

Sparking development or consuming the countryside? Lao charcoal commodity networks in the Mekong Region

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Abstract: *One of the unexpected outcomes of increased regional integration in southern Laos has been a boom in household production and roadside sale of wood charcoal. This paper develops an ethnographically informed analysis of charcoal as a socially embedded market, providing insights into the sociopolitical relations of access, legal and extra-legal regulations, and the distribution of rents that characterise this trade. Contrary to some assumptions about charcoal as a necessarily exploitative commodity, this paper points to some of the advantageous income smoothing opportunities that charcoal presents for many rural Lao households and detail the complex ways in which charcoal production can relate to forest sustainability and degradation. The paper elaborates a perspective of entrepreneurial Lao charcoal communities, energetically utilising locally available natural resources, for direct cash income. Charcoal production networks also connect everyday household livelihoods in Laos to large-scale extractive industry, in ways that have been arguably underemphasised previously. At the same time, the charcoal trade highlights the structural limits to notions of smallholder agency and local participation in commodified market relations, within broader political-economic contexts decidedly shaped through uneven development, and accumulation through dispossession.*

Keywords: *agrarian transition, charcoal, forest governance, Lao PDR, smallholder agency*

Introduction

The Government of Lao PDR has spent the last two decades promoting economic integration into the Greater Mekong Subregion, including with southern China. Laos' national development plan is to drive poverty alleviation through accelerated economic growth, via new resource sector investment, building physical infrastructure and involvement in new trading regimes including the World Trade Organization. In macroeconomic terms, this has been a successful strategy, with absolute poverty rates falling from 46% to 23% (Warr *et al.*, 2015), and the country on the cusp of advancing out of the United Nations 'Least Developed Country' grouping (Vientiane Times, 2016). However, a downside to regional integration and resource-led growth has become apparent, as hundreds of rural communities have experienced undercompensated loss of access to customary land and resources. In the countryside, the transition to more formalised agro-industrial and wage labour markets remains an uneven achievement (e.g. Shonweger and Messerli, 2015).

In this context, the future of Lao smallholder farmers looms large (Rigg, 2016). Operating in the interstitial spaces between large-scale extractive concessions and intensive smallholder agriculture, and negotiating the gap between household, communal, and state property, in Laos, there is a thriving but poorly documented, 'informal', smallholder resource economy, involving a wide range of non-agricultural products, flowing into both domestic and regional markets. These include natural aquatic and forest foods (Russell *et al.*, 2015), artisanal minerals, illegal wildlife, high value timber (Singh, 2012), as well as the focus for this paper – a vibrant informal trade in wood charcoal. Important resource and food 'safety nets' for the rural poor in Laos are under extractive pressure (Fullbrook, 2010), with the implication that upland Lao communities will become increasingly exposed to the full weight of market forces and capitalist dynamics of opportunity and risk.

In southern Laos, one of the unexpected outcomes of increased regional integration has been a boom in household production and

roadside sale of wood charcoal. In this paper, I analyse this trade in relation to two key literatures, the first on forest governance, livelihoods and value chains, and second on market-agrarian transitions and smallholder agency in rural Laos. The paper develops an ethnographically informed analysis of charcoal as a socially embedded, 'real market' (Ribot, 1998; Sikor and Pham, 2005), providing insights into the sociopolitical relations of access, legal and extra-legal regulations, and the distribution of rents, which characterise this trade. Charcoal production and selling have increased quite dramatically in Laos, facilitated by improved infrastructure, and driven by cross-border consumer and industrial demands. I point to some of the advantageous income smoothing opportunities that charcoal presents for many rural Lao households (cf. Kusakabe, 2004) and detail the complex ways in which charcoal production can relate to forest sustainability and degradation (Mwampamba *et al.*, 2013).

Second, I forward that the example of the wood charcoal trade helps to balance portrayals of rural Lao communities, either as the subjects of an externally imposed resource grab engineered by the country's elite and hegemonic neighbours, or alternatively, as conservation-oriented, community-based resisters. While the weight of political-economic forces in Laos do not favour smallholder farmers, markets are operationalised through multi-scalar political-economic power relations and socio-spatial arrangements, in which local state agents and villagers are also active players. Here, I provide a perspective on entrepreneurial Lao charcoal communities, as energetically utilising (indeed at times over-exploiting) locally available natural resources, for direct cash income. Lao women, from teenagers upwards, are noted as closely involved in the charcoal trade, as wage labourers, local producers and market savvy, long-distance commercial traders (Walker, 1999). Charcoal production networks also connect everyday household livelihoods in Laos to large-scale extractive industry, in ways that have been arguably underemphasised. At the same time, I suggest that the charcoal trade highlights the structural limits to notions of smallholder agency and local participation in commodified market relations, in broader political-economic contexts decidedly shaped through uneven development (Glassman, 2010), and accumulation through dispossession (Gellert, 2015).

New political economies and ecologies of wood charcoal

In the scholarly and policy literatures, charcoal has often been considered through a number of key approaches. These include: (i) technical approaches to charcoal as a 'fuelwood-energy crisis'; (ii) policy approaches to charcoal in unsustainable tropical forest management; (iii) political ecologies of charcoal; as a co-production of profit, poverty and environmental degradation through uneven relations of access; and (iv) charcoal, security and new regimes of global forest governance. In this necessarily briefly section, I outline these key approaches, before situating my interpretation of widespread local participation in charcoal value chains for commercial livelihoods, and the agency of various charcoal actors, as occurring within uneven geographies of agrarian transition, state-society relations and regional integration.

In the 1970s and 1980s, there was a flurry of international attention on the wood charcoal sector in Africa and Asia. International forestry experts often viewed fuelwood and charcoal as an energy source of the poor, with large gaps projected to emerge between global demand for wood energy including charcoal, and a sustainable supply, especially in sub-Saharan Africa and India (Arnold *et al.*, 2006: 597). Significant state support was mobilised around technical development inputs, such as the provision of efficient cook stoves, and the establishment of village wood-fuel forestry programmes (p. 598). By the late 1980s, it was clear that there were viable substitution options for both the supply and demand for wood fuel, and the more extreme modelling scenarios of charcoal and deforestation became viewed as overdrawn. Donor and state support programmes for wood-fuel forestry and charcoal were scaled back in the 1990s, as priorities in tropical forest management shifted.

An emphasis on fuel-efficient cook stoves, and community forestry woodlots for sustainable charcoal continues today in countries including Laos (e.g. Vientiane Times, 2013) and Cambodia (GERES, 2014). A recent study from GERES (2015) estimates some 336 000 tonnes of charcoal is produced annually in Cambodia, valued at some \$117m. Yet, key narratives about charcoal in Cambodia and elsewhere can at times slip into overcharged depictions of the 'devastating' impacts on deforestation, and an

emphasis on Geographic Information System (GIS) mapping of charcoal production 'hotspots' (Bailis *et al.*, 2015; GERES, 2015).

With a series of influential papers on the political ecology of charcoal in Senegal, Ribot (e.g. Ribot, 1998; Ribot, 2009) interprets the socially and politically embedded relations of access and competitive struggles involved in charcoal commodity chains, at times coalescing into charcoal oligopolies that undermine local democratic institutions. Ribot (1998) draws upon the charcoal trade to develop concepts of 'access mapping' and market exclusion, as shaped through property arrangements, social identities and local political power relations.

Charcoal has more recently been considered in relation to new and complex value chains, and new institutions of market-based global forest governance. In Brazil, charcoal has long been connected with the manufacturing of pig iron steel rather than as a rural or urban wood fuel (Sontter *et al.*, 2015). In Namibia, charcoal has been depicted as a lucrative 'black gold', exported to European barbecue consumers, while migrant charcoal workers live in 'wretched' conditions, in the '...grim shacks many of the charcoal workers and their families call home' (Fern, 2015: 6). While the laudable aims of this study are to call attention to examples of poor employment conditions and industry environmental standards, care also needs to be taken to avoid blanket representations, with arguably stereotypical representations of exploitation in Global South contexts. Charcoal is also a commodity market that makes a significant contribution to everyday livelihoods across many Global South countries (Mwampamba *et al.*, 2013), and scholars can seek to better understand the range of socio-economic practices, and political histories of wood charcoal production in different regions, as well as the potential implications of new regulatory interventions for local livelihoods.

New global forest governance mechanisms such as the EU Forest Law Enforcement, Governance and Trade (FLEGT), and the Reduced Emissions from Deforestation and Forest Degradation (REDD+) climate change mitigation programme could extend to include wood charcoal (Bailis *et al.*, 2015; EU FLEGT Facility, 2014). Cavanagh *et al.* (2015) argue that framing of informal charcoal production and trade as 'illegal' is unlikely to be effective and could

establish new incentives for the displacement of forest-dependent communities. Recently identified commercial linkages between charcoal and the Somalia-based Al-Shabaab (Al, 2015) could also provide further impetus towards adopting a security lens to 'environmental crime' in areas of Africa. These are salutary warnings on the potential pitfalls of an overly regulated and securitised approach to what is often more usefully understood as an 'informal' (as opposed to an across the board illegal) resource trade (Schure *et al.*, 2013).

In Laos, a recent report from the Asian Development Bank (Asian Development Bank, 2010) presents a view of wood charcoal as a traditional and unsustainable energy source, in the process of 'giving way to electricity and petroleum' (p. i), with '...only a small share commercially traded' (p. 38). However, in Laos, villagers are far more likely to use unprocessed small firewood for home cooking, while regional commercial-industrial demands for charcoal have expanded significantly in the last decade. As elaborated in the succeeding text, there is a complex economic geography of Lao charcoal, linking domestic and regional actors, purchasers and end consumers, and significant value is produced – certainly in the millions of dollars per year.

As opposed to viewing wood charcoal primarily as an environmental 'problem', I focus on understanding the market organisation of Lao charcoal value chains. I highlight the agency of Lao holders' engagements with commodity charcoal and emphasise the legitimacy of their resource-based labour and commercial livelihood aspirations (High, 2014). However, the Lao charcoal trade is not just carried out by aspirational villagers. It is embedded within a broader political economy of extractive resource development, characterised by ongoing accumulation through dispossession, and under conditions outside of local control. In building this analytical framework, it is helpful to ground an analysis in relation to the material realities of production, the political relations of access and profit and the social organisation of different charcoal value chains in Laos.

The informal charcoal trade and agrarian change in southern Laos

The fieldwork component of this study focused on two geographical regions in south-central

Laos – in Mahaxai district in Khammouane province, and the Route 9 East–West Corridor in Savannakhet province. Our interviews focused on understanding three key value chain dynamics: (i) charcoal product lines and the Lao regulatory framework; (ii) the production system, including trading arrangements, connections with local state actors and regional markets; and (iii) environmental sustainability and local livelihood issues. These points are discussed later, drawing upon Ribot's (1998) approach to access mapping and socially embedded markets (Diana, 2013), leading to a conceptual discussion of how the charcoal trade connects with entrepreneurial villagers, agrarian transformations and the future of smallholders in the new Lao resource economy.

Charcoal product lines and the Lao regulatory framework

There are two main product lines in the Lao charcoal commodity chain: black charcoal (*than dam*) and white charcoal (*than khao*). Most of Laos' black charcoal is produced by smallholder farmers, accessing scrap timber from sawmills, or household land and swiddens, or from land cleared for plantation development (Herail, 2013). The main techniques for black charcoal production relate to the type of kiln (or *dao*) used to make the charcoal. The most common is a *dao phi* (or 'spirit' *dao*, also referred to as *dao kee leuay*), so-called because wood is laid end-to-end (as with a human cremation). In a *dao phi*, the timber is covered with either sawdust (*kee leuay*) (for better results), or even soil or rice straw (for poorer quality charcoal), to create the conditions for pyrolysis (anaerobic carbonisation), and set alight for about six days. In some cases, labourers produce *dao phi* charcoal inside sawmill compounds, selling it back to the sawmill owner. In other cases, villagers purchase sawmill cutoffs and transport it back to their homes for kiln production, selling onwards to traders. Working within or near to sawmills, *dao phi* charcoal producers would have free or inexpensive access to sawdust.

A second main technique for black charcoal is through constructing an earthen pit with a clay mound (known as *dao op* or *dao coup*). In southern Laos, mixed dry dipterocarp forest timber will be used in these kilns – not sawmill cutoff timber, and it requires up to 15 days for

pyrolysis.¹ For those without access to sawmill scrap timber and sawdust, the *dao op* method offers a reliable technique, using local materials. Indicative roadside Savannakhet prices for black charcoal in 2014 ranged from approximately \$167 per tonne for *dao phi* charcoal, to \$176 per tonne for *dao op* charcoal (as sold in 10 kg bags).²

Alternatively, high quality, refined 'white charcoal' (known as *binchōtan* in Japan) is produced in larger industrial brick and clay kilns, by medium-scale enterprises dotted through southern Laos, and exported directly to premium buyers in Japan and South Korea. The best white charcoal has a carbon content of approximately 90%, with almost a metallic quality (Herail, 2013: 17), a conversion yield as low as 5%, and sells for up to \$1400 per tonne at Laem Chabang port in Thailand. *Mai tiew* (*Cratexylon spp.*) is the prime species used – a spikey, fast-growing pioneer tree, commonly found in disturbed forest areas, that has few other practical uses, with a reduced tendency to spark, and a high burning temperature. In 2014, there was reported to be about 65 firms producing white charcoal throughout Laos, although many are facing wood supply pressures, and are operating below capacity. A small number of Lao joint ventures with companies from Japan or Korea are market leaders, with access to state quotas for *mai tiew* timber.

In Laos, there is a rather complex legal framework around charcoal, as related to the overall forestland governance framework. The Ministries of Agriculture and Forestry, Industry and Commerce (MoIC), and Finance (via the Department of State Asset Management, and the Laos Customs Department) all have mandates for regulation or taxation. However, enforcement of smallholder charcoal appears light, and Ministry of Agriculture and Forestry legal decrees on charcoal are vague on monitoring or enforcement. A number of interviewed local officials reiterated the connection of black charcoal with rural livelihoods in their jurisdiction, even as entire villages clearly specialise in commercial production:

We cannot control charcoal production because villagers just do it on a small scale for their own household use. Regarding taxes, it is too difficult to survey [local producers] because

it's not like a business. [Interview, Phine district, Savannakhet, Jan 16, 2014].

As a general operating principle, Lao smallholders can produce and sell charcoal, although rarely would this occur under the full legal framework. In practice, as long as villagers and smallholders collect timber for charcoal within their own household or village use forests, there are no major disputes over timber access, and as long as the smoke from villagers' charcoal kilns are not causing a public nuisance, the activity appears to carry on without significant interference (Interviews, Phine and Phalanxai Forestry Offices, Jan. 16, 20, 2014). However, new legal decrees and campaigns are issued periodically that might attempt to tax local producers, or to suppress the expansion of smallholder charcoal production beyond certain limits. I suggest that this 'relative autonomy' for smallholder production, as well as low technical and cost barriers to entry, and broad local access to raw materials and markets

make charcoal a relatively equitable commodity, and indeed an attractive commercial option for many roadside communities in southern Laos, a quite different scenario than described by Ribot (1998) for Senegal. As explained next, local officials appear to focus the more of their efforts upon relations with charcoal traders.

The charcoal production system, trade and logistics

While Lao data for wood charcoal exports are unreliable, mirror data from Chinese Customs for 2014 show a rapidly increasing regional charcoal trade, with approximately 430 000m³ (round wood equivalent) of charcoal imported from Laos (Fig. 1). Indeed, Laos has emerged as China's second largest source of charcoal, with almost all of this volume likely represented by black charcoal.

In the context of this expanding regional market, we turn to two key charcoal producing areas in central-southern Laos to examine local production and trading arrangements in more detail.

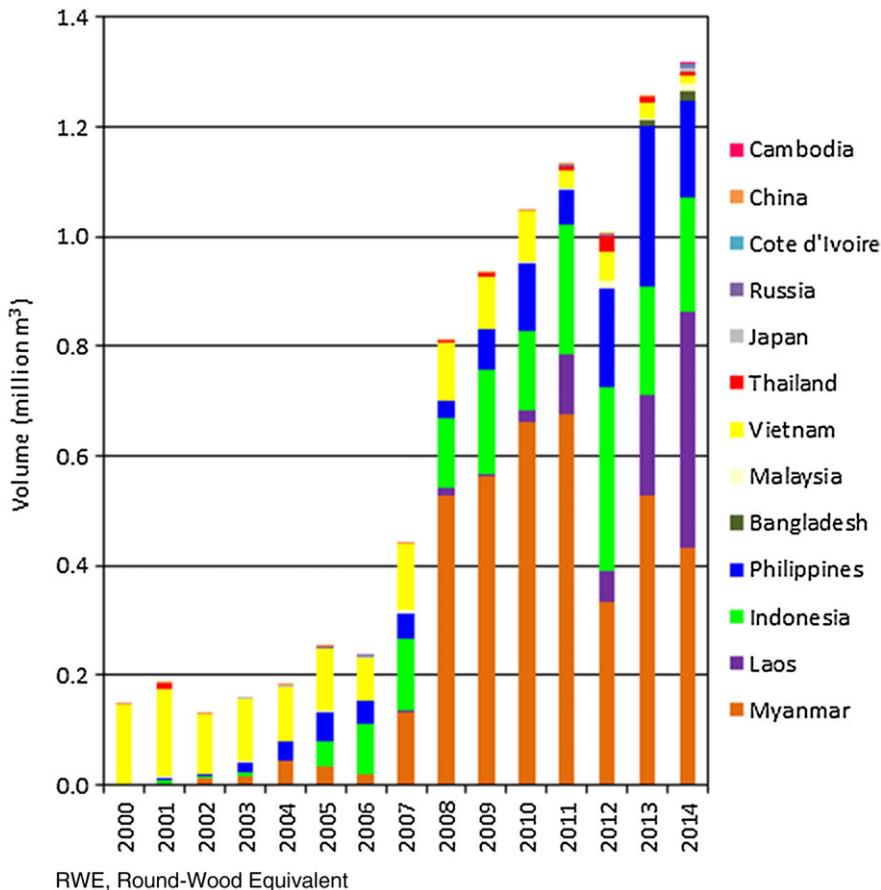


Figure 1. Volume of China's charcoal imports by country (2000–2014). Source: China Customs, as compiled by Forest Trends

Charcoal production and trading in Mahaxai District, Khammouane Province In Laos, it is common for provincial and district authorities to grant exclusive area-based trading concessions or 'quotas' to non-timber forest product (NTFP) commodity traders (e.g. Foppes and Wanneng, 2007). In January 2014, in Mahaxai town, two traders – one female Lao national, and one male Chinese national, maintained two large charcoal purchasing depots, while a third medium-scale Lao purchaser was also trading charcoal outside a house for shipment to Yunnan China. Although the district offices are located just a few hundred metres from these depots, forestry staff gave unclear information about the nature of the trading operations. However, these Mahaxai charcoal traders were crucial players, transporting 5 and 10 kg bags of charcoal from the remote district villages and sawmills while operating under the sanction of local officials.

According to local officials, about 70% of the charcoal from Mahaxai district comes from six industrial sawmills, operating in the area of *kum ban*³ Banaam. As with all sawmills in Laos, the compounds are enclosed by high concrete and metal walls and are inaccessible to passers-by. Through the district forestry office, we secured interviews with charcoal producers inside one sawmill compound. Here, a number of migrant husband and wife labourers, from Vientiane province and other areas of Khammouane, were accessing scrap cutoffs, selling charcoal back to the sawmill owner. These labourers had previous social connections with the sawmill owner, which helped to secure this employment.

Along the unsealed and dusty stretch of Route 122 from Mahaxai town towards Boulapha district, local men and women can also be seen producing and selling charcoal along the roadside, along with other local goods such as bananas, mushrooms and (illegal) wildlife. While the large sawmills originally spurred the entrance of traders in these quite remote areas, farmers have since tapped into the market as charcoal producers and sellers. *Kum ban* Banaam villagers are now reported to be relying more upon natural forest for charcoal, from their own village commons, as industrial wood volumes flowing into the sawmills have declined. Smallholders' mixed forest charcoal sells for \$1.00–\$1.25 per 10 kg bag with *mai tiew* and *mai bok* (*Irvingia malayana*) charcoal attracting a 50% premium. Households in

the area are often able to generate \$125 per month from charcoal, making it a core livelihood activity after rice and livestock. Charcoal volumes coming from 14 villages between *kum ban* Banaam and Boulapha district was estimated at about 11 to 14 tonnes per week, worth some \$1000–1500 at the farm gate (NGO Interview, Thakhek, 17 Jan., 2014); a significant trade given the relative poverty in this area of Laos.

To understand the trading network, we interviewed a Lao female charcoal trader working out of Mahaxai town. She identified her company as a black charcoal 'import-export' firm, starting operations four years earlier, and drawing upon the area around *kum ban* Banaam as the major supply zone. At the time of our interview, about 8500 smaller 5–6 kg bags (approximately 43 tonnes) were stored at the depot. Trading margins were reportedly thin, at \$0.18 per small bag, with 70% of charcoal by volume sold to Vientiane buyers, and 30% to Thailand. Notably, she identified her primary customer in Vientiane as Lao Silicon Company. By chance, a purchaser from a major Thai silicon metal producer, GS Energy, was present during our interview, arranging for a shipment of black charcoal to their manufacturing facility in Ratchaburi province. These encounters revealed an unexpected commodity linkage between Lao charcoal and the regional metallurgical silicon sector, which uses charcoal as a reducing agent in the quartz smelting process. Ultra-purified silicon metal is used in numerous downstream Southeast Asian regional and global industries, including in high-tech solar panels and semiconductors, with lower grade silicon used in the automotive and construction sectors.

The trader-quota system in Laos would appear to be partially functional, from a state taxation perspective. As Foppes and Wanneng (2007) point out (and as alluded to by our district informant above), in lieu of local governments attempting to tax hundreds of petty producers, a levy would be issued on major traders in exchange for purchasing rights over a region. However, traders with purchasing quotas could be incentivised to offer low farm-gate prices, due to restricted buyer competition. This in turn establishes an incentive for local sellers to skirt around the quota system and sell to independent third party traders offering better terms. Foppes and Wanneng (2007) argue that the use

of un-transparent trader quotas in Laos limits effective coordination and sustainability planning in natural resource management, dampens access to price information and market competition and restricts local people's access to extension services. Our field interviews and observations are suggestive, although not conclusive, that a trader-quota system is operational in Mahaxai with charcoal.

The third, smaller, charcoal trading operation involved a depot of a couple thousand 10 kg bags. During our visit, locally hired workers were loading charcoal to a truck for shipment to Mengla, Yunnan. The truck owner was an enterprising Hmong Lao, who had saved up the funds to purchase his own \$30 000 Isuzu vehicle, through previous employment with one of Laos' largest mining operations, Phu Bia Mining Ltd. Accompanied on his trips by his wife and infant child, he transports charcoal on the way north to Yunnan, and goods such as steel construction rods on the return journey. The Hmong trucker indicated that the owner of the depot had a 'quota' for exporting to China and that there were up to five smaller truck owners like him shipping charcoal out of Mahaxai district. For this Hmong family, wage labour in a large-scale extractive project in Laos provided the required start-up capital for his independent business and facilitated an extension of trading arrangements into new areas of the country.

From this overview, I draw attention to how the Lao charcoal trade in Mahaxai district is embedded in a quite particular social and regulatory context (Ribot, 1998). It is notable how charcoal markets initially developed, through the involvement of traders purchasing sawmill-based charcoal, and only afterwards connecting with smallholder farmers. In Mahaxai district, commercial charcoal production can be a core commercial activity, not just a household 'safety net'. The range of social identities of local traders and transporters involved is notable, including a leading role for a Lao businesswoman (see Diana, 2013, on female involvement in long-distance trade in Laos), a Chinese national, as well the young Hmong family as 'trucker-entrepreneurs'. Traders navigate social-political networks and invest their established capital, to secure trading permissions (and perhaps quotas) from local officials. In addition, there are interesting regional

demand drivers that connect peripheral and quite poor charcoal communities to industrial (even 'green') manufacturing such as photovoltaics. I forward that the charcoal trade in Mahaxai has developed less as an abstract, externally driven market imperative, and more as a result of quite intimate, and place-specific interactions between charcoal producers, sawmill owners, traders, local state officials and new regional buyers. As expanded upon next, the extent of local involvement in commercial charcoal production in Savannakhet province provides a range of livelihood opportunities and underscores the connections between an elite-dominated extractive logging sector, and local smallholder society.

Charcoal production and trading along Route 9 Savannakhet Province The districts of Atsapangthong (Dong Hen), Phine and Phalanxai along Laos' Route 9 East-West Corridor between Thailand and Vietnam, are perhaps the heartland of charcoal production in Laos. Over 10 days in January 2014, we conducted nearly a full roadside survey of visible charcoal production and sale points along the 235 km of Route 9 Savannakhet, involving more than 170 interviews and observation points. Previous research by the author in Atsapangthong district in September 2005 (prior to the 2006 completion of the Second Lao-Thai Mekong Friendship Bridge) indicated that local farmers then sold forest charcoal only sporadically, as a minor source of cash income, largely to purchase rice during times of shortfall (Author field notes, Sept. 2005). In the last 10 years, a dramatic change has taken place, with more domestic and international traffic, and an increasing number of Vietnamese traders and businesses.

The charcoal trade in Savannakhet is heavily oriented towards the Vietnamese urban food and consumer markets. A rather unique transportation system facilitates this, as nearly the entire export trade is conducted through the so-called *lot hin kao*, or Vietnamese double carriage trucks, transporting gypsum rocks (for cement production) from a quarry at Ban Bokeo, a village about 15 km south of Atsapangthong town, to Vietnam.⁴ The 260 ha gypsum quarry site represents a main logistical node in the overall charcoal trade in Savannakhet, as well as being the site of a large charcoal depot – with perhaps 10 000 10 kg bags stacked for shipment at the time of our 2014 visit

(about 100 tonnes). The destination is reported to be a cement factory in Vietnam's Quang Tri province, and from there Lao charcoal is transported to consumers in major central-northern urban centres, from Danang to Hanoi.

Savannakhet roadside charcoal transactions also have a distinctive character. On their way into Laos, Vietnamese *lot hin kao* truck drivers extend 1- or 2-day cash deposits (*ngeun mud chum*) ranging from about \$60–\$615 to roadside producers, topping up their gypsum truck cargo with charcoal on the return to Quang Tri. Reflective of the regional economic influences in southern Laos, one large Vietnamese charcoal trade shop owner in central Phalanxai district estimated that 85% of his sales were to Vietnam, with the other 15% to Thailand and China (Interview, January 20, 2014). The canvas coverings on the *lot hin kao* trucks work to minimise undue attention to the trade (e.g. Radio Free Asia, 2015), and likely facilitates an under-declaration of charcoal volumes at the border, which would be subject to a 15% export tax by Lao Customs. While this research was not able to document this issue fully, the Lao–Vietnamese mining venture may facilitate smooth export procedures for both gypsum and charcoal.

Black charcoal is stacked up for sale along most Route 9 communities, while some Vietnamese and Lao entrepreneurs have used their market position to develop larger trading depots, which sell on volume. One of the largest warehouse traders reported selling between 1000 up to 10000 10 kg bags (10–100 tonnes) of charcoal per month. With indicative margins of perhaps \$0.37 per 10 kg bag, monthly net revenues might range up to \$3700 for this shop owner (or more, if margins could be increased through exerting price control), representing a rather significant rural enterprise. Charcoal production by local communities drops off significantly as one moves north or south from Route 9, as transportation costs increase (Russell *et al.*, 2015), although as noted the largest charcoal depot is some 15 km south of Highway 9 at Ban Bokeo.

In Savannakhet town, charcoal prices increase to \$196–\$220 per tonne, while by the time charcoal reaches Quang Tri province, Vietnamese traders reported prices at \$283 per tonne – a 60% markup compared with the roadside prices in Laos. Lao charcoal sellers noted price fluctuations between rainy and dry seasons, and in the

lead-up to the Tet New Year festival when Vietnam's demand for charcoal peaks. Based upon our roadside survey, we estimate 9500 tonnes of *dao phi* and *dao op* black charcoal per year sold annually along Route 9 Savannakhet, which would correspond to a sizeable harvest of some 53 000 m³ of round timber annually, under given conversion ratios.

In comparison with Khammouane, Savannakhet charcoal trading and logistical infrastructure is further developed, taking advantage of cross-border traffic along Route 9, in fact 'piggy-backing' on the Vietnamese gypsum truckers. In this way, the transport and logistical networks for one commodity market can facilitate another, leading to dense 'commodity webs' at a local scale (Sikor and Pham, 2005). Charcoal is based upon quite open and competitive trading markets, supporting thousands of householder livelihoods along the highway. Charcoal production is also connected to environmental sustainability pressures and agrarian transformations, in locally complex ways.

Charcoal and agrarian-environment relations in southern Laos

The environmental relations of charcoal in Laos can be considered according to underlying property and access rights. Where charcoal timber is sourced from scrap wood from industrial sawmills, the supply chain connects into elite-dominated illegal logging networks, and an associated business model of 'timber-mining' Laos' remaining natural forests. Little of this timber would be legally compliant (Grace *et al.*, 2012; Smirnov, 2015), and local communities in logging areas do not receive a significant share of the economic benefits. For high value white charcoal, in one documented instance, the Provincial Forestry Office in Savannakhet allocated *mai tiew* timber harvesting quotas to a leading white charcoal firm, from forest lands cleared by the agribusiness company Birla Laos Pulp and Plantations Ltd, which reiterates how resource and market access for a range of actors is mediated through the Lao state.⁵

As rural communities in Laos generally lack legally secure communal land rights, in the context of expanding large-scale development schemes, the existing regulatory system broadly

incentivises the liquidation of common forest resources. At least one roadside community in Savannakhet reported a complete loss of communal forests suitable for charcoal, due to local overharvesting (Phalanxai district, Jan. 20, 2014). Where timber harvesting for charcoal is pushed beyond sustainable limits in Savannakhet's dry dipterocarp forest zone, access to a range of forest products and ecosystem services is undermined; such access can be important for supporting resilient livelihoods, especially for the poorest community members (Russell *et al.*, 2015).

In communities with more extensive landholdings, intensive charcoal production could be associated with a slower process of forest degradation and fragmentation. In other circumstances, charcoal can be relatively benign in environmental terms. In a community in Khammouane's Hinboun district, where the author has undertaken research over the past decade, land access remains quite equitable across the community. Households source charcoal timber from communal and household forestlands, and from their own upland swidden fields, and sell relatively modest quantities to traders, often as a means to pay down debts, or to purchase food for the household (Author interviews, August 2007). While there are clear commercial incentives, chainsaws are absent, and the community is located some distance away from the main Route 13 South highway, which limits the extent of overharvesting. Despite enclosure pressure due to land acquisition by a plantation company, in this village charcoal is not obviously linked with either forest degradation or deforestation.

An example of moderate smallholder environmental pressure can be taken from a Route 9 roadside village in Phalanxai district. Here, a work team of four local men were operating four *dao op* clay kilns. As many families in this highway-side village now hold land titles (*bai tii din*) and pay land taxes, for the most part, there are not large areas of communal forest or household 'reserved' (*jap jong*) forest land that could be used for sourcing timber for charcoal. A concessionaire has planted a large area of the village territory with eucalyptus trees, resulting in a squeeze on local access to dry dipterocarp forests. Our interlocutors reported using species such as *mai chik* (*Shorea obtusa*); *mai peuy* (*Lagerstroemia spp.*) and *mai tiew* trees for charcoal timber, either from their own

'land for tree planting' (*din suan book khon*) or from the 'village use forest' (*pa som sai khong ban*). Charcoal production is semi-mechanised, through the use of an (illegal) chainsaw and a *lot tai naa* modified tractor and trailer. Their 2014 selling price was \$1.70 per bag, to a specific Vietnamese gypsum truck driver with whom they had longer-term dealings. Gross sales from a 10-day *dao op* kiln cycle with four kilns, each yielding about eighty-five 10 kg bags of charcoal, might thus involve some \$583, which is indeed a significant sum for rural Savannakhet.⁶

The intersections between charcoal as a commercial livelihood, issues of forest sustainability, access to sawmill timber, household labour regimes and female youth participation were all highlighted during one household interview in Phalanxai district. Here, an older couple and their teenage daughter were making and selling *dao phi* charcoal next to a Route 9 furniture factory. This family purchased their wood supply from the factory sawmill. Their three *dao phi* kilns produced about 200 bags of charcoal, which could be sold at \$1.35 per 10 kg bag, and the family could thus generate a sizeable income of \$270 before the costs of wood (when available). However, the father reported that he only did this difficult work when the cutoff timber was available, and when his teenaged daughter was home and available to help. Previously, he produced charcoal through the *dao op* method, but the natural forest on his own 10 ha of land was now emptied of suitable timber. In the recent past, nearly every person in the village produced and sold charcoal; however, this activity had declined with dwindling community wood supplies. With the local sawmill also facing reductions in timber supply, his was now the only family in the village that had access to the scrap cutoffs. The other primary activities for his family were growing rice, and a fruit orchard, but charcoal was their primary household income source. The family used a mobile phone to arrange sales with the Vietnamese *lot hin kao* gypsum drivers, including cash advances.

In Xepon district, adjacent to the Vietnam border, roadside charcoal production tails off significantly, despite the extent of local forest resources. Near the village of Ban Dong in Xepon, we met one ethnic Lao husband and wife team who produced much of the charcoal in the area,

operating four large *dao phi* kilns. A large amount of acrid smoke drifted around the *dao phi* kilns. The couple has been producing charcoal for sale for the past six or seven years, purchasing cutoffs from the only local sawmill, at \$37 per Hyundai truck (approximately 2 m³). With four *dao*, the couple's production might be 500 bags (about 5 tonnes) of charcoal per week, continuing into the rainy season. Sold at \$1.60 per bag, the couple's revenues might reach an impressive \$795 per week before wood expenses. For this couple, living at the remote end of the Route 9 Corridor in historical Xepon district, charcoal has become their key to a successful engagement in the modern cash economy.

A complex picture therefore emerges from this fieldwork on charcoal and agrarian change. Social inequalities and environmental constraints arising from the Lao charcoal trade are not absent. However, the Lao context does diverge from Ribot's (1998: 322) observations of the wood-fuel trade in Senegal, described as a net economic loss and ecological burden for rural communities, particularly for women, due to control over forest access and commodity rents by village chiefs and merchants, and a widespread reliance upon migrant labour.

In Laos, charcoal is a widespread commercial activity for villagers along the Route 9 corridor, and Lao women, from teenaged to middle-aged, are especially involved as producers and sellers. The kilns can be easily constructed on one's household land, and sales (to Vietnamese *lot hin kao* drivers, or other traders and passers-by) can be managed by stacking charcoal bags along the roadside. Charcoal can dovetail with the flexible, circular wage labour migration strategies of Savannakhet youth along the Route 9 corridor, as mediated through Lao gendered household relations (Huijsmans, 2014), providing a commercially remunerative activity during time spent back in the household. Despite the international traffic flows along Route 9, evening-time theft of charcoal bags stacked along the road is reportedly quite uncommon. Full wage labour commodification for black charcoal production in Savannakhet was found to be relatively rare,⁷ while there is semi-skilled wage labour with the white charcoal companies. Charcoal work is nevertheless difficult, dirty and hot, and inhaling the acrid charcoal fumes on a regular basis would

surely have dangerous health impacts. For Lao teenagers earning a living and helping their families, working with black charcoal in the hot sun would be in some contrast to their dreams and aspirations.

Discussion and conclusion

I propose that the charcoal trade provides useful insights into both the trajectories of smallholder resource dependence and market engagement, and also the operationalisation of the 'informal' smallholder resource-based economy through which the majority of rural Lao citizens still earn their living (Putzel *et al.*, 2014; Schure *et al.*, 2013). Wood charcoal is a minor forest-product trade, which nevertheless engages large sections of the rural population in southern Laos living along major transportation routes, or in the vicinity of sawmills. The depth of local participation in this wood industry supports an interpretation of villagers as informal smallholder entrepreneurs, using locally accessible resources in a flexible and creative manner for cash income. Some aspects of the Lao charcoal trade fit with the broad thesis of 'displaced deforestation', from regional countries such as Vietnam and Thailand (Meyfroidt and Lambin, 2009), as well as broader notions of the Greater Mekong Subregion as a frontier 'fix' for regional capital accumulation (Glassman, 2010). However, both the social-economic relations of charcoal and the chains of causality to forest degradation are complex and embedded within local state-society relations, forest property regimes and systems of access, in distinctive ways.

This description of the charcoal trade from central-southern Laos highlights how these value chains are embedded within places, identities, sociopolitical relations, and local institutions. Different product lines shape the distribution of socioeconomic benefits and environmental outcomes, while the largely 'informal' (but state mediated) nature of the production and trading system is key to how charcoal networks operate. Local participation in black charcoal production is shaped through low technical and financial barriers to entry, access to raw materials, relative autonomy from state regulation and the active participation of a range of traders. Charcoal can fit well with household labour regimes, including

widespread female and youth participation. There are well-developed regional consumer and industrial demands for a range of charcoal products, including high value white charcoal. While hierarchical formal and informal relations and struggles over resource rents certainly mould the Lao charcoal trade, my interpretation outlines a relatively more open and equitable commodity trading system, as compared with Ribot (1998) for Senegal. Key issues of policy concern include the connections of sawmill-based charcoal production back to illegal logging, potential impacts of overharvesting for local forest sustainability, the regulation of traders and exports, and health impacts for charcoal workers. In policy terms, these are issues that externally driven, audit-based legality and forest certification programmes would struggle to address, and there could be potential for informed, targeted state and donor intervention into these areas.

Stepping back, this research also points to a number of under-acknowledged aspects in the scholarly literature on smallholders, markets and agrarian change in Laos. Different researchers have helped to highlight how rural Lao farmers and communities are key agents in development, actively seeking connections with external markets and actors, incorporating them into local relations of production and livelihood (e.g. High, 2014). The growing literature on the political ecology of forestry in Laos has focused on themes including elite networks of patronage and illegal logging (e.g. To *et al.*, 2014), and agribusiness development as accumulation by dispossession (e.g. Baird, 2011). While dealing with critical issues, Lao smallholders continue to draw upon locally available resources and navigate markets in order to make a living (Barney, 2007; Rigg, 2005; Suhardiman *et al.*, 2015). In many areas of Laos, informal access to remaining natural resources still presents people with options to engage with commercial markets at least somewhat on their own terms, as opposed to compulsory integration and complete entry into the wage labour system (Fischer, 2008). However, there are clear sustainability pressures – as related to a near-terminal sustainability crisis in the Lao timber industry, as well as localised over-exploitation. Indeed, some of the documented poverty reduction occurring in upland Laos could be based upon unsustainable, one-time resource windfalls (Singh, 2012). While I suggest that

charcoal plays an important stabilising and income smoothing role as an informal commodity for thousands of rural households, future reductions in production, and corresponding community incomes, are quite conceivable.

It is here that a larger challenge for rural development in Laos can be identified. At a national scale, resource-led development in Laos is governed through an authoritarian-patrimonial regime, producing uneven economic growth patterns that do not favour local participation in planning or decision-making. Local communities are drawn into and participate in this political economy of resource development. But recognising forms of local agency, and the creative commercial use of local resources does not mean that coercion and marginalisation are absent. As Paul Gellert (2015: 99) has recently reiterated, broader processes of accumulation through dispossession ‘... does not preclude some poor and relatively powerless actors, not to mention local elites, from gaining as well’. Ideas of local agency in the making of new commodity markets, and new economic subjectivities, also need to be considered in relation to agrarian class relations and the broader terrain of uneven development (Bernstein, 2010). In the absence of independent, collective, peasant-agrarian movements in Laos, or effective, broad-based political representation, and given Laos’ subordinate position in the regional Mekong (and global) economy, ultimately a limited range of options are being presented to rural communities in terms of market engagement and integration.

My aim in this paper has been to highlight a widespread and active, yet socially mediated, participation in commercial charcoal networks, and the collective agency of rural people in Laos’ ambitious sprint towards resource-led development. I have also detailed how the governance framework of resource development in Laos can relegate rural smallholders to the ‘scraps from the feast’ – in this case almost literally – in terms of a local reliance upon scrap timber from state-supported sawmills, for making and selling charcoal. As large industrial enterprises churn through the country’s natural capital, and as dispossession accelerates, a key question is whether rural communities in Laos can escape from an end-game process, in which each remaining ‘minor’ natural resource, including fish, NTFPs, wildlife, minerals, luxury rosewood and low-value timber for charcoal,

are over-exploited in succession, ushering the countryside into a reinforcing spiral of environmental degradation and persistent underdevelopment. At such a juncture, capitalist markets become not a flexible opportunity but rather a compulsory requirement. Close attention to changing rural markets such as for wood charcoal, and the ways that such commodity networks can 'spark development' or 'consume the countryside', can help to identify and analytically interpret the complex agrarian-environmental transitions underway in rural Laos.

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Notes

- 1 Heraill (2013: 15, 18) reports average *dao phi* and *dao op* conversion ratios of about 25 and 10% by mass respectively, figures which were broadly supported by our interviews.
- 2 All prices quoted in USD, using January 2014 exchange rate to Lao Kip.
- 3 *Kum ban patthana*, or village development clusters, have been promoted since 2004, as an intermediate administrative level between the village and the district.
- 4 The mine site is managed by Khounxay Gypsum Development Ltd, a Lao-Vietnamese joint venture operational since 1979 www.kxnlaos.com/gypsum_mining_laos.html.
- 5 Savannakhet PAFO Announcement No. 0822, 18 April 2013, unofficial translation.
- 6 To compare, Russell *et al.* (2015) presents household income and asset levels for three forest-dependent rural villages in rural Savannakhet province in 2012. Average household cash income ranged from \$380–\$1315 annually; forest resources were valued \$183–\$300 per year; and livestock at \$219–2820.
- 7 In 2014, wage rates for producing charcoal ranged from \$4.70–\$5.90 per day along Route 9 in Phine district, reflecting steadily rising labour prices in the countryside in the last decade.

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