Published in final edited form as:

Popul Environ. 2016 March ; 37(3): 265–287. doi:10.1007/s11111-015-0245-4.

Structure and agency in development-induced forced migration: the case of Brazil's Belo Monte Dam

Heather Randell¹

¹Department of Sociology, Population Studies and Training Center, Institute at Brown for Environment and Society, Brown University, Box 1916, Maxcy Hall, 108 George Street, Providence, RI 02912, USA

Abstract

This paper examines how structure and agency interact to shape forced migration outcomes. Specifically, I ask how structural factors such as compensation policies as well as social, financial, and human capital may either foster or constrain migration aspirations and capabilities. I use longitudinal, semi-structured interview data to study forced migration among farmers displaced by the Belo Monte Dam in the Brazilian Amazon. Results from baseline interviews indicate that nearly all community members aspired to purchase rural land in the region and maintain livelihoods as cacao farmers or cattle ranchers. Constraints limiting the ability to attain aspirations included strict requirements on land titles for properties, delays in receiving compensation, rising land prices, and the lack of power to negotiate for better compensation. Despite these constraints, most migrants succeeded in attaining aspirations, as they were able to mobilize resources such as social networks, financial capital, skills, and knowledge. These findings highlight the importance of considering the relationship between structure and agency within forced migration research. I conclude by discussing how the findings may inform resettlement policies for future cases of development- or environment-induced forced migration.

Keywords

Forced migration; Structure; Agency; Social Capital; Brazil

Introduction

Development projects and environmental change are key drivers of forced migration throughout the world. Economic development is tied to the expansion of hydroelectric dams, highways, mines, and urban infrastructure, and an estimated 15 million people per year are displaced to make way for such projects (Cernea and Mathur 2008). Additionally, climate-induced sea-level rise is predicted to result in the forced migration of tens of millions of people during this century (Dasgupta et al. 2009). In light of these economic and

Correspondence to: Heather Randell.

A previous version of this paper was presented at the 2015 Population Association of America Annual Meeting in San Diego and the 2015 American Sociological Association Annual Meeting in Chicago, where I received invaluable feedback from Sara Curran and Matt Hall, respectively.

environmental changes, it is crucial to better understand the process of forced migration as well as its impacts on affected populations. Yet forced migration has remained at the periphery of migration research, which largely focuses on voluntary economic migrants. As such, a number of scholars have called for greater attention to the social processes surrounding forced migration, including the roles of migrant agency and social networks (Castles 2003; Chatty and Marfleet 2013; Turton 2003). By examining the aspirations of forced migrants as well as the structural factors that enable or constrain the attainment of those aspirations, I aim to offer theoretical insights into the interaction between structure and agency in forced migration. In addition, I suggest how these findings may be applied to the design of resettlement policies for future cases of environmental- and development-induced forced migration.

A major factor contributing to development-induced forced migration is the construction of hydroelectric dams. Approximately 50,000 large dams (at least 15 m in height) exist throughout the world, and the World Commission on Dams estimates that dams have already displaced 40–80 million people (Scudder 2005; World Commission on Dams 2000). New dams continue to be built, primarily in low- and middle-income countries. For example, the Grand Inga Dam, planned for construction in the Democratic Republic of Congo, is expected to displace 30,000 people (Jullien 2013) and the 12 dams proposed for the Lower Mekong River in Laos and Cambodia are predicted to displace over 100,000 (ICEM 2010). Hydropower is a particularly important issue in Brazil; it has been a central component of the country's energy policy for nearly 70 years and now provides 85 % of Brazil's electricity (Alves et al. 2009; EIA 2012). Existing dams in Brazil have flooded 3.4 million hectares of productive land and displaced more than one million people (Zhou and Oliveira 2007). Further, the Brazilian government is currently constructing or planning to build 34 additional hydroelectric dams by 2021 to meet the country's rising demand for energy (Ministério de Minas e Energia 2012). This paper considers the case of one such project—the Belo Monte Hydroelectric Complex—which is under construction on the Xingu River in the Brazilian Amazon and will be the third largest dam in the world in installed capacity when complete in 2019. The government argues that Belo Monte is a crucial source of renewable energy, yet the dam will have substantial social and environmental impacts, displacing 20,000 urban residents, rural farmers, and subsistence fishermen (Eletrobrás 2009).

In this paper, I ask how structural factors such as compensation policies as well as social, financial, and human capital may either foster or constrain migration aspirations and capabilities. I use the case of a rural agricultural population whose homes and land were flooded to create Belo Monte's main reservoir and associated infrastructure. The households were compensated by either money or credit for their lost land and assets, and were then responsible for finding and purchasing new property on their own. Belo Monte therefore serves as an ideal case through which to study the forced migration decision-making process, as households were faced with having to make important migration decisions in a way that those resettled in planned communities are not. This longitudinal, qualitative analysis utilizes data from 67 semi-structured interviews conducted over the course of 2 years with 39 households displaced due to the dam. Baseline interviews were conducted in August 2012 with the 39 households—28 who were waiting to be compensated and migrate at the time of data collection and 11 who had already moved. Post-migration interviews were

conducted between August and October 2014 with the 28 households who had not yet moved at baseline.

Structure, agency, and forced migration

The interplay between structure and agency is a key concept in sociology, as it helps to situate individual actions within their appropriate social context. Giddens (1984) defined agency as the power of individuals to freely make choices and perform actions that affect the course of their lives, while structure is a system of rules and resources that shape the extent to which those choices and actions are possible. Examples of rules include laws, social norms, and policies, while examples of resources include social capital, wealth, and skills. Sewell (1992) argued that agency has a dynamic relationship with structure, as structures “empower and constrain social action and...tend to be reproduced by that social action” (p. 19). In other words, agency arises from structure—from one’s knowledge of rules and access to resources—and structures can be reinforced or reformed as a consequence of human agency. Agency and structure interact, and in fact agency may occur when individuals exploit structural resources to accomplish certain ends.

Structure and agency are particularly relevant to migration research, as migration decisions are shaped by an interaction between individual- and household-level preferences and characteristics as well as economic, political, environmental, demographic, and social structures (Black et al. 2011). Yet migration theory has tended to take a more simplistic view of migration decision-making, dichotomizing it into voluntary (i.e., choosing to move in order to access employment or educational opportunities, or for life course reasons such as marriage or retirement) or forced (i.e., moving involuntarily as a result of wars, persecution, natural disasters, or development projects). A number of researchers have argued that this conceptualization is problematic that migration decisions actually fall along a continuum between voluntary (completely driven by agency) and forced (completely driven by structure) (Black et al. 2011; de Haas 2009; Hugo 1996; Hunter 2005; Richmond 1988). While voluntary and forced migration represent ideal types, most migration occurs somewhere along the continuum between the two. de Haas (2009) illustrated this point well, arguing,

many migrants who move *primarily* for work do so because they face severe constraints on personal development at home, and the range of migration options available to them tends to be constrained and structured by economic, political, and social relations. Likewise, those who are usually characterized as forced migrants, such as refugees, exercise their agency as far as possible in the face of appalling circumstances. It is only with extreme movements such as slavery and deportation that agency may be discounted completely (pp. 2–3).

The concept of a migration continuum reflects the fact that all migrants face some level of constraint related to the decision of whether, when, and where to migrate. The Belo Monte case is interesting to examine from this perspective as it falls squarely near the forced end of the continuum—migrants have no choice of whether or not to move—though migrants are provided ample room for agency, as they are able to make decisions regarding their destinations. As such, I will use the term *forced migration* throughout the paper while

recognizing that nearly all migration in this category falls short of completely forced, because significant aspects of the process entail individual choices and preferences.

Research on migration—the majority of which focuses on economic migrants—has examined both structure and agency. For example, neoclassical theory argues that migrants make decisions based on potential income gains in the destination (Todaro 1969), while the new economics of labor migration (NELM) perspective focuses on the desire to diversify household income through sending migrant members to new labor markets (Stark and Bloom 1985; Stark and Lucas 1988). Other research focuses on the resource component of structure, examining how migrant networks (Deléchat 2001; Massey 1986; Massey and Espana 1987; Winters et al. 2001) and human capital (Taylor and Martin 2001; Todaro 1980) shape migration decisions. Additional work focuses on the rules component of structure by studying, for example, how immigration policies (Massey 1999) or China's Hukou system (Chan 2010) impact migration. Yet Bakewell (2010) argued that the majority of migration theory evades the structure–agency dynamic, focusing on one or the other while ignoring the interaction between the two. Indeed, few studies explicitly examine the relationship between structure and agency in migration (e.g., Carr 2005; Conway 2007; Findlay and Li 1999; Goss and Lindquist 1995), and a recent review on the environmental dimensions of migration explicitly calls for sociologists to consider the structure–agency dynamic (Hunter et al. 2015).

In recent decades, the majority of forced migration research has focused on three main areas: refugees who move as a response to war or political unrest (e.g., Adhikari 2013; Lubkemann 2004; Ruiz and Vargas-Silva 2013), individuals who migrate temporarily or permanently due to natural disasters (e.g., Asad 2015; Fussell et al. 2010; Gray et al. 2014; Gray and Mueller 2012; Groen and Polivka 2010), or those who are displaced permanently by development projects (e.g., Downing 2002; Hwang et al. 2011; Partridge 1993; Scudder 2005). Much of this work centers on either the structural drivers of forced migration or on its socioeconomic and livelihood impacts, while few studies focus on the agency of forced migrants. Examples of research that studies both structure and agency in forced migration include work by Lubkemann (2004), which examined the variation in individuals' decisions to migrate versus remain in war-torn areas of Mozambique, and a recent study by Asad (2015), which explored how institutional, economic, and social structures influenced whether Hurricane Katrina evacuees decided to return to New Orleans or stay in their destination. These studies show that individuals affected by crises made varied migration decisions informed by strategic comparisons of their current conditions with those in potential destinations, and by the historical, cultural, and social contexts in which they operated prior to experiencing war or natural disaster.

Aside from studies such as these, most forced migration research has failed to examine the variation in the decisions and actions of migrants themselves. As such, forced migration sits on the periphery of migration research, and migration scholars have suggested the need to better integrate the forced migration process into migration studies. A decade ago sociologist Stephen Castles called for the development of a sociology of forced migration, arguing that it “has its own specific research topics, methodological problems and conceptual issues...[it] needs to be analyzed as a social process in which human agency and social networks play a

major part” (2003: 13). Additionally, migration scholars Chatty and Marfleet (2013) contended that researchers must examine forced migration with a more rigorous focus on theory, and anthropologist Turton (2003) argued that the field must support research that conceptualizes forced migrants as purposeful actors who operate within unique local social and historical contexts. These calls highlight the need to better understand agency in forced migration—namely how decisions are made and networks are utilized—social processes that have historically been overlooked when studying refugees as well as environment- and development-induced migrants.

In order to better incorporate both structure and agency into migration theory, Carling (2002) and de Haas (2010) developed the migration aspirations versus capabilities framework. de Haas (2010) argued that most migration theory has largely ignored agency, conceptualizing migration decisions as responses to external factors such as employment opportunities and wage differentials while ignoring the fact that individuals may respond differently to the same external conditions. He stated that migration should instead be theorized as a relationship between one’s independent aspirations to migrate and his or her capabilities. de Haas defined capabilities as the social, human, and material capital needed to achieve aspirations, and argued that migration theory should,

(1) include structural constraints which might impede people from moving and tend to severely restrict the options migrants have (e.g., through physical and political barriers, limited knowledge, limited resources), while at the same time acknowledging that, within a given set of structural constraints, (2) people can make independent choices according to their own knowledge, tastes and preferences (2010: 16).

Thus, migration theory should integrate the independent preferences, decisions, and actions of migrants (agency) with the resources they have access to and constraints they face (structure). In addition, Carling (2002) independently developed the “aspiration/ability model,” which he defined as both the desire to migrate (shaped by the emigration environment, individual characteristics, and social capital) and the ability to attain that desire (shaped by the immigration environment, individual characteristics, and social capital). He applied this framework in order to explain *involuntary immobility*, in which people aspire to migrate internationally but are prevented from doing so by restrictive immigration policies. The aspirations/capabilities framework therefore incorporates migration desires with the various structures that foster or constrain the ability to attain those desires. Migrants are not simply rational actors responding to economic opportunities, but are embedded within structures that determine the extent to which they can translate aspirations into outcomes.

I apply de Haas and Carling’s framework in order to examine the role of structure and agency in dam-induced forced migration. Though initially developed in the context of economic migration, this framework provides a useful lens through which to explore the social processes associated with forced migration, as the ability for migrants to achieve aspirations may be either fostered or constrained by structural factors such as resettlement policies, local changes in land prices, economic resources, and social networks in both origin and destination communities. I focus primarily on the roles of three structural resources—social capital, financial capital, and human capital—in the ability for migrants to

attain aspirations. I define social capital as the actual or potential resources available to an individual based on his or her network of connections to other individuals; human capital as the knowledge, skills, and health possessed by individuals; and financial capital as wealth, assets, and income (Becker 2009; Bourdieu 1986/2011).¹

While a traditional forced migration approach would focus on the impacts of the dam and its resettlement policy on migrants, I shift the focus to understand how the migrants, as purposive actors, navigate the process. By using migration aspirations, constraints, and capabilities as an organizing framework, I examine how agency and structure interact throughout the course of the forced migration process to understand the factors associated with the ability for households to achieve desired migration outcomes.

Research site and study population

Figure 1 shows the study area, which lies in the eastern Amazon region of Brazil in the state of Pará. The bottom right panel displays the pre-migration study area in the municipality of Vitória do Xingu, while the other panels show approximate migration destinations.² This region began to develop rapidly in the early 1970s with the government's National Integration Plan (PIN), which constructed highways intersecting the rainforest, promoted colonization of the area by farmers, and fostered resource extraction and cattle ranching. The goal of the colonization projects was to develop the interior of the country, alleviate landlessness and poverty in the drought-prone Northeast Region, and resettle squatters and smallholder farmers from southern Brazil (Alonso and Castro 2005; Browder and Godfrey 1990; Fearnside 1984; Ozório de Almeida and Campari 1995; Yoder and Fuguitt 1979). As part of the plan, the government constructed the Transamazon Highway, which runs through Vitória do Xingu as well as the nearby city of Altamira. The program encouraged families to move to the region by offering a 100-hectare (20 acre) plot and a wooden house, payable in installments over a 20-year period with a three-year grace period (Umbuzeiro and Umbuzeiro 2012). Many settlers migrated to Pará from northeastern and southern Brazil, settling along the Transamazon or on the smaller roads surrounding it (Moran 1990). The PIN resulted in extensive in-migration, which led to deforestation and the growth of urban areas in the region (VanWey et al. 2007). In addition, a large number of migrants spontaneously settled on unclaimed land in the region, often without an official deed or title (Ozório de Almeida and Campari 1995).

The PIN led to a doubling of the population of Pará between 1970 and 1996, from 2.2 million to 5.5 million (Perz 2002). Now the region houses and processes a large herd of cattle and is home to the highest productivity cacao bean farms in the country (Comissão Executiva do Plano da Lavoura Cacaueira 2009). Altamira serves as the area's urban core, with a population of approximately 100,000 (Instituto Brasileiro de Geografia e Estatística 2015). Households in the study area ranged from landless sharecroppers, to smallholder

¹The concepts of social, human, and financial capital are central within sociology. While these are useful concepts for understanding the ways in which access to resources is associated with inequality and various life outcomes, it is important to note that the concepts have been criticized for key weaknesses, including being too conceptually broad or overly simplistic (Bowles and Gintis 1975; Fine 2003).

²The locations of households are approximated in order to protect the privacy of respondents.

cacao farmers, to wealthy cattle ranchers. Many families moved to the area during the PIN, while others moved to the region more recently. Given the region's recent settlement history, nearly all households had either migrated to the study area from other parts of Brazil, or were born in the study area to migrant parents. As such, most households had direct or indirect migration experience, and nearly every household had social networks that extended beyond Vitória do Xingu, whether to Altamira, elsewhere in the region, or other regions of Brazil (Randell and VanWey 2014).

The dam and compensation process

Norte Energia, a public–private partnership, is constructing the Belo Monte Hydroelectric Complex. Plans for the dam began in the 1970s, but the process experienced long delays due to concern over its environmental and social impacts. The project was redesigned a number of times to reduce potential impacts, and was pushed forward in the 2000s as part of a national program to foster economic growth (Fearnside 2006). Construction began in 2011 and will continue until 2019, with flooding of the area upstream from the dam slated to occur in 2015 when the first turbine begins to run. According to the environmental and social impact assessment, the dam is expected to displace approximately 20,000 people—16,400 in urban Altamira and 2,800 living in rural surrounding areas including Vitória do Xingu (Eletrobrás 2009). The Basic Environmental Plan (*Plano Básico Ambiental—PBA*) (Norte Energia S.A. 2010) addressed all social and environmental impacts, and indicated that the rural displaced population had a choice of: monetary compensation for their land and assets; assisted relocation to a property in the same region; resettlement assistance for rebuilding a home on the same property if it is partially flooded; or resettlement in a planned community in the region for smallholder farmers or those without property rights. The study population by and large chose the first option—monetary compensation for landowners or credit payments for landless households that they could use to purchase titled property—though interviews suggest that this may have been the only option offered to them at the time.

Studying the interaction between structure and agency in dam-induced forced migration begins by examining the compensation process itself, which I discuss in detail below. Regarding structure, households were constrained by a number of aspects of the policy including the amount of payment received, the cost of traveling to Altamira to handle the logistics of compensation, the cost of searching for new property, and the short time frame between receiving payments and having to vacate their property. Yet the process also provided room for agency, as migrants were not resettled in predetermined locations, but were free to choose new properties that suited their needs and desires.

In mid-2011, employees from companies contracted by Norte Energia began visiting the homes of affected households to evaluate their assets and calculate compensation amounts. Compensation was based primarily on productive assets (e.g., cacao trees, other fruit trees, and crops) as well as pasture, homes, and infrastructure on the property. According to the dam timeline, after the initial assessment the company was required to return to the farmer with a proposal within 90 days, though this first step often experienced long delays. After receiving the proposal, farmers could either accept it or request a new assessment if they

found that assets were not included (e.g., if the company failed to account for a portion of the cacao trees). Upon receiving the updated proposal, the households had a short period of time to evaluate it before signing the agreement. If farmers did not accept the second proposal, they were told that they must go to court, an expensive and time-consuming process that few farmers chose to pursue. Among the interview sample, compensation payments ranged from R\$90,000 to R\$4.5 million.³ Those who did not own land (sharecroppers or households that lived on a relative's land) were provided with credit for R\$132,000, which they could use toward buying documented land with a definitive title or public deed. In addition, farmers whose assets had been valued at less than R\$132,000 could opt for this credit instead of their compensation payment.

At the beginning of the process, compensation payments were made in two installments, which were deposited directly into the households' bank accounts. After signing the agreement, the households were expected to receive the first payment within 30 days, though payments were often delayed. Once the money was deposited the households then had 30 days to purchase a new home and vacate their property, at which time they received the second payment. As the process continued, many farmers protested to receive the entire payment at once. As a result, Norte Energia began offering payments in one installment, after which time the households were given 30 days to move. Because the money was deposited directly into the household head's bank account, he or she had to travel to the bank in Altamira to determine whether or not the payment had arrived, a one- to three-hour trip each way. Households were responsible for finding new land, which was plentiful in the region but varied greatly in price and quality.⁴ Households either looked for land on their own, searched with family or friends, or were brought to view properties by a real estate agent. Among those who received credit payments, a representative from Norte Energia would visit the property to verify if it met their criteria (i.e., legally titled land). If so, Norte Energia paid the property owner directly.

Methods

This paper uses qualitative data from 67 semi-structured interviews conducted during two time periods, and is part of a larger mixed methods project that also collected longitudinal household survey data from 165 households in the affected geographic area (see property boundaries in Fig. 1). Interviewing households at two points in time—pre- and post-migration—enables me to understand the process of forced migration prospectively, as well as understand how baseline migration aspirations aligned with eventual capabilities.⁵ In August 2012, a Brazilian research assistant and I conducted pre-migration semi-structured interviews with male and/or female heads of 28 households from the study area, a subset of the 165 households surveyed. The research assistant had conducted the baseline household

³The 2012 Brazilian real-US dollar exchange rate was approximately 2:1. The median price paid by surveyed households who used their compensation to purchase rural property was R\$190,000 and the median property size was 100 hectares.

⁴The median price per hectare paid for land among surveyed households who used their compensation to buy rural property was R\$1757, ranging from R\$115 to R\$10,000. In addition, some properties had high soil quality suitable for growing cacao and other valuable crops, while other properties had low soil quality that could only be used for pasture.

⁵I define a household as a group of individuals (often relatives) who live together and share resources. This correlates with the definition used in the resettlement program, though in some cases the sons of property owners received separate credit payments in addition to their parents' compensation even if they lived in the same house.

surveys a few months prior, so he had established a rapport with the study households and knew the geography of the study area and locations of houses. This proved critical for completing the interviews efficiently and obtaining high-quality data. The households were purposively sampled from the survey population in order to capture maximum variation along a number of factors, including the amount of land owned, length of time living in the study area, and household income.⁶ Furthermore, households were chosen based on their willingness to participate. While statistically not generalizable, selecting households along these lines allows me to speak to the range of processes that occur during forced migration.

In addition to these 28 households, I interviewed 11 households who had already migrated to new homes in the region. Interviewing these “early movers” enables me to examine an additional dimension surrounding forced migration—the relationship between structure, agency, and the timing of migration. For these 11 households, I obtained information on their locations using a snowball sampling methodology. I asked others in the sample to identify households who had already migrated, and when interviewing these “early mover” households I then asked them to identify other early movers with whom we could conduct interviews.⁷

Interviews averaged 30–60 min in length, and questions followed an interview guide that focused on topics including the household’s history, community, and livelihoods in the study area; the compensation process; migration aspirations and plans (asked to the households who had not yet moved); and the moving process and reasons for choosing migration destinations (asked to the early mover households).⁸

Interviews were recorded with informed verbal consent from the interviewees and transcribed by a native Portuguese speaker. Excerpts were selected and translated into English only after coding was complete to protect the integrity of the data. Ethics approval was granted by Brown University’s Institutional Review Board.

Then, between August and October 2014, I conducted post-migration semi-structured interviews with the 28 households who had not yet moved at baseline. I located the households in their new homes using information provided by friends or family members listed as contacts on the baseline household survey, as well as word of mouth from other members of the study population. The households migrated across the region, primarily to rural properties without access to cellular or landline service, which made identifying new residences challenging. I located and re-interviewed all 28 households, including the one household that moved outside Pará, to the neighboring state of Maranhão. Post-migration interviews followed an interview guide that focused on three main substantive areas:

⁶Baseline median land ownership was 45 hectares (ranging from 0 to 600 hectares); median total monthly household income was R \$1704 (ranging from R\$494 to R\$11,008); and the median year the household head migrated to the study area was 1981 (ranging from 1952 to 2003). Five of the household heads were born in the study area.

⁷Seven of the early mover households had migrated prior to the time that baseline household surveys were implemented. For these households, we conducted surveys at the same time as the interviews. The data collected in the household survey referred to their pre-migration conditions.

⁸This study was not designed to examine intra-household power dynamics, though differences in opinion between the male and female household head did emerge in two of the interviews.

negotiating and receiving compensation, finding and moving to new properties, and re-establishing livelihoods and social networks in their new communities.

I analyzed the data using NVivo 10, a qualitative analysis software package, coding the 67 interviews for themes. Themes were developed using a hybrid approach that included both deductive methods (creating a set of a priori codes based on the research questions) and inductive methods (generating new codes during the data analysis process) (Fereday and Muir-Cochrane 2008). For the baseline interviews, I generated 39 themes—29 were created a priori (e.g., life in Vitória do Xingu, moving plans, and compensation process) and 10 were created during analysis (e.g., paying community leaders first, cacao, and school/education). For the follow-up interviews, I generated 33 themes—24 were created a priori (e.g., cooperation or help finding land, family networks, and reasons for choosing new property) and nine were created during analysis (e.g., combined credit payment, old age or sickness, and bought house in Altamira). Generating these codes allowed me to organize the data, identify themes related to my research questions, and find commonalities across respondents.

Results

This section examines the migration aspirations of affected households, constraints to attaining those aspirations, migration destinations, and eventual migration capabilities in order to shed light on the roles of migrant agency as well as structural resources and constraints during the migration process. In addition, I examine the early mover households to explore the links between structure, agency, and the timing of migration.

Migration aspirations

In order to understand the dynamics between structure and agency within forced migration, I first examine the aspirations of those who faced displacement. Migration aspirations reflect the independent preferences of the households, a key component of agency. Yet the creation of aspirations themselves is shaped by structure, as resources (e.g., knowledge, wealth, and social networks) as well as economic, political, and environmental factors impact the extent to which migrants can aspire. Before exploring the aspirations, it is important to note that most families in the study area would not have aspired to migrate in the absence of Belo Monte. Many had lived there for decades and spoke fondly of the rural, agricultural lifestyle to which they were accustomed as well as the close-knit community. For example, a 57-year-old cacao farmer who had lived in the area for 30 years stated, “I always thought I would stay in this place for the rest of my life. Not to say that things are not going to go well in another place, we hope so...but we always have doubts.” In addition, an elderly man who had already migrated and was living in Altamira noted, “one day a man from Norte Energia came and asked me how much the land would be if I was to sell it, and I said that I wouldn’t sell it for any amount of money. If it were my choice I would leave the land to my children so that they can raise their children like I raised them.” These statements highlight the attachment that many families had to their land, community, and agricultural livelihoods, particularly older individuals who had lived in Vitória do Xingu for decades.

Because remaining in their original homes was not an option for most households in the region, households formed migration aspirations centered on the qualities they would seek in their new property and community. Nearly all households aspired to remain in the region, moving to rural properties off of the Transamazon Highway in the municipalities of Altamira, Brasil Novo, Medicilândia, or Anapu. These areas lie within a few hundred kilometers of Vitória do Xingu and most contain land that is favorable to cacao production. Only one household in the sample aspired to move out of the region, to the northeastern state of Maranhão where the female household head had many family members.

A primary aspiration for the majority of households was to find land that already contained cacao trees, because the strict deforestation laws enacted by Brazil's Environment Ministry would make it difficult for them to clear land to plant new trees and because cacao trees take four years to reach maturity. In addition, many families desired land suitable for cattle ranching, land close to the Transamazon highway in order to easily reach nearby cities, as well as land with a good quality house, electricity, access to rivers or streams, piped water, and schools nearby. Moreover, a number of households expressed the desire to move nearby to family members and friends in order to maintain a portion of their existing social networks.

Several households had not formed migration aspirations at the time of baseline interviews, stating that they did not know where they would move because they were waiting to receive compensation payments before beginning the planning process. A few households were limited by a lack of knowledge of potential destinations. For example, when asked whether she knew where she would like to move, a female cacao farmer stated, "I have no idea because I only know Vitória do Xingu, where I have lived for my entire life." Her husband added, "I also don't know anything past Altamira. It's terrible to go looking for land without knowing how the neighbors are, without knowing the region." The lack of knowledge of potential destinations presents an example of structure constraining the formation of aspirations and, in turn, the extent to which this household can exercise agency over its migration outcomes.

Structural constraints

This section examines how structural factors constrain migrant agency within dam-induced forced migration. de Haas (2009) notes that "people's motivations to migrate can be expected to be higher when they face relatively high social, economic and/or political constraints in the places, regions, or countries where they live" (p. 3). In the case of Belo Monte, those with the most to potentially gain from displacement—landless sharecroppers—were precisely those who were likely to face the greatest challenges in successfully finding and purchasing productive land. Sharecroppers were constrained by both low compensation amounts and the fact that they were compensated in credit that had to be used toward land with a legal title, which was scarce and expensive in the region. For example, a farmer who owned a small plot of land and also worked as a sharecropper on his father's land, chose to receive R\$90,000 in compensation for his land instead of the R\$132,000 credit he could have accepted for working as a sharecropper. He argued that even though the credit was R

\$40,000 more, it was difficult to find titled land for that amount, and cash compensation could be used in a more flexible manner.

Further, a man who lived with his wife and small child on the property of his father noted that he would like to move to Assurini because it was close to Altamira, had high-quality land, and his parents already owned land there. Yet he did not expect to find titled land there that he could afford. He stated, “we went to INCRA [the government organization that manages land in the area] and discovered that there are 78 documented plots in Assurini, but there are many people looking to buy the land and because of that the value has gone up a lot. A piece of property without anything on it costs R\$300,000.” This indicates that demand for land made certain destinations prohibitively expensive, particularly for those who received credit payments.

As mentioned above, rising land prices had become an increasingly critical issue in restricting a household’s ability to find suitable land. Prices for land and rent in the region rose rapidly after dam construction began as a result of growing demand due to population resettlement as well as in-migration to the region for dam-related employment opportunities. A cacao farmer and cattle rancher stated “at the start they paid everyone well, it was enough to buy land and survive. But today they are paying almost the same values, but land is more expensive. I’ve already looked a lot—in Brasil Novo, Setenta, Anapu. I can’t buy land there because land that was R\$250,000 is now R\$800,000 or R\$1 million.” This issue, mentioned by many respondents, highlights the concern that rising land prices would prevent them from purchasing agricultural land of equal or greater value than their current land.

An additional constraint—delays in receiving compensation payments as well as uncertainty as to when the payments would arrive—exacerbated the impact of rising land prices on farmers’ ability to purchase high-quality land. This discouraged many households from proactively looking for new land because of the inability to pay for new property before receiving compensation. For example, when asked whether her family had begun searching for land, a farmer who lived with her husband and four children said, “No...we only want to look when we have the money in our hands. There are many people who received their proposal and thought that the money would be deposited in their accounts immediately. They went and saw land and negotiated to pay after 2 or 3 months, but months passed and nothing.” This issue forced a number of households to delay procuring land until after they received compensation payments. Rising land prices combined with payment delays led many households to contend that the relocation process would have been significantly improved if all households were compensated within a short time frame, early in the dam construction process. This would have increased the probability that households could access land before prices rose, and would have enabled households to leave the region before disruptive construction activities began.

Lastly, many respondents discussed a lack of financial and human capital to negotiate with Norte Energia over receiving higher compensation amounts. A number of farmers stated that while their community association had four lawyers, Norte Energia had more than one hundred. They felt powerless against the corporation’s large and well-funded legal team, which discouraged households from attempting to negotiate for greater monetary

compensation. A young farmer with two small children noted, “they don’t negotiate with us...the lawyer told us that if we appealed the proposal, they would send it to another stricter company to evaluate and that they would lower the value, so we didn’t do anything.” In addition, a poor cacao farmer stated, “the man brought the proposal and I didn’t accept it... he said we would have to go to court, and we can’t, we’re not able to. They have lawyers and we don’t. So we accepted the value of R\$108,000.” Given that land prices had risen between the period when assets were evaluated (mid-2011) and the period when most payments were remitted (mid-2012 to mid-2013), the ability for households to negotiate higher compensation would have eased financial constraints associated with purchasing new property.

Migration destinations

By the time of follow-up interviews in 2014, all 39 households had migrated from their original homes. Migration destinations included urban Altamira as well as rural properties in the regional municipalities of Altamira, Brasil Novo, Medi-cilândia, Anapu, Senador José Porfírio, and Vitória do Xingu (see Fig. 1). In addition, one household migrated to a rural property in the northeastern state of Maranhão. All but two households used their compensation or credit to purchase rural agricultural land, and ten households purchased urban homes in addition to rural property. Thirty households received cash compensation, and eight households received the R\$132,000 credit. One household, who received a credit payment but could not find land that met its expectations after 2 years of searching, was given the opportunity to be resettled within the original study area by Norte Energia. This option was provided late in the process, as Norte Energia determined that a small portion of land acquired from farmers would not actually be affected by the dam. This land was offered to a limited number of households who had not yet succeeded in finding new property. The resettlement plot contained 75 hectares, 30,000 cacao trees, pasture, a house with electricity, and other amenities—a desirable option that would likely have been chosen by many households had it been available at the beginning of the process.

Migration capabilities

Despite the numerous constraints experienced during the process, most households succeeded in meeting their migration aspirations. Figure 2 presents a conceptual model of the dimensions that shape the structure/agency balance within development-induced forced migration. All migrants operated within a set of external structures discussed earlier in the paper (e.g., compensation policies and procedures, rising land prices), though households varied in the extent to which they met aspirations based on three primary structural resources: financial, social, and human capital. In Fig. 2, the arrows outside the box represent structure, while the arrows inside the box represent agency. The extent to which households were able to meet or exceed their aspirations is the extent to which they exercised agency. The first resource is financial capital, as wealthier landowners received higher compensation that eased constraints associated with land prices, while those without land received credit that was both low in value and restricted in that it could only be used to purchase documented land. The second is social capital, as mobilizing family and friend networks aided many households in achieving their aspirations. The third resource is human capital, as sicker or less skilled households faced greater barriers to attaining aspirations and

rebuilding agricultural livelihoods. I will discuss each of these dimensions in more detail below.

First, pre-migration financial capital, which translated into higher compensation payments due to more valuable assets on the original property, impacted the ability to attain aspirations. High compensation provided households with flexibility when searching for new properties. For example, an elderly cacao farmer and cattle rancher received R\$3.6 million in compensation because she farmed cattle and had a large cacao plantation with 35,000 trees. She aspired to move to property that contained many cacao trees, a nice house, and a corral. Because her compensation payment was high, she was able to purchase property near Altamira with 20,000 cacao trees, pasture, a corral, and a higher quality house. In addition, she purchased a new pickup truck and a second home in Altamira. In contrast, low compensation amounts limited some families from attaining aspirations. For example, a household that received R\$150,000 in compensation as well as a credit for one of their sons was not able to attain their aspiration of remaining close to Vitória do Xingu. The female household head stated, “I wanted to buy [there] because...I was born and raised in that municipality. I never thought I’d come here, so far away...my relatives live there, mother, father, everyone...but because we received little we had to go farther because land closer was expensive.” They purchased a property in Medicilândia for R\$155,000 (using their son’s credit as well as a portion of their compensation payment), yet the property was located far from their family and children, far from a school and health post, had no running water, and had no house on the land when they purchased it. At the time of follow-up data collection, the six household members had been living in an open-air wooden structure for over a year while constructing a new home with money earned from selling their four cows.

Second, social capital proved essential in attaining aspirations, even among the poorest households. In a number of cases, households succeeded in coordinating their property search with others facing displacement in order to purchase land nearby one another. In addition, numerous households were able to move nearby to family members who already lived in a particular community. For example, one family who received R\$137,000 was able to move to the same road as four of the household head’s brothers. The brothers had already moved to the area, and when an inexpensive property became available that met the household’s aspirations (cacao trees, ample water sources, and a nearby school), they informed their brother who was then able to purchase it. Another household moved to a community in Anapu where the female head’s father had already lived for 13 years. He helped his daughter and her family find land, and in turn, the family helped other households from their old community locate property on the same road. She stated, “I already knew this area and [my friend] didn’t. So we said to him ‘want to buy good land? Go there to [the road we are moving to] where there is a lot of land that people want to sell. There is the type of land you like, with cacao and space for livestock’, so he went and bought. And then a friend of his went afterward and bought too.”

Further, many credit-receiving households joined together with other households to collectively purchase a property that they would not have been able to afford on their own. There were few documented properties available that could be bought with the R\$132,000 credit, so joining with another household to buy one property for R\$200,000 or R\$250,000

and then subsequently dividing it eased financial constraints on poorer households. In addition, there were several cases in which family members provided monetary assistance to households who received credit in order to help them purchase and invest in their land. One respondent joined his credit with that of his brother to purchase a property in Vitória do Xingu, though this did not leave him with additional money to invest in the property. His father then gave him R\$200,000 from his own compensation, which enabled the respondent to construct a house, purchase cattle for the property, and purchase a small home in Altamira. These cases indicate that networks were essential in easing financial constraints among households who had not owned land in the original community.

Third, human capital resources such as good health and income-generating skills were also important determinants of the ability to attain migration aspirations. Moving to a new agricultural property often required labor-intensive investments—building or renovating a house, clearing land for pasture, constructing fences and corrals, or restoring abandoned cacao plantations. While healthy households could easily undertake these tasks, unhealthy individuals faced challenges in reestablishing livelihoods. For example, one middle-aged couple was able to attain their aspiration of finding land in Vitória do Xingu, but struggled to prepare their new land for cacao and cattle production. The female household head stated, “my husband is very sick...[in our old home] we had every little thing to sustain our family...everything was done and here it isn’t. Here he has to do it all and he is sick. He is in bad shape, with ten herniated disks and osteoarthritis.” In addition, income-generating skills helped households form and attain aspirations. For example, a cacao farmer with three young daughters aspired to move to a small rural village and open a store, because he had past experience managing a store. The household succeeded in building and opening a small general store in a rural part of Anapu, through which the family earns the majority of its income. Further, a farmer who had also worked as a local school bus driver aspired to purchase a house in Altamira and continue working a salaried job. He succeeded in purchasing both rural land and an urban house and took a job as a driver for the dam building company, which provided the family with steady income that could be invested in future agricultural activities.

Early movers

Lastly, interview data from early movers allow me to examine the relationship between structure, agency, and the timing of migration. Though most of the interview households ultimately attained their aspirations, the ability to move early enabled households to purchase land while prices remained low and avoid remaining in the study area during disruptive construction activities. Early mover households tended to have strong financial, social, and/or human capital. I will explore the human capital dimension—namely having the knowledge and persistence needed to pressure Norte Energia to remit payments early. Many interviewees suggested that Norte Energia compensated community leaders first in order to weaken community mobilization. For example, one respondent founded a local community association, which worked to mobilize community members affected by the dam. She received R\$810,000 in compensation in January 2012, which enabled her to purchase triple the amount of land she had owned previously. Yet she was highly critical of the process and noted that even she experienced delays in receiving her payments. She stated

that “even for us to receive the money it wasn’t easy...we signed the proposal in December 2011, but although they said it would take 21 days, it took 40 days. After going three times to complain about the delay they didn’t resolve the issue, so I went to file a report at the *Ministério Público*.⁹ The prosecutor asked me to officially file the report, and he determined that they should pay in 5 days, and on the fourth day they paid us.” She noted that while she was able to fight for her payment because she knows her rights, many others did not understand the laws and therefore could not “play the game” with Norte Energia.

Another example comes from a farmer who received R\$1.1 million in compensation. He and his family moved in May 2012 to a large house on the Transamazon Highway near Brasil Novo, and he noted that relocation greatly benefited his family socioeconomically. After migration, he owned 300 head of cattle when he used to own 50, had two properties when he used to own one, and purchased a car, which he had never expected to afford. When asked why he thought that he was able to receive his payment early while so many others are still waiting, he stated that “many people are negligent, many signed the proposal before me, but I was at [Norte Energia] every week, and the others forgot to do that. If you don’t go there they are going to give priority to other things...if you don’t put pressure on them it takes a long time.” Thus, knowledge, persistence, and experience dealing with bureaucratic organizations served as a key human capital resource, enabling these and other early movers to exercise a high degree of agency and attain or exceed their desired migration outcomes.

Conclusions

In Brazil, as well as many other low- and middle-income countries, economic development and environmental change act as key drivers of forced migration. Past research on forced migration has tended to overlook the role of agency, instead concentrating on the structural forces that drive migrants from their origin communities (Bakewell 2010; Castles 2003; Lubkemann 2004). The displacement of rural farmers associated with the Belo Monte Dam serves as an ideal case through which to examine the interaction between structure and agency in forced migration. This analysis demonstrates that agency is a key component of development-induced forced migration, as many migrants mobilized social, financial, and human capital resources to attain their migration aspirations.

Utilizing the migration aspirations versus capabilities framework (Carling 2002; de Haas 2009, 2010), I focus on the migration objectives of those affected, aspects of the compensation process that may have hindered the ability to achieve these objectives, and their ultimate migration capabilities. Baseline interview data demonstrated that the majority of community members aspired to move to farmland within the region that contained existing cacao plantations and/or cattle pasture. Nearly all families sought to move to another rural property as opposed to the city in order to maintain their agricultural livelihoods, and many aspired to find property with a well-constructed house, access to electricity and paved roads, and located nearby to schools. In addition, many families sought to procure property nearby family or friends. Recognizing the role of structural constraints

⁹Brazil’s *Ministério Público* is an autonomous body of prosecutors at the federal and state levels whose purpose is to monitor compliance with laws that defend the national heritage as well as social and individual interests, regulate police activity, foster public criminal proceedings, and expedite the provision of public services (Governo do Brasil 2010).

in shaping forced migration outcomes is an important component of the migration aspirations/capabilities framework. In the case of Belo Monte, a number of characteristics of the compensation process constrained households, including the requirement that those who received credit purchase legally titled land, rapidly rising land prices in the region, long delays in receiving proposals and compensation payments as well as uncertainties as to when they would arrive, and the lack of power to negotiate with Norte Energia over compensation prices.

Despite these constraints, most households were able to attain migration aspirations—and therefore exercise agency—by utilizing structural resources in the form of financial, social, and human capital. Social capital in particular enabled many poorer households to attain aspirations through help finding new land from family and friends in destination areas, by combining credit payments with other households to purchase a property they could not afford on their own, or through cooperating with other displaced households to find properties nearby one another. This contrasts with findings from Elliott et al. (2010) that poorer households displaced by Hurricane Katrina were less able to utilize *translocal* social ties outside New Orleans than more well-off households—either because they lacked these ties or did not have the resources to exploit them. I find in the case of rural displacement due to Belo Monte, households utilized both their local and translocal social networks during the migration process in order to attain aspirations. Thus, in a context in which translocal ties are abundant, they may serve as one of the most valuable resources for households facing displacement, particularly those who lack financial or human capital resources.

By examining migration longitudinally and qualitatively, this study offers a lens into how structure and agency interact during all stages of the process. Understanding how migrants experience forced migration—from forming aspirations, to navigating constraints, to utilizing resources in order to attain their aspirations—enables a more nuanced look into the migration process. The findings show that, even in a case that clearly falls toward the forced end of the migration continuum, most households exercised substantial levels of agency in order to migrate to destinations that fit their preferences. By utilizing their financial, social, and human capital resources to varying degrees, many households were able to make forced migration work in their favor.

A relocation process that effectively enhances migration capabilities will ensure that forced migration results in the improvement of livelihoods rather than in the declines of socioeconomic and psychological well-being. This analysis demonstrates that many rural households displaced due the Belo Monte Dam were buffered from livelihood decline by their ability to utilize financial, social, and/or human capital resources. This is a promising finding and suggests that the design of future resettlement policies associated with development projects or environmental change should target poorer, less healthy, and less skilled households as well as those with limited support networks for assistance during the migration process. Identifying factors that enable displaced households to achieve migration aspirations as well as those that prevent them from doing so can help to inform and improve relocation policy and resettlement programs for future dams, other infrastructure projects, as well as resettlement due to sea-level rise. This could be accomplished through in-depth qualitative and quantitative data collection with all affected households before designing a

resettlement program in order to understand their historical, social, and economic context, as well as identify households that may be particularly vulnerable to post-displacement livelihood decline.

Lastly, it is important to note that the relative roles of structure and agency vary greatly between different populations facing forced migration. The Brazilian Amazon serves as a unique case, as much of its current population migrated to the region through the government's Amazon settlement scheme in the 1970s and 1980s, which led to sizable rural population growth as well as the development of urban areas (Alonso and Castro 2005; Browder and Godfrey 1997; Moran 1990; Perz 2002). As a result, most households in the study area had prior migration experience as well as social networks that extended to other rural areas as well as to the city of Altamira. Indeed, this history of recent migration has shaped migration dynamics in Altamira more generally, as social networks were found to play a more important role in Altamira than in the nearby city of Santarém, which has an older settlement history (Randell and VanWey 2014). In the case of Belo Monte, this extensive web of social networks served as a key resource that migrants utilized in order to attain aspirations. A population with a more embedded history in a particular location, and thus fewer translocal ties in potential destinations, may not have the social capital to achieve this. In cases such as this, a more planned resettlement program in which the population is settled collectively in a new location may achieve better outcomes. Thus, during the planning phase for future situations of forced migration, it is key to assess resources among the population (e.g., social capital and transferrable skills) as well as potential structural constraints (e.g., poverty, lack of migration experience, or the shortage of available land) in order to design a resettlement program that is effective in fostering migration capabilities and improving livelihoods.

Acknowledgments

Data collection for this study was supported by a National Science Foundation Doctoral Dissertation Improvement Grant (SES-1434020), a Eunice Kennedy Shriver National Institute of Child Health and Human Development training grant (5T32HD007338-28) from the Population Studies and Training Center (PSTC) at Brown University, and a grant to Leah VanWey from Brown's Brazil Initiative and Office of Global Engagement. The PSTC receives core support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (5R24HD041020-14). I thank the three anonymous reviewers as well as Leah VanWey, Clark Gray, Michael White, David Lindstrom, Tania Jenkins, and Andrew Fenelon for helpful comments on earlier versions of this article.

References

- Adhikari P. Conflict-induced displacement, understanding the causes of flight. *American Journal of Political Science*. 2013; 57(1):82–89.
- Alonso, S., Castro, E. Small and medium size cities. Lima: Instituto del Bien Comun; 2005. The process of transformation of rural areas into urban areas in Altamira and its representation.
- Alves SA, Nascimento AC, Mesquita HA. Movimento dos Atingidos Por Barragens (MAB): Resistência popular e a construção de um novo modelo energético para o Brasil. *Revista Estudos Amazônidas: Fronteiras e Territórios*. 2009; 1(1):635–650.
- Asad AL. Contexts of reception, post-disaster migration, and socioeconomic mobility. *Population and Environment*. 2015; 36:279–310.
- Bakewell O. Some reflections on structure and agency in migration theory. *Journal of Ethnic and Migration Studies*. 2010; 36(10):1689–1708.

- Becker, GS. Human capital: A theoretical and empirical analysis, with special reference to education. Chicago: University of Chicago Press; 2009.
- Black R, Adger WN, Arnell NW, Dercon S, Geddes A, Thomas D. The effect of environmental change on human migration. *Global Environmental Change*. 2011; 21:S3–S11.
- Bourdieu, P. The forms of capital. In: Szeman, I., Kaposy, T., editors. *Cultural theory: An anthology*. Sussex: Wiley; 1986/2011. p. 81–93.
- Bowles S, Gintis H. The problem with human capital theory—A Marxian critique. *The American Economic Review*. 1975; 65(2):74–82.
- Browder JO, Godfrey BJ. Frontier urbanization in the Brazilian Amazon: A theoretical framework for urban transition. *Yearbook. Conference of Latin Americanist geographers*. 1990:56–66.
- Browder, JO., Godfrey, BJ. *Rainforest cities: Urbanization, development, and globalization of the Brazilian Amazon*. New York: Columbia University Press; 1997.
- Carling J. Migration in the age of involuntary immobility: Theoretical reflections and Cape Verdean experiences. *Journal of Ethnic and Migration Studies*. 2002; 28(1):5–42.
- Carr ER. Placing the environment in migration: Environment, economy, and power in Ghana's central Region. *Environment and Planning*. 2005; 37(5):925–946.
- Castles S. Towards a sociology of forced migration and social transformation. *Sociology*. 2003; 37(1): 13–34.
- Cerne, MM., Mathur, HM., editors. *Can compensation prevent impoverishment? Reforming resettlement through investments and benefit-sharing*. Oxford: Oxford University Press; 2008.
- Chan KW. The household registration system and migrant labor in China: Notes on a debate. *Population and Development Review*. 2010; 36(2):357–364. [PubMed: 20734556]
- Chatty D, Marfleet P. Conceptual problems in forced migration. *Refugee Survey Quarterly*. 2013; 32(2):1–13.
- Comissão Executiva do Plano da Lavoura Cacaueira. *O Estado do Pará e a Produção Brasileira de Cacau*. 2009. <http://www.ceplacpa.gov.br/site/?p=3009>. Cited January 10, 2014
- Conway D. Caribbean transnational migration behaviour: Reconceptualising its 'strategic flexibility'. *Population, Space and Place*. 2007; 13(6):415–431.
- Dasgupta S, Laplante B, Meisner C, Wheeler D, Yan J. The impact of sea level rise on developing countries: A comparative analysis. *Climatic Change*. 2009; 93(3–4):379–388.
- de Haas, H. Human development research paper (HDRP) series. Vol. 1. UNDP; 2009. Mobility and human development.
- de Haas H. Migration transitions: A theoretical and empirical inquiry into the developmental drivers of international migration. *International Migration Institute working paper*. 2010; 24:46.
- Deléchat C. International migration dynamics: The role of experience and social networks. *Labour*. 2001; 15(3):457–486.
- Downing TE. Avoiding new poverty: Mining-induced displacement and resettlement. *Minerals and Sustainable Development: Mining*. 2002:58.
- EIA. Brazil: 2012. <http://www.eia.gov/cabs/brazil/Full.html>. Cited March 17, 2012
- Eletrobrás. *Rima Relatório de Impacto Ambiental Aproveitamento Hidrelétrico Belo Monte*. Brasília: 2009.
- Elliott JR, Haney TJ, Sams-Abiodun P. Limits to social capital: Comparing network assistance in two New Orleans neighborhoods devastated by Hurricane Katrina. *The Sociological Quarterly*. 2010; 51(4):624–648. [PubMed: 20939128]
- Fearnside PM. Brazil's Amazon settlement schemes: Conflicting objectives and human carrying capacity. *Habitat International*. 1984; 8(1):45–61.
- Fearnside PM. Dams in the Amazon: Belo Monte and Brazil's hydroelectric development of the Xingu river basin. *Environmental Management*. 2006; 38(1):16–27. [PubMed: 16738820]
- Fereday J, Muir-Cochrane E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*. 2008; 5(1):80–92.
- Findlay AM, Li F. Methodological issues in researching migration. *The Professional Geographer*. 1999; 51(1):50–59.

- Fine B. Social capital: The World Bank's fungible friend. *Journal of Agrarian Change*. 2003; 3(4):586–603.
- Fussell E, Sastry N, VanLandingham M. Race, socioeconomic status, and return migration to New Orleans after Hurricane Katrina. *Population and Environment*. 2010; 31(1–3):20–42. [PubMed: 20440381]
- Giddens, A. *The constitution of society: Outline of the theory of structuration*. Cambridge: Polity Press; 1984.
- Goss J, Lindquist B. Conceptualizing international labor migration: A structuration perspective. *International Migration Review*. 1995; 29(2):317–351. [PubMed: 12319618]
- Governo do Brasil. Saiba mais sobre o Ministério Público do Brasil. 2010. <http://www.brasil.gov.br/governo/2010/01/ministerio-publico>. Cited August 25, 2015
- Gray C, Frankenberg E, Gillespie T, Sumantri C, Thomas D. Studying displacement after a disaster using large-scale survey methods: Sumatra After the 2004 tsunami. *Annals of the Association of American Geographers*. 2014; 104(3):594–612. [PubMed: 24839300]
- Gray C, Mueller V. Natural disasters and population mobility in Bangladesh. *Proceedings of the National Academy of Sciences*. 2012; 109(16):6000–6005.
- Groen JA, Polivka AE. Going home after Hurricane Katrina: Determinants of return migration and changes in affected areas. *Demography*. 2010; 47(4):821–844. [PubMed: 21308560]
- Hugo G. Environmental concerns and international migration. *International Migration Review*. 1996; 30(1):105–131. [PubMed: 12291410]
- Hunter LM. Migration and environmental hazards. *Population and Environment*. 2005; 26(4):273–302. [PubMed: 21886366]
- Hunter LM, Luna JK, Norton RM. Environmental dimensions of migration. *Annual Review of Sociology*. 2015; 41:377–397.
- Hwang SS, Cao Y, Xi J. The short-term impact of involuntary migration in China's Three Gorges: A prospective study. *Social Indicators Research*. 2011; 101(1):73–92.
- ICEM. MRC strategic environmental assessment (SEA) of hydropower on the Mekong mainstream: Summary of the final report. Hanoi, Vietnam: 2010.
- Instituto Brasileiro de Geografia e Estatística. Pará—Altamira. 2015. <http://www.cidades.ibge.gov.br/xtras/perfil.php?lang=&codmun=150060&search=para%7Caltamira>. Cited April 2, 2015
- Jullien, M. Can DR Congo's Inga dam project power Africa?. 2013. <http://www.bbc.com/news/world-africa-24856000> Cited June 9, 2015
- Lubkemann, S. Situating migration in wartime and post-war Mozambique: A critique of 'forced migration' research. In: Szreter, S., Dharmalingam, A., editors. *Categories and contexts: Anthropological and historical studies in critical demography*. Oxford: Oxford University Press; 2004. p. 371–400.
- Massey DS. The social organization of Mexican migration to the United States. *Annals of the American Academy of Political and Social Science*. 1986; 487:102–113.
- Massey DS. International migration at the dawn of the twenty-first century: The role of the state. *Population and Development Review*. 1999; 25(2):303–322.
- Massey DS, Espana FG. The social process of international migration. *Science*. 1987; 237(4816):733–738. [PubMed: 17751562]
- Ministério de Minas e Energia. Plano Decenal de Expansão De Energia 2021. Brasília: 2012.
- Moran, EF. Private and public colonization schemes in Amazonia. In: Goodman, D., Hall, A., editors. *The future of Amazonia: Destruction or sustainable development?*. New York: St. Martin's Press; 1990. p. 70–89.
- Norte Energia, SA. Projeto Básico Ambiental da Usina Hidrelétrica Belo Monte. 2010.
- Ozório de Almeida, AL., Campari, JS. *Sustainable settlement in the Brazilian Amazon*. New York: Oxford University Press; 1995.
- Partridge, WL. Successful involuntary resettlement: Lessons from the Costa Rican Arenal hydroelectric plant. In: Cernea, MM., Guggenheim, SE., editors. *Anthropological approaches to resettlement: Policy, practice, and theory*. Boulder: Westview Press; 1993. p. 351–374.

- Perz, SG. Population growth and net migration in the Brazilian Legal Amazon, 1970–1996. In: Wood, CH., Porro, R., editors. Deforestation and land use in the Amazon. Gainesville: University Press of Florida; 2002. p. 107–129.
- Randell HF, VanWey LK. Networks versus need: Drivers of urban out-migration in the Brazilian Amazon. *Population Research and Policy Review*. 2014; 33(6):915–936. [PubMed: 25419021]
- Richmond AH. Sociological theories of international migration: The case of refugees. *Current Sociology*. 1988; 36(2):7–25. [PubMed: 12281859]
- Ruiz I, Vargas-Silva C. The economics of forced migration. *Journal of Development Studies*. 2013; 49(6):772–784.
- Scudder, T. The Future of large dams: Dealing with social, environmental, institutional and political costs. London: Earthscan/James & James; 2005.
- Sewell WH. A theory of structure: Duality, agency, and transformation. *American Journal of Sociology*. 1992; 98(1):1–29.
- Stark O, Bloom DE. The new economics of labour migration. *American Economic Review*. 1985; 75(1):191–196.
- Stark O, Lucas REB. Migration, remittances, and the family. *Economic Development and Cultural Change*. 1988; 36(3):465–481.
- Taylor, JE., Martin, PL. Human capital: Migration and rural population change. In: Gardner, B., Raussier, G., editors. *Handbook of Agricultural Economics*. Vol. 1. New York: Elsevier; 2001. p. 457–511.
- Todaro MP. A model of labor migration and urban unemployment in less developed countries. *The American Economic Review*. 1969; 59(1):138–148.
- Todaro, M. Internal migration in developing countries: A survey. In: Easterlin, RA., editor. *Population and economic change in developing countries*. Chicago: University of Chicago Press; 1980. p. 361–402.
- Turton, D. RSC working paper. University of Oxford; 2003. Conceptualising forced migration; p. 12
- Umbuzeiro, A., Umbuzeiro, U. *Altamira e sua História*. Belém, Pará: Ponto Press Ltda; 2012.
- VanWey LK, D’Antona AO, Brondizio ES. Household demographic change and land use/land cover change in the Brazilian Amazon. *Population and Environment*. 2007; 28(3):163–185.
- Winters P, De Janvry A, Sadoulet E. Family and community networks in Mexico-US migration. *Journal of Human Resources*. 2001; 36(1):159–184.
- World Commission on Dams. *Dams and development: A new framework for decision making*. London: World Commission on Dams; 2000.
- Yoder ML, Fuguitt G. Urbanization, frontier growth, and population redistribution in Brazil. *Luso-Brazilian Review*. 1979; 16(1):67–90.
- Zhourri A, Oliveira R. Desenvolvimento, conflitos sociais e violência no Brasil rural: O case das usinas hidrelétricas. *Ambiente & Sociedade*. 2007; 10(2):119–135.

Fig. 1.
Map of study area including baseline property boundaries and approximate migration destinations

Fig. 2.
Conceptual model of factors associated with attaining forced migration aspirations