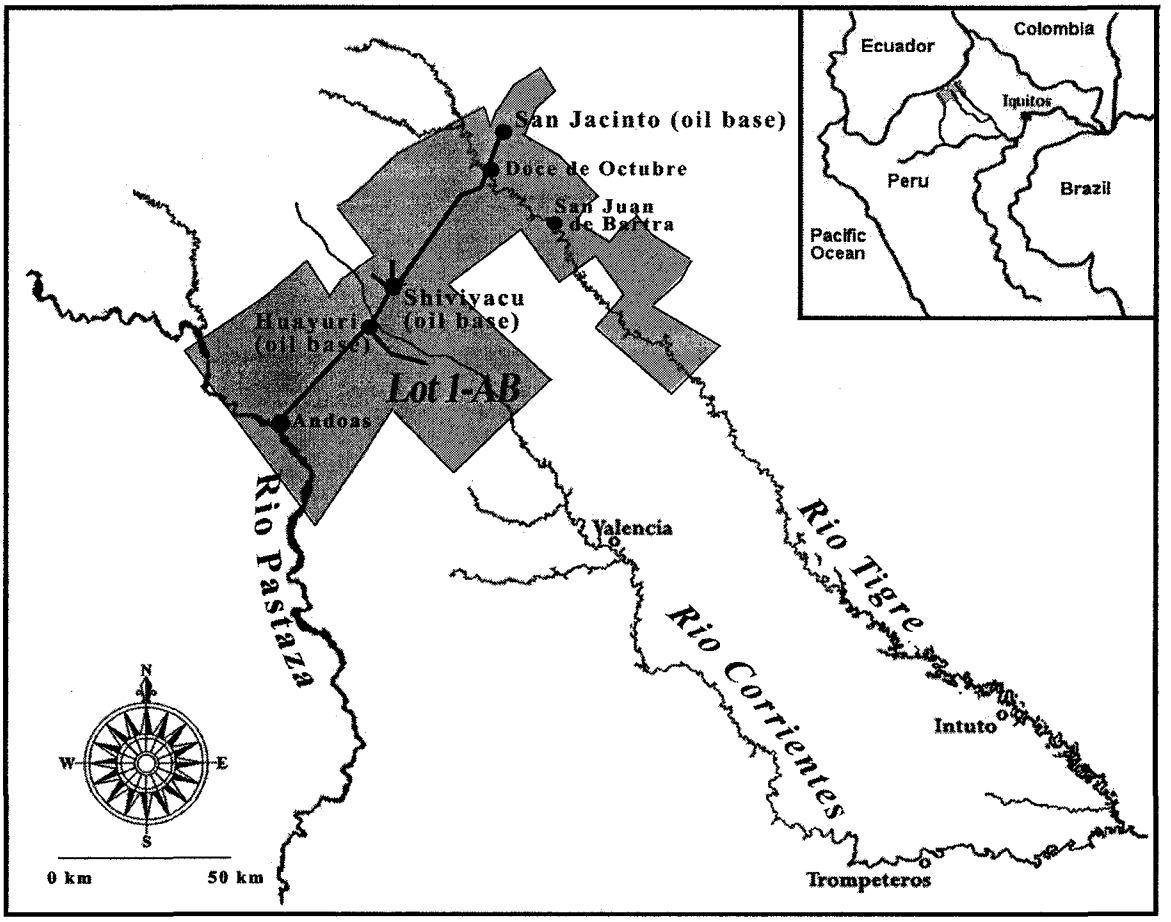


Figure 4.2 Map of Pluspetrol Lot-1AB showing the road connecting Andoas (on the Pastaza River) to San Jacinto (on the Tigre River), Peru.
Source: Adapted from *Mapa 9*, MINEM (2007).

[46] Many Amerindian villages that were once situated near Intuto have disappeared over the years as new communities began to develop further upstream. The process is still observable, as in Teniente Ruiz, where only seven households remain. The village of Pampa Hermosa is also quickly fading. Conversely, the village of Doce de Octubre continues to expand.

[47] A study released by the regional government of Loreto in May 2006 reported levels of cadmium and lead in children and teenagers that were above acceptable levels, as well as high concentrations of heavy metals and hydrocarbons in the waters of the Corrientes river basin. No studies have been conducted on the Tigre River to date, despite suspicions of contamination.

In an effort to mitigate the mounting controversies surrounding claims of negative environmental impacts (claims that the company insists reveal no causal connections to their activities), Pluspetrol instituted an Agreement (*Convenio*) with each community that is situated within the boundaries of Lot 1-AB. On the Alto Tigre, six communities are included in the Agreement; these are Doce de Octubre, Caceres, Marsella, San Juan de Bartra, Vista Alegre and Nuevo Remanente (refer to Figure 4.1).

The Agreement consists of several compensatory concessions ranging from infrastructural development to employment. Specifically, benefits include (or have included) the construction of a regional secondary school in Doce de Octubre (opened in 1999, new building constructed in 2005); access to the medical facilities at San Jacinto; the regular provision of free diesel, gasoline and oil to the communities; the provision of certain communal assets such as a 40hp outboard motor, a chainsaw, a lawnmower, a sewing machine (items that usually quickly fall into disrepair); free use of shuttle services along the private Pluspetrol road to the town of Andoas; as well as free sponsored flights to Iquitos (contingent on approval by the Social Action Office of Pluspetrol). In addition, Pluspetrol and its sub-contractors are required to hire a certain number of local workers every year. Each year, the agreement is reevaluated and communities are allowed to make new demands, although it may take several years before projects come to fruition.[48]

Although the Agreement applies to all six communities named above, the community of Doce de Octubre, given its location, has benefited disproportionately from the agreement. Doce has consistently enjoyed the bulk of infrastructural developments in the area, better access to education and transportation, better access to health services in San Jacinto, and better access to employment opportunities. In the next section, which describes the two study sites in which field research was conducted, I describe the differences as well as the similarities between the villages of Doce de Octubre and San Juan de Bartra. This description sets the stage for a comparative analysis of the influences of contrasting labour markets on rural livelihoods in the two communities.

[48] An agreement for the electrification of Doce de Octubre was signed in 2002, but work had not yet started at the time of writing.

4.3 Methods

4.3.1 Data collection

Data collection in Doce de Octubre and San Juan de Bartra was undertaken during September, 2005. The villages were selected based on a preliminary reconnaissance survey of the region conducted during August, 2005, in which the basic socioeconomic and market conditions of villages in the area were assessed through focus group discussions (Chapter 3). Fieldwork was conducted with the aid of Carlos Rengifo Upiachihua, a local research assistant from Iquitos. The two primary criteria that led to the choice of Doce de Octubre and San Juan de Bartra were: 1) their proximity and similarity with regard to cultural heritage, livelihood activities, resource endowments, access to river transport and remoteness from Iquitos; and, 2) the divergence in market opportunities in each village, most specifically the contrasting access to oil wage labour markets.

Fieldwork methods were the same for both villages and consisted of a household level socioeconomic survey (Appendix 1-C) and a semi-structured focus group discussion with village leaders (Appendix 1-D), complemented by participant observation and informal discussions with locals. Upon arrival in each community, a meeting was held with village leaders to introduce the nature and aims of the research project and to seek permission to conduct the household survey. All survey instruments and methods were examined and approved by the Research Ethics Board at McGill University (Appendix 3).

Each household survey took approximately 45 minutes to complete and was divided into four primary areas of interest. The first section was concerned with socioeconomic data, such as the demographic composition of the household, levels of education and household assets (land and non-land capital). The second section focused on sources of cash-income. The third section looked at trading habits and the last section examined local perceptions of the oil company.

Before conducting the surveys, each community was mapped and every household was assigned a number. Households were selected using convenience sampling (i.e., dependent on the presence of a respondent), given the time constraints surrounding fieldwork. In Doce de Octubre, 52 out of 73 households were surveyed (71%, n=52), while in San Juan de Bartra, 22 out of 36 households were surveyed (63%, n=22).

Interviews were conducted with both men and women, depending on availability. The majority of surveys were conducted by one researcher at a time. In order to minimize potential errors of interpretation with the questionnaire, the first five surveys in each village were conducted by the researchers together. Throughout the interviewing process, both researchers exchanged notes in order to maintain a consistent approach to interviewing.

Focus groups were conducted in each village in order to gather information about village-level characteristics, such as flood and crop cycles, the frequency and diversity of itinerant traders, and the details of the agreement with Pluspetrol, as well as to establish a reliable schedule of prices and sources of specific consumer goods (important for calculating asset wealth), as well as standard wages with each oil subcontractor. Finally, participant observation was also an important source of information, providing insight into the daily lives of local households and the challenges they face. Informal discussions with men and women, young and old, both during and apart from the survey process, were particularly helpful in opening the discussion beyond the somewhat rigid boundaries of the survey format. These exchanges not only provided much needed insight for the researcher, they also fomented a stronger relationship of trust between all parties involved and likely led to the collection of more accurate information.

4.3.2 Analysis

Data analysis was designed to identify differences between communities as well as between working and non-working subsets of households. Much of the analysis is based on income levels. Given the palpable difficulty respondents had with estimating their total production, income questions were modified in order to include only the portion of production that was marketed, excluding the portion that was consumed. Respondents had a much easier time estimating their market sales over the last year than their total production. Hence, data on income correspond to cash income and exclude subsistence income.

Data from household surveys were entered in Excel spreadsheets and crosschecked before analysis began. A codesheet was developed for the 56 variables (both qualitative and quantitative) extracted from the survey. Basic statistics were calculated using functions in Excel. ANOVA analyses were done using a custom Excel

calculator designed at the Université du Québec à Montréal (UQAM). Gini coefficients were calculated using the freeware statistics software available on the Web at www.wessa.net/co.wasp.

4.4 Results

4.4.1 Socioeconomic profiles: Doce de Octubre and San Juan de Bartra

The villages of Doce de Octubre and San Juan de Bartra were both founded shortly after the onset of oil exploration along the Alto Tigre in the 1970s, their populations having arisen primarily from the gradual dissolution of older indigenous communities in the area. The two communities share many common characteristics. The inhabitants of Doce and San Juan share a common cultural heritage and practice the same set of livelihood activities; their environmental endowments are similar, given their geographic proximity; they are both remote communities and transact with the same itinerant traders from Iquitos; and they are both signatories of the Agreement with Pluspetrol.

Table 4.2 compares the mean income portfolios in Doce de Octubre and San Juan de Bartra, distinguishing between labour income and specific sources of market income. Gini-coefficients also serve as indicators of equality within income distributions. The data presented immediately highlight certain similarities and notable differences in the way people earn their income in the two communities. The most striking difference rests in the proportion of households that receive oil-labour income, the consequences of which will be discussed below. It is important to note that these income portfolios do not include the portion of production that is used for subsistence consumption; in other words, I focus only on market production rather than on total production.[49] These data, complemented by other basic observations, are helpful in highlighting the contrasting market conditions and the overall character of both communities.

San Juan de Bartra was founded in 1981 on the eastern (left) bank of the Tigre River, approximately 200km upstream from Intuto. Situated near the now defunct Bartra

[49] The omission of subsistence production in income calculations has most likely had the effect of overemphasizing the contribution of hunting in livelihoods and underemphasizing the contribution of agriculture and other activities. Nevertheless, hunting on the Alto Tigre is a more prominent activity than in any other areas of Loreto studied to date (O.T. Coomes, pers. communication, March 2007).

oil base, its partial namesake, the village is nestled between the Tigre River and an adjacent oxbow lake which delimits its eastern frontier. The community, built around a typical soccer pitch, is composed of 27 households (122 individuals) with a mean household size of 5.55 individuals. Households are typically headed by men. The mean age of heads of household in San Juan is 37.3 years, with an average of four years of formal education.

Table 4.2 Household income portfolios in Doce and San Juan, Alto Tigre, July 2004-2005.

Income portfolio	Doce	San Juan
Mean total annual income* (S/.)	4,303 *	3,213 *
GINI – Mean total income	0.41	0.55
Mean market income (S/.)	2,439	2,448
GINI – Mean market income	0.63	0.61
Market income breakdown		
% from hunting	*64 %*	*69 %*
% from agriculture	*3 %*	*13 %*
% from livestock	*21 %*	*10 %*
% from fishing	*7 %*	*1 %*
% from turtles (and eggs)	*4 %*	*6 %*
Mean oil-labour income** (S./)	2,695 **	2,806 **
% employed by oil-labour	69 %	27 %
Total income from oil-labour (S/.)	97,024	16,837

* mean total income does not include subsistence production.
** includes only households that received income from oil-labour.

Given its relatively small size, the community exudes a marked tranquility (Figure 4.3). The range of livelihood activities is typical for the region and is geared toward both subsistence and cash-income production. At the time of the study, two *regatones* were traveling regularly to San Juan, each completing one trip per month. In addition, I encountered a small scale trader from Intuto interested in trading consumer goods for game; an itinerant timber collector from Iquitos who was evaluating the timber potential in the area; and a young *regatón* on his maiden voyage who evidently was assessing his

business potential on the Alto Tigre. For the period of July 2004 to 2005, the mean market income of households in San Juan was 2,448 Nuevo Soles ($775 USD; 1 USD = 3.16 Nuevo Soles, or Soles, or S/.), all of which was derived from sales to *regatones*.

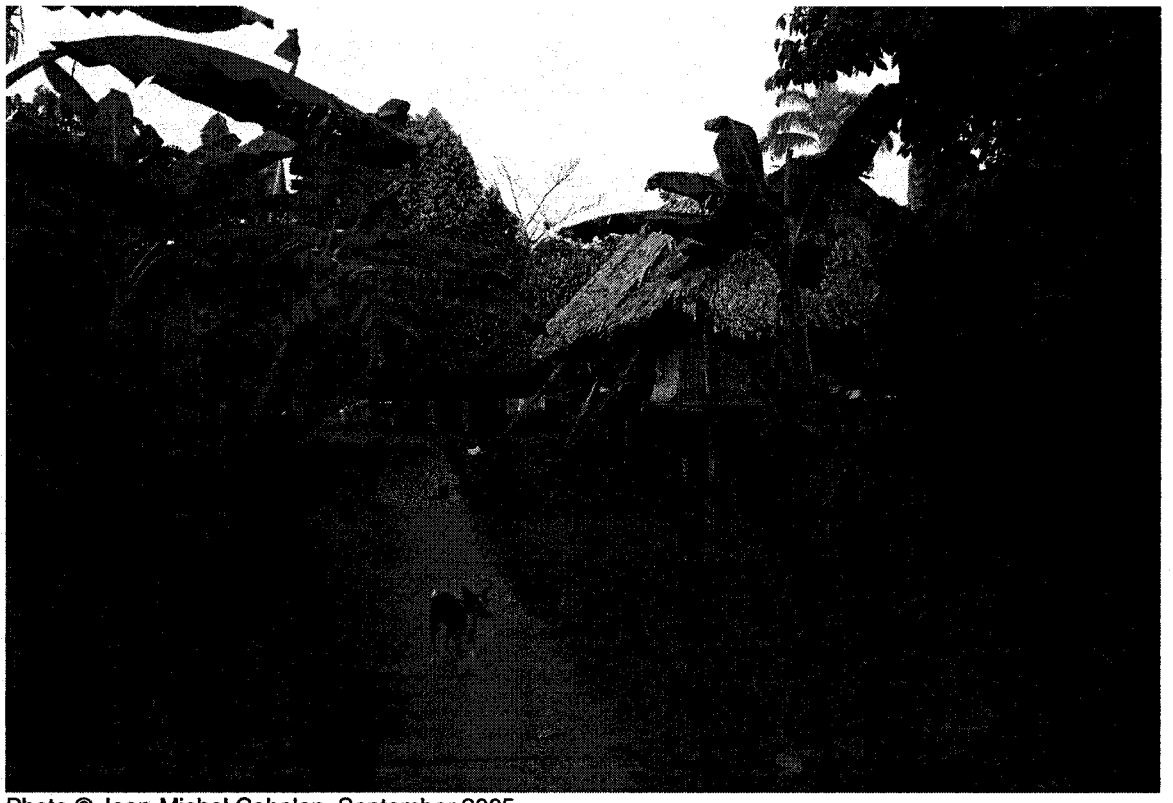


Photo © Jean-Michel Cohalan, September 2005.

Figure 4.3 House in San Juan de Bartra, Alto Tigre, Peru.

In many respects, the situation in Doce de Octubre is quite similar, despite a much larger population and clear infrastructural advantages. Situated approximately 50km upstream from San Juan, Doce de Octubre is the largest community on the Alto Tigre. It was founded in 1980 when construction of the San Jacinto oil base began and is comprised today of 73 households (306 inhabitants) scattered along both banks of the river, though most houses are situated on the eastern bank of the Tigre where the soccer pitch, the high school and the many stores (*bodegas*) are (Figures 4.4 and 4.5). Apart from the uncharacteristic infrastructural features of Doce, which seem misplaced in this remote part of the Peruvian jungle, basic household characteristics remain strikingly similar to those found in San Juan. The mean household size in Doce is 5.88, with heads

Photo © Jean-Michel Cohalan, September 2005.

Figure 4.4 Doce de Octubre near road, Alto Tigre, Peru.

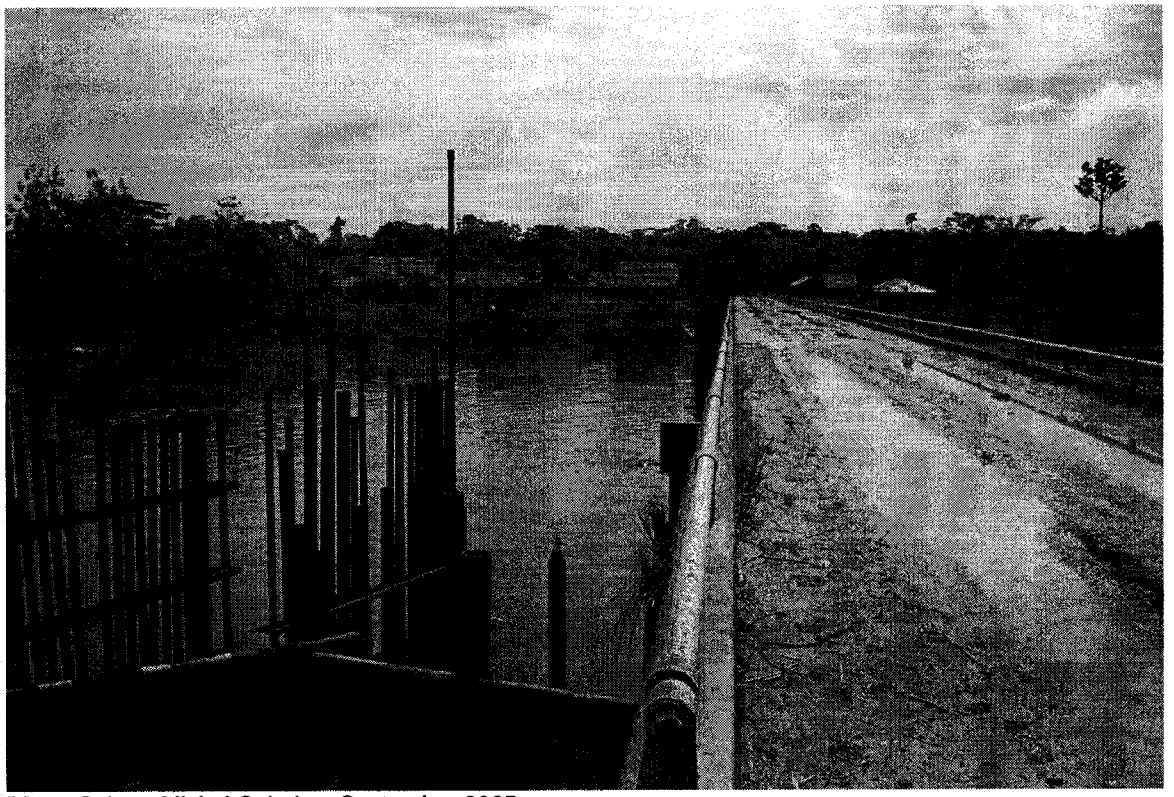


Photo © Jean-Michel Cohalan, September 2005.

Figure 4.5 Bridge crossing the Alto Tigre at Doce de Octubre, Peru.

of household having a mean age of 38.8 years, and an average of just over five years of education. Moreover, the mean market income in Doce, for the period of July 2004 to 2005, was 2,439 Soles ($772 USD) – very similar to that of San Juan.

In both communities, land is relatively abundant and held by usufruct in a system of shifting cultivation and common hunting grounds. Formal land markets are non-existent; likewise, credit markets are limited. Credit is available informally and in limited supply from itinerant traders in the form of *habilitación*, whereby consumer goods (usually soap, shotgun shells or salt) are supplied to producers in times of need in exchange for the expected delivery of produce in the near future.[50] In Doce de Octubre, only 7 out of 52 respondents (13%) said they received credit from an itinerant trader in the past year, while in San Juan, only 2 out of 22 respondents (9%) received *habilitación*.

Although both communities are serviced by the same *regatones*, producers in Doce de Octubre have considerably more varied access to product markets than do their neighbours in San Juan. First, there is a consistent, albeit modest, demand for fresh produce, especially game meat and fruit, from the nearby San Jacinto oil base. Every now and then, representatives from the base come to the village to announce their needs, usually offering substantially better prices than *regatones*. Similarly, a nearby military outpost manned by 20 to 30 soldiers serves as another alternative, again limited, outlet for produce. In the study year, total sales to the San Jacinto base and the military outpost amounted to 15,081 Soles ($4,772 USD). In addition, many households in Doce de Octubre buy and sell products from their neighbours, the cash income from labour having created a certain purchasing power in the community that is absent elsewhere on the Alto Tigre. During the study year, total sales within the community amounted to a healthy 12,598 Soles ($3,987 USD). In San Juan de Bartra, on the other hand, no local sales were reported, neither within the community, nor to nearby market alternatives.

Besides the presence of a local market, the citizens of Doce de Octubre also benefit from better access to external product markets in Andoas and Iquitos. Indeed, free transit to the town of Andoas on the Pastaza River is provided by company minibuses that travel from the San Jacinto base through Doce de Octubre. Although space is not always

[50] For a more in depth discussion of the *habilitación* system, see Kjöllerström (2002). In both villages, credit received from itinerant traders is not considered *habilitación*, even though for all intents and purposes, the system resembles the *habilitación* system described in Kjöllerström (2002).

guaranteed, this regular form of subsidized transport to a larger product market in Andoas does provide households in Doce with access to consumer goods at better prices than those offered by *regatones*. Moreover, the owners of *bodegas* in Doce rely heavily on the low prices in Andoas in order to stock their shops and remain competitive with *regatones*. In Doce, 81% of households sampled traveled at least once to Andoas during the study year, and 62% purchased goods. Though households in San Juan are also eligible for free transport, access to the road requires considerable river travel. As a result, only 36% of households in San Juan traveled to Andoas in the year, and only 23% purchased goods. Moreover, purchases in Andoas require cash, which is more abundant in Doce.

Ease of access to Andoas also facilitates travel to Iquitos by plane, which is included as another free provision in the agreement with Pluspetrol. Prices are lowest in Iquitos and travelers often make use of trips to the city to stock up on consumer goods that can be easily transported in a suitcase. For the purchase of expensive items, such as motors, televisions, or stereo equipment, for which prices tend to be highly inflated by *regatones*, it is possible to take a free flight to Iquitos and come back by boat, thereby avoiding one of the S/.80 one-way passenger fees charged by the *regatón*. In the study year, 21 members of households in Doce traveled to Iquitos (12 of them by plane), compared to only 3 in San Juan (1 of them by plane). With restricted access to Andoas, and by extension, Iquitos, households in San Juan depend more on Intuto for their external market needs. In the study year, 36% of San Juan households traveled to Intuto and 18% traded there, in comparison with 17% of Doce households having traveled to Intuto and only 6% having traded there.

Despite the clearly more diversified access to product markets in Doce, the mean market incomes in San Juan and Doce were found to be similar (S/.2,439 in Doce, S/.2,448 in San Juan). Given that in Doce, the mean income from local sales (within the community and to the oil-base and military post) was S/.534, it follows that rather than having acted as a supplemental outlet for trade, the local market alternatives available to households in Doce only served to compensate for significantly lower sales to *regatones* (S/.1,905 or $603 USD, compared to S/.2,448 or $775 USD in San Juan). Furthermore, whereas the presence of a local market with a significant amount of cash in circulation would be expected to facilitate specialization among local producers, findings show that

households specialized in hunting in Doce actually sold most of their game to *regatones*, not to their neighbours.

Differences in access to oil wage labour best typify the distinct market conditions in Doce de Octubre and San Juan de Bartra. It was found that in Doce, 69% of households sampled (36 households, n=52) were employed part-time by an oil subcontractor in the study year, while in San Juan, only 27% found work (6 households, n=22). Labour contracts typically consisted of 28 subsequent days of work. Monthly wages ranged from S/.600 ($190 USD) to S/.1400 ($443 USD) depending on the type of labour and the contracting company – substantial compared to the daily local wage (*jornal*) of 10 soles per day, 280 soles ($89 USD) per month. Though most workers were employed for one month in the year, several received more than one contract and one oil-worker in Doce was granted seven subsequent contracts.

These contrasting rates of employment affect local economies in different ways. For one, wage-labour in Doce infused S/.97,024 ($30,704 USD) into the community in the study year, compared to only S/.16,837 ($5,328 USD) in San Juan. Certainly, the greater cash flow in Doce has facilitated internal trade as well as the creation and maintenance of several local shops (*bodegas*). Furthermore, as Ellis *et al.* (2003) point out, the increased monetization of local economies creates new opportunities to construct pathways out of poverty. However, my study focuses less on the effects of oil-labour income at the community level but rather on its effects on livelihoods. The key question here is: how are livelihoods affected by whether or not one is employed by the oil company?

4.4.2 The effect of oil-labour income on cash-income portfolios

Cash-income portfolios are an insightful means of understanding the way in which households interact with product and labour markets. A comparison across each community of the cash-income portfolios of households that received oil-labour income and households that did not revealed a significant difference in the income producing strategies of oil-working households in Doce and San Juan. Figure 4.6 presents the mean annual market income and oil-labour income of oil-working and non-oil-working households in Doce and San Juan. Market income corresponds to the income derived

from the sale of produce, regardless of the buyer, whereas oil-labour income refers to the total wages earned from working for Pluspetrol.

Results from the analysis revealed that in Doce de Octubre, the mean total annual income of oil-workers (S/.4,228.64 or $1,338 USD) and of non-oil-workers (S/.4,477.88 or $1,417 USD) is almost identical. However, whereas this total consisted entirely of market income in the case of non-oil-working households (S/.4,478), the market income of oil-working households (S/.1533.53 or $485 USD) is significantly lower ($F=8.13$, $p<0.01$). Clearly, for oil-working households, oil-labour income serves as a substitute for market income. This is why analyses reveal similar total incomes, but very different market incomes.

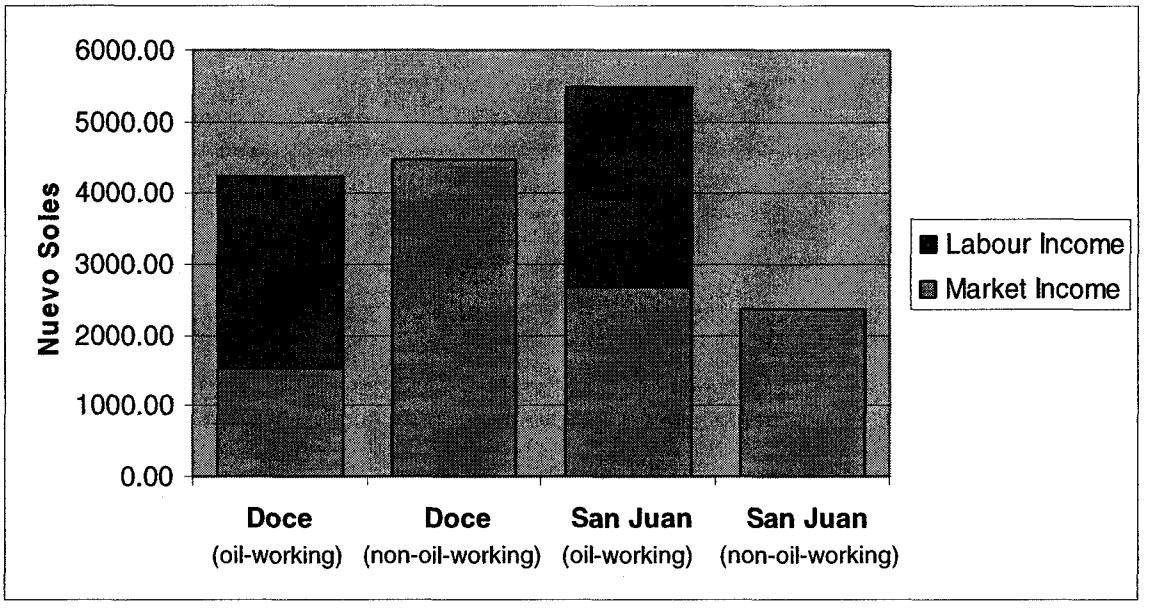


Figure 4.6 Market and oil wage-labour incomes of oil-working and non-oil-working households in Doce and San Juan, Alto Tigre, July 2004-2005.

In San Juan, the situation is essentially reversed, inasmuch as analyses reveal similar market incomes, but very different total incomes. Indeed, the mean income derived from market sales is similar between oil-working and non-oil-working households, i.e., S/.2,675.00 ($847 USD) and S/.2,363.38 ($748 USD) respectively. However, the total income of oil-working households (S/.5,481.17 or $1,735 USD) is significantly higher, i.e., more than double the mean total income of non-oil-working

households (F=3.86, p<0.1). Essentially, rather than oil-labour income acting as a substitute, as it does in Doce, in San Juan it serves as a complement to market income.

Figure 4.7 represents a more detailed depiction of the cash-income portfolios of oil-working and non-oil-working households, in which mean market income is broken down into the relative contributions of hunting, livestock, agriculture, fishing and aquatic extraction. Hunting is the largest contributor of market income. Moreover, among Doce oil-workers, oil-labour acts primarily as a substitute for hunting. Indeed, non-oil-working households in Doce derive the highest income from hunting of any group (S/.3,857.75 or $1,221 USD), whereas oil-working households in Doce derive the smallest income from hunting (S/.556.08 or $176 USD). This difference in hunting income is significant (F=12.28, p<0.01), and confirms that in substituting market income for oil-labour income, the primary market activity that is affected in Doce de Octubre is hunting.[51] In San Juan, on the other hand, hunting income is relatively equal among oil-working and non-oil-working households.

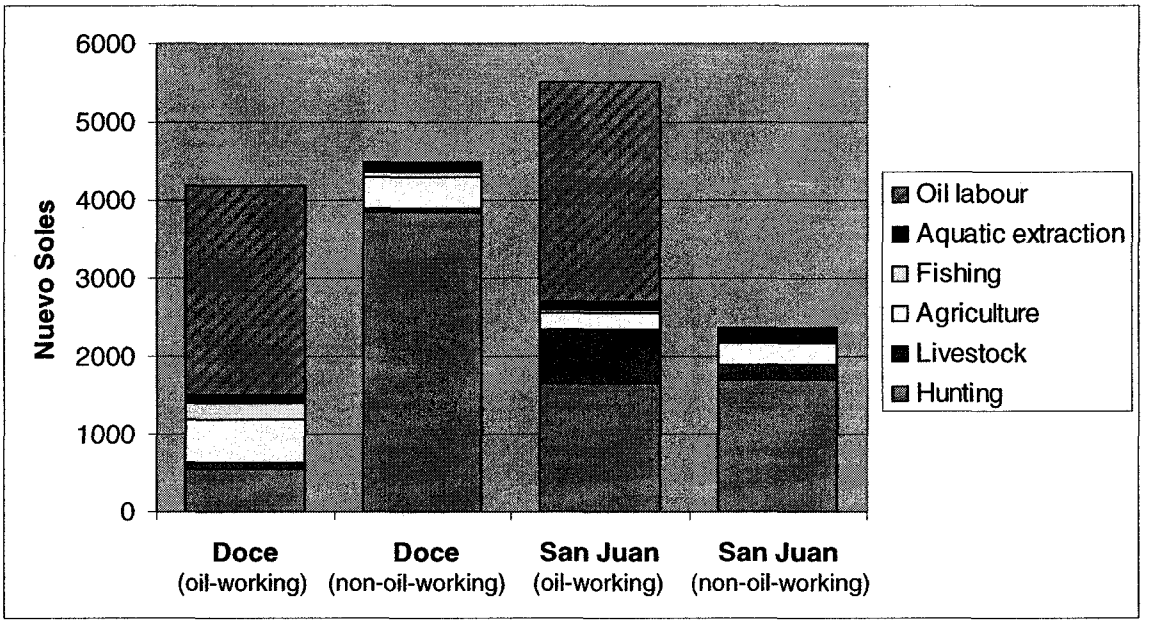


Figure 4.7 Cash-income portfolios of oil-working and non-oil-working households in San Juan and Doce, Alto Tigre, July 2004-2005.

[51] This finding corresponds with the assessment in Milner-Gulland *et al.* (2003) that wild meat is exploited more intensely in areas where few income alternatives exist.

Finally, upon comparing specifically the cash-income portfolios of oil-workers in each village, oil-workers in Doce are found to have derived significantly less income from hunting (S/.556.08 compared to S/.1668.83, $F=4.83$, $p<0.05$) and from livestock (S/.89.00 compared to S/.676.33; $F=5.66$, $p<0.05$) than did oil-workers in San Juan. Together, these findings reveal that the impact of oil-labour on the income-producing strategies of households is markedly different, depending on whether these oil-working household are situated in Doce de Octubre or in San Juan de Bartra.

4.4.3 Explaining the diverging effects of oil-labour income

The findings above all point to a clear divergence in the income strategies of oil-workers in each village, whereby oil-workers in Doce substitute their market income with oil-labour income whereas oil-workers in San Juan use their oil-labour income to complement market income. By examining the nature of oil-labour opportunities in each village as well as identifying the common characteristics of oil-working households in each community, it can better be understood why such different income strategies exist in each village.

In Doce de Octubre, oil-company work is cyclical, offered on a rotational basis, and remains more or less regular, given the proximity and access to San Jacinto and Andoas. Therefore, households with able bodied men can rely on oil-work coming their way on a regular basis. Given this regularity, households can afford to modify their production and more notably their sales portfolios in order to account for the significant and assured inflows of cash income from oil-labour.

Further, in examining the characteristics of oil-working and non-oil-working households in Doce, statistically significant differences were found in the age and education of heads of household (Table 4.3). Oil-workers in Doce are significantly younger than non-oil-workers (35.2 years compared to 47.1 years; $F=9.79$, $p<0.01$) and have on average attained a higher level of education (6.28 years, compared to 2.63 years; $F=10.16$, $p<0.01$). These findings suggest that there is a relationship in Doce between age and education and access to oil-labour. Given that oil-work is offered on a cyclical basis, it is likely that age and education are important criteria in the selection of oil-workers, whereby labour opportunities are offered within a pool of younger, able-bodied and more educated men in the community. The fact that younger oil-workers make considerably

less income from hunting ($F=12.28$, $p<0.01$) may be explained by their lack of experience and specialized skills. Similarly, older men who do not rely on oil wage-labour, and may have acquired better hunting skills over time, can depend more heavily on hunting as a form of cash income.

The situation contrasts sharply in San Juan de Bartra, where oil-labour is much less readily available and more sporadic. Indeed, focus group discussions in both villages revealed that Pluspetrol and its subcontractors only hire workers from other communities than Doce in times of exploration or increased infrastructure development and maintenance. In the study year, six men from San Juan got work; the last time anyone from San Juan was employed by an oil subcontractor was in 2001. Therefore, oil-labour opportunities are far from dependable and further opportunities are far from guaranteed. Given the irregularity of oil-labour, households who receive work can ill afford to modify their production and sales portfolios in order to account for extra income, since this extra income is only temporary. Therefore, it is more likely that households maintain their regular cash-producing activities and consider oil-labour income as a complement to regular market income.

Table 4.3 Basic characteristics of oil-working and non-oil-working households in Doce de Octubre, Alto Tigre, July 2004-2005.

	Oil-workers *(n=36)*		Non-oil-workers *(n=16)*		ANOVA
	Mean	Std dev	Mean	Std dev	F value
Household size	6.03	2.16	5.56	3.27	0.38
Age of household head	**35.17**	10.47	**47.06**	16.65	**9.79*** **
Education of head of household	**6.28**	3.78	**2.63**	3.88	**10.16*** **
Total land holding (ha)	3.32	2.64	2.87	2.58	0.33
Bajeal	0.98	1.28	1.33	1.58	0.72
Restinga	0.01	0.04	0.00	0.00	-
Altura	1.28	1.53	0.75	0.77	1.71
Purma	1.06	1.29	0.85	1.31	0.29
Total value of non-land assets (S/.)	2269.22	3589.15	2549.50	4120.42	0.06
Value of livestock	217.78	207.92	192.00	178.20	0.19
Value of productive capital	1197.97	1759.67	1507.50	2302.89	0.28
Value of non-prod. capital	853.47	2726.05	850.00	2474.33	0.00
Total annual market income (S/.)	**1533.53**	1735.11	**4477.88**	5687.21	**8.13*** **
Income from hunting	**556.08**	825.70	**3857.75**	5584.51	**12.28*** **
Total annual income (S/.)	4228.64	2491.21	4477.88	5687.21	0.05

Significance level *<0.1, **<0.05, ***<0.01

Upon examining the characteristics of oil-working households in San Juan, it was found that rather than being defined by their age and their education, oil-working households distinguished themselves more by their land holdings (Table 4.4). Oil-workers have 75% more land than non-oil-workers (3.56 ha compared to 2.03 ha; F=3.20, p<0.1) and over twice as much land in fallow (*purma*) (1.87 ha compared to 0.73 ha; F=3.82, p<0.1). These significant differences are illustrated in Figure 4.8. In addition, it was found that 50% of oil-working households in San Juan owned a motor, a valuable asset, compared to only 6% of non-oil-workers.

Table 4.4 Basic characteristics of oil-working and non-oil-working households in San Juan de Bartra, Alto Tigre, July 2004-2005.

	Oil-workers *(n=6)*		Non-oil-workers *(n=16)*		ANOVA
	Mean	St dev	Mean	St dev	F value
Household size	5.50	1.76	5.56	2.22	0.00
Age of household head	33.17	8.21	38.81	10.90	1.31
Education of head of household	5.33	2.73	3.56	2.56	2.02
Total land holding (ha)	**3.56**	2.93	**2.03**	1.18	**3.20***
Bajeal	0.26	0.35	0.68	0.92	1.16
Restinga	1.08	1.89	0.49	0.72	1.19
Altura	0.36	0.36	0.13	0.33	2.02
Purma	**1.87**	1.66	**0.73**	1.03	**3.82***
Total value of non-land assets (S/.)	1533.00	1713.17	1040.81	1631.38	0.39
Value of livestock	226.00	104.80	272.25	167.97	0.39
Value of productive capital	1207.00	1573.39	663.88	1544.86	0.53
Value of non-prod. capital	100.00	154.92	104.69	189.35	0.00
Total annual market income (S/.)	2675.00	2931.96	2363.38	3531.56	0.04
Income from hunting	1668.83	2403.16	1703.88	3185.74	0.00
Total annual income (S/.)	**5481.17**	2551.02	**2363.38**	3531.56	**3.86***

Significance level *<0.1, **<0.05, ***<0.01

These findings suggest a link, in San Juan de Bartra, between oil company employment and assets. Without an employment history of each household, it is difficult to establish a causal link between income and assets, since the two are endogenously related. However, given the specific context, wherein income from labour was acquired very recently, it is reasonable to assume that the differences in land-holdings and motor ownership are not so much the result of having received wage-labour. Rather, given the

evidence, it is more likely that labour opportunities in San Juan may have been given to households that were better off to begin with.

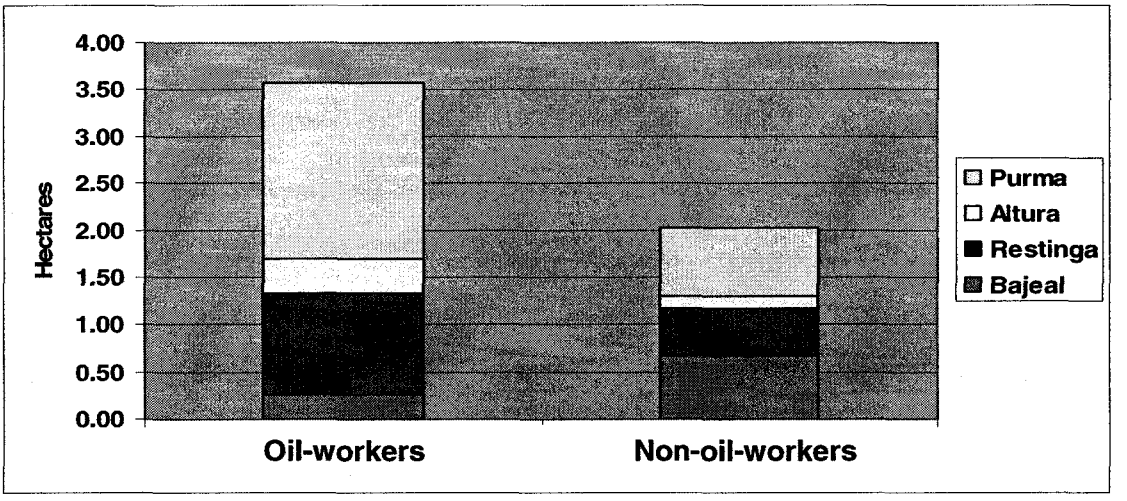


Figure 4.8 Land holdings among oil-working and non-oil-working households in San Juan de Bartra, Alto Tigre, July 2005.

In both villages, the distribution of labour opportunities is managed by the *Apu* who is informed of the employment requirements by Pluspetrol. Whereas in Doce, where oil-work is more abundant, labour opportunities are more or less evenly distributed among able-bodied men in a system of rotational employment, in San Juan, where oil-work is sporadic at best, there is no formal system of labour distribution. In this situation, it is more probable that labour would be offered to those who are closest to the *Apu*, that is, those who likely form the elite in the community. As it happens, although a kinship analysis did not reveal any close connections with labour income, most men that were offered work in the last year in San Juan all lived in neighbouring households. This finding corroborates similar observations in many villages of the Peruvian Amazon, where the most powerful and influential households tend to be located near one another (O.T. Coomes, pers. communication, March 2007).

In sum, findings reveal that given two neighbouring communities that share many common characteristics, including a common range of livelihood activities, cash-income strategies can vary significantly depending on the availability of wage-labour. Among households that were not employed by the oil company over the study period, cash-income strategies were similar across village boundaries. However, among oil-working

households, it was found that oil wage-labour had dramatically contrasting effects on the cash-income strategies of oil-working households in the study villages. Moreover, I argue that these differences are most likely based on the nature and availability of oil-labour opportunities in each village. Whereas these findings inform us of the income strategies of households, a more complete understanding of livelihoods and economic welfare in these two communities requires a bridging of the gap between income and assets.

4.4.4 Examining the links between cash-income and assets

Although cash income is needed to acquire certain assets, it is not a necessary precondition to asset accumulation. Indeed, certain assets such as land and livestock depend more on time and effort than on income, especially in the context of the Alto Tigre where land has no market exchange value and livestock can be reared sustainably. However, other types of assets, such as productive capital (shotgun, machete, fishing net, boat, motor, sewing machine) and non-productive capital (radio, television, battery, lamp)[52] can only be purchased with cash, and therefore require some form of income. Income spent on the acquisition of assets can therefore be considered as investments. Other forms of investments include sending children to school or investing in the trading sector. Conversely, income can also be spent on consumption when not invested. In the following analysis, I explore the relationship between income and assets in Doce de Octubre and San Juan de Bartra and seek to understand how households spend their income. The analysis continues to focus on the comparison between oil-working and non-oil-working households.

The analysis begins by comparing the asset endowments of oil-working and non-oil-working households in Doce and San Juan (Table 4.5). ANOVA analyses reveal little in the way of different asset wealth levels between groups; the paucity of statistically significant results may be attributable to the relatively low number of observations, since reasonably large differences are found between means. In Doce, no significant differences were found in asset holdings among oil-working and non-oil-working households. Likewise, in San Juan, significant differences were found only in total land holdings and

[52] Certain assets are more difficult to categorize. For instance, a television would normally be a non-productive asset, but if it helps draw customers to a *bodega*, it can be considered a productive asset for the shop owner.

land in fallow (*purma*), differences which as previously noted, are likely not the result of oil-labour income. In Doce de Octubre, such results would be expected insofar as oil-working and non-oil-working households have similar incomes, given the substitutive approach to labour income among working households. In San Juan however, the lack of significant differences in productive and non-productive assets is more intriguing given the substantial income surplus received by working households.

The analysis continues by comparing the distribution of income and assets among villages as well as within working and non-working groups in each community. By comparing Gini coefficients, a clearer picture of income distribution and equality within working and non-working groups can be built (Table 4.6). This analysis yields several findings.

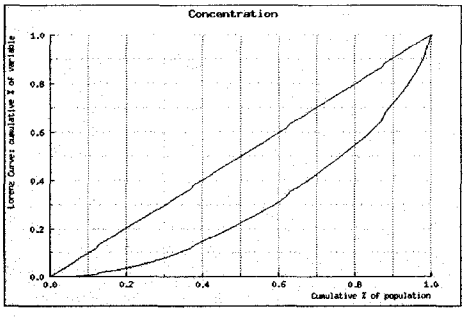
Table 4.5 Asset holdings of oil-working and non-oil-working households in Doce and San Juan, Alto Tigre, July 2005.

	Oil-workers		Non-oil-workers		ANOVA
	Mean	St dev	Mean	St dev	F value
Doce de Octubre	*(n=36)*		*(n=16)*		
Total land holding (ha)	3.32	2.64	2.87	2.58	0.33
Bajeal	0.98	1.28	1.33	1.58	0.72
Restinga	0.01	0.04	0.00	0.00	-
Altura	1.28	1.53	0.75	0.77	1.71
Purma	1.06	1.29	0.85	1.31	0.29
Total value of non-land assets	2269.22	3589.15	2549.50	4120.42	0.06
Value of livestock	217.78	207.92	192.00	178.20	0.19
Value of productive capital	1197.97	1759.67	1507.50	2302.89	0.28
Value of non-prod. capital	853.47	2726.05	850.00	2474.33	0.00
San Juan de Bartra	*(n=6)*		*(n=16)*		
Total land holding (ha)	**3.56**	2.93	**2.03**	1.18	**3.20***
Bajeal	0.26	0.35	0.68	0.92	1.16
Restinga	1.08	1.89	0.49	0.72	1.19
Altura	0.36	0.36	0.13	0.33	2.02
Purma	**1.87**	1.66	**0.73**	1.03	**3.82***
Total value of non-land assets	1533.00	1713.17	1040.81	1631.38	0.39
Value of livestock	226.00	104.80	272.25	167.97	0.39
Value of productive capital	1207.00	1573.39	663.88	1544.86	0.53
Value of non-prod. capital	100.00	154.92	104.69	189.35	0.00

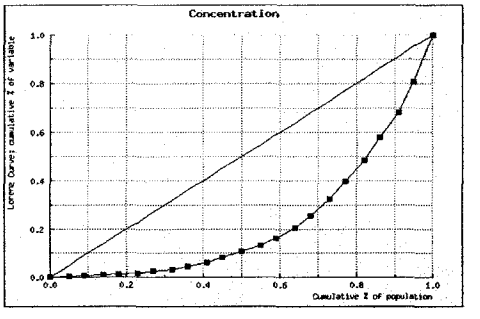
Significance level *<0.1

Table 4.6 Measures of inequality (Gini coefficients) for working groups in Doce de Octubre and San Juan de Bartra, Alto Tigre, July 2004-2005.						
	Total Income	Market Income	Land	Non-Land	Prod. Capital	Non-Prod.
Doce	.41	.63	.44	.63	.65	.86
San Juan	.55	.61	.35	.54	.66	.75
Doce (oil-workers)	.31	.56	.42	.61	.64	.86
Doce (non-oil-workers)	.59	.59	.47	.66	.66	.86
San Juan (oil-workers)	.24	.59	.36	.50	.58	.67
San Juan (non-oil-workers)	.63	.63	.31	.53	.65	.76

First, the Gini coefficients for total income in Doce and San Juan corroborate earlier findings on income substitution and complementarity. They reveal greater income equality in Doce de Octubre (Gini = 0.41) than in San Juan de Bartra (Gini = 0.55). Given that oil-working households in Doce tend to reduce their market income considerably, total incomes are more similar across the community than in San Juan where oil-working households maintain the same market income as non-oil-workers and their income from oil-labour serves to substantially boost their total income. In San Juan, one would expect more income inequality in years when certain households are employed by the oil company. Lorenz curves are helpful in visualizing the distributions of income in each village (Figure 4.9). The straight line represents a hypothetically even income distribution whereby each household enjoys an equal share of income. Many more households in San Juan share a smaller portion of total income than in Doce.



Doce de Octubre (Gini = 0.41)



San Juan de Bartra (Gini = 0.55)

Figure 4.9 Lorenz curves for total annual income in Doce de Octubre and San Juande Bartra, Alto Tigre, July 2004-2005.

Second, total income distribution is much more equal among working households, regardless of the village in which they live and the working conditions they face. It was found that working households in Doce and San Juan have total income Gini coefficients of 0.31 and 0.24 respectively, compared to the much higher coefficients for non-working households of 0.59 in Doce and 0.63 in San Juan (Figure 4.10). These findings suggest that oil-labour income has a significant equalizing effect on total income, given that non-working households in both villages display considerably greater income inequality.

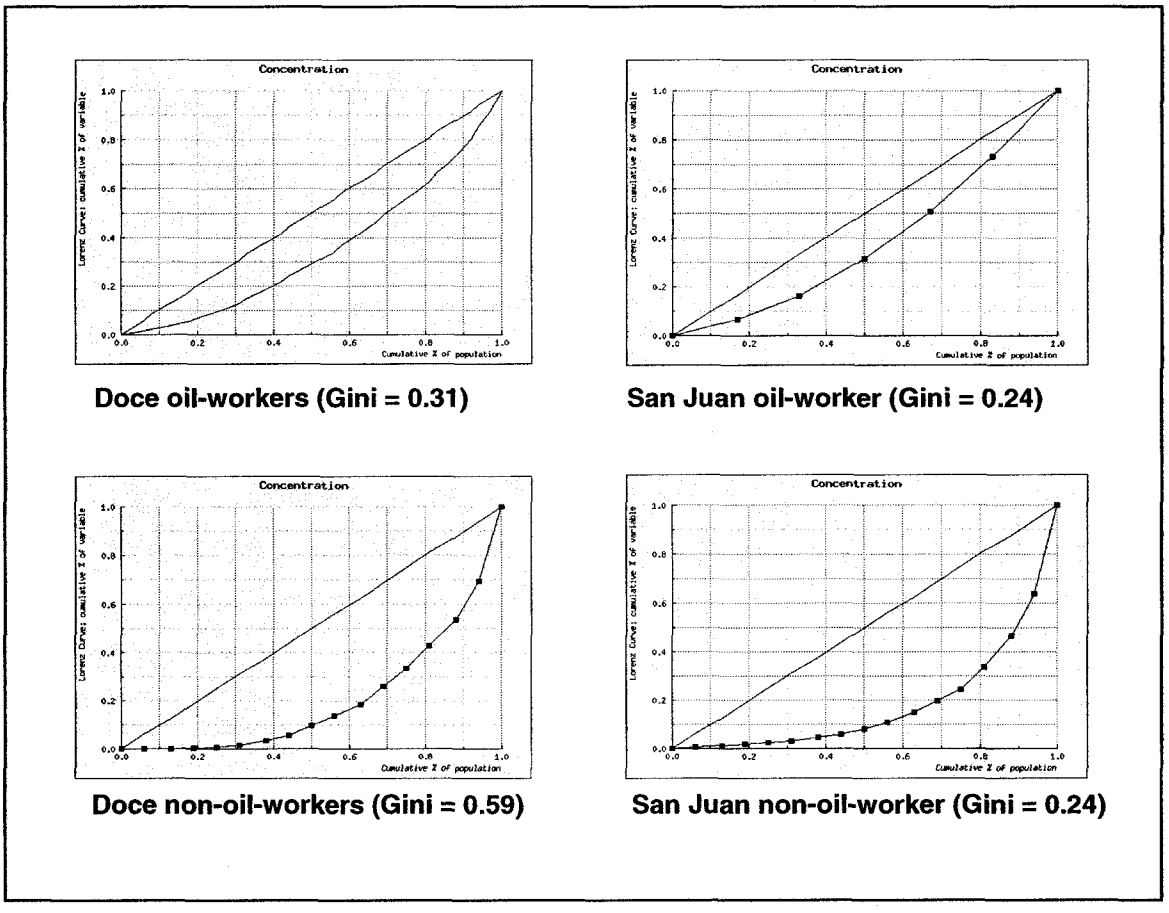


Figure 4.10 Lorenz curves for total income of oil-workers and non-oil-workers in Doce de Octubre and San Juan de Bartra, Alto Tigre, July 2004-2005.

The third finding that derives from the comparison of Gini coefficients helps to forge a link between income and assets. Table 4.6 reveals that, in general, Gini coefficients tend to increase as one moves from considering income, to land, to non-land assets, to productive assets and finally to non- productive assets. In other words, resources

tend to become more unevenly distributed as they become more specialized and more difficult to acquire. This is a logical relationship, given that a certain base income is used more or less in the same way by all households in order to acquire certain necessities (clothes, salt, oil, rice, etc). Those households that have slightly more available income would tend first to invest in livestock or in small productive assets. Subsequently, the fewer households with even more income could invest in larger, more expensive productive assets. Finally, one would expect to find the greatest inequality in non-productive assets, which for the most part are luxuries that only the richest households can afford to purchase, such as stereo equipment, a television or a generator.

Though for the most part, the distribution of income and assets in Doce and San Juan follow this trend, it is interesting to note that the trend for land does not follow suit in both villages – indeed, income portfolios in both communities show that hunting is the largest contributor to market income, and for hunting, land is not an important asset. Rather, research elsewhere in the Peruvian Amazon has shown that skills and experience are the most important assets for hunting (Coomes *et al.*, 2004). Thus, it is not surprising to observe that the distribution of land may not be so closely associated with income.[53]

While the comparative analysis of Gini coefficients served to strengthen earlier findings pertaining to the income-producing strategies of working and non-working households, as well as to identify noteworthy trends in the distribution of income and assets within the two study communities, it revealed no striking differences in households' investment portfolios. The question of how households – especially those working households in San Juan that received windfall incomes from oil-labour in the past year – spend their income remains unanswered.

A final look at alternative forms of investment revealed the following. First, in terms of investments in the trading sector, it should be noted that there are five general shops (*bodegas*) and four small household shops (*chinganas*) in Doce de Octubre. In San

[53] It is important to remind the reader that the income data in this study consist in cash-income alone and do not consider the contribution of subsistence income in the income portfolios of households. This omission is likely to overemphasize the importance of hunting for livelihoods, and likewise undervalue the contribution of agriculture. Nevertheless, it is clear that hunting forms a central part of livelihoods in the communities of the Alto Tigre; considerably more so than in the less remote areas of the Peruvian Amazon where studies have consistently found hunting to be a relatively marginal contributor to overall livelihoods (Bodmer, 2000; Bodmer and Lozano, 2001).

Juan there is only one small household shop.[54] Although income from oil-labour could serve as start-up capital for investing in a *bodega*, their absence in San Juan and their prevalence in Doce can simply be explained by the fact that *bodegas* depend not only on start-up capital but also on local demand, i.e., constant clientele – Doce is a larger community and has more oil-workers and therefore more cash – and reliable access to product markets in order to replenish supplies on a regular basis at a competitive price – Doce has unrestricted access to Andoas. In San Juan it would seem that rather than households not having sufficient capital to invest in *bodegas*, they choose not to invest in them.

Second, I looked at investments in secondary education, by considering a household's likelihood of a sending at least one child to high school. The value (a percentage) was calculated as such:

$$\% \text{ likelihood} = \frac{\text{Total \# of HHs with at least 1 child in high school}}{\text{Total \# of HHs with at least 1 child of high school age}} \times 100$$

I found that in Doce, the likelihood of sending a child to high school is 50% for non-oil-workers and 58% for oil-workers. In San Juan, the likelihood is 33% for non-oil-workers and 50% for oil-workers. The higher overall percentages in Doce reflect the fact the high school is situated within the community, thereby making it more accessible to all. Likewise, the larger difference in percentages among oil-workers and non-oil-workers in San Juan reflects the considerably greater investment required to send a child to high school in Doce, given the distance. Part of the investment of wages made by oil-working households in San Juan consists in sending their children to high school.

Finally, in terms of livestock, I did not find any significant differences in livestock holdings; however, we did find that oil-workers in San Juan derived significantly more income from livestock than did non-workers from Doce (S/.676 in San Juan, S/.89 in Doce; $F=5.66$, $p<0.05$). This finding might be explained by the fact that higher cash incomes in San Juan allowed them to liquidate some of their savings from livestock. However, this difference may also be caused by oil-working households in Doce having

[54] *Bodegas* are typically well established and sell a wide variety of commodities and food items whereas *chinganas* are more temporary and have only a few small products for sale (e.g., rice, alcohol, candies).

shifted their efforts away from livestock upon having received employment, following their income substituting strategy.

The only unequivocal finding that links income from oil-labour to assets in a direct unidirectional relationship was revealed in the observation of one of the six oil-working households in San Juan de Bartra. Members of this household traveled to Iquitos, shortly after having been employed by Pluspetrol, in order to purchase an outboard motor and a sewing machine, both very expensive productive assets. Essentially, this household used its windfall income from oil-labour to invest in costly productive assets that they would not have had the opportunity to purchase otherwise. This household suggests the investment potential brought by oil company employment in San Juan de Bartra, where labour income serves to complement regular market income. Regarding the other five oil-working households in San Juan, it is most likely too early to tell how they will invest their earnings, given that their income was acquired so recently.

4.5 Conclusion

This comparative study served to identify the range of influences that oil-labour income has on livelihoods in two remote communities of the Alto Tigre region in Peru. After analysis of socioeconomic surveys, focus group data and informal discussions in Doce de Octubre and San Juan de Bartra, I found that contrasting labour market conditions – wherein one community had substantially more regular access to oil employment than the other – can dramatically affect the income strategies of working households. Indeed, cash-income portfolios revealed that working households in Doce de Octubre have equivalent incomes to non-working households, and tend to substitute their market income for oil-labour income. Conversely, working households in San Juan display significantly higher total incomes than non-working households, as they tend to complement their market incomes with oil-labour income. These two contrasting strategies are the result of an uneven availability of employment opportunities with the oil company between the two communities.

In both communities, I found that hunting was by far the largest contributor to market income. It is highly probable, given that my assessment of income portfolios did not include subsistence production, that the relative contribution of hunting in livelihoods

is overemphasized. This is because households typically tend to sell a larger proportion of valuable produce such as game meat and consume a greater proportion of less valuable produce such as agricultural products. Nevertheless, it is clear that hunting is central to livelihoods in the Alto Tigre, as its contribution to household income is substantially higher than in any other communities studied so far in the Peruvian Amazon (cf. Bodmer and Lozano, 2001; Gram *et al.*, 2001; Coomes *et al.*, 2004).

Field research also revealed contrasting product markets between the two communities. In Doce de Octubre, households benefit from access to nearby external product markets in San Jacinto and especially Andoas. The situation in Doce is further enhanced by a marked advantage in access to key social services such as education and health care, which was not appraised in the economic analysis, but does confer important benefits to local households. Given these market advantages and a more developed local product market, it was surprising to find that the inhabitants of Doce were not significantly wealthier than those of San Juan. This finding reinforces the point that in the context of such remote areas situated so far from critical masses of buyers, a local economy can only develop so far. If there were better transportation to Iquitos and more employment in neighbouring villages, then perhaps Doce could develop as a small economic centre for nearby native communities (as Andoas has on the Pastaza River).

In San Juan, where working households have significantly higher incomes than non-working households because of their complementarity approach to oil-labour income, the absence of significant differences in asset wealth and investments was also intriguing. Given that the income from oil-labour had so recently been acquired, I concluded that it was too early to assess the investment strategies of working households. Subsequent research should explore the employment and investment histories of each household in order to deepen our understanding of the important connection between income and assets.

CHAPTER 5. SUMMARY AND CONCLUSION

This study of river trading arose to address a considerable gap in our understanding of the way in which regional market conditions influence the livelihood strategies of peasant and indigenous riverine producers in the Amazon. Indeed, it has become widely accepted in the literature on riverine livelihoods that the economic behaviour of riverine producers is dependent on a variety of local and regional ecological and socio-economic variables. In particular, differences in assets (social and physical) and capabilities (skills and knowledge) influence the ways in which households can use resources to their advantage and pursue sustainable, productive livelihoods. The importance of access to product and factors markets has been acknowledged but less studied. This study took the first steps toward dissecting the functional and economic rationale of river trading networks around the city of Iquitos and interpreting the broader influences of market access on rural livelihoods.

The specific objectives of this study were as follows:

1. to describe the structure, geographic extent, functional heterogeneity and economic logic of river trading networks in Loreto;
2. to explore the regional and sub-regional conditions that determine access to regional product markets for riverine households; and,
3. to assess the livelihood implications of contrasting access to labour markets in two highly remote rural communities on the Alto Tigre River.

5.1 Missing markets

In laying the groundwork for this assessment of the impacts of market access in the Peruvian Amazon, it was important first to address the nature and limitations of regional markets for products, labour, credit, land and insurance. Through a survey of the regional literature and theories on markets, I found that the absence or thinness of key factor markets had important consequences for rural producers in the region. Specifically, in the Peruvian Amazon, I found the following.

1. Because of low population density, land is available, acquired by usufruct, transferred along kin lines and holds no clear monetary value. I argued that thin land

markets can lead to the sub-optimal use of resources as households with a competitive advantage in other sectors of production might continue to invest in agriculture simply for the sake of using their resources evenly. Moreover, without clear valuation methods, land is an ineffective asset for securing credit as it cannot be used as collateral for loans.

2. Credit markets in the Peruvian Amazon are maintained by informal lenders through a system of interlinked credit-output contracts (Kjöllerström, 2002). As such, access to credit is contingent on access to valuable resources and loans become tied to products rather than to land. Further, the nature of credit-output contracts restricts the potential for credit to serve as a pathway to income diversification, especially in the non-farm sector.

3. Thin labour markets across the region make employment on or off-farm an unlikely alternative for generating the necessary capital to form investment, notably in the non-farm sector. Indeed, wage-labour opportunities are few and far between, and daily wages throughout the region seldom surpass 10 to 15 Soles ($3.16 to $4.75 USD). In riverine communities, where cash is scarce, households typically rely on reciprocal, communal work parties (*mingas*) for their additional labour needs.

4. Finally, I argued that the absence of insurance markets had an immediate impact on the accessibility of product markets by raising transaction costs, as producers are forced to self-insure their livelihoods. In sum, any further consideration of market access must take these realities into account, as all markets are interconnected.

5.2 The organization of river trading: high risks / high transaction costs

In my assessment of river trading in the Peruvian Amazon, I described an extensive system that is largely constructed around the central market node of Iquitos. Diverse transport routes that follow the course of rivers and tributaries extend outward from Iquitos, over hundreds of kilometers, toward the most remote rural villages in the region. Besides the boats that ensure the physical link between the core and the periphery, I identified a multiplicity of market intermediaries that ensure the transfer and transformation of produce and commodities. In addition, I identified the secondary and tertiary market hubs, embedded within the centralized system, that provide marketing alternatives to rural producers. Together, these elements form the backbone of the regional river trading system in Loreto. Their detailed description provided the necessary

basis for more in depth analysis of the rationale behind river trading and market access, in which key findings were as follows.

1. The study revealed a trading system in which exchanges are expensive. Indeed, transaction costs accrue over distance and at every point in which products change hands. However, rather than corroborating the view that intermediaries are exploitative and make trade artificially more expensive for producers, I argued that their presence is necessary in a system where distances are great, risk and uncertainty abound, and costs are high for everyone involved, not only producers. From this perspective, the role of market intermediaries is reinterpreted, from agents who exploit unsuspecting rural producers to agents who, like rural producers, are trying to make a living by identifying a viable economic niche. Their success lies in the common need to spread costs and risks which would be otherwise insurmountable. Several examples drawn from interviews in the field were offered to support this perspective.

2. Analyses indicated that access to product markets is often very expensive for rural producers. High marketing and transaction costs are partly to blame for the low net returns received by producers, but also, low net returns from trade are symptomatic of low gross returns from the produce itself. Indeed, rural producers typically market similar products of generally of low value: e.g., foodstuffs and natural building materials. Moreover, because the destination of their products is the city of Iquitos, where market incomes are low and purchasing power is limited, the value of incoming products will be all the more deflated. Thus, producers find themselves constrained to a regional product market from which they cannot obtain high returns. Not only is the actual cost of trading high in terms of transaction costs, the proportion of costs versus returns is substantial. It is important to consider both of these aspects in evaluating the true costs of river trading incurred by riverine producers and intermediaries.

5.3 Localized opportunities: labour on the Alto Tigre

Because river trading in the Peruvian Amazon is inherently such an expensive venture for everyone involved, especially as distance to market increases and transaction costs rise, improvements in market access are more likely to come from enhanced localized opportunities, rather than through changes in the regional structure of transport

and trade. To explore this perspective, my analysis shifted from a regional to a local focus. Based on a transect survey along the Tigre River, I identified two communities, San Juan de Bartra and Doce de Octubre, that benefited distinctly from differential access to employment in a nearby oil concession. Since their natural endowments and their access to river trading networks were very similar, it was possible to focus on the impacts of oil-labour on local livelihood strategies.

Key findings from a socioeconomic household survey conducted in both communities were as follows.

1. Hunting is the primary source of market income and contributes a much larger proportion of cash income than has been observed in any other areas in the Peruvian Amazon (O.T Coomes, pers. communication, March 2007). Results were skewed by the absence of data on subsistence production; nonetheless, hunting remains a very important livelihood activity for inhabitants of the Alto Tigre.

2. Many more people were employed by the oil company in Doce de Octubre (69%) than in San Juan de Bartra (27%). This is because in Doce, oil-labour is offered on a cyclical basis to all able bodied men in the community, whereas in San Juan, oil-labour is only offered when the demand for workers exceeds usual company needs.

3. Income strategies differ markedly between households that were employed with the oil company in Doce and San Juan. In Doce, I found that households that worked with Pluspetrol significantly reduced their market income, effectively substituting oil-labour income for their usual income sources. Conversely, in San Juan, oil-labour income served to complement working households' market income. The difference is explained by the fact that in Doce, employment is regular and expected and is therefore incorporated into livelihood portfolios, whereas in San Juan, where oil-labour is sporadic and unreliable, it is added on as a complement to regular livelihood portfolios.

4. Doce de Octubre has developed a small local product market because of the considerable influx of cash into the local economy, as well as inexpensive access to the town of Andoas where shopkeepers from Doce can stock up on commodities at lower prices. However, overall, market sales in Doce are not higher and standards of living do not seem superior to those in San Juan, despite better local product and labour market opportunities.

I concluded that while local opportunities in Doce provide better access to product and labour markets, its remoteness, like that of San Juan, impedes further development of its local economy. If producers in Doce were able to sell larger quantities of produce and generate higher market incomes, they would potentially strengthen their local market and perhaps even become a small local node for producers from nearby communities.

5.4 Conclusion

This study contributes to our understanding of the relationship between markets and livelihoods in the Peruvian Amazon. At the local scale, I demonstrated the relevance of specific socio-economic conditions in determining access to product and labour markets. At the regional scale, I described an extensive informal system of river-trading that, despite its many shortcomings, ensures an important link between riverine households and markets in Iquitos. In doing so, I explored both qualitatively and quantitatively the notions of the "remoteness" and "connectedness" of these rural communities. This study contributes much needed groundwork for advancing the debate on the determinants of livelihoods and resource use in riverine communities of the Peruvian Amazon. Interestingly, it is observed that with very little financial capital (if it is substituted for by social capital), small-scale rural producers as well as poor urban dwellers can build their own pathways out of poverty by engaging in the trading sector, provided they can identify a niche in which their services facilitate market access for rural producers. In an environment where factor markets are thin and access to product markets is often prohibitively expensive, development interventions to improve livelihoods will continue to fall short of expectations until we recognize the vital role and influence of river trading and intermediaries in regional and local markets.

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GLOSSARY

GENERAL

Aguardiente	Homemade cane liquor.
Apu	Traditional village leader in indigenous communities.
Balsa	Raft.
Bodega	General store selling a variety of consumer goods.
Bodeguero	Shopkeeper.
Chingana	Small in-home shop, selling only a few small items.
Colectivero	Small river boat operator
Colectivo	Small river boat.
Encomienda	Parcel; entrusting produce to a boat operator.
Flete	Cargo fee.
Habilitación	Credit-output contract.
Lancha	River launch.
Maderero	Timber collector.
Mayorista	Large-scale urban wholesaler.
Mercachifle	Itinerant merchant.
Mestizo	Of mixed indigenous and European descent.
Minga	Community-based form of reciprocal labour; communal work party.
Motonave	Motorized ship (alt. term for river launch).
Pasaje	Passenger fare.
Platanero	Plantain collector (alt. term for *regatón*).
Platano	Plantain.
Racimo	Raceme.
Regatón	Long-distance itinerant river trader.
Rematista	Small-scale urban wholesaler.
Ribereño	Riverine peasant.
Río	River.
Saco	Bag; burlap bag.
Tienda	Store; urban shop.

LAND TYPES

Altura	Upland; never flooded.
Bajeal	Low levee and back slope; flooded every year.
Barreal	Mudflat; exposed every year.
Playa	Sandbar; exposed every year.
Purma	Land in fallow.
Restinga	High levee; flooded some years.

GAME MEAT

Añuje	Agouti (*Dasyprocta fuliginosa*)
Huangana	White-lipped peccary (*Tayassu pecari*)
Majas	Paca (*Agouti Paca*)
Ronsoco	Capaybara (*Hydrocharis*)
Sachavaca	Common tapir (*Tapiris terrestris*)
Sajino	Collared peccary (*Tayassu tajacu*)
Venado	Red brocket deer (*Mazama americana*)

APPENDIX 1. SURVEY INSTRUMENTS

1.A Questions for boat operators

Guide for informal semi-structured interviews:

Boat name?

Name of boat operator?

Destination: first... last... (show on map)?

Time upstream, time downstream, time spent in port?

Boat capacity (in metric tonnes of cargo space)?

Frequency (how many trips per week/month)? Is it the same all year round?

How many boats service the same route (names)? Do they travel at the same frequency as you?

What products do you typically transport? Where does the majority of produce come from?

Passenger fares to and from each destination serviced? Are meals included? Other amenities?

Cargo fees from each destination serviced (for plantain, standard burlap bag filled with *aguaje* or manioc, rice, live chicken, tin of fish, tin of meat, other...)?

Is *encomienda* offered? What are the terms?

Do itinerant merchants conduct business aboard your boat? Do they pay a commission?

Do you buy/sell items directly from/to rural producers?

What products do you typically buy in communities? What products do you typically sell?

Do you use cash or barter? How do you determine your prices/exchange rates?

Prices of products bought in communities, at farm-gate and in Iquitos (plantain, rice, chickens, game meat, fish, other...)?

Prices of commodities sold in communities, in store and on river (processed rice, milk, kerosene, batteries, shotgun shells, other...)?

Who do you typically sell to in Iquitos? Do you have regular buyers?

How long have you been doing this route? Is this your first route? What did you do before?

How did you get started in the trading sector?

How many people work on your boat? What are each of their functions?

What are your operating costs?

1.B Focus groups: Tigre-Iquitos transect

Guide for informal focus group discussions:

Village name:

Number of households/inhabitants:

Village history:

Number of trading boats per week/month (names)?

What do you produce most here?

What is your greatest source of income?

How/where do you market your produce?

Selling prices: Plantain
Rice
Maize
Manioc
Chicken
Game meat (fresh, preserved)
Fish (fresh, preserved)
Heart of Palm

How/where do you purchase commodities?

Buying prices: Sugar
Salt
Oil
Soap
Kerosene
Batteries
Shotgun shells

What do you need most to improve conditions here?

These questions were often complemented by further discussion about specific local resources, assets, conditions and/or observations that arose in conversation.

1.C Household socioeconomic survey: Alto Tigre

ENCUESTA – ALTO TIGRE – 2005 **Fecha: ____ de setiembre del 2005**

Código de hogar: ____ **Nombre Jefe: _____**

Nombre Jefa: _____

1. HOGAR

No.	Nombre	Sexo	Edad	Relación	Situación	Educación

Nota: situación = saber donde vive la persona ahora, cuando salió, cuando murió

2. HISTORIA/MIGRACIÓN

¿Cuándo se formó su casa?

¿Cuándo vinieron vivir aquí?

¿Dónde vivían antes? ¿Porque vinieron establecerse aquí?

3. TIERRAS Y BIENES (ASSETS)

3.1 Tierras

Tipo (lugar – nombre)	*Dimensión* (m x m)	*Distancia* (tiempo)	*Edad*	*Cultivos*
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

Preguntar: Restinga (alta y baja), Barreal, Bajeal, Chacra, Altura, Frutal, Purma

3.2 Bienes (ahora)

Ítem	Cantidad	Ítem	Cantidad	Ítem	Cantidad
Escopeta		Motosierra		Batteria	
Trampa		Canoa		Gallina	
Trampa		Bote		Patos	
Trampa		Pequepeque (HP)		Perros cazadores	
Trampa		Otro motor (HP)		Ganado	
Arastradora		Fumigadora		Chancho	
Hondera		Lampara Petromax		Otra Casa	
Tarrafa		Maquina a coser		Bodega-Chingana	
Arpones		Radio			
Flechas		Televisor			
Hoz		Video/DVD			

4. INGRESOS

4.1 Producción/extracción (Del 28 de julio 2004 al 28 de julio 2005)

Producto	Producción total	Venta					
		Regatón		Empresa		Otro	
		Cantidad	Precio	Cantidad	Precio	Cantidad	Precio
Plátano							
Guineo							
Yuca							
Arroz							
Maíz							
Chiclayo							
Frejol							
Tabacco							
Cebolla							
Pepino							
Tomate							
Palta							
Chonta							
Culantro							
Sachapapa							
Camote							
Zapallo							
Sandia							
Papaya							
Mango							
Coco							
Naranja							
Limón							
Toronja							
Melón							
Maracuya							
Guayaba							
Umarí							
Guava							
Camucamu							
Mamey							
Caña							
Taperiba							
Caimito							
Aguaje							
Ungurahui							
Pijuayo							
Macambo							
Sachamangua							
Shimbillo							
Zapote							
Plantas medicinales							
Maní							
Pescado							
Paiche							
Piavas							
Taricaya							
Charapa							
Motelo							
Huev. de Taricaya							
Lagarto							
Ronsoco							
Huangana							

Producto	Producción total	Venta					
		Regatón		Empresa		Otro	
		Cantidad	Precio	Cantidad	Precio	Cantidad	Precio
Venado							
Majas							
Sachavaca							
Otorongo							
Sajino							
Ganado							
Aves							
Loros							
Pihuicho							
Monos							
Añuje							
Chanchos							
Gallinas							
Patos							
Huevo de gallina							
Huevo de Pato							
Leña							
Shebón							
Colmena							
Madera							
Cuero							

4.2 Relaciones con comerciantes

¿Cada cuanto tiempo viene un *regatón* aquí? _____

¿Siempre venden al mismo comerciante/*regatón*? **Sí** ____ **No** ____ ¿Preferencia?

¿Cuándo no hay *regatones*, cómo compran y venden producto?

¿Han pedido o/y han recibido apoyo de un comerciante en tiempo de necesidad, en los dos últimos años?

¿Les apoyan cuando tienen otras necesidades?

Historia de apoyo:

4.3 Trabajo remunerado (Del 28 de julio 2004 al 28 de julio 2005)

Persona	Dias	Tipo de Trabajo/para quién?	Jornal	Seco/comida

4.4 Apoyo de afuera (Del 28 de julio 2004 al 28 de julio 2005)

¿Han recibido apoyo este año de alguien que conocen afuera? **Sí**____ **No**____ Frecuencia:

¿Comida? ¿Dinero?

¿Otro?

4.5 Encomienda

¿Han mandado o recibido encomienda este año? **Sí** ____ **No** ____ Frecuencia:

¿Que mandan?

¿Qué reciben?

¿Cómo llega aquí? ¿Cuánto cuesta?

4.6 *Habilitación*

¿Han recibido *habilitación* este año? **Sí:** _____ **No:** _____

¿Para que?	¿De quién?	¿Qué? ¿Cuánto?

Notas:

4.7 Otras fuentes de ingresos (bodega, artesanía, venta de gasolina...)

5. CONSUMO

Producto	Donde	Precio	Producto	Donde	Precio
Jabón			Ropa		
Sal			Machete		
Azúcar			Maquina a coser		
Arroz			Peque-peque		
Pilas			Otro motor		
Cartucho					
Medicina					

6. DESPLAZAMIENTO

¿Cuántas veces fueron a **Iquitos** este año? _____

*Si no han viajado este año, ¿Hace cuanto tiempo que fueron a **Iquitos**?* _____

¿Cómo viajaron?
¿Cuánto costó?
¿Para que?
¿Compra y venta?

¿Cuántas veces fueron a **Intuto** este año? _____

*Si no han viajado este año, ¿Hace cuanto tiempo que fueron a **Intuto**?* _____

¿Cómo viajaron?
¿Cuánto costó?
¿Para que?
¿Compra y venta?

(¿Cuantas veces fueron a Doce de Octubre? - ¿Cómo viajaron? - ¿Cuánto costó? - ¿Para que?)

7. IMPACTO DE LA EMPRESA

¿Según ustedes, cómo la empresa PlusPetrol contribuye a la comunidad?

¿Según ustedes, cómo la empresa PlusPetrol le facilita a usted el acceso al mercado (venta y compra de productos)?

¿Que son los impactos negativos de la PlusPetrol, para usted?

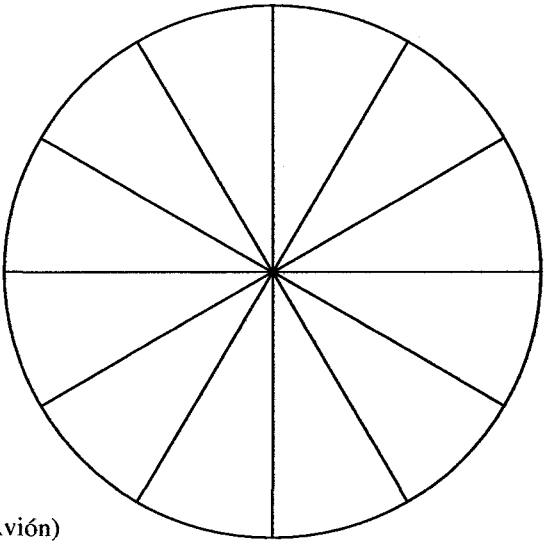
¿Según ustedes, cómo se podría mejorar el convenío con la empresa?

¿Según ustedes, cómo se podría mejorar el acceso al mercado?

1.D Focus groups: Alto Tigre

ENCUESTA DE GRUPOS – ALTO TIGRE

Comunidad: _____
Fecha: _____



- Tabla estacional de producción
  y niveles del río:

- Historia de la comunidad...
  - ¿Fundación?
  - empresas, proyectos y desarrollo

- El convenio con Pluspetrol...
  - proceso, concesiones, faltas

- Transporte
  - proceso, frecuencia
  - por Intuto, San Jacinto, Andoas, Iquitos (Avión)
  - ¿Quienes pueden viajar por avión?

- Trabajo con Pluspetrol
  - empresas subcontratistas, tipo de trabajo
  - como reciben/piden trabajo
  - frecuencia del empleo

- Botes comerciantes
  - ¿Cuales vienen?
  - ¿Que frecuencia (regulares, irregulares)?
  - Relaciones con comerciantes
  - ¿Cómo se comparan los precios a los de las bodegas, de Andoas, de Iquitos?
  - ¿En que tiempo no llegan los *regatones* aquí?
  - ¿Cuantos *regatones* diferentes han venido aquí en al año pasado?

- Ejercito, Pluspetrol (APC)
  - ¿Cómo compran productos? ¿De quién? ¿Frecuencia?

- Dónde se compran, de quién, cuánto cuestan:

Escopeta	Otro motor (HP)
Trampa	Bote
Arastradora	Maquina a coser
Hondera	Battería
Tarrafa	Gallina
Motosierra	Patos
Peque-peque (HP)	Chancho
Ropa	Machete

APPENDIX 2. TRANSECT DATA

River	Transport	Town (reaches)	Boats/week	Pasaje	Infirmary	2° school	Electricity	Telephone	Bodega	Buying prices: Rice	Sugar	Milk	Soap	Shotgun shells	Batteries	Selling prices: Plantain	Manioc	Rice	Maize	Moriche palm fruit	Heart of palm	Chicken (live)	Game meat (salted)	Fish (salted)
TIGRE RIVER	Regatones	Doce de Octubre	0.5	90	1	1	0	1	5	3	3	3	4	2.5	2.5	3.5	10	x	x	5	x	10	2.5	3
TIGRE RIVER	Regatones	Sargento	0.5	80	0	0	0	0	0	3	3	3	4	2.5	2.5	1.5	x	x	0.3	x	x	10	3	3
TIGRE RIVER	Regatones	[illegible]																						
TIGRE RIVER	Regatones	San Juan de [illegible]	0.5	80	0	0	0	0	0	3	3	3	4	3	2.5	1.5	x	x	0.35	x	x	10	3	3
TIGRE RIVER	Regatones	Vista Alegre																						
TIGRE RIVER	Regatones	Nuevo [illegible]	0.5	70	0	0	0	0	0	3	3	4	4	2.5	3	2	x	0.25	0.2	x	x	10	3	3
TIGRE RIVER	Regatones	Teniente Ruiz	0.5	70	0	0	0	0	0	3	3	3	4	3	3	1.5	x	0.4	0.4	x	x	10	3	3
TIGRE RIVER	Regatones	Nuevo Canaan	0.5	70	0	0	0	0	0	3	3	3	4	2.5	2.5	2.5	x	x	x	x	x	10	2.5	3
TIGRE RIVER	Regatones	Paichi Playa	0.5	60	1	0	0	1	0	3	3	3	4	2.5	2.5	3	x	0.2	0.3	x	x	10	2.5	3
TIGRE RIVER	Regatones	Pampa Hermosa																						
TIGRE RIVER	Regatones	28 de Julio																						
TIGRE RIVER	Lanchas to Iquitos	**INTUTO**	**2**	**40**	**1**	**1**	**1**	**1**	**8**	**2**	**2**	**2.5**	**3**	**2**	**2**	2.5	5	x	0.5	5	0.5	15	2.5	3.5
TIGRE RIVER	Lanchas to Iquitos	Sta Maria de Providencia	2	40	0	0	0	0	0	2.5	2.5	2.5	3.5	2	2	2.5	x	x	0.45	x	x	12	2.5	4
TIGRE RIVER	Lanchas to Iquitos	Sta Elena					1																	
TIGRE RIVER	Lanchas to Iquitos	Nuevo Jeruzalén																						
TIGRE RIVER	Lanchas to Iquitos	Belén	2	35	0	0	1	0	1	2.5	3	3	3	2	2	1.5	x	x	x	x	x	10	2	3
TIGRE RIVER	Lanchas to Iquitos	***Queb. Pavayacu***																						
TIGRE RIVER	Lanchas to Iquitos	*Santa Fe*																						
TIGRE RIVER	Lanchas to Iquitos	*Nuevo Triunfo*																						
TIGRE RIVER	Lanchas to Iquitos	*25 de diciembre*																						
TIGRE RIVER	Lanchas to Iquitos	*S.Juan de Pavayacy*																						
TIGRE RIVER	Lanchas to Iquitos	***Boca del Corrientes***																						
TIGRE RIVER	Lanchas to Iquitos	Sgt. Lores																						
TIGRE RIVER	Lanchas to Iquitos	San Andrés	4	35	0	0	1	0	1	2.5	2.5	3	3	2	2	2.25	7	0.4	0.5	x	x	12	2	3
TIGRE RIVER	Lanchas to Iquitos	Berlín																						
TIGRE RIVER	Lanchas to Iquitos	Libertad	4	25	1	1	1	1	2	2	3	2.5	3	2	2	2.5	10	0.4	0.4		x	12	2	3
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	7 de Marzo	*4*	*25*	*0*	*0*	*0*	*0*	*0*	*2.5*	*3*	*x*	*3*	*x*	*2*	*2.5*	*12*	*0.45*	*0.4*		*x*	*12*	*2.5*	*4*
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	[illegible]	4	25	0	0	1	0	1	x	3	3	3	2	2	3	12	0.5	0.4	epoca	x	x	2	x
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	San Jorge																						
TIGRE RIVER	Lanchas to Iquitos	Nuevo Paraíso																						
TIGRE RIVER	Lanchas to Iquitos	Santa Cruz																						
TIGRE RIVER	Lanchas to Iquitos	[illegible]	4	25	0	0	0	0	0	2.5	3	x	3	x	2	2.5	12	0.5	0.4		x	10	2	3
TIGRE RIVER	Lanchas to Iquitos	Las Malvinas																						
TIGRE RIVER	Lanchas to Iquitos	Bellavista																						
TIGRE RIVER	Lanchas to Iquitos	[illegible]																						
TIGRE RIVER	Lanchas to Iquitos	Monteverde																						
TIGRE RIVER	Lanchas to Iquitos	Nueva York	4	20	0	0	1	1	1	2.5	3	2.5	3	2	2	3	12	0.3	0.4	5	1	10	2	3
MARANON RIVER	Lanchas to Iquitos	**MIRAFLORES**	21	10	1	0	1	1	1	1.7	1.8	2	2.5	1.5	1.5	2.5	12	0.4	0.4	10	1	12	2	5
MARANON RIVER	Colectivos to Nauta	Puerto Orlando																						
MARANON RIVER	Colectivos to Nauta	Nuevo Miraflores																						
MARANON RIVER	Colectivos to Nauta	Solterito																						
MARANON RIVER	Colectivos to Nauta	*Palisadas*	*3*	*5*	*1*	*0*	*1*	*0*	*1*	*1.7*	*1.8*	*2*	*2.5*	*1.5*	*1.5*	*3*	*12*	*0.3*	*0.4*	*10*	*1*	*12*	*1*	*3*
MARANON RIVER	Colectivos to Nauta	Pampa Caña																						
MARANON RIVER	Colectivos to Nauta	Monte Alto																						
MARANON RIVER	Colectivos to Nauta	San Regis	21	5	1	1	1	1	6	1.7	1.8	2	2.5	1.5	1.5	2.5	12	0.35	0.4	10	1	12	2.5	2.5
MARANON RIVER	Colectivos to Nauta	San Jacinto																						
MARANON RIVER	Colectivos to Nauta	[illegible]																						
MARANON RIVER	Colectivos to Nauta	Gran Punta																						
MARANON RIVER	Colectivos to Nauta	[illegible]																						
MARANON RIVER	Colectivos to Nauta	San Pedro (1° zona)																						
MARANON RIVER	Colectivos to Nauta	San Pedro (2° zona)	4	5	0	0	1	0	1	1.7	1.8	2	2.5	1.5	1.5	3	12	0.4	0.4	10	1	12	x	3
MARANON RIVER	Colectivos to Nauta	[illegible]																						
MARANON RIVER	Colectivos to Nauta	Malvinas																						
MARANON RIVER	Colectivos to Nauta	San Isidro																						
MARANON RIVER	Colectivos to Nauta	[illegible]	5	3	0	0	0	0	1	1.7	1.8	2	2.5	1.5	1.5	2	12	0.4	0.45	10	1	12	x	3
MARANON RIVER	Colectivos to Nauta	Santa Fe																						
MARANON RIVER	Colectivos to Nauta	Jose Olaya																						
MARANON RIVER	Colectivos to Nauta	San Jorge	6	2	1	1	1	1	4	1.7	1.8	2	2.5	1.5	1.5	3.5	12	0.35	0.4	10	1	12	2.5	3
MARANON RIVER	Colectivos to Nauta	9 de Octubre																						
MARANON RIVER	Colectivos to Nauta	Florida																						
MARANON RIVER	Colectivos to Nauta	San Antonio																						
MARANON RIVER	Colectivos to Nauta	San José de [illegible]																						
MARANON RIVER	Colectivos to Nauta	Tupac Amaru																						
MARANON RIVER	Colectivos to Nauta	**NAUTA**	**x**	**x**	**1**	**1**	**1**	**1**	**x**	**1.7**	**1.8**	**2**	**2.5**	**1.5**	**1.5**	2	x	0.4	0.4	12	1	12	x	x
MARANON RIVER	Colectivos to Nauta	Santa Rosa																						
MARANON RIVER	Colectivos to Nauta	Santa Cruz																						
MARANON RIVER	Colectivos to Nauta	[illegible]																						
MARANON RIVER	Colectivos to Nauta	[illegible]																						
MARANON RIVER	Colectivos to Nauta	San Francisco																						
AMAZON RIVER	Colectivos to Nauta	[illegible]	6	1	1	0	1	1	4	1.7	1.8	2	2.5	1.5	1.5	1.5	12	0.4	0.4	12	1	12	x	4
AMAZON RIVER	Colectivos to Nauta	[illegible]																						
AMAZON RIVER	Colectivos to Nauta	Santo Domingo																						
AMAZON RIVER	Colectivos to Iquitos	San Juan Puritania																						
AMAZON RIVER	Colectivos to Iquitos	1 de Mayo																						
AMAZON RIVER	Colectivos to Iquitos	**S. Joaquin de Omaguas**	6	6	1	1	1	1	4	1.5	1.6	1	2	1.5	1	2.5	12	0.4	0.35	12	1	12	x	3.5
AMAZON RIVER	Colectivos to Iquitos	San Pedro																						
AMAZON RIVER	Colectivos to Iquitos	Porvenir (1° zona)																						
AMAZON RIVER	Colectivos to Iquitos	Porvenir (2° zona)																						
AMAZON RIVER	Colectivos to Iquitos	Paucarpata																						
AMAZON RIVER	Colectivos to Iquitos	Justicia	6	5	0	0	0	0	0	1.5	1.6	1	2	1.5	1	3	12	0.4	0.4	12	1	12	x	3
AMAZON RIVER	Colectivos to Iquitos	8 de Mayo																						
AMAZON RIVER	Colectivos to Iquitos	Trujillo																						
AMAZON RIVER	Colectivos to Iquitos	Centro America	6	5	0	0	0	0	0	1.5	1.6	1	2	1.5	1	4	12	0.4	0.35	12	1	12	x	2.5
AMAZON RIVER	Colectivos to Iquitos	Tapira (1° zona)																						
AMAZON RIVER	Colectivos to Iquitos	Tapira (2° zona)																						
AMAZON RIVER	Colectivos to Iquitos	San Jorge																						
AMAZON RIVER	Colectivos to Iquitos	Santa Ana	12	5	0	0	1	0	2	1.5	1.6	1	2	1.5	1	3	12	0.4	0.45	12	1	12	x	2.5
AMAZON RIVER	Colectivos to Iquitos	Tamshiyacu	12	5	1	1	1	1	x	1.5	1.6	1	2	1.5	1	3	12	0.4	0.4	12	1	12	x	2.5
AMAZON RIVER	Colectivos to Iquitos	Gran Perú																						
AMAZON RIVER	Colectivos to Iquitos	Panguana (1° zona)																						
AMAZON RIVER	Colectivos to Iquitos	Panguana (2° zona)																						
AMAZON RIVER	Colectivos to Iquitos	Aucayo	18	4	0	0	1	0	2	1.5	1.6	1	2	1.5	1	3	12	0.4	0.4	12	1	12	x	3
AMAZON RIVER	Colectivos to Iquitos	Gallito																						
AMAZON RIVER	Colectivos to Iquitos	Lupuna																						
AMAZON RIVER	Colectivos to Iquitos	Cañaveral																						
AMAZON RIVER	Colectivos to Iquitos	Padre Isla																						
AMAZON RIVER	Colectivos to Iquitos	**IQUITOS**	x	x	x	x	x	x	x	**1.5**	**1.6**	**1**	**2**	**1.5**	**1**	**3.5**	**12**	**0.4**	**0.4**	**12**	**1**	**12**	**3**	**3**