

# Social capital and access to (natural) resources and markets along the Brazil nut (*Bertholletia excelsa*) value chain in the Lower Amazon basin, Pará

## Capital social e acesso a recursos (naturais) e mercados ao longo da cadeia de valor da castanha-do-brasil (*Bertholletia excelsa*) no baixo Amazonas, Pará

Marcelo Cunha

Freie Universität Berlin. Berlin, Germany

**Abstract:** The aim of this study is to understand the relationships between social capital and access to (natural) resources and markets in the case of Brazil nut value chain actors in the meso-region of the Lower Amazon, with a focus on *quilombola* communities from Oriximiná and the environs of the market in Óbidos, Pará. The analytical framework combines conceptual analysis with empirical observations to improve understanding of the relationships among the variables in question and provides scientific input for co-development of the value chain. Socioeconomic and environmental data were collected through interviews with *agroextrativistas* and group interviews at community level. Results highlight the existence of 'bonding social capital' which unites individuals from the same community and 'linking' and 'bridging social capital' that connect them to downstream chain actors, potentially facilitating access to (natural) resources and markets. Mainly due to trust, trade relationships along the Brazil nut value chain generate significant mutual benefits among the Associação dos Moradores da Comunidade Remanescente de Quilombo de Cachoeira Porteira (AMOCREQ) from the *quilombola* community Cachoeira Porteira in Oriximiná and the firm Mundial Exportadora in Óbidos, despite the shorter distances to the Oriximiná market.

**Keywords:** Access to resources. Social capital. Brazil nut value chain. Non-timber forest product.

**Resumo:** Objetiva-se compreender a relação entre capital social e acesso a recursos (naturais) e a mercados por atores da cadeia de valor da castanha-do-brasil, na mesorregião do baixo Amazonas, com foco em comunidades quilombolas de Oriximiná e nos arredores do mercado de Óbidos. O arcabouço analítico contempla a análise de conceitos e observações empíricas para incrementar o entendimento da relação entre estas três variáveis, como insumo para o fortalecimento participativo da cadeia de valor. Os dados socioeconômicos e ambientais foram coletados por meio de entrevistas com agroextrativistas e reuniões em nível de comunidades. Resultados indicam que há, entre outros componentes, *bonding social capital*, que une comunitários entre si, bem como *linking* e *bridging social capital*, 'que fazem a ponte' e os conectam a atores a jusante da cadeia de valor, possibilitando eventualmente o acesso a recursos (naturais) e mercados. Sobreretudo devido à confiança, relações de coleta e comercialização da castanha-do-brasil trazem benefícios mútuos significativos entre a Associação dos Moradores da Comunidade Remanescente de Quilombo de Cachoeira Porteira (AMOCREQ), da comunidade quilombola de Cachoeira Porteira, em Oriximiná, e a Exportadora Mundial, em Óbidos, apesar de distâncias mais curtas para o mercado de Oriximiná.

**Palavras-chave:** Acesso a recursos. Capital social. Cadeia de valor da castanha-do-Brasil. Produto florestal não madeireiro.

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Autor para correspondência: Marcelo Cunha. Freie Universität Berlin. Malteserstr. 74-100, 12249. Berlin, Germany. World Agroforestry Centre – ICRAF (CGIAR). Trav. Dr. Enéas Pinheiro, s/n. Belém, PA, Brasil. CEP 66095-100 (marcelocunha@zedat.fu-berlin.de).

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## INTRODUCTION

Despite the well-known potential for Brazil nut extraction to help reconcile livelihood needs and forest conservation through its sustainable management (based on Peres *et al.*, 2003; Filocreão, 2007; Scoles & Gribel, 2012), in many areas where extraction takes place (*i.e.* Amazon region in Brazil, Peru and Bolivia; Peres *et al.*, 2003), there remains a disconnection between socioeconomic development of the Brazil nut value chain and environmental conservation, as in the Lower Amazon basin, state of Pará, Brazil. Within this meso-region, the so-called Calha Norte region is composed by one of the world's largest mosaics of conservation units, accounting together with other protected areas (*quilombola* and indigenous territories) for 82% of its total area (Santos *et al.*, 2012). R\$ 9,482,000.00 is the gross value of production of non-timber forest products (NTFP) in the Lower Amazon basin in 2011 (IDESP, 2011). Yet, immense distances separate *quilombola* communities from urban centers and their marginalization from markets, as well as institutionally limited access to (natural) resources in respective conservation units, weak institutional arrangements between local organizations and government challenges the locally desired equitable integration of upstream actors into the Brazil nut value chain.

The main problems identified with respect to the chain in question are (1) the lack of organizational structures, including the accessibility of remote and scarce *Bertholletia excelsa* stands as well as (2) the difficult transport conditions for collecting and marketing the Brazil nut. The access to (natural) resources and market opportunities, especially in the case of *agroextrativistas* is hampered by both these challenges which are intensified by the lack of understanding of the structures that generate high transaction costs and unbalanced power relations. Social capital promoted by projects for value chain development (VCD), can potentially influence the livelihoods of *agroextrativistas* and possibly have

an impact on sustainable rural development (Cosyns *et al.*, 2014). The concept of social capital, however, lacks a clear definition. Its relationship with the access to (natural) resources and markets, particularly in the frame of asset-based VCD for a given product in a specific socioeconomic and environmental context, is yet to be thoroughly understood. This study focusses on social capital and access to (natural) resources and market opportunities along the Brazil nut value chain, while investigating local civic participation, trust and trade relationships between upstream (Oriximiná) and downstream (Óbidos) chain actors. The key message hereby put forward, is: social capital based on mutual trust and composed by 'bonding', 'linking' and 'bridging social capital' can promote the access to markets and sustainable use of natural resources by *agroextrativistas*.

The aim of this study is to provide scientific input for the design of common value chain development strategies in order to effectively achieve mutual benefits along the Brazil nut value chain. The means to reach this goal is to increase understanding of the relationship between social capital and access to (natural) resources and markets related to downstream and, especially, upstream chain actors in the Lower Amazon basin. This understanding builds up on the analysis of the livelihoods of chain actors and the relationships amongst them.

The specific objective of the study is to identify and disentangle components and key variables that make up social capital and help address the relationship between social capital and access to (natural) resources and market opportunities, particularly related to *agroextrativistas* within the Brazil nut chain in the Lower Amazon basin. Two main research questions are addressed. First, if and how economically and geographically marginalized Brazil nut chain actors access (natural) resources and markets, particularly in the case of the Community of Cachoeira Porteira (CCPT, per acronyms in Portuguese) in Oriximiná? How can social capital influence the access to (natural) resources and markets by actors of the Brazil nut value

chain in the Lower Amazon basin with a geographic focus on Oriximiná and Óbidos, Pará?

The hypothesis derived from these research questions, as well as from a detailed literature review, is that trust, participation and solidarity – between actors from Oriximiná and Óbidos – may contribute to potential access to (natural) resources and markets, particularly of marginalized members of the Brazil nut value chain through 'bonding social capital', 'linking social capital' and 'bridging social capital' (Woolcock & Sweetser, 2002).

In order to build up the basis to answer these questions while testing the hypothesis, this article is structured as follows. The 'methods' will be explained in the next section (2), followed by the 'concepts and analytical framework' (section 3) in order to lay the groundwork for the results and discussion on the building blocks of social capital and access to (natural) resources and markets by the agents of the Brazil nut value chain in Oriximiná and Óbidos (section 4), and thus draw conclusions regarding the relationships between these variables while transmitting the key message and elucidating research perspectives (section 5).

## METHODS

A three-step approach was conducted to address the research questions: (1) a thorough literature review to build up the conceptual and analytical framework; (2) a quantitative socioeconomic and natural resource survey at the household level in the meso-region of the Lower Amazon basin, Pará<sup>1</sup>; and (3) three phases of collecting perceptions from *agroextrativistas* on social capital and access to (natural) resources and markets (capturing, amongst other information, problems and potentialities

for strengthening the Brazil nut value chain based on a Strengths Weaknesses Opportunities and Threats – SWOT – analysis).

Overall, sampling methods used were twofold: (1) for choosing municipalities and communities of *agroextrativistas* in the Calha Norte region, selective sampling was applied based on two criteria, 'prominent Brazil nut occurrence' and 'relative importance of Brazil nut as a family income source'; and (2) for selecting households of *agroextrativistas*, following the identification of their total number, snowball sampling was implemented so as to account for at least 25% of Brazil nut gatherers and 75% of buyers with a focus on *quilombola* communities in Oriximiná (Boa Vista do Cuminã, Cachoeira Pancada, Jauari, Cachoeira Porteira and Tapagem), as an economically and geographically marginalized rural group.

Traditional populations living in *quilombola* communities from Oriximiná, including their trade relationships with buyers from its urban center as well as Óbidos comprise the key target groups and issues to be understood in the frame of the present study.

Semi-structured group and key-informant interviews with local communities, especially in *quilombola* communities from the Erepecuru and Trombetas rivers (in particular the CCPT) were conducted from July 2012 until June 2013. Interviews were combined with participant observation and informal conversations to assess social capital and its components (trust, participation and solidarity) which relate to access to (natural) resources and markets by upstream actors of the Brazil nut value chain in the study area.

Interviews on local participation, were conducted at the household level at the CCPT with key-informants, being 50% members of the board of the AMOCREQ.

<sup>1</sup> The Amazon Livelihood and Environment Studies Network – RAVA (from its Portuguese and Spanish names) is led by the World Agroforestry Centre (ICRAF) and was created to conduct studies on livelihoods and the dependency of rural communities on forests and other natural resources in the Amazonian countries. RAVA methodology is composed by a comprehensive questionnaire (29 pages), based on the Poverty and Environment Network (PEN) prototype questionnaire, the PEN Technical Guidelines and list of codes elaborated by the Center for International Forestry Research (CIFOR). To meet particular research needs of this study, these data collection tools were adapted to the Amazonian context and include not only additional codes to address context and complementary questions on product-specific issues (e.g. gathered quantities in a common unit such as box of Brazil nut) but also a Microsoft Access database managed by the author.

The data collection tools employed were two structured questionnaires for household interviews<sup>2</sup> (following pilot surveys in July 2012), whereby semi-structured interviews on social capital were conducted at the household level at the CCPT. The analysis of primary data was conducted using the statistics program 'Stata' as well as the open-access software 'Qualtrics' for designing surveys and managing data. Quantitative data on income sources and value of production were collected particularly along the Brazil nut value chain in the Lower Amazon basin, whereas qualitative data on social capital, access to (natural) resources and markets of chain actors were captured in Oriximiná and Óbidos, with a focus on *agroextrativistas* from *quilombola* communities (particularly members of the CCPT).

This methodological approach helps build a baseline that encompasses institutional arrangements, social capital, production systems (agricultural and forest products), and access to (natural) resources and markets with regard to *agroextrativistas*. Further, the approach helps answer whether and under which conditions, social capital can influence access to resources for actors of the Brazil nut value chain and possibly generate mutual benefits amongst them, taking power relations into account.

## CONCEPTS AND ANALYTICAL FRAMEWORK

Definitions of key terms used in the paper are as follows:

'Social capital' is hereby defined as the resources generated and contained in social networks, which can be accessed or used by individuals for concrete actions, taking into account power relations and trust within interpersonal relationships (based on Bourdieu, 1986; Coleman, 1988; Wasserman & Faust, 1994; Woolcock & Narayan, 2000; Lin, 2002; Huber, 2009). 'Transaction costs' are costs that result from making economic exchange, search and information costs as well as bargaining costs (Williamson, 1981). High transport costs

due to large distances in the study area are hereby the key component of transaction costs.

'Livelihoods' are viewed as being made up of capabilities, assets (related to financial, social, physical, human, political and natural capital) and activities to sustain a means of living (based on Chambers & Conway, 1991; DFID, 1999). Diversifying income sources, while avoiding large-scale specialization and land degradation as well as deforestation (based on Escobal & Aldana, 2003), can potentially contribute to enhancing livelihoods.

These concepts are embedded in the analytical framework (Figure 1).

The relationship between social capital (as a component of the livelihood concept) and access to (natural) resources and markets by actors from the Brazil nut value chain is explained as follows: social capital can potentially contribute to enhancing the livelihoods of economically and geographically marginalized *agroextrativistas*, based on two 'motives': (1) solving problems related to collective action, and (2) direct or indirect mitigation of transaction costs faced by actors (Rydin & Holman, 2004; Porter & Lyon, 2006), in the case of the Brazil nut value chain. Both motives promote the establishment and maintenance of interpersonal relations, while generating 'means' of accessing social capital ('bonding', 'bridging' and 'linking social capital') (Woolcock & Sweetser, 2002; Cosyns *et al.*, 2014) and possibly gaining access to market and other opportunities. The first 'motive' applies for a given individual in relation to a group he/she belongs to and refers to 'bonding social capital', regarding connections within a community (Rydin & Holman, 2004), from the same socioeconomic *milieu* (Woolcock & Sweetser, 2002). The second 'motive' applies for two 'means': 'bridging' and 'linking social capital'. It potentially enables diminishing transaction costs within a given value chain, possibly influencing 'net transaction costs', through interactions among individuals (Rydin & Holman, 2004). These relationships with individuals who do not belong to

<sup>2</sup> Questionnaires are based on RAVA (ICRAF) and World Bank (Grootaert *et al.*, 2003) methodologies.

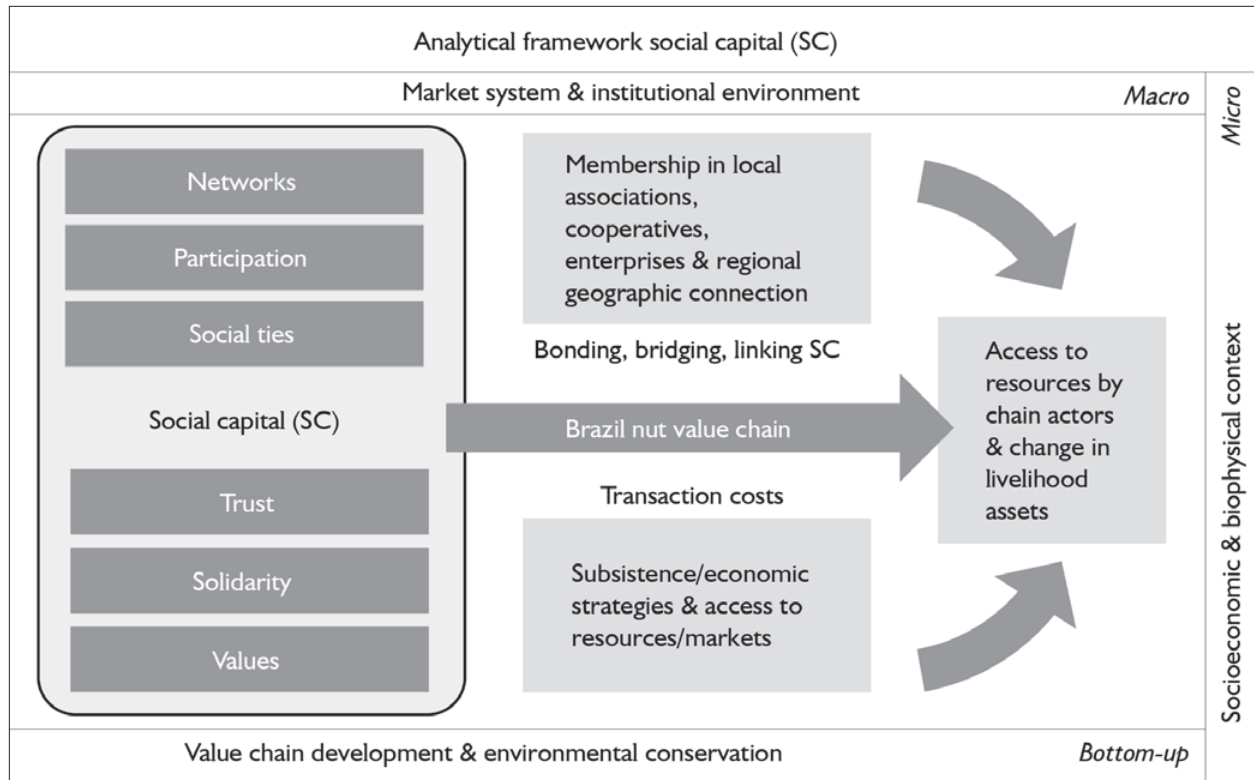


Figure 1. Analytical framework of social capital (SC – related to livelihoods) of value chain actors and their access to resources and markets. Source: own elaboration, based on Bourdieu (1986); Coleman (1988); Wasserman & Faust (1994); Portes (1998); Putnam (2000); Woolcock & Narayan (2000); Lin (2002); Woolcock & Sweetser (2002); Huber (2009); Donovan *et al.* (2013).

the same social system (e.g. community or socioeconomic *milieu*) are overall known as 'bridging social capital' and in case of ties to financially and/or politically powerful actors it relates to 'linking social capital' (Woolcock & Sweetser, 2002). In the case of *quilombola* communities from Oriximiná, except for leaders from these localities, who usually have connections to external actors, including vertical ties (Woolcock, 2001), most *agroextrativistas* are not characterized by having large amounts of 'linking' and 'bridging social capital'. These dimensions of social capital are depicted in Figure 1.

Social capital can be disentangled into: values as a basis for solidarity and trust among actors from the Brazil nut value chain for food security and market strategies, while social ties are the pillars for participation in networks of chain actors, e.g. within associations of *agroextrativistas*

and processing industries (see Figure 1). 'Bonding', 'bridging' and 'linking social capital' are the means to connect chain actors – considering the distances among them and transaction costs, particularly high transport costs that characterize trade relationships – and promote the access to resources while potentially affecting local livelihoods.

Overall, the framework for the relationship between social capital and access to (natural) resources and markets by chain actors (central arrow representing this relationship with the value chain as the unit of analysis) is laid out in three 'scopes' in Figure 1: (1) 'macro' – small-scale gatherer/ producer groups or buyers are embedded in market systems as well as in the environment, socioeconomic and institutional context, potentially enabling cooperation; (2) 'micro' – the relationship highlighted with the arrow referred to above

is filtered by means for securing subsistence and food sovereignty and strategies for accessing natural resources and markets, while considering the socioeconomic and biophysical conditions, including diversification of income sources from *agroextrativistas*, as well as the 'motive' of collective action and capability for geographic connection; and (3) 'bottom-up' – building-up livelihood assets through participating in the Brazil nut value chain while jointly strengthening local production and marketing systems and considering environmental conservation for sustainable asset-based value chain development at the regional level.

According to Bebbington (1999, p. 2022), "access becomes perhaps the most critical resource of all if people are to build sustainable, poverty alleviating rural livelihoods".

## RESULTS AND DISCUSSION: SOCIAL CAPITAL AND ACCESS TO RESOURCES AND MARKETS

Findings indicate the existence of 'bonding social capital' which unites individuals from the same community and 'linking' and 'bridging social capital' that connect them to downstream chain actors, potentially facilitating access to (natural) resources and markets. There are three Brazil nut processing plants in the Calha Norte region, one is located in Oriximiná and two in Óbidos. Only one, apart from intermediaries, is currently buying Brazil nut from *quilombola* communities of Oriximiná. Mainly due to trust, trade relationships along the Brazil nut value chain generate significant mutual benefits among the Associação dos Moradores da Comunidade Remanescente de Quilombo de Cachoeira Porteira from CCPT in Oriximiná and the firm Mundial Exportadora in Óbidos, despite the shorter distances to the Oriximiná market.

## TRANSPORT FROM FORESTS TO COMMUNITIES AND MARKETS

Among the assessed problems with regard to the access to (natural) resources and markets, high transaction costs were identified, especially transport costs, due to large distances and poor structures for marketing

agricultural as well as forest products in this region. This holds true for Oriximiná, particularly for remote communities, mostly distant from productive *Bertholletia excelsa* stands, markets and urban centers, hindering the generation of social capital and the access to resources through equitable market integration of economically and geographically marginalized chain actors.

This challenge is faced particularly by *agroextrativistas* from the analyzed *quilombola* communities, e.g. the Cachoeira Pancada by the Erepecuru and CCPT by the Trombetas river, as foci of the occurrence of the Brazil nut and respective income generation. The CCPT is located in the 'Upper Trombetas' river basin (Alto Trombetas), 15 hours by fishing boat and six hours by motorboat (engine with 'Horse Power – HP 15') from the market and Brazil nut industry in the municipality of Oriximiná, and practically a day fishing boat trip from the factories in Óbidos, accounting for the only three buyers of Brazil nut (*in natura*) in the Calha Norte region (see Figure 2). Map shows the key *quilombola* communities by the Erepecuru and Trombetas river (Figure 2C) analyzed within the study area encompassing two municipalities, as depicted by map (Figure 2B) – Oriximiná, particularly the CCPT, as well as Óbidos, where the main buyer of the Brazil nut from the CCPT is located.

In the case of the CCPT, the transportation of the Brazil nut from the community to the markets – namely 'external transportation', being the CCPT itself the reference point – is one of the most prominent challenges for the Brazil nut value chain actors. The Associação dos Moradores da Comunidade Remanescente de Quilombo de Cachoeira Porteira does not have a collectively owned boat and there are only two large private boats (Silva Moda and Frutos da Fé) that operate from the CCPT to the closest urban centers and markets – the first larger boat station Oriximiná and second Óbidos. The transportation can only be conducted through the rivers, in this case Erepecuru and Trombetas, while there are two means for doing so: (1) a boat can be rented for R\$ 1,500.00,

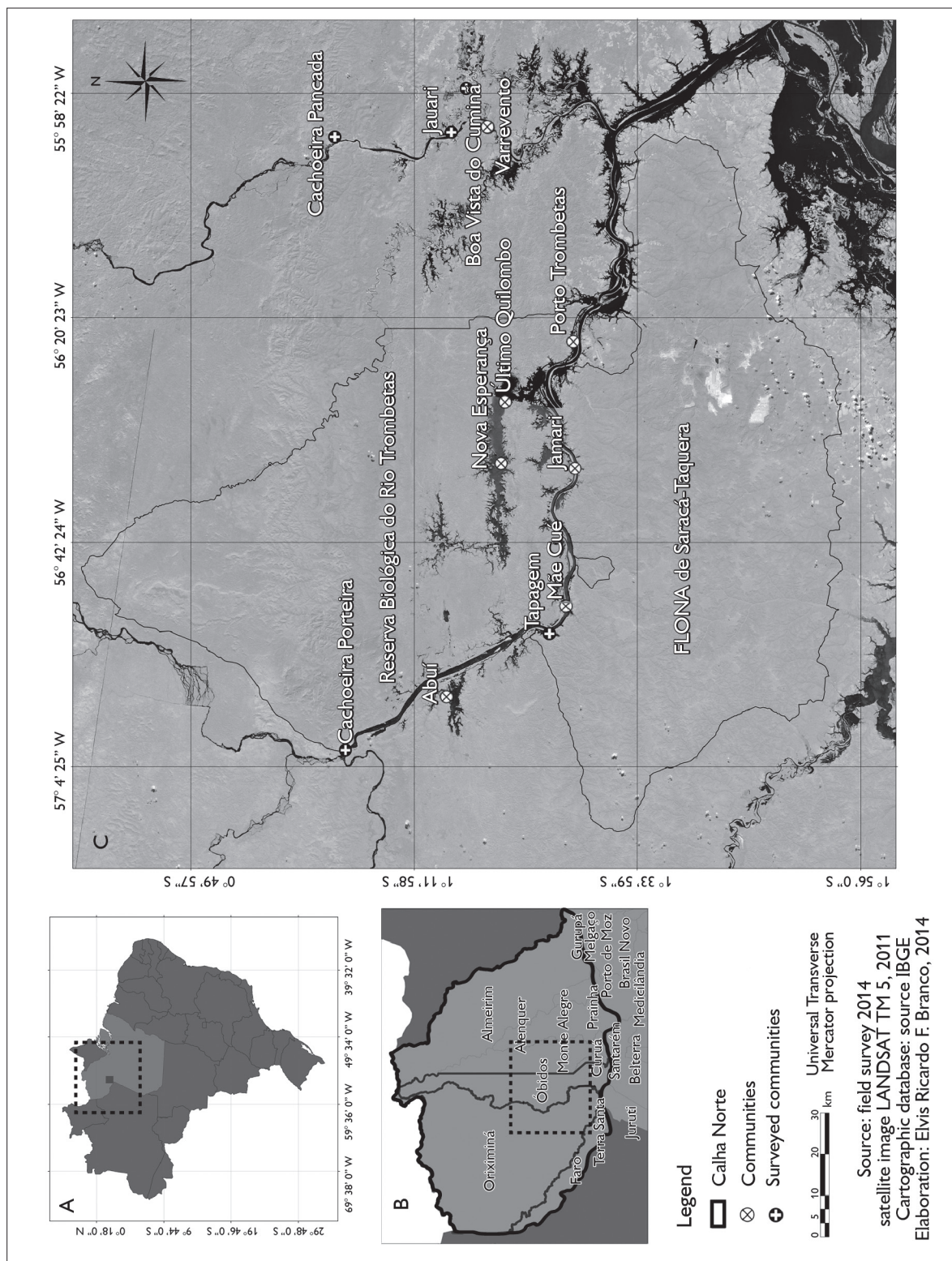


Figure 2. Maps showing part of the Calha Norte region in the Pará state (A), limits of the municipalities of Oriximiná and Óbidos (B), and the *quilombola* communities along the Erepecuru and Trombetas rivers in Oriximiná municipality (C).

or (2) R\$ 5.00 per *saca* for Óbidos and R\$ 3.00 per *saca* for the transportation to Oriximiná.

The transportation within the CCPT, the herein called 'internal transportation' is difficult, as most Brazil nut is gathered in remote *Bertholletia excelsa* stands, to a considerable extent located passed the 'kilometer (km) 31' from the only road of the community (former Perimetral Norte road), and much further away when referring to the 'Stream of the km 60', 'Stream of the km 52', amongst other Brazil nut collection points. Hence, a considerable proportion of the *agroextrativistas* face these problems and, in particular, relatively high costs to get by canoe and small motorboats to these distant localities which are characterized by having numerous waterfalls precluding transportation by boat in certain river sections.

One of the interviewees – who has amongst his social roles two professions, as an *agroextrativista* and a local buyer of Brazil nut from the CCPT – reported that traditionally his family has always been gathering Brazil nut from stands located a day's travel distance, one part by road (motorbike/tractor) and, near the collection point of the 'Stream of km 60', river transportation (by small motorboat, which is considerably faster than a canoe). Related costs (particularly fuel and labor costs) are sufficiently high that they already started to negotiate with another family for being able to work at the collection point 'km 30' (Perimetral Norte road) where this couple has long been extracting their Brazil nut. As the commuting distance to work would considerably decrease, the interviewed family would improve their cost-benefit ratio while being able to shorten their stays at the closer *Bertholletia excelsa* stand.

The transportation of the *sacas* of the Brazil nut gathered at different collection points along the Perimetral Norte road, is mainly conducted by the only tractor from the CCPT which has limited capacity to transport (35 *sacas* per round trip, using up 40 liters of fuel). In 2012, the Mundial Exportadora Comercial Ltda. has provided a truck to be paid back by the president of AMOCREQ through

his Brazil nut supply, who is already covering his expenses by locally transporting part of the Brazil nut gathered by *agroextrativistas* from the CCPT.

Results from the socioeconomic and natural resource use survey, include 'Global Positioning System (GPS) coordinates' of households and selected *Bertholletia excelsa* stands. The residential area of the CCPT (spatial distribution of households was taken into account as part of the sampling technique) is located 26.61 km (mean distance) and 73.71 minutes (mean travel time) by tractor (mainly used transport means by *agroextrativistas* as the fuel and driver are paid by the town council of Oriximiná) from the closest Brazil nut collection point.

## ECONOMIC CONDITIONS OF AGROEXTRATIVISTAS

The livelihoods of *agroextrativistas* are characterized by limited financial capital, especially in the off season periods of the Brazil nut. Over a century, Brazil nut has been traditionally gathered, leading to resource use specialization and low levels of diversification of income sources, particularly in *quilombola* communities. Results from the statistical analysis of data on income sources of *agroextrativistas*, point to a considerable dependency from forest resources, especially from households which are a long distance away by boat from markets.

A first characterization of the production systems and livelihood strategies from the *agroextrativistas* led to the identification of a relatively small number of components of the household income in place. It was confirmed that the Brazil nut is the main rural income source of *agroextrativistas* in Oriximiná. Overall, even in the 'Trombetas river biological reserve', they have at least one additional income source: fish and/or game (despite the fact that it is not permitted there) and/or *bolsa família* and/or pension. The majority of the *agroextrativistas* have cassava (flour) as an additional agricultural income source, whereby some families have other income sources, such as short-term contracts, particularly in off season periods

with the Mineração Rio Norte (MRN) or to work on the construction of river dams for hydroelectric power plants in the region in question. *Açaí* (*Euterpe oleracea*), *copaíba* (*Copaifera* sp.) as well as banana and corn are additional income sources, with six being the maximum of income sources identified in the study area. These results do not represent all families from Oriximiná, however they point to insufficient diversification of income sources of *agroextrativistas*. The specialization on only one additional agricultural or forest product can raise the risk of financial hardship, particularly in the off season periods of the Brazil nut extraction and in cases of severe production losses caused by diseases or extreme climatic events (excessive rainfall and extended drought periods).

When it comes to benefit sharing along the Brazil nut value chain in Oriximiná and Óbidos, prices in 2012 indicate an unequal distribution of economic returns, whereby downstream actors, who are overall more powerful especially in financial terms, benefit most. In July 2012 the Mundial Exportadora Comercial Ltda. bought its Brazil nut *in natura* for 1.30 R\$/kg, compared to Florenzano Ltda., 1.20 R\$/kg. It sells the processed Brazil nut (the so-called 'dry Brazil nut') to the supermarket Passatempo Preferido located in Oriximiná for 30.00 R\$/kg, which sells it for 57.00 R\$/kg to the consumer.

Overall, participation in community activities and groups, trust and solidarity among members of a particular community can contribute to enhancing livelihoods, especially social capital, in order to access resources while reducing transaction costs and increasing the feasibility of the collective management of natural resources (based on Ostrom, 1990, 1994; Isham, 2002).

## PARTICIPATION AT THE COMMUNITY LEVEL

The CCPT, as the geographic unit and social system this study lays focus on, is organized as follows. The association AMOCREQ was founded on 25.09.2002, with the goal of fighting for ethnic-cultural rights and rights to access land and tenure (according to the Minutes of

the Foundation of AMOCREQ, in 2002). Ten years later, CCPT had 410 inhabitants (interview with the evangelical minister from the CCPT, in CCPT, 20.06.2013). This association, from which the vast majority of the CCPT is member (in 2012, 104 members, whereby in 2013 this number rose to 158 from a total of 82 families living at the CCPT, given positive developments in the process of acquiring a land title for the '*quilombola* territory' in the area of the CCPT), builds up the core of internal connections among actors. In addition, it functions as a link between internal and external actors (with the CCPT as a reference), particularly regarding environmental and cultural issues as well as access to policies and market services related to the extraction of the Brazil nut.

All interviewees at the CCPT responded that the 'number of members of AMOCREQ increased' in the last three years, especially due to the perspectives of passing through the decree providing tenure to the local traditional population when turning part of the 'Trombetas river biological reserve', amongst other conservation units, into a '*quilombola* territory'. Two thirds of the interviewees at CCPT answered that AMOCREQ helps them have 'access to trainings and courses, credit and health services'. When asked about the biggest benefit from being part of such an organization, the answers varied equally between 'improves the family income' and 'access to services that benefit the community'. Yet, these contributions to access to resources are still incipient.

When asked about his participation in meetings from the AMOCREQ: "I only don't participate when I am not around, but when I am here, my obligation is to be at the meetings, considering that I am the vice-president of AMOCREQ" (interview with AMOCREQ's vice-president, in CCPT, 24.06.2013). However, this frequent participation does not reflect the one from most inhabitants from the CCPT. In order to increase engagement in collective issues concerning the community, a stronger democratic leadership from AMOCREQ's president is needed. He or she is the one to set an example, including

in issues such as to augment agricultural production and promote the improvement of the living conditions in the off season period, building up on a community consultation process for participative decision making.

Overall, there is scarce participation in meetings from the AMOCREQ, which relates to the relatively weak civic engagement at the CCPT (interview with the evangelic minister from the CCPT, in CCPT, 20.06.2013). In meetings on land tenure issues, up to 30% of the local inhabitants participate. However in other issues only 5% (mean participation of AMOCREQ's members, who are mostly delayed with the payment of the association fee of R\$ 3.00 per month), as it was the case at the presentation from its vice-president on 22.06.2013 to identify priority areas for the design of a project proposal on health at the community level, attended by AMOCREQ's president and eight inhabitants of the CCPT.

### Religious participation

The evangelical minister from the CCPT reports the lack of participation in the evangelic and catholic church at the CCPT, as well as in activities for the community. In the 1970s and 1980s, with the presence of the construction firm Andrade Gutierrez in the CCPT, 50% of the youngsters and adults were members of the evangelic church, according to the minister. On the day of the interview (20.06.2013), there were 13 members of the evangelic church in the community (3% of CCPT's population and 16% of the leaders of the households, according to the minister who refers to the official register, the 'hall of members'). On the 21.06.2013, the evangelic minister met with the AMOCREQ's president, when they decided to approach every single of 82 households personally for increasing the religious participation, as well as the civic, among the inhabitants of the community at stake: "together it would be possible to request and achieve more things for the CCPT" (interview with the minister of the evangelic church from the CCPT, in CCPT, 20.06.2013).

The turn-over rate of ministers is high at the CCPT, which is potentially related to difficulties in integrating in the local social system. The vast majority does not attend masses at the churches. The current involvement from the minister of the CCPT in the community is made harder due to the fact that he has only recently moved to the CCPT together with his wife, during the first week of 2013, besides the fact that he spends three days in a row per week (at least) in a boat as the co-captain to transport Brazil nut, passengers and other loads from CCPT to Oriximiná and Óbidos.

### Civic engagement and solidarity

With regard to the participation in activities for the CCPT (e.g. collective action in the form of *mutirões*, regionally called *puxiruns*), on average, CCPT's inhabitants invested two weeks in such activities and participated 16.5 times in actions for the AMOCREQ (meetings and other types of group work). 83% of the interviewees declared that it is very likely that people would be criticized by their peers if they did not participate in the above mentioned activities. Lack of unity in the community, such as the case of the broken engine of the power generator that was taken downtown to be repaired with the support of Oriximiná's city council. According to the minister of the evangelic church from the CCPT:

If there was a sense for us to speak in only one voice and we had united ourselves, they [city council members] would have given us our 'light engine' back much earlier or they would have even sent technicians to repair it here at the CCPT. Most families have not had electricity for a long time now (interview with the minister of the evangelic church from the CCPT, in CCPT, 20.06.2013).

Concerning solidarity within the CCPT, when asked about the frequency with which its inhabitants help each other, on a five-point Likert scale (from always to never help), 50% of the interviewees responded they 'always help' and 50% that they 'sometimes help' other people (in the community). In the case of severe diseases and deaths, a 100% answered they would help somehow:

When someone is sick, people try to do something about it, such as in the case of Mr. Forotó – people, including the ones that do not belong to the family, mobilize themselves to support, for instance, through organizing a bingo for raising money for a trip to Manaus [closest bigger city with a solid infrastructure]. If it happened to someone else, people would have also helped. At the CCPT people have a vision of helping one another (interview with the minister of the evangelic church from the CCPT, in CCPT, 20.06.2013).

## MUTUAL DEPENDENCY AND TRUST RELATIONSHIPS

Mutual dependency becomes explicit in the trust relationships among the actors of different links of the Brazil nut value chain: (1) internally, among *agroextrativistas* and local buyers; and (2) among both these local groups and industries in the urban centers, building up a complex network of mutually dependent actors. This relationship can be identified among upstream and downstream value chain actors from the CCPT through the fact that *agroextrativistas* usually gather and sell their Brazil nut for the same buyers at the local level, while they market this product from the CCPT to the same industries in Oriximiná and Óbidos. To a certain extent, this shows loyalty and mutual dependency in the trade relationships.

In the case of mutual dependency, between the Brazil nut industry Mundial Exportadora Comercial Ltda. and the AMOCREQ – the firm depends on the gathering activities and the inhabitants of the CCPT depend on the marketing of the Brazil nut. This relationship is strengthened through relatively strong social ties and trust among the leaders of both institutions. For instance, a used truck from Mundial Exportadora Comercial Ltda. was recently sold to the president of AMOCREQ (to be paid for over years with Brazil nut loads). Due to mutual trust built up over the years, trade relationships in the case of the Brazil nut are most intense, in terms of socioeconomic benefits, among the CCPT which is located in the municipality of Oriximiná and the Mundial Exportadora Comercial Ltda., in Óbidos, despite the shorter distances between CCPT and

the market of Oriximiná. Even though this company pays a slightly higher price for the Brazil nut than its competitors, it does not pay off the additional fuel and labor costs that buyers from the communities must disburse to get to Óbidos. This vertical relationship based on trust amongst value chain actors as a promoting factor for 'bridging' and 'linking social capital', enables upstream actors from the Brazil nut value chain to access resources (including financial) from downstream chain actors and vice-versa. The access to natural resources is made easier for the latter through 'bridging social capital'.

Vertical relationships can potentially lead to problems due to unbalanced power relations and market asymmetries. Often, *agroextrativistas* from remote communities, such as the CCPT, do not have access to information about the price variation of the Brazil nut, which could empower them when negotiating with local (internal) buyers and through them with external buyers. There are cases of disruption of trust between *agroextrativistas* and local buyers, caused by non-fulfilled commitments within the market system, given the 'payments in advance' – provided by certain buyers for the *agroextrativistas* who usually supply them – to have the resources to gather Brazil nuts. Thereby, some *agroextrativistas* happen to sell their Brazil nuts to the first available buyers who offer the highest price and immediately pay while satisfying the need for liquidity of *agroextrativistas*. Not fulfilling trade agreements from any side (upstream or downstream chain actors, in the case of external stakeholders) can lead to the reduction of 'bridging social capital' and possibly 'linking social capital' as well, while the diminishment of 'bonding social capital' may also occur when the trust between *agroextrativistas* and local buyers is broken due to mismatched expectations.

The system of advancing economic resources (*sistema de aviação*) can potentially be useful in a short term, providing liquidity (at a cost, given price variations when supplying Brazil nut itself) for *agroextrativistas* who otherwise would not have been able to cover initial costs for gathering Brazil nut. This credit provision scheme is a

financial service that can be accessed by *agroextrativistas* at the local (among CCPT actors) and regional level (among AMOCREQ in Oriximiná and the Mundial Exportadora Comercial Ltda. in Óbidos). This access can be facilitated through 'bonding social capital' and, especially, 'bridging social capital' as well as 'linking social capital', respectively.

However, the system in question also has its downside, as it can lead to (strengthening) dependency of *agroextrativistas* – who make use of it (most of them at CCPT) – from these service providers (Filocreão, 2007; Silva, 2007). Still, trust systems among Brazil nut actors is pivotal for enabling the use of social capital and thus the potential access to market opportunities and resources. With regard to trust among local actors and between them and external actors (from outside the community), 83% of the interviewees responded 'caution when interacting with others is never enough', signalling a certain degree of mistrust, in general terms.

There certainly is considerable room for improvement of trust systems for it to effectively contribute to accessing social capital and resources as well as potentially playing a more prominent role in accessing new market opportunities.

Further, increased organization is critical for stimulating civic engagement in order to enhance livelihoods, by accessing resources and possibly promoting a fair integration of *agroextrativistas* into markets.

## INFORMATION ASYMMETRY, ORGANIZATIONAL STRUCTURES AND SOCIAL TIES

The access to local and regional markets by *agroextrativistas*, not counting national and international markets, is hampered by the lack of organizational structures to deal, in particular, with knowledge sharing and management. There is an overall lack of transparency on useful information for accessing and using market systems (in an efficient manner, with relatively low transaction costs) among chain actors, even among relatives of the same community of *agroextrativistas*.

The information asymmetry problem at stake is faced particularly by economically marginalized *agroextrativistas*.

It is related to the fact that – except for one local buyer – all other four who are inhabitants from the CCPT, only get to know the price developments through AMOCREQ's president and/or, sporadically, when they transport their Brazil nuts to Oriximiná (Florenzano Ltda.) and, more commonly, to Óbidos (Caiba Indústria e Comércio S/A and, mostly, to Mundial Exportadora Comercial Ltda.). Overall, there is a lack of economic cooperation in the value chain at stake, which affects local *agroextrativistas* who have substantially less market power and, thus, smaller share of the related financial capital than these buyers:

There are gatherers and buyers who have a small grocery store... they are actually the only ones that can cover their own initial expenses for going to the forest. We, about three groups, are thinking about joining forces and dividing the transport, food and equipment costs... this way everyone could help each other to get the nut and when we get back from the forest we could do the maths and take the sacas we got directly to town... we would get much more out of it (interview with an *agroextrativista* from the CCPT, in CCPT, 22.06.2013).

Organizational structures, as the one described above, can contribute for *agroextrativistas* to get better prices as well as a larger market and benefit share for the ones included in such social systems. However, these structures are not positive *per se* as it could lead to cartel formation and harm excluded *agroextrativistas* and buyers.

Further, building up on over a decade of political engagement of leaders from the CCPT and on their 'bridging social capital' and 'linking social capital', AMOCREQ has joined forces with institutions at the municipality level as well as, at the state and national level, the Instituto de Desenvolvimento Econômico, Social e Ambiental do Pará (IDESP) and the Instituto de Terras do Pará (ITERPA) as well as the Comissão Pró-Índio de São Paulo (at the national level) amongst other, to request their tenure rights as traditional populations, achieving commitments at federal level in the process of establishing their '*quilombola* territory', taking up part of the area of the 'Trombetas river

biological reserve'. Despite the historically low-impact of the traditional use of resources (compared to large scale cattle ranchers, soy bean farmers and loggers), it is too early to make any statements on whether this tenure modality will turn natural resource use and management more or less sustainable, taking into account balanced human-nature interactions in a long term. Yet, as soon as they are effectively granted the land title in question, these inhabitants who live in forest margins and strongly depend on natural and even forest resources (based on Cavendish, 2000; Angelsen *et al.*, 2011), would not be limited in the extraction and cultivation as *agroextrativistas*, which in principal might not increase substantially the relatively small environmental impact they currently have.

Results show that organizational structures that build up social capital and potentially contribute to the access to resources and markets by *agroextrativistas* in the study area are scarce and incipient. Nevertheless, a considerable part of the *quilombola* communities from the meso-region of the Lower Amazon basin is organized in groups that represent them, whereby most of them are members of the Associação dos Remanescentes de Quilombos do Município de Oriximiná (ARQMO), not counting inhabitants from the CCPT. This association is well connected to institutions that provide services at the state and, partly, federal level. The respective social capital ('bridging' and 'linking social capital'), among other factors, contributes to the access to concrete remittances, including pension and *bolsa família* (which accounts for a substantial proportion of the beneficiaries income), yet not to *bolsa floresta* in the CCPT (at the time of the interviews).

The local organization of economic activities of *agroextrativistas* is at an initial stage, compared to the well-known Cooperativa Central de Comercialização Extrativista do Acre (COOPERACRE), for instance. For a large portion of *agroextrativistas* from the CCPT, managing the financial capital that stems from economic activities represents a severe challenge: "overall, there is a lack of financial planning at the household and community level in the medium to long run" (interview with the school director

from the CCPT, in CCPT, 20.06.2013). This problem relates to the lack of liquidity that applies for practically all *agroextrativistas* from the CCPT, particularly in the off season period of the Brazil nut. Inevitable, however, is the necessity to cover the daily family expenses, which along with the lack of reinvestment of the financial capital acquired by marketing Brazil nut in extractive or agricultural activities, are problems that challenge the livelihoods of *agroextrativistas*. There is a growing number of alcoholics while a considerable amount of *agroextrativistas* who earn their living with Brazil nut extraction spend most of their respective seasonal income in wine and beer. Yet, CCPT has managed to pass through an internal agreement prohibiting the marketing and consumption of strong alcoholic drinks within the community.

## NETWORKS, ACCESS TO RESOURCES AND (LACK OF) SERVICES

The access to policies at the CCPT is very scarce, whereas the access to extension and rural advisory services by the inhabitants of the CCPT and mechanisms of governmental institutions to promote access to credit for strengthening agro-extractive activities practically do not exist at the CCPT. Research and development programs and projects to effectively support local socioeconomic systems hardly exist. Incipient in the region at stake, are sustainable rural development strategies in a long term, apart from a recently created working group – comprised by the Instituto do Homem e Meio Ambiente da Amazônia (IMAZON), the Instituto Floresta Tropical (IFT) and the Instituto de Manejo e Certificação Florestal e Agrícola (IMAFLORA), all from Brazil, in addition to civil society and governmental organizations with regional representations – to deal with the Brazil nut value chain in the Calha Norte region.

Distances, not only from the homes of *agroextrativistas* to the *Bertholletia excelsa* stands in their own *quilombola* communities, but also from those to markets as well as the lack of organizational structures and incipient social capital characterize 'institutional (dis)arrangements' among local

associations and governmental institutions, which challenges the design of a common strategy for sustainable VCD. In this context moving beyond biodiversity conservation towards promoting agro-biodiversity – food security and additional rural income sources are currently scarce which tends to decrease resilience to climatic and price shocks – and socio-biodiversity could further lead to multiple and mutual benefits for *agroextrativistas*, and buyers.

## CONCLUDING REMARKS

The main message is: social capital based on mutual trust and composed by 'bonding', 'linking' and 'bridging social capital' can promote the access to markets and sustainable use of natural resources by *agroextrativistas*, so as to effectively contribute to the inclusive development of the Brazil nut value chain.

Key research and development problems faced by local members of the Brazil nut value chain are presented as a basis for understanding ways to improve the integration of economically and geographically marginalized populations of *agroextrativistas* in market systems, taking into consideration socioeconomic equitability and environmental integrity in the meso-region of the Lower Amazon basin, in the state of Pará, Brazil.

High transaction costs, especially transport costs, and insufficient organizational structures along the Brazil nut value chain in the meso-region of the Lower Amazon basin were identified as the two main problems. Both of them relate to poor infrastructure – given the lack of roads which hinders community internal transportation – and large distances of the analyzed *quilombola* communities to markets and urban centers which are located in Oriximiná and, further away, Óbidos.

The results presented here serve as concrete first steps towards understanding the relationships between social capital and access to (natural) resources and markets in the lower Amazon basin, with a focus on Oriximiná and Óbidos. It was possible to establish a base to confirm, the hypothesis that trust, civic engagement and solidarity related

to 'bonding social capital', 'linking social capital' and 'bridging social capital' among actors from Oriximiná and Óbidos, can contribute to potential access to resources and new market opportunities for members of the value chain in question.

Besides the fact that the price for Brazil nut is limited by the (neo)classic functioning of markets, as per supply and demand dynamics, the information asymmetry and unbalanced power relations, can lead to low prices paid by 'industrial buyers to local buyers' which reflects the little economic return *agroextrativistas* get for what they invested in gathering, e.g. in remote *Bertholletia excelsa* stands at the CCPT. Trust is to be considered in the analysis along with power relations among value chain actors overall, and, particularly in the context of asymmetric market systems, characterized by varying degrees of bargaining power amongst actors of the Brazil nut value chain.

In general terms, trust can function as a key factor for promoting the social capital and access to resources for the respective actors while contributing to an inclusive development of the Brazil nut value chain. Primarily due to trust, trade relationships along the Brazil nut value chain generate significant mutual benefits among the association AMOCREQ from the *quilombola* community Cachoeira Porteira in Oriximiná and the firm Mundial Exportadora in Óbidos, even though distances are shorter to the Oriximiná market. There is a long lasting trust relationship between the CCPT (AMOCREQ) and the Brazil nut industry Mundial Exportadora Comercial Ltda., which is closely related to the fact that the *agroextrativistas* from the CCPT, sell their product almost exclusively to the market in Óbidos, and practically not in Oriximiná (although it is closer). Trust systems are, therefore, key pillars for building up social capital among the actors involved in gathering and marketing the Brazil nut, as well as for these members of the value chain at stake to be able to access (natural) resources and potentially promoting equitable market integration of marginalized *agroextrativistas*.

The Brazil nuts in question in this study come from native stands and, even though there overall is at least one additional income source, diversification of income

sources is still incipient what potentially increases the sensitivity of *agroextrativistas* in case of socioeconomic and/or environmental shocks. In this context, the demand for further action-research initiatives raised by interviewed representatives from civil society and governmental institutions in Oriximiná, is to investigate the feasibility for implementing *Bertholletia excelsa* based agroforestry systems in this municipality and – if proven to efficiently and effectively contribute to raising the resilience of *agroextrativistas* in the frame of participatory asset-based development of multiple value chains while increasing mutual benefits of their actors – in the meso-region of the Lower Amazon basin as a whole.

Quantifying the potential contribution of social capital to livelihood asset building (considering Brazil nut gathering costs) provided with access to resources while investigating the relation of these three variables with the change in the degree of the vulnerability of *agroextrativistas* at the Calha Norte region over time, could be fruitful to explore next.

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