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Between Discourses of Extreme Pressure and Modernization: Small Farmers' Diverse Perceptions of Vulnerability to Soy in Santarém, Pará

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Abstract

The socio-ecological implications of the soybean agricultural expansion in the Brazilian Amazon cannot be fully understood without examining the interactions between soy and small farmers. The expansion of soy in Santarém following the construction of the Cargill port in 2001 has affected local smallholders, but how and to what degree is the subject of significant controversy. Discourse has emerged describing the impact of soybean agricultural expansion on the small farmers of the region. One discourse, which we term the modernization discourse, depicts effects on smallholders like migration as natural and welfare-improving. In opposition, a second discourse, which we term the extreme pressure discourse, portrays smallholders as struggling to survive under social, economic, and biological pressures associated with rapid land-use change due to soy. However, characterizing smallholders' livelihoods as vulnerable too often assumes that smallholders have a single, homogenous experience of the expansion of soy agriculture and that they are unable to adapt to changes. Interviews with smallholders who remain farming in 20 communities of rural Santarém reveal heterogeneity in farmers' perceptions to the soybean-smallholder conflict. Understanding of vulnerability must expand to encapsulate farmers' adaptive capacity. Smallholders do express a desire and capacity to maintain a rural livelihood and their farming identity amidst the land-use change. Smallholders' perceptions of the impacts of the soy frontier complicate both extremes of public discourse vis-à-vis the soy conflict.

Author's Note

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1. Introduction

Santarém, Pará is the site of a new frontier and, as such, a locus of contested changes. At the end of the 1990s, the industrial soybean agricultural frontier began to reach Santarém, bringing new social actors, economic relations, and land-use change to the region. We designate the expansion of soy in Santarém a “frontier,” a term with a diverse history of use in Amazonia, to suggest an “uneasy boundary between alternative definitions of what resources are to be appropriated how and by whom” (Schmink and Wood, 1992). While the state just to the south, Mato Grosso, is the site of substantial soy production, Santarém is the only region in the state of Pará with soy agriculture. Never before has such a concentration of commercial agricultural production been mushroomed in the middle of the Amazon basin. Upon the arrival of the soy frontier in Santarém, distinct discourses have emerged to describe the influence of the soybean industry on a region previously managed almost exclusively by smallholders. Debate over the influence of soy has broadened from a strictly environmental focus emphasizing soy-driven deforestation (see: Fearnside, 2001; Nepstad et al., 2006) to, more recently, an awareness of the local social impacts of soy (Steward, 2006; Greenpeace, 2007; Baletti, 2011).

The influence of the soy industry on smallholders has had a social impact that has provoked significant conflict. Two dominant discourses have emerged describing the impact of soybean agricultural expansion on small farmers of the region. While both sides agree that small farmers are selling their land to soy farmers and migrating to other farmsteads or to urban Santarém, there is disagreement over the extent of this displacement and the degree of smallholder volition. The modernization discourse promoted by Cargill, the multinational agricultural commodity-distributing corporation which built the port in Santarém, depicts the effects on smallholders, like migration out of farming, as minimal, natural, and welfare-improving. The opposing, extreme pressures discourse, developed by recent academic research, Greenpeace, and other local political organizations, portrays forced smallholder migration out of farming when extreme social, economic, and biological pressures associated with soy-driven land-use change deteriorate their quality of life and farming conditions beyond the point of livelihood viability. When pressures become too great, the discourse argues, farmers sell their land, abandon their community, and sometimes leave farming altogether. Previous research linked to this discourse has intended to communicate the aggregate impacts of soy on smallholders as a social group, and in so doing, forgoes an exploration of the diversity of impacts and responses within this group. The migration of small farmers has been one of the most tangible effects, yet also one of the most difficult to quantify, for it remains unclear why some farmers migrate while others do not. Previous researchers have investigated why smallholders sell their land, but none have asked why those that remain have *not* sold their land.

By analyzing the social, economic, and ecological influences of soy on smallholders as smallholders themselves report, we sought to understand how smallholders who remain farming perceive and respond to the soy frontier. We compared farmers’ actual perceptions and behaviors to these two dominant discourses. Perceptions of smallholders about their own vulnerability and capacities will influence how they shape their livelihood: “the response to any change will

depend on the reasons farmers use to explain to themselves their own ability and power, or their vulnerability” (Trujillo, 2008). We sought to uncover the discourses that farmers themselves produce to explain their experience of being affected by soy in relation to their capacity to adapt.

2. Invisible Smallholders and Inevitable Soy

Smallholder agriculturalists in the Amazon have long been marginalized, antagonized, or simply neglected by government policy, non-governmental projects, and the public imagination. This trend of neglect towards the *caboclo* smallholders has led Nugent (1993) to describe them as invisible in Amazonia. *Caboclo* producers fall through the cracks between the dichotomies that characterize thinking and policy in the Amazon: pristine versus destroyed ecosystems, indigenous versus invading colonizers, economically efficient versus inefficient.

Culturally, *caboclos*' diverse mixed ethnic heritage involving indigenous, Portuguese, and, more recently, Northeasterners drawn in on state-sponsored colonization projects, distinguish *caboclos* from the “truly indigenous” and deny them some of the privileges of being imagined as noble savages. While indigenous forest management and traditional ecological knowledge are appreciated for their conservation and cultural value, *caboclos*, producing for the market and subsistence on diverse, intensely cultivated plots, have more often been antagonized by conservationists for the use of fire and higher impact management. However, conservationists have recently begun to argue that smallholders can serve as key allies in conservation (Campos and Nepstad, 2006). Their management regimes, especially in comparison with industrial agriculture, more closely mimic native nutrient cycling, soil conservation, and biodiversity. On plots less than 100 hectares, Amazonian smallholders tend to use minimal machinery and chemical inputs, leave large swaths of land fallow or under forest cover, and make ample use of agroforestry techniques.

Smallholders have also been ignored in economic growth planning since they are perceived as inefficient because of their small-scale operations and limited access to capital, technology, and inputs. Furthermore, smallholders mostly produce non-commodity crops for local markets, and their output is hard to quantify and thus goes untaxed. However, a national family agriculture movement spearheaded by the creation of the national Program for Strengthening Family Agriculture (Pronaf) in 1996, and the creation of the Secretary of Family Agriculture within the Ministry of Agrarian Development, shifted the dialogue to recognize smallholder economic contribution, viewing them as “multifunctional,” and offering a combination of social, economic, and ecosystem benefits. Research that laid the foundation for Pronaf argued that family agriculture accounts for almost 40% of the gross value of agricultural production and produces more value per hectare (Guanziroli, 2010). While Pronaf has leveraged subsidized credit lines, technical assistance, and rural extension for smallholders categorized as family farmers all over the country, the Northern region of Brazil remains one of the least serviced regions of the country.

In the Amazon, the value of smallholder agriculture in development strategies remains particularly contested. Santarém, with a population of 294,580, is the third largest city in the legal Amazon. Roughly a quarter of the populace (78,790) resides in rural Santarém (IBGE, 2010). Almost 9,200 agricultural properties cover

approximately 275,000 hectares (IBGE Censo Agropecuário, 2006). An average plot size of 30 hectares indicates that smallholder agriculture dominates in Santarém despite the expansion of soybean cultivation, which requires upwards of 100 hectares to reach economies of scale. Smallholders produce manioc, fruits, corn, and vegetables (*horticultura*) in patchwork forests and fields and, now, soy plantations as well. Of more than 9,000 farmers in the region, 400 are soy farmers, planting in 2010 an estimated 27,000 hectares – only 10% of total area in agriculture in Santarém (IBGE, 2010; Personal Communication, Cargill).

In the 1990s, the state and municipal government of Santarém elected to pursue a developmental strategy with soy agribusiness at its center. The municipality of Santarém lies in a strategic position as a deepwater port at the confluence of the Tapajós and Amazonas rivers, the last point of connection in the Amazon to a global market. The Municipal Council on Rural Development, an institution convened by Pronaf, deemed soy a more profitable use of land than small-scale agriculture. The municipal government opted to expand its existing port, and Cargill, the multinational agricultural commodity-distributing corporation won the contract. With neighboring state Mato Grosso rapidly expanding, soy production from a new varietal suited to the region developed by the Brazilian agricultural research organization Embrapa, Santarém thought to capitalize on an opportunity. Indeed, soy has been a major contributor to the Brazilian economy. The food and agricultural economy constituted 30% of Brazil's GDP and comprised 40% of all exports in 2004 (Chaddad and Jank, 2004). Brazil is both the second largest producer and exporter of soy, producing in 2011 75 million tons of soy and exporting 29.1 million tons behind. Total exports of soy are valued at USD\$11 billion (Embrapa, 2011).

The focus on soy as a development strategy in Santarém led to infrastructural and institutional changes that brought the Cargill soy processing and export port as well as a wave of soy farmers into the region. With cheap land and Cargill as a guaranteed buyer and creditor, capitalized soy farmers from southern states of Mato Grosso, Paraná, or Rio Grande do Sul migrated into the Santarém region, mostly between 2001 and 2005 (The Nature Conservancy, 2005). These farmers usually had previous experience growing soy and thus settled in Santarém with machinery, workers, and their families. By 2010, 46,170 metric tons of soy were harvested annually, an increase from just 107 tons in 1997 (IBGE, 2010).

The Santarém region represents the only site of soy production in the state of Pará and its production is less than 1% of the national total (Embrapa, 2011). The arrival of the soy frontier forced a dialogue in Santarém to compare the value of smallholder versus industrial agriculture, and as soy expanded into the region, perceptions of the relative value of each evolved. This division gave birth to the two polarized discourses we return to throughout the paper. One discourse is supportive of soy cultivation and sees it as contributing to national economic growth and potentially yielding trickle-down effects at the regional level. This discourse propelled soy into Santarém in the first place, and as soy expanded, the opposing discourse emerged to criticize soy agriculture's environmental and social impacts. We elaborate upon both discourses in the subsequent section.

3. “Modernization” and “Extreme Pressure” Discourses on Soy in Santarém

With the Cargill port built and in operation by 2002, farmers from southern Brazil purchasing land, and soybean production expanding, the soy frontier brought a period of rapid change to Santarém. A dissonant chorus of responses from local and international organizations emerged in the wake of this upheaval. Debate crystallized over how soy impacts Santarém and what should be done about it, whether collaborating with Cargill and the soy industry or opposing it. As local social movements like Frente da Defesa Amazônica and Greenpeace spearheaded protest against Cargill and soy production in general, the Nature Conservancy and the World Wildlife Fund independently developed certification schemes for soy. TNC currently certifies “legal soy” for Cargill, and WWF supports the Round Table on Responsible Soy to certify “responsible soy.” Both collaborations seek to preserve soy while mitigating environmental externalities. Social concerns associated with soy expansion are seen as an issue resolved through management and governance.

In 2004, Cargill sought out a partnership with TNC to ensure that it only purchases “legal soy” that is grown by farmers in compliance with the Brazilian Forest Code, which states that farmers must leave a certain portion of their property in forest reserve and clear no forest. Since the initiation of the TNC certification in 2006, there are 331 farms in the Santarém region participating in the program. TNC revels in the fact that there has been no deforestation on any farm since July 2006, although there is just one employee responsible for administering this program, and monitoring for compliance with the forest code is outsourced to a third party. The RTRS draws together representatives of the soy supply chain and civil society to collectively define “responsible soy” nationwide in Brazil. The RTRS certification extends beyond the TNC-Cargill collaboration by requiring that soy expand only onto government-designated ecological-economic zones (ZEE). Unlike with “legal soy,” the RTRS encourages consensus-building processes with local stakeholders and requires dispute resolution mechanisms and the establishment of “channels of communication” with locals (RTRS, 2011).

Yet for many, deforestation is merely a starting point of the catalogue of concerns with soy. In contrast with the collaborative efforts of TNC and the RTRS, other groups do not trust negotiation as a way to contain the expansion of soy nor make it accountable to local demands. The local pastor, Padre Edilberto Senna, articulated a common sentiment: if Cargill is not removed, eventually all of Santarém will turn to soy. His grassroots organization, Frente da Defesa Amazônia (Amazonian Defense Front), is highly critical of both certification schemes that rationalize soy production on “already anthropogenically modified lands,” arguing that the biodiverse agricultural land of smallholders and soy monoculture represent two very distinct anthropogenic modifications and that the two forms of production are socially and economically very different (Caminha Barros, 2010). There is deep skepticism about whether or not soy expansion has truly benefited Santarém or brought the promised economic growth, given that the vast majority of soy farmers have migrated into Santarém from outside the state. Many feel that Santarém has donated land and sacrificed its local production in exchange for export-oriented commodity agriculture whose benefits are never seen.



Image 1: Barren, tilled soy fields carved out in Santarém.



Image 2: A typical smallholder plot with a diversity of annual and perennial crops.

Local polarization was exemplified when the Cargill Public Audience convened in July 2010 to discuss the Environmental Impact Assessment for the port's expansion. A half hour before the event began, the 400 seats of the auditorium of the Yacht Club were filled by Cargill supporters who had been encouraged to arrive early and wear white shirts to distinguish their support. Uniform signs hung around the walls of the auditorium read, "The community associations of Liberdade and Salé are with Cargill in search of development and a better life for residents" and "a small friend can be an important partner." Only the back of the room and aisles remained for those who arrived on time, all of whom were forced to stand under the scrutiny of the audience seated in white. The few voices critical of Cargill that were allowed to speak publicly were scheduled hours later into the daylong event. The seated mass of white cheered for pro-Cargill sentiment and nearly drowned out dissidents with booing. With some protests agitating outside the auditorium, a group of students eventually snuck in and stood in the back of the room with banners that read, "Out Cargill!" and, "After a crime, a prize?" in reference to the pardoning of Cargill after their failure to complete an EIA for the initial construction of the port.



Image 3: The student activists behind the audience wearing white shirts in support of Cargill.

4. Debate over Soy's Impacts on Santarém Smallholders

These two dominant discourses resulted in two polarized accounts of soy's pressure on smallholders. In Cargill's own publication of the impact assessment of the Santarém port, Cargill identifies just two social impacts: "Social conflicts triggered by land issues" and "Farm property concentration and migration of smallholders" (Cargill, 2010). Cargill promotes discourse along with TNC and RTRS that declares that social conflict related to the soy frontier is minimal and manageable, and that other changes are evidence of modernization and welfare improvement. Other research associated with the alternate discourse that emphasizes smallholder vulnerability has highlighted a slough of direct and indirect pressures that smallholders experience as a result of their interaction with the soy frontier, and argue that smallholders cannot easily coexist alongside soy farmers.

4.1 "Social conflicts triggered by land issues"

In its impact report, Cargill mentions that violent conflicts between soy farmers and smallholders have been reported, but depicts these reports as unverified accusations, emphasizing that there are "no official records available." The Rural Worker's Union (Sindicato dos Trabalhadores Rurais, STR) argues that there have been significant social conflicts due to the influx of soy. The president of STR

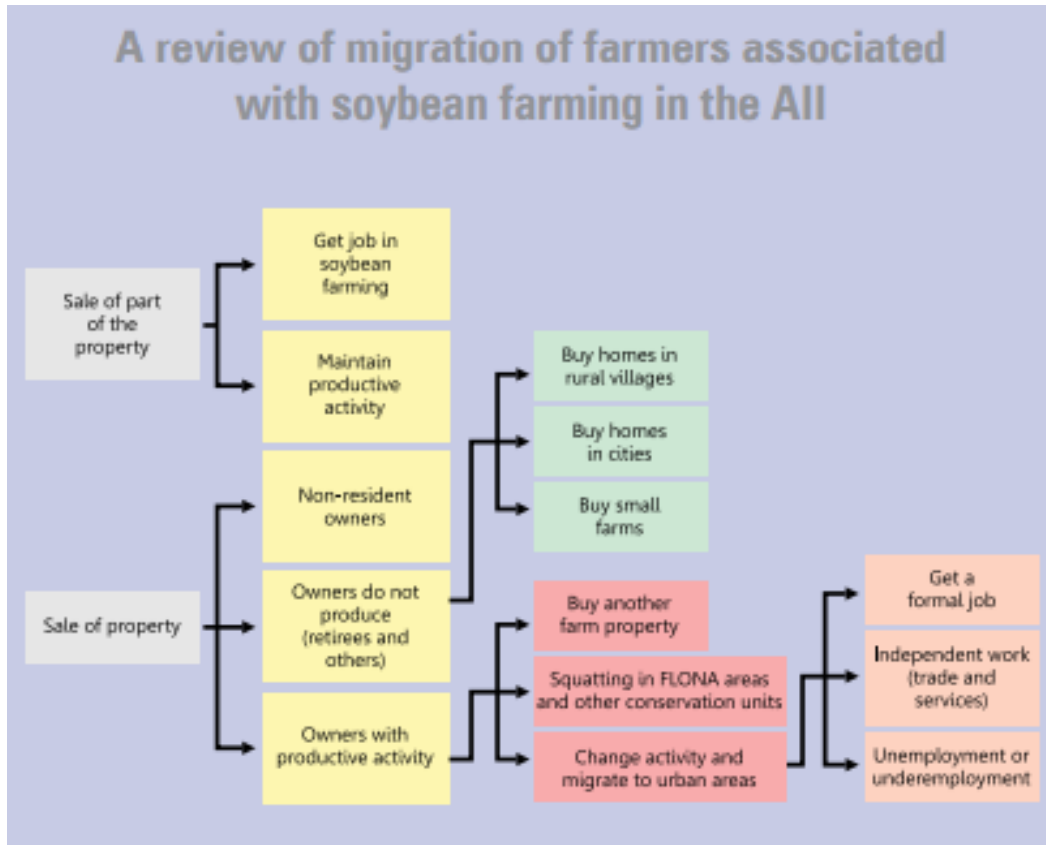


Figure 1: This figure was taken from the Cargill EIA brochure to the general public (English version available online) offers optimistic prospects for smallholders who sell their land.

related that they have received numerous reports from their constituents that they were facing aggressive purchasing tactics and intimidation by land buyers, including a report about four houses of small farmers that were burnt down in a land dispute in 2004 (Pers. Comm., 2010). The Catholic Pastoral Land Commission (CPT) has also documented violence, criminality, and disputes in the land sales between soy farmers and smallholders, including cases of *grilhagem*, land title falsification and illegal sales (CPT, 2008).

4.2 “Farm property concentration and migration of smallholders”

Beginning around 1998 and peaking roughly from 2001 to 2006 during the highest market price of soy, soy farmers and speculators purchased land in the region from 500 families (CPT, 2008). Cargill provides a flowchart (Figure 1) to explain the outcomes of people who sell their land to soy farmers. The report downplays the rural emigration as “on a scale similar or smaller than seen in other regions of Brazil’s North.” Cargill implies that economic development empowers smallholders and prompts them to leave farming, which “is a sign of people yearning for better conditions of life associated with the ‘benefits’ available in urban areas” (Cargill, 2010).

In contrast to Cargill's estimation of the process, the extreme pressures discourse argues that the migration is often involuntary, either because of the conditions of the sale or because changes in living and farming conditions provoked by the expansion of soy has made a farming livelihood unviable. Projeto Saúde e Alegria estimated that 26 communities completely disappeared between 1998 and 2007 (Baletti, 2011). Steward calls this rural exodus and Baletti "land grabbing." Smallholders who sell their land either move into the city or buy new, smaller plots in the only areas where land is cheap enough and available: in more remote locations, often in primary forest (Steward, 2006; Baletti, 2009). For example, New INCRA settlements (e.g. Bom Sossego, founded in 2002) have been created out of primary forest to house some of these farmers. Baletti found that all relocations lead to a reduction in farming by dislocated smallholders (Baletti, 2011).

4.3 "Pressure" on smallholders from indirect impacts

The disjuncture between the two discourses is largest on the subject of indirect impacts of soy on smallholders. Cargill does not touch upon the idea that the impacts of soy may extend beyond the land transaction. The extreme pressures discourse's principal criticism is that the indirect effects of soy reduce the viability of the remaining farmers in Santarém. The discourse depicts farmers as experiencing great pressures in the form of cultural friction with soy farmers, social disintegration due to smallholder out-migration, and ecological pressure from soy cultivation.

STR officials argue that the arrival of industrial soy production threatens smallholders' rural identity. One official pointed out that smallholders want to leave their farm to future generations, but their children are not interested in traditional farming because of exposure to mechanized agriculture on nearby soy fields (Personal Communication, STR). Ethnic divisions (soy farmers tend to be called "gauchos," as Brazilian southerners of European ancestry) exacerbate differences between smallholders and soy farmers. Steward (2006) quotes a small farmer who laments that while the smallholders have nothing, "the new soy farmer can come and have everything." The emigration of small farmers is argued to fracture social networks and dissipate the support needed to maintain local infrastructure like schools, churches, water tanks, soccer fields, manioc processing houses, and bus routes. Those that remain are described as living in the aftermath of deteriorating infrastructure and rural community networks.

The environmental externalities of soy production include dangerous farming systems and the health of farmers, as well as what farmers are able to grow. Baletti (2009) writes that smallholders reported an "extreme reduction in their ability to grow" crops due to agrottoxins used in nearby soy fields that had forced them to purchase food that they usually grew themselves. In 2007, Greenpeace, local NGO Saúde e Alegria, and STR created a community map to identify local impacts of soy. The first and only map of the municipality's 121 rural communities highlights contaminated water sources, 55 sites of deforestation, blocked access to communities, and 29 "threatened" communities with severely reduced populations (Greenpeace, 2007). Steward (2006) writes that smallholders "wondered how long they or their neighbors could live under these exacerbated socioeconomic conditions and deteriorated environmental conditions." Baletti reports that a common

sentiment expressed in her study was, “Life is difficult, but it wasn’t always this way,” which

Dominant Perceptions of Pressure of Soy on Smallholders
<i>The Nature Conservancy 2004</i> “Legal” soy; must comply with Brazilian forest code
<i>Steward 2006</i> Loss of hard-earned community infrastructure (e.g. schools, drinking water) Increasing pressure to sell their land as soy farms surround colonos’ homes and agricultural fields Agricultural product loss and children sick from pesticide spraying Diminished or completely destroyed water sources, a result of erosion and sedimentation caused by agricultural machinery
<i>Greenpeace-STR-Saúde e Alegria community map 2006</i> Impacted <i>igarapés</i> (water sources) Blocked access Threatened communities Deforestation
<i>Cargill 2010</i> Farm property concentration and migration of smallholders Social conflicts triggered by land issues
<i>Roundtable on Responsible Soy 2011</i> “Responsible” soy; only in EEZ designated zones Representation of civil society to define sustainable soy Appropriate communication with community
<i>Baletti 2011</i> Deterioration of infrastructure Destruction of communities Families split in process of selling land Extreme reduction in ability to grow Forced to purchase food that they had formerly grown

Figure 2.

indicates that those who remain never received offers to sell, implying that they have not necessarily elected to stay.

The normative premise of this discourse, embedded within an environmental justice argument that soy brings no benefit to the local community, does not suggest ways in which smallholders are managing to adapt or cope with the soy frontier. Their rhetoric is necessarily polarized to question Cargill and the value of soy. At the same time, the image of pressure deprives smallholders of agency, which implies homogeneity within this group, and presumes that farmers have no employable assets to contest and cope with the changes above (Figure 4).

5. Methods

The two authors conducted field research June through August 2010 in the municipality of Santarém. Fieldwork involved semi-structured interviews and surveys

with 21 smallholder families in 20 communities as well as site visits to farmers' markets, the Cargill soy processing and export port, and soybean farms. Expert interviews were also conducted with community leaders and public agencies, including the rural laborers' union (STR), the rural producers' union (SIRSAN), the rural producers' union (APRUSAN), the state agricultural extension agency (EMATER), state agricultural research agency (SAGRI), the municipal agency for the small farmer (SEMPAF), the Bank of the Amazon (BASA), NGO Saúde e Alegria, and Cargill.

The "principle of opportunity" as established by the literature (Aldrich et al. 2006) guided us to maximize the number of communities visited and capture the broadest range of experiences across the municipality, instead of concentrating on any one community. Formal semi-structured interviews and surveys were conducted with twenty-one households in the peri-urban area along each of the major paved roads through rural Santarém: BR-163, Curuá-Una, and PA-445. The farthest community contacted was located on BR-163 about 70 km from urban Santarém.

6. Results

Smallholders' own accounts of their vulnerability complicate the polarized discourses of extreme pressure and modernization. Political ecology perspectives emphasize that vulnerability is not an outcome but a dynamic state (Eakin and Luers, 2006). Smallholders can move in and out of vulnerable states, and movement is directed by their adaptive capacity (Smith and Wandal, 2006).

While the modernization discourse discounts smallholder vulnerability altogether, the extreme pressure discourse characterizes smallholder vulnerability as a homogenous response under a fixed set of pressures due to soy. However, interviews with farmers revealed a diversity of smallholder experiences with soy. We observed that vulnerability amongst smallholders involves (i) *exposure* to the impacts of soy and (ii) *adaptive capacity* to cope with these impacts. Both exposure and adaptive capacity vary between smallholder households, and the results can even be positive.

While neglected in the extreme pressures discourse, smallholders' adaptive capacity is an integral component of their vulnerability to soy. Adaptive capacity is also diverse among smallholders and depends on factors such as proximity to Santarém or the degree of community involvement. It is with knowledge of this adaptive capacity that smallholders perceive themselves as having both the choice and capacity to remain rural.

6.1 Diverse Experiences of Vulnerability to Soy

Smallholders we interviewed have a range of perceptions of soy farmers ranging from antagonistic, neutral, or friendly. Most smallholders describe limited interaction with soy farmers. In the communities designated by local organizations as most impacted by soy expansion, residents tended to be more aware of the political aspects of the conflict but frequently referred to other communities as worse off. No farmer in our study described themselves as suffering or their community as "destroyed." However, the fact that smallholders point to other communities shows their empathy with the struggle of smallholders everywhere.

Several farmers defended soy farmers from criticism, arguing that they have been used as scapegoats for Santarém's deforestation or the problems of small farmers. Often, small farmers know the local soy farmers by name and sell produce to them. While rare, there were a few reports of temporary employment for smallholders and the recent ability to rent machinery from soy farms. In a few cases, smallholders report that a soy farmer had contributed to the local community, bringing better roads or building churches.

Farmers' understanding of those who sold their land illustrates a very different understanding of migration than the extreme pressure discourse. They frequently explained that small farmers sold voluntarily but irresponsibly, accepting unfair offers because they were unable to work the land as a consequence of sickness, old age, or laziness. When asked how the farmers who sold their land fare, farmers in our sample suspect that they are worse off, but that they did not keep contact with them.

In certain communities, small farmers describe their relationship with soy farmers as interdependent. These communities tend to be more isolated and thus garner less support from the city or STR. Often, these relationships form in the wake of extreme rural abandonment. A family that was one of seven remaining households in Prata, where between 40 and 70 families sold their properties, talked about continuing business as usual. Three soy farms were established in their community, the closest just 300 meters from their house. They were some of the few remaining people in that community, and they had no available social network. They lost a number of services from emigration and spoke about *veneno*—the effects of pesticides on their crops—causing them to switch out of beans and rice to grow primarily manioc. Despite these circumstances, they did not emphasize vulnerability to soy and instead said that soy farmers support small farmers.

The effect of industrial soy agriculture on smallholder production is in itself controversial among smallholders. Many say that the small-scale cultivation of beans, rice, and corn are directly impacted by large-scale soy production. The production of these staples is reportedly decreasing in the region and we saw no one selling these products at the market (Personal Communication, STR). Farmers frequently explain that production suffers as a result of pesticide use in nearby soy farms, which drives pests to their plots. However, while a third of the farmers independently mentioned this type of pest transfer, a quarter independently said that this story was not true.

While the effect of *veneno* is an ecologically sound explanation for increasing pest challenges, it was difficult for farmers to give specific evidence from their own farm fields or exact timelines of when they moved away from the annual crops. We did notice a strong consistency in the radical language used to describe the effect of soy by the most politically active of smallholders and the story described by STR. A strong indication that the expansion of soy indeed encouraged a transition out of annual crops is the sharp rise in manioc production, as it is solely a smallholder crop in the region (IBGE, 2010). The driving force of this crop transition cannot be explained in our study, but it is a good example of tension between perceptions and experience.

6.2 Adaptive Capacity

In addition to the more nuanced discourse on their own vulnerability, our research revealed a rich context that supports small farmers' capacity to remain rural. Rural identity, land security, urban-rural linkages, government cash transfers, and community networks all support the farmers' adaptive capacity in the face of the pressures of soy.

Given varied experience with soy, the smallholders in our study were not excluded from the wave of land sales that sent many of their fellow farmers out of their homes. Over half of the subjects interviewed received one or more offers from someone interested in purchasing their land, and all declined. The fact that they were offered an opportunity to leave farming and declined signifies that these smallholders value a farming livelihood over the perceived alternative. These farmers were not looking for an exit route to leave their current livelihood, nor were the pressures of soy so great that they were forced out of farming.

A strong rural identity among the small farmers plays a large part in their resistance to sell. Smallholders focused on farming as an identity for reasons why they did not sell when they received an offer. Farmers speak about family connection to the land where they have lived on for many years. One farmer responded, "the land is where we draw sustenance" (*de onde retira o sustento*). Others responded, "where would food come from?" and "nowhere to go." All reported that they plan to pass their farm on to their children rather than sell it. Selling is virtually unthinkable.

While land tenure insecurity is widespread amongst small farmers in the Amazon, all farmers of this study reported feeling secure in their land ownership. INCRA estimates that less than 30% of smallholders in Santarém have formal title to their land (Steward, 2001), and Ludewig and Brondízio (2009) found that most smallholders in the municipality have no title. However, in our study, a clear majority (72%) of respondents report possession of title, and most of the remaining (16%) report possessing a receipt of sale (*posse*) or (.05%) protocol to demonstrate ownership of the land. All three property regimes (private property with title, protocol, or *posse*) establish the owner's perception of land security. This is an asset that equips smallholders to decline the sale of their land, and that also increases the value of their rural livelihood and willingness to invest in their properties.

Santarém also has unique characteristics that support informal land security. Rural Santarém's proximity to a significant urban center adds value to their land. The communities close to urban Santarém tend to have a 100+ year, multi-generation settlement history, with communities like Tabocal, about 20 km from the city periphery, founded in 1906. These communities have some of the highest property values in rural Santarém due to established infrastructure (schools, electricity, *microsistemas* for water) and easy access (frequent public transportation, good roads) to urban Santarém. These communities are also denser than communities farther from Santarém, since families often locate their homes in a community and station their farm property further away. Such multi-sited households—a family may have a house on the main road, near bus lines, schools, and health services, and have their crop field a few kilometers from the road—is a common strategy to help families benefit from urban services while practicing a rural livelihood (Padoch et al., 2008). The density, high property value, and strong sense of history and community of the

neighborhoods close to the urban periphery make them less attractive to land speculators and capitalized farmers seeking to buy and consolidate properties for rural production. These qualities lend them passive protection from land buyers, and contrast to the case of Prata, where a community far from the city found had less resistance to selling.

As the third largest city in the legal Amazon, Santarém provides an important urban resource to all the rural communities in our study. Santarém is recognized for particularly strong rural-urban linkages, social networks that extend into the city, and multi-sited households (Padoch et al., 2008). Rural farmers rely on the urban population for an accessible consumer market for their products. City residents actively use the three thriving farmers markets, while extensive transportation infrastructure through the peri-urban region, including public bus transportation and three major paved roads, bring farmers to the market. Farmers can also reliably access the goods and services of the city, like bulk food purchases or medicine. Smallholders must also come into Santarém to collect their welfare payments. Almost all farmers rely substantially on federal conditional cash transfers, a trend documented elsewhere in the Brazilian Amazon (Brondízio, 2011). Families receive monthly stipends from several sources: government cash transfers (Bolsa Familia), retirement, and disability pensions. Bolsa Familia pays families about R\$20 per month per child as long as the child attends school. Retirement pensions (R\$510 per month) are available for women over 55 and men over 60, or those with mental health and physical impairments, including depression (ILO, 2009). These transfers buffer smallholders from making economic decisions at the margin but also motivate farmers to assume more entrepreneurial risk (ILO, 2009; Soares et al., 2008). Two families, however, stopped selling at the market and subsist entirely off government payments.

Community organization is high in Santarém, with community associations and STR representatives in almost all communities. Community associations serve as a collective governing body for the community, organizing water distribution systems, communal bus transport to the city market, and social events. With 20,000 members and 250 delegates, STR represents an organizing voice for the rural population, and connects communities to government services. The union states that its main role is to maintain the land for the people who live there, help smallholders understand their rights, and verify their ownership of the land (Personal Communication, President of STR). Rural farmers interact to a high degree with STR because it administers a number of federal and state government social pension programs and helps communities receive credit. The STR delegates organize monthly meetings in their representative community, and are well known and identified as leaders.

New emerging networks show a degree of adaptation behind the emphasis on community fracturing (Steward, 2006; Baletti, 2011). For some small farmers, capitalized soy agriculture can offer opportunities to intensify production via increased access to machinery (tractors, chainsaws), synthetic inputs (now sometimes cheaper than organic fertilizers), and large areas of cleared and tilled land. Clearing regrowth was the most commonly cited challenge in farming for smallholders, and it was eased by expanded access to machinery brought by capitalized soy agriculture operations. Two families actually moved onto former soy farms: one family purchased land from a soy farmer and was able to move off their family's property to

begin intensive fruit cultivation, and another rented land from a soy farmer that they otherwise would not have been able to purchase. These examples are rare and cases of adaptation do not imply that the impacts of soy are minimal. They do, however show how smallholders are not dwelling on their own vulnerability, and are instead taking advantage of opportunities for empowerment.

Pressures and Changes Reported by Farmers	Factors of Adaptive Capacity	Observed Adaptations
<ul style="list-style-type: none"> • Immigration of soy farmers • Establishment of soy fields nearby • Emigration of neighboring small farmers • Pest transfer from pesticides used on soy fields 	<ul style="list-style-type: none"> • Natural capital: pest transfer, pesticide externalities • Economic capital: Conditional cash transfers • Social capital: community organizations, relatively long settlement histories, community infrastructure • Political mobilization in support of smallholders (STR, CPT, Greenpeace, etc.) • Informal land security 	<ul style="list-style-type: none"> • Migration to urban Santarém, Manaus, or new farmstead • No perceived adaption necessary • Greater dependence on welfare • Stop selling or producing certain crops (corn, rice, beans) • Intensify agriculture (borrow machinery from soy farmer, cheaper synthetic inputs) • Sell part of land • Stronger rural farming identity and membership in group

Figure 3. Summary of Smallholder Adaption

7. Conclusions: Encounters and critical consciousness

Small farmers of Santarém are aware of the changes brought about by the soy frontier, but they do not have a uniform experience of these changes and pressures. By examining their perceptions of the personal impacts of soy, we see that smallholders in Santarém have meaning invested in their rural livelihoods. To a certain extent, they exercise a choice to remain rural. Smallholders' experiences of the soy frontier lie between the two polarized extremes of discourse demonstrated in the fraught atmosphere at the Cargill Public Audience. While the modernization discourse disregards the value of smallholder agriculture, the extreme pressure discourse sees soy as a direct threat, capable of erasing smallholder agriculture and its related social and ecological benefits to the region.

However, rather than being a space of dominance and subservience, the soy frontier is an encounter, a contested space of distinct understandings (Vivanco, 2006). It appears that for many smallholders, coexistence is more feasible than originally described by the extreme pressures discourse. Parsing apart the

heterogeneous experiences of smallholders points to opportunities for strengthening local coping strategies and assets that could lead to empowerment.

Both modernization and extreme pressure discourses paint vulnerability as a linear, uniform process. We see that the process of vulnerability often involves diverse feedback between impacts and responses. Exposure to pressures may reduce farmer viability in many cases, but it can also stimulate and give birth to new adaptations. Perhaps what is most distinctive is that the soy frontier crystallizes a critical consciousness, a political awareness of the boundaries, identity, and power of small farmers' social group. For the first time, the soy farmer presents the Santarém small farmer with an "other" against which to define the small farmer.

The story of soy expansion in Santarém is not over. Processing 1 million tons of soy per year, Cargill's port currently runs significantly under its total capacity of 5 million tons (Personal Communication, Cargill). Plans to pave the last stretch of the BR-163 will make truck transportation of soy from Mato Grosso to the Santarém port feasible. This infrastructure improvement will bring the continued establishment of soy agriculture along the road that will presumably fill the port's capacity. Understanding how smallholders interact with soy and their dynamic and diverse adaptive strategies should be a critical component of any future development or conservation strategy in the region.

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