

INDIGENOUS MOBILIZATION AND MULTI-LOCAL LIVELIHOOD STRATEGIES IN  
THE MIDDLE RIO NEGRO, NORTHWESTERN BRAZILIAN AMAZON

By

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To my mom and Alfredo, always encouraging me to go farther

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By

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This dissertation investigated how spatial mobility and increased rural-urban relations affect indigenous community political mobilization and livelihood strategies at different scales in the Brazilian Amazon. I focus on the municipality of Barcelos, in the middle Rio Negro area, Amazonas state. There, spatial mobility is a key factor behind indigenous political mobilization, livelihood strategies and ties to urban areas. Mobility of indigenous leaders helps to account for the formation of new regional and local indigenous political networks. Through association offices in town, rural communities were in turn linked to the regional indigenous network. The changing urban–rural relationships also presented new opportunities and challenges for resource management. The poor delimitation of indigenous rights to terrestrial and aquatic resources led to conflicts among diverse user groups. Rural–urban connections helped indigenous peoples to mobilize in order to secure official protection of their traditional fishing territories. Political mobilization thus contributed to a more democratic process of securing tenure rights to support natural resource management. At the household level, rural-urban circulation has become very important to indigenous households, who now spend much of their time away from their primary homes. Circulation to the town is

particularly prevalent, for multiple purposes, while rural circulation is more related to the collection of natural resources and social activities. Circulation is not uniform among households, as there are socioeconomic differences tied to livelihoods. In particular, high-income households circulate more than low-income households, to both rural and urban areas. However, relatively low and high-wealth households have the same levels of circulation. These findings suggest that circulation is related to income opportunities available at a given time. Circulation rarely differed among households differentiated by whether they practiced a particular livelihood activity. Circulation thus reflects the diverse portfolio of household livelihood activities, rather than specific activities. The overall results suggest that mobility is a central element of indigenous livelihood strategies. The capacity to be mobile can provide community and household access to diverse resources for political mobilization to secure tenure rights, as well as access to urban amenities, all of which support their livelihoods.

## CHAPTER 1 INTRODUCTION

During the last two decades, the Amazon has experienced a process of urbanization alongside the official recognition of indigenous lands and protected areas in rural forests. The second phenomenon reflects collective efforts by traditional rural communities to have their territorial rights acknowledged and to have alternative forms of development based on their culture (Hall 1997; Little 2002a; Almeida 2004; Schwartzman and Zimmerman 2005). But because there is a lack of services and economic opportunities in rural areas, there is also a proliferation of examples of intensified rural-urban interactions as a strategy to diversify livelihood options and to access urban amenities (Padoch et al. 2008; Pinedo-Vasquez and Padoch 2009; Brondizio 2011). This is not merely an Amazonian trend; rural-urban linkages are also strengthening in many other regions worldwide (De Haan and Zoomers, 2005; De Haas 2007; Thieme 2008; Tacoli and Mabala 2010; Brandao and Zoomers 2010; Elmhirst and Resurreccion 2012).

Indigenous peoples have historically moved around in large rural territories defined in part by political and economic factors (Alexiades 2009; Pinedo-Vasquez and Padoch 2009) and in part by seasonality (Winklerprins 2002a). The demarcation of legal territories for some groups has in turn been strategic for purposes of securing traditional land claims, ensuring access to natural resources and supporting social reproduction. Indigenous territories are considered part of a larger strategy of rainforest conservation (Nepstad et al. 2006). There are several studies in the Amazon that focus on how traditional and indigenous people have struggled for rural territorial rights (Cunha and Almeida 2000; Almeida 2004).

However, there has been rather less attention to the role of rural-urban migration and rural-urban interactions in influencing social mobilization as a means of pursuing territorial rights and other political goals (McSweeney and Jokisch 2007). Indigenous peoples have realized that administrative authority resides in state offices in urban areas, making them a focus of social mobilization for territorial rights and so forth. That in turn has led indigenous groups to invest resources in rural-urban circulation in order to increase their presence in urban areas and thus their access to state resources and services. This is instrumental for advancing tenure claims as well as securing social benefits. Hence rural-urban circulation among indigenous groups as related to social mobilization becomes a priority research topic for understanding their political priorities and their ability to access state services.

Another aspect of rural-urban interactions that is not well understood concerns the influence of urbanization on rural livelihoods, especially those of indigenous peoples. Even in cases where indigenous territories are already recognized, they may not provide sufficient livelihood options for rural communities and families. This has made rural-urban circulation among indigenous peoples an important topic for understanding their livelihood strategies. At least for indigenous groups that do not seek isolation, active engagement with urban economies is advantageous for indigenous peoples who otherwise may have limited livelihood options in their rural communities. Urban areas not only present opportunities to access state benefits, they also encompass wage labor markets, markets for products extracted from rural resource sites, educational opportunities, and more. All such considerations can factor into livelihood strategies as households must make decisions about the allocation of human

and capital resources for the sake of social reproduction. The question then concerns the decisions which indigenous peoples actually make to engage urban economies.

This dissertation investigates how the intensification of rural-urban relations have been affecting indigenous community identities, political organization and livelihood options on different scales in Brazilian Amazon. Indigenous movements are expanding their regional networks, incorporating more communities, which makes communication and circulation ever more important for coordination. Rural communities are engaging indigenous movements, which are increasingly based in urban areas, where they have greater access to state resources and other advantages when looking for key resources in the pursuit of their various goals. At the local scale, via rural-urban circulation, households can expand their livelihood options beyond rural agriculture and extractivism, though some households may have greater capacity to visit urban areas and thus take advantage of urban amenities and opportunities.

### **Background**

According to the United Nations, the majority of the world's population will be living in cities in 2030 (United Nations 2006). Developing countries are responsible for most contemporary urban expansion, but patterns of urbanization vary in different regions (Montgomery et al. 2008). While most of Latin America is already urbanized, many African and Asian countries still have a large rural population, but also increasing urbanization rates (Martine et al. 2008).

Definitions of what is urban and what is rural vary, representing challenges for demographers and other scholars to develop comparative studies. Most countries have their own definitions of what is urban, with rural usually being a residual category (Tacoli 2006:4). A diversity of administrative, economic, demographic and political factors

influence definitions of urban areas (Montgomery et al. 2008). Some general criteria are: population size, population density, types of economic activities, administrative boundaries, and political status (Cohen 2006; Tacoli 2006). However, even when countries use the same criterion, for example population size, the threshold could vary from 2,000 people in one country and 20,000 in other. To define urban areas by their physical boundaries is also problematic, especially in very large urban centers where population estimates may change drastically depending on how administrative limits are set (Cohen 2006; Montgomery et al. 2008). Finally, the increasing complexity and interdependency between rural and urban areas challenges the rural/ urban dichotomy (Champion and Hugo 2004; Tacoli 1998 2006).

A more complex and spatialized perspective is provided by studies featuring rural-urban linkages (Tacoli 2006). These linkages are interactions across space expressed as flows of goods, people, information, and resources; and across sectors, such as agriculture, manufacturing, and services (Tacoli 1998; Tacoli 2006; De Haan and Zoomers 2005). These perspectives challenge the assumption of a simple rural-urban dichotomy as sufficient for understanding how people in developing countries compose their livelihoods across space.

An unequal spatial distribution of resources is prevalent between rural and urban areas in developing countries. While rural livelihoods tend to rely on natural capital, urban areas provide more labor market options. Infrastructure and services tend to be concentrated in urban areas, but housing is easier to access in rural zones. Rural-urban linkages are becoming important since rural households are relying more on urban incomes, but also many poor urban households depend on rural resources and rural

reciprocity networks (Satterthwaite and Owen 2006; Greiner 2011). Some authors suggest treating “rural-urban areas” as a continuum space instead of separate categories (Tacoli 1998; Satterthwaite and Tacoli 2002; Satterthwaite and Owen 2006). This is especially relevant when studying small urban centers, peri-urban areas, and large rural villages where boundaries between town and countryside are difficult to define (Satterthwaite and Owen 2006).

Livelihood approaches provide a flexible and complex view of mobility and migration in development studies (McDowell and De Haan 1997; De Haan 1999). Mobility is recognized as part of complex livelihood strategies (Ellis 2003). Migration and other forms of mobility are practices that may allow access to resources that are spread spatially between different areas (Tacoli and Mabala 2010). Through mobility, households can diversify their livelihood activities, and thus the resources to which they have access, not only to maximize income, but also to minimize risk, as by spreading time invested in income sources across space (Stark and Levhari 1982; Stark 1991). Temporary, circular or long term migration are strategies that can minimize risks, to cope with crisis and to accumulate assets (Ellis 2000). However, mobility as an element of other livelihood strategies, is not only economic, but also embedded and mediated by historical and social relationships (Ellis 2003). Mobility can also serve to maintain social ties or respond to cultural expectations based on kin networks and cultural identity (Alexiades and Peluso 2015). Of course, such mobility can also support social capital, which in turn can undergird livelihoods as well as political participation.

### **Theoretical Framework and Research Questions**

This research is inspired by the “capitals and capabilities” framework for sustainable livelihoods developed by Bebbington (1999). In that framework, access to

resources from different spheres - market, state, civil society - is considered a key asset for rural communities and households. "Access" is defined here as the "ability to derive benefits from things" (Ribot and Peluso 2003 153), which goes beyond property and rights. Access is also the ability of household and community to engage with other social actors in order to procure key resources. "Resources" in this framework are defined as various capitals that serve as inputs and outputs of livelihood strategies. Capitals are resources that can be natural, social, institutional, financial, etc. In all cases, capitals give households capabilities and make livelihoods viable, sustainable and meaningful (Bebbington 1999).

Particularly important in questions of access and capitals in sparsely populated areas such as the Amazon is the construction of social capital across scales (Bebbington 1999). Social capital is defined as "norms and networks that enable people to act collectively" (Woolcock and Narayan 2000 226) and it is crucial to (re)negotiate the rules at play in market, state and civil society spheres, and consequently to be able to claim, defend, transform and benefit from resources (Bebbington 1999).

In the case of relatively less powerful groups such indigenous peoples, political mobilization through social movements becomes an important collective strategy to access and defend their rights in distinct spheres (Ramos 1998; Albert 2005; Yashar 2005). Indigenous peoples increasingly invoke their distinct cultural identities and draw on complex kin networks and shared challenges to collectively mobilize in order to demand key resources such as territorial rights and state benefits. Hence social capital via kin networks, and cultural capital via indigenous identity, constitute important resources on which indigenous peoples mobilize to pursue other resources, including

land rights (natural capital) and state services. Crucial in such strategies, given the location of traditional indigenous territories in rural areas, is mobility that provides access to state institutions based in urban centers.

Migration and mobility constitute both a component of livelihood strategies as well as a means of political mobilization. Consequently, mobility brings the potential to open access to key resources among indigenous groups. Rural-urban circulation may open opportunities for livelihood options and even political mobilization, but may also create tensions regarding collective and individual rights over resources and territorial boundaries (Newing 2009). On the one hand, there is rural “territorialization” through the recognition of collective land and natural resources rights; on the other hand, there is a “de-territorialization” through urban migration and multi-local livelihood strategies (Mcsweeney and Jokisch 2007). Mobility among rural and urban areas opens opportunities for possible political and economic benefits to indigenous peoples, but may come at a social or cultural cost.

To understand this apparent contradiction, we need an interdisciplinary approach that considers processes related to mobility that operate at different scales. In this dissertation, I consider regional and municipal-level characteristics tied to location that influence participation in political mobilization and social movements, as well as household characteristics that influence mobility decisions as part of family livelihood strategies. I therefore draw on multiple literatures, including those on social movements and indigenous mobilization, as well as rural household livelihoods and rural-urban migration, to understand the interplay between indigenous mobility, political mobilization, and livelihood strategies in a remote area in the Brazilian Amazon.

The overarching focus of this dissertation concerns how indigenous rural-urban mobility has influenced, and been influenced by, processes of indigenous political mobilization at the regional and municipal scale as well as livelihoods at the household scale. Within this research focus, I address three more specific research questions. The first question is, how do migration and mobility contribute to indigenous political mobilization? Here I focus on the role of regional migration in the re-emergence of indigenous identities and the creation of urban indigenous associations. I take up the case of indigenous movements in the Rio Negro. In particular, I pay attention to historical forms of indigenous mobilization in order to understand how contemporary rural-urban mobility has influenced current mobilization. The historical context helps to understand how recent urbanization has influenced indigenous mobility, and in turn how mobility has contributed to current processes of mobilization and social capital formation.

The emergence of urban indigenous movements has in turn fostered new forms of political organization among indigenous peoples in nearby rural areas. Engaging in indigenous networks, additional rural communities became proactive agents in bringing political pressure for management of local fisheries traditionally claimed by indigenous peoples. This constitutes a case where existing mobilization for certain goals such as land rights led to an expansion of mobilization for other goals such as fisheries management. In turn, mobilization by indigenous peoples may contribute to improve access to and control over natural resources that are claimed by other social groups. In this context, my second research question is: What are the opportunities and challenges

presented to indigenous peoples by the intensification of rural-urban linkages with regard to natural resource management in rural territories?

While collective mobilization is an alternative way to seek to achieve better conditions in rural areas, important resources are still concentrated in urban areas. Rural indigenous households therefore deploy their assets to gain access to urban resources as a means to diversify their livelihoods and improve their well-being. While there is extensive literature on livelihoods for both traditional and detribalized indigenous peoples, there remains limited information about indigenous spatial mobility, especially with regard to rural-urban circulation strategies. Further, it remains unclear how community location and household assets affect indigenous circulation strategies, and in turn how circulation among indigenous households influences livelihood strategies, income sources, and overall income levels. The circulation analysis therefore addresses two key questions: First, what is the relationship of indigenous household socioeconomic status with rural-urban circulation? A key issue therefore is whether households with more assets are better able to pursue multi-local livelihood strategies. Second, how is circulation among indigenous households related to specific income sources and thus livelihood strategies? The issue here is whether specific income sources are driving household mobility.

### **Study Area**

The Upper and Middle Rio Negro are two of the most conserved regions of the Brazilian Amazon, and one of the richest centers in the basin for cultural and environmental diversity (Cabalar and Ricardo 2002, 2006). There are around 23 indigenous ethnicities linked to three main linguistic branches: the Tukano, Arawak and Maku (Cabalar and Ricardo 2002). The European colonization of the region started in

the mid-17th century with various explorations. Development of initial settlements led to an extractive economy in which the enslavement of indigenous peoples was central. This proceeded alongside the establishment of Catholic missions in the region, resulting in “reductions” of dispersed indigenous groups into centralized settlements. Together, slavery and reductions led to indigenous population decline in many areas along rivers, and displacement of other groups (Wright 1992).

The municipality of Barcelos, located in the Middle Rio Negro, was founded in 1728 as a Catholic mission. It became the first capital of the state of Amazonas. Barcelos thus became an important port for the trade of enslaved indigenous people as well as the export of various extractive products (Prang 2001). As part of that process, the region exhibited intense population movement, including of indigenous peoples.

After the transfer of the state capital to Manaus in 1807, Barcelos experienced a period of economic stagnation, and declined in importance as a political and market center (Prang 2001). The Middle Rio Negro went through another period of economic growth during the rubber boom from 1880 to 1925. During that period, Catholic missionaries encouraged some indigenous groups to move downriver to work in native rubber extraction (Meira 2000). Rubber extraction was organized around a system of patronage dominated by patrons, locally known as *patrões*. Patrons operated through mercantile networks of river vessels with merchants who sold basic goods to rubber tappers and bought rubber for transport to patrons in Manaus. The circulation of rubber buyers thus supported linkages between forest sites for rubber tapping and urban centers with rubber warehouses. After the 1920s, rubber exports declined, except for a

brief resurgence during World War II (Santos 1980). Rubber production in the area ceased in the mid-1980s with the end of federal government rubber subsidies.

Instead, other products, notably piassava (*Leopoldinia piassaba*) and ornamental fish, became the main extractive products of the Middle Negro region. While rubber declined, the patronage system persisted, with rural peoples still dependent on river boats for market transactions (Meira 2000). That however has begun to change in recent years, with the increasing importance of sport fishing and commercial fishing.

While the Upper Rio Negro had indigenous lands demarcated in 1998 as part of indigenous mobilization combined with state efforts to clarify tenure (Cabalar and Ricardo 2006), such efforts did not transpire in the Middle Rio Negro. Consequently, there remained many lands with undesignated status, making them in effect public forests without official recognition of tenure. This left many indigenous groups in the Middle Rio Negro in a precarious position, and generated demand among indigenous peoples for secure land tenure. That in turn prompted indigenous peoples to seek ways to access urban centers with state administrative offices. However, the Middle Rio Negro region has no overland connections between rural and urban areas such as roads (Emperaire and Eloy 2008).

At the same time, the towns in the Middle Rio Negro have in recent years exhibited rapid growth. This has strengthened ties between rural extraction sites and urban markets, and generated demand by outsiders for access to natural resources. Consequently, the urban population of Barcelos has increased, and rural-urban relations are intensifying in and around Barcelos municipality. Indeed, between 2001

and 2010 the urban population increased while the rural population decreased (IBGE 2013a).

This dissertation focuses on the municipality of Barcelos, for several reasons. First, the municipality occupies a location that falls in the middle of a continuum between the metropolitan modernity of Manaus and rural traditions and cultural diversity of the upper Rio Negro. Second, Barcelos has a significant indigenous population, which has mobilized politically to seek secure land tenure and state benefits via increased mobility between rural lands and urban areas. Barcelos is thus a useful study case for understanding the interplay between indigenous movement, migration and rural-urban circulation. As a consequence of indigenous spatial mobility, in Barcelos one finds substantial rural and indigenous populations alongside urbanization and market-oriented livelihoods. This is because Barcelos encompasses a mix of traditional indigenous and caboclo culture with modern influences from urban areas both up- and down-river.

### **Dissertation Organization**

The analysis of this dissertation is presented in three separate articles which correspond to the three specific research questions posed earlier. Two of the articles have already been published in academic journals. The articles explore indigenous urban-rural linkages through indigenous migration and circulation between these areas. Each manuscript can be read independently and focuses the analysis on different scales of livelihoods in Barcelos, Medium Rio Negro, Amazonas, Brazil.

The first part of the analysis (Chapter 2), entitled “Can urban migration contribute to rural resistance? Indigenous mobilization in the Middle Rio Negro, Amazonas, Brazil”, was published in the *Journal of Peasant Studies* in 2015. This article focuses on the

Middle Rio Negro on a regional scale and with a historical perspective. The paper discusses how mobility and migration can serve as means to spread indigenous political mobilization capacity. I present a case study on the indigenous movements in the Middle Rio Negro basin in the municipality of Barcelos. Regional migratory movements among indigenous peoples and the formation of regional alliances among local indigenous groups contributed to the emergence and spread of the indigenous movement in Barcelos. Through an analysis of key informant interviews, the paper makes the larger point that migration and mobility can be key mechanisms for expanding indigenous social movements. Mobility thus does not necessarily result in the emptying of indigenous territories due to the loss of traditional culture; on the contrary, migration flows can support regional networks for political mobilization in support of indigenous identity and territorial claims.

The second manuscript (Chapter 3) entitled “Urban-Rural Livelihoods, Fishing Conflicts and Indigenous Movements in the Middle Rio Negro Region of the Brazilian Amazon” was published in the *Bulletin of Latin American Research* in 2015. This paper discusses how changing urban–rural relationships pose new challenges but also new opportunities for resource management by indigenous peoples at the municipal level. In Barcelos, the lack of official recognition of indigenous territorial claims, along with an expanding economy and growing interests of outsiders in local resources, led to conflicts over indigenous lands as well as fisheries. The conflicts prompted indigenous peoples to mobilize in order to protect their traditional fishing territories. In particular, I focus on how rural-urban connections facilitated by increased spatial mobility among indigenous groups played a crucial role in the struggle for control over fisheries. A key

element of this struggle concerns the model for management of fisheries, and the role of spatial mobility not only for mobilization but also as it relates to access to fisheries in different locations with respect to indigenous land claims. In particular, the spatial mobility of indigenous people challenges resource management models that are based on permanent residence. This complexity underscores the urgent need for new ecological and political management models to deal with the flux of both people and natural resources between rural and urban areas.

The third manuscript (Chapter 4) entitled “Rural-urban circulation and livelihood strategies of indigenous households in Middle Rio Negro”, explores the relationship between the livelihoods and assets of indigenous households as they relate to rural-rural and rural-urban circulation. I draw on detailed survey data for a panel of indigenous households in each of four indigenous communities to evaluate circulation over the period of a year. I first describe household circulation patterns between rural and urban areas. The analysis then compares circulation among households with relatively high and low annual incomes and overall wealth. The findings show that while households with higher cash incomes also exhibited greater circulation values to both rural and urban areas, there is no difference in circulation among different wealth groups. These findings suggest that mobility is related to the flow of resources in the livelihood system and not the stock. I also examine the importance of participation in specific livelihood activities for circulation, and find mixed results. Mobility reflects the net income of the overall portfolio of diverse livelihood activities, and it is not related to specific activities. These findings bear implications for the study of the relationship of

mobility to livelihoods and material well-being, and call for more work on indigenous mobility and livelihoods in particular.

Finally, Chapter 5 presents a concluding discussion that reflects on the dissertation as a whole. I begin by summarizing the main findings for each of the manuscripts, noting their importance for the study case and for the relevant literatures to which they speak. I then turn to the contributions of the dissertation that relates the findings from different manuscripts to each other in the broader ambit of the study of spatial mobility, indigenous mobilization, resource management, and well-being. This is followed by a review of the implications and significance of the results for future research, and for the practice of development and conservation of indigenous lands in the Amazon.

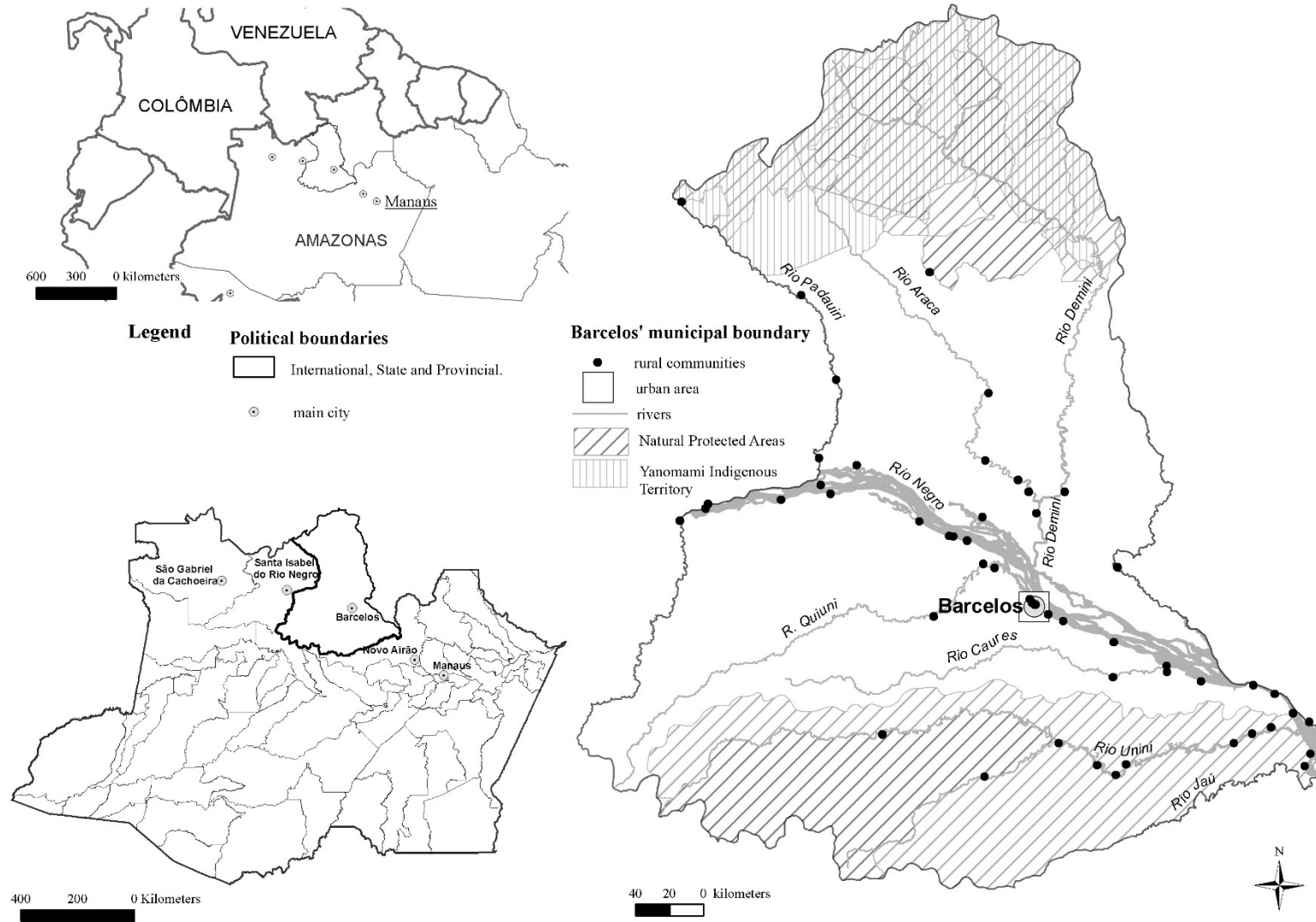


Figure 1-1. Barcelos' municipality location. Cartographic base from IBGE (2010), MMA (2011), FUNAI (2014), and FOIRN (2014). Source: Sobreiro (2015).

## CHAPTER 2

### CAN URBAN MIGRATION CONTRIBUTE TO RURAL RESISTANCE? INDIGENOUS MOBILIZATION IN THE MIDDLE RIO NEGRO, AMAZONAS, BRAZIL

All over Latin America, the rise of indigenous movements and other “new social movements” is seen as a response to military dictatorships, re-democratization and the rise of neoliberal policies (Jackson and Warren 2005; Yashar 2005; Stahler-Sholk, Vanden, and Kuecker 2007; Deere and Royce 2009). Many countries enacted constitutional reforms in the 1980s that recognized multiculturalism, including Brazil, Mexico, Paraguay, Guatemala, Nicaragua, Colombia, Ecuador, Argentina, Peru and Venezuela (Jackson and Warren 2005; Yashar 2005).

Indigenous political mobilization focuses on claims of indigenous identity as being distinct from other groups, both to maintain that identity and also as an attempt to assert rights over their territories (Occhipinti 2003; Jackson and Warren 2005). These claims were posed against state policies that were based on ideologies of assimilation into national societies (Jackson and Warren 2005). In many cases, the need to assimilate indigenous populations is the main argument used by governments and elites to dismiss the legal recognition of indigenous status and associated rights, especially territorial claims (Santos and Oliveira 2003).

The indigenous rights achievements in the 1988 Brazilian Constitution were the result of a continuous political mobilization among indigenous groups and non-indigenous allies during and after the military regime (Ramos 2011). This constitution was considered a benchmark in the Latin American indigenous rights movement

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(Ramos 1998). For the first time since European colonization, Brazilian policy for indigenous peoples ceased to be based on the goal of assimilation (Ramos 2011). Indigenous peoples were given rights to maintain their culture, and rights over their lands (with the exception of underground resources), as well as rights to use the judiciary without interference from the state, via the National Indian Foundation (FUNAI).

Indigenous political participation has been increasing on different scales and in various spheres (Brysk 1996), and many indigenous leaders have become well known nationally and internationally (Conklin and Graham 1995; Ramos 1998). Alliances and networks with national and international organizations were crucial for the visibility of indigenous causes (Brysk 1996). In Brazil, there was a proliferation of local, regional and national indigenous associations after 1988 (Albert 2005). Local associations created official leadership positions with clear responsibilities, including elected boards of directors. Most of these associations are based on a particular ethnicity, gender (e.g., there were many women's associations), or professional categories within ethnic groups (e.g., artisans, teachers, etc.; Albert 2005; Chernela 2012). Many indigenous associations have maintained continuous political mobilization, especially those struggling to have their constitutional rights respected.

The literature on Latin American indigenous movements offers several different explanations for mobilization. These perspectives have been driven by considerable theoretical work, and notable here are political process theory and identity theory. Political process theory focuses on a movement's organizational capacity, motives and political opportunities in order to explain levels of mobilization (Van Cott 2001; Yashar

2005). In parallel, identity theory highlights cultural and symbolic content of movements as the basis for mobilization and its outcomes (Alvarez et al. 1998; Warren 2001; Bolaños 2011). In this paper, I provided a case study for detailed analysis of the processes through which mobilization networks are built, contributing to the political process approach to social movement analysis. I suggest migration and mobility as factors accounting for new networks of local and regional mobilization of indigenous groups in the Brazilian Amazon.

One key priority among indigenous movements is to have indigenous territorial rights acknowledged (Almeida 2004; Schwartzman and Zimmerman 2005). According to the new constitution, all indigenous lands were to be demarcated in a period of 5 years. While many groups had land demarcated, there are still more than 100 awaiting the process.<sup>1</sup> There have also been requests for additional land demarcation. It is necessary to explain the difference between “indigenous land” and “indigenous territory”. Indigenous land is a legal category related to the political process conducted by the state to delimit an area of exclusive use by an indigenous collectivity. “Territory” refers to the relationship between a particular society and its territorial base, based in their construction and experience, which is culturally variable (Gallois 2004). When a territory (or part of it) is delimited as indigenous land, the material and symbolic relationships with the space transform into a new conception of property rights (Oliveira 1996).

The necessity to establish territorial limits demarcating indigenous land is a result of historical contact and conflict with the colonizers. Conflicts have resulted in

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<sup>1</sup> For more information about indigenous land in Brazil, see FUNAI (2014).

“territorialization” processes, where the political struggle for land is intertwined with the rearranging of social and ethnic boundaries (Oliveira 1996; Almeida 2004; Gallois 2004). Different groups have been reaffirming forgotten indigenous identities and assertions of rights over land to secure cultural continuity (Occhipinti 2003; Jackson and Warren 2005; Bolanos 2011). This indigenous “resurgence” (Warren 2001) or ethnogenesis “often denotes a gradual process through which older ethnic categories and boundaries are redefined. Sometimes it is also used to refer to the transformation or shifting salience of preexisting cultural identities as they become politicized in new contexts” (Bilby 1996, 119). In the territorialization struggle, it is common to invoke cultural ties to land and cosmologies, and the importance of land for social and cultural reproduction, as well as guaranteeing access to essential natural resources (Cunha 2012).

Given the importance of rural territory for indigenous peoples, rural out-migration may be associated with the disruption of indigenous culture. In the Amazon region, indigenous peoples tend to be labeled as attached to the forest and bounded by their territories (McSweeney and Jokisch 2007). However, the violent penetration of national fronts in their territories in each economic cycle produced strong displacements (Alexiades 2009). More recently, there are multiple examples of indigenous migration to urban areas, due to reasons ranging from search for jobs, education and healthcare to community conflicts (Brandhuber 1999; Baines 2001).

Both rural and urban spaces are important for indigenous peoples, and the literature on this topic recognizes the multi-local nature of indigenous communities (Brandhuber 1999; Alexiades 2009), with households participating in “social and

economic activities in several places” (Trager 2005, 28), spreading their functions between rural and urban areas, which is only possible through sustaining extended kinship social networks (Pinedo-Vasquez and Padoch 2009; Eloy and Lasmar 2012).

The lack of economic opportunities for indigenous communities in the Amazon rural areas, combined with urbanization, increases the interdependency and mobility between rural and urban spaces. This can result in rural out-migration or the constitution of new multi-local livelihood strategies (Eloy and Lasmar 2012). The causes of migration go beyond economic reasons, varying from forced migration induced by missionaries (Chernela 2012), threats to traditional territory (Romano 1981) and internal conflicts (Brandhuber 1999), to voluntary desire for upward mobility (Lasmar 2005, 2008).

Mobility represents both challenges and opportunities for indigenous people's livelihoods. Even when land rights are guaranteed by demarcation, there are other challenges such as a lack of suitable health services, and educational and economic opportunities, in rural areas. As indigenous people try to procure these services, rural–urban mobility and rural out-migration have increased (Bernal and Mainbourg 2009).

Historical indigenous population movements in Rio Negro (RN) are well described: forced displacement during colonization (*descimentos*), mobility related to prophetic indigenous movements, displacement to work for merchants extracting forest products and movement toward missionary centers (Wright 1992; Wright 2005). More recently, there are various records of indigenous migration/mobility to urban areas. They tend to focus on Manaus, the largest urban center in the region (Romano 1981; Pereira da Silva 2001; Bernal 2003; Bernal and Mainbourg 2009; Melo 2009; Fígoli and Fazito 2009), or Upper RN (Fígoli 1982; Brandhuber 1999; Lasmar 2005, 2008; Andrello 2006;

Chernela 2012; Eloy and Lasmar 2012). In cities, indigenous people reorganize their social networks, creating an extended kinship network that includes more distant kin and friends, and is maintained by visits among them (Pereira da Silva 2001). This support network contributes to maintain their identity inside the urban context (Fígoli 1982) and to resist against prejudice (Romano 1981).

More recent studies suggest that there is a growing fluidity between the forest and the city, forming multi-local communities on a regional scale – structured by kinship networks and flows of goods and people between various nodes (Albert 2005; Eloy and Lasmar 2012). Based on studies with Tukanoan people, Brandhuber (1999) suggested that mobility is inherent to the socio-cultural system of RN.

Little is known about the influence of this culture of mobility on the political mobilization of indigenous people in RN. However, there is growing evidence that migration and urbanization can contribute to indigenous political mobilization (McSweeney and Jokisch 2007; Bernal and Mainbourg 2009). Formal indigenous organizations are commonly located in urban areas. Many migrants are linked to political networks related to urban indigenous organizations, and this relationship depends on the capacity of indigenous leaders and organizations to attract migrants (Pereira da Silva 2001, 76). Urban indigenous organizations unite ethnic diversity into a specific place, creating new networks and forms of social mobilization (Pereira da Silva 2001). In these organizations, migrants are connected to members of their own group, as well as other ethnic groups and identities. These places can be gathering places for migrants, where they can receive valuable information about their rights, and where they learn strategies for mobilization (Bernal and Mainbourg 2009).

Mobility and increasing amounts of interactions with urban areas may also influence a community's social capital and political organization, which may in turn provide access to important resources and rights. Amazon rural–urban networks permit the circulation of cash, remittances, goods and gifts, but also new technologies, tools, consumer preferences and skills (Pinedo-Vasquez 2009). Sometimes these networks expand towards the “white world”, through marriages between indigenous women and non-indigenous men (Lasmar 2005, 2008). Networks are not only constituted and maintained by kinship, but they also create political relationships that serve to mobilize resources.

In this paper, I argue that migration and mobility permit the extension of the social networks of rural Amazonians into local and regional cities, and that these networks connect these urban associations to rural communities. Migration can serve as the means to shift the scale of indigenous mobilizations seeking state recognition of indigenous identities and territorial claims. This paper discusses how this migration contributed to indigenous mobilization by articulating rural communities with urban movement associations, and how such mobilization increasingly depends on ties to other organizations.

Specifically, I suggest that migration can support mobilization and territorialization by serving as the mechanism that permits a movement “scale shift” (McAdam, Tarrow, and Tilly 2001; McAdam 2003; Tarrow and McAdam 2005). Scale shift is “a change in the number and level of coordinated contentious action leading to broader contention involving a wider range of actors and bridging their claims and identities” (McAdam, Tarrow, and Tilly 2001, 331). I argue that two key historical

migration flows involving indigenous peoples in RN permitted the emergence of new mobilization: one flow involved migration of indigenous people with mobilization experience to a new location that did not have a history of indigenous mobilization, thus providing the conditions for local urban mobilization. This constituted a regional scale shift by extending the conditions for indigenous mobilization to new locations. A second migration process involved local rural–urban circulation, which connected rural indigenous communities to urban indigenous activists. This network process was key for urban mobilization to incorporate rural communities, and constituted a local scale shift by expanding participation in mobilization from local urban centers to rural communities. In addition to these two historical migration flows, the context of Brazilian indigenous politics since the 1988 Constitution is also considered.

The remainder of this paper is organized as follows: in the next section, I present a short history of recent Brazilian ethnic politics in order to situate the context in which indigenous groups in the Amazon have been organizing their movements. Second, I will present the current literature dealing with networks and indigenous mobilization. Third, I present a case study in the municipality of Barcelos in the Middle RN, where an indigenous movement emerged in an urban area and later spread to rural areas via rural-urban circulation. This movement subsequently became part of a larger network of RN indigenous associations.

### **Brazilian Ethnic Politics and Amazon Indigenous Movements**

The Upper RN indigenous movement is one of the most prominent in the Amazon. This movement has followed the broader national trends of indigenous struggles. To understand questions of indigenous identity and political mobilization in Brazil, it is important to highlight Brazilian ethnic politics in the last four decades, and

how it is related to the RN movement's history. This will set the stage for the recent scale shift from Upper RN towards Barcelos.

Brazil has a long history of ambiguous policies towards indigenous peoples (Perrone-Moisés 1992; Cunha 1992; Lima 1992). The policies, until the Constitution of 1988, varied from the indigenous people's slavery in colonial times, to various attempts to assimilate tribal groups into Brazilian national society. Here, I will focus on the more recent history related to the rise of indigenous political mobilization beginning in the 1960s during Brazil's military regime. In this period, large-scale development programs were launched in the Amazon, causing intense competition for land and resources among different interest groups (Schmink and Wood 1992; Ramos 1998). Diverse ethnic groups were negatively affected by land grabbing, mining, and the construction of dams and roads (Davis 1977), which drew the attention of national and international media and generated criticism against the Brazilian government (Albert 2005).

The military government created new legal instruments in order to deal with the "problem" of indigenous lands, which prevented the implementation of development policies. At the same time, this government was accused in national and international forums of violations of indigenous rights (Ramos 1998, 2011). In 1967, the government transformed the Indian Protection Service (SPI) into FUNAI as a response to international accusations of SPI's corruption, exploitation and coercion of indigenous peoples (Albert 2005).

In 1973, the military government promulgated the Indian Statute (IS; Law 6001), which classified indigenous peoples as being "relatively capable" – a legal standing on par with that of minors – and thus under FUNAI wardship. The law's idea was to "pacify"

and assimilate indigenous groups into Brazilian society, and classified all ethnic groups under a generic category of *silvícolas* (forest dwellers) (Albert 2005). The statute also created new territorial categories which restricted indigenous groups to specific areas with defined boundaries determined by the government. Until the end of the military government, there were many political attempts to manipulate the IS in favor of various development interests. Among these were attempts to “emancipate” indigenous peoples, which carried implications that they would then have no more rights to the land as descendants from original inhabitants. There were also efforts to create criteria for “indigenusness” as a means of identifying some groups as authentically indigenous but not others, therefore excluding “acculturated” indigenous groups (Ramos 1998).

In this context, the indigenous political movement emerged in the Amazon to engage in resistance against the Brazilian state and development interests, in order to maintain their traditional lands and their culture, and assert their citizenship rights (Albert 1996; Ramos 1998). With support from the Catholic Church, anthropologists, artists and volunteers, the first independent multi-ethnic Brazilian indigenous organization was founded in the 1980s: the Union of Indigenous Nations (UNI). UNI amounted to a national-level organization composed of several well-known indigenous leaders. However, UNI had difficulty in connecting effectively with local groups (Ramos 1998). UNI members were also persecuted by the military government because of their “relatively capable” legal status. But despite these difficulties, UNI constituted an important social actor in the negotiations for the new Constitution in 1988 (Ramos 1998).

Article 231 of the 1988 Constitution (Brasil 1988, 181) recognized “the indigenous social organization, customs, languages, beliefs and traditions and the rights to the lands they traditionally occupy, and is the responsibility of the Federal government to demarcate, protect, and respect this land”. It was the first time that indigenous groups were recognized as culturally distinct, which allowed indigenous groups to invoke cultural ties, cosmologies and ethnic reproduction arguments when claiming territorial rights. The concept of land traditionally occupied is:

land inhabited by them on a permanent basis, those used for their productive activities, those indispensable to the preservation of the environmental resources necessary for their well-being and for their physical and cultural reproduction, according to their uses, customs and traditions (Brasil 1988, 181).

Once demarcated, these lands are registered in the name of the Federal government, but for the permanent possession and exclusive use of the indigenous communities.

In RN the struggle for recognition of indigenous territory preceded the new Constitution. At the end of the 1980s, despite the optimism of Brazil’s re-democratization and the end of the military dictatorship, the military increased its presence in the Amazon region through a strategic plan of territorial control called Calha Norte (CN). CN was planned in 1985 and its logic was focused on military control of Brazilian borders in the Amazon for security reasons. Those borders, however, including the Upper RN, were also the territory of 63,000 indigenous people from more than 50 ethnic groups (Ramos 1998). The military transformed a border area, of 6500 km in length and 150 km in width, into a national security area, with military checkpoints and open areas for private mining companies. The military controlled FUNAI from 1989 to 1992, and thus was able to interfere in policy concerning indigenous peoples. Many

indigenous groups consequently experienced threats to their lives and territory by the creation of different categories of indigenous “colonies” with ambiguous criteria that fragmented large territories. Impacts varied among different regions and groups. The military also forced the creation of Indigenous Colonies surrounded by National Forests in the Upper Solimões River and in the Upper RN. Military posts were even created on these indigenous territories.

Since the 1970s, different Upper RN indigenous associations have made requests for official recognition of their traditional territories. In this context, leaders from different indigenous associations created the Federation of Indigenous Organizations of Rio Negro (FOIRN) in São Gabriel da Cachoeira in 1987. Despite early internal disagreements, indigenous peoples from diverse ethnicities united against the creation of indigenous colonies that would reduce 58% of their traditional territory. They were in favor of the demarcation of a continuous indigenous land that included multiethnic indigenous communities. FOIRN used diverse strategies, from destroying the physical marks delimiting the “indigenous colonies”, to legally claiming the recognition of their land by drawing arguments from the rights officially acquired in the 1988 Constitution (Cabalar and Ricardo 2006). After years of litigation in the federal courts, 10.6 million hectares of continuous land were demarcated in 1998 by Brazilian President Fernando Cardoso.

Currently, FOIRN is one of the most recognized indigenous organizations in the Amazon. FOIRN is an umbrella organization composed of 89 local associations representing about 750 villages spread throughout both demarcated and non-demarcated indigenous lands (Soares 2012). Their coverage area comprises the

municipalities of São Gabriel da Cachoeira, Santa Izabel do Rio Negro and, more recently, Barcelos, corresponding to a total area of 108 million km<sup>2</sup>. Over 35,000 indigenous people, belonging to 23 ethnic groups, representative of Tukano, Arawak and Maku language families, live in this area (FOIRN 2013).

### **The Importance of Networks for Indigenous Mobilization**

Several studies on indigenous movements stress the importance of alliances and networks between local groups and national and international organizations (Conklin and Graham 1995; Brysk 1996; Keck and Sikkink 1999; Mato 2000; Tilley 2002). Research has particularly focused on the role of advocacy networks formed by social movements and civil society supporting a common cause. The literature on transnational advocacy networks (TANs) (Keck and Sikkink 1998) emphasizes the transmission of strategic information from international to national to local indigenous organizations, to frame indigenous claims and pressure national governments for their rights. TANs create transnational public spaces outside of state control, where the local and global scales are interdependent (Mato 2000), contributing to a “global civil society” (Moghadam 2012).

The emergence of indigenous movements on the international scene through TANs has helped to give indigenous groups a global visibility (Brysk 1996). The circulation of information about the marginalized position of indigenous identity was turned from a weakness into strength (Brysk 1996). Indigenous identity was therefore used strategically to call attention to issues of indigenous rights (Turner 1991; Conklin and Graham 1995; Gray 1997; Ramos 1998). International media attention to environmental issues, including Amazon deforestation, biodiversity loss and global warming, also helped to reinforce the image of indigenous peoples as reliable protectors

of nature, thereby connecting human rights and environmentalist networks (Conklin and Graham 1995; Cunha and Almeida 2000). The creation of the International Alliance of the Indigenous Tribal Peoples of the Tropical Forests, and the participation of the indigenous movement in the Rio Summit in 1992, formalized the conservation and indigenous alliances (Cunha and Almeida 2000).

The ratification of International Labor Organization Convention 169 on the rights of Indigenous and Tribal Peoples by 14 Latin American countries was one the most significant results of this international mobilization (Van Cott 2010). The United Nations also approved the Declaration of the Rights of Indigenous Peoples in 2007. These international declarations are not only the result of indigenous mobilization, but also constitute resources that can be used to pressure states to protect indigenous rights (Brysk 1996; Gray 1997; Sieder 2002; Van Cott 2010). With these international norms and repercussions, a wide range of organizations such as the World Bank, environmental nongovernmental organizations (NGOs) and governments have included indigenous issues in their agendas and projects.

National networks were also crucial for indigenous mobilization. During the discussions for the new Brazilian constitution, indigenous leaders and allies in civil society organizations played a crucial role in lobbying for reforms in legislation (Ramos 2011). The Catholic Church was also an important ally of indigenous people in their struggles in the 1970s and 1980s (Ramos 1998; Yashar 2005; Albert 2005). More specifically, the development of indigenous alliances in the Brazilian Amazon is directly related to the participation of a progressive branch of the Catholic Church (Albert 2005), especially the Missionary Indigenist Council (Conselho Indigenista Missionário, or

CIMI). CIMI promoted meetings and assemblies of indigenous chiefs from different ethnicities in the 1970s. CIMI's logistical support and political education of indigenous leaders helped to establish the base for Brazil's national indigenous movement. Many lay volunteers started to join the mobilization. At the end of 1970s, there were around 30 pro-indigenous NGOs in addition to these church organizations (Albert 2005).

These national and international networks provided numerous opportunities and resources, and political support, for indigenous groups, which started to constitute themselves as formal associations. The previous networks formed during these first alliances developed into a second generation of indigenous movement (Yashar 2005). While there is an extensive literature on this latter process, less attention has been given to the role of these local advocacy networks for indigenous mobilization, especially after these communities achieved victories concerning indigenous rights. In the next section, I present a case study that illustrates the important role of local networks for indigenous mobilization, with a particular focus on how migration contributes to the scale shift of the mobilization process by connecting rural communities with urban associations and support organizations.

### **Indigenous Mobility and Resistance: the Case of Barcelos**

In the remainder of this paper, I use the municipality of Barcelos, Amazonas, Brazil, as a case study to show the importance of indigenous migration as a means of rural–urban articulation for indigenous mobilization. This case study is based on interview data and participant observation collected over numerous research trips to Barcelos since 2006. This work started during my master's research from 2005 to 2009, which focused on the political ecology of fishing in Barcelos. My research in Barcelos has continued as part of my doctoral field research. In 2011 and 2013, I collected

qualitative data about the role of indigenous movements in local development through semi-structured interviews with 20 key informants. Interviewees included representatives from indigenous movement associations, interest group associations and rural communities. During this period, I also participated in several activities and meetings organized by the indigenous movement in the municipalities of Barcelos, Santa Izabel do Rio Negro and São Gabriel da Cachoeira. Information about the indigenous movement's earlier history is primarily based on secondary data (Peres 2003, 2011), interviews, project reports and publications from the Instituto Socioambiental (ISA).

The municipality of Barcelos is located in the Middle RN basin, in the northwestern Brazilian Amazon. Barcelos is still a relatively isolated region, maintaining most of its forested area with no road access to other municipalities. The municipality has a large area of 122,476 km<sup>2</sup> (IBGE 2013a), and most rural land has no official titling. Upstream from Barcelos are the municipalities of Santa Izabel do Rio Negro and São Gabriel da Cachoeira. In those municipalities, most rural land has been demarcated as indigenous lands, and the region currently has the largest indigenous population in Brazil (IBGE 2013b). Downstream from Barcelos is Novo Airão, where rural land is largely in protected areas. Beyond Novo Airão is Manaus, the capital of Amazonas State, with a population of 1.8 million inhabitants (IBGE 2013a). Transportation among these municipalities is mostly based on river navigation. The town of Barcelos has strong spatial, economic and cultural connections to the river and forest, which in turn translate into an urban spatial organization oriented towards the river (Trindade Jr. et al. 2008).

Barcelos was founded in 1728 as a Catholic mission, and 30 years later it became the first capital of the Amazonas State, which then represented the main colonial power in Western Amazon (Reis 1999). At that time, the urban population consisted of about 2000 indigenous peoples of various ethnicities (Ferreira 1959). The Middle and Upper RN are recognized as having a large number of different ethnic groups from three linguistic branches: Arawak, Tukano and Maku. These groups had inter-ethnic relations predating Portuguese colonization (Guzman 2009). During the early colonial period (1700–1758), Barcelos was an important port for trade of enslaved indigenous people as well as the export of extractive products (Prang 2001). The regional inhabitants suffered a process of intermarriage with European and African peoples during the eighteenth and nineteenth centuries (Guzman 2009). As part of that process, the region exhibited intense population movement. During colonization, indigenous groups were forced to move downriver as a result of Catholic missionary influence, and to work on extraction of rubber and other products.

After the transfer of the state capital to Manaus in 1807, Barcelos experienced a period of economic stagnation and declined as a political and urban center (Prang 2001). The RN went through another period of economic growth during the rubber boom from 1880 to 1925. After the 1920s, rubber exports declined, except for a brief resurgence during World War II (Santos 1980). Rubber production ceased in the mid-1980s with the end of federal subsidies. Since then, *piassava* fiber (*Leopoldinia piassaba*) and ornamental fishing have become the main extractive products of the Middle RN region. Extraction of these resources operated under the traditional system of patronage that carried over from rubber production (Prang 2001). Between 1970 and

the 1980s, many indigenous people moved from Upper to Middle RN tributaries to work on *piassava* extraction (Emperaire and Eloy 2008). Since 2000, agriculture, sport fishing, commercial fishing and tourism have increased in importance for the local economy.

A Salesian Catholic mission was founded in Barcelos at the beginning of the twentieth century (Machado 2001). The missionaries' centers in RN were a bridge between the indigenous rural life and the "civilized" and urban world (Figoli 1982; Andrello 2006). Missionaries repressed the remaining cultural indigenous traditions and languages, and kept indigenous children in boarding schools. In the 1970s, Salesian missionaries organized dispersed indigenous and riverine people into formal rural settlements (*comunidades*, or communities), and this model of socio-spatial rural organization has prevailed until today.

### **Indigenous Livelihoods and Mobility**

Most of the rural population of Barcelos lives in communities that are recognized by the municipal authorities. These communities are located adjacent to water bodies. Households were settled around a chapel, school and social center, an organization that was reproduced and adapted to the urban context when these populations moved to the city (Peres 2003, 2011). Almost every community has primary schools maintained by the local government, but few have secondary schools.

There are approximately 48 rural communities, 30 composed by a multiethnic indigenous population. Indigenous people in Barcelos are descendants of different ethnicities whose languages come from the Arawak and Tukano linguistic families. The vast majority of the population is of the Baré ethnicity, followed by Baniwa, Tukano and Desana (Sobral and Dias 2013). Baré culture was heavily impacted in the historical

process of colonization of RN. These Baré peoples lost their native language and, until recently, were considered extinct (Gourevitch 2011).<sup>2</sup>

Indigenous communities are composed of households that have diversified livelihood strategies, generally based on a combination of shifting agriculture, hunting, fishing and extraction of non-timber forest products such as *piassava* fiber and Brazil nuts. Spatial mobility is necessary to have access to seasonal resources that are dispersed throughout these territories. There are periods of the year in which the communities are more dedicated to agriculture, combined with expeditions to other locations for fishing, hunting and collection of *piassava* and nuts. It is also common for households to spend time with their distant relatives, helping with work or just visiting. In addition, people travel to other communities to participate in Catholic saint feasts. Rural mobility is therefore common and important for household reproduction.

Visits to the urban center have increased more recently as result of access to federal programs for the inclusion of minorities and poverty reduction (for example, cash transfer programs such as *Bolsa Família* and retirement benefits). People go monthly to town in order to receive their payments, and to buy industrialized goods. Urban centers are also spaces where rural households access services such as education and health care, and sell their agricultural and extractive products. Thus, while visits to town are not a novelty, they are occurring with more frequency than ever before.

Deficiencies in the educational and health care systems in rural areas have led some families to move more permanently to the Barcelos urban area. This process of rural outmigration tends to be gradual, with a few members of the family establishing

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<sup>2</sup> More information about Barés can be found in Vidal (2000), Figueiredo (2009) and Melo (2009).

economic activities in the town, complemented by resource extractivism from their rural community. To support themselves, many households pursue a livelihood strategy of multi-locality or, in other words, living in both rural and urban areas. Many families live in urban settings, but also have agricultural land (*roça*) in rural or peri-urban locations. Some families may return to fish or hunt in their rural community, in order to sell the catch in the urban center. In the process, the migrants maintain social networks with their rural origin community and territory (Peres 2011).

Although urban areas provide new opportunities and access to goods, migration to town also has some negative impacts. For example, finding jobs in the city is difficult, especially for indigenous people with no formal education. Another difficulty is the cost of living; as one informant said, “in Barcelos’ town you have to buy everything” (Interview, 2013). The town is also perceived as a dangerous place, with violence and drugs. Parents say that in town they lose control of their children. However, even with these difficulties, many families insist on settling in the city for their children to be able to study. Education for children and adolescents is considered a priority for rural households as the best way to improve their lives (*melhorar de vida*). While some rural communities have schools managed by the local government with federal government resources, these communities do not have high schools, leading parents to move to town or to send their children to live with relatives in the city.

The growth of the indigenous population in both rural and urban areas makes Barcelos a useful study site for an evaluation of migration processes, indigenous mobilization and ethnic identity. In the last 30 years, there were two migration flows into Barcelos: (1) from São Gabriel da Cachoeira and Santa Izabel do Rio Negro

municipalities to rural and urban areas in Barcelos, and (2) from rural communities and *sítios* (individual settlements) in Barcelos to Barcelos town. With regard to the first of the migration flows, Barcelos attracted migrants because, compared to the Upper RN, it was considered to be a region that was relatively rich in important natural resources such as fish and land for agriculture.

The increase in tourism and the recent establishment of an army battalion in Barcelos town also attracted migrants searching for work opportunities. Barcelos is also closer to Manaus, the major urban center in the region. The first migration flow thus brought indigenous people with mobilization experience to Barcelos. This would later prove crucial as a basis for indigenous mobilization based in this city.

With regard to the second migration flow, this rural out-migration was mainly related to the lack of adequate education and health services. The lack of schools in rural communities is pointed out as the main factor for rural out-migration. This second migration flow has connected rural communities to Barcelos. While this was initially for livelihood reasons, it became a means of linking rural communities to indigenous associations and thus became a mechanism to support indigenous mobilization via rural–urban networking.

Data from the Brazilian census indicate that the Barcelos indigenous population increased five-fold from 1991 to 2010 (Table 2-1).<sup>3</sup> While the non-indigenous population decreased 7 percent, the indigenous population increased 136 percent between 2000 and 2010. In the Barcelos urban area, the indigenous population increased by 934

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<sup>3</sup> Brazilian census methods have probably underestimated the indigenous population in 1991 (Santos and Teixeira 2011; IBGE 2013b).

percent while the non-indigenous population grew 52 percent. In rural areas, the total population declined by 23 percent; the non-indigenous population declined by 48 percent, while the indigenous population grew by 66 percent.

This steep increase in the indigenous compared with the non-indigenous population, especially in urban areas, suggests that ethnic resurgence is the main reason for the increase of indigenous population in Barcelos. This phenomenon is not restricted to Barcelos. Perz, Warren, and Kennedy (2008), analyzing Brazilian census data, found that the indigenous population doubled from 1991 to 2000. The 71 percent growth of the indigenous population in Brazil during this period was due to the reclassification of race. A significant proportion of indigenous reclassification occurred in urbanized areas. Rural out-migration also probably contributed to the growth of the indigenous population in Barcelos, but the available census data make it difficult to estimate the extent of this impact.

Although the indigenous population was always present in Barcelos, rural communities and urban populations were until recently considered “acculturated”, and classified instead as *caboclos* (Pereira 2007) or “civilized Indians” (Peres 2003, 2011)<sup>4</sup>. Even among people maintain indigenous cultural practices in their private life, the public manifestation of any indigenous ancestry was received negatively by the non-indigenous elite as a sign of underdevelopment (Adrião 1991; Peres 2003). The presence of indigenous people in Barcelos was routinely denied, except for reference to

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<sup>4</sup> As an academic concept, *caboclo* comprises groups from multiple origins, initially mixed descendants of indigenous and Europeans, and later mixed with Northeast Brazil migrants (Lima 1999). They are treated as the historical Amazon rural peasants, with ecological knowledge and customary practices influenced by indigenous cultures (Nugent 1993).

Yanomami groups that live in distant and isolated areas in the municipality. Local discourses denying the presence of the indigenous people reflect the ambiguous strategies of the Brazilian State to “pacify” and “integrate” them into national society since colonization (Cunha 1992; Lima 1992; Ramos 1998).

### **Indigenous Mobilization in Barcelos**

In this section I describe how mobility and migration contributed to political mobilization and the recent historical process that led to the ethnic resurgence in Barcelos. The migration in Barcelos provided the context for the flashpoint of mobilization that is the focus of this study. First, I will outline how the migration from the Upper RN of indigenous people with mobilization experience explains the presence of indigenous people in Barcelos who had an interest in discussing indigenous issues. I will then discuss how the circulation of indigenous people among rural communities and the city of Barcelos connected rural communities with urban activists and organizations. These two types of migration flows together constituted a social foundation for collective identification among indigenous people, who then perceived a shared interest in mobilization in support of their indigenous claims to identity, territory and other resources.

Influenced by the national context of indigenous rights acquired in the 1988 Constitution and the demarcation of indigenous land in Upper RN, the National Institute for Historical and Artistic Heritage (Instituto do Patrimônio Histórico e Artístico Nacional, or IPHAN) visited Barcelos in 1999 to investigate influences of indigenous culture in the city. In the same year, indigenous leaders living in Manaus were hired to map the location of regional indigenous populations, as part of a study for the implementation of an Indigenous Special Health District (Distrito de Saúde Especial Indígena, or DSEI) in

the Upper and Middle RN. Surveys and interviews with people in Barcelos stimulated local meetings to discuss indigenous issues, which initiated a process of redefinition of ethnic identities in the municipality.

In November 1999, by radio, the DSEI team invited indigenous peoples in the town to come for a meeting. The expectation was that only few people would appear, but 90 people were present in a first indigenous meeting. The participants at the first meeting then engaged in discussion of the urgency of recognizing the presence of indigenous culture in Barcelos. At that meeting, they proposed the creation of an indigenous association<sup>5</sup>. Most participants were descendants of indigenous people who migrated from the Upper RN to rural Barcelos to work in forest extractivism for local merchants (patrões), or indigenous households that lived and moved among different rural communities and sitios in RN until they settled in Barcelos. But it also happened that some of the participants in fact had previous experience as organizers in the indigenous movement up river in São Gabriel da Cachoeira via FOIRN, and had studied in Salesian boarding schools.

Indeed, the first ASIBA president had just migrated from Upper RN with his family to Barcelos. He came looking for improved life conditions and better access to natural resources. All the same, he and his wife had previous experience working in the

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<sup>5</sup> Association is non-profit institution that represents the interests of a specific group. The organizational model based in associations was first introduced by liberal branches of the Catholic church in Upper RN in the 1970's (Peres 2003). It later became the main structure of political mobilization characteristic of the Upper RN indigenous movement (Peres 2011). This model, later spread in the Amazon due to both national and international processes: the legalization of indigenous associations after the 1988 constitution; national state decentralization from indigenous issues (except for land demarcation) combined with budget cuts in indigenous policies; and networks between indigenous and international agencies for financing local ethnodevelopment and conservation projects (Albert 1996).

indigenous movement and associations up river. They knew the steps to create an association and they knew the model of local and regional assemblies used in Upper RN to discuss indigenous issues. For these reasons, he was appointed to be the first president the new indigenous association in Barcelos.

The Barcelos Indigenous Association (Associação Indígena de Barcelos, or ASIBA) was created in a second meeting in December 1999. Discussions underscored questions about structural and bureaucratic aspects of the new organization. The meeting included the participation of FOIRN and Coordenação das Organizações Indígenas da Amazônia Brasileira (COIAB), which represented respectively the RN and Amazon indigenous movements. Their presence meant an official recognition of ASIBA as part of the indigenous movement (Peres 2003, 2011). The NGOs CIMI and ISA were also present.

From a political process perspective, the capacity for indigenous mobilization in Barcelos was built upon alliances between regional movements and NGOs, which helped to consolidate new urban–rural networks. With the political and financial support of FOIRN, ASIBA became part of a local network that constituted an indigenous resurgence. The institutional presence of actors such as IPHAN and DSEI was a political opportunity for highlighting the indigenous presence in Barcelos. With the help of this mobilizing structure (McAdam, Tarrow, and Tilly 2001), ASIBA was able to build support for their demands and struggles. This process of territorialization developed within a national context, where policies of affirmative action for ethnic groups and minorities were being developed and implemented (Almeida 2004). For indigenous

peoples, these policies were a direct consequence of the recognition of their rights by the Constitution of 1988.

In 2001, ASIBA started to engage rural communities, making visits to survey indigenous populations, and discussing issues of identity, independence from patronage work relations, development of the agriculture for self-sufficiency, and information about indigenous lands. Four rural assemblies were set up, and, as a result of the discussions, ASIBA sent a document to the local FUNAI office requesting the demarcation of indigenous lands in the sub regions of the Aracá/Demeni basin, Padauri/Rio Preto basin and the right bank of the RN and Caurés basin. Each of these sub-regions created their own rural indigenous associations. Each association elected their representative leaders in sub-regional assemblies, which in turn is connected with elected ASIBA leaders. In 2007, FUNAI established several technical groups (GTs) to conduct studies to evaluate proposals for the legal recognition of indigenous lands.

ASIBA had initial support from two NGOs, Caldes Solidaria (a Catalan NGO) and Fundação Vitória Amazônica (FVA), for economic projects involving agriculture and handicrafts. More recently, ASIBA strengthened its relations with FOIRN and ISA. In this partnership, ASIBA implemented a communication and transportation network by providing radios to rural communities and boats for sub-regional associations. Since 2008, ASIBA, FOIRN and ISA have held workshops on participatory mapping of natural resource use and conflicts, which have resulted in proposals for management plans to improve natural resource governance in rural areas (ISA 2010, 2011, 2012a). In November 2008, ASIBA, FOIRN and ISA organized a workshop (I Seminário de Ordenamento Territorial) to discuss territorial planning in the municipalities of Barcelos

and Santa Izabel do Rio Negro (ISA 2008, 2009a). Rural communities, local associations and NGOs discussed indigenous territories and state proposals for the creation of protected areas in Barcelos and Santa Izabel do Rio Negro. A preliminary mapping exercise was conducted to organize the demands of rural communities in relation to conflicts, as well as areas of traditional use and importance for conservation. They discussed legal mechanisms that could ensure the protection of important natural resources for rural community residents.

In July 2009, ASIBA organized a public meeting with their associations to discuss the infrastructure for education and healthcare, as well as the migration to urban areas (ISA 2009b). On the last day of the meeting, the participants marched to demand the demarcation of their indigenous lands. At the end of the protest, they went to the local government office to demand the legal recognition of indigenous peoples in the municipal law.

Early in October of the same year, ASIBA held a second seminar (ISA 2009c, 2010), in order to continue the discussion about territorial planning and participatory mapping of rural areas with regard to natural resource use and conflicts. The meeting was well attended by local urban and rural associations, NGOs and local government representatives. However, due to some misinformation that the seminar intended to “close rivers” by delimiting areas through mapping exercises, there were protests in the city against the demarcation of indigenous land. These protests were promoted by the Piassava Extractors Cooperative (Cooperativa de Piassabeiros do Médio e Alto Rio Negro, or COPIAÇAMARIN) and the Fishermen’s Association (COLPESCA Z-33), with the support of councilors of the local government. Carrying banners against the

demarcation of indigenous lands, the protesters were invited to attend the indigenous territorial planning seminar. Those against the indigenous movement argued that land demarcation was being made in an obscure way, and disregarded the town's residents, fishermen and extractivists who were born and raised in the region. These protests created a hostile environment for rural communities living in Barcelos (Peres 2011).

Those who opposed to the demarcation of indigenous land in Barcelos questioned the authenticity of the indigenous population in Barcelos, since they consider this population to be "mixed." They accused the NGOs and their international financier of influencing caboclos to identify themselves as indigenous. Their discourse aligned with a dichotomous vision of traditional/rural versus acculturated/urban indians. At stake for this urban opposition was the loss of their rights to natural resource extraction as result of land demarcation. Natural resource extraction has been carried out without restrictions, which compromises the availability of resources for rural communities.

From an ethnic identity perspective, indigenous mobilization emerged as result of distinct ethnic groups demanding recognition of indigenous identity and culture (Jackson and Warren 2005). These arguments are posed against state policies based on the ideology of assimilation. In Barcelos, the presence of indigenous people and culture was historically denigrated and officially denied. Engaging in ASIBA, indigenous people and their descendants living in Barcelos were able to question the caboclo label and thereby revive their indigenous identity (Peres 2003, 2011; Pereira 2007).

Perceptions of ethnic identity were also influenced by the national and state context. The installation of infrastructure for indigenous health care, financed by the

federal government, legitimized indigenous people's presence, in the face of denials by urban elites. Although indigenous authenticity is questioned in discourses against land demarcation, it is not questioned by local governments that are benefiting from the federal government's investment in indigenous healthcare. In addition, despite resistance, ASIBA has contributed to the strengthening of rural indigenous identity by providing political support for the process of demarcation of indigenous land (Pereira 2007; Peres 2011). This land demarcation is still being evaluated by FUNAI and the Brazilian government.

Historical migration flows were a key factor in the constitution of the local indigenous movement. Both migration flows – the regional flow from São Gabriel da Cachoeira and Santa Izabel do Rio Negro to Barcelos's rural and urban areas, and local circulation among rural communities and sitios and Barcelos town – were the key for the spread of the indigenous movement in Barcelos. Migration linked previously unconnected sites, which became a key mechanism for a "scale shift", which McAdam, Tarrow, and Tilly (2001) refer to as "brokerage". This scale shift allowed for the transmission of information from one place to another. Migrants from the Upper RN River were brokers who contributed to the mobilizations by drawing on their previous experience in the indigenous social movement, helping to maintain connections between the Upper and Middle RN. The spread of a movement between two places depends on actors in both locations having a mutual identification about the reasons for mobilization. This is the second mechanism of a social movement scale shift: the "attribution of similarity" (McAdam, Tarrow, and Tilly 2001; Tarrow and McAdam 2005) or "frame bridging" (Snow and Benford 1988, 1992). Mobility and migration contributed

to the linkage of people from different regions who held in common cultural practices as indigenous peoples. Interactions between them contributed to the (re)creation of common identities. Migration may hinder relationships with the origin community, but unites migrants around a common identification of their social position inside the urban world (Figoli and Fazito 2009).

The indigenous movement scale shift in Barcelos started first with ASIBA's emergence in the urban area, and later spread to rural areas. The movement leveraged rural–urban interactions established via local circulation and kinship networks, both by maintaining a radio communication system and by holding meetings in rural areas, all of which increased opportunities for interactions that supported a mobilization network in the service of rural communities. Rural communities thus engaged with ASIBA and created their own associations, incorporating the same model as employed previously in the Upper RN. The participation of rural communities in the indigenous regional network in turn built capacity for coordinated action and resistance against labor exploitation, paternalistic relations with the local government, and disputes over natural resources including land. Interactions through political networks thus strengthened the shared sense of indigenous identity among rural and urban indigenous peoples by increasing their participation in local and regional political spaces.

### **Conclusions**

ASIBA's organizational model followed the larger process of indigenous “associativism” and ethnic resurgence that had begun in the 1980s in the Upper RN. The alliance between ASIBA and FOIRN inserted these regional indigenous groups into a larger multiscale network of indigenous mobilization. Common identification between different sites served to justify political action in the form of “associativism” (Peres 2003,

2011), leading to coordinated actions and tactics based on other experiences (Tarrow and McAdam 2005).

Contrary to the movement in São Gabriel da Cachoeira and Santa Izabel do Rio Negro, which was born under the flag of demarcation of indigenous land, the movement origins in Barcelos developed in a context of mobilization to recognize and appreciate indigenous culture, to demand better urban living conditions (such as access to education and health care services), and to open markets for handcrafted products. Now that the indigenous presence is openly acknowledged in Barcelos, and ASIBA is institutionally recognized, the focus of indigenous mobilization has shifted towards the demarcation of indigenous land and rural ethno-development. Presently, mobilization for land demarcation is the main reason for political contention in Barcelos. This demarcation would confer legal rights to rural indigenous communities not only over the land but also over natural resources, which are in dispute by the urban elites.

McSweeney and Jokisch (2007) suggest that urbanization and indigenous rural outmigration are factors contributing to indigenous mobilization in rural territories. This paper has corroborated this argument, presenting a case study of how indigenous mobilization spread in RN and specifically how rural-to-urban migration contributed to indigenous political mobilization in both urban and rural areas. I argued that migration and mobility can become key mechanisms for a “scale shift” of social movements and indigenous territorialization. Mobility and migration do not necessarily result in the emptying of traditional territories; to the contrary, these migration flows can support regional multi-local networks for mobilization, with the potential to contribute to processes of territorialization. Future research is necessary to clarify whether this

positive relationship between migration and social movement scale shifts is present in other Amazonian regions and indigenous groups.

Table 2-1. Barcelos population according to 1991, 2000 and 2010 Brazilian censuses.

	Year	Total population		Non-indigenous population		Indigenous population	
		(total)	(index)	(total)	(index)	(total)	(index)
Urban	1991	4018	100	3888	100	130	100
	2000	7954	198	7785	200	169	130
	2010	11157	278	9787	252	1370	1054
Rural	1991	7017	100	5544	100	1473	100
	2000	16243	231	10225	184	6018	409
	2010	14561	208	7564	136	6997	475
Total	1991	11035	100	9432	100	1603	100
	2000	24197	219	18010	191	6187	386
	2010	25718	233	17351	184	8367	522

Source: Sobreiro (2015). IBGE database (2012a).

### CHAPTER 3

#### URBAN-RURAL LIVELIHOODS, FISHING CONFLICTS AND INDIGENOUS MOVEMENTS IN THE MIDDLE RIO NEGRO REGION OF THE BRAZILIAN AMAZON

The Amazon rainforest has become increasingly urbanized since the 1980s (Browder and Godfrey 1997). Nowadays, more than 70 percent of the Brazilian Amazon's population lives in cities (IBGE 2013a). Scholars who study urbanization generally focus on agricultural frontiers (Becker 1985; Browder and Godfrey 1997), but urbanization has recently emerged as a driving force of transformation in forested areas far from frontiers (Guedes et al. 2009; Eloy et al. 2014).

After the 1988 Brazilian Constitution was approved, the state began to recognize many rural areas as indigenous and traditional territories, after different groups mobilized to demand recognition of their identity, culture and rights over traditional land and natural resources (Cunha and Almeida 2000; Almeida 2011; Allegretti and Schmink 2009; Bolaños 2011). Traditional groups had the opportunity to gain recognition as social subjects with collective territories and specific livelihoods. The law recognizes different sorts of territorial rights such as indigenous land, extractive reserves and sustainable development reserves (Little 2002; Almeida 2011; Schwartzman and Zimmerman 2005); rights over aquatic territories under fishing agreements (Castro and McGrath 2001); or rights subject to integrated use agreements (Fabr   et al. 2011). The recognition of these territorial rights is part of a larger national strategy of rainforest conservation (Nepstad et al. 2006).

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The historical relationship of an indigenous people with a rural territory may determine who has rights to land and natural resources. However, in many cases, regional and international economies have driven migration between different areas (Alexiades 2009; Pinedo-Vasquez and Padoch 2009). Similarly, better access to transportation and information has allowed people to move between urban and rural areas (Padoch et al. 2008; Pinedo-Vasquez and Padoch 2009). These “multi-sited” households continue their economic activities in rural areas while depending on income from urban activities. Other households may migrate to the city or settle near urban areas for educational and health services, which can contribute to the abandonment of traditional areas (Parry et al. 2010).

Mobility and increasing interactions with urban areas extend rural social networks to incorporate local towns and regional cities, strengthening indigenous social capital and political organization (Bernal and Mainbourg 2009). However, deficient services in rural areas can cause rural out-migration (Parry et al. 2010). The “de-territorialization” this creates contrasts with rural “territorialization” – the legal recognition of indigenous lands, protected areas and rights over rural natural resources (McSweeney and Jokisch 2007). Urbanization demonstrates how traditional territorialities are perpetuated through demographic movement and redefinition of social networks (McSweeney and Jokisch 2007; Eloy et al. 2014).

This paper contributes to the analysis of changing urban–rural dynamics, presenting a case study where interactions such as the development of an indigenous network, rural–urban mobility and migration have posed opportunities and challenges for the management of aquatic natural resources in the municipality of Barcelos in the

Middle Rio Negro region of the Brazilian Amazon. First, I set the region's rural livelihoods and recent urban–rural dynamics in historical context. Second, I describe the nature of fishing activities in Barcelos and a typology of fishing conflicts between rural and urban stakeholders. Third, I describe the formation of the indigenous rural–urban network, which works to ensure rural communities retain their rights over traditional fishing territories in cases of conflict with other interest groups. Focusing on conflicts reveals how institutional alternatives for resource management can evolve in a public arena in which all actors have a voice, contributing to more democratic and sustainable use of aquatic resources in the Amazon. Finally, I discuss how growing interdependency between rural and urban spaces represents both an opportunity and a challenge for fishing management and rural livelihoods, even in a context of weak land rights, competing fishing interests and government deficiencies.

### **Methods**

I conducted interviews and collected ethnographic data in Barcelos between 2005 and 2013. Between 2005 and 2007, I collected data in four rural communities using semi-structured interviews (n = 43 households) addressing the nature of fishing activities, the areas in which communities claim/exercise fishing rights, and conflicts between community residents and other users. I also interviewed other fishing stakeholders about fishing activities and conflicts with rural communities: commercial fishermen from urban areas (n = 25), fishermen who collect live fish for aquaria (n = 5), sport fishing guides (n = 9), sport fishing entrepreneurs (n = 5), representatives of the fishermen's union (n = 2), and the municipal officials responsible for tourism and the environment (n = 2). I asked open questions about episodes of conflict, the actors' perceptions about conflicts and their relationship with other fishing actors. Qualitative

analysis of all the semi-structured interviews and fieldnotes, which I transcribed, coded, and analyzed is the basis of the conflict typology presented in Table 3-3.

Between 2006 and 2010, while researching public policies affecting sustainable fisheries, I surveyed 93 stakeholders involved in fishing in Barcelos about the economic and social organization of the fisheries. Using these data and my field notes, I identified the main types of fishing in Barcelos and updated the conflict typology.

In 2011, I conducted semi-structured interviews with twelve representatives from the indigenous movement and leaders from rural communities and collected further ethnographic data. Interviews focused on the history of the indigenous movement in Barcelos, the role of indigenous organizations in community development, fishing conflicts and proposals for fishing management. I also participated as an observer in participatory mapping of subsistence fishing areas/territories with the leaders of three rural communities. Two years later, I spent three months in Barcelos, conducting participant observation of the activities of indigenous associations such as meetings, assemblies and trips to rural communities. I transcribed, coded and qualitatively analyzed my interviews and field notes from 2011 to 2013. This source material contributed to my understanding of the role of the indigenous movement in fishing management and its relationship with rural communities and urban–rural interactions, as well as my understanding of ongoing conflicts in rural areas.

### **Barcelos and the Middle Rio Negro**

The town and municipality of Barcelos are located in the Middle Rio Negro basin region in the north-western Brazilian Amazon. The area encompasses 122,476 km<sup>2</sup> (IBGE 2013a). It is a relatively isolated region with no road connecting it to other municipalities, and most of the area is forested.

Catholic missionaries founded Barcelos in 1728; thirty years later it became the first capital of Amazonas state, the main Western Amazon colonial power in the eighteenth century (Reis 1999). At that time, Barcelos was an important port trading indigenous slaves and exporting extractive products, and its urban population consisted of 2000 indigenous people of different ethnicities (Ferreira 1959). After Manaus became the capital in 1807, the region declined as a political and an urban center.

The Middle and Upper Rio Negro housed a range of ethnic groups that maintained inter-ethnic relations before and after colonization (Guzmán 2009). Some of the indigenous inhabitants mixed with Europeans and Africans during the eighteenth and nineteenth centuries (Guzmán 2009). During the nineteenth-century rubber boom, the missionaries encouraged some indigenous groups to move downriver to work on native rubber extraction (Meira 2000).

The rubber boom brought economic growth to the Rio Negro region from 1880 to 1925. After the 1920s, rubber exports declined, except for a brief resurgence during World War II (Santos 1980). Between 1970 and 1985, many indigenous people moved to the Middle Rio Negro tributaries to work on *piassava* (fiber from a native palm tree, *Leopoldinia piassaba*) extraction (Emperaire and Eloy 2008). Rubber production ceased entirely in the mid-1980s. *Piassava* and ornamental fish became the main extractive products of the Middle Negro region, maintaining the system of debt peonage carried over from the era of rubber production (Meira 2000).

A Salesian mission was founded in Barcelos at the beginning of the twentieth century (Machado 2001). The missionaries repressed the remaining indigenous cultural traditions and languages, consigning indigenous children to boarding schools. In the

1970s, the missionaries organized indigenous and riverine people into *comunidades* (rural villages or communities) along the rivers. They brought isolated extractivists together, breaking with the debt peonage system and encouraging subsistence agriculture.

Currently most public and private services in the Barcelos municipality are concentrated in the small municipal center, with 11,157 inhabitants. Between 2001 and 2010 the urban population increased while the rural population decreased (Table 3-1). However, in 2010, 56.6 percent of the population was still living in the countryside. Barcelos has 48 rural communities, all located along watercourses. Residents include indigenous and non-indigenous households with diversified livelihood strategies based on shifting agriculture, hunting, fishing, *piassava* fiber collection and Brazil nut collection. Most of the rural population of Barcelos lives in *comunidades*, rural settlements recognized by the municipal authorities. Catholic missionaries created the first villages, but nowadays a settlement of just a few families in a rural area can gain recognition as a *comunidade*. Groups with kin relations tend to live together in *comunidades*.

Until recently, some residents of Barcelos considered its indigenous population to be acculturated and dubbed them *caboclos* (civilized Indians) (Peres 2003). Scholars consider *caboclos* to be the traditional Amazonian peasantry, descended from both indigenous peoples and Europeans and, later, migrants from the north east of Brazil (Lima 2009). Indigenous cultures and a long period of adaptation to the Amazon environment influenced *caboclos'* livelihoods, such as the adoption of swidden agriculture and extractivism strategies (Nugent 1993). Colloquially the term *caboclo* is

ambiguous, and in some contexts it is used in a derogatory sense. As Lima (2009) argues, *caboclo* is as a relational term, identifying a category of people considered to occupy a lower social position in relation to the speaker's position.

Indigenous people in Barcelos are descendants of different ethnicities whose languages come from the Aruak and Tukano linguistic families. The main ethnicity is Baré, followed by Baniwa, Tukano and Desana. However, the presence of indigenous in Barcelos was denied by local government, and residents of Barcelos look down on those displaying any indigenous ancestry (Peres 2003). The shift in this indigenous invisibility began in 1999, when the National Institute for Historical and Artistic Heritage hired indigenous leaders living in Manaus to investigate the presence of indigenous people in Barcelos and to implement an Indigenous Special Health District in the Upper and Middle Rio Negro. This research led indigenous people to meet to discuss the issues affecting them, and these meetings called attention to the urgency of documenting the presence of indigenous culture in Barcelos.

The second such meeting, in December 1999, created the Barcelos Indigenous Association (ASIBA). A larger process of indigenous organization and ethnic reaffirmation that began in the 1980s in the Upper Rio Negro (Peres 2003) had created the Rio Negro Indigenous Organizations Federation (FOIRN), with support from the nongovernmental organization Instituto Socioambiental (ISA). ASIBA joined FOIRN in a mobilization network that led to a redefinition of identities and indigenous resurgence in Barcelos, emerging first in urban areas and later spreading to 35 rural communities.

Against this backdrop, the indigenous population of Barcelos increased five-fold from 1991 to 2010 (Table 3-1) (although Brazilian census methods had probably

underestimated the indigenous population in 1991: Santos and Teixeira 2011; IBGE 2012b). While the non-indigenous population decreased by 7 percent, the indigenous population increased by 136 percent between 2000 and 2010. In the urban area, the indigenous population increased by 934 percent, while the non-indigenous population grew by 52 percent. In rural areas, the total population declined by 23 percent; the non-indigenous population declined by 48 percent, while the indigenous population grew by 66 percent. The strong increase in the indigenous compared with the non-indigenous population, especially in the urban area, suggests the role of ethnic reaffirmation in the changes recorded. Rural out-migration probably also contributed to the growth of the indigenous population in the town, but the available census data make it difficult to estimate the extent of this impact.

While indigenous identity in rural communities strengthened and the demand for land rights intensified, my interviews suggest that rural–urban mobility and multi-local strategies are even more important contributors to the changes observed. People go to urban centers to access services such as education and health care, to sell their agricultural and extractive products, to buy consumer goods and to collect monthly pensions and cash transfers through government social benefit programs.

The interview respondents identified the lack of schools, or in some cases, of post-primary schools, in rural communities as the main factor driving rural out-migration. They consider education the best way to improve their children's lives. In the four rural communities that I studied closely from 2005, all residents migrated to town from one of the communities, and most households maintain multi-local strategies in another

community. In both cases the respondents cited schools as the crucial factor.

Informants from other communities also underlined the importance of schools.

The process of rural out-migration tends to be gradual, with a few members of the family establishing economic activities in town, while other members continue resource extractivism in their rural community. Many families live in urban areas but retain agricultural land in rural or peri-urban locations. Some families may return to fish or hunt in the rural area in order to sell their catch in the urban center. In the process they maintain social networks with the rural origin community, forming a multi-sited community tied by kinship.

These urban–rural networks permit the circulation of cash, remittances, goods and gifts, and also of new technologies, tools, consumer preferences and skills. Kinship propels the formation of networks, but these networks also encourage the emergence of political relationships seeking to obtain benefits for the rural communities.

### **Fishing Livelihoods**

Fishing is essential for rural communities' food security, but other actors compete with communities for the resource. Various types of fishing – subsistence, commercial (for human consumption), ornamental (for aquarium) and sports fishing – are all important economic activities in Barcelos (Table 3-2). Large seasonal variations in aquatic environments influence fishing affecting both fishing techniques and the composition of the catch. In the dry season, low water levels reduce aquatic habitats and fish are easier to catch.

Fishing is an aspect of rural livelihood strategies that rely on multiple natural resource use. Subsistence fishing is an everyday activity for household or community consumption. All rural households and some urban and peri-urban households rely on

subsistence fishing, which typically occurs close to the place of residence, where people can go paddling in canoes. Residents devote approximately a couple of hours per day to fishing, depending on their household's protein needs and the seasonal availability of fish. Fish is consumed immediately or conserved, salted or smoked. Some residents complement other income sources with ornamental or commercial fishing or by acting as guides for those going sport fishing.

Ornamental fishermen collect small live fish, primarily Cardinal (*Paracheirodon axelrodi*), for export and sale on the national and international aquarium markets. They collect fish in streams and lakes using small nets and fish traps, and sell them to an intermediary. Intermediaries order a specific quantity of fish in advance, and the fishermen deliver the fish in the town.

Ornamental fishing became a significant part of the Barcelos economy in the 1960s; Prang (2001) estimated that ornamental fishing represented 60 percent of the municipality taxes revenue in the 1990s. However, competition with species reproduced in captivity abroad has caused a decrease in international fish prices in the past ten years and ornamental fishing produced the same income, making no allowance for inflation, in 2009 as it had done twenty years previously (CEPAM 2009).

Rural households that used to rely on ornamental fishing report that they have shifted to commercial fishing, agriculture and extractivism. As older fishermen retire, the younger generation seeks other employment. Former ornamental fishermen from urban areas reported that they are working in commercial fishing, as sports fishing guides or in low-skilled jobs.

Commercial fishing targets a range of edible fish using low-technology methods and equipment. Most of the commercial fishermen in Barcelos are urban residents or migrants and, unlike rural fishermen, fishing tends to be their only economic activity. Thirty percent of the commercial fishermen I interviewed (n = 67) operate independently, fishing daily in their own canoes propelled by small engines, while 70 percent work for boat owners in trips varying from two to five days. Boat owners advance the fisherman money for fishing supplies, forming a patronage relationship. The larger boats store fish in compartments filled with ice with a maximum capacity of 5 tons. Fish are either sold in Barcelos itself or shipped in boats and ferries to São Gabriel da Cachoeira (SGC). In October 2009 between 2 and 4 tons of fish were sent to SGC town weekly. A limited quantity of fish is sent to Manaus.

Voluntary declarations from 152 fishermen between June 2008 and May 2009 suggested a total catch of 160 tons of edible fish (an average of 257 kg/fishermen/month). Membership in the Barcelos Fishermen's Union (COLPESCAZ-33) increased from 231 to 961 between 2007 and 2013. The number of boats engaged in commercial fishing increased from four to thirteen between 2008 and 2013 (Data from COLPESCAZ-33). These data indicate a growth in commercial fishing stemming from the installation of an ice factory in Barcelos in 2007, an increase in urban demand for fish, the economic decline of ornamental fishing and migration to urban areas.

Sports fishing started in Amazonas state in the 1990s (IPAAM 2001). Approximately 1500 tourists per season come to Barcelos, more than any other Amazon location, to practice catch-and-release of peacock bass (*Cichla sp.*). Sports fishing businesses operate in hotel-boats travelling around the rivers of Barcelos

searching for the best fishing areas; Barcelos had 12 of these hotel-boats in 2006 and 23 in 2012. The sports fishing season lasts from September to March, coinciding with the peak in commercial fishing activity. Most guides are urban fishermen who work seasonally, taking tourists up to the fishing areas.

### **Fishing Conflicts**

Fishing is a classic common pool resource, mainly because “exclusion is difficult and joint use involves subtractability” (Berkes and Farvar 1989, 7). Any registered fisherman can exploit fisheries resources providing they observe specific regulations in Brazil, but subsistence fishing does not require registration. In the Amazon, some areas function under an “unregulated common property regime” (Baland and Platteau 1996, 49), meaning that diverse stakeholders fish with minor restrictions. Large rivers and high monitoring costs make it impossible for the state to control most fishing.

Successive state decrees have sought to protect the fish stock in the Middle and Upper Rio Negro regions, which together are less productive than the floodplain areas, since 2001. The state sought to ban the commercial Manaus fishing fleet from fishing in Middle and Upper Rio Negro to preserve sports fishing. Only registered local fishermen can fish commercially. The decree recommended that the state environmental agency carry out studies to establish a sound basis for fishing zoning and management rules. The agency is responsible for monitoring and enforcing the law, but it has not taken any action to manage fisheries or enforce regulations. Commercial fishing landing data are limited and no data about fish stocks exist, but a range of users report that fishing has become less productive in Barcelos.

Overlapping use of the same fishing areas and distinct models of appropriation and use of resources have led to rising conflict between different stakeholders in

Barcelos. When the interests of two or more stakeholders clash, conflicts emerge. Table 3-3 summarizes the most common conflicts.

Rural residents consider aquatic environments next to their dwellings as extensions of their home territory. For those involved in subsistence fishing, maintaining control over the nearest fishing territory is aimed at maintaining high fishing productivity, reducing the time required to meet a household's protein needs. Their interests clash with those of urban commercial fishermen and those engaged in sports fishing, when these actors "invade" rural communities' territories. Ornamental fishing does not compete for resources with subsistence fishing.

Communities consider urban commercial fishing a legitimate activity. However, conflicts arise when fishermen use technologies that damage fishing ecosystems, such as trawling, the use of explosives and discarding fish species caught unintentionally. On the other hand, local commercial fishermen argue that they respect communities' fishing areas, and that illegal boats from Manaus are responsible for the incursions.

Communities complain about sports fishing motorboats disturbing fishing and flooding their ports. They believe that catch-and-release harms the fish, which will become easy prey for predators or die, and complain about garbage abandoned on beaches along the river. In 2006 informants described a sports fishing entrepreneur's abuses. The entrepreneur harassed commercial fishing boats, prohibited rural residents from fishing peacock bass and from hunting in exchange for fuel, and caused internal conflict in the communities between those residents who complied with this deal and those who did not.

Communities want a share in sports fishing profits. Some communities charge sports fishing companies for access to fishing areas or for exclusive use of fishing areas. Not all companies agree to pay, since the municipal government charges tourists fees and since the tourists must also pay for a state fishing license. When companies do pay the communities for access, internal conflict can arise over the distribution of payments.

Communities point to their historical territorial rights when they call for exclusive fishing rights in their subsistence fishing areas and for the designation of specific areas dedicated to commercial and sports fishing. Sports fishing companies based in hotel-boats dislike fixed fishing zones, preferring to fish wherever water levels will generate good chances of catching peacock bass.

A combination of a lack of legal definition of fishing rights and increased commercial and sports fishing has aggravated these conflicts. The state environmental agencies (SDS/IPAAM) oversee fishing regulation and management, but they do not have an office in Barcelos. The municipal government complains of a lack of resources for monitoring fishing activities. Sports fishing has a strong lobby in state and municipal governments, since Barcelos is the main sports fishing destination in the state.

Of all the actors involved in fishing, it is rural communities that are hurt worst by a decline in fish stocks, but they have the least power. In previous work, Sobreiro and Freitas (2008) stressed that the lack of government support for rural communities limits their power to manage fishing resources. However, the urban indigenous movement has begun to change the power differences among actors, and new stakeholders have begun to intervene in the debates about fishing. Rural communities' complaints about

fishing problems in Barcelos received serious consideration only after mobilization around indigenous rights had emerged. In the next section I consider the indigenous movement in Barcelos and how it became involved in demands for management of the fisheries.

### **Indigenous Movement and Management of the Fisheries**

Created in 1999, ASIBA developed to demand better conditions for indigenous peoples through access to social services (education and health), a market for handcraft products and recognition and appreciation of indigenous culture (Peres 2003). In 2001, ASIBA started to engage 35 rural communities, visiting indigenous populations to discuss issues of identity and indigenous lands. Alliances between regional movements and NGOs in Barcelos helped to consolidate the new urban–rural networks. With the political and financial support of FOIRN and legal advice from ISA, ASIBA became part of a local network promoting a resurgence of indigenous identity.

As a result of discussions of rural community issues in four rural assemblies, ASIBA sent a document to the National Indian Foundation (FUNAI) requesting demarcation of indigenous lands in sub-regions of the Aracá/Demeni basin, Padauri/Rio Preto basin, the right bank of the Rio Negro and the Caurés basin. Each sub-region created its own rural indigenous association with elected leaders interacting with ASIBA and FOIRN leaders. FOIRN has installed a radio communication network in most indigenous communities, connecting them to ASIBA's office and to other communities.

In 2007, FUNAI established technical groups that have been conducting studies supporting claims for legal recognition of indigenous lands. The indigenous movement in Barcelos seeks the demarcation of indigenous land, but many urban stakeholders

such as the municipal government, COLPESCAZ-33, sports fishing entrepreneurs, and *piassava* sellers (who fear losing control of *piassava* extraction areas) have sought to block demarcation. The studies have not yet been completed, and they will have to be analyzed by several federal government institutions when completed. It will probably be many years before a final decision on demarcation is reached.

As the drive to demarcation has stalled, the indigenous movement has turned its attention elsewhere. Since 2008, ASIBA, FOIRN and ISA have held workshops to discuss indigenous territories' use of natural resources and the conflicts that have emerged in this respect. The workshops have resulted in proposals for management plans to improve natural resource governance in rural areas (see also ISA 2011). Conflicts over fishing emerged as a key theme in discussions with rural communities. Given the urgency of finding a solution to these conflicts, ASIBA, ISA, and FOIRN promoted participatory mapping, discussing proposals for managing the fisheries. They met separately with community residents and with urban commercial fishermen, mapping fishing territories and discussing proposals for zoning. In September 2011, a workshop took place in Barcelos with the participation of SDS/IPAAM, the indigenous peoples' state agency, the federal fisheries and aquaculture agency, residents of indigenous and non-indigenous rural communities, fishermen and sports fishing companies. This process generated maps with proposals for *acordos de uso* (resource use agreements).

The indigenous network presented proposals for *acordos de uso* (managing the fisheries) officially in a meeting with the Amazon state government agencies in March 2012 (ISA 2012a, 2012b). They focused on legal recognition of the areas used by rural

communities for subsistence fishing and restrictions on both commercial and sports fishing in traditional territories. They presented specific proposals for each river basin and called for scientific studies of the fishing capacity in each area, regulations governing commercial fishing (frequency of fishing trips allowed, boat size and gear permitted, permissible catch per commercial fishing operation, and regulations governing sports fishing—control of boat traffic, garbage management, appropriate norms for hiring community guides). They also requested effective government monitoring and law enforcement. However, as of 2013 these efforts to launch a fisheries management plan had stalled.

The federal public prosecutor (MPF) visited Barcelos in December 2013 to investigate complaints from rural communities about sports fishing. The MPF recommended that the municipal government establish regulations for sports fishing, consulting rural communities before doing so. They recommended the immediate prohibition of boat traffic in rural communities' traditional areas, such as lakes for subsistence fishing, areas used to supply water for human consumption and other everyday needs. The MPF also requested a breakdown of how the income from sports fishing fees raised during the 2013 season was spent. They recommended that the municipal government invest part of the funds raised in public services and improvements to rural community facilities.

### **Fishing Management and the New Urban–Rural Dynamics: Opportunities and Challenges**

The indigenous network in Barcelos has proposed fisheries zoning and regulation through *acordos de uso*. This alternative would protect subsistence fishing in traditional territories while also considering other fishing stakeholders' interests.

However, there are some significant barriers to implementing these proposals, or indeed any other fisheries regulation. First, land tenure is not legally defined in these traditional areas, and this affects the fisheries. The unresolved land demarcation process causes insecurity for rural residents. Since traditional indigenous territories are not recognized as such, urban users such as commercial and sports fishermen do not respect them; nor do hunters, *piassava* merchants, loggers or miners. The chance that demarcation will deny these actors access promotes irresponsible natural resource use by non-residents.

Second, there is a range of different and competing interests involved in fishing in Barcelos, with varying levels of economic and political power. Even within a single stakeholder group, actors may disagree. For example, boat-based sports fishing companies oppose the creation of fishing zones because they do not want any restrictions placed on their movements. The larger companies, however, support fishing zoning, because they can afford to pay communities for exclusive access to their waters. Commercial fishermen with big boats may hire community residents to fish in the reserved areas, aligning the economic interest of those residents with their own, while other community residents oppose such strategies. In the absence of regulation, community residents will be caught in the middle of disputes over access to fishing areas. Finally, the institutions legally responsible for fishing governance are ineffective. State and municipal governments do not fulfil their fishing regulatory and law-enforcement roles. They attribute this failure to a lack of economic and human resources, but investing municipal and state sports fishing fees in fisheries regulation and law enforcement might alleviate this problem.

In this context of ill-defined rights and duties and unbalanced power relations among stakeholders, the development of an indigenous network has lent new impetus to negotiations about fisheries management and natural resource use in Barcelos. The indigenous movement has built on urban–rural interactions established via local circulation and kinship networks. Working together in pursuit of political aims has strengthened the shared sense of indigenous identity among rural and urban indigenous peoples, increasing their participation in local and regional politics. Social groups with a common identity and similar problems have been better able to mobilize to pressure governments (Bicalho and Hoefle 2009). Participation in the network has provided an opportunity for rural communities to learn about their rights and to unite around their shared problems. Maintenance of a radio communication system and meetings in rural areas have increased opportunities for interaction and mobilization, building capacity for coordinated action and resistance in the context of fishing disputes.

The urban–rural indigenous network, composed of rural communities, ASIBA, FOIRN and ISA, has advocated the *acordos de uso* model. This model is based on the Amazonian “fishing agreements” model (Almeida et al. 2009), where all actors are involved in defining fisheries regulations in a particular area, but the regulations tend to prioritize the interests of subsistence fishermen. Indigenous networks presented a fisheries plan to state and municipal governments in 2012, but the authorities have not adopted this plan. The indigenous movement sought support from MPF, a new, federal, actor in these disputes. The MPF is trying to oblige municipal government to implement fisheries regulations and to make its use of sports fishing fees more transparent. Like indigenous organizations in other areas of the Amazon, indigenous peoples in Barcelos

have been able to scale up sustainable development politics beyond the local level (Bicalho and Hoefle 2009).

The intensification of urban–rural interactions in Barcelos brings opportunities for political mobilization but also creates tensions over collective rights, territorial boundaries and household livelihood strategies. Rights over traditional territories in the Amazon are usually tied to traditional identities, long-term residence and conservation of natural resources (McSweeney and Jokisch 2007; Alexiades 2009). These may not be compatible with new individual and household livelihood strategies involving mobility between rural and urban spaces.

Mobility allows households to access services and markets while maintaining their traditional activities and their use of natural resources. The model for fisheries management that has been proposed in Barcelos does not, however, allow for such mobility. As with other community-based management schemes, this model is based on the premise that communities need exclusive and permanent rights to use their natural resources sustainably (Ostrom 1990; Agrawal 2001). The right to the resource is tied to community membership, normally defined by residence. Communities involved in the agreement must reside in locations close to the fishing spots. However, in Barcelos the existence of multi-sited households and increased rural–urban mobility challenges the idea of community membership. Defining who is urban and who is rural thus becomes difficult because multiple livelihood activities connect people to different places.

Fisheries agreements usually limit or prevent commercial fishing in community subsistence areas (Castro and McGrath 2001). Some rural indigenous households are also involved in, and in some cases dependent on, commercial fishing, and the same

also applies to some migrants in Barcelos town. If strict rules against commercial fishing were implemented, commercial fishing-dependent households might lose an important source of income. Strict regulation making commercial fishing unfeasible would benefit most rural communities and sports fishing tourism but might marginalize local commercial fishermen. Commercial fishing absorbs low-skilled labor (Béné 2003; Coomes et al. 2010), especially in urban areas of Amazonia (Batista et al. 2004).

The new urban–rural dynamics also involve rural-out migration. Entire rural communities have been abandoned due to lack of schools. In other Amazonian indigenous groups, young community members return to their traditional territories after completing their education in the towns (Tritsch et al. 2014). In Barcelos, however, many households maintain “permanent” residence in the town. In the Upper Rio Negro, Eloy (2008) found that once households obtained land in urban or peri-urban areas, and spent more time there, bonds among extended family members tended to weaken and households established permanent residence in town. In areas that have suffered massive rural out-migration and even abandonment, uncertain property rights can lead to overexploitation of fisheries and property speculation (Parry et al. 2010). Other studies (Nasuti et al. 2015; Tritsch et al. 2015) suggest that when the state recognizes indigenous peoples’ claims to traditional territories, they provide these groups with a degree of security that allows them to circulate without losing their rights over rural resources. The demarcation of indigenous land in Barcelos would bring property rights security, including exclusive control over important natural resources.

## **Conclusions**

Within a context of fishing conflicts, the new dynamics of urban–rural relationships present new opportunities and challenges for the management of aquatic

natural resources. New indigenous urban–rural networks have strengthened indigenous rural communities in Barcelos politically, contributing to a more democratic process of natural resource management. At the household and individual level, mobility and multi-sited livelihood strategies have increased economic options and allowed flexibility in resource use. However, circulation challenges resource-management models based on permanent rural residence. While clear land and water rights are important for the governance of natural resources (Ostrom 1990), more research is needed to shed light on community mechanisms regulating territorial membership and the impact of multi-sited households and migration on natural resources conservation.

Mobility and territorialization dynamics challenge the capacity of local people, users and policy-makers to manage natural resources in Amazonia. This complexity underscores the urgent need for ecological and political management models to deal with the flux of people and natural resources (Zimmerer 2000), while maintaining the heterogeneity of local needs (Strum 1994). Scholars suggest that efficient natural resources governance should involve actors from several scales (Brondizio et al. 2009) with multiple levels of political power (Hoefle 2000), and that it should be designed in ways that can be adaptive and experimental (Armitage et al. 2008; Berkes 2009). New models will be needed which account for human mobility and diversified livelihoods across different places and which do not exclude minority groups.

Table 3-1. Barcelos population according to 1991, 2000 and 2010 Brazilian censuses.

	Year	Total population		Non-indigenous population		Indigenous population	
		(total)	(index)	(total)	(index)	(total)	(index)
Urban	1991	4018	100	3888	100	130	100
	2000	7954	198	7785	200	169	130
	2010	11157	278	9787	252	1370	1054
Rural	1991	7017	100	5544	100	1473	100
	2000	16243	231	10225	184	6018	409
	2010	14561	208	7564	136	6997	475
Total	1991	11035	100	9432	100	1603	100
	2000	24197	219	18010	191	6187	386
	2010	25718	233	17351	184	8367	522

Source: Sobreiro (2015). IBGE database (2012a).

Table 3-2. Fishing in Barcelos and its Features

Fishing Type	Short description	Target species	Main gears	Seasons
Subsistence	Everyday fishing for household or community consumption	<i>Pacus</i> and <i>piranhas</i> (Characidae family), <i>aracus</i> (Anostomidae family), <i>carás</i> (Cichlidae family), <i>tucunarés</i> ( <i>Cichla</i> sp), <i>filhote</i> ( <i>Brachyplatystoma filamentosum</i> ), <i>surubim</i> ( <i>Pseudoplatystoma</i> sp), <i>pirarara</i> ( <i>Phractocephalus hemioliopterus</i> ), <i>traíra</i> ( <i>Hoplias</i> sp), <i>jacundá</i> ( <i>Crenicichla</i> sp)	Harpoon, longlines, line and hook, gillnets	All year (largest catches during dry season)
Commercial edible	Small scale commercial fishing exploring edible fish for local and regional markets	<i>Pacus</i> and <i>piranhas</i> (Characidae family), <i>aracus</i> (Anostomidae family), <i>carás</i> (Cichlidae family), <i>tucunarés</i> ( <i>Cichla</i> sp), <i>filhote</i> ( <i>Brachyplatystoma filamentosum</i> ), <i>surubim</i> ( <i>Pseudoplatystoma</i> sp), <i>pirarara</i> ( <i>Phractocephalus hemioliopterus</i> )	Gillnets and longline	All year (largest catches during dry season)
Ornamental	Small live fish collection, exported for national and international aquarist market	<i>Cardinal</i> ( <i>Paracheirodon axelrodi</i> ), <i>Apistogramma</i> sp, Loricariidae Family, <i>Carnegiella</i> sp, <i>Hyphessobrycon</i> sp, <i>Nannostomus</i> sp, <i>Hemigrammus rhodostomus</i>	<i>Cacuri</i> (small net trap) <i>Puçá</i> (sac format net)	August to May
Sport	Touristic recreational fishing in Barcelos predominated 'catch and release'	Main target is <i>tucunaré</i> -or peacock bass ( <i>Cichla</i> sp), but also diverse catfish species	Rod, reel, line and hook	September to February (dry season)

Source: Sobreiro (2015). Fieldwork surveys, Barcelos 2006 to 2010.

Table 3-3. Fishing Conflicts Summary.

Stakeholder in conflict	Causes
Rural communities vs. Barcelos commercial fishermen	Commercial fishing is not supported in subsistence fishing areas.
Rural communities/sport fishing vs. Illegal commercial fishermen (from outside Barcelos)	Use of illegal technologies considered damaging to fishing ecosystem such as trawling, explosives, selective fishing, or discarding bycatch.
Rural communities vs. sport fishing	Sport fishing is not supported in subsistence fishing areas. Rural communities charging money from Sport fishing companies.
Sport fishing vs. sport fishing	Companies paying to have exclusive rights to access communities' fishing areas.
Rural communities vs. sport fishing	Sport fishing high speed boats causing disturbance in artisanal fishing and flooding rural communities' ports and ornamental fish nets. "Catch and release" causing harm to fish.

Source: Sobreiro (2015). Fieldwork data, Barcelos 2006 to 2013.

## CHAPTER 4

### RURAL-URBAN CIRCULATION AND LIVELIHOOD STRATEGIES OF INDIGENOUS HOUSEHOLDS IN MIDDLE RIO NEGRO

There is an unequal spatial distribution of income sources between rural and urban areas in developing countries (Satterthwaite and Tacoli 2002). Infrastructure and services tend to be concentrated in urban areas, but housing is easier to access in rural zones. While rural livelihoods still depend on natural capital, urban areas provide more labor market options (Tacoli 1998, 2006). Urban-rural linkages are therefore becoming important since rural households are relying more on urban incomes, but many poor urban households also depend on natural resources and rural reciprocity networks (Satterthwaite and Owen 2006; Greiner 2011).

The increase in rural-urban linkages may be attributed to a worldwide tendency toward livelihood diversification and “deagrarianization”, which includes the rising importance of non-farm activities for rural households. “Urban–rural multi-sitedness is both a product and a cause of the decline in importance of agricultural production especially for the market, and its replacement by myriad income sources (...)” (Pinedo Vazquez and Padoch 2009, 92). This phenomenon is not new (Nugent 1993), but there is increasing evidence that it is becoming more widespread worldwide (Winklerprins 2002a, 2002b; Moreira 2003; Padoch et al. 2008; Newing 2009; Alexiades 2009; Eloy and Lasmar 2012; Peluso and Alexiades 2005; McSweeney and Jokisch 2007).

Livelihood studies have discussed the extensive spatial diversification of livelihood strategies (Trager 2005; Koenig 2005; Agesa 2004; Padoch et al. 2008; Tacoli and Mabala 2010; Brandao and Zoomers 2010; Elmhirst and Ressurreccion 2012; Thieme 2008; De Haan and Zoomers 2003; De Haas 2007). This phenomenon of engaging in activities in different places is supported by the circulation of people. At the

same time, circulation among locations maintains familial ties and other social relationships. As a result, circulation among locations to support livelihoods does not necessarily disrupt relations between household members, but also may maintains them (Koenig 2005, 78).

Rural-urban circulation has potential to increase access to markets and natural resources (Ellis 2003, Tacoli 2006). It also helps to constitute and maintain social networks that in turn permit the movement of not only cash, remittances, goods and gifts, but also new technologies, tools, consumer preferences, and skills (Levitt 1998; Pinedo Vasquez 2009). Networks are not only composed by kin relationships, but also political affiliations that can serve to mobilize resources for community and social movement goals (McSweeney and Jokisch 2007; Pinedo Vasquez 2009). In particular, rural-urban circulation provides access to governmental agencies and creates the potential to take advantage of various public payment programs.

Although normally associated with forest and rural areas, many indigenous peoples in the Amazon also maintain strategies of rural-urban circulation (Alexiades and Peluso 2015). Scholars and policymakers have shown growing interest in the influence of urbanization on indigenous peoples as their circulation between rural and urban areas has increased (Eloy and Lasmar 2012; Alexiades and Peluso 2015; McSweeney and Jokish 2015). Most academic work on these topics in the Amazon is based on ethnographic research that focused on indigenous migrants living in cities (Fígoli 1982; Bernal 2003; Bernal and Mainbourg 2009; Melo 2009; Chernela 2012), and rural-urban multi-local livelihood strategies (Brandhuber 1999; Lasmar 2005, 2008; Andrello 2006; Eloy and Lasmar 2012; Peluso 2015). Alexiades and Peluso (2015) argue that issues of

circulation and migration by indigenous people will become more important as socio-environmental conflicts increase around indigenous territories and as indigenous identity is contested when their presence increases in urban areas.

The implication is that many indigenous peoples in the Amazon span the rural-urban divide via linkages made possible by spatial mobility. However, rural-urban circulation is still poorly understood. This research therefore complements ethnographies by using quantitative data to examine the prevalence of rural and urban circulation among indigenous households based in rural indigenous territories. Although there are many factors influencing indigenous circulation (Alexiades and Peluso 2015), this article's focus is in the relationship between socioeconomic status, livelihood activities, and circulation.

## **Background**

### **Temporary Mobility and Circulation**

Mobility is defined here as a broad term that “refers to all forms of territorial movement by people” (Alexiades 2009, 4). It is temporary when change from one point in space to other does not imply a long term permanence in the new point. Many studies use the concept of multi-local or multi-sited households to deal with the extensive spatial diversification of livelihood strategies (Trager 2005; Koenig 2005; Agesa 2004; Padoch et al. 2008; Tacoli and Mabala 2010; Brandao and Zoomers 2010; Elmhirst and Rensuccion 2012; Thieme 2008; De Haan and Zoomers 2003; De Haas 2007). Multi-locality can be defined as “the attachment to and participation in social and economic activities in several places” (Trager 2005, 28). One way to understand the dynamic of multi-locality is to look at “circulation” of people, which are the short-term, frequent, or cyclical movements (Zelinksky 1971), with “continual returns to a “home-

base” after frequent journeys away” (Prout 2009, 412). The definition of a “home base” can be difficult when dealing with multi-local strategies (Weichhart 2015), but for the purpose of this study of indigenous peoples in the Amazon, the rural area is defined as the home base.

Temporary mobility and migration have long been part of rural livelihoods. While rural-out migration had received more attention (Ellis 2003; De Haas 2007, 2010), there is increasing interest in understanding temporary mobility and its relationship with livelihood strategies (De Haan and Zoomers 2005; De Haas 2007) and use of natural resources (Eloy et al. 2015; Emperaire 2015). In livelihoods studies temporary mobility represents opportunities for rural livelihood diversification (De Haan 1999; Ellis 2003), while in natural resource management studies there is an interest to understand the impacts of mobility on rural land use (Eloy 2008; Parry et al. 2010). For indigenous peoples, the study of circulation and multi-locality is a developing field. Population growth (McSweeney and Arps 2005), better transportation and more access to state policies have intensified indigenous mobility between rural and urban areas (Alexiades and Peluso 2015). While the literature describes diverse motives for mobility such as economic purposes, conflicts, and displacement (Brandhuber 1999; Alexiades 2009), the focus of this article is on the frequent and short-term movements that are important in indigenous livelihood strategies, especially the mobility of rural households to access key urban services and markets. Understanding circulation patterns can help to provide better services for indigenous peoples in both rural and urban areas, and to develop strategies for socioecological management of indigenous territories.

## **Livelihoods, Socioeconomic Status, and Circulation**

Individuals and households compose complex livelihoods by combining different assets and engaging in diverse activities that are mediated by institutions and social relations, thus constituting livelihood strategies (Ellis 2000; Bebbington 1999). One fundamental characteristic of rural livelihood strategies is diversification of activities and assets (Bebbington 1999; Ellis 2000). Activities can be divided into on-farm or natural resource-based (e.g., forest extractivism and agriculture) and non-farm or non-natural resource-based (e.g., wages, pensions). Assets are composed of different types of capitals: natural, human, financial, social and physical (Scoones 1998; Bebbington 1999; Ellis 2000).

Livelihood approaches provided a flexible and complex view of mobility in development studies (McDowell and De Haan 1997; De Haan 1999). Mobility is recognized as part of complex livelihood strategies (Ellis 2003). Circulation strategies allow access to resources that are distributed between different areas (Tacoli and Mabala 2010). Activities and asset portfolios are not exclusively rural, but instead can be spread among different places, including urban areas, mixing farm and nonfarm activities (Bebbington 1999).

The presence of various types of markets and services modifies the latitude of households to make choices concerning diversity in their livelihood strategies. For example, the presence of labor markets elsewhere can offer alternatives for income diversification (Ellis 2000). Further, the location of markets may influence households to engage in circulation as a livelihood strategy to improve accessibility. Circulation can be considered either an asset or a capital itself, or a way to have access to capitals (Bebbington 1999; Ellis 2003). It can provide access to capitals such as financial

(markets, jobs), natural (natural resources), social (social networks), and human (education) (Ellis 2003). On the other side, financial capital generated from natural capital or from jobs can support the maintenance of circulation (Nasuti et al. 2015), increasing options for livelihood diversification.

Mobility thus has the potential to reduce vulnerability (Ellis 2003), but also has the potential to increase rural social stratification (De Haan 1999; Greiner 2011). But the relationship between circulation and socioeconomic status is not well understood. There is limited quantitative work on temporary mobility, and what there is in the mobility literature has yielded conflicting findings. This suggests that the relationship of household socioeconomic status and circulation is context-dependent. In some cases, poorer households are more likely to circulate or migrate (De Haan and Rogaly 2002), but in others, wealthier households are those who invest in mobility (Koenig 2005; Tsegai 2007; Eloy and Lasmar 2012). In yet other cases, both poor and wealthy households exhibit seasonal mobility and are more likely to migrate than middle income households (Asfaw et al. 2010).

### **Circulation and Livelihoods in the Riverine Amazon**

In the riverine Amazon, rural livelihoods strategies are diversified (Caviglia-Harris and Sills 2005; Castro 2009) as in other rural areas worldwide (Ellis 2000). The increase of rural-urban circulation and multi-locality have been related to different transformations in livelihood strategies of diversification: de-agrarianization as incomes become more based on non-natural resources sources, new urban markets for natural resources (f.e. açai berry and fish) and intensification of peri-urban and urban agriculture (Eloy et al. 2015; Lima 2005; Brondizio 2008; Padoch et al. 2008).

A key question that is not well understood concerns the economic factors which predispose rural households in the Amazon to pursue a circulation spatial strategy. In remote areas in the Brazilian Amazon, qualitative research suggests that multi-local and rural-urban circulation strategies are related to market-oriented activities and access to government welfare payments. Lima (2005) suggested that in rural communities in floodplain areas, retirement pensions were financing circulation of multi-local households between rural and urban areas. Although Brondizio (2011) stressed the large number of rural families receiving cash transfer payments via governmental programs, there is very little work evaluating its impact in Amazon rural community livelihoods (Piperata 2011a, 2011b) and circulation.

Nasuti et al. (2015) quantified circulation of maroon communities between rural and urban areas during a one-year period. They suggested that households with more circulation had more diversified activities and more assets. Individuals with employment and trading in natural resources had also higher circulation. Other quantitative studies focused on the causes of rural out-migration in Amazonas State, and found that wealth and household characteristics did not explain rural out migration, but investments in education and access to social services did (Parry et al. 2010a, 2010b). In particular, these authors noted that receiving government benefits is an incentive to visit urban areas.

Research relating livelihoods strategies and mobility is more limited for indigenous peoples. Eloy (2008) suggested that wealthier households in the Upper Rio Negro (those with businesses, employment or retirement) were the ones that could maintain double residencies between rural and urban areas. Tritsch et al. (2015) also

noted that greater circulation and the capacity to maintain multi-local strategies of the Wayapi and Teko indigenous peoples in French Guiana was possible due to greater access to monetary sources from employment and government benefits. These anecdotal findings suggest that access to monetary income, either from non-farm sources (jobs and government) or from access to markets for farm/forest products are supporting the maintenance of multi-local strategies.

### **Research Questions and Theoretical Expectations**

This paper has two objectives: 1) to understand indigenous household patterns of circulation among rural and urban areas, and 2) to understand the relationship between circulation and household livelihood strategies and socioeconomic status. Some studies of traditional and indigenous communities suggest that households with more access to monetary sources, mainly from non-farm income sources such as jobs and government benefits, are more likely to circulate between rural and urban areas. This resonates with the general livelihood literature, which suggests that there is a positive correlation between non-farm income and overall income for rural communities (Ellis 2005). There is also evidence that easier access to markets for natural resources may also support circulation (Brondizio 2008; Nasuti et al. 2015).

I argue that households with better socioeconomic status are better able to pursue multi-local livelihood strategies via circulation. In this study, I use two variables as proxies for socioeconomic status: annual cash income and accumulated wealth. Circulation is the variable of interest, and for purposes of statistical analysis is treated as a dependent variable. However, due to the endogenous nature of circulation related to economic activities, it has to be acknowledge that is difficult to determine the direction of their relationship. Socioeconomic status might influence circulation by providing

greater assets that facilitate movement; but circulation might influence socioeconomic status by permitting access to key income sources like urban jobs and government service payments. I therefore do not frame my hypothesis in causal terms per se. Rather, I merely argue that households with higher incomes and more wealth also tend to have higher circulation measures for rural and urban areas.

Specific livelihood strategies can potentially drive mobility in rural and urban areas, given the focus of multi-local households on engaging in markets and increasing access to government welfare programs. The expectation is that a household that receives income from important non-natural resource activities will exhibit greater mobility with respect to urban areas and a lower mobility to rural areas. On the other side, households engaged in natural resource-based commercial activities as fishing, agriculture and forest extractivism may exhibit circulation dynamics focusing on rural areas.

### **Study Area**

This research was developed in the municipality of Barcelos, located in the Middle Rio Negro basin in Amazonas State in the northwestern Brazilian Amazon. The Middle Rio Negro is in a relatively remote corner of the Amazon that is still largely forested, with a population density of 0.2 people per km<sup>2</sup> (Emperaire 2000). There is no road connection with other municipalities, so transportation is mainly along rivers. Barcelos municipality has a large land area of 122,476 km<sup>2</sup> (IBGE 2013a), and most rural land has no official titling<sup>1</sup>. Going upstream from Barcelos are the municipalities of

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<sup>1</sup> There is a process underway for the demarcation of indigenous lands in large part of the rural territory of Barcelos.

Santa Izabel do Rio Negro and São Gabriel da Cachoeira. In those municipalities, most rural land has been demarcated as indigenous lands, and they have the largest municipal indigenous populations in Brazil. Downstream from Barcelos is Novo Airão, where rural land is largely in protected areas. Beyond Novo Airão is Manaus, the capital of Amazonas State, with more than 1.8 million inhabitants (IBGE 2013b).

Barcelos town was founded in 1728 as a Catholic mission. During the early colonial period, Barcelos was an important port for the trade of enslaved indigenous peoples and the export of extractive products (Prang 2001). Barcelos' economy, as in other parts of the Amazon, experienced multiple boom-bust cycles of forest extractivism (Emperaire 2000). In all such booms, the commercial chain was based on *aviamento*, a long-established debt peonage system (Meira 2000; Prang 2001). Indigenous peoples were recruited as forest products collectors, and they depended on a patron for their subsistence (Emperaire 2000). Debt peonage occurred with forcible relocations of indigenous peoples, which meant that extractive booms involved intense indigenous population movements (Meira 2000). The history of Barcelos is thus interconnected with historical indigenous population movements in the Rio Negro. Not only was there forced displacement during colonization (*descimentos*), there has also been mobility related to prophetic indigenous movements, displacement to work for merchants extracting forest products and movement toward missionary centers (Wright 1992; Wright 2005).

From 1950 to 1980, mainly due to the influence of Salesian missionaries, indigenous people dispersed throughout the forest were brought together in villages (*comunidades*) along rivers. There, they developed subsistence agriculture, fishing and hunting combined with seasonal extractivism of *sorva* (*Couma sp.*), *piassava*

(*Leopoldinia piassaba*) and *castanha* (*Bertholletia excelsa*). Agriculture permitted more independence from patrons (Emperaire 2000). In 1960-2000, many families started to engage in ornamental fishing. From the 1990's on, most extractivist systems declined, and that in turn led to increased livelihood diversification (Emperaire 2000). In the 2000s, sport fishing, commercial fishing, and tourism all increased in importance, as well as income from state welfare programs and employment in the municipal government.

During the course of its history, the population of Barcelos has shifted from the rural to the urban. Because Barcelos continues to rely on rural labor and products, the shift has been gradual, and even in 2010, 56.6 percent of the population was still living in rural areas (IBGE 2013b). Barcelos currently contains around 48 rural communities located along rivers and other water bodies, of which 30 are indigenous<sup>2,3</sup>. Indigenous people in Barcelos are descendants of different ethnicities whose languages come from the Arawak and Tukano linguistic families. The vast majority of the population is of the Baré ethnicity, followed by Tukano and Baniwa. Baré culture was heavily impacted in the historical process of colonization of the upper Rio Negro. The Baré peoples lost their native language and, until recently, were considered extinct (Gourevitch 2011).

Communities have diversified livelihood strategies, generally based on swidden agriculture, hunting, fishing and collection of non-timber forest products such as *piassava* fiber and *castanha*. Some households engage in regular circulation between

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<sup>2</sup> The numbers of communities will eventually change with the abandonment of settlements that had becoming common due to migration, and consequent closing of rural schools. On the other side, some communities are increasing their size due to rural-rural migration.

<sup>3</sup> This research is focused on rural riverine indigenous communities. There are Yanomami communities living inside Barcelos municipality, but they are located far from the main rivers.

rural and urban areas (Peres 2011). For rural households, urban areas represent a space to access services as education and health care, sell their products, and receive government benefits such as pension payments and other cash transfers. Deficiencies in rural educational and health institutions have led some households to move permanently to Barcelos town. Even in those cases, households maintain social network ties with their rural origin community (Peres 2011). Other households pursue multi-locality by sending members to urban areas. In some households, multi-locality instead emphasizes urban residence by most of the family most of the time, who nonetheless maintain their agricultural land in rural or peri-urban areas. Some families may return periodically to seasonally fish or hunt in rural areas and then sell the catch in urban centers. In these and possibly other ways, households maintain ties to both rural and urban areas.

Barcelos is thus a useful study case for understanding the interplay between livelihoods, socioeconomic status, and indigenous circulation. In Barcelos one finds substantial rural indigenous populations alongside urbanization and market-oriented livelihoods. This is because Barcelos encompasses a mix of traditional indigenous and caboclo culture with modern influences from urban areas both up- and down-river. In the Upper Rio Negro, one finds a mosaic of indigenous lands upstream, along with a growing urban areas that are articulated to the state capital of Manaus and other centers that constitute markets and channel governmental resources.

### **Methods**

The indigenous population assessed in this article comprises households living in four rural communities in Barcelos municipality. The communities were chosen based on their variability in the distance to Barcelos town (two relatively near to town and two

far from town), each located along different rivers. Before the field research, a meeting was set up in each community with the residents, where participants mapped the community, showing each house (occupied or not) and who was living there (if occupied), as well as collective spaces such as the community center, chapel, soccer field, school, agricultural plots, etc.

Data about circulation and income were collected through three rounds of household surveys with intervals of four months between each round. This permitted measurement of seasonal circulation and income, and allowed better recall by respondents due to the short time intervals. At the end of the three rounds, there were data for a one-year period (March 2014 to February 2015), which captures a full cycle of river and forest seasonality. The surveys were adapted from the questionnaire used to document livelihoods from the Center for International Forestry Research (Angelsen et al. 2011).

I did household censuses instead of choosing households randomly, because the communities were relatively small, ranging from 9-22 households. In the first round survey, I was able to interview 98% of the households in the four communities sampled (n=65). At the end of the data collection, after three rounds of surveys, the number of households participating dropped to 77% (237 people), ending with complete data for 50 households. The main reason for drop-outs was the absence of household members during later rounds of surveys. When possible, I interviewed all household adult members. There were a few occasions where the household was absent in the rural community, but I was able to contact them in Barcelos town. The questionnaires

comprised data about 1) household composition and characteristics, 2) assets owned, 3) monetary income, and 4) rural and urban circulation.

A summary of household demographic characteristics is presented in Table 4-1. Households have an average of 4.7 residents, with an age average residents of 26 years, and 3.7 years of schooling. Communities far from Barcelos town had higher averages for educational attainment than communities near town. For other variables, there were no significant statistical differences. Ninety percent of the residents declared themselves as from Baré ethnicity, followed by Tukano (6.6%) and Baniwa (2.9%). Ninety-two percent declared themselves as Catholic. The average time living in the community was 21 years.

### **Circulation Patterns**

Every round in the survey, household adult members were asked to recall trips to urban and rural areas in the last four months. Detailed information about each trip was collected: dates, durations of trips, reasons for trips, means of transportation, and where they stayed. A “trip” here is defined as an absence from home that lasted more than 24 hours<sup>4</sup>.

Temporary mobility can be considered a multidimensional concept (Bell 2004), and difficult to measure (Taylor and Bell 2012). However, the temporal dimension is a key aspect of mobility that can easily be measured: number of movements and time spent away from the primary home. I employ three measures to evaluate rural and urban circulation: 1) the number of trips (C1) during the observation period (C2), 2) the

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<sup>4</sup> “Home” here is defined as the rural community where the household maintains its primary house. Some households have also houses in town or in *sítios* that are areas with agriculture located outside of the base community. They also can stay temporarily in the *colocação* that is close to the spot for the collection of forest resources like piassava where they build a temporary shelter.

number of days away from home (C3) during the observation period (C2), and 3) a circulation index (CI) that combines C1 and C3 with regard to the observation period, created by Baby Collin et al. (2005) and adapted by Nasuti et al. (2015). The circulation index accounts for both the number of trips as well as the duration of the trips. A high CI value represents higher capacity to circulate and consequently to access certain livelihood capitals spread in space. I calculated all of the circulation measures separately for circulation to rural and urban areas in order to compare mobility among these different types of locations<sup>5</sup>. Table 4-2 presents statistics for the circulation measures.

### **Cash Income Composition**

A key question is whether circulation reflects income. Therefore, absolute net income (AI) was estimated from total gross cash income from all available sources minus total monetary costs of purchased inputs<sup>6</sup> (Vedeld et al. 2007). Income sources were broken down into a list of all products and possible sources in units familiar to respondents for periods for which the probability of accurate respondent recall is high.

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<sup>5</sup> I am assuming that the households in this research have their primary house in the communities visited (rural area). When I mention rural trips I mean that one or more member of a household left their house for somewhere in the rural area, which in the geographical context of the study is any place outside the perimeter of the towns, which are either forest (high land and islands) or rivers (main river and tributaries). When I mention urban trips it means that one or more members of the household left their primary house at the community to go to any town or city. When I mention total trips, I mean the sum of rural and urban trips during the observation period that comprised one year.

<sup>6</sup> I recognize that for a complete picture of household economic strategies, especially indigenous groups, an ideal estimation of income would include the subsistence economy (consumption). However, during the recalls, many participants had difficulty with recalling consumption events older than a week. For that reason, and for the purpose of this article, I am considering only net cash income, which I believe people were accurate to recall. Access to consumption resources (material for houses, and food - fish, game, cassava flour) is generally available to relatively all households inside a community. There are differences with regard to the locations of communities, some of which have better access to certain resources. Labor availability also varies among households.

Overall income (AS), as well as income shares from both natural resources (NR) and non-natural resource sources (NNR or non-farm), were calculated.

By considering income shares from NR and NNR sources, I differentiate income shares among distinct types of livelihood activities. Income from NR comprises agriculture and extractivism. Extractivism comprises all sources extracted from forests and rivers, and is sub-divided into non-timber forest products (NTFPs), fishing, turtles, hunting, and timber/charcoal. Income from NNR comprises wages from employment (temporary or not), *Bolsa Familia* (BF)<sup>7</sup>, retirement pensions, and other government benefits (OGB)<sup>8</sup>. Employment includes temporary jobs in agriculture, construction, seasonal work as sport fishing tourism guide, and wages from work in the community school, public health agents, etc. BF, retirement and OGB are all government programs payments, but BF and retirement are presented separately because I consider them the most important and stable programs.

## Wealth

A closely related question is whether wealth affects circulation. I consider both income and wealth because income reflects a flow of monetary value over a specific time period, whereas wealth indicates a stock of accumulated value over a longer period of time. Income may thus be more endogenous with respect to circulation if both are measured for the same time period, whereas wealth may be less so since wealth

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<sup>7</sup> BF is a federal program, whose goals are to alleviate hunger, and decrease poverty and social inequalities by strategies of conditional cash transfer to poor households conditioned to participation in educational and health programs (Wiesebron 2014).

<sup>8</sup> OGB are other specific temporary or long-term government programs such as pension for chronic disease (*auxílio doença*), pension for death, maternity cash grant (*auxílio maternidade*), insurance for fishermen (*seguro defeso*), and subvention for *piassava* fiber.

refers to a stock of value accumulated over a longer time period than that for which circulation can be reliably observed. I evaluated household wealth by collecting information on ownership of durable goods, house quality, house occupancy and other infrastructure. The list of variables presented in the survey was based on items suggested by local key informants in earlier interviews<sup>9</sup>. The survey was pre-tested and applied to each household in the first round. I recoded binary data for each indicator of household assets: assets owned (1=own item, 0=does not own item); housing quality (1=good quality, 0=bad quality), and infrastructure (electricity and clean water) (1=have access, 0=does not have access)<sup>10</sup>.

To create the wealth index, a Principal Component Analysis (PCA) was run as suggested in the literature (Filmer and Pritchett 2001; Vyas and Kumaranayake 2006; Córdova 2008) to reduce the dimensionality of the data. After running the PCA, only variables that had factor loadings of at least 0.40 were kept. The factor scores from the first component were multiplied by each item as weights and summed and the result is a wealth index for each household. Items included in the analysis and the results of PCA are presented in Table 4-3.

### **Circulation and Household Economic Strategies**

To test the relationship between circulation and household livelihood economic strategies, I ran a series of t-tests where I compared the means of the circulation variables (C1, C3, and CI for urban, rural and total trips) between groups of households

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<sup>9</sup> Items included in the survey: *Bate/lao* Boat, outboard motor, wood canoe, motorized aluminum canoe, bicycle, gas stove, freezer, radio, TV, dish antenna, DVD, computer, cell phone, stereo, chainsaw, shotgun, gillnet, electric power generator.

<sup>10</sup> Good quality floor= processed wood, cement, bad quality floor= palm tree or dirt floor. Good quality wall=processed wood or brick wall, Bad quality= no wall, palm tree or leaves.

divided by 1) total cash income, 2) total cash income per number of adults, and 3) the wealth index. In all three cases, I divided the households into “low” and “high” groups based on their scores relative to the sample median (50<sup>th</sup> percentile) <sup>11</sup>. The circulation variables for all t-tests were transformed into their natural logs because their distributions were not normal<sup>12</sup>.

In accordance with prior research, I expected household income and wealth to influence rural and urban circulation. Specifically, I anticipated that households with higher incomes and greater wealth would exhibit greater circulation between rural and urban areas. Data on sources of income also permit an evaluation of how livelihood strategies influence circulation. To explore specific livelihood activities and their relationships to circulation in rural and urban areas, I grouped households by whether they practiced selected prominent livelihood activities. These activities included NR management (fishing, agriculture and forest extractivism) and NNR income sources (retirement, *Bolsa Familia* and employment). Since all such analyses involved two-group comparisons, I employed independent t-tests for statistical testing. I repeated the tests for total, urban and rural circulation. This is because I expected that households involved in fishing and forest extractivism would have higher circulation in rural than urban areas. Conversely, I expected that a household that received more income from

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<sup>11</sup> For total income, total income per adults, and wealth, the means for the high and low groups turned out to be statistically different at the 0.95 confidence interval. I also considered dividing the sample into more than two groups. This complicated the divisions and resulted in weaker findings due to smaller group sizes. I therefore present the analysis with two groups.

<sup>12</sup> Because C1 and C3 for rural trips were equal to zero for two households, I added one to all rural scores (C1, C3, and CI) before transforming in natural logs. Households with zero rural trips had the log score equal zero.

important NNR activities such as employment and BF would exhibit greater mobility with respect to urban areas than rural areas.

## **Results**

I organize the presentation of the results into three sections. First, I present measures of household circulation (C1, C3, CI) for rural, urban and total trips. I also describe the characteristics of circulation for both urban and rural trips: places visited, reasons for the trips, and individual differences in household travelers. The second section presents income composition by high and low income households, with details about specific NR and NNR income sources. I also present the wealth index for relatively high and low wealth households. In the third section, I present a series of bivariate analyses using independent t-tests to compare the following: a) circulation measures in high and low income households; b) circulation measures in high and low wealth households; c) circulation measures in households that did or did not practice selected prominent livelihood activities based in NR (fishing, agriculture and forest extractivism) and NNR (retirement, *Bolsa Familia* and employment).

### **Household Circulation**

During the one-year observation period, I recorded a total of 734 trips<sup>13</sup> taken by the 50 households. Measures of circulation for urban, rural and total trips are presented on Table 4-4. Households traveled an average of 14.7 times per year, or 1.2 times per month. In terms of duration of the trips, households spent around 125.2 days away from their primary home per year, or around 10 days per month. Most trips (76.5%) had a

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<sup>13</sup> Is important to stress that trips with less than 24 hours' duration were not quantified in this work.

duration between 1 and 7 days, 16% lasted between 8 and 21 days, and longer trips with more than 21 days were rare (7.5%).

The number of trips (C1) to urban areas was higher than the number of trips to rural areas. Of the total trips per year, 66% were taken to urban areas, with the remaining 34% to rural areas. The average number of trips to urban areas was 9.7 per year compared to 4.98 trips to rural areas, and this difference was statistically significant ( $p < 0.05$ ). In terms of number of days away from home (C3), households spent a mean of 69.2 days per year in trips to urban areas and averaged 56 days per year in rural trips. This difference was not however statistically significant. Thus, households traveled more to urban areas per year than to rural areas, but they spent around the same number of days away in urban and rural areas per year. That said, the circulation index (CI) reflects both the number of trips and time away, and shows that there was overall greater circulation to urban than rural areas among the household surveyed. This finding was statistically significant.

In relation to the means of transportation used by the indigenous communities, seventy percent of the households had their own transportation, mostly small motors (*rabetas*) attached to large wooden canoes. Those without their own transportation traveled with relatives, friends and river traders. The high number of trips per year reflects the increasing access to small motors with lower prices, as well as investments by rural development agencies.

The places most visited in urban areas were Barcelos (83% of the trips) and Santa Izabel do Rio Negro (11%), the closest towns in the region. The remaining trips were to the state capital Manaus (4%) or São Gabriel da Cachoeira in the upper Rio

Negro (2%). In 71.3% of trips to town, people stayed on their own boat. In other cases, in 10.7% of trips they stayed in relatives' houses, in 6.8% they stayed in the municipal floating house, 5.2% in the hospital, 4.3% in their own house in town, and the remaining (0.6%) in friends' houses.

Places visited in trips to rural areas for natural resources were mostly areas of forest extraction (48% of trips), rivers and adjacent waterbodies (29%), followed by trips to agricultural and agroforestry plots (11%) outside their communities (called *sítios*), tourism lodges/boats (6.8%) and other communities (5.2%). When collecting natural resources, people create temporary shelters in the forest where they stay for cooking and sleeping, or they stay on board their boats/canoes.

Table 4-5 presents the reasons for both urban and rural trips. Trips to urban areas are in general multi-purpose. Most urban trips were made for various purposes, including a combination of receiving government benefits (28% of the total responses), selling forest products (17%) and buying other products (mainly groceries and fuel; 22%). Other reasons were elections (10%), access to health care (6%), citizenship (3%), leisure (3%), receive salary (2.5%), and work (1%). There are good reasons why trips to urban areas are often multi-purpose. Travel to urban areas is expensive, so households try to maximize each trip, planning ahead of time all of the activities they will pursue in town. This is especially important for the more distant communities from Barcelos. The average cost of fuel for a round trip to Barcelos for the two most distant communities was R\$ 144.00, which corresponds to around 20% of the monthly

minimum wage at the time of the research<sup>14</sup>. By contrast, for “near” distance communities from Barcelos, the average cost was R\$54.00 per trip (7% of the minimum wage).

The year of the data collection (2014-2015) was a federal election year<sup>15</sup>. Voting is mandatory in Brazil, so the election induced mobility to town in October and November, during the two rounds of voting for the presidential election. Due to the proximity of the dates between the first and second rounds (21 days), some households decided to stay in town between rounds of voting. Others went for the first round of voting but did not return to town for the second round because they did not have resources for the second trip.

Another event in town that attracted people from rural areas was the presence of “Barco PAI” (*Pronto Atendimento Itinerante*) that visited in August 2014. This is a large boat that travels along rivers offering government services to the population in remote places in Amazonas State. There are services for expediting documents, enrolling in social security, and other government welfare programs.

Rural trips were more focused on solely one or few activities and most were related to productive activities. The main reason for rural trips was the collection of natural resources such as for fish, *piassava*, and *castanha* (44% of total responses). The second important reason for rural-rural circulation was leisure (23%), which includes visits to other communities during Catholic saint feasts, visits to kin and friends,

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<sup>14</sup> Prices based on average liters of gasoline per trip (in a motorized canoe) declared for respondents, multiplied by the average price of gasoline during the data collection.

<sup>15</sup> There are elections every two years, alternating elections for federal and local positions.

and school vacations. Trips for work in rural areas comprised 18% of the responses, which included sport fishing, logging and temporary work in agriculture.

In relation to individual differences within households about who travels, most trips to urban areas had the male and female heads of the household travelling together, with or without children (60.5%); followed by the male head only (20%) and female head only (16.5%) and adult children (3%). In rural areas, most trips had couples (45.4%) traveling together, with or without other family members, male head only (43.4%), adult children (10.4%), and female head only (0.8%). Women tend to travel less than men in rural areas due to traditional gender roles that highlight reproductive duties such as taking care of children, cleaning, and cooking. Children attend classes daily in schools located in the communities, and mothers usually stay to take care of them. In addition, men are responsible for fishing, hunting and collecting forest resources. Nonetheless, many women are responsible for receiving many of the government transfers. Further, the majority of government jobs are held by women, and many women are retired and thus go to town to receive pension payments<sup>16</sup>. These considerations suggest that women participate more in trips to town because they control a significant part of the NNR income, which is received in town.

In this study, distance to town did not influence mobility, as shown in Table 4-6. As expected, communities near town had slightly higher means than more distant communities for both urban and total circulation, but these differences were not significant. However, distant communities had higher means for number of rural trips,

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<sup>16</sup> In seven jobs available in the communities, six were filled by women (job as health agents or school maintenance).

and the difference was significant ( $p < 0.10$ ). These results suggest that the circulation to urban areas was already part of the rural household routine, independent of their home location, whereas rural circulation was greater among more distant households.

### **Livelihood Strategies and Income Composition**

Having described household circulation, it is important to examine how household incomes are composed. Income can be considered the most forthright measure to evaluate livelihood outcomes (Ellis 2000). In turn, different sources of income can be related to specific strategies of circulation. Table 4-7 and Figure 4-1 provide breakdowns of overall income by livelihood activity. All incomes are based on data collected in R\$. I present income sources divided between livelihood activities based on NR and NNR sources. I differentiate between “low” and “high” income households (defined based on income relative to the overall median income in the sample) in order to evaluate the importance of various NR and NNR income sources by household socioeconomic status.

Income from NR sources was divided into “forest extractivism” and “agriculture”. All households rely heavily on natural resources, with some activities more oriented toward consumption (subsistence) and others more cash (market) oriented. Results on the percentage of households engaged in NR for subsistence in table 4-7 shows the importance of NR as a key source of subsistence across all indigenous households. NR income represents 31.5% of the total household income across low and high groups, and the mean cash received from NR per all households was R\$ 3575 per year.

Comparing different income groups (Figure 4-1), NR sources comprised a slightly larger share for the high (33.3%) than for the low income households (27.7%). In terms of absolute income, the high income group received 2.5 times more cash from natural

resources than the low income group. This difference is larger for forest extractivism than for agriculture. For extractivism, NTFPs and fishing were the most lucrative NR sources of income for high-income households, while timber/charcoal and fishing were the most lucrative for the low-income households. The earnings with turtles and hunting were low for both groups when compared with other activities, probably because commercialization is illegal. There is also a chance that these earnings were also underreported because of the illegal nature of these activity.

For agriculture, 84% of the households surveyed had agricultural plots (*roças*). They had between one and three *roças* with different cultivation stages, totaling on average 1.7 hectares per household and 0.4 hectares per capita. However, only 56% of households sold agricultural products during the research period, mainly cassava flour. Average agricultural earnings were higher for high than low-income households, but the low income group had almost twice as much households involved in commercial agriculture than the high income group.

Of the households surveyed, 68% of their total income came from NNR activities. Households received an average of R\$7764 per year from NNR income sources. Comparing high and low income households, NNR is the most important relative source for both low (72.3%) and high (66.7%) income groups. However, in absolute numbers, the high-income group received twice as much income from NNR sources as the low-income group (Table 4-7).

Government benefits (BF, retirement and OGB) are the major share of NNR income for low-income households, representing 67.1% of total income. For high-income households, government benefits represent only 41.3% of the total income. The

average absolute income from BF was similar between low and high income households, around R\$2200 per year. But BF represented 24.65% of income of low-income households, while it comprised 9.7% of the income in high-income households. Retirement was 23.8% of relative income in low-income group and 21.57% in high-income group. The average income from retirement was R\$9260 for high-income households and R\$7172 for low-income households. OGBs are other programs and contributed 18.64% of the income of low-income group, but only 9.7% of the income in the high-income group.

Employment is an important NNR source for high-income households, representing 25.44% of their total income, while for low-income group, employment represented only 5% of their total income. The households with employment income received an average of R\$ 2153 (SD 4942) per year from wages. However, the average income from employment was eight times higher for high-income groups than for low-income households. Not surprisingly, high-income households held more stable jobs (as in government) and well-paid positions (as in tourism) than low-income households, which held more temporary or self-employed jobs.

### **Household Wealth**

After describing income composition and livelihood, I next discuss the wealth index. I divided households into high and low wealth categories based on their scores relative to the sample median (50<sup>th</sup> percentile). The wealth index and its composition are presented in Table 4-8. The index varies from 0 to 1, with higher values indicating greater wealth. Durable goods differentiated household welfare more than infrastructure and housing quality. Most of the items had significant differences between wealth groups, except for house floor material. The index created by PCA discriminated well

between the two groups. The wealthier group had higher means, indicating that they owned more durable goods and had better access to utilities and good house quality.

### **Relationship of Household Income and Wealth with Circulation Patterns**

Having discussed household circulation, income composition, and wealth separately, the second part of the analysis crosses these variables in order to understand how household differences in terms of income and wealth among livelihood activities is related to circulation to rural and urban areas. First, I assess the relationship of household income and wealth with circulation. Scores for the three circulation measures (urban, rural and total) among low- and high-income households are compared using independent t-tests. Second, I evaluate circulation scores between households with specific livelihood activities using independent t-tests.

Table 4-9 reports the findings comparing household groups (low and high) by their total income (AI). Using an independent-samples t-test, I found that higher income groups have higher scores for urban, rural and overall mobility. High-income households travel 2.36 more times per year to urban areas, 1.32 times more to rural areas, and 3.7 times more overall<sup>17</sup>. On average, higher-income households also spend 38 more days per year away from their homes in rural trips than households with lower incomes. These differences are statistically significant (Table 4-9), except for the number of days out of the home in urban trips. Households spent the same number of days in town per year, independent of their income. Considering all trips per year,

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<sup>17</sup> In all tables presented in this section, the circulation means are in a log format. For reference, the real means for these tables are presented in the Annex.

households with higher incomes spent 36.64 more days away from their homes than lower-income households.

The number of household members can potentially influence circulation because more people mean higher chances to travel more or longer. To control for that possibility, I divided households by income per adults (AIA) and compared them (high and low) through an independent-samples t-test (Table 4-9)<sup>18</sup>. The high income per adult group had higher urban, rural and total circulation scores than the low-income group, and these differences were statistically significant. Higher AIA households traveled 2.84 more times per year to urban areas, 1.8 times more to rural areas, and 4.64 times more overall. On average, higher-income households spent 11 more days in urban areas per year, and 3.24 more days per year away from their homes in rural trips than households with lower incomes. These results suggest that mobility is related to activities of productive (adult) household members.

When comparing household groups by their relative wealth, the results differ from income. High- and low-wealth households exhibit similar levels of mobility. While the high wealth group does exhibit some higher circulation values, the differences are not statistically significant. Occasionally, low-wealth households have higher rural mobility scores, but the differences are not significant. There is only a weakly significant difference in the number of days away from home, where high-wealth households spent 46 more days away from home per year.

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<sup>18</sup> Adults are 18 years-old or more. I excluded children and young (<18 years-old) because they do not travel alone. When we include adolescents or children in the analysis the differences are no longer statistically significant.

What the findings presented in table 4-9 suggest is that higher income households are more mobile than lower income households, whether we speak of urban or rural mobility. This relationship becomes slightly stronger when considering overall mobility. The findings are similar and somewhat stronger for income per adult. However, when evaluating households by wealth, the richer households circulated as much as poorer households to both urban and rural areas, though wealthier households spent more time away from their home per year.

Table 4-10 presents a comparison of circulation measures between households based on whether they practiced prominent NR activities: fishing, agriculture, and forest extractivism. For fishing, there are larger differences in mobility. Households that practiced commercial fishing had higher circulation scores than households with no commercial fishing, and the differences are significant. Fishing households traveled 2.84 times more, and spent 21.64 more days in urban areas per year than non-fishing households. Fishing households also traveled 3.79 more times, and spent 19.64 more days in rural areas than non-fishing households. The only insignificant finding was for length of the trip in rural areas, which means that non-fishing households spend the same number of days out of the home in rural trips as fishing households. Although fishing happens in rural areas, the markets and asset suppliers are located in towns. Hence elements of fishing require regular dislocations among rural communities and towns.

For agriculture, households that did not sell agricultural products spent 22 more days per year in urban areas than households that commercialized agricultural products. One possible explanation is that household members cannot be away from

home for long periods due to the labor-intensive nature of swidden agriculture. For other circulation measures, the differences for agriculture were not statistically significant.

For forest extractivism, households who sold forest products (Brazil nut, charcoal, *piassava* or wood) had slightly lower means for urban trips than households that do not sell these products, though differences were not statistically significant. For rural trips, households with forest extractivists had higher means than the other groups, but the differences also were not significant. Hence forest extractivism does not differentiate households in terms of rural or urban circulation.

Table 4-11 presents a comparison of circulation measures for households differentiated by their NNR income sources: retirement, *Bolsa Familia*, and employment. Households with retired members exhibited higher means for the number of trips to urban areas (2 trips more per year) than households without retired members, and this difference is significant. Retired households however, had lower scores for rural mobility, though the difference is not significant. There was also no difference related to rural, urban and total circulation based on household BF status. Households with employed members reported a higher number of days away from their homes in rural trips (35 more days per year) and overall trips (56 more days per year) than households without employed members. These differences were significant. For other circulation variables, including urban circulation measures, there were no significant differences based on employment status.

## **Discussion**

This research contributes to the emerging literature on circulation, livelihoods and urbanization, particularly for indigenous peoples. Previous work suggested that rural indigenous communities in the Amazon are becoming more mobile and developing

multi-local strategies that include urban areas as key places for their livelihoods. Most of that work was ethnographic and focused on issues of indigenous identity and rights (McSweeney and Jokisch 2015; Peluso 2015) or natural resource management (Eloy 2008; Eloy et al. 2015). This article contributed a more systematic approach to indigenous circulation, with a particular emphasis on quantitative comparisons of circulation measures for households of varying socioeconomic status (income and wealth), and distinct livelihood activities.

The descriptive findings on circulation confirm that indigenous rural households are highly mobile, with an average of more than one trip per month, spending one third of the year away from their home communities. Spatial circulation in Amazonian rural areas to collect natural resources is not a novelty (Eloy et al. 2015), and some previous studies had addressed that issue in the Rio Negro (Josa 2008; Peres 2011; Menezes 2012; Zingra 2014). However, circulation to urban areas is especially prevalent, and became part of the routines of rural households due the concentration of services and markets in towns. Urban areas constitute an important strategic space, especially in the Brazilian Amazon, where due to logistical difficulties and costs, it is difficult to deliver services in rural areas. Urban trips thus tend to follow the monthly calendar of government and salary payments, and are planned to maximize economic, bureaucratic and social activities. Even long distance and lengthy travel times to urban centers do not limit circulation. This result corroborates what Nasuti et al. (2015) found in Pará state with maroon communities, where distance to town did not influence the circulation frequency. That phenomenon seems to reflect social public policies developed over the last fifteen years that not only provide cash transfers, but also created a network of

public services trying to reach more remote and vulnerable populations (Wiesebron 2014).

The results on income composition corroborate the idea that the indigenous population is gaining more access to welfare benefits (Baines 2008; Brondizio 2011). Government welfare programs are a large share of the income composition of both low- and high-income households, but relatively more important for low-income households. Ethnographic literature views household circulation and multi-local strategies as results of access to these urban-based programs (Lima 2005; Parry et al. 2010; Tritsch 2015). At the same time, these monetary resources also have the potential to finance circulation for natural resource extraction in rural areas, and for selling production in urban markets (Brondizio 2008; Padoch et al. 2008; Sears and Pinedo-Vasquez 2014). The combination of government welfare programs, cash incomes from employment, and greater access to urban areas created a more favorable economic relationship for households seeking to become less dependent on intermediaries and subject to relations of debt peonage (Peres 2003; Coelho and Peralta 2015). Circulation permits more autonomous household decision-making about the allocation of resources and investments in productive activities, and thus various opportunities to diversify their livelihood strategies.

Although rural-rural and rural-urban circulation strategies are prevalent, the main findings indicate that circulation is not uniform among indigenous households with a different socioeconomic status. The ethnographic literature suggests that households with access to monetary sources or economically better-off are the ones able to circulate or maintain multi-local residency (Eloy 2008; Nasuti et al. 2015; Tritsch et al.

2015). Nonetheless, the literature does not explicitly distinguish between the concepts of “wealth” and “income”. In this study, households with higher incomes had significantly higher circulation scores for urban, rural and overall mobility measures. This finding was expected but, when comparing households with low and high wealth, there were no differences in circulation. These findings indicate that circulation was influenced by the flow of monetary resources (income) available during the time period in which circulation was observed, but not by the asset stock (wealth) accumulated over a longer period of time.

Households in the study region likely experience inter-annual variations in their incomes, something is commonly reported in the rural livelihood literature (Ellis 2001; Narloch 2016). This helps explain why circulation tracks annual income more than accumulated wealth. This in turn suggests that mobility decisions are made by households in the short term and are related to income opportunities available at that time. If circulation is related to cash income, and income varies across time, circulation measures for the same households vary in a similar fashion. This also reflects the endogeneity of income and circulation, such that each influences the other. By contrast, accumulated wealth may reflect high incomes of previous years, which may or may not ensure a high income and thus high circulation in a given year. A household with high wealth from previous years, but low income in a specific year, may thus exhibit high wealth but low circulation due to low income.

Results suggest that mobility reflects the portfolio of livelihood activities, rather than specific activities. Specific livelihood activities themselves cannot explain overall differences between household circulation measures, probably due to distinct

household strategies of livelihood diversification. Nonetheless, a few activities did differentiate households in terms of circulation, and thus provide some hints in how particular elements of livelihood strategies are related to mobility. Commercial fishing was an example of a high-mobility activity (Almeida et al. 2009) that differentiated households, since fishing households actively circulated in search of a key natural resource that is spatially dispersed and unpredictable. The product is also highly perishable and has to be transported immediately and sold quickly, primarily in urban areas where most consumers are. For other NR livelihood sources with distinct properties, circulation did not vary significantly. Similarly, for NNR sources, there were no significant differences in circulation among households. This was a surprise, since NNR sources require circulation to urban areas. That is contrary to what literature suggests. Employment, *bolsa família*, and retirement is usually associated to trips to urban areas (Tritsch et al. 2015; Parry et al. 2010). A possible explanation for the lack of differences in this study is that households travel to urban areas for multiple purposes. Consequently, a given NNR income source may not increment the number of trips that would be made anyway for other purposes. That supports the argument that household circulation reflects aggregated livelihood strategies and not specific activities.

## **Conclusions**

The findings highlight the importance of rural and urban circulation for rural households in the Amazon as a way to have access to resources that have an unequal spatial distribution. This work contributed to the literature on rural-urban mobility and livelihoods, notably for indigenous peoples, by quantifying household socioeconomic status and livelihoods and circulation. I specifically pursued comparative testing of the relationship of socioeconomic status, livelihood activities and rural and urban circulation.

The results suggest that low-income households circulated less than high-income households, which implies that income and circulation decisions are jointly made in the short term. At the same time, households with high and low wealth exhibited similar circulation levels, whether for rural or urban mobility. This implies that circulation decisions are made in light of short-term income opportunities.

Results also suggest that urban circulation is multipurpose and does not reflect specific non-natural resource activities, such as being recipient of *bolsa familia*. However, I recommend caution with generalization of the results for other contexts. Different indigenous peoples have diverse cultural, economic and social contexts that may result in distinct relationship between economic strategies and circulation. More quantitative and comparative studies are necessary to understand the impact of non-natural resource monetary sources, especially welfare programs, on different indigenous peoples' circulation and migration.

This study is limited by its short-term design, encompassing a period of one year. Longitudinal data over multiple years would help clarify the relationship of socioeconomic status and circulation patterns. Having data for multiple time steps would also facilitate testing of the two-way relationship of socioeconomic status and mobility. In addition, a future analysis with focus on intra-household differences may reveal variations in circulation patterns related to specific livelihood activities and specific household members. Another important issue to be explored is the impact of circulation on specific individual and household livelihood activities involving NR management, which is usually based on models of collective ownership of resources.

Table 4-1. Summary of household socioeconomic data for each community.

Socioeconomic data		Near communities		Far communities		Total
		A	B	C	D	
Total Number HH		15.0	9.0	22.0	19.0	65.0
HH surveyed (n)		10.0	9.0	16.0	15.0	50.0
HH surveyed (%)		67.0	100.0	72.7	79.0	77.0
Population covered (n people)		50.0	41.0	89.0	57.0	237.0
Average HH residents		5.0	4.6	5.6	3.8	4.7
Number rooms per HH		3.0	3.1	2.9	4.3	3.4
Sex ratio (males/100 females)		117.4	141.0	128.2	171.0	136.0
Average age of residents (years)		29.5	26.5	22.0	26.0	26.0
Percentage under age 15		42.0	34.2	42.7	42.1	40.9
Average schooling heads (years) <sup>a</sup>		3.1	2.1	4.0	4.8	3.7
Years living in the local (mean)		25.3	17.1	27.9	23.1	21.0
Ethnicity (%)	Bare	100.0	84.2	87.5	86.7	89.6
	Tukano	0.0	10.5	9.4	6.7	6.6
	Baniwa	0.0	5.3	3.1	3.3	2.9
	Non-indigenous	0.0	0.0	0.0	3.3	0.8
Religion (% of Catholic) <sup>b</sup>		100.0	100.0	100.0	67.0	91.7
Time travel to Barcelos (hours) <sup>c</sup>		5.6	13.0	29.0	31.7	19.2

HH=household. a. Average schooling is the only variable that have significantly different mean values ( $t=1.85$ ,  $df=48$ ,  $p<0.005$ ) between near (mean=2.68) and far communities (mean=3.08). b. The remaining is Evangelical. c. Mean round trip navigation time declared by households. Here only the means for the most common mean of transportation is presented: an outboard motor boat (called *rabeta*) attached to a wooden canoe. Other factors such as weight of the vessel, weather conditions, can influence the time of trips.

Table 4-2. Variables and its operational definitions.

Code	Variable	Operationalization
C1	Number of trips per year (urban, rural and total)	C1= number of trips during one year
C2	Observation period	C2= 365 days
C3	Number of days away from home	C3=number of days spent away from home during a year
CI	Circulation Index (Urban, rural and total)	$CI = C1 * C3 / C2 * (1 - (C3 / C2)) * C1 / C2 * 1000$
AI	Absolute net monetary income	Income (I) is the gross value (price times quantities of all $n$ products) minus total costs (price times quantities of all $m$ purchased inputs) plus cash from other sources (pension, wages, etc.) during the observation period
NR	Natural resource income share	Income from all natural resources based sources (e.g. agriculture and forest-river extractivism)/AI
NNR	Non-natural resource income share	Income from all non-natural resource sources (wages, government cash transfers)/AI
WI	Wealth index	Index based on the ownership of eight durable goods, housing quality (floor and wall material) and access to electricity.
DIST	Household travel time to town	Hours of navigation by boat from rural community to Barcelos town

Table 4-3. Factor Scores for items included in the Principal Component analysis

	Variable description	Mean	SD	Factor Score
Durable goods	Freezer	0.48	0.50	0.78
	Electricity generator	0.40	0.49	0.71
	Dish antenna	0.86	0.45	0.68
	TV	0.82	0.39	0.65
	Cell phone	0.36	0.48	0.46
	Gas stove	0.84	0.37	0.51
	DVD	0.56	0.50	0.43
	<i>Batelao</i> boat	0.18	0.38	0.46
	Motorized aluminum canoe	0.92	0.27	0.43
Infrastructure	Access community electricity	0.92	0.27	0.48
House quality	Floor material	0.88	0.33	0.42
	Wall material	0.86	0.35	0.53
Largest Eigenvalue				3.79
Proportion of variance explained				0.315

Table 4-4. Measures (means) of circulation for urban, rural and total (sum of all trips) trips.

Circulation variables	Urban	Rural	Total	t-test
Number of trips (C1)	9.70 (4.12)	4.98 (4.47)	14.68 (6.66)	6.15**
Number days away home (C3)	69.22 (47.00)	56.02 (58.76)	125.24 (81.21)	1.36
Circulation Index (CI)	48.60 (59.68)	22.07 (60.99)	131.56 (134.91)	2.48*

\*p<0.05, \*\*p <001. df=49. Standard deviations in parentheses.

Table 4-5. Frequency of responses about trip reasons for urban and rural areas.

Reasons	Description	N	Urban %	% Cases	N	Rural %	% Cases
Government benefits	To receive money from government programs ( <i>Bolsa Familia</i> , retirement, health support, etc).	193.00	28.00	39.80	0.00	0.00	0.00
To buy	To buy products for consumption (groceries, clothing, fuel, etc) or to buy natural resources products in rural areas for reselling.	150.00	22.00	31.00	19.00	7.00	8.00
To sell	To sell products from agriculture, wildlife, and forest extraction.	121.00	17.00	25.00	19.00	7.00	8.00
Election	Mandatory voting.	70.00	10.00	14.40	0.00	0.00	0.00
Health	To receive health care or to accompany someone that needs health care.	42.00	6.00	8.70	0.00	0.00	0.00
Other	To accompany someone in the trip, to access services in town, unknown reason.	29.00	4.00	6.00	3.00	1.00	1.00
Citizenship	To solve issues with formal documents and governmental agencies.	23.00	3.00	4.70	0.00	0.00	0.00
Leisure	To visit relatives, school vacation, to attend a feast, or holiday travel.	22.00	3.00	4.50	62.00	23.00	25.00
Salary	To receive the salary from work.	17.00	2.50	3.50	0.00	0.00	0.00
Meeting	To attend a meeting or workshop.	14.00	2.00	2.90	0.00	0.00	0.00

Table 4-5. Continued.

Reasons	Description	Urban			Rural		
		N	%	% Cases	N	%	% Cases
Work	To work (includes work in construction, wood, sport fishing tourism, etc).	6.00	1.00	1.20	50.00	18.00	20.00
Study	To attend school or to resolve school enrolling issues.	6.00	1.00	1.20	0.00	0.00	0.00
Extraction natural resources	To fish (fish and turtles), to hunt, to collect forest products (Brazil nut and <i>piassava</i> fiber).	2.00	0.50	0.40	121.00	44.00	49.00
Total		695.00	100.0	143.30	274.00	100.00	111.00

N refers to how many times a reason was mentioned. Column “%” refers to the percentage per reason category in relation to the total of responses (n=639 for urban trips and n=274 for rural trips). “% cases” presents the percentage of each reason declared in relation to the number of households (n=50). The “% cases” sums to more than 100% because households often made a given trip for more than one reason.

Table 4-6. Independent t-tests comparing near and far from town households in relation to circulation measures

Circulation measures	Distance to town		
	Near	Far	t(df=48 )
Number of urban trips (Ln)	2.31 (.33)	2.10 (0.48)	1.66
Number of days out of home in urban trips (Ln)	4.08 (0.65)	4.01 (0.61)	0.33
Urban Circulation index (Ln)	3.56 (0.84)	3.11 (1.30)	1.32
Number of rural trips (Ln)	1.36 (0.70)	1.69 (0.62)	-1.72*
Number of days out of home in rural trips (Ln)	3.52 (1.65)	3.29 (1.12)	0.58
Rural Circulation index (Ln)	1.11 (2.69)	1.62 (2.02)	-0.76
Number of trips (Ln)	2.62 (0.32)	2.57 (0.49)	0.36
Number of days out of home (Ln)	4.77 (0.64)	4.53 (0.67)	1.21
Circulation index (Ln)	4.46 (0.65)	4.36 (1.20)	0.32
n	19	31	

\*p<0.10. Standard deviations in parentheses.

Table 4-7. Percentage of households engaged in each income activity, mean annual cash income per activity, mean annual income per low and high income groups.

Income activity	% HH engaged		Mean (SD) cash income				
	Subsistence	Cash	All HH (n=50)	Low income HH	n	High income HH	n
NR Natural resource source (total)			3575 (4560)	2001 (1892)	25	5149 (5807)	25
Extractivism (total)	96	86	3270 (4791)	1455 (1705)	21	5003 (6058)	22
Non-timber forest <sup>a</sup>	100	60	2704 (5414)	405 (516)	16	5331 (7151)	14
Fishing	100	40	1748 (2331)	983 (1158)	10	2513 (488)	10
Turtles	100	50	422 (449)	383 (405)	10	448 (488)	15
Hunting	80	6	294 (230)	300 (0)	1	290 (326)	2
Timber and charcoal	100	30	538 (411)	1124 (1142)	9	428 (367)	7
Agriculture	84	56	1362 (1376)	1082 (1166)	18	1865 (1634)	10
NNR Non-natural resource source (total)			7764 (5811)	5221 (2977)	25	10306 (6827)	25
<i>Bolsa Familia</i>	-	74	1639 (1323)	2226 (983)	20	2203 (1125)	17
Retirement	-	30	8425 (2412)	7172 (959)	6	9260 (2764)	9
Other Government benefits (OGB)	-	40	1444 (2283)	3366 (1081)	10	3866 (3113)	10
Employment (total)	-	42	2153 (4942)	1035 (1949)	9	8193 (7281)	12
Government	-	14	6184 (3903)	3306 (33651)	2	7334 (3703)	5
Tourism	-	14	7465 (6757)	0	0	7465 (6757)	7
Self-employment/ temporary	-	16	1979 (2035)	338 (251)	8	1878 (2646)	5
Total income			11339 (5632)	7223 (2726)	25	15455 (4695)	25

a. The two key NTFPs are Brazil nut (*Bertholletia excelsa*) and piassava (*Leopoldinia piassava*). The income from *piassava* is probably lower than previous years because the reason previously mentioned. All values in Brazilian Real (1 R\$= 2.37 US\$ in 2014). HH=households.

Table 4-8. Wealth index by household wealth group.

Variable description		Low wealth (n=25)	High wealth (n=25)	t	df
Assets	Freezer	0.04 (0.20)	0.92 (0.27)	-12.88**	48.00
	Electricity generator	0.04 (0.20)	0.76 (0.43)	-7.50**	33.67
	Parabolic antenna	0.48 (0.50)	0.96 (0.20)	-4.38**	31.21
	TV	0.64 (0.48)	1.00 (0)	-3.67*	24.00
	Cell phone	0.16 (0.37)	0.56 (0.50)	-3.17*	44.17
	Gas stove	0.68 (0.47)	1.00 (0)	-3.36*	24.00
	DVD	0.40 (0.50)	0.72 (0.45)	-2.35*	48.00
	<i>Batelao</i> boat	0.04 (0.20)	0.32 (0.48)	-2.71*	32.2
	Sterndrive engine	0.84 (0.37)	1.00 (0)	-2.13*	24.00
Infrastructure	Access community electricity	0.84 (0.37)	1.00 (0)	-2.13*	24.00
House quality	House floor material	0.80 (0.40)	0.96 (0.20)	-1.76	34.89
	House wall material	0.72 (0.45)	1.00 (0)	-3.05*	24.00
Wealth index		2.91 (0.99)	5.88 (0.14)	-12.05**	48.00

\*p<.05, \*\*p<.001. Standard deviations in parentheses.

Table 4-9. Comparative analysis (t-tests) of household circulation for households by income status (low/high), income per adult status, and wealth status.

Circulation measures	AI			AIA			Wealth		
	Low	High	t (df=48)	Low	High	t (df=48)	Low	High	t (df=48)
Number of urban trips (Ln)	2.04 (.46)	2.31 (.38)	-2.31**	2.00 (.47)	2.35 (.33)	-2.98***	2.15 (.44)	2.21 (.47)	-0.5
Number of days out of home in urban trips (Ln)	3.98 (.73)	4.10 (.50)	-0.72	3.89 (.70)	4.2 (.50)	-1.79*	3.97 (.62)	4.1 (.62)	-0.85
Urban Circulation index (Ln)	2.93 (1.29)	3.64 (.92)	-2.23**	2.80 (1.24)	3.77 (.85)	-3.26***	3.17 (1.16)	3.40 (1.17)	-0.7
Number of rural trips (Ln)	1.42 (.68)	1.71 (.64)	-1.53	1.38 (.66)	1.75 (.64)	-1.98*	1.64 (.66)	1.49 (.68)	0.79
Number of days out of home in rural trips (Ln)	2.93 (1.30)	3.83 (1.23)	-2.5**	2.9 (1.36)	3.82 (1.19)	-2.44**	3.17 (1.07)	3.58 (1.55)	-1.07
Rural Circulation index (Ln)	0.76 (2.32)	2.10 (2.09)	-2.13**	0.68 (2.27)	2.18 (2.09)	-2.41**	1.44 (2.09)	1.41 (2.51)	0.04
Number of trips (Ln)	2.46 (.42)	2.72 (.42)	-2.15**	2.42 (.43)	2.76 (.38)	-2.93**	2.61 (.40)	2.57 (.47)	0.34
Number of days out of home (Ln)	4.46 (.66)	4.78 (.64)	-1.74*	4.41 (.68)	4.83 (.59)	-2.35**	4.46 (.60)	4.78 (.70)	-1.73*
Circulation index (Ln)	4.05 (1.06)	4.74 (.89)	-2.46**	3.94 (1.01)	4.8 (.83)	-3.46***	4.44 (.99)	4.35 (1.07)	0.3
n	25	25		25	25		25	25	

\*p<0.10, \*\*p<0.05, \*\*\*p<0.005. Standard deviations in parentheses.

Table 4-10. Independent t-tests comparing NR livelihood activities groups (yes/no) in relation to circulation measures

Circulation measures	Commercial fishing			Agriculture			NTFP		
	No	Yes	t (df=48)	No	Yes	t (df=48)	No	Yes	t (df=48)
Number of urban trips (Ln)	2.05 (.44)	2.37 (.36)	2.68*	2.26 (.46)	2.12 (.43)	-1.06	2.28 (.40)	2.14 (.45)	-1.24
Number of days out of home in urban trips (Ln)	3.89 (.63)	4.27 (.54)	2.19**	4.29 (.51)	3.85 (0.65)	-2.611**	4.13 (.74)	4.00 (.58)	-0.38
Urban Circulation index (Ln)	2.9 (1.13)	3.86 (.97)	3.10**	3.65 (1.13)	3.00 (1.12)	-1.998*	3.51 (1.11)	3.2 (1.18)	-1.00
Number of rural trips (Ln)	1.37 (.52)	1.86 (.76)	2.75**	1.52 (.74)	1.60 (.63)	0.41	1.41 (.74)	1.62 (.64)	1.54
Number of days out of home in rural trips (Ln)	3.14 (1.38)	3.73 (1.21)	1.55	3.58 (1.54)	3.22 (1.16)	-0.93	3.28 (1.55)	3.42 (1.27)	1.17
Rural Circulation index (Ln)	.82 (2.03)	2.34 (2.39)	2.40**	1.49 (2.61)	1.38 (2.06)	-0.16	1.02 (2.60)	1.59 (2.18)	1.59
Number of trips (Ln)	2.41 (.39)	2.86 (.36)	4.10***	2.62 (.47)	2.57 (.42)	-0.40	2.61 (.40)	2.59 (.45)	-0.08
Number of days out of home (Ln)	4.45 (.69)	4.87 (.54)	2.28**	4.86 (.62)	4.43 (.65)	-2.356**	4.68 (.72)	4.60 (.65)	0.08
Circulation index (Ln)	3.93 (.93)	5.08 (.74)	4.63***	4.59 (.98)	4.25 (1.05)	-1.18	4.32 (.79)	4.43 (1.11)	0.48
n	30	20		22	28		14	36	

\*p&lt;0.10, \*\*p&lt;0.05, \*\*\*p&lt;0.005. Standard deviations in parentheses.

Table 4-11. Independent t-tests comparing NNR livelihood sources groups (yes/no) in relation to circulation measures.

Circulation measures	Retirement			Bolsa Familia			Employment		
	No	Yes	t (df=48)	No	Yes	t (df=48)	No	Yes	t (df=48)
Number of urban trips (Ln)	2.1 (.50)	2.38 (.25)	2.68**	2.05 (.50)	2.22 (.42)	1.20	2.17 (.52)	2.19 (.31)	0.17
Number of days out of home in urban trips (Ln)	4.06 (.63)	3.99 (.62)	-0.39	3.9 (.51)	4.1 (.65)	1.00	3.96 (.52)	4.16 (.73)	1.12
Urban Circulation index (Ln)	3.15 (1.26)	3.62 (.82)	1.57	2.94 (1.14)	3.40 (1.16)	1.24	3.22 (1.28)	3.37 (1)	0.44
Number of rural trips (Ln)	1.63 (.61)	1.41 (.80)	-1.08	1.5 (.82)	1.59 (.62)	0.42	1.54 (.73)	1.6 (.58)	0.29
Number of days out of home in rural trips (Ln)	3.5 (1.16)	3.12 (1.70)	-0.89	3.68 (1.52)	3.27 (1.27)	-0.95	3.10 (1.30)	3.76 (1.32)	1.74*
Rural Circulation index (Ln)	1.68 (1.96)	0.85 (2.91)	-1.16	1.55 (2.75)	1.39 (2.14)	-0.21	1.16 (2.46)	1.8 (2.03)	0.97
Number of trips (Ln)	2.55 (.50)	2.7 (.30)	1.35	2.52 (.49)	2.62 (.42)	0.66	2.6 (.48)	2.59 (.38)	-0.08
Number of days out of home (Ln)	4.7 (.63)	4.53 (.75)	-0.62	4.67 (.66)	4.61 (.68)	-0.27	4.45 (.57)	4.85 (.72)	2.17**
Circulation index (Ln)	4.37 (1.10)	4.45 (.85)	0.23	4.33 (1.05)	4.42 (1.03)	0.27	4.39 (1.06)	4.41 (.99)	0.09
n	35	15		13	37		29	21	

\*p&lt;0.10, \*\*p&lt;0.05. Standard deviations in parentheses.

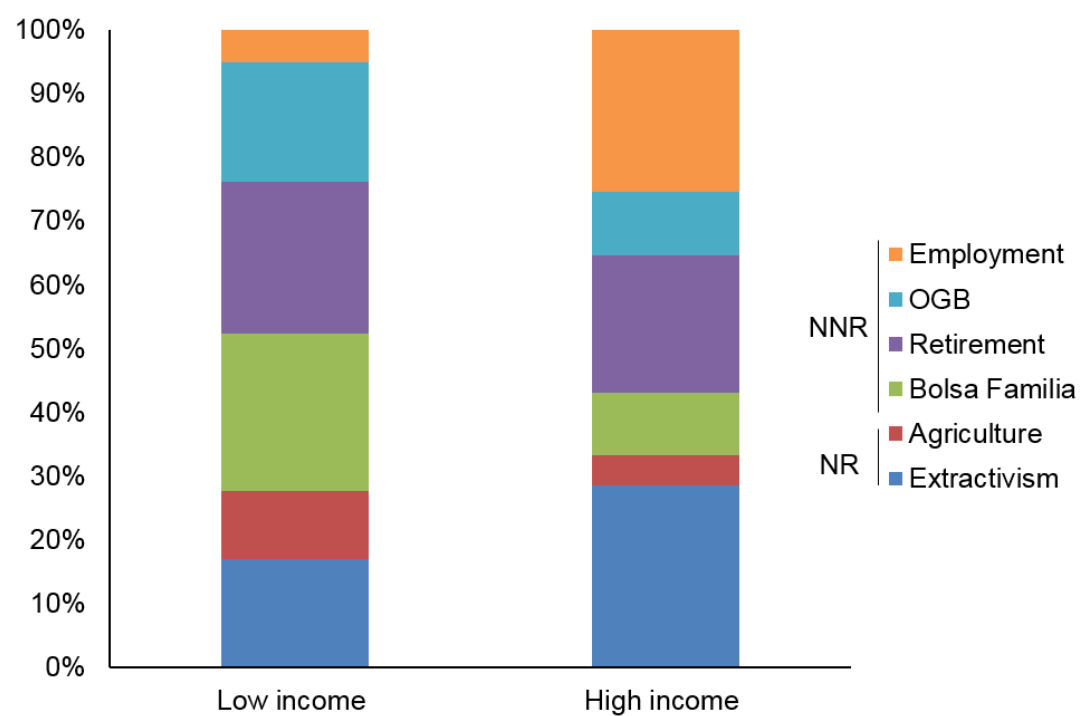


Figure 4-1. The relative composition of income for low and high groups. NR: natural resource-based activity, NNR: non-natural resource-based activity.

## CHAPTER 5 CONCLUSIONS

This dissertation investigated how the intensification of rural-urban relations have been affecting the political organization and livelihood options of indigenous communities in the Middle Rio Negro in the Brazilian Amazon. I have argued that mobility and migration are key processes behind these changes. Spatial mobility allows for the exchange of people and information across space, which is relevant for political mobilization strategies for achieving collective goals, especially struggles to secure rural territorial claims. While territory is key for indigenous communities and households, rural territories may not provide enough livelihood options. With the concentration of services and markets in urban areas, households employ circulation strategies that permit access to various resources along the rural-urban continuum.

Mobility and migration connect indigenous peoples through social, political and economic networks across regional, municipal and local scales. Regional mobility connects different indigenous groups across municipalities and among local associations. Such mobility constitutes a regional network that is connected to the national level through partners, mainly NGOs. The mobility of network leaders across rural and urban areas sustains mobilization and the flow of information. At the municipal scale, rural households diversify their livelihoods by circulating to urban areas to engage with urban markets and access state and private services.

This interdisciplinary research drew on literature on social movements, indigenous politics, rural livelihoods, spatial mobility, and fisheries management. Each literature offered insights into the impacts of the increasing rural-urban linkages on indigenous mobilization and livelihoods. The social movements literature contributed by

elucidating the mechanisms by which indigenous movements expand mobilization to new areas. Literature on the relation between indigenous peoples and the state helped to understand how indigenous laws and regulations have evolved and how they influence indigenous rights and relations of indigenous groups with their territories nowadays. The livelihoods literature provided support to understand the various strategies that households employ to access different resources dispersed across space. Literature on community fisheries management and policy helped to understand the steps in democratic processes for implementing fishing regulations.

In this chapter, I present the main findings of the dissertation and its contributions to the literatures just noted. In addition, I present the limitations of the study and outline future research priorities. Finally, I discuss the policy implications of the findings.

### **Summary of Key Findings**

Chapter 2 discussed how migration and mobility contributed to the emergence of the indigenous movement in the Middle Rio Negro of the Brazilian Amazon. The findings showed that mobility accounted for the formation of new regional networks that supported rural-urban political mobilization among local indigenous groups. Migration of indigenous leaders permitted the expansion of the regional indigenous organization network into the local towns. The network thus connected rural communities to urban indigenous associations in several municipalities. Two key migration movements involving indigenous peoples allowed the emergence of new mobilization. One process involved a flow of leaders with previous mobilization experience to the municipality of Barcelos. That provided the conditions for the creation and development of a local urban association. This constituted an expansion in the social movement to the regional scale by extending the conditions for indigenous mobilization to new locations. A

second mobility process involved local circulation between urban and rural areas, which connected rural communities to urban indigenous activists and organizations. This constituted a local scale shift by expanding participation in mobilization from local urban centers to rural communities, which later created their own associations. These two processes of spatial mobility constituted a local base of indigenous mobilization over shared interests: identity, territory and other resources. The participation of rural communities in the indigenous regional network in turn built capacity for coordinated action. Interactions through political networks thus strengthened the shared sense of indigenous identity among rural and urban indigenous peoples because of their increased participation in local and regional political spaces.

Migration and mobility of political leaders served as strategies to “shift the scale” of indigenous mobilizations seeking state recognition of indigenous identities and territorial claims. Such mobilization received support from the indigenous regional network alliance with other organizations such as NGOs, which helped to consolidate the urban-rural mobilization network in Barcelos, providing technical, political and financial support. The process also benefited from the major national context where the federal government was implementing social policies for indigenous peoples after the 1988 Constitution. The establishment of indigenous health care infrastructure financed by the federal government helped to legitimize the indigenous presence in Barcelos.

Adding to Chapter 2's discussion of indigenous mobilization, Chapter 3 discussed how the indigenous network and rural-urban mobility posed challenges but also opportunities for resource management at the municipal level. Fishing is essential for the food security of rural communities, but the poor delimitation of the rights to land

and water resources led to conflicts among communities and other users of fisheries, notably sport and commercial fishers. The increasing rural–urban connections helped indigenous peoples to mobilize in order to push for official protection of their traditional fishing territories. Indigenous organizations led discussions with various communities, government agencies and other stakeholders for implementing fishing management. In this context, the development of the indigenous rural-urban network lent new impetus to negotiations about fisheries management in Barcelos. Participation in the mobilization network provided an opportunity for rural communities to learn about their rights and unite around shared problems. The mobilization thus contributed to a more democratic process of engaging in natural resource policy and management.

There are still barriers to implement fisheries management in the region. These include the lack of tenure that leaves natural resources subject to open access, as well as interest groups with differing levels of power, and inefficient government to implement and enforce management rules. Another challenge is the proposed model of management - *acordos de uso* – where the community members living close to fishing spots have priority or exclusive rights to fish in that area. This model is based on the premise of fixed residence, but indigenous rural-urban circulation challenges ideas of rural permanent residence. This complexity underscores the need for developing natural resource management models to deal with the spatial mobility of people, without excluding minority groups who rely on both circulation and use of natural resources to sustain their livelihoods.

Chapter 4 provides an analysis of circulation patterns among rural and urban areas by indigenous households. I discussed the relationship of household

socioeconomic status with rural-urban circulation, and how circulation is related to income sources and thus livelihood strategies. The descriptive findings show that indigenous rural households are highly mobile, spending roughly one third of the year away from their primary home, on trips to both rural and urban areas. Notably, circulation to urban areas is already more prevalent than to rural areas. Trips to urban areas are multipurpose since towns concentrate many services and markets. Most households have their own mean of transportation, but as trips to town are expensive, households try to plan each trip following the schedule of salaries and government welfare payments in order to accomplish a maximum number of tasks and priorities. Interestingly, distance from the primary residence to town did not influence the amount of circulation to urban areas. Households in distant communities traveled as much as those living close to urban areas. This finding shows that circulation to urban areas is already a significant part of the rural household routine, independent of their home location. Trips to rural areas are mostly to extract natural resources and for social events. Indigenous households are still dependent of natural resources for consumption, and circulation is very important to access those resources. That said, most monetary income to indigenous households surveyed in Barcelos now comes from non-natural resource sources such as employment and government welfare programs.

The analysis then compared circulation among high and low-income and wealth households in order to evaluate how social status is related to mobility. Circulation is important for indigenous households, but it is not uniform: high-income households circulate more than low-income households, to both rural and urban areas. High-income household members do travel more frequently and spend more time away from their

home per year. This accords with expectations based on speculations in previous literature. However, relatively low and high-wealth households exhibited the same levels of circulation, which was a surprise as it contradicts expectations. A possible explanation is that circulation was influenced by the flow of monetary resources (income) available during the time period in which circulation was observed, but not by the asset stock (wealth) accumulated over a longer period of time. These findings suggest that circulation is related to income opportunities available at a given time. Households in the study region likely experience significant inter-annual variations in their incomes, which helps explain why circulation reflects annual income more than accumulated wealth. If circulation is related to cash income, and income varies across time, circulation measures for the same households vary in a similar fashion. This also reflects the endogeneity of income and circulation, such that each influences the other. By contrast, accumulated wealth may reflect high incomes of previous years, which may or may not ensure a high income and thus high circulation in a given year.

The analysis then evaluated the importance of particular livelihood activities and thus income sources for circulation. The findings suggest that circulation reflects the diverse portfolio of household livelihood activities, rather than specific activities. When comparing households by specific activities, natural and non-natural resource-based, I did not find differences in circulation. Contrary to what previous literature suggests and to what I expected, non-natural resource based livelihood activities such as being recipient of welfare programs does not correspond to more urban trips. For example, there was no difference in circulation between households that did and did not receive the bolsa familia or retirement payments. This finding is probably due to the

multipurpose nature of urban trips. That is, having an additional urban income source does not increment urban circulation since households time urban trips to maximize their activities during a given trip. More generally, specific livelihood activities cannot explain overall differences between household circulation, probably due to distinct strategies of livelihood diversification across households. Fishing is the only exception, and the results showed that households with commercial fishing activities do circulate to both rural and urban areas more than other households. That result is probably due to the nature of the activity: fishing must occur in specific locations that depend on regular trips to rural areas to catch fish, the product is highly perishable and must therefore be moved to market immediately, and markets are spatially concentrated in urban areas.

### **Contributions of the Dissertation**

This dissertation contributes to a broader understanding of how spatial mobility between rural and urban areas is important for contemporary indigenous peoples. This study showed new ways in which indigenous households organize their lives across spaces beyond their traditional rural territories. Livelihoods now feature multi-local spatial strategies. But multi-locality does not represent necessarily a ruptures with traditional indigenous culture. Rather, it offers a means of supporting continuities between rural and urban spaces where people circulate, information can be exchanged, and traditional resource claims can be defended. In the process, ideas and values about cultural identity are shared, and are specifically invoked in political mobilization if territorial claims are threatened.

This dissertation adds to the work of McSweeney and Jokish (2007, 2015), who called attention for the importance of migration for indigenous political mobilization in the Amazon. They were pioneers to suggest that contemporary indigenous mobility and

migration to urban areas do not necessarily result in the emptying of traditional territories. On the contrary, these migration flows can support regional networks for mobilization, with the potential to contribute to processes of defending territorial claims. This dissertation contributed with a study case that suggests specific mechanisms of mobilization that can lead to an official process to recognize indigenous territories. This inquiry is relevant to literature on indigenous mobilization as well as indigenous policy. The assumption that indigenous rural-out migration is necessarily a disruptive process of assimilation to non-indigenous societies is thus questionable. My results show a contrary outcome, with indigenous peoples recognizing their traditional cultural roots as supported via exchanges of experiences among indigenous migrants. The result is the development of a common indigenous identity that unites various groups for mobilizing around issues of shared concern.

Specifically, the findings showed that migration and mobility helped as mechanisms that contribute to the diffusion of indigenous mobilization on the regional scale. The migration of indigenous political leaders contributed to the formation of mobilization networks and the expansion of the network ties to new municipalities and communities. The physical presence of such leaders with previous mobilization experience helped to spread the movement into new places like Barcelos. The presence of urban leaders in rural areas contributed with sharing information about indigenous rights, which is relevant in more isolated places where the means of communication are limited. The case study contributed to studies of social movements showing how indigenous migrants can serve as brokers that connect indigenous groups in different communities and municipalities. This creates the conditions for the formation

of a network of communication that maintains the “mobilizing structures” (McAdam et al. 2001). These structures connect issues and people at the local scale to networks of shared interests on larger scales such as the state and even the national level. Such connections are crucial for indigenous peoples in Brazil because legislation dealing with indigenous territorial issues is framed at the federal level.

The participation of rural communities in the indigenous regional network in turn built capacity for local coordinated action. Indigenous groups thus created their own local associations in rural areas that were then linked to the urban associations. The rural-urban network in turn supported community resistance concerning issues of labor exploitation, paternalistic relations with the local government, and disputes over natural resources, mainly in conflicts over accessing fisheries.

While at the regional and municipal level there is a focus on indigenous rural territorialization and management of resources, at the local level households maintain circulation between rural and urban areas as way to expand and diversify their livelihood options beyond agriculture and extractivism, increasing non-farm and urban activities and accessing government welfare programs. This study contributed an unprecedented quantitative analysis of rural-urban circulation and socioeconomic status among indigenous households. Previous literature on multi-local livelihoods was based on ethnographic research, and there has been limited empirical research using quantitative methods on indigenous mobility and urbanization. Quantification contributes to understanding of patterns of circulation across rural and urban spaces and the impacts on indigenous livelihoods. The dissertation results confirmed previous literature that suggested that circulation is increasingly common among indigenous households.

However, the quantification of mobility showed that the amount of circulation varies across households according to monetary income, but not household wealth. It is important to highlight that despite high circulation to urban areas, rural territories continue to be a key site of natural resources which provide a large part of household consumption. Rural territories also continue to constitute the locus of indigenous cultural and symbolic value, as manifest via travel for social events.

The results in this dissertation suggest that circulation is not only a contextual factor in livelihoods, but rather that it constitutes a central element of livelihood strategies that deserves more careful attention. The capacity to be mobile can provide community and household access to diverse resources for their sustainable development, such as the recognition of their territory (social, cultural and natural capital), including rights to manage key natural resources, as well as access to public education and health care (human capital). Mobility can potentially strengthen social capital, which is crucial for minority groups with limited power to access other spheres such as state, markets and civil society (Bebbington 1999).

### **Limitations of the Study and Future Research**

This dissertation has generated important findings concerning indigenous mobility, political mobilization and livelihoods. However, the work presents some limitations that have to be recognized. First, the quantitative analysis in Chapter 4 has a low number of cases, and it was restricted to a one-year period. Both are due to logistical challenges and budget limitations. The result is that the explanatory power of the analysis is somewhat limited. The low number of cases makes it difficult to build more sophisticated empirical models that can include other variables that may also affect circulation. While the one-year period allows us to capture seasonal variations, it

is too short to capture differences over longer time scales such as among years. Future studies mobility in indigenous groups are thus necessary to understand the impact of non-natural resource monetary sources, especially welfare programs, on circulation among indigenous peoples. Comparative studies among different indigenous groups, and studies over periods of more than one year are also in order. Repeated measures of circulation over multiple years would clarify the relationships among income, wealth and circulation. Measures of income and circulation taken in successive periods would allow for better control of the endogeneity among these variables.

A second limitation is related to the findings on political mobilization in Chapters 2 and 3. The results suggest some mechanisms of regional and municipal political mobilization related to migration and mobility of brokers, but I recommend caution with generalization of the results for other indigenous ethnic groups. Different indigenous peoples have diverse and distinct cultural, historical, economic, political and social contexts that may result in varied mobilization strategies and outcomes related to rural-out migration, especially with regard to outcomes for demarcation of rural territories. One may find similar processes elsewhere among indigenous groups along rivers in the Amazon, but in frontier areas with old colonization projects, the situation is distinct due to stronger external pressures on indigenous territories. Future research comparing different indigenous territories is necessary to clarify whether the positive relationship between migration, social mobilization, the spatial expansion of mobilization, and processes of rural territorialization is present in other contexts in the Amazon.

This research contributed to a better understanding of how rural communities and households seek to access and maintain natural resources as livelihood options.

More research is needed to understand the implications of multi-local livelihood strategies for indigenous resource use and thus conservation of forests and fisheries in tropical regions. Legalized indigenous lands are recognized as the “the most important barrier to Amazon deforestation” (Nepstad et al. 2006, 65). Nevertheless, the impact of household migration and circulation on resource conservation in indigenous lands is still unknown. How do indigenous communities regulate indigenous membership and rights to use natural resources for community members living in urban areas? Another question that still remains is if multi-local residency and livelihood strategies may lead to rural out-migration in the future. Is circulation or multi-local residence a pathway for future indigenous migration that would abandon traditional territories? Longitudinal studies comparing circulation and migration of groups living inside recognized territories with groups living in non-recognized territories would help answer these questions. In addition, long-term studies comparing indigenous groups in different contexts within the Amazon (such as along rivers and in colonization zones) would reveal other drivers of rural-out migration but also possibly the development of alternative forms of multi-local livelihoods.

### **Policy Implications**

There are potential policy implications related to the dissertation findings. Although the results in this dissertation suggest that rural-urban circulation is important to indigenous livelihoods and rural territorial claims, there are also anecdotal data suggesting that circulation to take advantage of state welfare programs has negative effects on indigenous groups (Folha de São Paulo 2016a, 2016b). One such argument is that the Bolsa Família is driving circulation of indigenous people from rural to urban areas, and access to money is causing changes in culture as via dietary and

industrialized consumption patterns, and resulting in rural-out migration from indigenous territories. There is no systematic research published about the impact of recent welfare policies on indigenous peoples. Future research is needed to understand the impacts – positive and negative – of these policies on indigenous peoples. That research should ideally compare different regions and indigenous groups due to their cultural variability and degree of access to money. A better understanding of the relationship between mobility and access to social policies can help to design better strategies to deliver public services and welfare programs in order meet the needs of indigenous peoples while respecting their cultural practices.

This research contributes to the recognition of indigenous mobility as a valid livelihood strategy that affects different political, economic and social aspects of indigenous communities. Studies that look at the complex way indigenous peoples develop rural-urban linkages can help to deconstruct media and even policy narratives (McSweeney and Jokish 2015) that dismiss indigenous identities and rights by associating their increasing participation in urban life, and circulation, with acculturation and abandonment of the land. It is likely that there are cases when this assumption can be true, but at least thus far in the case of Barcelos, that has not transpired.

Spatial mobility does not automatically lead to emptying of indigenous territories or disruptions of traditional culture. This is because there are multiple processes underlying the dynamics of rural and urban circulation. However, even in the specific region studied it is possible to envision a future scenario where rural-out migration can increase to become a problem. The persistence of the lack of official recognition of indigenous claims to land and water resources can lead to an increase in invasions and

the irresponsible use of natural resources by outsiders. That in turn can undermine indigenous livelihoods and motivate rural out-migration out of necessity. By contrast, secure territorial rights can encourage the sustained use of natural resources by indigenous groups and thus help guarantee rural livelihoods for communities, who can then decide themselves who are their members and the responsibilities attached, even if they are not present all year round in the rural area. That said, even in the case of demarcation of indigenous lands, if rural education infrastructure continues to be deficient, rural-out migration may still increase and potentially cause problems in urban areas.

This research focused on voluntary mobility and migration in a region with relatively few land conflicts and deforestation compared other parts of the Amazon. In the broader Amazonian context, there are indigenous groups suffering increasing pressure from infrastructure and development projects advancing into or near indigenous territories, which can cause forced displacement of indigenous people from their territories. In addition to these pressures, there are successive attempts to change indigenous constitutional rights as way to allow the advance of infrastructure projects into indigenous territories (Curi 2014; Campbell 2015). These represent significant threats to indigenous peoples' livelihoods and cultures, by either direct impacts inside their lands or environmental degradation associated with these impacts. All these pressures over indigenous territory reinforce the importance of indigenous groups to maintain networks for political mobilization. That in turn is why it is important to identify successful forms of indigenous mobilization. Such knowledge can then contribute to indigenous organizations and institutions that support indigenous rights to develop

strategies of resistance. To understand why certain cases of resistance succeed can potentially help other groups to mobilize to resist to increasing pressures on their territories.

# APPENDIX A HOUSEHOLD QUESTIONNAIRE (PORTUGUESE)

## QUESTIONÁRIO FAMILIAR

1. DATA \_\_\_\_\_

2. COMUNIDADE: \_\_\_\_\_

### A. COMPOSIÇÃO FAMILIAR

3. Quantas famílias moram nessa casa? \_\_\_\_\_

(Se morar mais de uma família perguntar)

4. A produção das famílias é separada ou em conjunto?

5. Quem mora nessa casa atualmente?

1. Numero	2. Nome	3. Relação/ parentesco com o chefe da família	4. Idade	5. Sexo	6. Anos de escola completados	7. Etnia	8. Religião	9. Principal atividade produtiva atualmente
1 Entre vistado								
2								
3								
4								
5								

\* determinado por tempo dedicado.

**Códigos:** 1=esposa; 2 filho(a); 3=enteado(a); 4=neto(a); 5=Mae/pai; 6=sogra(o); 7=irmã(o); 8=cunhado(a); 9=tio(a); 10=sobrinho(a); 11=filho(a) adotado(a); 12=outro familiar; 13=não parente.

### B. HISTÓRICO DE MIGRAÇÃO

6. Quando e onde você e sua esposa(o) nasceram?

1a. Data de nascimento (ano)	2a. Estado	3a. Município	4a. Área Rural/Urba
1b. Data de nascimento (ano)	2b. Estado	3b. Município	4b. Área Rural/Urba

7. Ano em que chegou neste local \_\_\_\_\_

**8. Por favor, me fale até as últimas quatro localidades onde você morou antes se mudar para esta localidade.** (NOTA: Para anos que se mudou para este local, se necessário pergunte quantos anos desde a mudança de residência ou refira-se para grandes acontecimentos, tais como eleições e pergunte se a “última vez que se mudou de residência foi antes ou depois desse evento.”)

	a. Ano da mudança para localidade de residência	b. Estado	c. Município	d. Área Rural/Urbana
1. Última localidade de residência anterior				
2. Residência anterior (segunda localidade)				
3. Residência anterior (terceira localidade)				
4. Residência anterior (quarta localidade)				

**9. Quem são os membros de sua família que previamente moravam na sua casa mais que agora estão ausentes por mais de seis meses?**

#	1. Relação/Parentesco com o chefe da família	2. Ano da saída (coloque meses se a saída foi este ano)	3. Razões para ausência (trabalho, escola, doença, casamento, etc.)	4. Local de residência (cidade, município, estado)	5. Vivem em: casa própria/alugada/casa parentes/ outro	6. Pretende regressar para cá? (Sim/Não/nao sabe)	7. Contribuição com a família? (dinheiro, insumos, produtos, etc)
1							
2							
3							
4							
5							
6							
7							
8							

### C. MOBILIDADE

**10. Gostaria de saber das viagens dos membros da família para outros locais (por mais de 24 horas) além da comunidade NOS ÚLTIMOS 4 MESES**  
(NOTA: MOSTRAR CALENDÁRIO COM CADA UM DOS MESES ANTERIORES/PERGUNTAR SOBRE DATAS IMPORTANTES COMO ELEIÇÕES, FESTAS, REUNIÕES, ETC)

1. Quem viajou	2. Para onde (urbano /rural)	3. Data partida	4. Data chegada	5. Razões da viagem (Saúde/Educação/ Comércio/ReceberBF etc/Visita/Outro motivo (especificar)	6. Transporte utilizado (Rabeta/Motor centro/Voadeira/Recreio/Outro-especificar)	7. Transporte próprio (sim/não)	8. Tempo para chegar ao destino (horas navegação)	9. Onde ficou (Casa própria/Casa parente/Casa amigo/Casa de apoio prefeitura/Outro (especificar)
1								
2								
3								
4								
5								
6								

<b>11. Você possui ou aluga casa na cidade? (CIRCLE UM)</b> Sim                  Não	1. Se sim, em que cidade (nome)? _____	2. Quando comprou/alugou? _____ (mês/ano)
<b>12. Você tem algum parente próximo (filhos, netos, pais, irmãos) vivendo na cidade/rua? Sim                  Não</b>	1. Se sim, em que cidade (nome)? _____	2. Quem (relação de parentesco)? _____
<b>13. Estes parentes possuem ou alugam casa na cidade/rua? Sim                  Não</b>	1. Casa própria/ alugada/ Outro _____	

**14. Como sua família divide seu tempo entre aqui na comunidade e em outros locais (por exemplo sítio, cidade, casa de parentes, etc). NOTA: números tem que somar 100%. Se necessário pergunte quantos meses em cada local e converta para porcentagem.**

	a. % tempo comunidade	b. % tempo outras residências rurais	c. % tempo cidade
1. Verão-homens			
2. Verão-mulheres			
3. Inverno-homens			
4. Inverno-mulheres			
5. período letivo			
6. férias			

**15. Quanto tempo leva para chegar em:**

	1. Barcelos	2. Santa Izabel RN
1. Horas navegação		
2. Meio transporte		

#### D. RENDA/E1. RENDA BASEADA EM RECURSOS NATURAIS

**AGRICULTURA 18. Vocês possuem roça? Sim      Não \_\_\_\_\_**

**19. Quem da família trabalha na roça? \_\_\_\_\_**

**20. Quantas quadras (1 quadra=1 ha) vocês possuem de:**

1. Roça nova ( <i>plantada ultima safra</i> )	2. Roça madura ( <i>roça para próxima colheita</i> )	3. Roça antiga ( <i>capoeira abandonada</i> )	4. Quantas sacas de farinha rende em média uma quadra?

**21. Fale sobre os cultivos sua família colheu nos ÚLTIMOS QUATRO MESES**

	1. quadras plantadas	2. Produção total	3. UND (kg, lt, lata, saca, etc)	4. Prod.consumida (incluir presentes)	5. Prod. vendida (incluir trocas)	6. Preço vendido (R\$)	7. Preço unid (R\$)	8.Quem comprou produção (membro da comunidade ou alguém de fora)	9. Local da venda (nome da comunidade ou cidade)**
<b>Mandioca (quantidade total colhida)</b>									
<b>Farinha</b>	-								
<b>Farinha tapioca</b>	-								
<b>Goma</b>	-								
<b>Tucupi</b>	-								
<b>Macaxeira</b>									
<b>Milho</b>									
<b>Cana de açúcar</b>									
<b>Gerimum</b>									
<b>Cará</b>									
<b>Maxixe</b>									
<b>Melancia</b>									
<b>Abacaxi</b>									
<b>Banana</b>									
<b>Outros (especifique)</b>									

**\*\*** Se vendido nesta comunidade, coloque "aqui"; se vendido em outra comunidade, coloque o nome da comunidade; se vendido em uma cidade, coloque o nome da cidade.

**22. Quais materiais (insumo)s para agricultura/roça foram comprados nos ÚLTIMOS QUATRO MESES (despesas)**

1.Insumos	2. Quantidade	3. Unidade	4. Preço por unidade
1. Sementes			
2. Fertilizantes			
3. Trabalho			
4. Ferramentas			
5. Transporte/combustível			
6. Outros-especificar			

**CRIAÇÃO DE ANIMAIS**

**23. Qual o número de animais ADULTOS sua família tem agora, e quantos foram vendidos, consumidos ou perdidos nos ÚLTIMOS QUATRO MESES?**

1. Animais	2. No de animais inicial (4 meses atrás)	3. Animais nascidos	4. Animais perdidos (morte, roubo, etc)	5. Animais comprados	6. Animais consumidos	7. Animais vendidos	8. Preço vendido	9. Preço por animal	10. Quem comprou os animais (membros da comunidade e ou de fora)	11. Lugar de venda (nome da comunidade e ou cidade)*
Suínos										
Galinhas										
Pato										
Bovino										
Outro-especificar										

**24 Quais materiais (insumos/despesas) para criação de animais foram comprados nos ÚLTIMOS QUATRO MESES?**

1. Insumos	2. Quantidade	3. Unidade	4. Preço por unidade
1. Material abrigo (cerca, etc)			
2. Remédios			
3. Ração			
4. Ferramentas			
5. Transporte			
6. Trabalho			
7. Outros-especificar			

**SALÁRIOS E BENEFÍCIOS**

**25. Por favor nos diga quais outras fontes de renda sua família tem recebido nos ÚLTIMOS QUATRO MESES?**

1. Tipo de renda	2. Quando começou a receber (mês/ano)	3. Quanto recebeu (-1 mês) ____/____	4. Quanto recebeu (-2 mês) ____/____	5. Quanto recebeu (-3 mês) ____/____	6. Quanto recebeu (-4 mês) ____/____	7. Observações
1. Bolsa família						
2. Pensão						
3. Seguro defeso						
4. Aposentadoria						
5. Auxílio maternidade						
6. Aluguel ou arrendamento de terra						
7. Remessas (recebidas)						
8. Negócio próprio						
9. Empréstimo						
10. Diária trabalho						
11. Outra atividade/fonte 1						
12. Outra atividade/fonte 2						

## EXTRATIVISMO FLORESTAL

### 26. Fale sobre os produtos que você e sua família extraíram nos ÚLTIMOS QUATRO MESES?

1. Produto	2. Quem da família extraiu	3. Qtdade produzida	4. Und (kg, lt, lata, saca, etc)	5. Qtdade consumida (incluir presentes)	6. Produção vendida (incluir trocas)	7. Preço vendido	8. Preço unidade (R\$)	9. Quem comprou a produção (membro da comunidade o alguém da fora)	10. Lugar de venda (nome da comunidade ou cidade)
Piaçava									
Madeira									
Carvão									
Palha									
Castanha									
Açaí									
Bacaba									
Patauá									
Tucumã									
Cupuaçu									
Ingá									
Manga									
Goiaba									
Outro (especifique)									

### 27. Quais materiais (insumo)s para extrativismo foram comprados nos ÚLTIMOS QUATRO MESES? (despesas)?

A. Insumos	B Quantidade	C. Unidade	D. Preço por unidade
1. Trabalho			
2. Ferramentas			
3. Transporte			
4. Outros-especificar			
5.			
6.			
7.			

## ARTESANATO

### 28. Alguém de sua família produziu artesanato nos ÚLTIMOS QUATRO MESES?

1. Tipo artesanato (piaçava, sementes, madeira, outro-especificar)	2. Quem confeccionou	3. Qtdade produzida	4. UN D	5. Como conseguiu matéria prima? (comprou/ Se extraiu- substrair da tabela Extrativismo)	6. Qtdade vendida	7. Preço vendido	8. Preço unidade (R\$)	9. Quem comprou (membros da comunidade e ou alguém de fora)	10. Local venda (nome da comunidade e ou cidade)

**29. Quais materiais (insumo)s para artesanato foram comprados nos ÚLTIMOS QUATRO MESES? (despesas)?**

A. Insumos	B Quantidade	C. Unidade	D. Preço por unidade
1. Trabalho			
2. Ferramentas			
3. Transporte			
4. Outros-especificar			
5.			
6.			
7.			

**PESCA**

**30. Quantas vezes por semana alguém da sua família sai normalmente para pescar?**  
\_\_\_\_\_ dias/semana

**31. Alguém pescou na última semana?** Sim Não (Se não pescou nessa semana pular para a pergunta 33)

**32. Quanto foi pescado na última semana?**

1. Espécie (incluir bichos de casco)	2. Quem pescou	3. Qtdade capturada	4. UN D	5. Tempo demorado na pescaria (horas)	6. Qtdade consumida pela família	7. Qtdade vendida	8. Preço vendido	9. Preço por unidade (R\$)	10. Quem comprou a produção (membro da comunidade e o alguém da fora)	11. Lugar de venda (nome da comunidade e ou cidade)
12. Para essa época do ano a pescaria da última semana foi: ( ) muito boa, ( ) normal, ( ) ruim (..) não sabe										
13. Época do ano: ( ) cheia ( ) vazante ( ) enchente ( ) seca										

**33. Quanto foi pescado no último mês?**

1. Espécies (incluir bichos de casco)	2. Quem pescou	3. Qtdade capturada	4. UN D	5. Número de dias que pescou	6. Qtdade consumida pela família	7. Qtdade vendida	8. Preço vendido	9. Preço unidade (R\$)	10. Quem comprou a produção (membro da comunidade e o alguém da fora)	11. Lugar de venda (nome da comunidade e ou cidade)
12. Para essa época do ano a pescaria do último mês foi: ( ) muito boa, ( ) normal, ( ) ruim (...) não sabe										
13. Época do ano: ( ) cheia ( ) vazante ( ) enchente ( ) seca										

**CAÇA**

34. Quantas vezes por semana alguém da sua família sai normalmente para caçar?  
\_\_\_\_\_ dias/semana

35. Alguém caçou na última semana?      **Sim**      **Não (Se não caçou nessa semana pular para a pergunta 37)**

36. Quanto foi caçado na última semana?

1. Espécies	2. Quem caçou	3. Qtdade capturada	4. UND	5. Horas caçando	6. Qtdade consumida pela família	7. Qtdade vendida	8. Preço vendido	9. Preço unidade (R\$)	10. Quem comprou a produção (membro da comunidade o alguém da fora)	11. Lugar de venda (nome da comunidade ou cidade)
12. Para essa época do ano a caça esta semana foi: ( ) muito boa, ( ) normal, ( ) ruim (...) não sabe										
13. Época do ano: ( ) cheia ( ) vazante ( ) enchente ( ) seca										

37 Quanto foi caçado no último mês?

1. Espécies	2. Quem caçou	3. Qtdade capturada	4. UND	5. Horas caçando	6. Qtdade consumida pela família	7. Qtdade vendida	8. Preço vendido	9. Preço unidade (R\$)	10. Quem comprou a produção (membro da comunidade o alguém da fora)	11. Lugar de venda (nome da comunidade ou cidade)
12. Para essa época do ano a caça este mês foi: ( ) muito boa, ( ) normal, ( ) ruim (...) não sabe										
13. Época do ano: ( ) cheia ( ) vazante ( ) enchente ( ) seca										

38. Quais materiais (insumo)s para PESCA/CAÇA foram comprados nos ÚLTIMO MÊS (despesas)?

A. Insumos	B Quantidade	C. Unidade	D. Preço por unidade
1. Trabalho			
2. Ferramentas			
3. Transporte			
4. Outros-especificar			
5.			
6.			
7.			

## E. BENS FAMILIARES

### 39. Qual dos itens a seguir sua família tem acesso? (MARQUE TODOS QUE SE APLICAM)

1. Itens	2. Moradores da casa possuem (TIPO/ quantidade)	3. Outras formas de acesso (através da comunidade – empréstimo QUEM etc.)
1. Barco com motor-batelão		
2. Canoa rabeta (coberto, descoberto)		
3. Canoa		
4. Voadeira		
5. Moto		
6. Bicicleta		
7. Fogão a gás		
8. Freezer/geladeira		
9. Rádio		
10. Televisão		
11. Antena parabólica		
12. DVD		
13. Computador		
14. Telefone celular		
15. Aparelho de som		
16. Motosserra		
17. Espingarda/arma de fogo		
18. Malhadeira		
19. Motor de luz próprio		

### 40. Como você descreveria esta casa e suas características? (CIRCULE UMA OPÇÃO PARA CADA ITEM.)

1. Piso	Chão de barro	Tronco palmeira	Madeira	Tijolo/cimento	Outro:
2. Parede	Barro	Tronco palmeira	Madeira	Tijolo/cimento	Outro:
3. Telhado	Palha	Madeira/cavaco	Zinco/brasilite	Telha de barro	Outro:
4. Eletricidade	Não tem	Gerador a gás ou diesel	Placa solar	Linha de eletricidade da cidade/governo	Outro:
5. Fonte de água para consumo	Rio/igarapé/córrego	Poço	Tubulação encanada	Outro:	
6. Instalação sanitária	Não tem	Fossa	Fossa séptica	Outro:	
7. Lixo sólido	Enterrado	queimado	Lançado no rio	Coletado pelo serviço da cidade	Outro:
8. Número de cômodos	1	2	3	4	≥5

## F. MUDANÇAS PASSADAS E PLANOS FUTUROS

### 41. Fale sobre mudanças na sua comunidade nos últimos 5 anos. (MARQUE UMA OPÇÃO POR ITEM)

	Melhorou	Mesmo jeito	Piorou	Comentários
Transporte para cidade				
Serviços de saúde				
Serviços de educação				
Facilidade na venda da produção				
Acesso a água				
Liderança comunitária				
Andamento da associação local				
Governo Local (municipal)				
Governo Estadual				

### 42. Fale sobre os planos de sua família para os próximos dois anos

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### 43. Estão no planos ? (MARQUE UMA OPÇÃO PARA CADA ATIVIDADE)

	Iniciar	Mesmo jeito	Aumentar	Reduzir	Parar	Não tem interesse em começar
1. Roça						
2. Castanha						
3. Borracha						
4. Outros PFNM						
5. Cultivo anual						
6. Cultivo perene						
7. Gado						
8. Outros animais						
9. Trabalho assalariado						
10. Madeira						
11. Caça						
12. Pesca						
13. Remessas						
14. Negócio próprio						
15. Mudar para a cidade						
16. Trabalho em associação						
17. Outro 1 (Especificar):						
18. Outro 2 (Especificar)						

### 44. O que achou da entrevista?

### 45. O senhor(a) quer me perguntar alguma coisa? Alguma dúvida?

APPENDIX B  
EXTRA TABLES FOR CHAPTER 4

Table B-1. Comparative analysis (t-tests) of household circulation for households by income status (low/high), income per adult status, and wealth status. Numbers not normalized.

Circulation measures	AI			AIA			Wealth		
	Low	High	t (df=48)	Low	High	t (df=48)	Low	High	t (df=48)
Number of urban trips	8.52 (3.84)	10.88 (4.11)	-2.09**	8.28 (3.87)	11.12 (3.91)	-2.58**	9.36 (3.72)	10.04 (4.52)	-0.58
Number of days out of home in urban trips	70 (58.09)	68.44 (33.62)	0.12	63.52 (55.41)	74.92 (36.98)	-0.86	64.08 (42.65)	74.36 (51.30)	-0.77
Urban Circulation index	38.38 (45.81)	58.80 (70.40)	-1.22	33.53 (43.40)	63.65 (70.11)	-1.83*	40.55 (38.13)	56.64 (75.38)	-0.95
Number of rural trips	4.32 (4.83)	5.64 (4.05)	-1.05	4.08 (4.71)	5.88 (4.09)	-1.44	5.4 (4.89)	4.56 (4.05)	0.66
Number of days out of home in rural trips	36.92 (46.42)	75.12 (64.29)	-2.41**	39.40 (49.26)	72.64 (63.60)	-2.07**	38.28 (44.79)	73.76 (66.23)	-2.22**
Rural Circulation index	21.07 (76.56)	23.07 (41.61)	-0.11	19.76 (76.43)	24.38 (41.72)	-0.26	23.66 (76.24)	20.48 (42.14)	0.18
Number of trips	12.84 (5.72)	16.52 (7.12)	-2.01*	12.36 (5.57)	17.00 (6.95)	-2.60**	14.76 (6.05)	14.60 (7.34)	0.08
Number of days out of home	106.92 (75.61)	143.56 (83.96)	-1.62	102.92 (75.26)	147.56 (82.23)	-2.00	102.36 (59.58)	148.12 (93.93)	-2.06**
Circulation index	100.89 (126.49)	162.22 (138.55)	-1.63	88.14 (114.87)	174.96 (141.54)	-2.38**	134.18 (135.82)	128.92 (136.72)	0.14
n	25	25		25	25		25	25	

\*p<0.10, \*\*p<0.05. Standard deviations in parentheses.

Table B-2. Independent t-tests comparing NR livelihood activities groups (yes/no) in relation to circulation measures.  
Numbers not normalized.

Circulation measures	Commercial fishing			Agriculture			Forest		
	No	Yes	t (df=48)	No	Yes	t (df=48)	No	Yes	t (df=48)
Number of urban trips	8.56 (3.90)	11.4 (3.92)	2.50**	10.45 (4.45)	9.10 (3.80)	-1.15	10.57 (4.56)	9.36 (3.94)	-0.93
Number of days out of home in urban trips	60.56 (48.35)	82.20 (42.76)	1.62	81.54 (37.50)	59.53 (51.87)	-1.67	80.71 (65.12)	64.75 (37.96)	-1.08
Urban Circulation index	34.62 (48.93)	69.55 (69.00)	2.09**	65.37 (75.53)	35.41 (40.21)	-1.80*	64.75 (37.96)	43.39 (46.55)	-0.99
Number of rural trips	3.46 (2.43)	7.25 (5.77)	3.19***	4.81 (4.17)	5.10 (4.75)	0.22	4.28 (4.28)	5.25 (4.56)	0.68
Number of days out of home in rural trips	48.16 (55.59)	67.8 (62.79)	1.16	70.22 (63.03)	44.85 (53.67)	-1.54	57.00 (63.54)	55.63 (57.73)	-0.07
Rural Circulation index	7.38 (17.27)	44.10 (91.03)	2.16**	19.28 (41.98)	24.26 (73.27)	0.28	18.24 (50.56)	23.56 (65.19)	0.27
Number of trips	12.03 (4.80)	18.65 (7.18)	3.91***	15.27 (7.52)	14.21 (5.99)	-0.55	14.85 (7.73)	14.61 (6.31)	-0.12
Number of days out of home	108.73 (79.75)	150 (78.89)	1.80*	151.77 (79.34)	104.39 (77.77)	-2.12**	137.71 (104.74)	120.38 (71.21)	-0.67
Circulation index	79.85 (90.36)	209.11 (154.65)	3.73***	151.74 (146.64)	115.69 (125.34)	-0.94	109.79 (139.25)	139.26	0.71
n	30	20		22	28		14	36	

\*p<0.10, \*\*p<0.05, \*\*\*p<0.005. Standard deviations in parentheses.

Table B-3. Independent t-tests comparing NNR livelihood sources groups (yes/no) in relation to circulation measures.  
Numbers not normalized.

Circulation measures	Retirement			Bolsa Familia			Employment		
	No	Yes	t (df=48)	No	Yes	t (df=48)	No	Yes	t (df=48)
Number of urban trips	9.11 (4.51)	11.06 (2.66)	1.55	8.61 (3.50)	10.08 (4.29)	1.10	9.93 (4.85)	9.38 (2.89)	-0.46
Number of days out of home in urban trips	70.20 (42.60)	66.93 (57.52)	-0.22	55.39 (28.40)	74.08 (51.40)	1.24	60.27 (35.02)	81.57 (58.43)	1.60
Urban Circulation index	48.30 (67.20)	49.26 (38.70)	0.05	29.37 (21.52)	55.35 (67.18)	1.36	51.91 (71.21)	44.01 (39.86)	-0.45
Number of rural trips	5.28 (4.86)	4.26 (3.41)	-0.73	5.23 (6.30)	4.90 (3.72)	-.23	5.10 (5.17)	4.80 (3.37)	-0.22
Number of days out of home in rural trips	56.20 (56.96)	55.60 (64.81)	-0.03	72.54 (57.40)	50.21 (58.90)	-1.18	41.24 (45.94)	76.42 (68.91)	2.16
Rural Circulation index	26.23 (71.63)	12.36 (20.31)	-0.73	38.53 (104.84)	16.30 (35.60)	-1.13	26.16 (77.91)	16.43 (23.60)	-0.55
Number of trips	14.4 (7.56)	15.33 (3.97)	0.45	13.85 (6.40)	14.98 (6.81)	-.13	15.03 (7.69)	14.19 (5.04)	-0.43
Number of days out of home	126.40 (74.04)	122.53 (98.78)	-0.15	127.92 (76.28)	124.30 (83.86)	0.19	101.51 (64.28)	158.00 (91.82)	2.56
Circulation index	138.31 (151.23)	115.80 (88.17)	-0.53	125.27 (144.09)	133.76 (133.53)	0.19	139.60 (157.13)	120.45 (98.97)	-0.49
n	35	15		13	37		29	21	

\*p<0.10, \*\*p<0.05, \*\*\*p<0.005. Standard deviations in parentheses.

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