Informal mining in livelihood diversification: mineral dependence and rural communities in Lao PDR

Kuntala Lahiri-Dutt
Australian National University

Kim Alexander
University of Wollongong, kim.alexander56@gmail.com

Chansouk Insouvanh
Vientiane, Lao PDR

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Dr Kuntala Lahiri-Dutt
Senior Research Fellow
Resource Management in Asia Pacific Program
Crawford School of Public Policy
ANU College of Asia and the Pacific
The Australian National University
Canberra, ACT 0200, Australia

Tel: +61 2 6125 4343; +61 409158145
Fax +61 2 6125 1635

Email: kuntala.lahiri-dutt@anu.edu.au

Dr Kim Alexander
Senior Research Fellow, Flagship Project: Health Connect
Illawarra Health and Medical Research Institute
Building 32, University of Wollongong, NSW, 2522

T: +61 2 4221 3182
F: +61 2 4221 5161
M:+61409092525

E: kalexand@uow.edu.au

and

Ms Chansouk Insouvanh
Social Development expert, Vientiane, Lao PDR
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Abstract
In the context of mineral extraction in Southeast Asia, the rural poor are generally portrayed as victims of large, invading corporatized mining enterprises. However, this paper argues that local villagers have also shown considerable agency in taking advantage of the mineral resource boom by diversifying their livelihoods to include informal mining. In Southeast Asia, the growth of informal mining has occurred within the overall process of agrarian transition. This paper focuses on a mineral-rich valley in southern Laos in order to highlight the location-specific nature of such transitions. The valley's environmental transformation has both caused and accompanied a modification in the peasant ways of life, and the recent entry of transnational mining companies and the growing market price of tin have fundamentally altered the relationships of the peasants with place, but at the same time encouraging them to claim mineral resource rights in ways that are not accommodated in conventional mining legislation. To conclude, the paper notes the multiple interpretations and contradictions of the increasing mineral dependence among Lao peasants in a rapidly changing world.

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Rural livelihoods in transition

Lao PDR (henceforth Laos) is one of the last frontiers of the contemporary world, remote and inaccessible, with abundant resources in relatively unexplored regions (Barbier, 2005; Cleary, 1993). Following prescriptions from the Asian Development Bank and the World Bank (Bouahom et al, 2004), the country is cautiously moving from command-and-control policies to a market-based liberal economy, though notionally still labelled as a communist state (CIA, 2013). Transition from subsistence farming to a cash-based economy is a crucial aspect of Laos’ frontier development (Rigg, 2006; 2009). However, rural development in the mountainous terrain of Lao PDR has presented a number of important challenges for remote, endemically poor communities as they struggle to maintain productive ecosystems and adapt their farming systems to new economic imperatives (Alexander et al, 2009; Khammounheuang et al, 2004; Thongmanivong and Fujita, 2006).

The neoliberal-inspired portrayal of Laos as an ‘untapped resource frontier’ waiting for the implementation of large-scale resource development, particularly in hydropower and agribusiness (Barney, 2009: 147), has also included large-scale mining within this narrative. Consequently, notions of untouched mineral reserves waiting to be extracted by foreign investors through large-scale mining have been crucial in the emergence of Laos as a ‘new frontier for corporate investment’. External donors (such as the Asian Development Bank and the World Bank) consider foreign investments in the mining sector good to enhance the government’s revenue base, and hence encourage corporate investment (Mining: Partnerships for Development, 2011). Barney sees this contemporary portrayal as an update of the colonial idea of Laos as an available but under-populated territorial space, untapped
and outside the reach of international capital and investment (Barney, 2009: 149). In contemporary times, the central government of Laos, favouring industrial-scale mineral extraction, has emerged as a facilitator of local economic growth based on surpluses generated from mining projects. Many Lao villagers, Tooker (2004) suggests, tend to perceive the expansionary bureaucratic state as an abstraction affecting the lives of those who consider themselves outside it (Singh, 2011). This latter concern is particularly relevant in a country where the benefits of state-led mineral exploitation are not necessarily felt at the local community level and the ability of these benefits to trickle down is still questionable. How to explain the prolific growth of informal mining in Laos becomes an important question to explore then.

Evidence that points to the fact that large-scale land concessions, interventions in rural societies, slash-and-burn policies and large dam projects often fail to benefit local farmers (Barney 2007), raising the question of the ability of Laos’ rural poor can take hold of economic opportunities provided by market globalization. This paper argues that informal mining in Laos has offered a livelihood opportunity: to diversify livelihoods and to take advantage of rising global prices of minerals, but such opportunities are experienced in place, at the micro-scale. To show the importance of place, in its entirety of history and geographical context, we take the readers into a valley in southern Laos that has a long history of mining. Here, in Phathen valley informal mining of tin has expanded as environmental degradation and the deterioration of farm-based livelihoods have demanded a transition away from traditional rice-farming based occupations. As we will show, paradoxically, as villagers living in this valley become more entrenched in informal mining, they also
erode the very basis of their former livelihoods that depended on the local environment. This fact presents a puzzle that is difficult to be solved by using economic logic: why are the peasants undermining their livelihood bases? We argue that the decision of local villagers to exploit natural resources by themselves and their reservation of the right to sell the processed product to the buyer that offers the best price cannot be explained by conventional, marketplace economics; a host of factors, exertion of moral claims and autonomy, attempts to (re)gain some control over the rapidly changing contexts. Thus, the paper shows the complex interplay between multiple actors and facts, and questions the level at which resource sovereignty may be assumed.

**Mineral resource extraction**

Economic and agrarian transitions are occurring throughout the world in response to neoliberal economic policies. Akram–Lodhi and Kay (2009) suggest that these changes can be studied at the individual, community and regional levels. At the macro-scale, the exploitation of natural resources, including minerals, play an important role in connecting remote resource frontiers to the global centre (as shown by Hayter et al. 2003). The mineral-rich regions of Laos, therefore, offer analytical spaces in which intense global–local interactions can occur, building and shaping the ‘relational’ resource frontier (Barney, 2009). These spaces, according to Agergaard et al (2010), have a direct link to world market dynamics through intensified exports of specific commodities or product categories. Throughout the world, many of these formerly isolated and remote regions are experiencing rapid changes in their demographic structures, economic basis, occupational possibilities and land use. Consequently, the livelihoods of peasants are also changing through the diversification of rural incomes and with more cash being earned from sources other
than farming. While food security remains a major concern, in many remote areas Lao upland farmers have sought additional income through opium cultivation (Howe and Sims, 2011: 341) or scrap metal trade from unexploded ordnance (Moyes, 2005).

In the context of mineral extraction in Africa, Bryceson (2002b: 725) considers such changes to be much more than ‘livelihood experimentation’—in which peasants cultivate a number of sources of income to ensure subsistence. She argues that the reliance of national economies on mineral exports has opened up spaces for small-scale miners to look for minerals and excavate the land in search of commodities, activities which have coalesced as discernible career trajectories in mining (Bryceson and Jønsson, 2010). This paper argues that rural communities living on mineral-rich tracts of land in southern Laos are spiralling into a vortex of social, political and economic change, and are emerging as participants in the exploitation of Laos’ mineral resources—albeit with insignificant capital. They are transitioning into and securing their own mineral extraction-based livelihoods, a trajectory with variable environmental and socio-economic prospects (Lahiri-Dutt, 2007; 2012).

**Implications for subsistence farming**

Many accounts of development have reflected on situations where peasant farmers dependent on forest-farming subsistence have been dispossessed. In outlining changes to peasant livelihoods in Laos, one traces two different strands of argument. Walker (1999) and Rigg (2005) argue that, historically, there was a good deal of population mobility and trade, and flows of people, goods and information. From another perspective, Barney (2012), Baird et al (2009) and Vandergeest (2003) describe the complexities of land ownership in Laos, implications of top-down land policies, social injustices, state-sponsored displacement, and the marginalization of the rural poor as a
result of large-scale, land-intensive projects. At the opposite end of the spectrum in this argument thread, High (2008; 2010) claims that rural desires for development conform to standard state discourses that allow complex forms of consensus around the goal of development.

Singh (2012) argues that Buddhist beliefs associate forests with wilderness and cleared areas with spaces of human development, and affect Lao understandings of logging- and deforestation-related issues. Ducourtieux (2005), Ducourtieux and Castella (2006), and Ducourtieux et al (2006) also observe that the effects of state intervention in the form of land allocation are variable and even counterproductive because local specificities are not taken into account. Rigg’s *Living with Transition in Laos* contributes to this line of thought by questioning the sweeping assumptions embedded in the term ‘agrarian transition’ and by encouraging us to look beyond the universal and ‘scratch through the layers of muddle’ (Rigg, 2005: 1).

However, in the light of Laos’ ongoing pursuit of neoliberal economic development, the question then arises: as peasants shift to petty commodity production, do they turn into an industrial sub-proletariat within the capitalist market economy? Research into the livelihoods and labour of women and men working in the informal mining sector must consider whether informal mining is a recognizably valid form of mining—a kind of ‘mining by peasants’ that is more or less equal to ‘a kind of mining’. Thus, greater credence needs to be given to the function and significance of informal mining, not just within the stable of mining enterprises, but within the overall economic, social and livelihood changes being experienced by poorer countries.
Artisanal and small-scale mining and the challenges of agrarian change

The umbrella term ‘informal mining’ is diverse and includes a range of artisanal, unlicensed, small-scale and licensed modes of mineral extraction practices. These practices are collectively called ‘artisanal and small-scale mining’, a contested term (Lahiri–Dutt, 2003) introduced by the World Bank. Informal mining tends to be equated with the gold rushes of the past, mushrooming within a short time as one of the frontier economic activities that provides an opportunity to diversify rural livelihoods (Banchirigah and Hilson, 2010; Kwai and Hilson, 2010). The World Bank estimates that over 20 million people, mostly in developing countries, depend on artisanal mineral resource extraction for their survival (CASM, 2005).

Global capitalist attention is generally focused on high-value commodities, such as diamonds and gold; industrial commodities, such as tin or, stone and gravel, are generally not considered. As in other Southeast Asian countries, Laos has a long history of artisanal mining, but miners are among the poorest labourers engaged in the most insecure and dangerous work. Located at the edge of the mainstream economy, their survival raises new insights into mining and informality, illuminating the meanings of poverty and destitution.

In spite of its long history, informal mining is poorly accommodated within the mineral laws of almost all Asian countries. These laws are undergoing change, often pushed by Structural Adjustment Programmes and neoliberal development agendas (Lahiri–Dutt, 2004; Lestari, 2011). Laos is not an exception. But confusion over what exactly constitutes informal and illegal mining activities, particularly as conducted by
the poor and the marginalized, has given rise to social and political issues, a debate that is underpinned by increasing environmental degradation. The question remains as to how the rural poor take hold of economic opportunities provided by market globalization and changing mineral governance regimes by diversifying their livelihoods.

The experience of deagrarianization and depeasantization resulting from unsatisfactory developmental and environmental outcomes has been intensively studied in Africa, where mineral exploration has in many instances established new frontiers in agrarian transition. Bryceson and colleagues have explored mining-led diversifications in rural occupations over several decades in Tanzania (see Bryceson, 1993; 1999; 2002a; 2002b; Bryceson and Bank, 2001; Bryceson and Mwaipopo, 2010). The pursuit of frontier livelihoods in mining and trade has triggered rapid population growth, with varying degrees of accompanying urbanization, migration pressures, land constraints and worsening livelihood prospects (Bryceson, 1996). Bryceson and Mwaipopo (2010) believe that the erratic boom-and-bust character of mining in these situations leads to eventual resource exhaustion and the destruction of urban and social structures.

Concerns over the effects of informal mining on rural livelihoods include environmental degradation, the loss of arable land, conflicts over resource rights and the loss of agricultural skills. Yankson (2010) questions the relationship between mineral extraction and national economic development insofar as the benefits of economic opportunities and poverty alleviation can be localized. Sarin et al (2006)
suggest that detrimental socio-economic conditions and environmental degradation can often overshadow the positive effects of mining.

Doubts also remain as to how neoliberal policies adopted at the centre filter down and affect livelihood strategies, because such policies may serve to widen inequalities and increase vulnerability (Baird, 2010). The intensification of the market economy challenges and disrupts well-established livelihoods, with some individuals capable of adapting and benefiting, while the remainder are often unable to survive. Davis et al (2003) suggest that a decline in welfare occurs at the local level when livelihoods are predicated on incomes from the resource industry. Lahiri–Dutt (2006; 2007) has observed that informal mining, as a livelihood which is both contested and unsustainable in nature, has not been included in previous livelihood studies originally conceptualized by Chambers and Conway (1992) and more recently reviewed by Scoones (2009). This is in spite of Ellis’ (2000) view that rural communities all over the world are diversifying and re-patterning their livelihoods to cope with the changes initiated by the neoliberal economic order. There must be a greater focus on determining how and why individuals engage with the informal mining sector, and how this engagement can subsequently degrade traditional livelihoods—making communities even more dependent on mining activities. Acknowledging both the agency and the vulnerability of local villagers, and understanding the complex relationship between different actors—including peasants, mining companies and the state—are two important steps in this direction.

**Research methods in the community**

A baseline assessment of livelihoods in the mining communities of the Phathen valley was conducted around the village of Ban Nahi during April–June 2010. Ethnographic
methods were used to obtain qualitative data. Three visits to the site were made to familiarize the local communities with the field researchers, and to develop a working relationship with local government and company officials. Difficulties occasionally arose in conducting open discussions, and cultural constraints were due in part to political circumstances. A field survey was conducted to understand the local context, general conditions and aspects of changing livelihoods. Secondary data from French records at the Lao–Korea Tin Mining Company (LKTMC) mine site office were obtained. Participatory workshops were also conducted, as recommended by Chambers (2002).

Following this field work, informal interviews and discussions were undertaken with self-selected community members who offered to act as key informants, as recommended by Kvale (1996). Following Gusfield’s (2000) concern for acquiring clear meanings, interviews were held separately for village residents, government officials, company personnel and others associated with the mines. The widely used field method of participant observation was undertaken at the mining and processing sites and in villages, where women, men and children mined and processed tin. Several focus group discussions and impromptu consultations were also conducted on mining sites and in villages. In focus groups we met with both women and men, jointly and separately, to discuss their circumstances and livelihoods. Other issues, such as health concerns, labour processes, social and production organization, and marketing concerns, were also discussed. Rich descriptions that further supplemented the study included personal histories that were gleaned from interviews with village elders. Finally, two focus group workshops were conducted to triangulate, confirm and share observations with the community.
Mining tin and farming rice

Mining in Lao PDR has yielded precious metals in the form of gold, silver, and copper and tin for making bronze. These metals have long been used for making tools and decorative artefacts and handicrafts. Tin ore is generally found as alluvial deposits, such as those located in the Phathen valley, which comprise part of the Indo–China tin belt that runs from China, through Thailand to Malaysia and the Indonesian archipelago.

In spite of its long history, commercial tin mining in Lao PDR has remained an economically minor activity. It is only recently, as tin reserves in other countries are gradually exhausted, that Lao PDR has emerged as an economical source of tin mining (Index Mundi, 2012). Thailand is Laos’ biggest trading partner, and most of Laos’ tin is exported for industrial processing in that country. In recent years some of Laos’ tin exports have also been sold to China (Bougnaphalom, 2010).

Like other mineral commodities, the price of tin has risen continuously since the financial crisis that hit Southeast Asian nations in the late 1990s. Tin prices peaked in May 2008 (at US$25,000 per ton), resulting in an expansion of tin mining in Lao PDR. To expand the mining sector the Lao government has reformed its mining policies, with the new Minerals Law promulgated in December 2008 (Bougnaphalom, 2010). The law reasserts the ownership of all mineral resources by the state. Key government strategies have also included the privatization of older, state-owned mining enterprises, and the establishment of either new joint ventures or privately owned mining companies (UNDP, 2006). Most of these private or joint-venture mining companies are owned by entrepreneurs based in China, Thailand,
Australia and North Korea (UNDP 2006: 92). In 2005, about 145 mining concessions allowed for exploration and prospecting in an area of nearly 4,000 square kilometres, which collectively is much larger than the 1,000 square kilometres occupied by Nam Theun 2 Dam (UNDP, 2006: 92).

The Ministry of Energy and Mines is looking to expand the mining sector further to increase the contribution of minerals to the country’s export income. One of the effects of this rapid integration with the global market has been a mushrooming of informal and artisanal mining of gold and tin in rural areas to provide alternative or supplementary livelihoods and to generate cash incomes (Boland et al, 2001). However, the Ministry of Energy and Mines is yet to establish a common and accepted definition of artisanal and small-scale mining. Generally, the Department of Mines has made a distinction between ‘artisanal mining’, which is purely manual and family-based, and ‘small-scale mining’, which has some mechanization and whose production is on a larger scale (Lahiri–Dutt and Insouvanh, 2010).

These changes give rise to an important question: if transitions such as those experienced in the mining sector are the leitmotif of Lao PDR’s development ambitions, how are these transitions occurring? As peasants shift to petty commodity production, do they turn into an industrial sub-proletariat within the capitalist market economy? In considering the implications of rural transition for those residing in a peasant community nestled in the Phathen valley in southern Laos we also investigate whether subsistence-to-market transition also implies a transition from self-reliance to dependency. We explore this question through field-based research in the village of
Ban Nahi, located close to the Phontiu tin mine, which is overseen by LKTMC, in the Phathen valley.

**Ban Nahi village: caught between tin and rice**

Rich in tin due to the geological continuity of the Indo–China tin belt (Miller, 1946), the Phathen valley has been one of the prime areas of state-developed tin mining. Here, fertile paddy fields have been reduced to wasteland by open-cut mining operated by Russian- and North Korean-assisted companies. This environmental transformation has initiated a change in peasant ways of life and altered the relationship of peasants with mining operators. Rising commodity prices and the entry of foreign tin mining companies have connected Lao peasants to the global market, earning additional cash while scavenging for tin as informal miners. The expansion of informal mining has occurred in response to environmental degradation and the consequent deterioration of farm-based livelihoods. Rural settlements in the valley have metamorphosed into informal mining communities, with informal miners exposed to landscape transformation, livelihood adjustment and exploitation by the global commodity market.

The major livelihoods found in the valley have traditionally centred upon the shifting cultivation of rice and other crops, with livestock husbandry and the collection of non-timber forest products as subsistence activities (Alexander et al, 2009). Monsoon rains are essential for dryland farming, as well as rice cultivation. Within the Phathen valley, the Nam Phathen (river) has been a crucial source of drinking, household and agricultural water for everyday life, and a source for washing extracted tin. Tin companies operating locally also access this river for their commercial operations.
Informal tin mining is seasonal; during the rains, the soil washes more easily than at other times, and almost every individual in the village scrubs and scratches the soil, often on the sides of slushy roads and with equipment ranging in size from stainless steel spoons to mechanized earth-diggers. Washing the soil to extract tin ore competes directly with the seasonal nature of rice farming and the division of household labour, rendering mining a gendered activity (Lahiri–Dutt and Invouvanh, 2010). Almost every individual residing in the Phathen valley—women, men and children from over 2,000 households—has now adopted informal mining as her or his primary livelihood.

Figure 1: Concession area of Lao-Korea Tin Mining Company
Figure 2: Cross section of the Phathen valley

Tin is mined by LKTMC in the Phathen valley under a joint-venture agreement signed in 1994 between the Lao government and North Korea (Lahiri–Dutt and Insouvanh, 2010). LKTMC’s total land concession is for 4,068 hectares, effective for 15 years, with extensions (see Figure 1; Figure 2 depicts a cross section of the valley). This contract hides a long history of tin mining in the Phathen valley, which, according to the local people, began over 90 years ago. Records kept in LKTMC’s onsite offices and in Vientiane suggest that French colonialists and entrepreneurs began exploring the area for tin prior to 1920 and constructed roads and other infrastructure, including small iron bridges, warehouses, mine offices and workers’ living quarters. After the French departed, the Lao government took over mine operations in 1977.

From 1980 to 1994 the Russians assisted the Lao government with further exploration and geological mapping. During this time they brought in modern technology, such as bulldozers and excavators, to improve the efficiency of mine operations and tin processing. The introduction in 1986–7 of open-cut techniques to produce tin proved to be excessively detrimental to the local environment. Currently, the Lao government is collaborating with the Vietnamese government to establish joint ventures between
Vietnam and Laos for the mining of tin. Extracted tin ore is transported over the Lao–Thai Mekong border. Within the leased area indicated by the Contract Agreement of LKTMC there were originally eight villages, which have now been merged into six. This is in line with the Lao government’s village consolidation policy.

Through their productive and freelance labour in informal mining, local communities contribute to the overall profits of the Company. The village committee sub-rents the processing equipment from the Company and re-rents it to individuals or households at a profit. The Company produces tin on a larger scale, and likewise for purchasing tin ore. Villagers sell extracted concentrated tin ore to the Company at prices that are set by the Company after inspecting the percentage of ore present in the collected material. After upgrading the tin, the Company sells the ore to Thailand or China. On the margins of this informal mining economy are the opportunistic individuals who act as middlemen, buying directly from the villagers and selling to the mining companies operating in the valley.

**Peasants producing tin**

Even within the relatively small area of the Phathen valley, informal mineral extraction practices are diverse and complex in structure and organization. The processing technology alone represents several stages of capital accumulation. Various forms of extraction processes cover a spectrum on which one end is purely artisanal mining, with very low levels of mechanization and with families constituting the primary unit of labour; the other represents highly mechanized open-cut operations undertaken by commercial companies, such as LKTMC. However, there are close links between these various forms of mining as the ore moves along the supply chain. The end product, tin, is secured by the local tin companies, and the
maximum amount of capital accumulates at the company or formalized end of the mining economy spectrum. It is worth noting here that the more mechanized the operations run by companies, the higher the impact on the environment. In the Phathen valley, corporate mining activities have removed hills, deforested hill slopes, caused sheet-wash, and deposited sand into the river system and lowered soil fertility, making farming unsustainable in the valley.

Informal tin production processes can be classified into five broad categories. The first two, *thuert* and *het keo*, are fully manual and artisanal in nature. *Thuert* is a traditional mining technique in which miners dig a small hole with a pickaxe to loosen the ore-bearing soil, which is then carried in small buckets to a nearby water source used for washing away the earth to extract the tin. *Het keo* (also known as *pai keo*) is another fully artisanal process in which LKTMC removes part of the mountain slope with heavy earth excavation equipment. Villagers then dig out earth from the open pit using shovels, pickaxes or hoes, and transport the ore up to 200 metres to a pond built by the company. *Kao phou* is similar: villagers extract ore manually from open pits and transport it by trucks to the factory, where a hired panning machine separates the ore.

The other three techniques are better described as small-scale mining; they are more formalized and involve greater use of technology, equipment and capital, and often constitute scaled-down versions of corporate operations. These include *hang long*, *keo chaan* and shaft mining. In *hang long*, villagers dig channels on the mountain slope and pump water uphill from the river to wash away the soil, earth and stones, leaving the heavier ore at the bottom of the open channels. Villagers then pan pure ore from
the mixture. Some villagers pan at the site, while others transport the mixture to the village for panning. *Keo chaan* is almost the same as shaft mining, in which villagers dig a shaft—the old French technique—and extract the ore manually. The ore is then transported by trucks to the factory for panning.

Table 1 summarizes these different mining techniques, classifying them into three categories according to ownership—company, small-scale mining and artisanal mining. The table shows that more women and young children participate in artisanal, open-cut mining processes. They are involved in digging the ore, carrying it in buckets, washing and panning the tin, and selling it to companies. In undertaking *het keo*, a working group comprises direct family members, relatives or close friends, who share both the labour and the earned income. One economic unit usually comprises six to eight people. The Company purchases their tin for 50,000 KIP per kilogram if it is of high quality—that is, 60 per cent-plus tin content—and pays 15,000 KIP per kilogram for low-quality tin—that is, around 30 per cent tin content.\(^1\)

On average, a group earns about 45,000 KIP per day, which is equally divided among the labour force. This comes to about 5,000–6,000 KIP per person per day (approximately US$0.75). In the rainy season or on a good day, production and profits can be doubled. When asked about control over money, and over the making of decisions to spend family incomes, women were demonstrative in suggesting that they have significant control and decision-making ability, with control retained as they sell the end product directly to LKTMC.

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\(^1\) KIP is the national currency of Laos. In June 2010, US$1 was about KIP 8,200. See [http://www.xe.com/ucc/](http://www.xe.com/ucc/).
<table>
<thead>
<tr>
<th>Attributes</th>
<th>Tin mining techniques</th>
<th>Small-scale mining</th>
<th>Labourer and family unit</th>
<th>Labourer and family unit</th>
<th>Artisanal mining</th>
</tr>
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<tbody>
<tr>
<td><strong>Type of employment</strong></td>
<td><strong>Company</strong></td>
<td><strong>Self-employed (family unit)</strong></td>
<td><strong>Labourer and family unit</strong></td>
<td><strong>Labourer and family unit</strong></td>
<td><strong>Family unit</strong></td>
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<td><strong>Gender</strong></td>
<td><strong>Men</strong></td>
<td><strong>Men</strong></td>
<td><strong>Men</strong></td>
<td><strong>Men</strong></td>
<td><strong>Women and children</strong></td>
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<tr>
<td><strong>Mining method</strong></td>
<td><strong>Fully mechanized</strong></td>
<td><strong>Panning is mechanized (khun song)</strong></td>
<td><strong>Extraction is mechanized (hang long)</strong></td>
<td><strong>Shaft mining (khout khoun)</strong></td>
<td><strong>Traditional open pit (het keo)</strong></td>
</tr>
<tr>
<td><strong>Ore extraction techniques</strong></td>
<td><strong>Open-pit extraction with motor grader</strong></td>
<td><strong>Open pit, tunnel, manual extraction</strong></td>
<td><strong>Open channel, pumped, mechanized water washing, manual extraction</strong></td>
<td><strong>Manually dig shaft, manual extraction</strong></td>
<td><strong>Open pit, manual extraction</strong></td>
</tr>
<tr>
<td><strong>Equipment used</strong></td>
<td><strong>Shovel, earthmover, fuel</strong></td>
<td><strong>Pickaxe, shovel and bucket</strong></td>
<td><strong>Fuel, generator, pump, water, shovel, bucket</strong></td>
<td><strong>Electricity, pickaxe, shovel, bucket, rope</strong></td>
<td><strong>Pickaxe, shovel, bucket</strong></td>
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<tr>
<td><strong>Transport technique from pit to panning site</strong></td>
<td><strong>Wheel loader, self-pouring truck</strong></td>
<td><strong>Hyundai truck</strong></td>
<td><strong>Hyundai truck</strong></td>
<td><strong>Hyundai truck</strong></td>
<td><strong>Walk with bucket or bag</strong></td>
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<tr>
<td><strong>Equipment used</strong></td>
<td><strong>Fuel</strong></td>
<td><strong>Fuel</strong></td>
<td><strong>Fuel</strong></td>
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<tr>
<td><strong>Panning technique</strong></td>
<td><strong>Mechanized grinder, panning, bagging</strong></td>
<td><strong>Mechanized grinder, panning</strong></td>
<td><strong>Mechanized grinder, panning</strong></td>
<td><strong>Mechanized grinding, panning</strong></td>
<td><strong>Manually grinding and panning with coconut bowl</strong></td>
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<tr>
<td><strong>Equipment used</strong></td>
<td><strong>Electricity, water</strong></td>
<td><strong>Electricity, water</strong></td>
<td><strong>Electricity, water</strong></td>
<td><strong>Electricity, water</strong></td>
<td><strong>Panning board, water</strong></td>
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<tr>
<td>Income kip/day</td>
<td>35,000</td>
<td>–</td>
<td>100,000–200,000</td>
<td>50,000–150,000</td>
<td>6,000–45,000</td>
</tr>
<tr>
<td>Safety and health</td>
<td>Good</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Intermediate</td>
<td>Bad</td>
</tr>
<tr>
<td>Risk and vulnerability</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Very high</td>
</tr>
</tbody>
</table>

Source: Focus group discussions with men and women held in April–May 2010.

**Company governance: the legitimacy of miners**

The relationship of informal miners with the formal tin mining company is complex. As is evident from French records available from LKTMC offices, peasants have worked as miners in the area since at least the 1920s. These records also detail the quantities produced by the Company and the amounts purchased from villagers. Today, there are about 2,000 people living in the six villages in the valley. Almost 95 per cent of the working-age population is engaged to some extent in tin mining, and most of the income earned by this group stems from the proceeds of tin sales. None of the 2,000 people has full title (*bai thi din*) to the land they mine or where they live. They only have temporary user rights (*bai cheng*), which allow them to live in their homes located on land leased to the Company. In other words, farmers are living on mining land that LKTMC claims to own; this and the mining laws that favour large mining companies make the livelihood of peasant miners an illegal activity in the eyes of the state.
LKTMC personnel are aware that the original contract requires the Company to relocate and resettle the villagers, if required. However, the Company has determined that it makes better financial sense to allow villagers to continue mining because the small size of the mineral deposit does not justify compensation costs. During the interview, one of the Company representatives said: ‘this is such an old mine. It has been in operation for a very long time, and most of the tin is finished.’ This is contradicted by the manager of the Company based in Vientiane, who estimated that tin reserves in the valley would last for another 75 years. The new leases being offered in the general area also vouch for existing ore reserves. Clearly, LKTMC preferred to allow villagers to mine within the leased area and then sell the tin to the Company for sound financial reasons. These are obvious: relocating the villagers would be expensive and there is no unused/unclaimed land in the surrounding area for them to move to.

Villagers, however, have a different account. They say that initially they were not allowed to mine under the Contract Agreement of LKTMC. In 1997, the Company fined 45 Ban Nahi residents 40,000 KIP (around US$5) per person plus one day’s labour for land clearance. The fine was levied because villagers continued to collect ore after the Company overseer ceased the day’s work. Villagers complained to district and provincial authorities, stating that the Company prevented them from obtaining their routine livelihoods and did not offer alternative work or compensation. The provincial authority dealing with the case opined that since the Company did not offer an alternative livelihood, it was obligated to provide villagers with basic infrastructure. This was confirmed by a senior official at the Division of Energy and Mines, who said the government had indeed asked the Company to assist the
community with the provision, repair and maintenance of public services and amenities, such as a school, a health centre and roads.

The Contract Agreement, signed in 1994, however, did not mention support for the community or its mining activities. In the official document, Article 11 stated that 380 Lao and 30 North Korean staff members were to be recruited, and Article 5.2(f) stated that the Company had the responsibility for human capacity building in mining activities for Lao workers. There was no mention of the welfare of the community, details of Lao staff recruitment, or whether the villagers in the Contract Agreement had the right to mine tin. Nor was it made clear that the Company had the responsibility to resettle villagers if necessary.

Nonetheless, both LKTMC personnel and local villagers believe the latter have a moral right to mine tin within the Contract Agreement. In order for the Company to mine community farmland without relocation or resettlement, and to avoid additional costs, villagers were permitted to remain within LKTMC property, on the condition that the Company would purchase all minerals extracted by them. Over time, with other companies setting up operations in nearby areas, LKTMC’s monopoly has been broken. Informal miners working under the LKTMC Contract Agreement can now sell their tin to other companies offering competitive prices. This illegal purchasing has frustrated LKTMC, which claims sole purchase rights over the tin produced by informal miners from their leasehold land. Contentiously, the Company’s North Korean managers have asserted that while LKTMC meets the government’s legal registration and taxation requirements, other companies are freely buying tin from people digging up LKTMC land without paying tax. LKTMC managers consider
these sales to be illegal. On the other hand, villagers considered it their right not only to mine, but also to choose to whom they sell their products. Ultimately, the freedom to sell tin to whomever they choose may encourage better management of the supply chain and thereby help to empower the community.

One can, therefore, identify three sources of illegitimacy: the villagers’ lack of entitlement to land through dispossession by LKTMC; their displacement from traditional occupations, such as rice farming, due to environmental degradation that further traps villagers in the mining sector; and the poor accommodation of artisanal and small-scale mining in the minerals regulatory regime of Lao PDR. The last is seen as a problem of resource governance, and the mobility of miners is generally blamed. One of the regional officers of the government commented: ‘The Company you can easily control, but you cannot control the community.’ This is because of khut thouathip: ‘because the miners go (or dig) everywhere.’ The term ‘everywhere’ is the key; in Phathen valley, it means informal miners cannot easily be contained within the concession boundaries. The government officials see such mobility as the major driver of environmental degradation. They wish instead to recognize the value of local villagers through their traditional occupations, such as sedentary farming on stable land.

The tin miners at the Phontiu site are not alone. A similar situation has been experienced with regard to shifting cultivators in Laos and elsewhere in Southeast Asia, where the state has taken a generalizing attitude. In the diverse ecologies of Laos, the reflection of such generalizations in land policies related to farming practices (Ducourtieux et al, 2005) and to forest allocation (Fujita and Phanvilay,
2008) do not work. In the Phathen valley, villagers argue that after the departure of French colonialists, when the Russians took over mining operations and brought large machinery to bulldoze the hills and destroy the forests, their cultivated land areas were lost to soil contamination caused by toxic runoff. This claim was tested by comparing the land-use maps of 1985 and 2010 (see Figure 3). The figure shows that local forest cover had indeed been reduced significantly during this period. Recent satellite images show that entire mountaintops have been washed away, leading to a change in the river course and general topography of the area. Currently, the villagers perceive that the increased allocation of land to tin mining companies is continuing the destruction of their environment while keeping them tied to informal mining.

Figure 3: Comparative land use, 1985 (left) and 2010 (right)

**Trapped by tin: a new kind of mineral dependence**

By showing how the poor respond to the minimal opportunities offered by the systemic violence of neoliberal economic policies, this paper helps us to see beyond a simplistic, non-contextual model of displacement. Indeed, the very nature of tin
extraction has changed, with more and more aggressive mining companies using environmentally damaging processes, forcing peasants to become entirely dependent on tin for survival.

The livelihoods based around tin mining that are traced in this paper contribute to a greater understanding of rural, social and economic changes, and have implications not only for mineral governance theories and policies, but also for natural resource governance as a whole. This paper also illuminates a grey area; it shows that informal mining undertaken by peasants is by no means unrelated to the operations of formal mining companies. In a way, these connections provide degrees of formalization for peasant-miners and a concomitant amount of informalization for the mining companies, particularly because informal mining is not regulated or defined by law. However, the blurred boundary between formality and informality in resource frontier spaces is not central to the present discussion, even while it is a crucial aspect of mining for Lao villagers. What is shown to be significant in this paper is the movement in and out of farming and mining sectors by peasants, and the livelihood implications of these dynamics for communities. These changes continue to affect communities in the present day, in spite of the long history of artisanal tin mining in the Phathen valley. Indeed, while the established nature of tin mining in the valley should continue to provide local villagers with a source of income, it is also undermining traditional livelihoods as it degrades the natural environment.

Current mining legislation in Laos exhibits a poor understanding of these ongoing transitions and shifts. The case of LKTM supporting informal mining, which is at odds with Lao governmental policy, takes us beyond large- vs. small-scale mining
conflict scenarios and draws out the contradictory stances of different actors on how mineral resources and people within resource-rich areas should be governed. Government officials and affected communities claim that such mining is illegal, though the tin produced in this way finds its way into systems of formal tin mining. For peasants experiencing integration into a market-based system, informal mining provides access to an alternative livelihood within a rapidly deteriorating environment.

Villagers affirm their moral right to mine the tin and take advantage of the oligopsonistic market, which continues to evolve as the national economy becomes increasingly integrated with the global economy. Tin companies are advantaged because they purchase already processed ore. They determine the quality and ore content, and set the price for the tin harvested by local communities. Informal tin miners share the same space with companies such as LKTMC, leading to some overlaps in their interests. But miners defy LKTMC by choosing to sell their ore to whomever they want (or whomever pays a better price) and by digging indiscriminately within the leasehold lands of all companies. Clearly, the relationship between the state, or state-sponsored capital enterprises such as LKTMC, and informal miners is neither unidimensional nor characterized by opposing economic interests in every instance. In the complex interactions that emerge, legality and legitimacy separate from each other; if state organizations present informal miners and their activities as illegal, the miners reclaim legitimacy by drawing attention to the importance of mining to their livelihoods. This encourages us to reframe the broad development question: instead of asking how peasant communities can be integrated into the market, we are encouraged to ask how these communities can be afforded
equity in the representation of their economic and social interests, particularly in view of greater capital mobility within the specific context.

As a number of maps tracking changes to land use in Laos have also shown, this paper argues that agrarian and environmental changes do not exist in separate silos; dispossession and pauperism go hand in hand with environmental degradation. As the land-use maps show, extensive degradation has been caused by large earth-moving equipment. Monsoonal rainstorms and high water flows over denuded landscapes have resulted in silt flows, increased flooding and clogging of the local river system. Livelihoods have been adversely affected by the loss of soil fertility and arable land.

In conclusion, we found that although the French mining company used local peasants to extract tin ore in below-ground mining operations, it did not radically modify local livelihoods. In the past, peasants shifted in and out of agriculture, with mining and farming providing seasonal incomes. In the present, Laos’ rural poor have used the sources of their vulnerability—including their lack of land rights, a steadily degrading environment and an insensitive state keen to enter the global market—to break the monopsonistic trading practices that LKTMC has imposed. Once we realise that, we begin to see the rural poor as agents. It is only through this perspective that one might see peasants as active participants in the process of agrarian transition. By refusing to change their occupational identity as miners, villagers not just resist being labelled as illegal miners but also challenge statist mineral governance systems that have remained blind to their interests. In this site-specific analysis, it is clear that villagers contest the ways that rural transitions are understood. The particularity of Phathen valley as a mineral-rich place, with a long history of mining that led to specific rural,
social and economic transformations, demonstrates that the frontier is not merely a
generalizable space but a multitude of specific relations both defining and resulting
from local ecological politics enacted over nature and natural endowments.

In studying rural livelihoods, much has been written on the mobility of rural labour
from one region to another, from rural to urban settings. Comparatively less scholarly
attention has been directed towards inter-sectoral movement as a livelihood choice,
and even less attention has been paid by scholars of Southeast—and South—Asia to
the mineral dependency of rural sedentary or shifting farmers and nomadic herders.
This paper brings to light the importance of adopting a sectoral view of rural mobility,
with the hope of continuing further research on mineral-based rural livelihoods. The
misinformed synonymy of informality with illegality affirms the absolute and
contested ownership of mineral resources by the colonial state and, more recently, by
corporatized mineral enterprises.

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