

From colonization to “environmental soy”: A case study of environmental and socio-economic valuation in the Amazon soy frontier

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Abstract. This paper examines the socio-economic and environmental implications of soy development in Santarém, Pará, located in the Brazilian Amazon. The settlement history of the region contributes directly to the way in which soy agriculture is currently proceeding in Santarém. Government policies and perspectives have been shaped by a history of agrarian colonization of Amazon forests, and the small farmers, or colonos, who are now being bought out by soy agribusiness are also rooted in this history. As a means of ascertaining the current state and interaction of soy actors with the burgeoning soy-based economy in the area, field research was conducted on the role of primary and secondary forests for soy production. Research also included an analysis of valuation discourses – that is, how the differing soy actors (local government, agribusiness, conservation NGOs, and small farmers) assign value to types of forests and their different interpretations of what constitutes environmental degradation. The ways in which these different actors assign such values to forests and how they structure the definition of environmental degradation is a key factor in determining who “wins” and “loses” in the realm of Amazon development. Significant environmental and socio-economic implications of soy expansion, especially for the colonos, are not taken into account because the dominant rhetoric of Amazonian development ignores their contribution to social and ecological diversity. This omission keeps colono communities living at poverty level and even exacerbates colono poverty under the soy development project. The colonos and their representatives are responding by setting forth their own, competing valuations of primary and secondary forests that contrast sharply with state soy growing schemes and NGO plans for “sustainable soy.” These have their roots in local knowledge and best practices.

Key words: Agriculture, Amazon, Biodiversity, Brazil, Development, Forests, Small farmer, Soy

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Abbreviations: TNC – The Nature Conservancy; WWF-RSS – World Wildlife Fund’s Roundtable on Sustainable Soy; STR – Rural Workers Union; ASB – Articulação Soja-Brasil; NGO – Non-governmental Organization

Introduction

A growing worldwide demand for soy is shaping South America’s agricultural output and development policy. Combined, Brazil, Argentina, and Paraguay constitute 44% of the world’s soy production (FAS, 2005). The regional expansion of soy production raises socio-economic and environmental concerns because of the high concentration of biodiversity in many production zones and the income disparity between soy producing enter-

prises and small-scale agriculture producers (Fearnside, 2001; Hecht, 2005). This paper examines the socio-economic and environmental implications of soy development in the Brazilian Amazon. Currently soy actors, which include government, agribusiness, conservation-focused non-governmental organizations (NGOs), and colonos (small farmers), are taking a variety of approaches to develop, combat, or adapt to soy in Santarém.

The analysis focuses on the Santarém municipality, located in the state of Pará, on the banks of the Amazon

River (Figure 1). The process of implementing soy production into the region's development plans began in 1996. Historically, the socio-economic and environmental conditions that support soy as a pillar of regional development date back to the Brazilian government's colonization projects during the 1960s through 1980s. Research conducted from June to August 2003 investigates the soy industry's environmental and socio-economic interpretation of the Amazon landscape and the livelihood strategies of the region's colonos. The paper examines the role of primary and secondary forests for soy production and soy actors' valuation of forests and environmental degradation. It explores how soy actors' assessment of primary and secondary forests and the history of Amazon development projects exacerbate livelihood struggles for colonos. Using the soy actors' assessments as a framework, this analysis finds that soy development increases colonos' struggles.

Soy actors are managing soy production in the Amazon in vastly different manners. This research found essentially three approaches to soy production in the Amazon. The first, taken by government and agribusiness, focuses purely on soy's benefits and expansion. The second approach, taken by conservation focused NGOs, mediates the negative socio-economic and environmental implications of soy development and explores several proposals, projects, and processes. These include two collaborative conservation organization and industry efforts: (1) the World Wildlife Federation-led (WWF) Roundtable on Sustainable Soy (RSS) (now, called the Roundtable on Responsible Soy) and (2) The Nature Conservancy's (TNC) Forest Friendly Soy Pilot Project, or "environmental soy" projects. The third approach to soy in the Amazon is a local approach that views soy from an on-the-ground perspective, trying to understand the impacts it will have on colonos in the area. Locally driven projects are supported by communities and social and environmental networks. Their primary proposals for managing soy development are: (1) the Rural Workers Union's (STR) agro-extractive reserve proposal, (2) Articulação Soja-Brasil's (ASB) proposed criteria and standards for soy production, and (3) the Via Campesina's food sovereignty concept.

The paper demonstrates that colonos' livelihood struggles are not resolved by the current "environmental soy" projects, which adopt forest valuation structures similar to those of municipal government and agribusiness. In some incidences, such "environmental" projects, by utilizing the same value assignments as both government and agribusiness, contribute to the same historical failures that have occurred via government and agribusiness interventions. In contrast, the STR, ASB, and the Via Campesina proposals, which impose different forest value structures and consider the potential of the colonos' livelihood strategy, make valuable con-

tributions to the "environmental soy" discussion and to improving colonos' living standards. At a minimum, rather than continuing the Amazon development practice of marginalizing colonos' livelihood challenges, the grassroots proposals consider colonos as valid actors deserving of a voice and a role in the soy development question for the Amazon.

Methods

To investigate the soy actors' discourse regarding agricultural development in the Santarém region and the socio-economic and environmental implications of this particular representation, I explored the following questions: (1) Who are the key soy actors?; (2) How does the expansion of soy cultivation alter land-use practices and colonos' socio-economic well-being?; and (3) What are the soy actors' perceptions of the socio-economic and ecological viability of agricultural practices and development models? I conducted semi-structured and structured interviews to "study up and down" the region's soy actors (Pierce, 1995). I identified initial interviewees who had visible relationships to the soy development project.

Grounded theory provided a framework for identifying soy actor interview candidates and conducting research analysis (Bernard and Ryan, 2000). Grounded theory advises conducting additional interviews as themes emerge from initial research. With each new interview, I choose new interviewees based on emerging themes and the need to "test" them on new interviewees. Ultimately, this framework allowed the research process to categorize soy actors' socio-economic and ecological perceptions of agricultural development without preconceived notions.

The soy actors involved in this research are: (1) government, both local and federal, particularly city officials, the federal agricultural agency (EMBRAPA), the federal land settlement and titling agency (INCRA), and the federal environmental agency (IBAMA); (2) agribusiness, including soy producers, primarily those newly settled from southern and central Brazil, soy buyers, Cargill and other regional buyers, input suppliers, and national banks, specifically Banco da Amazonia (Amazon Bank); (3) non-governmental organizations, particularly TNC and WWF; and (4) small farmers (colonos) and representative organizations, including STR and the Via Campesina.

To explore the contrasting meanings and values assigned to forest types and livelihood strategies, I examined soy actors' discourse regarding primary and secondary forests, their reported and observed land-use practices, and their use of a state-sponsored map that delineates Santarém's agro-ecological zones. Colonos' livelihood strategies are based on research observations,

regional agricultural production statistics, observations of existing social networks, and analysis of relevant literature. I conducted over 40 semi-structured and structured interviews with the soy actors and performed participant observation with Cargill and colonos.

To interview colonos, I chose communities where soy was already established (for about 3 years) and transitioning areas (where a few soy farms existed and/or land speculation was occurring). I first interviewed leaders of STR to gather trends in land sales and to find out where colonos were most affected by soy expansion. Secondly, I interviewed two of Cargill's soy buyers and collected a map of current soy farms in the region. Based on these interviews, I choose to interview colonos in communities in the first expansion area (Belterra, Tracua, and Janipapo) and transitioning areas (Una Dos, Guaranazinha, Paca, Baixa da Onça, Terra Area, Agua Fria). Further input for potential interviewees from these communities came from STR. Often, these individuals were the elected STR representatives for the community.

Colono interviews were semi-structured around the following categories: personal history, agricultural and land-use practices, land tenure, socio-economic and environmental impacts of soy, and future expectations for family, community, and region. I did transect walks with the interviewee, sketched household land-use, and recorded agricultural products. I also conducted participant observation with one colono family in a transitioning community. I attended community events, observed agricultural practices, and participated in family tasks.

As a means of “studying up,” I conducted participant observation with a Cargill soy buyer. For 3 weeks, I went into the field with the soy buyer to meet with soy producers and negotiate contracts, observe crop quality, and discuss general operational health. I also attended introductory meetings with visiting soy farmers interested in establishing soy farms in the region. In these meetings, I was introduced as an intern interested in learning about agricultural development in the agricultural frontier. I observed the interactions between Cargill's managers and the farmers. While an intern at Cargill, I conducted structured interviews with all office staff (managers, loan officers, assistants, database managers, accounts payable) and key infrastructure staff (director of infrastructure and scale operator). The interview questions focused on job responsibilities, personal and professional history, and opinions regarding Cargill's socio-economic influence in the region. I conducted semi-structured interviews with the soy buyers to foster open dialog about Cargill's agricultural development and environmental discourse. I also reviewed primary documents prepared by Cargill regarding Santarém's pilot soy production project and environmental and socio-economic impact reports.

During my field visits with the soy buyers, I asked soy farmers for interviews, which I conducted with a research assistant several weeks after my Cargill visit. I conducted most soy farmer interviews on-farm, with only two of 12 in Santarém city. The interviews were semi-structured and covered the following categories: personal history, agricultural and land-use practices, land tenure, socio-economic and environmental impacts of soy, and future expectations for family, community and region. Farm machinery and agricultural input business owners were chosen for interviews based on input from Cargill, my research assistant,¹ and by targeting highly visible businesses (i.e., ones found on the main roads and listed in newspaper articles). These interviews were semi-structured and included the following topics: personal history, scope of business, agricultural and land-use practices, land tenure, socio-economic and environmental impacts of soy, and future expectations for business, family, community, and region.

For government actors, I conducted semi-structured interviews with the regional directors of federal agencies (i.e., the highest level employee in the municipality) and the head of agricultural development in the Mayor's office. Interview questions addressed the following categories: history of regional soy development, agency/office's role in soy development, socio-economic and environmental benefits and costs of soy to the region, and the future expectations for regional agricultural development. I also reviewed primary documents by Santarém's regional development office on regional development planning and by EMBRAPA on the region's agricultural potential. Lastly, I interviewed a former government employee who was charged with advancing regional agricultural development. This interview was semi-structured and focused on the history of regional soy development.

For NGOs, I conducted semi-structured interviews with two local NGOs doing community-based conservation projects focusing on the scope of their work and the socio-economic and environmental impacts of soy. A national conservation NGO served as my host organization and allowed me to observe their projects. I reviewed primary documents by the WWF-RSS, TNC's Forest Friendly Soy Pilot Project, ABS, and the Via Campesina.

Background

Santarém sits at the confluence of the Amazon and Tapajós Rivers in Western Pará (Figure 1). It has an urban population of approximately 179,000 and a rural population of 63,000 that includes the Santarém and Belterra municipalities combined (IBGE, 1996).² The region is composed of secondary forest generated from

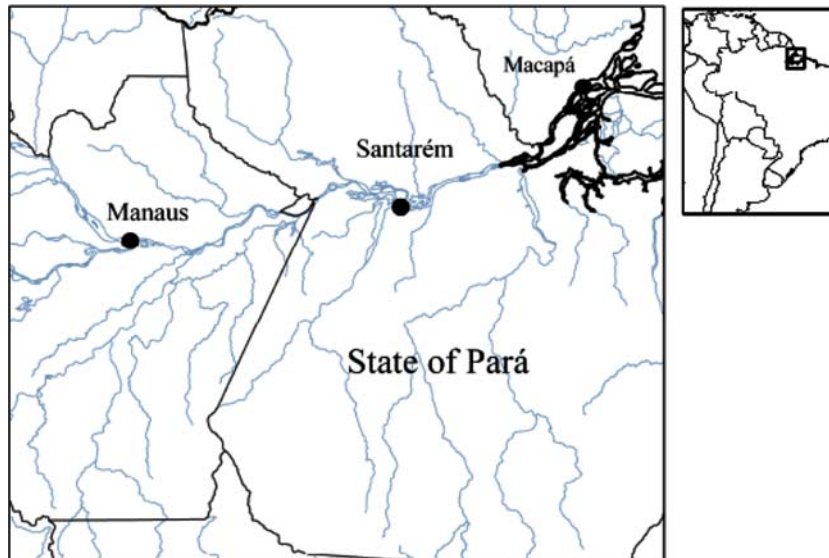


Figure 1. Map of the study area, Santarém, Pará, Brazil.

colonos and cattle ranchers. Dense, primary forest, or *terra firme*, can be found in patches up to 70 km south of Santarém; past 70 km, primary forest extends in continuous forest tracts southward.³ Soils are oxisols, which are typical of tropical forest regions and considered to be low in agricultural fertility and conducive to erosion (Wabeke, 1992; Grubb, 1995). There are areas of *terra preta*, indigenous soils known for their agricultural fertility (Woods, 2004). The Santarém region has a dry and rainy season and receives approximately 2 m of rain annually (Agrária Engenharia and Consultoria, 1995).

During the 1960s through 1980s the Brazilian government initiated agrarian reform projects throughout the country that brought thousands of poor families to the Amazon. The first small farmer settlements were established in the Santarém municipality during these decades. The colonization process was overseen by the National Institute of Colonization and Agrarian Reform (INCRA), which orchestrated recruitment, the application process, transportation to settlement areas, and land tenure and supplied household goods and construction materials (Moran, 1976). As the Amazon region was opened to outsiders through the colonization process and infrastructure was developed (primarily roads), landless and poor families migrated to the region on their own (not under INCRA-sponsorship) with the hope of finding arable land (see Moran, 1981; Mahar, 1988; Hecht and Cockburn, 1990). In the early 1960s, Santarém's population grew by 196%. The construction of a new highway, the BR-163, running from Santarém to Cuiabá, Mato Grosso, serviced the INCRA settlements (SEMAB, 2000). Santarém's colonos represent both official and unofficial settlements. Today, approximately 70% of

Santarém's colonos lack legal land title (Futemma and Brondizio, 2003).

As recent migrants to a new environment, colonos relied on government institutions for agricultural knowledge and tools, based on the Green Revolution agricultural model (e.g., technology packages of hybrid seeds and synthetic fertilizer) (Moran, 1976). The densely forested landscape required colonos to prepare the agricultural fields through the labor-intensive process of shifting agriculture, cutting and burning the forest as a method of clearing tracts of land for Green Revolution-style agriculture. Once given their land, colonos found that government services were generally inadequate, with many settlers receiving no financial support or supplies (Schmink and Wood, 1992). INCRA also was inadequate in granting land titles to colonos (Alston et al., 1999).

Due to insecure socio-economic beginnings and difficult environmental conditions such as low soil fertility, colonos struggled to produce crops in sufficient volume. The results are well-documented: increased clearing of primary forest by colonos for new agricultural lands; minimal incomes and inability to pay-off debts for technology packages; further migration into the Amazon in search of better land; and increasing urbanization of Amazonian cities (Browder and Godfrey, 1997; Wood and Porro, 2002). Many of these consequences, particularly colonos' shifting agricultural practices and their migration into other regions, placed them at the center of Amazon deforestation debates (Goodland and Irwin, 1975; Fearnside, 1989; Repetto, 1990).

Today, Santarém's agricultural system reflects the colonos' agrarian settlement history.⁵ They have shifted from Green Revolution-style agriculture to a hybrid of

modern and historic agricultural styles, one that includes shifting agriculture for commercial and subsistence crops. They have integrated local species and pre-existing populations’ agricultural methods. Forest re-growth (secondary forest) is relied on for fruit and other extractive products like latex, resins, and nuts. Fudemma and Brondizio (2003) identified eight classes of land-use and land cover in a Santarém settlement – mature terra firme forest, two stages of secondary forest, floodplain, waterways, pasture, cropland, and bare soils (roads and urban areas). Their classification is supported by EMBRAPA’s regional forest cover map, which also identifies land dominated by palm forests and protected, extractive reserve areas (EMBRAPA, 1998). (This classification of eight land classes contrasts sharply with the dualistic categories, primary and secondary forest, utilized by government, agribusiness, and conservation NGOs.) Colonos land-use and consequent land cover are the result of the “peasant pioneer cycle” (Pinchón, 1997), the 30 plus years of settlement, during which Santarém’s colonos have grown reliant on a diversity of land-use strategies and land cover to support a broad portfolio of income sources.

The institutional barriers that historically shaped colono livelihoods continue to restrict their ability to rise above the poverty level (e.g., Barbier and Burgess, 2001; Cattaneo, 2001; Vosti et al., 2003). These include limited support for socio-economic development (e.g., credit is given for agricultural investment rather than community infrastructure like wells and improving secondary roads) (Fudemma and Brondizio, 2003). Community associations, not individual colonos, are eligible for Banco da Amazonia (BASA) Financial Support for the North Region credit. However, Fudemma and Brondizio (2003) indicate that community associations in Santarém have difficulty paying back the loans and are largely in debt to BASA.

Market and transportation restrictions also are associated with the colono struggle for increased incomes (Carvalho et al., 2002). Transportation costs and dependence on public transportation (e.g., ferries and buses) restrict market expansion. Annual agricultural income is extremely low, averaging R\$1,178 (US\$616.75) per rural household in Santarém.⁶

Santarém’s colonos rely on various social networks to maximize their economic and social security. Of nine communities visited, at least five have organized community associations, and the majority of them maintain a combination of community-manioc processing houses, rice and pineapple processing machinery, and community-managed water tanks. Most of Santarém’s colono settlements also maintain schools, athletic fields, churches, community centers, stores, public cemeteries, and community waterways.

Soy production in the Amazon: The Santarém case study

The structuring of soy-related forest-valuation

A number of discourses surround the development of soy in the Amazon. To consider the viability of the “environmental soy” projects and grassroots proposals, it is important to understand how soy development is unfolding in the Santarém region and how “environmental soy” projects categorize the Amazon landscape as well as colonos land-use and livelihood strategies. The research findings below spell out these distinctions by tracing the ways in which the four main groups of soy actors – Brazilian national and local government, agribusiness, conservation NGOs, and local farmers (colonos) – have structured the meaning of soy development in Santarém.

Government discourses of soy development

Both local and national government have created a discourse around soy development that encourages soy development and is either unable or unwilling to acknowledge the negative impacts of soy in the Amazon.

Brazil’s national government is encouraging more soy production in response to high market prices, cheap production costs in Brazil, and trade arrangements with China and the European Union (FAS, 2003). Brazil’s efforts to take advantage of the global soy market can in part be explained by the International Monetary Fund’s (IMF) restructuring of the Brazilian economy in the late 1990s to pay back its mounting debt. In order to increase the country’s export income, the IMF mandated “increasing Brazil’s export earnings and attracting more foreign investments” (Jacquacu, 2001, p. 58). The Brazilian government supports soy production to generate revenue for paying down its debt and efficiently utilizing its land area.

The foundation of Santarém’s agro-industrial development rests on the very close relationship between agribusiness (including soy farmers) and local and national government.⁷ The government strongly supports agribusiness. Representatives of Cargill’s Santarém branch explained that the local government upholds agro-industrial development as the most ideal economic activity for the region, and two agribusiness owners described their role as buyers as contributing to Santarém’s local development goals. The role of soy farmers is to connect the national soybean agenda with the local development agenda. Soy farmers view themselves as fulfilling national economic goals when they purchase land, clear it, prepare it, and cultivate soy for the export market. As one farmer explained, “Soybean farmers believe they are national heroes.”

The federal government's role via the national agricultural agency, Brazilian Agricultural Research Corporation (EMBRAPA) is to supply agricultural research, products, and information to soybean producers and agribusinesses. Local government's function is to ease the expansion of mechanized agriculture by providing local political support. The municipal government's slogan, "Santarém, the land of development," signifies the local government's belief that the region is on the cusp of a development transition founded on the soy "promise."

In order to structure soy development in the Amazon, Brazilian government, both local and national, created a tacit valuation system for primary and secondary forests. Brazil possesses vast areas of potentially arable and inexpensive land, especially in the savannah regions (located in central Brazil and bordering the Amazon) and in the Amazon, where land is inexpensive (FAS, 2003). Several infrastructure projects under Brazil's economic development plan, Plano Brasil de Todos, are aimed at

expediting access to new land areas for soy cultivation and creating transportation routes for export. Santarém is part of Plano Brasil's proposal to pave the BR-163 highway that links the burgeoning soybean producing state Mato Grosso with the Amazon River in Santarém. Anticipating BR-163's completion, Cargill built a port on the Amazon River in Santarém in 2000 called the "Northern Exit." Beginning in June 2003, Cargill began exporting soy to European Union nations, Japan, China, and Mexico via the Santarém port. By the end of 2003 approximately 200 agro-industrial farms settled in Santarém primarily to produce soy, rice, corn, and sorghum are also cultivated.⁸

Well before Cargill's arrival in Santarém, however, the groundwork for agro-industrial development was initiated in the region (Table 1). In 1996, the governor of Pará hired the consulting agency Agrária Engenharia e Consultoria, South America (Agricultural Engineering and Consulting) to do a study on the potential of San-

Table 1. Soybean development timeline for Santarém region.

1995

- National and Local: Brazil launches *Avança Brasil* (now *Plano Brasil de Todos*) development program. Brazilian highway route 163 (BR-163) earmarked for pavement to connect Santarém, Pará with Cuiabá, Mato Grosso.
- Local: Pará governor finances Agrária Engenharia e Consultoria, South America (Agricultural Engineering and Consulting) to study Santarém and neighboring municipalities' potential for commercial agriculture.

1996–1997

- State and Local: Local municipalities implement a soy pilot project and form a co-op to solicit money from the state to further develop soybeans.

1997–1998

- National and Local: Regional maps depicting agro-ecological zoning, soil types and forest cover completed. Local government officials and Santarém businessmen traveled to the state of Mato Grosso advertising Santarém as the new frontier for soybean development. Mato Grosso producers begin visiting Santarém and meeting with the national agricultural agency (EMBRAPA), local officials and Cargill representative.
- International and Local: Cargill begins the "Northern Exit Project" to seek Northern export routes and establishes office in Santarém.
- Local: First soy farm established and is followed by the arrival of agribusiness entrepreneurs including buyers, agricultural technicians, agricultural input suppliers, and land dealers.

1998–2000

- Local: First wave of small farmer displacement. Land prices during this time were often less than R\$1000/ha (US\$330/ha).

2000

- Local: Cargill begins port construction on the banks of the Amazon in Santarém.

2001–2003

- Local: Second wave of small farmer displacement. Land prices increase to R\$1000–2000/ha (US\$330–660/ha).

2003

- National and Local: In April, Cargill opens port and begins accepting soy from Porto Velho and Santarém. Approximately 200 agro-industrial farms are established in the Santarém region. Unions and NGOs report large numbers of small farmer displacement to primary forest and Santarém city. In July, the Rural Workers Union launches a campaign to stop soy production in the region and asks colonos to refuse to sell their land to soybean farmers.

- Local: The Nature Conservancy proposes "forest friendly" soy as a strategy for protecting the environment and communities in Santarém.

2005

- National: The World Wildlife Fund hosts the first Roundtable on Sustainable Soy to address the socio-economic and environmental consequences of soy expansion, with a special focus on the Amazon.
-

tarém and neighboring municipalities for commercial agriculture. Based on Agrária’s recommendations, the local municipalities implemented a soy pilot project and formed a co-op to solicit money from the state to develop soybean production. Armed with the results of the soy pilot project and government-produced maps (made by EMBRAPA and the Mineral Integration Program in Amazon Municipalities. (PRIMAZ) that highlight the feasibility for mechanized agriculture in the Santarém region, local government officials and Santarém businessmen traveled to the state of Mato Grosso to convince soy producers to invest in the region. The group of agribusiness entrepreneurs that made the original investment in Santarém included buyers, agricultural technicians, agricultural input suppliers, and land dealers and now constitutes the foundation of the region’s soy sector.

Agribusiness discourses of soy development

Agribusiness discourses of soy development echo those of the Brazilian local and national government. A clear example of this mirroring effect occurred when agribusiness soy actors were asked the following question: “What is Santarém’s soy production potential?” The majority of agribusiness soy actors replied that the area’s potential is 550,000 ha. The consistency of their reply is not coincidental, but a verbatim figure from the EMBRAPA/PRIMAZ agro-ecological zoning map that identifies land-use potential for the municipality (i.e., a future land-use scenario for the region). The map defines the potential “mechanized agriculture zone” as all lands degraded by anthropogenic uses, either from colonos’ shifting agriculture or cattle ranching. From participant observation, I learned that when new soy farmers arrive at Cargill’s Santarém office to learn about the region’s soy potential, Cargill’s soy buyers point to the agro-ecological zoning map to indicate suitable areas for cultivation. The government-sponsored map plays a key role in deciding the placement of soy plantations. As of 2003, soy farm settlement matched the agro-ecological zoning map with soy farms being established in colono landholdings and cattle pastures.⁹

In addition to providing a regional road map for soy settlement, the agro-ecological zoning map constructs an environmental and socio-economic interpretation of the landscape with respect to secondary and primary forests. When asked if there are any negative environmental effects from soy production, agribusiness actors declared that unlike previous Amazonian development projects, soy development, particularly in Santarém, is more advantageous because it does not result in deforestation. The agribusiness discourse rests on the belief that the “mechanized agriculture zone” is not in a forested area. The colono-managed landscape, including the various

stages of secondary forest, does not count as they are considered **non-forest**. Interviews with soy farmers, Cargill employees, and agribusiness owners reveal that they do not equate soy expansion in the region with deforestation or with the reality that the “mechanized agriculture zone” consists of colonos landholdings, which would need to be transferred to soy farm landholdings to meet the region’s theorized soy production potential.

Colonos’ exclusion from the map, and the consequent regional development plan, is reflected in the corporate description of the region’s agricultural activities before and after the arrival of the soy industry. When informed of my research objective to understand economic development in the Amazon, a high-level manager for Cargill-Brasil exclaimed, “What economy? There are only trees here!” When the agribusiness actors are asked about previous development efforts, colonos’ settlement history is notably absent from their descriptions. They describe the rubber and gold mining efforts and identify these activities as boom-and-bust economic growth cycles that left the Santarém region economically decimated. When pushed to acknowledge colonos settlement, they discuss colonos’ “environmentally degrading” land-use practices, which they see as having little or no regional economic benefit.

In direct contrast to their beliefs about colonos’ land-use, agribusiness stresses that soy farming introduces environmental and economic value to the landscape. A Cargill soy buyer explained that agro-industrial development provides a more stable foundation for economic development (than previous development projects) because it is linked to the global agricultural market where soy has great product versatility and a lucrative world price. Buyers believe that soy expansion to the Santarém region signals an upward economic growth trend, one in which **all** Santarém’s citizens will benefit and one which will not result in increased deforestation. One soy buyer described the region’s development trend as embodying a new, “hopeful expectation” that jobs will be created and new markets for colonos will become available.

The zoning map’s demarcation of a “mechanized agricultural zone” distinguishes primary forest from secondary forest, a distinction reflected in agribusiness’ socio-economic and environmental valuation of forests. While secondary forest is valued as **non-forest** and suitable for soy cultivation, primary forest is valued as short-term “forest reserves.” Interviews revealed that, in the Santarém municipality, the Brazilian Institute for Environment and Natural Resources (IBAMA) largely overlooks soy farmers who do not abide by the Amazon Forest Code, which requires 80% of landholdings to remain as “forest reserves.” The Amazon Forest Code was intended as a means for land conservation. The original intention of the code was to conserve primary

forest and to keep forest reserves as part of contiguous parcels of land. But many soy producers disclosed that they allocate “reserve” areas that are hundreds of kilometers from their soy farms (i.e., the reserve is not located where they produce soy). Also, as one producer informed me, many soy farmers only abide by the land-use law for Brazil’s savannah region, which requires a smaller reserve of 50%. This “counting” of reserve lands in parcels distinct and separate from the land under cultivation flies in the face of the intent of the Amazon Forest Code to maintain continuous tracts of primary forest for biodiversity conservation and microclimate stabilization.

There are two main threats to Amazon forest reserves. The first is direct, coming from the soy farmers themselves. Not only are the present “forest reserves” not serving their intended conservation purposes, anecdotes indicate that soy farmers plan to produce soy in their “forest reserve” areas in the future. For example, several soy farmers shared plans to extract timber from their “reserves” in preparation for soy production. In these cases, the “forest reserves” are actually “soy reserves,” guaranteed land for soy production in the future.

The second threat is a more indirect one that comes from the impacts of increased soy expansion in Santarém. Previous research connects the increased concentration of landholdings among fewer owners (as is currently occurring) to increased encroachment by colonos into primary forest (Ozório de Almeida, 1992). As soy farms expand into the “mechanized agriculture zone” (the secondary forest areas), colonos often re-settle in primary forest regions. One informant and several colonos indicated that colonos’ new settlements are often adjacent to soy producers’ “forest reserves.” Described as “invasive forest mobility” (Myers, 1980), colonos follow new logging activity since it makes dense forest areas easier for settlement. For Santarém, this scenario allows soy farmers to buy colonos’ land adjacent to their “forest reserves,” potentially leading to further deforestation (from soy production) and another wave of colono migration. Santarém’s IBAMA officials acknowledge that this land-use scenario is unfolding. Yet, they are not able to adequately monitor the situation (i.e., their enforcement of the Forest Code is limited to issuing penalties to a few violators). Combined with the soy farmers’ widespread practice of disregarding the 80/20% land-use law, the direct and indirect threats to the Amazon forest reserves further weakens the conservation value of the Amazon Forest Code.

A discussion regarding small producers’ contributions to environmental degradation or their prevention of degradation goes beyond the scope of this paper. However, the government and agribusiness actors’ socio-economic and environmental valuation of Amazonian forests and colonos land-use patterns contributes to a

better understanding of how soy actors and soy-oriented development policies (e.g., Plano Brasil de Todos) will decide the outlook of Amazonian development in the soy frontier.

Hecht (2005) points out that the late-1980s saw a transition from state-controlled development projects in the Amazon to global market directed development. The local government and agribusiness see this transition as a positive one. Their hopeful expectation rests on the belief that through decentralization, the local government and economic actors will leverage their productive resources for local development. Hecht explains that global market driven development deeds the larger social-economic and environmental conditions “to enterprises and NGOs to negotiate” (2005). We now turn to two of these enterprises and NGO projects and look at their ability to address these larger concerns.

“Environmental soy” projects

Conservation NGO discourses of soy development

Conservation NGOs are concerned about the expansion of soy production to the Amazon. Unfortunately, their concern, although well-meaning, adopts the dominant discourse of the government and agribusiness. Therefore, while NGOs are nominally in support of local citizens and forest conservation, their efforts effectually are more rhetorical than real as they play into the valuation structure constructed by agribusiness and government.

NGO worries arose particularly in relation to soy production in northern Mato Grosso. The proposed BR-163 highway further spurred concerns from environmental and conservation organizations, including Instituto de Pesquisa Ambiental da Amazônia (IPAM), Instituto Socio-Ambiental (ISA), Greenpeace-Brazil, TNC-Brazil, and WWF-International. Among their concerns were increased deforestation, biodiversity loss, genetically modified soy, small farmers’ displacement, illegal land takings, water contamination, and the inequitable distribution of soy profits.

Of all these concerns, increased deforestation has received the most attention. Conservation organizations’ heightened interest in the deforestation rate is not surprising given the tendency for conservationists to research and prescribe environmental policies for high-biomass tropical forests rather than secondary and non-humid forests (e.g., semi-deciduous, savannah) (Zimmerer, 2000). Yet, the bias is problematic, considering that current soy development is unfolding in transition and secondary forests and savannah regions. In the case of Santarém, this high (primary) forest bias is a factor in the ability of WWF and TNC to resolve many of

the environmental and socio-economic challenges in Santarém.

In 2003, Brazil’s National Institute for Space reported a 14% increase in Amazon deforestation with almost half of the deforestation occurring along the advancing soy frontier in Mato Grosso (Gazeta de Santarém, 2003). In March 2005, while the local development of soy and colono resistance to it were occurring in Santarém, the WWF hosted and coordinated the first meeting of the Roundtable on Sustainable Soy (RSS) in Foz de Iguaçu, Brazil to respond to concerns about deforestation in the Amazon and conversion of sensitive habitats in central Brazil and Argentina. The first RSS initiated a process to develop criteria and standards for “sustainable soy” production in South America for European markets (RSS, 2005a). The planning committee included potential buyers for “sustainable soy” products, including the world’s largest soy producing company, Grupo André Maggi, Unilever, WWF, and the Southern Brazil Family Farmworkers’ Federation (FETRAF-Sul). It is worth noting that the under-representation of communities affected by soy expansion and the RSS assumption that soy production can be socio-economically and environmentally viable catalyzed a counter RSS conference coordinated by the Via Campesina, a global network of farmer, indigenous, and fisher organizations. In addition to protesting the RSS, this conference formulated “a response to the industrial agriculture model based on monocultures and genetic engineering” (Via Campesina et al., 2005).

The RSS process grew out of a concern for the conversion of “high conservation value forests and other critical habitats” for soy production (WWF, 2002). High forests (i.e., primary forests) are a priority in WWF’s institutional goals for soy, which aim to “eliminate incentives for soy production that convert natural habitats” and “identify conservation zones protected from soy production” (WWF, 2002). The RSS meeting began a consensus-building process for establishing general criteria for “sustainable soy.” As described by the lead facilitator, the process should “see the active engagement of the key stakeholder[s]...[and] the strong seeds of a sustainable soy industry for years to come” (WWF, 2004:2). The first RSS reached consensus on the following points: (1) to acknowledge that soy production brings about social, economic, environmental, and institutional benefits and problems; (2) to continue with the process for addressing these problems and develop and reinforce the chain for responsible soy production; (3) to ensure that this is a transparent, open, multi-sectoral, participatory and decentralized process; and (4) to take into account issues discussed in the working groups in all future work (RSS, 2005b).

“Sustainable soy” criteria were developed in working groups on the social, environmental, and economic

aspects of soy production. A brief summary of their recommendations were:

- Environmental working groups: “Sustainable soy” criteria involve protecting “valuable natural areas” from soy cultivation to ensure that areas crucial to ecological processes are unaffected (RSS, Working Group No. 5: Environmental Aspects, 2005e);
- Economic working groups: “Sustainable soy” should receive a financial reward for providing environmental services (e.g., protecting critical habitats) (RSS, Working Group No. 3: Economic Aspects, 2005d);
- Social working groups: “Sustainable soy” criteria involve abiding by labor and property laws such as indigenous and local community land rights (RSS, Working Group No. 1: Social Aspects, 2005f).

Ultimately, how “valuable natural areas” and “environmental services” are defined will determine whether the final RSS criteria and standards will address the challenges facing Santarém’s forests and colono communities. The limits of colonos’ property rights will also bump into the RSS framework’s ability to protect their landholdings. Given the current RSS line-up of negotiating players, the historical pattern of Amazon development projects, which has overlooked the socio-economic needs of marginal communities like the agrarian settlements will be difficult to overcome. WWF stressed that there was balanced representation of those involved in soy production and those affected by it (RSS, 2005c). However, affected groups represented the smallest number of attendees with approximately 30 of 200 participants – and only a handful of them work directly with indigenous and local communities (see www.responsiblesoy.org for the complete participant list).¹⁰

In addition to the RSS, TNC is formulating a pilot project for certifying “forest friendly” soy in conjunction with Brazil’s major soy buyers, Cargill and Bunge (TNC, 2004). Santarém is proposed as one of the locations for the pilot project. TNC’s plan to address the environmental and socio-economic implications of soy production involves a more targeted project for certifying “forest friendly” soy. The proposed project will be initiated either in the Santarém municipality or northern Mato Grosso and will directly involve Cargill, Bunge, IPAM, ISA, TNC, Brazil’s environmental certification body IMAFLORA, and soy producers (TNC, 2004). The “forest friendly” soy project aims to reduce “Amazon deforestation through formal certification schemes for soya producers obeying legislation mandating 80% of landholdings to be maintained as native forest reserve” (TNC, 2004:2). The “native forest reserve” refers to Brazil’s Amazon Forest Code discussed earlier.

“Forest friendly” soy certification would designate soy that IMAFLORA has certified as meeting Brazil’s Forest Code obligations. TNC explains that IPAM and

ISA would employ their GIS capacity to monitor soy farms' deforestation patterns, and IMAFLORA would certify the soy as meeting the Forest Code (TNC, 2004). Following certification, Cargill and Bunge would serve as the primary buyers of "forest friendly" soy. TNC describes the benefits of "forest friendly" soy as "tackl[ing] Amazon deforestation," "promot[ing] Brazil's economic prosperity," and "sustainable development," and "improv[ing] respect for ... the rule of law in Brazil" (TNC, 2004:2). TNC's Program Director of Amazon Conservation explains, "TNC's Responsible Soy project creates incentives for soy farmers to follow the Forest Code, which tackles the principle threats to the Amazon. Even though, the Brazilian environmental legislation is the most advanced in terms of forest conservation, few farmers respect the law" (TNC, 2006). They also point out that "forest friendly" soy certification aids Cargill and Bunge "to secure themselves against reputational risk, especially in the European Union," a major soy importer (TNC, 2004:7).

An assessment of agribusiness' environmental behavior and primary and secondary forest valuation indicates that, on the ground, the TNC project supports the continued conversion of secondary forest to soy fields. The proposed project aims to conserve the mandatory "forest reserves," which in the agribusiness actors' assessment are primary, intact forests. For agribusiness, secondary forest is **non-forest** and its removal for soy production is not considered deforestation. As a result, "forest friendly" soy does not contribute to resolving either the high forest bias problem or the consequent colonos' displacement from Santarém's secondary forest areas. The land-use scenario that is unfolding in Santarém with respect to "invasive forest mobility" and the use of "forest reserves" as "soy reserves" requires an "environmental soy" project that grapples with colonos' historically invisible socio-economic needs. Ironically, in TNC's failure to include colonos' livelihood struggles in the "forest friendly" soy concept, it might further fragment the high forest that it wishes to protect.

Grassroots resistance: Beyond "enterprises and NGOs"

Local farmers discourses of soy development

Local, small-scale farmers conceive of soy development entirely different. Based on their local knowledge and value structures, they have created a place-based response, one that widely differs from that of government, agribusiness, and NGOs.

As soy production expanded in Santarém, local farmers' unions and NGOs raised concerns that soy farming threatened colonos already precarious livelihoods.

Interviews with colonos and visits to nine communities indicated that a large portion of colonos were selling their land, many moving to new primary forest regions, semi-urban neighborhoods, and/or Santarém city. Often these moves were a result of coercive action. It was claimed, for instance, that groups of men approached colonos' homes occupied by women whose husbands had left to work in Manaus' Free Trade Zone or in a variety of extractive jobs like logging or mining and returned many times despite initial refusals to sell their land.¹¹ Other socio-economic impacts included: (1) the loss of hard-earned community infrastructure such as schools and drinking water when a few soy farmers bought a whole community;¹² (2) colonos returning to their previous communities after finding no opportunity in the city or other rural areas only to find there is no more land for them to farm; (3) the increasing pressure to sell their land as soy farms surround colonos' homes and agricultural fields; (4) agricultural product loss and children sick from pesticide spraying;¹³ and (5) the diminished or completely destroyed water sources, a result of erosion and sedimentation caused by agricultural machinery.¹⁴

Colonos' reactions to the quickly changing socio-economic and ecological conditions of their settlements ranged from anger to sadness and dismay. When describing a recently converted forest-to-soy area in his community, one colono remarked, "It's an ecological crime!" Others mourned the loss of their neighbors who sold their land, but insisted they would not "sell their land for any price, because I love my land." Despite the steadfast attitude of resistant colonos, most of those interviewed noticed the increasing socio-economic inequity in their communities. While they were losing community resources, new soy establishments had access to water and electricity almost immediately. One resistant colono said, "Life for us in the Amazon is difficult. Small farmers don't have incentives like credit to stay on the land. But for the new soy farmer they can come and have everything." Many interviewed colonos wondered how long they or their neighbors could live under these exacerbated socio-economic conditions and deteriorated environment.

Given the long-term settlement history of Santarém's colonos, STR, other unions, and several NGOs became greatly alarmed by the new trends of rapid land transformation and colonos' heightened migration. They launched a "Do Not Abandon Your Land" campaign to slow the land transformation. The campaign, launched in July 2003, called on colonos to refuse to sell their land to soy farmers.¹⁵ A campaign leaflet appeals to colonos: "For our children, for our family, we have the strength to protect our forest, our corn, our beans, our manioc, our fruits ... the palm that covers our homes, the water in our rivers, our fish, our hunt. Do not abandon your land!" The campaign is building solidarity among colono communities in the region despite mounting pressures to sell.

One of the socio-economic benefits of colonos' shifting mode of agriculture is that it generates a landscape in multiple stages of succession. This, in turn, promotes soil regeneration and the opportunity for diversified income generation (Padoch et al., 1985; Unruh, 1988; Walker, 2003). The agro-biodiversity literature and direct observation show that colonos produce and manage resources that do not always result in direct income but are used for household consumption and/or to sustain future production (Dove and Kammen, 1997; Walker, 2003). Studies on smallholder farming in Southeast Asia and the Amazon indicate that landscapes without small farmers are less biologically diverse and often result in unintended degradation (Dove et al., 2005).

The agro-biodiversity maintained by Santarém's colonos is significant. Research and national household census data shows that settlements earn income from major crops (e.g., manioc, corn, rice, beans), minor crops (e.g., coffee, black pepper, urucum seeds, tomatoes, sugarcane, cacao, and sweet potatoes), major fruits (e.g., orange, lemon, tangerine, mango, passion fruit, and pineapple), minor fruits (e.g., papaya, avocado, watermelon, coconut, banana, and melon), and tree extracts (e.g., rubber latex, woody fibers, nuts and berries, and oils) (IBGE, 1999). Winklerprins (2004), for example, found 98 species in urban homegardens in Santarém and argues that urban homegarden diversity is representative of rural home gardens and extensive production, because the rural and urban populations are not fixed in their rural or urban landscapes (e.g., families have relatives in the rural areas and the city and spend significant time at each homestead).

STR is working to gather support from communities, IBAMA, and NGOs to better secure their land rights through an agro-extractive reserve. The reserve is modeled after rubber tappers' extractive reserves and based on colonos' on-farm and forest production system, one that includes both agriculture and forest areas. They also plan to develop marketing campaigns for colonos' higher value agricultural products. The agro-extractive reserve makes a valuable contribution to the current discussions on “environmental soy.” The proposed site for the reserve is in an area where colonos' land rights are currently being threatened by soybean farming and logging. The reserve concept departs from current community-based conservation projects in the Amazon because it gives priority to colonos communities, rather than more traditional communities. During an interview, STR's vice president recognized that the transition to collective land ownership would be difficult for some colonos because they are accustomed to individual, family-based tenure. But, he stated, “an agro-extractive reserve would make for more cooperation for environmental protection, and it would guarantee our preservation.”

The model would provide a negotiating space for colonos to legitimize their socio-economic needs within the soy development project. Almeida (2002) explains that the legitimization of rubber tappers' extractive reserves allowed the rubber tappers to transform from a marginal group to a participant in grassroots sustainable development. Rather than leaving the larger socio-economic and environmental questions entirely to “enterprises and NGOs,” the agro-extractive reserve gives those most intimately affected a role in answering them.

The resistance of Santarém's colonos to soy development and their proposed alternative exemplify the social organizing that is being replicated throughout South America's soy expansion regions. A network of Brazilian social and environmental organizations facilitated an internet discussion called *Articulação Soja-Brasil* (ASB) to determine a “common denominator” for social and environmental criteria for soy production (CEBRAC, 2004). The debate ran from February to June 2004 with 121 participants, including the Brazilian Forum of NGOs, Social Movements for the Environment (FBOMS), the Cerrado Network, the Amazon Working Group and the FETRAF-Sul (CEBRAC, 2004). In contrast to the RSS conference, this discussion represents many of the communities affected by soy expansion, especially in the Amazon (See Appendix). Nearly half of FBOM's organizational members are located in the Amazon (CEBRAC, 2004).

The discussion recognized several of the socio-economic and environmental effects of soy development felt by Santarém communities, particularly increased land rights conflicts, smallholder displacement and migration, and removal of agro-biodiversity. Participants further recognized that new criteria, even if soy farmers fully implemented them, would not constitute “sustainable soy production,” but rather “production with fewer negative impacts.”¹⁶ ASB's concluding recommendations were as follows:

(1) Environmental:

- Environmental laws are minimal, not optimal, standards;
- Soy buyers cannot purchase soy from producers whose land was occupied by perennial crops after December 2003;
- Soy buyers can only purchase soy from land legally cleared before December 31, 2003 for areas outside of the legal Amazon and October 1999 in the Amazon;
- Soy production is not permitted on wetlands, swamps and floodplains drained after December 2003; and
- In the long-term soy “must be planted on fields no larger than 200 hectares” to ensure that forests are not severely fragmented and that

other agricultural and non-timber forest production can continue to exist (CEBRAC, 2004:7).

(2) Socio-economic:

- Labor laws are minimal, not optimal, standards;
- A soy farm workers' profit-sharing scheme;
- Soy farms "cannot be composed of or expanded through the addition of lots smaller than 200 hectares" or "areas where there is or has been a land-tenure conflict, not yet resolved to the satisfaction of the weaker party" or land illegally "grabbed" (CEBRAC, 2004:4-6).

ASB's recommended standards also make a valuable contribution to the "environmental soy" discussion. Where the current "forest friendly" soy and RSS process fall short of protecting "throw away forests" and marginalized communities, ASB standards advance small farmer, agro-biodiversity, and multiple forest type considerations.

The environmental and socio-economic parameters prioritized in the agro-extractive reserve concept and ASB's recommendations reflect a larger resistance, led by the Via Campesina, against neo-liberal economic policies and export-oriented agriculture. By building a network of small farmers, indigenous people, and community fishermen, the Via Campesina is globalizing local resistance efforts and is attempting to put its members' needs at the center of agricultural policy negotiations.

As mentioned earlier in this paper, members of the Via Campesina organized a counter-RSS conference that questioned the validity of "sustainable soy" and highlighted the implications of soy development on small farmers' livelihoods (Via Campesina et al., 2005). Participants in the counter conference included: Via Campesina members from Brazil, Paraguay, and Argentina, Grupo Reflexión Rural, Coordinadora Antitransgénicos del Uruguay, Peasant Movement of Santiago del Estero-Argentina, Coordinadora Latinoamericana de Organizaciones Campesinas, Brazil's Landless Workers Movement, and Comissão Pastoral da Terra. The counter conference associated the RSS process with the global trend toward the increasing privatization of community resources such as water, genetic diversity, and agricultural landscapes (Via Campesina-Brasil, Paraguay and Argentina et al., 2005). With respect to the RSS, they conclude that "sustainability and monoculture are fundamentally irreconcilable, as are the interests of peasant society and agribusiness" (Via Campesina-Brasil, Paraguay and Argentina et al., 2005:1). As an alternative, ASB participants resolved to struggle and mobilize against the present agricultural development model and "encourage and disseminate the agro-ecological experience of peasant societies ... to defend the cultures, territories and traditional economies of indigenous peoples and peasants" (Via Campesina-Brasil, Paraguay and Argentina et al., 2005:1).

While the Via Campesina did not put forward project recommendations or standards for soy production, they

represent a growing grassroots voice that has been largely unheard in the "environmental soy" discussions. Underlying the Via Campesina mobilization is "food sovereignty" – a political concept they developed that calls for "the peoples', Countries', or State Unions' right to define their agricultural and food policy" (Via Campesina, 2003:2). Food sovereignty offers a useful political framework for the "environmental soy" discussions, one that may well invoke greater participation by currently marginalized communities.

Discussion and conclusions

Given the way in which agribusiness and government soy actors define primary and secondary forests, the livelihood struggles of colonos are not resolved by the unfolding soy development scheme in Santarém. Current "environmental soy" projects adopt forest valuation structures similar to those of the government and agribusiness soy actors and thereby neglect the socio-economic needs of smallholder agrarian settlements. Agribusiness, government, and NGO soy actors uphold an historically dichotomous reading of the Amazon's forested and productive space. Beginning with the economic development policies during the 1960s through 1970s, the Brazilian government rewarded agribusinesses with tax breaks and subsidies for converting forest to productive spaces (Wood and Schmink, 1993). Within this development discourse, forested space took on both "green hell" (Goodland and Irwin, 1975) and "pristine forest" connotations (de Onis, 1992). These perceptions served to control the Amazon's natural resources for economic development and established the notion that the Amazon forest was absent of communities (Hecht and Cockburn, 1990). The notion put forward by agribusiness soy actors that "there are only trees here" indicates that the development beliefs of the last 40 years, despite advances in sustainable development policy (Hall, 1997), remain a legitimate development platform today (Escobar, 1998). Soy actors' dismissal of pre-soy land-use and "hopeful" optimism in effect fails to consider colonos' history of settlement and livelihood struggles in the soy development plans.

Under this Amazonian development discourse, only pristine forest is valued as forest with conservation importance. Secondary forests are felt to be more valuable as productive agricultural space. Yet, as Hecht points out, "the more desperate questions [regarding soy development] are being posed in the [Amazon] Basin's 'throw away forests'" (2005:397). Agribusiness, government, and NGO soy actors fail to examine their assumption that secondary forests are "throw away forests." They also overlook the discussion regarding the human contribution to the natural history of Amazonian forests. Increasing evidence dispels the notion of a "pristine forest" as well as the belief that forest biodiversity has resulted from the absence of human intervention

(Denevan, 1992; Vasquez et al., 2002; Heckenberger et al., 2003). Rather, indigenous communities' land-use practices have contributed to and maintain biodiversity (Balee, 1989). The agribusiness, government, and the NGOs' environmental discourse obscures the agro-biodiversity contribution colonos made and make to the region. They also neglect the environmental contributions of secondary forests (e.g., carbon sequestration, the conservation of corridors and habitats, and curbing forest fires) (Brown and Lugo, 1990; Sorrensen, 2002).

As a case study, Santarém contributes to on-going discussions on the parameters of soy development in the Amazon. Yet, it also hints at potential land-use scenarios for other soy expansion regions: (1) “forest reserves” actualized as “soy reserves,” (2) colonos' “invasive forest mobility,” and (3) secondary forest understood as **non-forest**. Further research into forest-soy transition zones is needed to better understand soy actors' land-use in the Amazon. In light of historical processes, regional differences will certainly be revealed, as has always been the case for Amazonia. Grounded theory would allow these regional differences to surface. In the Santarém case, it has enabled us to see who the soy actors are as well as the specific socio-economic and ecological conditions that support soy development in this region.

Under the current soy development project, colonos continue to be a residual after-thought. Following decades of state failure to adequately address their poverty, “enterprises and NGOs” are also falling short in their “environmental soy” proposals. Who participates in frontier governance will determine the socio-economic and environmental outlook of the soy frontier (Nepstad et al., 2002). Grassroots proposals offer the possibility of an enhanced participatory process for greater agro-biodiversity and forest conservation. The “environmental soy” discussions are an opportunity to improve on historical state failures and conservation bias toward “pristine” forests. For Santarém, the open question remains whether the soy development project will undermine its history, peoples, and environment in the long run. The soy frontier continues to expand. Whether or not it will expand in concert with communities or expand on top of them will be determined by a combination of further research and policy development that involves all soy actors and hears all voices.

Appendix

Signators to Articulação Soja-Brasil's Outcomes Document

- Grupo de Trabalho Floresta do Forum Brasileiro de ONGs e Movimentos Sociais pelo Meio Ambiente e Desenvolvimento – FBOMS
- Grupo de Trabalho Amazônico – GTA
- Federação dos Trabalhadores na Agricultura Familiar do Sul – FETRAF-Sul
- Fundação Centro Brasileiro de Referência e Apoio Cultural – CEBRAC
- Agência de Desenvolvimento da Capetinga
- Amigos da Terra – Amazônia Brasileira
- Animação Pastoral e Social no Meio Rural – APR
- Argonautas Ambientalistas da Amazônia
- Assessoria e Serviço a Projetos em Agricultura Alternativa – AS-PTA
- Associação de Educação e Assistência Social N^a S^a da Assunção
- Associação de Mulheres Trabalhadoras do Baixo Amazonas – AOMTBAM/Pará
- Associação dos Chacareiros do Córrego Coqueiros
- Associação Maranhense para Conservação da Natureza – AMAVIDA
- Associação Mineira de Defesa do Ambiente – AMDA
- Associação para o desenvolvimento da Agroecologia – AOPA (PR)
- Cáritas Brasileira Região Norte II
- Centro de Apoio aos Projetos de Ação Comunitária – CEAPAC/Pará
- Centro de Educação Popular – CEPO (RS)
- Centro Ecológico de Ipê – CAIPE (RS)
- Centro Vianei de Educação Popular (SC)
- Comunicação e Cultura
- Departamento de Estudo Sócio-Econômico Rurais – DESER (PR)
- Ecodata
- Ecologia e Ação – ECOA
- Federação de Órgãos para a Assistência Social e Educacional – FASE FASE
- Fundação Águas do Piauí – FUNAGUAS
- Fundação O Boticário de Proteção à Natureza
- Fundação Pró-Natureza – FUNATURA
- Instituto Ambiental Ratonos
- Instituto Centro de Vida – ICV
- Instituto de Estudos Socioeconomicos – INESC
- Instituto de Formação e Assessoria Sindical Rural – IFAS
- Instituto de Pesquisa Ambiental da Amazônia – IPAM
- Instituto de Pesquisa e Desenvolvimento Amazônico
- Instituto Goyá
- Instituto para o Desenvolvimento Ambiental – IDA
- Instituto Sociedade População e Natureza – ISPN
- Instituto Socioambiental – ISA
- Núcleo Amigos da Terra/Brasil
- Organização de Cidadania Cultura e Ambiente – OCCA
- Semapi-Sindicato
- Sindicato dos Trabalhadores Rurais de Sarandi
- Sociedade de Proteção e Utilização do Meio Ambiente – PUMA

Notes

1. My research assistant was a student from the federal university (located in Belém, Pará's capital) who was from Santarém and had lived in the region for more than 30 years.
2. Because Belterra is located inside Santarém, I will refer to both the Santarém and Belterra municipalities as the Santarém municipality throughout the paper.
3. *Terra firme* consists of forested and agricultural areas not within the margins of rivers. These dry land areas comprise 98% of the Amazon landscape (Pires and Prance, 1985). *Terra firme* is characterized by low soil fertility, high diversity of tree species per hectare, low density of one species per hectare, and soil erosion and compaction of cleared lands (Wabeke, 1992; Bawa, 1992; Grubb, 1995).
4. The Santarém region also experienced the economic boom and bust cycle of rubber extraction from 1850–1920 and gold at the time of agrarian colonization (SEMAB, 2000).
5. Colonos typically own 100 ha and cultivate 20–30 ha annually.
6. This calculation was made by dividing the number of rural households in the Santarém municipality (i.e., 14,015) by its total agricultural income (i.e., R\$16,514,000) (IBGE, 1999).
7. A fourth actor, financial supporters of soy such as the Banco da Amazonia (BASA), is also relevant. For instance, BASA provided loans to all of the soybean farmers interviewed. Without BASA's financial support, most soy farmers would not have been able to establish farms in Santarém. Investigating their relationship further goes beyond the scope of this paper.
8. Agro-industrial farms in the region are categorized as small to medium-sized. They range from 200–1000 ha of productive land and raise varying amounts of soy, rice, corn, sorghum, and milheto.
9. There is one exception to this coincidence. The newspaper *O Liberal* reported on a case where soy farmers attempted to purchase land from an individual living in the Tapajós National Forest, which is illegal. There are 14 communities that have usufruct rights in the national forest, but their property rights cannot be sold. The federal environmental agency IBAMA responded quickly and prevented the sale (*O Liberal*, 2003).
10. The largest representation was from agribusiness and conservation organizations, including Maggi, Monsanto, Unilever, Dow Agro Sciences, Pioneer, and Syngenta, WWF, Conservation International, the World Conservation Union, and TNC.
11. Another example occurred in November 2004 when 20 colono homes were torched because the owners would not sell their land to soy farmers (Southgate, 2005).

12. The research documented two settlements – Paca and Guaranazinha – that were each bought by a single soy farmer. Paca (located approximately at 100 km of BR-163) was a community of 50 colono households with an elementary school, soccer field, church, cemetery, and a creek for a water source. The community is now replaced by one soy farmer who, at the time of my research, was constructing a gas station, a soy and rice drier, and a home.
13. One family indicated that their chickens all died, their youngest child vomited for days, and they were afraid to eat the fruit from their fruit trees after a soy field across the road from their home was sprayed with pesticides. They reported the incident to IBAMA, but at the time of the interview they had received no compensation or follow-up communication from either IBAMA or the soy farmer.
14. First hand observation and interviewees' accounts indicate that several streams in the region that once served as primary water sources for colono communities have been filled in as roads were leveled to ease soy transportation.
15. The sponsoring organizations are Saúde e Alegria (Health and Happiness), Conselho Nacional dos Seringueiros (National Council of Rubber Tappers), Organização das Associações da Resex Tapajós-Arapiuns (Association of the Tapajós-Arapiuns Extractive Reserves), the agricultural workers union FETAGRI, and Comissão Pastoral da Terra (Pastoral Land Commission).
16. The discussion concluded: "The use of the word 'sustainable' generates an expectation that no doubt will be difficult to achieve with large-scale soy plantations" (CEBRAC, 2004:2).

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