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Alternatives to Land Grabbing: Smallholder Engagement in Commodity Booms in Southeast Asia

Rob Cramb, Vongpaphane Manivong, Jonathan Newby, Kem Sothorn, Patrick Sujang
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BRICS Initiatives for Critical Agrarian Studies (BICAS)
Email: bricsagrarianstudies@gmail.com
Websites: www.plaas.org.za/bicas | www.iss.nl/bicas

MOSAIC Research Project
Website: www.iss.nl/mosaic

Land Deal Politics Initiative (LDPI)
Email: landpolitics@gmail.com
Website: www.iss.nl/ldpi

RCSD Chiang Mai University
Faculty of Social Sciences, Chiang Mai University Chiang Mai 50200 THAILAND
Tel. 66-53-943595/6 | Fax. 66-53-893279
Email : rcsd@cmu.ac.th | Website : http://rcsd.soc.cmu.ac.th

Transnational Institute
PO Box 14656, 1001 LD Amsterdam, The Netherlands
Tel: +31 20 662 66 08 | Fax: +31 20 675 71 76
E-mail: tni@tni.org | Website: www.tni.org

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Abstract

Given the widespread smallholder impulse to engage in commodity booms in Southeast Asia and the potential for this engagement to offer a more inclusive development pathway than large-scale plantation production, we examine three issues: What are the agro-economic factors favouring or obstructing smallholder modes of commodity production relative to large-scale production entities? What are the incentives for agribusiness firms to contribute to smallholder commodity production through roles other than direct farm management? Can smallholder commodity production be broadly inclusive in the face of tendencies towards agrarian differentiation and the market imperatives of agribusiness firms? We present a preliminary exploration of these questions through localised case studies of smallholder engagement with four commodity sectors – oil palm, rubber, cassava, and teak.

Introduction

The contemporary phenomenon of "land grabs" or "large-scale farmland acquisitions" in Southeast Asia needs to be seen in the context of agricultural commodity booms (Hall 2011). The underlying economic motivation for agribusiness firms to gain access to extensive areas of land is to use the land to generate profits from producing a booming commodity. It is true that agribusiness firms often have other reasons for gaining control over land that are not directly related to its role as a productive asset. A firm may be motivated by speculating on rising land values, increasing the "land bank" in its corporate prospectus and hence the value of its shares, receiving government incentives for cross-border investment, harvesting and selling valuable timber in the process of land clearance, or capitalising on access to state land at concessional prices to make windfall gains by on-selling at market prices (Cramb 2013; Fairbairn 2014; McAllister 2015; Baird and Fox 2015). However, the economic context for these other motivations remains the commodity boom that fuels the escalating demand for potentially productive agricultural land.

Byerlee (2013) points out that extensive market-driven investment in land development during commodity booms is nothing new. In particular, he reviews what he terms the "first era of globalisation" from the middle of the nineteenth century up to World War I. "Then, as now, rapid industrialization (at that time in Europe, North America, and a bit later, Japan) produced growing consumer incomes and rising demand for food and industrial raw materials, in a context of sharply reduced transport costs and liberalisation of trade, foreign investment, and international migration" (Byerlee 2013: 21). The lessons Byerlee draws from this period are that farmland investments have always been very cyclical; investments have been largest in the four or five classic plantation crops where economies of scale in processing encourage (if not necessitate) investment in large-scale production entities; failure rates have often been high, frequently resulting in subsequent rounds of corporate consolidation; and the potential of smallholders to engage in commercial agriculture has been consistently underestimated by both governments and investors.

In the past three decades, a second period of globalisation has in many ways seen history repeated (Bernstein 2010; Byerlee 2013). The rise of the corporate plantation has been the most significant way in which the second era has mirrored the first. The differences between the two eras identified by Byerlee (2013) are that the high social impacts of large-scale investment in crop production previously centred on the exploitation of plantation labour, whereas now conflict over land rights has become a major concern; that in the second era South-South investments in production operations are much more important than the North-South investments of the colonial and immediate post-independence periods; and that there is now considerable historical evidence for the dynamism and economic success of smallholders, who have come to dominate industries such as rubber. It can be added that, compared to the first era, global financial markets have expanded enormously and have come to exercise an ever greater influence on the organisation of agricultural production (Bernstein 2010: 126; Fairbairn 2014).

Byerlee concludes that "historical experience has shown the importance of providing a level playing field for smallholders. Where support services have been put in place, including research, extension, land-tenure security, and finance, a vibrant smallholder sector has eventually emerged to dominate the industry. This has not only alleviated land conflicts, but also promoted inclusive rural development" (Byerlee 2013: 39). However, in both the first and second eras of globalisation, plantation interests have attempted to block or minimise such smallholder-oriented development. This was the case with rubber in the colonial era (Barlow 1978; Cramb 2007) and has been evident in the current oil palm boom (Cramb 2011). Notwithstanding the ideology of market liberalism that underpins the current globalisation agenda, the plantation sector has successfully sought government intervention to facilitate and protect its access to and control over cheap, "unencumbered" land and a

low-wage, dependent labour force, just as in the colonial era (Cramb and Curry 2012). The expansion of independent smallholders is seen by many in the plantation sector as undermining both these aspirations.

This tension between the interests of plantations and smallholders has led to the promotion by governments and development agencies of intermediate production arrangements – managed smallholdings, nucleus estate and smallholding (NES) schemes, and various forms of joint venture between plantation companies and smallholders (McCarthy and Cramb 2009; Cramb and Curry 2012; Nga 2015). Nevertheless, as the current era of globalisation unfolds, the ideology of "rolling back the state" combined with the shocks of the Asian (1997-8) and global (2007-8) financial crises have prompted the disengagement of governments from smallholder agricultural development. The most significant changes include the removal of subsidies and services that previously supported smallholders and the shift away from settler and out-grower schemes for smallholders towards investor-managed, dividend schemes with minimal smallholder engagement (McCarthy and Cramb 2009; Cramb and Curry 2012; Nga 2015). This has occurred alongside increased concentration in the ownership of agribusiness corporations and intensification of their control over commodity value chains (Bernstein 2010).

Yet, in the midst of this newly dominant plantation sector, there is a resurgence of smallholder production of industrial export commodities, suggesting that the experience with rubber and other crops since the colonial era may indeed be reprised (Byerlee 2013, 2014; Cramb and Sujang 2013). Indeed, smallholder production of tree crops and other commodities has been widely advocated as a basis for the agricultural commercialisation that the World Bank and others see as a significant "pathway out of poverty" for large numbers of rural households, especially in upland environments (World Bank 2007; Snelder and Lasco 2008). However, while many small-scale farmers have benefited from commodity booms, Li reminds us that "smallholder farming has its own problems, not least the new inequalities that arise through the 'everyday' processes of accumulation and dispossession among smallholders that roll on relentlessly, despite efforts to prevent them" (Li 2011: 285). The belief that the adoption of commodity production can lift whole rural populations out of poverty ignores both the initial diversity within these communities and the differentiating processes involved in such a transition. Thus interventions to help farmers commercialise their operations can be systematically linked to the impoverishment of other farmers, through the loss of access to land and other resources. Approaches that attempt to link smallholders to agribusiness firms through various forms of intermediation such as contract farming are seen to offer a potential middle way between small-scale production and large-scale post-harvest operations (M4P 2005; Hayami 2010; Eastwood et al. 2010). However, these too have their pitfalls, particularly in the early stages of agricultural commercialisation (Zola 2008; Walker 2009; Wright 2009; Li 2011), including "backwash" effects on those who miss out on or fail to meet the contracts.

Given the widespread smallholder impulse to engage in commodity booms in Southeast Asia and the potential for this engagement to offer a more inclusive development pathway than large-scale plantation production, we ask three questions: What are the agro-economic factors favouring or obstructing smallholder modes of commodity production relative to large-scale production entities (estates, plantations, land concessions)? What are the incentives for agribusiness firms to contribute to smallholder commodity production through roles other than direct farm management? Can smallholder commodity production be broadly inclusive in the face of tendencies towards agrarian differentiation and the market imperatives of agribusiness firms? We explore these questions through comparative case studies of smallholder engagement with four commodity sectors – oil palm, rubber, cassava, and teak. The case studies are set in specific contexts – oil palm in Malaysia, rubber in Laos, cassava in Cambodia, and teak in Laos – hence the comparisons between commodities are "underdetermined" in the sense that many other factors are influencing each case. Nevertheless, the

cases provide initial insights into the potential for and risks of smallholder-based alternatives to land grabbing.

Oil Palm

Oil palm (*Elaeis guineensis*) has been the most extensively planted boom crop in recent decades, particularly in Indonesia and Malaysia. The industry is dominated by large plantations, though there is a sizeable smallholder sector in Indonesia, and in Thailand small and medium-sized holdings predominate. Sarawak is regarded as the last frontier for oil palm expansion in Malaysia, following the effective closure of the frontier in Peninsular Malaysia and in Sabah to the north (Fold 2000; Sutton 2001; McCarthy and Cramb 2009). From 23,000 ha in 1980, the area planted with oil palm in Sarawak had increased to just over a million ha by 2013, reflecting a rate of expansion of around 10% (Department of Agriculture 2015). Oil palm now accounts for about 8% of the total land area and 71% of the area under agricultural crops.

As described in Cramb (2011a, 2013), the Sarawak Government has in the past three decades pursued a policy that favours large-scale estates over smallholder production, articulating a dualistic vision that has rapidly become an empirical reality. Thus Sarawak's agricultural sector, once almost exclusively in the hands of smallholders, has been transformed by politico-legal means into one that is dominated by private estates. Hence most oil palm plantations (80%) have been established by private companies (or privatised government agencies) holding long-term leases over State Land (though claims to customary ownership have been pursued in many of these, sometimes successfully).

As the profitable opportunities for developing State Land have been taken up, attention has increasingly turned to the development of areas officially recognised as Native Customary Land. The Sarawak Government's view has been that the only viable way to involve landholders in the oil palm boom is to consolidate their land into larger production entities with externally provided management and finance, whether following the "managed smallholder" approach typified by the Sarawak Land Consolidation and Rehabilitation Authority's (SALCRA) schemes, or the "joint venture" approach implemented by the Land Custody and Development Authority (LCDA) (Ngidang 2002; Cramb 2011a; Cramb and Ferraro, 2012), with priority given to the latter approach since the introduction of the "New Concept" policy in 1995. This overt push to incorporate Native Customary Land in joint ventures with plantation companies has been associated with covert pressure on various agencies to curtail measures to assist smallholders directly, in order to leave as much land as possible for the private sector to develop (Cramb 2011a).

However, the area of smallholder oil palm has increased dramatically in the past decade and a half, from 9,000 ha in 2001 to 96,000 ha in 2013, a growth rate of 20% (almost three times the growth rate of the estate sector over the same period). Smallholder oil palm now accounts for nearly 10% of the total planted area and has outstripped the area in either managed smallholder or joint-venture schemes. There are about 19,000 smallholdings averaging about 5 ha each. These include "independent smallholders" and various types of "supported (or subsidised) smallholders" (Table 1) but the latter category accounts for only 12% of the total smallholder area.

Hence the growth in smallholdings has occurred with little government assistance compared to the concerted political campaign in support of the joint-venture approach. Indeed, as noted above, it has occurred in the face of active discouragement (Cramb 2011a; Ngidang 2002). The unassisted adoption of oil palm by smallholders in those regions with access to roads and palm oil mills is an unsurprising extension of Sarawak's long history of autonomous smallholder development. The history of smallholder rubber and pepper over the past century not only demonstrates responsive and dynamic economic behaviour but that customary land tenure has not been an obstacle to the adoption and expansion of smallholder cash crops (Cramb 1990, 2007, 2011b). It is true that, unlike rubber or

pepper, oil palm cultivation displays economies of scale in first-stage processing, and the harvested product is not storable, hence there is a need for a minimum planted area within a maximum distance from a mill to ensure an efficient level of throughput of fresh fruit bunches (ffb). However, it has long been recognised that, once processing infrastructure is in place (mills, roads, transportation), oil palm smallholders can readily take advantage of this infrastructure to pursue what is a profitable livelihood option, with lower cost and greater flexibility than large-scale operations (Barlow 1985, 1986; Zen et al. 2005; Hayami 2010; Byerlee forthcoming).

Table 1. Types of oil palm smallholder in Sarawak and modes of government support

Type of smallholder	Agency	Features
Independent smallholders	N/A	Little or no technical or financial support
Supported smallholders		
Smallholder Oil Palm Planting Program	DA	Subsidised inputs and advice to individual smallholders; discontinued
Oil Palm Mini Estates	DA	Area developed for group of landowners; entirely subsidised up to maturity; discontinued
Oil Palm Smallholder Support Program	MPOB	Subsidised inputs provided to individual smallholders; discontinued
Smallholder Buying Groups (KBT)	MBOB, FO	Inputs provided on credit; output sold to mill; repayments deducted; on-going

Notes: DA, Sarawak Department of Agriculture; MPOB, Malaysian Palm Oil Board (Sarawak Branch); FO, Sarawak Farmers Organisation (a government agency).

Hence the recent expansion of smallholder oil palm has occurred mainly in Miri District in Sarawak's Northern Region, which is where large-scale oil palm planting began in the late 1960s with a Commonwealth Development Corporation (CDC) plantation, and which in 2013 had a total planted area of 318,638 ha, or 31% of the Sarawak total. Of this, 87.5% was in estates and 12.5% in smallholdings. The 40,000 ha of oil palm smallholdings in Miri District represented 42% of the total area of smallholder oil palm in Sarawak. Thus smallholders have successfully inserted themselves into the interstices of this extensive oil palm landscape. It is important to note that the relationship between the plantation companies and smallholders in this landscape is largely confined to the voluntary delivery of smallholder fruit to privately-owned mills, established by the plantations in the first instance to process their own output. There are no flows of capital or technical support from plantations to smallholders (though some smallholders have purchased oil palm seedlings from larger plantations), and negligible provision of plantation labour by local villagers, which is mainly provided by Indonesian migrant workers.

A survey was conducted in 2009 of a cluster of five Iban longhouses in the Sungai Bok region of Miri District (Cramb and Sujang 2013). The Iban constitute the largest ethnic group in Sarawak and are numerically dominant in the oil palm zone of Miri District. The study involved interviews with key informants and a questionnaire survey of 72 households, including both oil palm planters and non-planters and regardless of the area planted. The oil palm planters in the survey were essentially independent smallholders who had taken on the activity with little or no assistance from government agencies or private traders and financiers. In all cases, the oil palm was established on the household's existing farming land and did not involve clearing primary forest or acquiring land from others. In over 80 per cent of cases the land was under secondary scrub or forest within the shifting cultivation cycle. In other cases the oil palm had directly replaced rubber, pepper, cocoa, or fruit trees. Moreover, no-one had taken any private credit or loan, whether short-term or long-term, in cash or kind. Even for

those who received early government assistance, most of the planting has been a result of their own investment of labour and capital.

Though there was a small number of landholders with 10-30 ha of oil palm who had started earlier and now made use of hired labour, by far the majority had planted under 8 ha, typically 2-4 ha, and operated with family workers who also engaged in other farm and non-farm pursuits. Less than 20% of households had not planted oil palm, most of whom had insufficient labour, lacked start-up capital, and/or did not have suitably located land. Thus, although there were different strata in terms of the area planted with oil palm, this did not reflect a process of agrarian differentiation in the sense of "a cumulative and permanent … process of change … based on … increasing inequalities in access to land" (White 1989, 20). Land remained relatively abundant and the strata were more the product of initial differences in wealth within the longhouse and differences in "human capital" affecting labour supply and access to off-farm sources of cash flow rather than a necessary consequence of the oil palm boom.

Many of the Sungai Bok smallholders began planting desultorily and experimentally, mainly to confirm their claim to the land (Cramb and Sujang 2011), but for most this was now their major on-farm source of income – "strategic agriculture" (Majid Cooke 2002) had become a genuine "livelihood strategy". Their oil palm smallholdings provided them with steady employment and cash income throughout the year, without them being subject to the directions of plantation managers or having onerous financial obligations to suppliers of inputs and credit. This strategy was buttressed, on farm, by low-input swamp-rice cultivation for subsistence and, off farm, by urban wage and salary employment, and in a few cases self-employment in rural transportation and marketing.

Smallholder oil palm has thus proved to be a livelihood strategy that generates relatively high returns to household labour and capital, even though yields per unit of land are relatively low. However, this is consistent with the circumstances of most farm-households in Sarawak, where farming land is still relatively abundant and underutilised, but family labour is increasingly scarce and costly, given the opportunities available for urban-based employment and residence. Capital has also been scarce and costly, with limited availability of private credit for smallholder farm development and restricted access to the subsidised capital resources channelled through government schemes for smallholders. This constraint is being progressively lifted as increased income from oil palm provides the working capital to purchase farm inputs and expand the planted area without resort to credit, but the level of fertiliser use is still low, suggesting that capital remains limiting.

Even with low inputs of labour and capital, and hence yields of around 12 tons per ha, smallholders with about 3 ha of mature palms were able to earn around MYR 7,000 per year, providing a return to family labour of over MYR 40 per day in 2009 when prices were low, rising to over MYR 100 per day at 2011 prices, well above rural wage rate of MYR 30-35 per day.[1] Nevertheless, smallholder returns to labour and capital could be improved, particularly by greater use of fertiliser to increase yields. Provided the ratio of ffb price to fertiliser price is favourable, the response of yield to increased fertiliser application (up to say 1 ton per ha of an appropriate compound fertiliser properly applied) would translate directly into increased net income per day. A further area of improvement would be in the upgrading of farm access roads to lower the cost of harvesting and hauling fruit, and to assist those whose land is currently not sufficiently accessible for them to consider planting.

In sum, oil palm smallholders in Sarawak mostly obtain lower yields than the estates but achieve good returns to their limiting resources of labour and capital, while maintaining a degree of livelihood diversity. Importantly, the rapid growth of oil palm smallholders has not been associated with marked differentiation between rural households. The context here is all important – extensive landholdings

[1] 1 USD = 3.3 MYR

derived from the traditional practice of shifting cultivation, continuing low population density, and the rapid growth of non-farm employment in the Malaysian economy have all combined to produce a relatively land-abundant village agriculture as well as diversified livelihood portfolios in which non-farm sources of income and capital feature prominently. Hence establishing three hectares or so of oil palm is within the reach of most households – provided they have a couple of farm workers and some start-up capital and their land is not too inaccessible – without incurring onerous obligations to large landholders or creditors. Nevertheless, targeted support for these smallholders in the form of group-brokered credit for key inputs (as in the Farmer Buying Groups mentioned in Table 1), technical advice, and coordinated provision of infrastructure, especially farm access roads and fruit collection centres, could help to raise their incomes still further and spread the benefits of the oil palm boom more widely and equitably.

Rubber

Rubber (*Hevea brasiliensis*) in both mainland and insular Southeast Asia began as a plantation crop (except in Thailand) but over time the sector came to be dominated by smallholders (Byerlee 2013). Yet the current rubber boom has seen the rapid expansion of large-scale land concessions and joint venture schemes, particularly in Laos and Cambodia, but also in Vietnam, with significant negative impacts on rural communities whose land is appropriated (Baird 2010; Fox and Castella 2013; Nga 2015; McAllister 2015).

The area of rubber in Laos rose from only 900 ha in 2003 to 28,800 ha in 2007 to 234,000 ha in 2010 – a growth rate over the latter period of 70%. Nearly 60% of the total rubber area in 2010 was in the Northern Region, 23% was in the Southern Region, and 17% in the Central Region. In terms of modes of production, about 61% of the total rubber area in 2010 was in large plantations under land concessions, 13% was under contract farming systems, and 26% was planted by independent smallholders (NAFRI, 2011). As the rubber area in Central and Southern Laos is mostly in large concessions, the proportion of independent and contracted smallholders in Northern Laos is higher than these national percentages, together accounting for well over half the total planted area. We briefly discuss contract farming before focusing on a case study of individual smallholders.

Contracts with Chinese rubber investors in Northern Laos have normally been in the form of a “2+3” arrangement, with “2” referring to the land and labour contributed by the farmer and “3” referring to the capital, technology, and marketing provided by the investor. Contracts are for 30 to 35 years, with options for extension or renegotiation. The revenue distribution is based on the type of agreement and the remoteness of the investment zone; normally 60-70% accrues to the farmer and 30-40% to the investor. Depending on the particular contract, farmers have a choice whether to sell rubber to the investor, but the investor still receives the agreed share of revenue. Rubber is sold at the prevailing market price, whether to the investor or another trader. The “2+3” model of contract farming has been promoted widely by the Government as a way to provide smallholders with the necessary inputs and to maximise their share of revenue, as well as to ensure they retain their access to the land (NAFRI, 2011).

While contract farming has the obvious advantage of providing new rubber planters with access to capital and technology, there has been a major issue with regard to farmers’ inability to contribute the agreed labour, given that they receive no return during the long establishment phase. Hence in many cases what started as a “2+3” contract has become a “1+4” contract in which farmers have ceased to provide “free” labour, contributing only their land, while the investing company has taken over responsibility for management of the rubber plantation during the pre-tapping years, perhaps employing the landholder who has thereby gained a regular cash income while the rubber is maturing. The agreed revenue sharing has then been reversed, with a lower share for farmers (30-40%) and a

higher share for companies (60-70%). In some instances, the sharing has involved a partitioning of land and trees rather than revenue (Shi, 2008; NAFRI, 2011; Manivong, 2011). Thus the "1+4" model, when aggregated across many landholders, approximates to a straight land concession, except that in the "1+4" arrangement farmers maintain access to at least part of their land in addition to the wages they receive if they work as wage labour for the project (Shi, 2008; McAllister 2015).

From the point of view of inclusive rural development, the "2+3" scheme is clearly preferable to large land concessions, enabling farmers to hold onto their land and thus giving them the incentive to manage their rubber plantations. However, the pressure on incomes in the establishment phase remains a problem. Intercropping young rubber can provide some subsistence output for the first three years but still leaves farmers short of income. Perhaps intermediate contractual arrangements could be considered that require investors to pay "advances" or "rental" to farmers, without greatly reducing their long-term revenue share. Similar options have been considered for landholders in joint-venture oil palm schemes in Malaysia (Cramb and Ferraro, 2012; Cramb and Sujang, 2013).

A case study of a smallholder rubber village in Northern Laos provides some insights into the prospects for independent (non-contracted) smallholdings (Manivong 2007; Maniovng and Cramb 2008a, 2008b). Hadyao is a Hmong village situated in Namtha District of Luang Namtha Province, close to the district centre and near the main road to the Chinese border. The village was established in 1975, following relocation from the highlands. In 1994, 14 Hmong households from Yunnan migrated to Hadyao where they had relatives. These people introduced rubber cultivation to the village because they had over 15 years' experience working in a rubber collective in Yunnan. The village headman and authorities went to Yunnan to explore the possibility of planting rubber and concluded it was the most promising alternative to shifting cultivation, which the government was actively discouraging. They made a proposal to the provincial authorities and received loans for rubber cultivation, with repayments deferred until after tapping had commenced. This institutional credit proved crucial; if farmers in Hadyao had not received loans, they would have had to draw on their own limited savings or borrow from moneylenders at higher rates and on less favourable terms, which would have reduced their ability to invest in rubber, even though the crop was profitable. From 1994 to 1996, 341 ha of rubber were planted on sloping land by individual smallholders, using seed supplied by Chinese traders. During this period many households faced the problem of having to maintain their immature rubber holdings while cultivating rice for their subsistence. In addition, a heavy frost in 1999 killed a number of rubber trees. Nevertheless, in 2002 about 266 ha of rubber trees began to be tapped, making Hadyao the first rubber-producing village in Laos. Many villagers have since expanded their rubber holdings, using seed obtained from existing trees. A further 296 ha of rubber trees were planted during 2003–2005, so the area for shifting cultivation has been substantially reduced.

The results of a household survey in Hadyao in 2005 showed that upland rice cultivation had changed significantly since rubber was introduced to the village (Manivong, 2007). Nearly 75% of the survey households reported that they cultivated a smaller area of upland rice since planting rubber. Around 72% said that the yield of upland rice was lower and 78% said that the labour allocated to shifting cultivation had decreased. The reasons given for the decline in upland rice were that less land was available so they had to grow rice on the same plot for many years, resulting in lower yields. Moreover, they did not have enough labour, especially for those who had started tapping rubber. Because the land available for upland rice cultivation had been decreasing, many farmers grew upland rice in another village territory. Indeed, 45% of the rice-growing households grew rice only in another village's lands. About 39% of the rice-growing households intercropped rice in their immature rubber plantations and in 22% of cases intercropping was the only mode of rice cultivation.

From the beginning, rubber farmers in Hadyao sold their rubber as "tub-lump" (the coagulated latex from a bucket) to Chinese traders who came to buy at the village, usually once a month. Although there was no formal marketing contract between the rubber farmers and the Chinese traders,

every month the village authorities contacted the buyers in Yunnan by mobile phone and searched for those who offered the highest price. At the time of the survey the villagers did not see any problem with the market because there was strong demand from China. An on-going concern among farmers was that if they could not sell their rubber to China, they would have few alternatives and would get a lower price. Despite the establishment of a rubber processing factory in the province by the Lao-SINO company in 2004, Hadyao farmers continued to sell their rubber to the Chinese traders as they received a higher price.

Based on a group discussion with Hadyao rubber farmers in late 2011 (Manivong, 2011; Manivong and Cramb 2015), there were by then about 650 hectares of rubber planted in the village (not much more than in 2005), of which 360 hectares were being tapped. Every household in the village owned a rubber holding and none grew upland rice by shifting cultivation. However, 70 households of the total of 151 had not yet tapped their rubber trees. They undertook tapping for others whose rubber trees were mature and received 25% of the total rubber production as their share. Some of these households tapped rubber in other nearby villages as well. Since tapping rubber began in 2002, rubber had become the major source of income in the village.

While rubber was helping farmers in Hadyao increase their income, they articulated a number of issues (Manivong 2011; Manivong and Cramb 2015). Land was becoming a constraint due to a growing demand among farmers to expand their rubber holdings, though less-accessible land was still available and, at least for a time, some farmers were able to plant rice and rubber in other villages. Labour was also becoming a constraint – though in 2005 family labour could handle the tapping, as more trees came into production this was becoming an issue. Even in 2005, the land and labour constraints meant that most households no longer attained rice self-sufficiency. Village leaders undertook their own survey in 2008 and found that every household had enough rubber trees to fully utilise their household labour force, hence in that year the village declared “no more growing rubber”.

Another key concern raised by Hadyao farmers was an urgent need to define a clear village boundary to avoid other nearby villages encroaching on their land. They were aware that many people in neighbouring villages had sold their land and, to meet their need for more land for subsistence, they might illegally expand their village areas onto Hadyao territory. Interestingly, Hadyao village had cancelled the Land and Forest Allocation (LFA) that had been implemented in 1997 as part of a widespread government program. Now all land was considered to belong to the village and was subject to village governance. In particular, sale of land was not permitted, except in cases of emergency such as illness requiring money for hospital treatment, but such land could only be sold to people within the village. A household could request more land to grow rice only if they could show that they had enough labour and good reasons for the request. The decision would be made by all villagers. In 2011 the village still had some former shifting cultivation land of about 100 hectares that could be allocated to plant rubber in the future.

The village had also proposed to the district and provincial authorities to set up rubber cooperatives. If this was approved, all rubber land would be managed by the cooperatives, as well as rubber marketing. Hadyao’s rubber production group had played a key role in the success of rubber establishment in this village (Chanthavong et al., 2009). Smallholder rubber cooperatives could perhaps also assist rubber farmers to access improved production and processing techniques in the future, as well as improve their marketing skills and bargaining power. A similar conclusion is drawn by Fox and Castella (2013) in their review of differential responses at the village level to rubber expansion in Laos. They also point out that long-established rubber-producing countries in which smallholders have been very successful, notably Thailand and Malaysia, have invested in rubber research and extension and have given financial support for smallholders and cooperative groups.

Farmers cannot be insulated from fluctuations in the world price and acknowledged in the 2011 discussion that they would need to expand rice production or shift to other field crops if the price fell

and remained low, or if they suddenly could not sell to China. Indeed, the prices of smoked sheet rubber in Singapore followed an increasing trend from 2002 and peaked in early 2011, before dropping sharply. Prices of tub-lump rubber from Luang Namtha Province sold to China also fluctuated, rising from 3.5 yuan/kg in 2002 to 6 yuan/kg in 2005, stabilising around 14-15 yuan/kg in 2011, but then falling to around 4 yuan/kg in 2014 before recovering somewhat to almost the same as the 2005 price currently (May 2015).[2] Economic modelling based on the initial Hadyao survey indicated that at a price of 4 yuan/kg it was no longer profitable to invest in a smallholder rubber plantation but that the price could fall to 2.5 yuan/kg before it was no longer profitable to tap an existing plantation (Manivong and Cramb 2008). Nevertheless, there are recent reports that some farmers in Luang Namtha have cut down 500-600 ha of (immature?) rubber trees, suggesting that alternative uses of land and labour may have become more economic.[3] As independent smallholders who retained control over their land, at least this option was open to them.

Cassava

Cassava *(Manihot esculenta*) is a small perennial shrub that produces a starchy root (Howeler 2014). The crop is typically cultivated on an annual basis and has a diverse range of uses, including direct consumption as a food crop, livestock feed, starch production, and biofuel production. Cassava originated in Latin America but is now grown throughout the tropics and subtropics. It spread throughout Southeast Asia in the nineteenth century as a secondary food crop grown by smallholders, but from late in that century it was also cultivated as an export crop on a plantation basis to meet the growing demand for starch and processed foods, particularly in Britain. With a few notable exceptions, cassava in Southeast Asia is now largely grown as an industrial crop, both by smallholders and plantations.

The recent rapid spread of commercial cassava cultivation has been one of the major land-use changes in Southeast Asia, where over 3.6 million hectares are now cultivated (De Koninck and Rousseau, 2012; Lefroy 2014). Cassava production began increasing in Thailand in the 1970s, and then in Vietnam, to meet new market opportunities, particularly for livestock feed in Europe. Since 2000, changing trade policies and rising incomes have seen the market for cassava products become increasingly focused on Asia, particularly China. Southeast Asia now contributes over 95% of global cassava exports, with Thailand and Vietnam accounting for the majority of both dried cassava chips and cassava starch. However, given the limited opportunity for further expansion in these countries, the industry has turned to Cambodia, Laos, and more recently Myanmar to meet the growing regional demand, while production areas continue to fall in Indonesia. Most prominent has been the rapid expansion in Cambodia, where the area has increased 15 times in the past 10 years. In Laos the increase has been more recent, with a five-fold increase in the past 5 years.

Cassava is subject to a range of production risks, including drought and emerging pests and diseases, and is particularly affected by price fluctuations in a range of global commodity markets that compete for land (such as maize, sugarcane, and rubber) and/or substitute in final product markets (maize, oil, sugar, potato starch). Nevertheless, cassava production is considered an ideal activity for resource-poor farmers, given its low demand for inputs and labour and its ability to grow on marginal land. This makes it potentially important for local livelihood development in marginal upland

[2] 1 USD = 6.2 CNY

[3] "Rubber prices may decrease in Luang Namtha", Vientiane Times, 23 April 2015. The increasing returns to other livelihood options is reflected in a higher financial and opportunity cost of labour than was assumed in the original economic modelling.

communities.[4] However, unlike the first wave of expansion in Thailand, Vietnam, and Indonesia, which was dominated by smallholders supplying traders and processors, the current growth in Cambodia, Laos, and Myanmar has been driven by domestic and foreign companies receiving large concessions to establish both plantations and processing facilities, with smallholders delivering varying amounts of feedstock under different market linkages (Zola 2008; Wright 2009; MSU and MDRI, 2013). For example, in Kachin State in Myanmar's north, the Yuzana Company has a 100,000 ha cassava concession (with 16,000 ha currently established) which it claims has created 2,000 new jobs.

Despite this, thousands of smallholder farmers are growing cassava in these countries as independent producers or under various contractual arrangements. In particular, cassava production in Vietnam has become an important livelihood activity for upland farmers. There are now almost 100 starch factories operating throughout the country as well as hundreds of small-scale, family-operated starch extraction enterprises. As with oil palm, cassava starch factories have an interest in developing formal and informal relationships with traders and farmers to secure a reliable supply of feedstock. The perishable nature of the crop means that coordination of delivery is important to maintain quality and processing efficiency. In the absence of a public extension system, starch factories have been providing planting material, credit, and extension services to farmers within their supply zones. The incentive to do so depends on the processor's ability to capture the benefits from increasing the productivity of farmers. In situations where there are competing factories or alternative value chains, hence an increased probability of side-selling, there tends to be less incentive to provide inputs and technical advice. However, strong linkages and loyalty can often be retained, with processors providing other incentives and inducements to traders.

For example, DAFOCAM, a large processor in the Central Highlands, previously used formal contracts with a large number of farmers, but this was a complicated and inefficient process. The processor now has formal contracts with specialist traders to deliver roots according to a schedule; the traders then develop a network of farmers, often using informal arrangements. These traders are advanced money from the processor which they in turn advance to the farmers in their network. These specialist traders have an incentive to increase the productivity of their farmers and to monitor quality and coordinate delivery. The processor is thus able to operate his factory year-round, increasing his efficiency and profits. In other parts of the processor's catchment area, farmer groups have been established with a farmer leader as the main intermediary between the processor and farmers, whose role is to advance inputs and coordinate the harvest. The impact of these different arrangements on technology transfer, productivity, and livelihoods is the subject of ongoing research.

Another study of smallholder cassava producers is underway in Cambodia. This includes a case study in 2014 of Dambae, one of six districts in the newly-delineated province of Tbong Khmum, previously part of Kampong Cham in the country's east. Unlike newer cassava areas in the west where there has been an influx of migrant farmers, Dambae has a long-established population, most of which was locally born, with some migrants from other districts within the province. In addition to lowland rice, grown mainly for family consumption, farmers in Dambae have been planting cash crops since the early 1990s, following de-collectivisation, the restoration of peace and stability, and improvements in infrastructure. Cassava is now the major commercial crop, accounting for 15,940 hectares in 2014 or 54% of total agricultural land. Other commercial crops include rubber, cashew, pepper, and vegetable crops. Farmers also raise livestock for income, food, and manure. Proximity to Soung, a

[4] However, in highly-suitable commercial areas such as Battambang in Cambodia's west, farmers with very small holdings find it difficult to compete with medium-large landholders (10-20 ha) because of the cost of inputs, labour, and mechanisation. Hence they suffer lower yields and frequently cannot prepare their land and harvest their cassava on time.

major market centre, and to the border with Vietnam makes it easy to transport agricultural produce and obtain inputs.

Two major cassava-growing villages were selected – Pr Sreleu and Bangheur Khleng. The former had close proximity and a good connecting road to Soung while the latter was more remote from markets and had a higher incidence of poverty. Land allocation after 1989 meant that most households in both villages owned 2-3 ha of farming land, while around 20% owned 5-10 ha. Farmers had been able to slowly clear village forest land for cash crops while retaining their paddy fields for subsistence production. In the 1990s they grew multiple crops such as sesame, soy bean, and cassava, switching between them as the market demand fluctuated. Production was mainly for the local market with some exported to Vietnam. A minority of households worked as daily-paid agricultural labourers within the village. Some landless poor had moved out of these villages to other nearby provinces such as Kratie and Prea Vihear where there was still land that could be cleared and occupied.

Since the early 2000s, increasing demand for cassava tubers from starch factories in Vietnam has driven the cassava boom in the two villages. A new cassava variety (KU50) was introduced to Pr Sreleu in 2000 and to Bangheur Khleng in 2004. Cassava stakes were supplied by traders from Vietnam and retained by farmers for subsequent plantings. Pr Sreleu adopted commercial cassava production earlier than other villages because of its proximity to Soung. The price of cassava roots has been fluctuating but the demand from traders keeps increasing, with the vibrant processing sector in Tay Ninh Province (Vietnam) largely dependent on roots sourced from Cambodia during the local off-season. The expansion of cassava led to abandonment of existing cash crops such as soybean and sesame. Farmers preferred cassava because it was much easier to plant, had higher returns, had better market prospects, the village was accessible to traders, and newly-cleared forest land was suitable for cassava production.

The increased focus on commercial crops over the past 20 years has produced a major transition in the study villages from the earlier subsistence focus. Cassava is the main cash crop but there has been increasing integration of other crops such as rubber, pepper, and cashew. Production increasingly depends on hiring labour, purchasing inputs, and borrowing money through the formal financial system. This transition has led to a differentiation between farmers in terms of access to farm land, inputs, finance, farm labour, mechanisation, and ability to diversify agricultural production. To reveal the differences, farm households were divided into four categories depending on the size of farm land they possessed. Key features of these four landholding groups are summarised in Table 2.

The village studies found three implications of the cassava boom for rural livelihoods. First, the conversion of land to cassava production led to loss of access to forest for food, timber, and resins. Most people stopped raising cattle because they were replaced by tractors and there was very little forest available for grazing. In Bangheur Khleng, an increasing proportion of forest land had been cleared for soybean production. On adoption of commercial cassava farming, the rate of forest loss increased. In 20 years of cash crop production, the village forests had disappeared. As noted, some households had moved to less populated provinces to the northeast to clear forest lands for farming.

Table 2. A typology of cassava farming households in two case-study villages in Dambae District, Tbong Khmum Province, Cambodia

Feature	Landless and near-landless (0 – < 0 .5 ha)	Small landholders (0.5 – <2.0 ha)	Medium landholders (2.0 – <5.0 ha)	Large landholders (5 – 20 ha)
Occupations	Wage labour, migration	Wage labour, farming, migration	Wage labour, farming, migration	Farming, trading, small business
Cropping pattern	None Rice, cassava	Rice, cassava, vegetables	Rice, cassava, vegetables	Rice, cassava, pepper, cashew, rubber, vegetables
Farming orientation	Mainly home consumption	Mainly home consumption and cash crops	Home consumption and cash crops	Cash crops and home consumption
Allocation of crop land	65% with no land Cassava 0.03 ha Rice 0.03 ha Other 0.04 ha Leased-in 0.01 ha	Cassava 0.4 ha Rice 0.4 ha Other 0.06 ha Leased-in 0.05 ha	Cassava 1.5 ha Rice 0.85 ha Other 0.3 ha Leased-in 0.03 ha	Cassava 3.0 ha Rice 1.8 ha Other 1.1 ha Leased-in 1.3 ha
Sources of farm labour	Labour seller	Predominantly family labour, hired labour	Family labour, hired labour, mutual help	Family labour, hired labour, mutual help
Use of agricultural inputs	Almost none since most have no farm production	Fertilizer (50 kg/ha), herbicide (0.5 bottle)	Fertilizer (80 kg/ha), herbicide (1 bottle)	Fertilizer (30kg/ha), herbicide (1 bottle)
Farm mechanisation	None, hand tools only	Hand tools, hand tractors	Hand tools, hand tractors, renting from others	Hand tools, small and large tractors, trucks
Sources of credit	MFIs, moneylenders, relatives	MFIs, moneylenders, relatives	MFIs, moneylenders, relatives	MFIs, moneylenders, relatives, friends
Size of loan	USD 300	USD 2,100	USD 1,600	USD 2,000
Purpose of loan	Farming, consumption, repay another loan	Consumption, farming, repay another loan	Farming, consumption, buy land, agricultural trade	Farming, consumption, expand business or trading
Perceived challenges and constraints for farming	Bad weather, price fluctuation, limited credit, cannot diversify crop production, high cost of production, declining soil fertility, low farm-gate prices, lack of capital	Bad weather, price fluctuation, limited credit, cannot diversify crop production, high cost of production, declining soil fertility, low farm-gate prices, lack of capital	Bad weather, price fluctuation, declining soil fertility, low farm-gate prices, lack of capital	Bad weather, price fluctuation, high cost of production, declining soil fertility, low farm-gate prices

Sources: Household and group interviews in Pr Sreleu and Bangheur Khleng villages in 2014

Second, commercial crop production caused rising land prices and attracted both better-off

farmers and urban-based investors to buy land. Both distress sales and strategic sales were occurring. Some farmers sold their land to urban investors or better-off households in the village as a means to survive when faced with price or yield downturns or other financial shocks. Some sold, fearing that their land would be grabbed due to the lack of a formal land title. However, others took the opportunity of increasing land prices to sell their land so as to invest in other livelihood activities. Some of these had insufficient family labour to work their land and so sold to other farmers in the village**.** The cassava boom was thus linked to rising land inequality. Evidence from Bangheur Khleng indicates that, before the cassava boom, each family had about 1-3 ha of farm land. At present, around 70% of households possess 2-3 ha while 15% have less than 0.5 ha and 15% have 5-10 ha. This was partly because households with more labour could clear more forest land to capitalise on the boom but also reflected the gains and losses in land arising from land transactions. Specifically, the incidence of selling land was high among the first two land classes in Table 2 while the incidence of buying land was high for the medium and large land holders, indicating that land was being concentrated in the hands of the latter.

The third implication is that the cassava boom has prompted the movement of some farm households out of the community. In both villages the push factors causing villagers to migrate were insufficient land due to population increase, failure in commercial crop production, land sales, and the rising price of land locally. The pull factor was the availability of forest land in other provinces that people could still grab for farming.

Teak

Teak (*Tectona grandis*), a tall, deciduous, tropical hardwood, occurs naturally in a discontinuous distribution across India, Myanmar, and Thailand, extending into northern Laos (Midgely et al. 2007, 2015). It has also become naturalized in Java, following its introduction several centuries ago. Steadily increasing global demand for tropical hardwoods and depletion of native teak forests have created an incentive to establish teak plantations in these and other tropical countries, both as smallholdings (as in Thailand) and large-scale plantations (as in Brazil). The total planted area is estimated to be about 30 million ha in 36 countries (Midgley et al. 2015). The Floresteca Group is the world's largest privately owned teak producer, with 24,000 ha of planted teak forest in Brazil, producing 200,000 m^3 of round timber annually. The Floresteca website frankly identifies the desiderata of plantation companies world-wide: "The group benefits from ideal conditions in Brazil due to the availability of arable low priced land, sufficient rainfall, high soil quality, and optimum climate conditions. Moreover Brazil offers access to an economically favourable labour force …"[5] However, as with other plantation crops, Midgely et al. (2007) report a general shift from large-scale teak plantations to small-scale lots incorporated in diversified farming systems, whether as independent holdings or as outgrowers of a vertically-integrated concern.

In Laos, smallholder teak farms have been identified by government planners as a potentially valuable component of upland farming systems, enabling subsistence shifting cultivators to move into commercial agriculture and out of poverty. Teak planting commenced with government support more than 50 years ago in Luang Prabang Province in Northern Laos, but a rapid expansion has occurred in the last 20 years, with over 10,000 ha of smallholder teak now established in the province (Midgley et al. 2007). This crop provides high returns, especially in relation to current household incomes, and has good long-term market prospects. Teak stumps have been available from government and private nurseries, and some farmers have learned to produce their own seedlings. Trees are ideally harvested

[5] Floresteca Group website, http://www.globalforestry.com/floresteca-group-overview (accessed 1 May 2015).

at 15-20 years, but can be harvested earlier if a farmer is in urgent need of cash. Most of the teak is sold to traders who supply local sawmills, but only 5% of the sawn timber remains in the region while 95% is transferred through Vientiane-based traders to Thailand, Vietnam, and China (Mohns and Laity 2010). Improved planting material, management (spacing, thinning, pruning), and marketing have the potential to increase the returns to teak-growing households.

Researchers have identified a variety of reasons for the boom in smallholder teak in Luang Prabang (Hansen et al. 1997; Kolmert 2001; Midgley et al. 2007):

- depletion of wood supply from natural forest and the emergence of a market for relatively young teak timber (15-20 years old);
- secure private land tenure (since the 1990s);
- the permanent settlement pattern adopted by most villages;
- expansion of the road system;
- land allocation schemes that gave additional land for production of perennials;
- promotion of tree planting by private investors through financial support, the production of stumps, and information dissemination;
- promotion and extension by government agencies.

Teak planting has been strongly influenced by government land policy, which is designed to eradicate shifting cultivation and encourage sedentary agriculture, including tree plantations. The state authorises individuals and households to use agricultural land in accordance with a local allocation plan and objectives (the Land and Forest Allocation (LFA) process, mentioned above in relation to rubber), with the maximum area available to a household based on the type of agriculture and the number of labour units in the household. The area allocated includes up to 3 ha of degraded forest land where plantation activities are to be focused. Degraded forest land is defined as forest that has been extensively modified — mainly land previously used for shifting cultivation. If a household does not utilise the land it has been allocated within 3 years the law requires that it be returned to the village committee for redistribution to other farmers within the village who can make use of it (Ducourtieux et al. 2005). As a result, many farmers planted teak on plots they did not currently need for food crops in order to retain access to this land for the future (Kolmert 2001; Midgley et al. 2007). According to Kolmert (2001), this disadvantaged farmers in the villages where the LFA process first took place because those farmers did not know how the process would work, and did not have time to plant teak to gain access to more land. Moreover, households arriving more recently (either as part of a resettlement program or through voluntary migration) could not take advantage of this transitional period and now have limited access to land due to the expansion of plantations on land that may previously have been controlled by the village committee.

In November 2009 a survey was carried out of 127 households in five teak-growing villages in Luang Prabang Province to explore the differences within and between villages in teak planting and management (Newby et al. 2012, 2014). The five villages were selected to highlight differences in proximity to Luang Prabang City, ethnicity, resettlement history, population density, and other land-use opportunities. About 81% of the surveyed households had planted teak, averaging 1,330 trees (1.4 ha) per household across the five villages. However, the sampling was not able to capture absentee landholders whose holdings represented a large proportion (up to 50%) of the planted teak area in the more accessible parts of Luang Prabang.

The pattern of planting reported in the household survey showed a few years of extensive planting during the 1990s, consistent with Kolmert's (2001) finding that there was a small boom around that time. However, the real boom in teak planting has occurred in the 2000s. The data suggest that this more recent rapid expansion in planting was not primarily due to strategic planting to take advantage of the LFA process, which was mostly in 1995-1996. Rather, it appears to be related to

factors such as the implementation of restrictions on shifting cultivation, the new ability to transfer land, and the improvement in road infrastructure and market opportunities. Furthermore, early adopters are now able to reap the benefits of their plantations as the trees have reached harvest age, and seeing this has encouraged other households to adopt.

While the mean plantation size of the survey households was about 1,330 trees, this varied from a mean of 750 trees in Ban Phatonglom to 2,110 trees in Ban Phonsavang. The distribution of plantation size was positively skewed, so the average plantation size was inflated by a small number of larger plantations. About 20% of households surveyed had never planted teak, and 40% had planted less than 1,000 trees. The largest 10% of plantations had holdings over 3,000 trees and ranged up to 20,000 trees (over 20 ha).

The analysis of survey data indicates that it was the better-off households that had settled earlier, had access to paddy land, had achieved higher education, had off-farm sources of income, were not reliant on shifting cultivation, and were less dependent on cattle that had adopted teak and planted more trees. Those households without teak typically had fewer assets and lived in houses constructed of bamboo with a grass-thatch roof. Specifying the causal relationship between teak holdings and household assets is not straightforward. Did these households have more assets because they had planted and benefited from teak, or were they able to establish teak plantations because they had more resources to begin with? Further analysis of the survey data showed that the asset levels of those households that had planted and not yet harvested teak tended to be higher than those of households that had never planted teak, which suggests that household wealth was a precursor to rather than an impact of establishing teak plantations. However, early planters who had already harvested some teak tended to have greater wealth than other teak households that had not yet harvested any trees, indicating that in the long run teak made a positive contribution to household wealth.

Given the low rate of rice self-sufficiency, households with little land that adopt teak face a food shortage problem until the trees can be harvested. For this reason, Hansen et al. (1997) suggested that teak is primarily suitable for wealthier farmers, businessmen, and government employees. These authors concluded that one of the main motivations for other upland farmers to plant teak is the possibility of selling the 1-3 year-old plantations to investors. Furthermore, they supposed that, since plantations are predominantly established on flatter land next to roads, farmers have lost much of the best agricultural land for the production of cash crops. According to Kolmert (2001), the selling of land recently planted with teak had been occurring even before farmers had the required certificates and resulted in many farmers not having enough land on which to grow food.

During the interviews, households were asked if they had purchased or sold land in the past. Given the sensitive nature of the topic, they were not asked to whom they sold land, although information regarding the number of trees was obtained. For those households that had purchased land, information regarding the land-use of the parcel was also obtained. Overall, 36% of households had purchased land and 21% had sold land. These data suggest that households in the survey were purchasing both established teak blocks and fallow land that they later converted to teak. Given that the survey did not include absentee landlords, the full extent of land transactions is difficult to quantify. Anecdotal evidence, however, suggests that the scale of land transactions is increasing, with investors looking for land on which to plant both teak and rubber. The money from land sales was reported to be used for school fees, weddings, and to meet healthcare expenses. The long-term result was a growing inequality in landholding within the teak villages and a significant loss of land to outside investors.

Discussion

We have used these four case studies to explore three questions. First, what are the agro-economic

factors favouring or obstructing smallholder modes of commodity production relative to large-scale production entities? Each of the commodities considered has attributes that advantage and disadvantage smallholders, but on balance smallholder production proved viable for a majority of households in all four cases, showing that arguments for large-scale agriculture cannot be based on commodity-specific factors alone. Key attributes are listed in Table 3 and discussed below.

Table 3. Agro-economic characteristics of four boom crops

Characteristic	Oil palm	Rubber	Cassava	Teak
Need for major land development	L-M	L-M	L	L
Investment up-front for production	M-H	M-H	L-M	L-M
Benefit of using improved planting material	H	H	H	M
Time to first harvest	3 years	6-7 years	<1 year	10+ years
Year-round labour requirements	H	H	M	L
Susceptibility to mechanised production	L-M	L	M-H	L
Yield risk	L	L	H	L
Susceptibility to mechanised harvesting	L-M	L	M	M
Harvesting frequency	3-4 weeks	1-2 days	Annual	Episodic
Storability of harvested product	L	M	L	H
Selling frequency	3-4 weeks	Monthly	Annual	Episodic
Price risk	M	H	H	M
Coordination between harvesting and processing	H	M	H	L
Percent of processed product to raw material	H	H	H	H
Investment in first-stage processing	M-H	L-M	L-H	L-M

Source: Adapted from Byerlee (2013, Table 2.1). Note: L=Low; M=Moderate; H=High.

The need for major land development is low to moderate across all commodities, given that transport infrastructure is already in place and smallholders are typically converting a small plot of existing crop or fallow land, or gradually clearing village forest lands, using traditional low-cost techniques. Farmers may or may not apply fertiliser in the establishment phase, particularly if converting fallow or forest lands. However, the acquisition of good-quality planting material is a key factor in success. High-yielding oil palm seedlings have been provided by government agencies and plantation companies in Malaysia. Rubber farmers in Laos first obtained seed of adapted varieties from Chinese traders and learned nursery techniques to establish their own seedlings. Cassava is propagated vegetatively, with farmers obtaining stakes from other farmers or from traders who have spread improved varieties, then typically saving their own planting material for subsequent seasons until another improved variety becomes available. Teak farmers in Laos buy seedlings from government and commercial nurseries or collect seed to plant in their own nurseries.

While the up-front investment may be low, the crops vary from 1 to 10 or more years in the time to first harvest. While some intercropping can be practised in rubber and teak holdings for the first 2-3 years, farmers need additional land for food crops and/or other sources of livelihood if they are to survive this waiting period. In the Malaysian case study, farmers had wet rice land for subsistence and other employment, on- and off-farm, enabling them to self-fund the investment in oil palm. In Laos, better-off households were in a similar position but poorer households were pressured to find swidden land in more remote parts of the village or in other villages to underwrite their long-term investments in rubber and teak. Cassava farmers, in contrast, had a relatively quick turnaround on their investment.

Once established, oil palm and rubber provide a steady income stream due to continual (daily to monthly) harvesting and sale, while cassava farmers are paid once a year and teak farmers are paid only when they decide to harvest. In the latter two cases, then, there is greater pressure on cash flow. Cassava farmers typically depend on advances from traders or processors for both inputs and family

consumption needs, while many teak farmers sell trees before they reach their optimal size or sell their standing crop well in advance of harvest to raise capital for major household needs.

The labour requirements for crop maintenance and harvesting also vary. Labour is needed year-round for oil palm and rubber but is more seasonal with cassava and is hardly needed for teak once the trees are established and have formed a canopy (thinning and pruning is recommended but not widely practised). Most of the commodities are not especially susceptible to labour-saving mechanisation. The oil palm industry in Malaysia is developing mechanised fertilising, spraying, harvesting, and fruit hauling, but none of these innovations has yet been widely taken up by smallholders. Annual land preparation for cassava can be done by machine, whether owned by the farmer of hired on a contract basis.

The labour requirements for crop maintenance and harvesting also vary. Labour is needed year-round for oil palm and rubber but is more seasonal with cassava and is hardly needed for teak once the trees are established and have formed a canopy (thinning and pruning is recommended but not widely practised). Labour-scarce households still utilise share-cropping arrangements during the establishment years to deal with the peak demand for weeding (Newby et al. 2014). Most of the commodities are not especially susceptible to labour-saving mechanisation. The oil palm industry in Malaysia is developing mechanised fertilising, spraying, harvesting, and fruit hauling, but none of these innovations has yet been widely taken up by smallholders. Annual land preparation for cassava can be done by machine, whether owned by the farmer of hired on a contract basis, but only on flat to gently undulating land.

The yield and price risks faced by smallholders vary between the crops. Oil palm, rubber, and teak are less susceptible to yield fluctuations, whereas cassava can be affected by seasonal drought and a range of pests and diseases, some of them spreading into new production areas, especially Cambodia. Rubber and cassava have also experienced considerable price fluctuation in the past decade, with the market for cassava particularly intertwined with global starch- and energy-producing commodities. The crop duration makes a considerable difference to smallholders' ability to cope with price risks. Cassava farmers can switch to other crops (e.g., maize, sugarcane, bananas) on an annual basis, whereas rubber farmers are locked in unless the price remains low for long enough to justify not just cessation of tapping but cutting down the trees.

The commodities also vary in the degree to which smallholder producers are tied to a buyer or processor. Oil palm mills in Malaysia typically require a supply area of at least 5,000 ha to be economic, so most smallholders have only one mill nearby and they must transport their fruit to a mill within 1-2 days of harvest. However, they are not tied to a given mill or trader, and price information is readily communicated, hence prices appear to be competitively determined. Rubber smallholders in Laos have even more flexibility with selling. Coagulated latex can be stored for weeks, whether as sheets or tub-lumps. Village leaders in Laos can phone around for the best price before arranging for Chinese traders to come, and repeat dealing means that traders have an incentive to maintain a reputation for fairness. Cassava farmers tend to be tied by credit to a particular trader who supplies only one processor. The distance between mills means that they tend to be natural monopsonies within their own catchment. However, cassava farmers have the option of producing dried chips on-farm and bypassing the local starch processor, or planting other crops if the cassava price is too low or the services provided are inadequate. Hence processors are motivated to give a fair price and to provide a range of services, including introduction of higher-yielding or more pest-resistant planting material, in order to stabilise the supply of feedstock. Teak farmers can potentially sell to different traders/millers at a time that suits them; the crop is storable indefinitely both before and after harvesting. However, sales are often made due to financial duress and may not be on the most favourable terms.

The second question concerns the incentives for agribusiness firms to contribute to smallholder commodity production through roles other than direct farm management. Agribusiness firms and/or

state agencies can provide a variety of inputs to commodity value chains, singly or in various combinations, as enumerated in Table 4. The incentives for agribusiness firms to contribute any given input vary not only with the agronomic and economic characteristics of the commodity but also, crucially, the politico-legal context. Where these combine to provide strong incentives for large-scale, vertically integrated operations, there will be pressure to squeeze out smallholder activity, increasing the likelihood of a land grab. However, the incentives might be such that large firms consider themselves better off concentrating on just some of these functions (e.g., processing) and prefer to rely on smallholders to undertake at least the management of crop production. These incentives typically shift over time, both for smallholders and agribusinesses, for example, as industry infrastructure is developed, as smallholder knowledge and skills increase, and as government policies change. Such shifts can account for the historical resurgence of smallholder commodity production, as well as the contemporary impetus for smallholders to capitalise on commodity booms.

The ability of small family farms to out-compete large-scale centrally-managed production operations has long been argued – though with widely differing interpretations (Chayanov 1925; Netting 1993; Hayami 2010; Eastwood et al. 2010; Bernstein 2010, ch. 6; Byerlee 2013; Van Vliet et al. 2015). The advantages derive from considerations such as the intrinsic motivation of family labour to support the household as a unit, the flexibility with which family labour can be deployed in space and time (on- and off-farm), the low supervision costs, the greater local (site-specific) knowledge, and the diversity of household livelihood activities, promoting greater economic resilience. These advantages were borne out in each of the case studies.

Table 4. Potential contributions of agribusiness firms and/or state agencies to production and marketing of industrial crops

Function	Details
Land development	Firm/agency undertakes broad-scale, mechanised land clearing and development, possibly including infrastructure (roads, houses, social infrastructure)
Land settlement	Firm/agency surveys/allocates individual smallholder lots; agency issues titles, often subject to repayment of development credit and other conditions
Production inputs	Firm/agency provides planting material, fertiliser, and other inputs, typically as credit-in-kind
Technical knowledge	Firm/agency provides training and advice to smallholders in crop production, processing techniques, and land management
Finance	Agency provides direct grants or loans to smallholders; firm/agency obtains finance for other functions, e.g., land development
Labour recruitment	Firm/agency recruits and accommodates plantation labour force, whether locally or internationally
Management	Firm/agency provides direct oversight of production (planting, maintenance, harvesting); work undertaken by plantation labour force
Harvesting	Firm undertakes contract harvesting of crop, whether mechanised or by harvesting gangs; may involve harvesting fee or purchase of standing crop
Logistics	Firm/agency undertakes purchase, assembly, and/or transportation of harvested crop to processor and/or wholesaler
Processing	Firm/agency transforms raw product into intermediate or final product
Marketing	Firm trades/exports intermediate or final product; agency manages trade/exports to control prices and/or raise revenue
Facilitation	State agency brokers/enforces agreement between landholders and company for the latter to undertake one or more functions in return for land rent, profit share, or other payment

However, large-scale entities may have an economic advantage in activities where there are

significant economies of scale. These may include land development, mobilising finance, acquiring high-quality production inputs, and of course processing and marketing. None of these in itself necessitates large-scale production or long-term control of land. For example, land development on the "agricultural frontier" exhibits economies of scale where it involves mechanised land clearing, terracing, drainage, soil improvement (e.g., heavy doses of lime and phosphorus in acid upland soils), road construction, and finance. However, as Byerlee et al. (2015) have recently highlighted, there are many historical examples in both developed and developing countries where this function has been the precursor to sub-dividing and selling the developed land to small-scale farmers who then take over the management of production (a "sites-and-services" approach to land development).

Likewise, economies of scale in processing often favour large-scale agribusiness entities with the necessary capital, technology, and skills. Whether this also favours large-scale production depends on the stage of development of the industry as well as policy decisions. In order to achieve economies of scale, processors need a reliable throughput of raw material, hence in the pioneer phase it may make economic sense to invest in large-scale production to assure this supply. However, if there are sufficient small-scale producers within the catchment of a processing plant, a steady flow of raw material may be forthcoming without incurring the higher costs of centralised production (provided the harvest and delivery can be coordinated by various intermediaries to avoid the high transaction costs associated with dealing with a large number of smallholders).

The four case studies showed a range of complementarities between smallholders, agribusiness firms, and government agencies, specific to each context. These are summarised in Table 5.

The third question that the case studies shed light on is whether smallholder commodity production can be broadly inclusive in the face of tendencies towards agrarian differentiation and the market imperatives of agribusiness firms. The agro-economic attributes of the commodities and the complementarities with agribusiness firms, discussed above, combined to allow smallholder production to be a profitable undertaking, increasing household incomes and assets, both tangible (e.g., land values, house quality, vehicles) and intangible (e.g., knowledge, skills). Moreover, participation in these booms has been widespread, with most or all households in the case-study villages benefiting from planting the crop in question.

Nevertheless, in each case there was an emerging inequality in the area planted to the boom crop and in some cases in the overall distribution of land owned (where the boom crop did not account for the total area). The key factors contributing to this differentiation are listed in Table 6. However, there is no simple causal relation between a given factor and an observed outcome. Rather, it is the conjunction of multiple factors that influences the degree of inequality that emerges.

In the oil palm case, though there was abundant land (including widespread access to paddy land), no indebtedness, alternative sources of income, and no land transactions, there was a positively skewed distribution of oil palm holdings. This was largely related to initial differences in land and labour resources, enabling some households to plant more oil palm, without impinging on the ability of other households to follow suit. A minority of households whose land was not accessible missed out. However, these households had other livelihood pursuits and were not providing wage labour to the larger holdings. This, then, was a case of "non-impoverishing differentiation" in which all or most households are progressing but some are progressing faster than others.

Table 5. Contributions of stakeholders in four smallholder value chains

Function	Oil palm (Miri, Malaysia)	Rubber (Luang Namtha, Laos)	Cassava (Dambae, Cambodia)	Teak (Luang Prabang, Laos)
Land development	Infrastructure already in place; land cleared by smallholders	Infrastructure already in place; land cleared by smallholders	Infrastructure already in place; land cleared by smallholders	Infrastructure already in place; land cleared by smallholders
Land settlement/ titling	Customary tenure remains in force	Land and forest allocation managed by village	Land ownership recognised by village	Land and forest allocation managed by village
Production inputs	Smallholders purchase inputs with cash; agency provides some planting material	Smallholders purchase seed and inputs	Smallholders purchase planting material and inputs	Smallholders purchase planting material from government and private nurseries
Technical knowledge	Farmers learn from government agencies and other farmers	Farmers learn from experienced farmers and traders	Farmers learn from processors	Farmers learn from government agencies
Finance	Government planting grants; credit for fertiliser deducted by mill	Government loans, repayable on maturity of crop	Credit from processors, moneylenders	Purchase of standing crop
Labour recruitment	Family and local labour	Family and local labour	Family and local labour	Family and local labour
Management	Farm household	Farm household	Farm household	Farm household
Harvesting	Family and local labour	Family and local labour	Family and local labour; harvested by buyer	Harvested by buyer
Logistics	Smallholder delivers fruit direct to mill or via local collector	Trader comes to farm to purchase tub-lump rubber	Trader/processor comes to farm to purchase, perhaps harvest, and transport tubers	Trader/miller comes to farm to cut and transport logs
Processing	Large-scale palm oil mills	Large-scale rubber mills (in China)	Mostly large-scale mills (small-scale mills in Myanmar)	Small- to medium-scale local sawmills
Marketing	Mills to refineries to exporters	Traders to mills in China	Starch processors to traders and end-users	Sawmills to exporters
Facilitation	Agency facilitates link between smallholders, fertiliser suppliers, and mills	Government loans; village negotiates best price, arranges traders to come	Processors/traders supply planting material, inputs, advice, scheduling	N/A

In the rubber case, farmers were more constrained. Land for shifting cultivation was limited and they had to wait 6-7 years for an income from rubber. However, the early rubber planters were able to find enough land to grow rice, within and outside the village, and the later planters were able to work as tappers while their own holdings matured. The provision of formal credit with deferred repayments enabled the pioneers to invest on reasonable terms and easily repay their loans. Though some

inequality in land and income emerged, largely related to the time of rubber planting, the village leaders took a strong role in ensuring everyone had a rubber holding, limiting the total area planted, prohibiting land sales to outsiders, and promoting a cooperative approach to marketing. Among other things, this involved superseding the government-initiated Land and Forest Allocation Plan for the village. The outcome was “minimal differentiation” as a result of participation in the rubber boom, with households progressing at similar rates. In fact, the pioneer planters helped to bring other households with them, encouraging them to plant, sharing technical knowledge, and providing employment during the waiting period.

The cassava case study in Cambodia shows a less well-insulated situation. Though farmers started on a fairly equal footing with land reform in the 1990s and had maintained their subsistence base, the expansion in commercial crops, especially cassava, combined with steady growth in population, had eaten into their available forest land, limiting forest-based livelihood pursuits such as cattle grazing and closing the frontier for new households. In addition, the high levels of indebtedness and the risks associated with cassava production meant that some households were forced into distress sales of land. More successful farmers were ready to buy up this land and enlarge their holdings, while outside investors were also attracted by the rising land values and the opportunity to profit from cassava production. Hence some households became landless or near-landless, and some left the village to occupy land in more remote provinces. Village institutions were not able to address this process of “impoverishing differentiation”, for example, by preventing absentee land purchases.

The teak case study has elements of both the rubber and cassava cases. Farmers who planted teak earlier were able to acquire more land resources through the Land and Forest Allocation process and maintain a more diverse farming and livelihood portfolio, particularly if they had paddy land and so were not reliant on shifting cultivation for subsistence. Farmers who planted later and depended on shifting cultivation were in a more vulnerable position, having to go further afield to find land for food production, or borrowing land from other villagers to grow food on condition that they plant the land with teak and hand it back when intercropping was no longer feasible. Hence the expansion of teak has been at the expense of poorer households. Moreover, while some villages have prohibited the sale of cropping land to outsiders, teak has been exempt. Hence urban-based investors have bought young stands of teak from farmers, thereby indirectly acquiring the land. In some cases, 50% of the teak may be owned by outsiders. Distress sale of teak lands is obviously impoverishing, but strategic sales also occur, as when a better-off farmer liquidates some of the household’s teak assets to invest in non-farm business or the children’s university education

Table 6. Factors affecting agrarian differentiation in the four case studies

Factor	Oil palm (Miri, Malaysia)	Rubber (Luang Namtha, Laos)	Cassava (Dambae, Cambodia)	Teak (Luang Prabang, Laos)
Initial wealth differentiation	Moderate	Low	Low	Moderate
Land frontier	Closed	Closed	Open	Closed
Land abundance	High	Moderate	Moderate	Moderate
Tenure security	Moderate-High	High	Moderate-High	High
Access to rice land	Widespread	Limited	Widespread	Limited
Extent of participation in crop boom	High	High	Moderate-High	Moderate-High
Ease of absentee management	Low	Low-Moderate	Low	High
Income risk due to yield and/or price fluctuation	Low-Moderate	High	High	Low
Dependence on credit	Low	High (but not onerous)	High	Low
Alternative sources of livelihood	Widespread	Limited	Moderate	Moderate
Strength of community institutions	Moderate-High	Moderate-High	Low	Moderate

Conclusion

Land grabs in Southeast Asia are driven by many motivations but the underlying dynamic is to cash in on booming agricultural commodity markets, increasingly driven by demand from within Asia. Past and present crop booms have seen both small- and large-scale production entities emerge. While large-scale operations may have economic advantages, particularly in a pioneering setting, it is clear that once an industry is underway and infrastructure is in place, there is a strong smallholder impulse to engage in commodity production, such that the share of planted area and output attributable to smallholders increases over time. In some policy settings, a successful industry can be developed from the outset entirely by small- and medium-holders, such as with rubber, oil palm, and cassava in Thailand. Hence the agro-economic attributes of the commodities associated with land grabbing do not in themselves warrant a policy emphasis on large-scale land investments.

The case studies show that smallholder commodity production depends on crucial contributions to value chains by private- and public-sector actors. These include upstream contributions, notably the provision of quality planting material, production inputs, technical knowledge, and finance, and downstream contributions, especially transportation, processing, and marketing. Public agencies committed to smallholder development can broker innovative arrangements between farmers and agribusinesses that ensure all parties benefit, such as the fertiliser buying groups (KBT) for oil palm smallholders in Sarawak. Even without such public-sector facilitation, specialised processors dependent on smallholder supplies of feedstock often have an incentive to provide technical and financial support to smallholders in their catchment, as with starch factories in Vietnam (including their cross-border supply areas in Cambodia). However, to avoid the high transaction costs of dealing with many smallholders, intermediaries in the value-chain become important to coordinate activities.

There is little doubt that smallholder engagement with commodity booms is associated with more inclusive patterns of rural development than large-scale land concessions that typically restrict and displace traditional rural livelihoods. However, what Tania Li calls “everyday processes of

accumulation and dispossession" can undermine the effectiveness of smallholder-oriented policies in reducing rural poverty, leading instead to "small-scale land grabs". All four case studies presented here showed this tendency towards growing inequality among smallholders. Nevertheless, depending on the contextual factors in play, the emerging differentiation can be either impoverishing (as with teak in Laos and cassava in Cambodia) or non-impoverishing (as with oil palm in Sarawak). One important factor is the initial inequality and vulnerability of poorer households in the community. Another is the incentive and opportunity for outside investors to acquire increasingly valuable land from smallholders, many of whom find they end up without their foothold in the village economy and have to resort to selling their labour or migrating. However, strong village institutions can enable all households to benefit from a commodity boom, limit the extent of internal differentiation, prevent a land grab by outside investors, and engage on a cooperative basis with the market. The rubber village in Laos is a rare example of this degree of foresight and self-organisation.

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About the Author

Rob Cramb is Professor of Agricultural Development at the University of Queensland, Brisbane, Australia (r.cramb@uq.edu.au). For the past 30 years, he and his colleagues have been engaged in research on ways to improve smallholder livelihoods in marginal farming zones in Southeast Asia. In the last decade this has included an examination of the expansion of industrial crops and the potential for smallholders to benefit from this expansion, whether as independent smallholders or through various contractual arrangements with agribusiness companies.