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The Role of Remote Sensing for Understanding Large-Scale Rubber Concession Expansion in Southern Laos

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Article

Large-Scale Land Concessions, Migration, and Land Use: The Paradox of Industrial Estates in the Red River Delta of Vietnam and Rubber Plantations of Northeast Cambodia

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Abstract: This study investigated the implications of large-scale land concessions in the Red River Delta, Vietnam, and Northeast Cambodia with regard to urban and agricultural frontiers, agrarian transitions, migration, and places from which the migrant workers originated. Field interviews conducted near large-scale land concessions for industrial estates in the Red River Delta and rubber plantations in Northeast Cambodia suggest that these radically different concessions are paradoxically leading to similar reconfigurations of livelihoods, labor patterns, and landscapes despite basic differences in these forms of land use. Both the Red River Delta and Northeast Cambodia are frontier environments undergoing extensive agrarian change with migration to work in the large-scale land concessions leading to a shortage of farm labor that anticipates changes in farming practices and farm livelihoods. These population movements will lead to further land-use changes as governments invest in the infrastructure and services needed to support increased population density in the receiving areas. In addition, labor migrations associated with these investments affect land-use practices both at the site of the concession and the places from where the migrants originate.

Keywords: land concessions; tele-connections; livelihoods; labor; landscapes; Southeast Asia

1. Introduction

Four bodies of literature on agriculture change in the developing world overlap in ways that are not always clear. These include literature on frontier environments (Hirsch 2009 [1]), agrarian transitions (Hart et al., 1989 [2], Baird 2011 [3]), migration and remittances (e.g., Jokisch 2002 [4]), and tele-coupling (e.g., Lambin & Meyfroidt 2011 [5]).

Philip Hirsch's (2009) [1] essay exploring frontiers as transitional spaces in Thailand describes agricultural and peri-urban frontiers. Professionals define agricultural frontiers as areas that lie between farmland and forests. These areas exhibit modern ways of organizing production and changes in the way farmers approach farming, conservation, and the management of natural resources (Hirsch 2009 [1]). A complex set of factors promotes the transition of agricultural frontiers. Chief among these are land-use policies that extend ownership or usufruct rights to individuals for residential and agricultural land and in some countries establish mechanisms for granting land concessions for economic purposes such as an agribusiness enterprise. Other factors include logging, construction of roads, and demographic pressures. Hirsch (2009) [1] concludes that the agricultural frontier represents a loss of forest and other natural vegetation in response to demands from the global market for rice and other crops.

The second frontier is the urban transition (Hirsch 2009 [1]; Saksena et al., 2014 [6]; Rigg 1995 [7]), which is a change that drives dramatic rapid social adjustment as farmers and their communities are compelled to change their life styles from rural to more urban ways of life. Urban frontiers, often called peri-urban areas, are associated with piecemeal change and assorted land uses with large amounts of land still used for agriculture. The McGee's (1991) [8] concept of desakota (Bahasa Indonesia for "village-town") is one of the more recognized models of the peri-

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urbanization process. McGee describes desakota regions in terms of six characteristics. These include a sizable number of smallholder farmers, an upsurge in non-farm occupations, immense and rapid movement of people, a combination of land uses including farming, small industries, and suburban expansion, more females in the work force, and an absence of governmental oversight (i.e., bureaucratic "grey zones") that cause unofficial and illegal undertakings (McGee 1991 [8]). Rigg (2006) [9] looks at the urban transition from the viewpoint of the farmer, which is evident in the label he uses for the process—"de-agrarianization"—characterized by factors similar to those listed by McGee.

The agrarian transition refers to a conversion from an agricultural culture where farming provides the largest source of household income and the biggest proportion of a nation's Gross Domestic Product (GDP) to an urbanized, industrialized, and market-based culture, a process known as "de-agrarianization" (Rigg & Nattapoolwat 2001 [10]). Hart et al. (1989) [2] broaden the definition of the agrarian transition to emphasize power and not just relations of production, which highlights the need for case studies that provide insights into how agrarian changes occur in specific places and recognizes the importance of non-economic variables such as gender, age, and family structure (Kelly 2011 [11]).

The literature on out-migration from rural areas overlaps the literature on agrarian transitions. Some scholars argue that migration weakens agricultural systems while others suggest that migration allows farmers to invest remittance income in improving and mechanizing their farming practices (Jokisch 2002 [4]). Scholars know that out-migration causes a shortage of farm labor when farmers especially young workers go to work in non-farm activities in other areas or countries (Rigg 2007 [12]). However, migrant family members sending a remittance income home to their families can help reduce the capital and labor constraints of poor households (Hecht et al., 2015 [13]). The effects of migration, therefore, are not necessarily clear. They can encourage agricultural intensification or at least help maintain output levels with less family labor when remittances enable the hiring of off-farm laborers or the purchase of agricultural inputs such as seeds, fertilizers, livestock, and laborsaving equipment (Manivong et al., 2014 [14]). Many studies, however, conclude that migration weakens agricultural systems because the loss of workers robs households of necessary labor and families rarely invest remittances in farming or other improvements needed to preserve and develop the agricultural sector (Hecht & Saatchi 2007 [15]; Hecht et al., 2012 [16]; Maharjan 2010 [17]).

Lastly, there is a body of literature on "tele-coupling" or "tele-connecting" (e.g., Lambin & Meyfroidt 2011 [5]; Seto et al., 2012 [18]; Liu et al., 2013 [19]; Baird & Fox 2015 [20]). The initial idea of tele-connections appeared in the climate literature and referred to meso-scale atmospheric processes that have climate implication in different places (Eakin et al., 2014 [21]). The concept of land tele-coupling seeks to develop a better understanding of cause-and-effect linkages between distant and apparently unconnected places as well as socio-economic and land-use dynamics. Since governance of the components within linked systems tends to be independent and uncoordinated, the impact of tele-coupling processes, which often are ancillary, developing, and of a second or third order, are difficult to expect or assess (Eakin et al., 2014 [21]).

This study purposely selected two perceptually different sites—an urbanization frontier in the Red River Delta and an agricultural frontier in Northeast Cambodia—in order to examine how these different frontier environments are affected by the transformation of agriculture, migration, and tele-coupling. As suggested by Marcus (1995) [22], we look at the site of change—the industrial estate in the Red River Delta and the rubber plantation in Northeast Cambodia—but since both activities require migrant workers, we also looked at the migrants' home places to document the impact of migration on their places of origin. We begin with a brief review of the national and local policies that permit international and

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domestic investment in large-scale industrial estates in the Red River Delta of Vietnam and rubber plantations in Northeast Cambodia. We then document the changes in land use and labor associated with these developments at the site of the development and at the home places of the migrant workers.

2. Background

2.1. Land and People

The Red River Delta is the flat, low-lying plain formed by the Red River and its tributaries (see Figure 1). Measuring some 15,000 square km, the delta is home to almost 19 million people (2010 census [23]), which is approximately one-fifth of Vietnam's total population. It has a population density of approximately 1260 people per square km. The delta is also the second most important rice-producing area in Vietnam. It produces 20% of the national crop. The delta region hosts other important economic activities such as wild-capture fisheries, aquaculture, harbor construction, mangrove forestry, and land reclamation for agriculture. Since the early 1990s, the Vietnamese government has seen this area as an urbanization frontier and has promoted peri-urbanization through the establishment of large industrial zones clustered in Hanoi, Nam Dinh, and Hai Phong. The development of these zones destroyed productive rice fields and natural habitats and caused water and soil pollution problems. Peri-urbanization has also driven socio-economic change as migrants from nearby communities and the lower delta moved closer to Hanoi to participate in the work economy.

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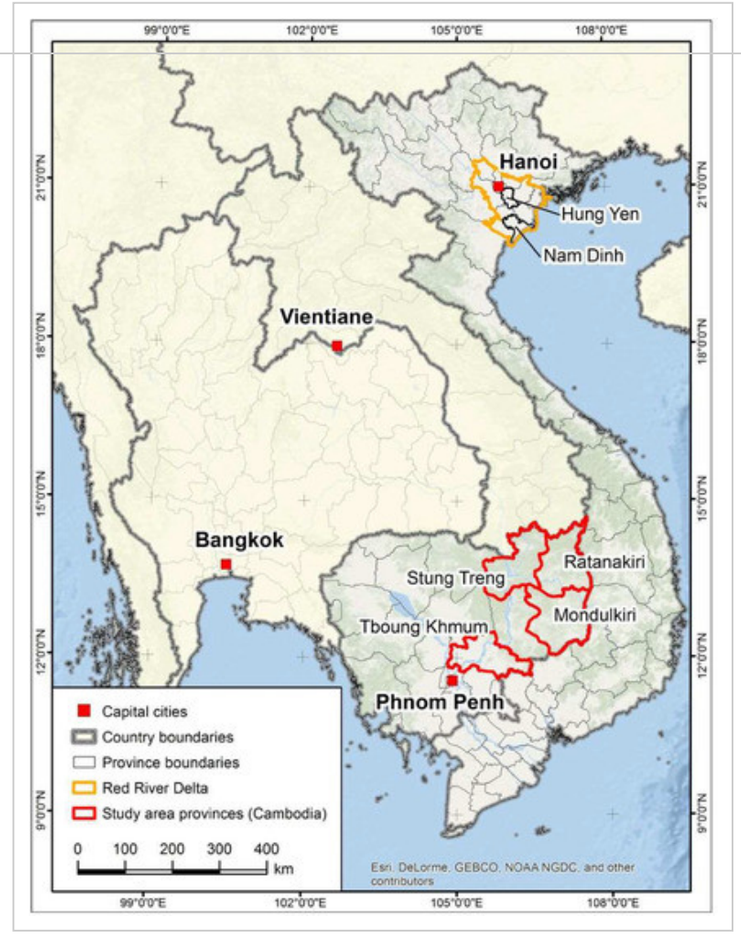

Figure 1. Study sites in the Red River Delta and Northeast Cambodia.

Northeast Cambodia, which is sometimes considered to consist of the three provinces of Ratanakiri, Mondulkiri, and Stung Treng (see Figure 1), is one of the last agricultural frontiers in Mainland Southeast Asia. The region has been home to vast swathes of forests sparsely inhabited by several distinct ethnic minority groups who practiced shifting cultivation in the uplands and ethnic Lao people who grew paddy in the lowlands. In 2008, the population density was only about nine people per square km, which makes this one of the least densely populated regions of Southeast Asia. Historically, transportation between the northeast and other parts of the country was difficult. Today, a newly built road sponsored by the Chinese government links the Northeast with Phnom Penh while an older road links the region to Laos and China in the north.

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The promotion of industrial estates in Vietnam echoes a global narrative that industrial states provide a pathway for developing countries to accelerate national economic development. This includes creating employment opportunities and spreading the benefits of industrialization across the nation (particularly in rural and backward areas), promoting small businesses, and helping small and artisan industries relocate away from over developed urban areas (World Bank 2017 [24]). Similarly, the promotion of rubber plantations in Cambodia parallels a global narrative that countries must abandon small-scale modes of agricultural production and modernize their agricultural sectors. Justifications for promoting large-scale land acquisitions reflect the view that traditional forms of agricultural production are less productive than commercial production systems (White et al., 2012 [25]). These narratives of the importance of industrial development and the promotion of large-scale agricultural production play out in the land-development policies promulgated in these countries.

Vietnam and Cambodia both recognize smallholder rights to the lowland paddy region but give the state priority to use "underutilized or undervalued" land for national development. Both countries rely on external inputs of knowledge and investments from state and private entrepreneurs who are both domestic and international for land development. China has played an important role in large-scale land investments in both countries. Cambodia, Thailand, and Vietnam are also important actors. Domestic investors play large roles in both countries and both countries rely on relatively inexpensive labor.

2.2. Policy Context of Land Concessions and Industrial Estates in Cambodia and Vietnam

2.2.1. Vietnam

In 1986, Vietnam implemented free market reforms known as Doi Moi (renovation) that instigated movement from a command economy with centralized planning to a decentralized transitional economy where a mix of market mechanisms and central state control determine the allocation of resources. The land law of 2003 granted farmers long-term land-use rights as well as rights of land transfer, exchange, lease, inheritance, and mortgage. Central and local governments also enact five-year and 10-year plans that specify in detail the acreage of land to be devoted to annual crops especially rice. These plans require most farmers in the Red River Delta to grow rice two times a year or face the possibility of having their land confiscated by the government (Giesecke et al., 2013 [26]).

In 1994, Decree No. 36/CP3 provided the legal basis for developing industrial zones and offered a wide range of incentives to domestic and foreign investors (Phung 2002 [27]). The government rents land to Industrial Zone Infrastructure Development Companies. These companies clear the land, resettle people who are living in the project areas, and construct roads, electric plants, water plants, and other necessary infrastructure. These companies then rent land in the industrial estates to investors (firms) at a suitable rental fee for a certain period. These companies propose a land rental fee that must be in accordance with the standard price set up by the government (Phung 2002 [27]).

In the Red River Delta, these policies granted small holders long-term land-use rights to farmland but required them to grow two crops of rice a year on land zoned for rice production. At the same time, industrial development policies allowed the state to confiscate and compensate

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farmers for their land in order to develop industrial estates. We sought to explore the effects of these contradicting policies on land use in the delta.

2.2. Cambodia

In 2001, Cambodia approved a revised land law that created a new legal framework for land tenure and administration and initiated a number of important reforms. First, it provided "ownership" rights to residential and agricultural land. Second, it developed a new method for categorizing land ownership, including state-public land, state-private land, private-individual land, and indigenous communal land. Third, it formalized a system for authorizing land concessions on state-private land. The government may grant land concessions for commercial production purposes such as an agribusiness enterprise (Economic Land Concessions or ELCs) as well as for subsistence purposes providing land for landless and land-poor farmers (Social Land Concessions or SLCs). The law stipulates that ELCs have a maximum duration of 99 years, are limited to 10,000 ha per concessionaire, and must be put to use within 12 months of being granted (Scurrah & Hirsch 2015 [28]). By 2012, ELCs covered approximately 2 million ha (Open Development Cambodia 2015 [29]) or about one-half of Cambodia's total arable land.

The rapid increase in ELCs led to a surge of land disputes between concessionaire companies and local residents. In response, in 2010, the government initiated an unofficial strategy known as the Leopard-Skin Policy (Sbek Khla) that sought to enable concession development by regulating rather than by eviction. This policy treated smallholders who lived in an area prior to the granting of economic land concessions—occupants whom official discourse often terms "encroachers"—as legitimate parts of the economic landscape and developed concessions around them rather than by evicting them (Dwyer, Polack, & So 2015 [30]). One foreign advisor to the Cambodian land sector described the policy as "leaving the people where they are and just using the rest" (Müller 2012 [31]). Similarly, the Phnom Penh Post (Becker 2012 [32]) called the approach a "workaround strategy" in the literal sense of leaving small-scale farmers in place and making companies work around them.

In May 2012, the government initiated a new policy (Order 01 on Measures Strengthening and Increasing Effectiveness of the Economic Land Concessions Management) freezing the issuing of new ELCs and ordering a review of existing concessions. The government followed Order 01 with a campaign to fast track the granting of land titles to households with land claims in or near ELCs, forest concessions, forestland, or other state land (Milne 2013 [33]; Müller & Zülsdorf 2013 [34]). Although the government issued many individual land titles under Order 01, authorities discontinued the process after the July 2013 national elections. In 2013, more than 330,000 ha of ELCs were cancelled (ADHOC 2014 [35]), and a freeze on new ELCs was imposed, which suggests that the government recognizes the need to review the ELC mechanism and focus on the inequalities at the heart of widespread unrest.

In Northeast Cambodia, these policies granted ELCs that covered 22.1% and 23.4% of the land in Stung Treng and Ratanakiri Provinces, respectively (see Figure 3). As a result, local ethnic minorities have lost access to their land. Sopheak Nika and Sopheak Pheenik are two of the largest rubber companies operating in Sesan District of Stung Treng Province. Each company was allotted a 10,000 ha concession. Baird (2008) [36] discussed the Sopheak Nika and Sopheak Pheenik concessions and the enclosure of the farm and forestlands of villagers living near the plantations. A majority of the 20,000 ha concessions was planted with rubber. However, due to the efforts of a local NGO, Development and

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Partnership in Action (DPA), the government returned 3000 ha from each concessions to the community. Some people reported that villagers began practicing shifting cultivation on some of the land. The ethnic Brao village of Katot received one-half of the land and the Jarawp village (mixed Khmer and Brao) received the other half. The village headman of Katot Village reported that DPA started working in the village just a few months after the concessions started developing their rubber plantations.

The Sopheak Nika and Sopheak Pheenik companies needed a labor force available to work for them at odd hours seven days a week. Local people reportedly were not interested in this arrangement since they needed time to harvest rice and time for other social and economic activities. Only local people who do not cultivate rice are available to work all year round and are now working for the companies. The companies consequently decided to hire laborers from southern Cambodia where there are large number of landless villagers and many families have moved to the Northeast to work for the companies.

2.2.3. Study Area and Methods

Researchers conducted fieldwork in Vietnam between February 2015 and October 2016. In Vietnam, Fox and Nghiem conducted the interviews. The first author accompanied Nghiem to the field on three occasions. In these instances, Nghiem provided near-simultaneous translations of the interviews. We went to the field with the specific intention of speaking with two groups of households. In Hung Yen Province, we spoke to people who lost last to the industrial zone either because the industrial estate appropriated the land or because it was difficult or impossible to continue farming because of polluted water, soil contamination, or other problems. In Nam Dinh Province, we identified people whose adult children worked in factories usually elsewhere in the Red River Delta. Many of these people had migrated to the place of employment while others continued to live at home. All of them, however, were no longer actively engaged in farming. We conducted interviews using a semi-structured interview format with a list of key topics. Nghiem took notes during the interviews (as did the first author when he was present) and these notes were later typed up and major findings were recorded in an Excel spreadsheet.

After initial visits to the field sites in the summer of 2015 by Baird, Fox, and Hong and his students from the Royal University of Phnom Penh, field workers conducted interviews with rubber tappers in Cambodia between November 2015 and July 2017. The first author worked with Hong and his students to conduct field interviews in Stung Treng Province in Northeast Cambodia. In the interviews with rubber tappers, we identified the provinces from which they originated. Tbuong Khmum had the second largest number of migrants so we chose to spend several days interviewing households in communities reported as the homes of the tappers. The first author was present during all field trips, but the Cambodian team conducted the interviews. We used the same semi-structured interview methods used in the Red River Delta surveys, with key topics modified to address rubber tapping. As described above, we took notes and later typed them up with major findings recorded in an Excel spreadsheet. We conducted most of the interviews in the Northeast with rubber tappers who had migrated to work on the plantation. We also interviewed people who had migrated to work as farmers or traders. Finally, we interviewed the managers of three rubber plantations.

Hurni and Fox prepared the figures as part of the larger project funded by NASA entitled: “Forest, agricultural, and urban transitions in Mainland Southeast Asia: Synthesizing knowledge and developing theory”.

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3. Industrial Estates in the Red River Delta and Rubber Plantations in Northeast Cambodia: Similar Stories

3.1. Vietnam

In the Red River Delta, we focused on telling two stories including one of farmers living in Hung Yen Province about 30 km from Hanoi and another of farmers living in Nam Dinh Province about 100 km from Hanoi (see Figure 2). Authorities describe Hung Yen Province as the eastern gate of Hanoi. Crossed by three of Hanoi's major beltways and lying in the middle of the China-Hanoi-Hai Phong economic corridor, the province attracts FDI from global industrial powers as well as domestic investments. In order to benefit from its favorable location, the provincial government plans to build 19 concentrated industrial parks on 6650 ha of land by 2020. In contrast, the economy of Nam Dinh Province depends mainly on agriculture. It is one of the most important agricultural areas in Northern Vietnam for grains such as rice and corn as well as fruits and cotton. The province, however, is beginning to transform from an agricultural to an industrial economy.

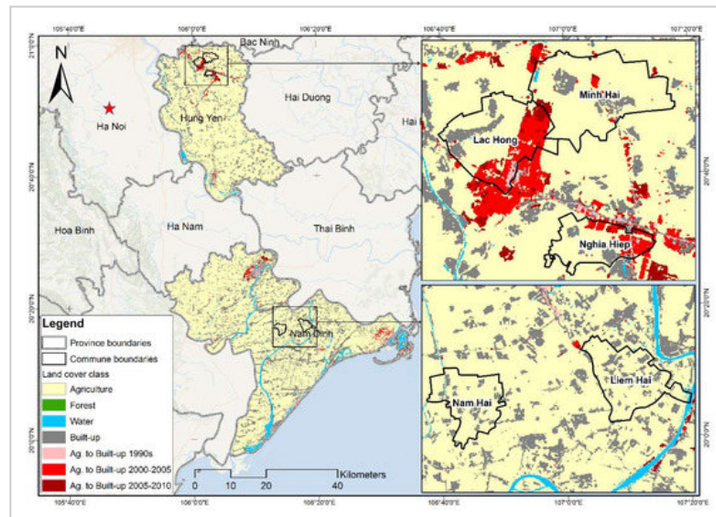

Figure 2. Study Sites in Red River Delta.

In Hung Yen, we interviewed people living in Minh Hai and Lac Hong Communes (Văn Lâm District) and in Nghĩa Hiệp Communes (Yên Mỹ District) located near the Hung Yen Industrial Zone. According to officials from the Hung Yen Department of Labor Management, the industrial zone was developed in the early 2000s and is divided into two tracts. Together, the two tracts cover almost 900 ha and host 240 companies. In 2015, the industrial zone employed 35,000 laborers. Of these, 40% migrated to work in the zone. Most migrants are from the Red River Delta and

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all are from Northern Vietnam. The industrial zone set aside 20% of the land for building housing for laborers, but, as of today, no housing has been built and laborers rent housing in neighboring communes.

Table 1 summarizes interview results from households in the two provinces. The average age of factory workers and professionals was 30 years old and 55% of them were female. Of respondents reporting salary, the average was 4.6 million đồng (VND) per month ($200). They worked an average of 10 h per day and had four days off per month. A total of 16 respondents reported that salaried family members contributed financially to supporting household livelihoods. An average household received 1.5 million đồng (VND) ($66) per month from employed family members who either lived in the house or had migrated.

Table 1. Results of household interviews in Hung Yen and Nam Dinh provinces.

Among people who reported farming as their major occupation, the average age was 48 years old. The average household had 344 m^2 of residential land and 1124 m^2 (0.1 ha) of agricultural land (note the average household lot size in the U.S. is 766 m^2). All households reported owning farmland and most reported being involved in some farming. As required by national and provincial policies, all farming households continued to plant rice twice a year in which a majority of the households consumed. Some respondents raised chickens and other small livestock and a few rented their land out to others. Seventy-two percent of the households had lost land to the industrial estate. On average, they had been compensated for 1167 m^2 (0.1 ha) of land (both residential and agricultural).

Farmers have mechanized and hired people to plow their remaining fields and thresh their crops. Some households purchased plows and threshers and hired themselves out to perform these tasks. Respondents reported that it was difficult and unproductive to grow rice in recent years because of pollution, the breakup of their fields into smaller disjointed pieces, and rat and pest infestations. The world price of rice (5% broken milled white rice) has fallen from a high of $1015 per ton in April 2008 to $372 per ton in January 2017 (World Bank 2017 [24]). People are tired of farming because of low productivity and the low market price. Three households reported abandoning rice growing. Farmers would prefer to grow higher-value cash crops but government regulations forbid this because of zoning regulations that require them to grow two rice crops per year or face the possibility of losing their land. People choose to work in the industrial park because of fixed salaries, health insurance, and other benefits. Some households also have built rooms to rent out to migrant factory workers. We recorded household annual income for 14 households. The average income for these households was approximately 98 million đồng (VND) ($4325) per year.

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In interviews with managers of five companies in the Hung Yen Industrial Zone, we identified the home province of 605 laborers. After Hung Yen, most laborers came from Bac Ninh and Nam Dinh Provinces. We purposely selected 10 households in Nam Dinh Province known to receive remittance income from their children including five households from Liem Hai Commune (Truc Ninh District) and five from Nam Hai Commune (Nam Truc District). The demographics of these 10 households show some interesting differences from households in Hung Yen Province. The average household had only 4.5 people (as compared to six people in Hung Yen). The mean age was 37 (compared to 32 in Hung Yen) and only 60% of household members lived in the house (compared to 84% in Hung Yen). When asked about the major occupations of their household members, respondents replied that 47% were employed (as compared to 36% in Hung Yen) with 29% as factory workers (compared to 18%). The proportion reporting professional or multiple jobs was the same in both places. Seven respondents reported that employed family members help to support the household. As in Hung Yen, they received on average about 1.5 million đồng (VND) ($66) per month from employed family members who either lived in the house or had migrated.

Of people who reported farming as their major occupation, the average age was 56 years old. The average household had 208 m^2 of residential land and 2700 m^2 of agricultural land (as compared to 1124 m^2). None of these households had lost land to industrialization. Farmers in Nam Dinh have mechanized land preparation and harvesting more than have farmers in Hung Yen and everyone is required to participate in these activities. All 10 households reported hiring people to plow their fields and to harvest them with combinations and four of these households reported that they used their remittance money to hire laborers for this purpose. All households reported a shortage of labor and many farmers felt they would be the last generation to engage actively in farming. As in Hung Yen Province, farmers would prefer to grow high-value cash crops rather than rice, but zoning regulations limit their options. Officials from the Truc Ninh District Department of Agriculture, however, reported that they are not currently enforcing the requirement to grow two rice crops a year because, even if farmers plant rice, they put minimal effort into it.

While few respondents were willing to consider selling their land, many were willing to rent-out land if they could find a renter. Several large-scale enterprises have shown interest in renting land but have not been able to find enough contiguous land to make large-scale farming feasible. District agriculture officials reported that the Hoa Phat Steel Joint Stock Company wants to develop a cattle feedlot to supply beef to the market in Hanoi. The company would like to rent as much as 500 ha in the Liem Hai Commune but have only been able to rent 65 ha of contiguous land from 120 households. Numerous problems make it difficult for the Hoa Phat Company to rent enough land including the fact that their land tenure documents (green books), which need to be renewed every 30 years, are currently expired. In another example, the Vingroup Corporation, which is one of the most powerful corporations in Vietnam, wanted to rent 140 ha from 3000 farmers in Xuân Hồng Commune of Xuân Trường District (Nam Dinh Province) to grow vegetables. Local authorities forced farmers to consolidate their land so that the Vingroup could access a 140-ha plot. The national government recently asked the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment to change land laws and regulations to support the consolidation of plots into larger fields. Once local authorities get involved, farmers will not be able to negotiate fair compensation for their fields.

In general, farming has been disturbed in both Hung Yen and Nam Dinh Provinces. Farmers in Hung Yen near the industrial zone report problems with pollution, the disruption of irrigation channels, smaller disjointed fields, rat and pest infestations, and the low price of rice as major

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disincentives for continuing to farm. Given a choice, farmers would prefer to grow vegetables and peach flowers for the Tet celebration to sell to factory workers. Other farmers would prefer to abandon farming altogether. In the two communes in Nam Dinh Province that are not close to factories, farmers report a shortage of labor to work the land. Population data from the 2006 and 2011 Vietnam Agricultural Censuses support this finding. Over the five-year period, population in the three communes near the industrial zone grew by 3% to 5% while the population in one of the communes in Nam Dinh decreased (−0.03%) and in the other grew by only 0.23%. (During this five-year period, the total population of Vietnam grew by 1.1%.) Respondents in Hung Yen reported more people per household, younger members, fewer factory workers, and more farmers than in Nam Dinh.

In Nam Dinh, older farmers are farming more land with less labor and see little hope for the future. They do not want to sell their land because they realize an economic downturn could send migrant workers back home, but they would like to grow higher-value cash crops and they are willing to rent out their land if someone is willing to pay a fair price. In both places, we see the beginning of a transition out of rice farming into commercial activities. While the Red River Delta will remain densely populated, there will be fewer people engaged in farming.

3.2. Cambodia

In Cambodia, we also focused on telling two stories including one of rubber tappers in Sesan District, Stung Treng Province and another of farmers and rubber tappers in Tboung Khmum Province. The two provinces are about 160 km apart (see Figure 3). In 2005, the government granted the Sopheak Nika Investment Agro-Industry Company a land concession of 10,000 ha to grow rubber trees in Sesan District. As of 2015, the company had planted approximately 5000 ha of rubber.

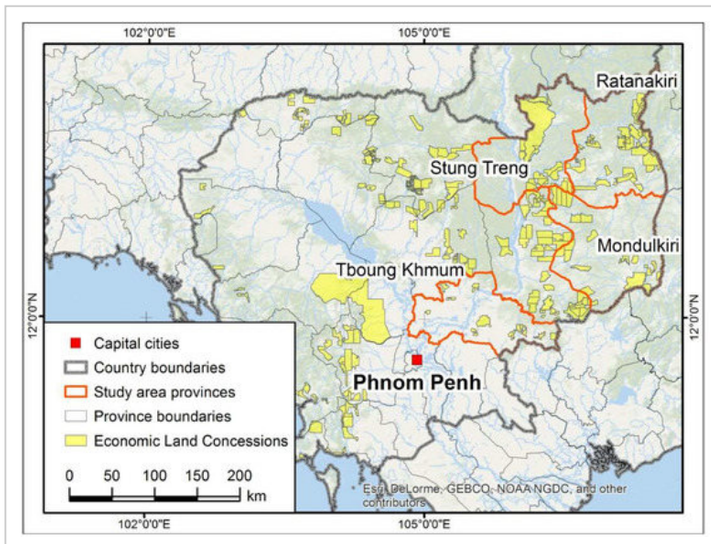

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Figure 3. Study sites in Cambodia.

We interviewed people who had migrated to Sesan to work as rubber tappers or to acquire farmland (see Baird and Fox 2015 [20]). The mean age of informants was 35 years old and the average family had four members (see Table 2). Migrants originated from eight provinces with the largest number coming from Kampong Cham (33%), Tboung Khmum (26%), and Kandal (12%). Other provinces of origin included Prey Veng, Kampong Thom, Svay Reing, Takeo, and Siem Reap. On average, respondents had moved to Sesan District five years earlier. Of those interviewed, most reported that they migrated to work for the rubber plantations. Rubber tappers reported that, on average, two family members migrated with them to the Northeast, 75% of them stated that their spouse or other family members also worked for the plantation, and 51% claimed that they intended to stay and settle in Stung Treng. We interviewed a rubber plantation manager who estimated that approximately 5% to 10% of tappers eventually save enough to buy land. Our data suggested that approximately 13% were able to buy land in the Northeast (see Table 2).

Table 2. Results of household interviews in Stung Treng and Tboung Khmum Provinces.

In addition to rubber tappers, there were approximately 49 households of farmers and others who had migrated to buy land on the periphery of the Sopheak Nika plantation (see Baird and Fox 2015 [20]). We interviewed 16 people who reported that they were farmers and did not work for the rubber company and four people who reported doing various jobs such as selling products in the market (see Table 2). These respondents reported an average household size of four members, which suggests a population of 210 additional migrants. Slightly more than half of these respondents reported buying land in the northeast, with a mean size of 1.35 ha per household. All but one of these households purchased their land in 2012. Three respondents reported that they use land that they do not own either encroaching on plantation land or borrowing from other people.

We estimate that when all the rubber currently planted in Stung Treng comes into production, it will require a labor force of approximately 20,000 new tappers. Family members will accompany most tappers. The combined population of rubber tappers, their families, and people who migrate to purchase farmland will increase the population of the province by about 30% over its 2008 population level. Therefore, in Northeast Cambodia, investments in industrial plantations will lead to a large increase in population density. The 1998 and 2008 Cambodian national censuses support this conclusion. The population in Sesan District grew at an annual rate of 4.52% during this period while the national annual

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population increase was only 1.59%. Many minorities in Sesan District have already lost significant amounts of land to economic land concessions and settlers and the situation could become much worse.

We also interviewed the managers of three rubber plantations. All three companies are Cambodian-owned because it was easier for our Cambodian collaborators to gain access to these plantations than those owned by Chinese or Vietnamese investors. The managers agreed that they do not generally employ ethnic minorities from the local villages because such people do not want to work full-time and they want to be paid daily or weekly instead of monthly. Therefore, almost all of their tappers are migrants from elsewhere in Cambodia. They use similar word-of-mouth methods to obtain new laborers by relying on tappers to recruit friends and relatives from their home villages. While they all agree that ideally it is best to employ one tapper per hectare of trees, they were only employing one tapper per three or four ha. They cited two reasons for this. First, rubber prices fell drastically between 2011 and early 2017 and rubber is only marginally profitable or even loses money. In spite of this, the government requires the plantations to continue to plant more rubber trees every year in order to meet the obligation that all concessions utilize the land they were granted. When the plantations start tapping these trees in six to seven years, latex supplies will grow. The law of supply and demand suggests that, when supply grows, prices may fall further. The second reason they do not employ more tappers is that tappers are not available. With the growth of industrial plantations as well as textile and other industries, labor is becoming increasingly scarce. They all agreed that when they finish planting all rubber concession land and begin to tap it, they will face a labor shortage. As in the Red River Delta, labor scarcity is a growing issue that will affect future land-use changes.

In Tboung Khmum Province, we interviewed people living in Tmor Pech Commune in Tbuong Khmum District and people living in Toul Shope Commune in Ou Reang Ov District (see Table 2). In this province, most households reported farming as their main source of income. Additionally, six households reported diverse activities such as selling ice, meat, and vegetables in the market, fishing, and working for a logging company, while nine households reported tapping rubber. As in Sesan District, the Sopheak Nika Investment Agro-Industry Company manages the rubber plantations in Ou Reang Ov and Tboung Khmum Districts (the Chub Rubber Plantation formerly managed these lands). The average interviewee in Tboung Khmum was 48 years old while, in Stung Treng, there was a much younger population with a mean age of 35. The tappers in Tboung Khmum did not own any land or houses (as opposed to 100% of the farmers who owned land and 85% who owned houses).

As in the Northeast, it is clear that rubber tappers in Tboung Khmum are poorer than farmers or people who do not work for the rubber plantation. In general, however, young people from all types of families (farmers, tappers, and others) are leaving the province to seek their fortunes elsewhere. Approximately 24% of the households we interviewed had family members working in Thailand, 10% had family members working in factories elsewhere in Cambodia, and 31% had family members working in Northeast Cambodia (see Table 2). It is not possible to tell whether young people are leaving Tboung Khmum because of push or pull factors. In household interviews, we heard that young people went to work in Bangkok (mainly in construction), Phnom Penh (mainly women to work in garment factories), and Kampong Cham (to work in services). In addition, young people from all types of households went to the northeast to work on the plantations or related jobs. Everyone who spoke of moving to the northeast (whether they were farmers, tappers, or others) expressed an interest in buying land, but only 50% of farmers, 22% of

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tappers, and 16% of others had actually managed to do so. Approximately 40% of households sent income earned in Northeast Cambodia to someone else. Recipients used this income almost exclusively for meeting household needs.

4. Frontier Landscapes, Land Use, and Labor

Both the Red River Delta and Northeast Cambodia are frontier environments undergoing extensive agrarian change, with migration to work in the large-scale land concessions leading to a shortage of farm labor in places of origin that anticipates changes in farming practices and farm livelihoods. Our interviews suggest that the introduction of large-scale land concessions for industrial estates in the Red River Delta and rubber plantations in Northeast Cambodia are leading paradoxically to similar changes in livelihoods, labor patterns, and landscapes despite the basic differences between industrial production and plantation agriculture.

As the pace and scale of people migrating out of rural areas has increased over the past few decades, scholars have raised concerns about the effects of this migration on agriculture and agrarian landscapes (Jokisch 2002 [4]). Scholars have suggested that the removal of labor threatens the capacity of households to respond to labor demands, which leads to a decline in cultivation and agricultural production and/or to forms of agriculture that require less labor such as broadcast sowing and mechanized plowing and harvesting. They have also suggested that remittances have the potential to overcome labor shortfalls by providing capital inputs to make agricultural improvements. In Vietnam, we found aspects of both of these consequences.

In the Red River Delta, large-scale investments in industrial estates have attracted young people from rural areas to migrate for employment. Simultaneously, back on the farm, the opportunity to hire tractors and combine harvesters has decreased the amount of labor needed to produce rice, but has increased the need for cash to pay for these services. Young people who migrate often provide the cash needed to continue farming. This is the second consequence postulated by scholars. Remittances lead to intensification and modernization of agriculture, which is an outcome documented by a number of studies (Adger et al., 2002 [37]; Findley 1987 [38]). All the households we interviewed, however, reported a shortage of farm labor. Many farmers believe that they will be the last generation to engage actively in farming. This is the first consequence noted above. Migration leads to a shortage of labor and threatens the decline of farming, which is an outcome noted by others. Jonathan Rigg, who is well-known for his work on the agrarian transition and the diversification of farm income (Rigg 2006 [9]), also concludes that, since the turn of the millennium, labor is in short supply in rural areas across Asia (Rigg et al., 2016 [39]; Rigg & Salamanca 2017 [40]).

Both the hypothesized consequences of migration—labor shortages and, therefore, dis-intensification or abandonment of agriculture and investment of remittances into the intensification and modernization of agriculture—are tele-connection effects. The development of industrial estates and the migration of rural youth to work in these estates can affect the migrants' sending communities through investment of remittances and/or through the absence of labor. Over the longer term, the shortage of labor may lead people to sell or rent their land. Like Rigg (2016) [39], we found no evidence that people were currently willing to sell their land. Many wanted to rent-out their land, however, but could not find renters. In contrast, several large-scale enterprises have shown interest in renting land but cannot find enough contiguous land to make large-scale farming feasible. The national government is beginning to create the institutional mechanisms needed to encourage farmers to rent-out land to

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farming enterprises. The result could be a radically transformed landscape as young people abandon farming for factory work and older farmers rent-out their land to large-scale enterprises. If this happens, the development of industrial estates in the Red River Delta will have an impact far beyond anything predicted by government officials or planners seeking to accelerate national economic development, create employment opportunities, and spread the benefits of industrialization more evenly across the country. The unplanned consequence would be the transition of smallholder agriculture to progressively larger farms.

In Cambodia, the migration of rubber tappers to work on the plantations in Stung Treng Province, as well as farmers looking for comparatively inexpensive land to buy, will increase the population of the province by up to 30% over its 2008 level. Similarly, communes in the Red River Delta, where industrial estates are being developed, have population growth rates that are three to five times the national average. These changes in population will lead to further land-use changes as governments invest in the infrastructure and services needed to support the increased population density.

In Tboung Khmum Province, which is the place of origin of many of the rubber tappers, young people from all types of households are migrating to earn cash incomes. A comparison of the 1998 and 2008 censuses for Tboung Khmum District shows that the population increased by only 297 people over the decade (fewer than the number of babies born during this period), which is clearly more people moving out than being born each year. In the Ou Reang Ov District, the population actually decreased by 1859 people (Open Development Cambodia 2018 [41]). We cannot blame this out-migration exclusively on the new rubber plantations in the northeast. The drivers of migration are multiple, and the tele-coupling explanation that large-scale industrial developments in one place lead to land-use changes elsewhere distorts reality in places where more than one outside factor is driving change.

Since the end of World War II, labor has been an abundant resource in mainland Southeast Asia. However, historically labor was scarcer than land. Today, labor seems to be reverting to a historical norm of shortage. As industrial estates and plantations continue to develop, labor is becoming the main constraint on future growth. In this situation, rubber plantations are paying high wages to attract and maintain tappers despite low rubber prices on the global market. The tappers we interviewed in Stung Treng reported an average wage of $157 (640,000 Riel) per month, ranging from a minimum of $20 (80,000 Riel) to a maximum of $270 (1,100,000 Riel). In addition to their wages, workers receive free housing and a rice allowance for each worker and child. In comparison, the Phnom Penh Post (2017) [42] reported that the minimum monthly wage for garment and footwear workers was $170 a month. Clearly, in order to keep workers, plantation owners have to pay competitive wages.

5. Conclusions

This paper reviewed the changes in national policies that permitted the development of large-scale industrial estates in the Red River Delta of Vietnam and rubber plantations in Northeast Cambodia and documented the changes in land use and labor associated with these developments. We summarized the major government policies that enabled the establishment of large-scale land investments in the two regions. While capital, both domestic and international, plays an important role in the growth of these estates, national and local government policies set the stage for their development. As Pedersen (2016) [43] concluded in Tanzania, government actors control the policy-making processes that

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regulate access to land. This broadens the conception of the land-grab literature, which often maintains a focus on theft and dispossession by capitalists, and acknowledges that actions by local-level and state-level players are much more significant than initially believed (Baird 2014 [44]; Baird and Barney 2017 [45]).

Labor is a key component of any land-use change. Investments that attract labor either to an industrial estate or a plantation affect land use in the place from which the labor originated. This is clear in the Red River Delta as people emigrate from the rice-growing basin of Nam Dinh Province to work in the factories of Hung Yen and elsewhere, leaving fewer, older farmers to work the land. The migration of laborers in Cambodia is changing the demographic character of Northeast Cambodia as well as the central heartland from which the migrants originate, which again leaves fewer and older farmers to grow crops.

In land-change studies, scholars use the tele-connections framework to conceptualize the linkage between local land-use changes and related land-cover changes elsewhere (Haberl et al., 2013 [46]). This study suggests that the area undergoing the development of large-scale industrial estates in the Red River Delta of Vietnam and the area undergoing the change to rubber plantations in Northeast Cambodia are both frontiers. These are areas where change is occurring with effects that spread and last beyond their primary locus and period of activity (Hirsch 2009 [1]). In Hung Yen Province, these changes are causing a shortage of farmers in Nam Dinh Province that may eventually lead to fewer farmers cultivating larger land holdings. The rapid development and interaction of industrial estates near Hanoi and the decline of agricultural production in provinces deeper in the Red River Delta have occurred in somewhat of a governance vacuum (Eakin et al., 2014 [21]).

As studies make these interactions and causal relations visible, government authorities may incorporate their results into governance and decision-making in Vietnam at national, provincial, and local levels. Likewise, in Cambodia, the development of large-scale rubber plantations is beginning to lead to a population boom in the Northeast composed primarily of rubber tappers and their families as well as farmers attracted by the promise of cheap land. In Tboung Khmum Province, these changes are causing a shortage of farmers that may eventually lead to different ways of farming. Planners should have anticipated both the rapid development of rubber plantations and an accompanying increase in population density in Stung Treng and loss of population in Tbuoung Khmum. Unfortunately, they did not. As empirical studies like this make these changes more discernable, government policies may adapt. We need to develop a deeper and more comprehensive understanding of land-use changes and their implications for the broader landscape. This requires that we also consider the policies that enable the investment of capital in land and the labor requirements of such new investments. The loss of labor from farming communities to large-scale land investments will affect land use in the places from which the laborers originated.

Author Contributions

Conceptualization, J.F.; Methodology, J.F., I.G.B., T.N., H.K., K.H.; Software, K.H.; Validation, J.F., T.N., H.K., K.H.; Formal Analysis, K.H.; Investigation, T.N., H.K.; Resources, J.F.; Data Curation, T.N., and H.K.; Writing-Original Draft Preparation, J.F.; Writing-Review & Editing, J.F., T.N., H.K., I.G.B., K.H.; Visualization, K.H.; Supervision, J.F.; Project Administration, J.F.; Funding Acquisition, J.F., K.H., I.G.B.

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The authors declare no conflict of interest.

References

1. Hirsch, P. Revisiting frontiers as transitional spaces in Thailand. *Geogr. J.* **2009**, *175*, 124–132. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Revisiting frontiers as transitional spaces in Thailand&author=Hirsch,+P.&publication_year=2009&journal=Geogr.+J.&volume=175&pages=124–132&doi=10.1111/j.1475-4959.2009.00321.x)] [CrossRef (https://dx.doi.org/10.1111/j.1475-4959.2009.00321.x)]
2. Hart, G.; Turton, A.; White, B. (Eds.) *Agrarian Transformations: Local Processes and the State in Southeast Asia*; University of California Press: Berkeley, CA, USA, 1989. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Agrarian+Transformations:+Local+Processes+and+the+State+in+Southeast+Asia&author=Hart,+G.&author=Turton,+A.&author=White,+B.&publication_year=1989)]
3. Baird, I.G. Turning land into capital, turning people into labour: Primitive accumulation and the arrival of large-scale economic land concessions in Laos. *New Proposals* **2011**, *5*, 10–26. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Turning land into capital, turning people into labour: Primitive accumulation and the arrival of large-scale economic land concessions in Laos&author=Baird,+I.G.&publication_year=2011&journal=New+Proposals&volume=5&pages=10–26)]
4. Jokisch, B.D. Migration and agricultural change: The case of smallholder agriculture in Highland Ecuador. *Hum. Ecol.* **2002**, *30*, 523–550. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Migration and agricultural change: The case of smallholder agriculture in Highland Ecuador&author=Jokisch,+B.D.&publication_year=2002&journal=Hum.+Ecol.&volume=30&pages=523–550&doi=10.1023/A:1021198023769)] [CrossRef (https://dx.doi.org/10.1023/A:1021198023769)]
5. Lambin, E.F.; Meyfroidt, P. Global land use change, economic globalization, and the looming land scarcity. *Proc. Natl. Acad. Sci. USA* **2011**, *108*, 3465–3472. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Global land use change, economic globalization, and the looming land scarcity&author=Lambin,+E.F.&author=Meyfroidt,+P.&publication_year=2011&journal=Proc.+Natl.+Acad.+Sci.+USA&volume=108&pages=3465–3472&doi=10.1073/pnas.1100480108&pmid=21321211)] [CrossRef (https://dx.doi.org/10.1073/pnas.1100480108)] [PubMed (https://www.ncbi.nlm.nih.gov/pubmed/21321211)][Green Version (http://www.pnas.org/content/108/9/3465.full.pdf)]

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6. Saksena, S.; Fox, J.; Spencer, J.; Castrence, M.; DiGregorio, M.; Epprecht, M.; Sultana, N.; Finucane, M.; Nguyen, T.D.; Vien, L. Classifying and Mapping the Urban Transition in Vietnam. *Appl. Geogr.* **2014**, *50*, 80–89. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Classifying and Mapping the Urban Transition in Vietnam&author=Saksena,+S.&author=Fox,+J.&author=Spencer,+J.&author=Castrence,+M.&author=DiGregorio,+M.&author=Epprecht,+M.&author=Sultana,+N.&author=Finucane,+M.&author=Nguyen,+T.D.&author=Vien,+L.&publication_year=2014&journal=Appl.+Geogr.&volume=50&pages=80–89&doi=10.1016/j.apgeog.2014.02.010)] [CrossRef (https://dx.doi.org/10.1016/j.apgeog.2014.02.010)]
7. Rigg, J. *The Challenges of Highland Development in Vietnam*; Rambo, A.T., Reed, R., Cuc, L.T., Digregorio, M., Eds.; East-West Center Program on Environment: Honolulu, HI, USA; Hanoi University Center for Natural Resources and Environmental Studies: Hanoi, Vietnam; University of California, Center for Southeast Asia Studies: Berkeley, CA, USA, 1995. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The+Challenges+of+Highland+Development+in+Vietnam&author=Rigg,+J.&publication_year=1995)]
8. McGee, T.G. The emergence of desakota in Asia: Expanding a hypothesis. In *The Extended Metropolis: Settlement Transition in Asia*; Ginsburg, N., Koppel, B., McGee, T.G., Eds.; University of Hawai'i Press: Honolulu, HI, USA, 1991; pp. 15–55. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The emergence of desakota in Asia: Expanding a hypothesis&author=McGee,+T.G.&publication_year=1991&pages=15–55)]
9. Rigg, J. Land, farming, livelihoods, and poverty: Rethinking the links in the rural South. *World Dev.* **2006**, *34*, 180–202. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Land, farming, livelihoods, and poverty: Rethinking the links in the rural South&author=Rigg,+J.&publication_year=2006&journal=World+Dev.&volume=34&pages=180–202&doi=10.1016/j.worlddev.2005.07.015)] [CrossRef (https://dx.doi.org/10.1016/j.worlddev.2005.07.015)][Green Version (https://core.ac.uk/download/pdf/66565.pdf)]
10. Rigg, J.; Nattapoolwat, S. Embracing the global in Thailand: Activism and pragmatism in an era of deagrarianization. *World Dev.* **2001**, *29*, 945–960. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Embracing the global in Thailand: Activism and pragmatism in an era of deagrarianization&author=Rigg,+J.&author=Nattapoolwat,+S.&publication_year=2001&journal=World+Dev.&volume=29&pages=945–960&doi=10.1016/S0305-750X(01)00021-3)] [CrossRef (https://dx.doi.org/10.1016/S0305-750X(01)00021-3)]
11. Kelly, P.F. Migration, agrarian transition, and rural change in Southeast Asia: Introduction. *Crit. Asian Stud.* **2011**, *43*, 479–506. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Migration, agrarian transition, and rural change in Southeast Asia: Introduction&author=Kelly,+P.F.&publication_year=2011&journal=Crit.+Asian+Stud.&volume=43&pages=479–506&doi=10.1080/14672715.2011.623516)] [CrossRef (https://dx.doi.org/10.1080/14672715.2011.623516)]

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12. Rigg, J. Moving lives: Migration and livelihoods in the Lao PDR. *Popul. Space Place* **2007**, *13*, 163–178. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Moving lives: Migration and livelihoods in the Lao PDR&author=Rigg,+J.&publication_year=2007&journal=Popul.+Space+Place&volume=13&pages=163–178&doi=10.1002/psp.438)] [CrossRef (https://dx.doi.org/10.1002/psp.438)]
13. Hecht, S.; Yang, A.L.; Basnett, B.S.; Padoch, C.; Peluso, N.L. *People in Motion, Forests in Transition: Trends in Migration, Urbanization, and Remittances and Their Effects on Tropical Forests*; CIFOR Occasional Paper No. 142; Center for International Forestry Research: Bogor, Republic of Indonesia, 2015. [Google Scholar (https://scholar.google.com/scholar_lookup?title=People+in+Motion,+Forests+in+Transition:+Trends+in+Migration,+Urbanization,+and+Remittances+and+Their+Effects+on+Tropical+Forests&author=Hecht,+S.&author=Yang,+A.L.&author=Basnett,+B.S.&author=Padoch,+C.&author=Peluso,+N.L.&publication_year=2015)]
14. Manivong, V.; Cramb, R.; Newby, J. Rice and remittances; Crop intensification versus labour migration in Southern Laos. *Hum. Ecol.* **2014**, *42*, 367–379. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Rice and remittances; Crop intensification versus labour migration in Southern Laos&author=Manivong,+V.&author=Cramb,+R.&author=Newby,+J.&publication_year=2014&journal=Hum.+Ecol.&volume=42&pages=367–379&doi=10.1007/s10745-014-9656-6)] [CrossRef (https://dx.doi.org/10.1007/s10745-014-9656-6)]
15. Hecht, S.B.; Saatchi, S.S. Globalization and forest resurgence: Changes in forest cover in El Salvador. *BioScience* **2007**, *57*, 663–672. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Globalization and forest resurgence: Changes in forest cover in El Salvador&author=Hecht,+S.B.&author=Saatchi,+S.S.&publication_year=2007&journal=BioScience&volume=57&pages=663–672&doi=10.1641/B570806)] [CrossRef (https://dx.doi.org/10.1641/B570806)]
16. Hecht, S.B.; Kandel, S.; Morales, A. *Migration, Livelihoods and Natural Resources*; IDRC PRISMA: San Salvador, Salvador, 2012. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Migration,+Livelihoods+and+Natural+Resources&author=Hecht,+S.B.&author=Kandel,+S.&author=Morales,+A.&publication_year=2012)]
17. Maharjan, A. Labour out migration and its impacts on farm families in the mid-hills of Nepal. In *Farming and Rural Systems Economics*; Doppler, W., Bauer, S., Eds.; Margraf Publishers: Weikersheim, Germany, 2010; Volume 113. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Labour out migration and its impacts on farm families in the mid-hills of Nepal&author=Maharjan,+A.&publication_year=2010)]
18. Seto, K.C.; Reenberg, A.; Boone, C.G.; Fragkias, M.; Haase, D.; Langanke, T.; Marcotullio, P.; Munroe, D.K.; Olah, B.; Simon, D. Urban land teleconnections and sustainability. *Proc. Natl. Acad. Sci. USA* **2012**, *109*, 7687–7692. [Google Scholar

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(https://scholar.google.com/scholar_lookup?title=Urban land teleconnections and sustainability&author=Seto,+K.C.&author=Reenberg,+A.&author=Boone,+C.G.&author=Fragkias,+M.&author=Haase,+D.&author=Langanke,+T.&author=Marcotullio,+P.&author=Munroe,+D.K.&author=Olah,+B.&author=Simon,+D.&publication_year=2012&journal=Proc.+Natl.+Acad.+Sci.+USA&volume=109&pages=7687–7692&doi=10.1073/pnas.1117622109&pmid=22550174)] [CrossRef (https://dx.doi.org/10.1073/pnas.1117622109)] [PubMed (https://www.ncbi.nlm.nih.gov/pubmed/22550174)][Green Version (http://www.pnas.org/content/109/20/7687.full.pdf)]

19. Liu, J.; Hull, V.; Batistella, M.; DeFries, R.; Dietz, T.; Fu, F.; Hertel, T.W.; Izaurralde, R.C.; Lambin, E.F.; Li, S.; et al. Framing sustainability in a telecoupled world. *Ecol. Soc.* **2013**, *18*, 26. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Framing sustainability in a telecoupled world&author=Liu,+J.&author=Hull,+V.&author=Batistella,+M.&author=DeFries,+R.&author=Dietz,+T.&author=Fu,+F.&author=Hertel,+T.W.&author=Izaurralde,+R.C.&author=Lambin,+E.F.&author=Li,+S.&publication_year=2013&journal=Ecol.+Soc.&volume=18&pages=26&doi=10.5751/ES-05873-180226)] [CrossRef (https://dx.doi.org/10.5751/ES-05873-180226)]
20. Baird, I.G.; Fox, J. How land concessions affect places elsewhere: Telecoupling, political ecology, and large-scale plantations in southern Laos and northeastern Cambodia. *Land* **2015**, *4*, 436–453. [Google Scholar (https://scholar.google.com/scholar_lookup?title=How land concessions affect places elsewhere: Telecoupling, political ecology, and large-scale plantations in southern Laos and northeastern Cambodia&author=Baird,+I.G.&author=Fox,+J.&publication_year=2015&journal=Land&volume=4&pages=436–453&doi=10.3390/land4020436)] [CrossRef (https://dx.doi.org/10.3390/land4020436)]
21. Eakin, H.; De Fries, R.; Kerr, S.; Lambin, E.F.; Liu, J.; Marcotullio, P.J.; Messerli, P.; Reenberg, A.; Rueda, X.; Swaffield, S.; et al. Significance of telecoupling for exploration of land-use change. In *Rethinking Global Land Use in an Urban Era*; Seto, K.C., Reenberg, A., Eds.; MIT Press: Cambridge, MA, USA, 2014; pp. 141–161. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Significance of telecoupling for exploration of land-use change&author=Eakin,+H.&author=De+Fries,+R.&author=Kerr,+S.&author=Lambin,+E.F.&author=Liu,+J.&author=Marcotullio,+P.J.&author=Messerli,+P.&author=Reenberg,+A.&author=Rueda,+X.&author=Swaffield,+S.&publication_year=2014&pages=141–161)]
22. Marcus, G.E. Ethnography in/of the world system: The emergence of multi-sited ethnography. *Annu. Rev. Anthropol.* **1995**, *24*, 95–117. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Ethnography in/of the world system: The emergence of multi-sited ethnography&author=Marcus,+G.E.&publication_year=1995&journal=Annu.+Rev.+Anthropol.&volume=24&pages=95–117&doi=10.1146/annurev.an.24.100195.000523)] [CrossRef (https://dx.doi.org/10.1146/annurev.an.24.100195.000523)]
23. *The 2009 Vietnam Population and Housing census: Major Findings*; Central Population and Housing Census, Steering Committee: Hanoi, Vietnam, 2010.

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24. World Bank. 2017. Available online: http://www.indexmundi.com/commodities/?commodity=rice&months=180 (http://www.indexmundi.com/commodities/?commodity=rice&months=180) (accessed on 1 May 2018).
25. White, B.; Borras, S.M., Jr.; Hall, R.; Scoones, I.; Wolford, W. The new enclosures: Critical perspectives on corporate land deals. *J. Peasant Stud.* **2012**, *39*, 619–647. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The new enclosures: Critical perspectives on corporate land deals&author=White,+B.&author=Borras,+S.M.,+Jr.&author=Hall,+R.&author=Scoones,+I.&author=Wolford,+W.&publication_year=2012&journal=J.+Peasant+Stud.&volume=39&pages=619–647&doi=10.1080/03066150.2012.691879)] [CrossRef (https://dx.doi.org/10.1080/03066150.2012.691879)][Green Version (https://core.ac.uk/download/pdf/20311424.pdf)]
26. Giesecke, J.A.; Tran, N.H.; Corong, E.L.; Jaffee, S. Rice Land Designation Policy in Vietnam and the Implications of Policy Reform for Food Security and Economic Welfare. *J. Dev. Stud.* **2013**, *49*, 9. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Rice Land Designation Policy in Vietnam and the Implications of Policy Reform for Food Security and Economic Welfare&author=Giesecke,+J.A.&author=Tran,+N.H.&author=Corong,+E.L.&author=Jaffee,+S.&publication_year=2013&journal=J.+Dev.+Stud.&volume=49&pages=9&doi=10.1080/00220388.2013.777705)] [CrossRef (https://dx.doi.org/10.1080/00220388.2013.777705)]
27. Phung, P.T. Ecological Modernization of Industrial Estates in Vietnam. Ph.D. Dissertation, Wageningen University, Wageningen, The Netherlands, 2002. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Ecological Modernization of Industrial Estates in Vietnam&author=Phung,+P.T.&publication_year=2002)]
28. Scurrah, N.; Hirsch, P. The Political Economy of Land Governance in Cambodia. Vientiane, Laos: Mekong Region Land Governance Project. 2015. Available online: http://www.mekonglandforum.org/sites/default/files/Political_Economy_of_Land_Governance_in_Cambodia.pdf (http://www.mekonglandforum.org/sites/default/files/Political_Economy_of_Land_Governance_in_Cambodia.pdf) (accessed on 12 June 2018). [Google Scholar (https://scholar.google.com/scholar_lookup?title=The Political Economy of Land Governance in Cambodia. Vientiane, Laos: Mekong Region Land Governance Project&author=Scurrah,+N.&author=Hirsch,+P.&publication_year=2015)]
29. Open Development Cambodia. 2015. Available online: https://opendevelopmentcambodia.net/topics/concessions/ (https://opendevelopmentcambodia.net/topics/concessions/) (accessed on 12 June 2018).
30. Dwyer, M.B.; Polack, E.; So, S. 'Better-practice' Concessions? Some Lessons from Cambodia's Leopard Skin Landscape. *Int. Dev. Policy* **2015**, *6*, 205–228. [Google Scholar (https://scholar.google.com/scholar_lookup?title='Better-practice' Concessions? Some Lessons from Cambodia's Leopard Skin Landscape&author=Dwyer,+M.B.&author=Polack,+E.&author=So,+S.&publication_year=2015&journal=Int.+Dev.+Policy&volume=6&pages=205–228&doi=10.4000/poldev.2046)] [CrossRef (https://dx.doi.org/10.4000/poldev.2046)]

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31. Muller, F. Commune-Based Land Allocation for Poverty Reduction in Cambodia: Achievements and Lessons Learnt from the Project: Land Allocation for Social and Economic Development (LASED). Presented at the Annual World Bank Conference on Land and Poverty, The World Bank, Washington, DC, USA, 23–26 April 2012. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Commune-Based Land Allocation for Poverty Reduction in Cambodia: Achievements and Lessons Learnt from the Project: Land Allocation for Social and Economic Development (LASED)&conference=Presented+at+the+Annual+World+Bank+Conference+on+Land+and+Poverty,+The+World+Bank&author=Muller,+F.&publication_year=2012)]
32. Becker, S.A. Largest Teak Nursery in Cambodia. Phnom Penh Post. 4 July 2012. Available online: http://www.phnompenhpost.com/special-reports/largest-teak-nursery-cambodia (http://www.phnompenhpost.com/special-reports/largest-teak-nursery-cambodia) (accessed on 4 May 2018).
33. Milne, S. Under the leopard's skin: Land commodification and the dilemmas of Indigenous communal title in upland Cambodia. *Asia Pac. Viewp.* **2013**, *54*, 323–339. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Under the leopard's skin: Land commodification and the dilemmas of Indigenous communal title in upland Cambodia&author=Milne,+S.&publication_year=2013&journal=Asia+Pac.+Viewp.&volume=54&pages=323–339&doi=10.1111/apv.12027)] [CrossRef (https://dx.doi.org/10.1111/apv.12027)]
34. Muller, F.; Zulsdorf, G. Old Policies—New Action: A Surprising Political Initiative to Recognize Human Rights in the Cambodian Land Reform. Presented at the Annual World Bank Conference on Land and Poverty, Washington, DC, USA, 8–11 April 2013. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Old Policies—New Action: A Surprising Political Initiative to Recognize Human Rights in the Cambodian Land Reform&conference=Presented+at+the+Annual+World+Bank+Conference+on+Land+and+Poverty&author=Muller,+F.&author=Zulsdorf,+G.&publication_year=2013)]
35. ADHOC. *Land Situation in Cambodia 2013*; The Cambodian Human Rights and Development Association (ADHOC): Phnom Penh, Cambodia, 2014. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Land+Situation+in+Cambodia+2013&author=ADHOC&publication_year=2014)]
36. Baird, I.G. Various Forms of Colonialism: The Social and Spatial Reorganisation of the Brao in Southern Laos and Northeastern Cambodia. Ph.D. Dissertation, Department of Geography, University of British Columbia, Vancouver, BC, Canada, 2008. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Various Forms of Colonialism: The Social and Spatial Reorganisation of the Brao in Southern Laos and Northeastern Cambodia&author=Baird,+I.G.&publication_year=2008)]

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37. Adger, W.N.; Kelly, P.M.; Winkels, A.; Huy, L.Q.; Locke, C. Migration, remittances, livelihood trajectories, and social resilience. *AMBIO* **2002**, *31*, 358–366. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Migration, remittances, livelihood trajectories, and social resilience&author=Adger,+W.N.&author=Kelly,+P.M.&author=Winkels,+A.&author=Huy,+L.Q.&author=Locke,+C.&publication_year=2002&journal=AMBIO&volume=31&pages=358–366&doi=10.1579/0044-7447-31.4.358&pmid=12174607)] [CrossRef (https://dx.doi.org/10.1579/0044-7447-31.4.358)] [PubMed (https://www.ncbi.nlm.nih.gov/pubmed/12174607)]
38. Findley, S. An interactive contextual model of migration in Ilocos Norte, the Philippines. *Demography* **1987**, *24*, 163–189. [Google Scholar (https://scholar.google.com/scholar_lookup?title=An interactive contextual model of migration in Ilocos Norte, the Philippines&author=Findley,+S.&publication_year=1987&journal=Demography&volume=24&pages=163–189&doi=10.2307/2061628&pmid=3609404)] [CrossRef (https://dx.doi.org/10.2307/2061628)] [PubMed (https://www.ncbi.nlm.nih.gov/pubmed/3609404)]
39. Rigg, J.; Salamanca, A.; Thompson, E.C. The puzzle of East and Southeast Asia's persistent smallholder. *J. Rural Stud.* **2016**, *43*, 118–133. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The puzzle of East and Southeast Asia's persistent smallholder&author=Rigg,+J.&author=Salamanca,+A.&author=Thompson,+E.C.&publication_year=2016&journal=J.+Rural+Stud.&volume=43&pages=118–133&doi=10.1016/j.jrurstud.2015.11.003)] [CrossRef (https://dx.doi.org/10.1016/j.jrurstud.2015.11.003)]
40. Rigg, J.; Salamanca, A. *Tracking and Explaining Evolving Rural Livelihoods in Southeast Asia*; Routledge Handbook of Southeast Asian Development: Abingdon-on-Thames, UK, 2017. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Tracking+and+Explaining+Evolving+Rural+Livelihoods+in+Southeast+Asia&author=Rigg,+J.&author=Salamanca,+A.&publication_year=2017)]
41. Open Development Cambodia. 2018. Available online: http://archive.opendevelopmentcambodia.net/census-data/ (http://archive.opendevelopmentcambodia.net/census-data/) (accessed on 7 May 2018).
42. Phnom Penh Post. 2017. Available online: http://www.phnompenhpost.com/national/big-boost-garment-sector-minimum-wage-though-some-see-political-motive?utm_source=Phnompenh+Post+Main+List&utm_campaign=640202f7f9-20171006&utm_medium=email&utm_term=0_690109a91f-640202f7f9-61715017 (http://www.phnompenhpost.com/national/big-boost-garment-sector-minimum-wage-though-some-see-political-motive?utm_source=Phnompenh+Post+Main+List&utm_campaign=640202f7f9-20171006&utm_medium=email&utm_term=0_690109a91f-640202f7f9-61715017) (accessed on 26 April 2018).
43. Pedersen, R. Access to land reconsidered: The land grab, polycentric governance and Tanzania's new wave land reform. *Geoforum* **2016**, *72*, 104–113. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Access to land reconsidered: The land grab, polycentric governance and Tanzania's new wave land

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44. Baird, I.G. The global land grab meta-narrative, Asian money laundering and elite capture: Reconsidering the Cambodian context. *Geopolitics* **2014**, *19*, 431–453. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The global land grab meta-narrative, Asian money laundering and elite capture: Reconsidering the Cambodian context&author=Baird,+I.G.&publication_year=2014&journal=Geopolitics&volume=19&pages=431–453&doi=10.1080/14650045.2013.811645)] [CrossRef (https://dx.doi.org/10.1080/14650045.2013.811645)]
45. Baird, I.G.; Barney, K. The political ecology of cross-sectoral cumulative impacts: Modern landscapes, large hydropower dams and industrial tree plantations in Laos and Cambodia. *J. Peasant Stud.* **2017**, *44*, 769–795. [Google Scholar (https://scholar.google.com/scholar_lookup?title=The political ecology of cross-sectoral cumulative impacts: Modern landscapes, large hydropower dams and industrial tree plantations in Laos and Cambodia&author=Baird,+I.G.&author=Barney,+K.&publication_year=2017&journal=J.+Peasant+Stud.&volume=44&pages=769–795&doi=10.1080/03066150.2017.1289921)] [CrossRef (https://dx.doi.org/10.1080/03066150.2017.1289921)]
46. Haberl, H.; Erb, K.; Krausmann, F.; Berecz, S.; Ludwiczek, N.; Martinez-Alier, J.; Musel, A.; Schaffartzik, A. Using embodied HANPP to analyze teleconnections in the global land system: Conceptual considerations. *Geografisk Tidsskrift-Danish J. Geogr.* **2013**, *109*, 119–130. [Google Scholar (https://scholar.google.com/scholar_lookup?title=Using embodied HANPP to analyze teleconnections in the global land system: Conceptual considerations&author=Haberl,+H.&author=Erb,+K.&author=Krausmann,+F.&author=Berecz,+S.&author=Ludwiczek,+N.&author=Martinez-Alier,+J.&author=Musel,+A.&author=Schaffartzik,+A.&publication_year=2013&journal=Geografisk+Tidsskrift-Danish+J.+Geogr.&volume=109&pages=119–130&doi=10.1080/00167223.2009.10649602)] [CrossRef (https://dx.doi.org/10.1080/00167223.2009.10649602)]

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