KNOWLEDGE FOR DEVELOPMENT
LAO PDR

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Research Evidence for Policy

Land Use and Land Cover Change Caused by Commercial Investments in Land in the Lao PDR: Opportunities for Improved Governance

Land use land cover change for a rubber plantation in Luang Namtha Province. Photo by Vong Nanhthavong, 2009.

Introduction

Commercial investments in land (CILs) typically result in land use and land cover (LULC) changes. In the Lao PDR (Laos), CILs are a cause of LULC change which are not adequately understood, especially the implementation pathways that lead to forest and agricultural land conversion. And although economic growth based on CILs is a government priority, it may conflict with other goals in the areas of forest management and conservation, national food security, expansion of commercial agricultural, energy production and general rural development.

The Government of the Lao PDR (GoL) has an ambitious forest conservation and management programme with the three state forest categories (Conservation, Production and Protection) at the core. To effectively manage this large forest estate towards its intended objectives, while also ensuring rural livelihoods, the GoL needs robust systems of data collection and analysis that help detect and avoid forest related LULC change. Loss of forest cover to CILs also has implications for the national Lao-European Union FLEGT[1] Program and the legality of forest conversion as well as the success of REDD+[2] and climate mitigation efforts. The GoL's intention to expand tree plantations further onto degraded forests and their contribution to national forest cover is also relevant. Especially as degraded forests often include fallow agricultural land (i.e. "potential forest" land type) critical to rural villages' food security. Permanent conversion of cropland to CILs creates further challenges for national food security goals.

Prior to CILs approval, decision makers from involved government agencies need to understand the potential social, economic and environmental impacts and trade-offs (i.e. what is lost and what is gained and for whom) of proposed LULC change. Up-to-date LULC change information can serve as a decision-support for policy makers and involved government agencies for understanding the implications and impacts of existing land, forest and investment policies and to provide potential alternatives that reduce the negative impacts on nature and human wellbeing. Presently many potential CILs are at the prospecting and exploration phase so there is an urgent need for appropriate mechanisms and measures to prevent unsustainable LULC change and support successful implementation the National Master Plan on Land Allocation.

Key Findings and Messages

- Between 2000 and 2018 CILs resulted in a large area (347,508 ha) of LULC change that are dominated by the conversion of three former land types: i) forest (49%) ii) potential forest (33%) and iii) cropland (16%) totaling 339,753 ha. 17% of total forest cover loss in this time period was caused by CILs in the LCI data.
- The CILs sectors that caused in the greatest LULC change are: i) tree plantations (55%), ii) mining (26%) and iii) commercial agriculture (19%). Proportionately, commercial agriculture resulted in more forest and cropland conversion.
- The CILs analysis revealed 169,266 ha of natural forest loss, 82,490 ha of which was converted to tree plantations, which are counted as forest cover, reducing actual forest cover loss to 86,776 ha.
- Inside the three state forest categories (3FC) a total of 74,000 ha of forest cover was lost: Conservation forest 11,789 ha, Production Forest 19,638 ha and Protection Forest 42,452 ha. Outside the 3FC 95,337 ha of forest cover was lost.
- To better manage CILs, decision-makers need the capacities, tools and information to understand the trade- offs (i.e. what is lost and what is gained and by whom) when LULC change occurs and how the benefits can be fairly distributed to investors, government and villagers.
- Effective LULC change management requires the GoL to use a holistic approach for decision making that considers social, environmental and economic aspects of CILs and resulting LULC. Greater informed coordination within government systems and with all stakeholders, especially involved villages is needed.
- CILs approval process and monitoring of preparation and implementation (field and remotely) are the phases during which illegal or unapproved LULC change can be halted. Strict government law enforcement is need during both to ensure this is done.

[1] *As part of the EU Forest Law Enforcement Governance and Trade Action Plan, Laos is presently negotiating a legally binding Voluntary Partnership Agreement.*

[2] *The National Reduced Emissions from Deforestation and Degradation (REDD+) Strategy is a key component of the Nation Strategy on Climate Change in the Lao PDR.*

Data and Methods

To investigate LULC change two key national data sets of the GoL were intersected: the 2020 Land Concession Inventory (LCI) and the national Forest Type Maps (FTM). The LCI data set includes CILs between 2000 – 2017. The FTM is a time series (2000, 2005, 2010, 2015 and 2019) spatial data set created to assess forest cover and land use changes. A total of 584 CILs from the LCI data base were include in the intersection of land use at Level 1 of the National Land Classification System of the FTM. The LCI variables intersected with FTM data (forest, potential forest and cropland) were selected based on the aim to understand the types of LULC change, the extent, investment sectors and how forest cover is affected by CILs. The LULC changes shown (table 1) from the intersection are less than the actual amount for several reasons: the LCI data doesn't include LULC change caused secondary and tertiary sectors (manufacturing, tourism, and transport infrastructure), special economic zones, smallholder expansion or the hydropower sector. Also, due to uncertainty caused by technical issues, the 584 "developed" CILs included from the LCI data base, accounts for only 84% of the total "developed" con- cession area in the data base.

Trends in Land Use and Land Cover Change

The analysis of LULC change due to CILs included 584 invest- ment projects across Laos: 186 tree plantations (32%), 229 mining concessions (39%) and 169 commercial agricul- ture projects (29%). Table 1 summarizes the total LULC change for different land types caused by CILs. The three land types included in the analysis made up the majority (98%) of all LULC change by CILs. An important result is that nearly half of the LULC change was loss of forest cover. Following Level 1 of the National Land Classification System, this includes all forest sub-types. As a separate land type 'Potential Forests' includes regenerating vegetation and bamboo forests sub- types. Crop-land includes the sub-types: rice paddy, upland crop, other agriculture and agriculture plantations. From a rural livelihood perspective, these diverse land types are critical and loss of access to them has negative effects. If villages are to benefit from CILs, there are numerous variables and multiple potential pathways involved but for the most part in Laos, people have been adversely affected (Nanthavong et al, 2021) by CILs. The reason LULC change for forest and potential forestland type was higher than the others may be attributed to investors targeting land types with weaker tenure security (e.g. customary communal forest versus titled private land) thus making land acquisition easier, avoiding conflicts and any legal requirements to pay compensations. The ulterior investor motive of timber harvesting may also influence selection of forest for CILs. An important issue not captured by LULC change analysis is land rights. The conversion of land types through CILs always involves voluntarily or involuntarily transfer of formal or customary land rights. Loss of land rights, even when compensated for, can have long lasting negative impacts on a household for multiple generations.

Subsector Impact on LULC Change

Differences in CILs sectors' impacts on LULC change area are shown in Figure 1 The largest circle shows the portion of LULC change caused by the CILs sectors. The smaller circles show the portion of LULC change for each CILs type. For all sectors, forest cover loss was the largest portion of LULC change, being the highest portion for commercial agricul- ture (61%). Commercial agriculture was also highest in conversion of cropland (26%) but much less than other sectors in the conversion of potential forest. The extent that different CILs sectors impact land types can vary due to factors such as different regulations governing the CILs sectors, the legality of land conversion and land tenure status and strength. Some of these LULC changes appear not to follow regulations such as the establishment of tree plantations in natural forest when they only are allowed on de- graded or barren forest land. The questions of tradeoffs (i.e. benefits versus gains) and reasoning for CILs approval are also challenging to explain. For example, the conversion of existing smallholder cropland (26%) to commercial agriculture.

Table 1: LULC change caused by CIL in the LCI database

Land Type	Area ha	% of LULC
Forest	169,226	49
Potential Forest	116,321	34
Cropland	54,206	16
Total (ha)	**339,753**	**100**

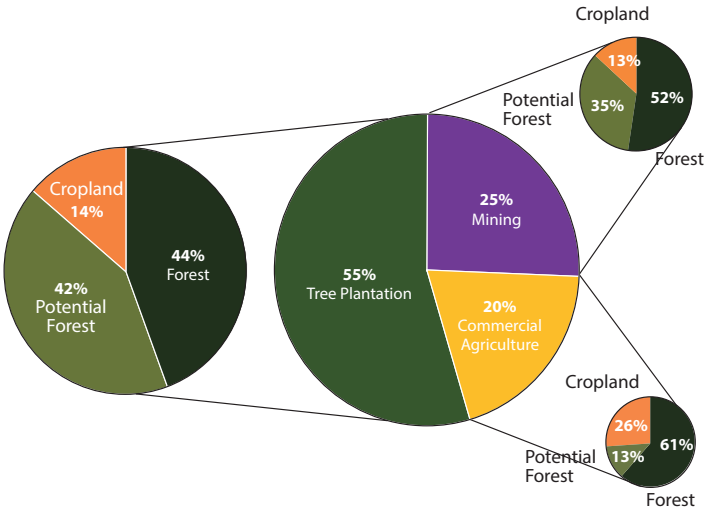


Figure 1: Sub-sector Portion (%) of LULC Change & Land Type Converted/ Subsector

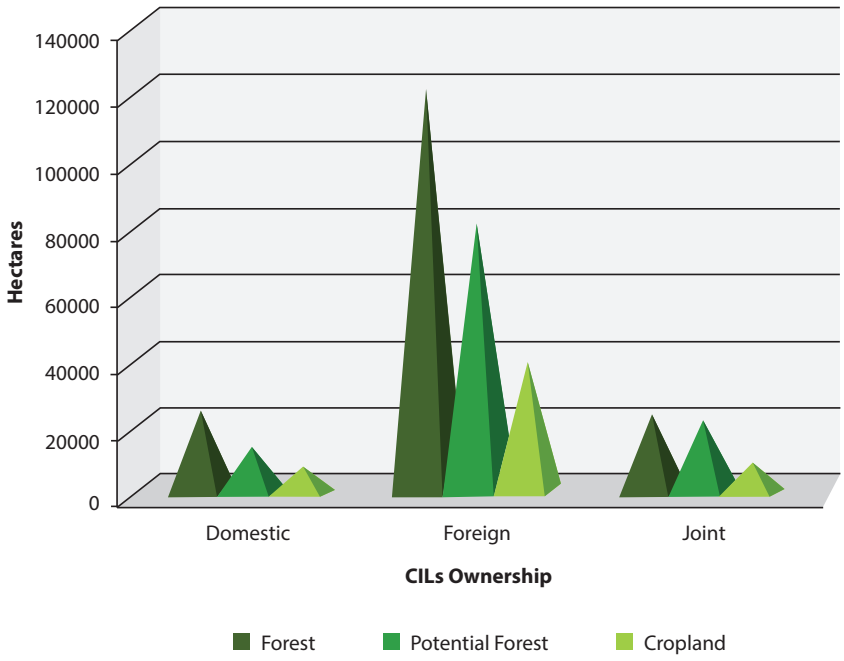
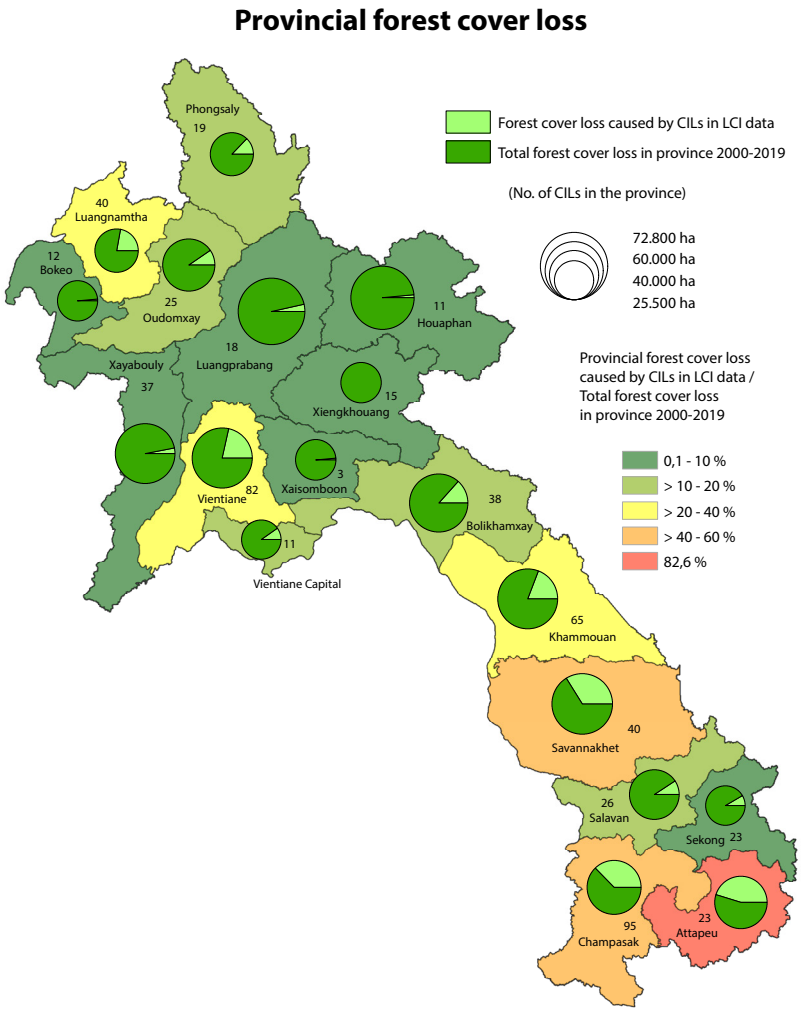


Figure 2: CILs ownership and LULC change



CILs Ownership and LULC Change

An interesting trend is LULC change related to ownership of the CILs (Figure 2). Within 584 CILs, ownership was divided as: 280 domestic, 236 foreign and 66 shareholders. In absolute terms, LULC change caused by foreign owned CILs was greater for all land types (forest: 5x higher) than domestic or joint venture. The reasons for this higher forest cover loss may be that foreign owned CILs are located in more remote areas where forest cover is higher and that foreign CILs are larger than other types of ownership (Hett, 2020). Another possibility is that since foreign CILs had lower legal compliance (Hett, 2020) they may have converted forests outside of their approved investment areas. However, in relative terms (i.e. comparing the no. of joint venture to foreign CILs to forest cover loss), joint ventures resulted in more forest cover loss and associated environmental and social impacts. This indicates that greater government scrutiny of CILs applications and implementation monitoring are needed for all ownership arrangements. To more fully explain these differences will require further investigation of the relationship between ownership types, approval process of CILs projects and their implementation pathways.

Focus on Forest Cover Change

Looking more closely at forests, according to the FTM data, a total of 801,999 ha of forest cover was lost country wide to all causes (CILs, smallholders, contract farming, illegal logging, infrastructure etc.) between 2000-2019. The FTM-LCI data intersection (Table 1) shows that 169,266 ha of forest were converted specifically by CILs sectors. Of the 169,266 ha of CILs related forest loss, 82,490 ha was converted to tree plantations by 186 projects. In Laos, tree plantations with sufficient cover are measured and classified as forest cover. Therefore, when planted on land with no pre-existing forest, they increase forest cover. When they replace areas classified as forest there is no net loss. It is critical to high-light that the replacement of natural forests and potential forests (often fallow agriculture land) with large continuous areas of mono-culture tree plantations have many negative impacts on wildlife and biodiversity and rural livelihoods (Van der Meer Simo et al, 2019). To avoid negative impacts while benefiting from the international demand for tree products (pulp, rubber, wood) and achieving government development goals, inclusive, pro-poor household tree plantation investment design is needed (Midgley et al, 2017).

Within each province the circles show the area of forest cover converted by CILs (light green) and the total provincial forest cover loss by all causes (dark green) is shown. The number of CILs in each province is also shown. Similarly, the percent and colour indicate the contribution of CILs to provincial forest cover loss. In all provinces, a portion of the total forest cover loss is accounted for by the CILs in the LCI data. In parts of the north (Bokeo, Xaisomboon, Xiengkhouang) there is a very small amount of forest cover loss (dark green provinces) caused by CILs. In the south of Laos, the portion of CILs forest loss is much higher (yellow, orange and red) with several provinces (Attapeu, Champasak, Savannakhet) as "hotspots". These three provinces contain higher numbers of large CILs; of the 50 largest CILs in the country, 25 occur in them. The reason for this may be flatter topography which is generally more suitable for larger tree plantations and better transport infrastructure to neighboring countries. The general distribution of CILs and LULC change can also be influenced by other factors such as: distance to roads, urban areas and international borders, elevation and slope and distribution of mineral deposits (Hett et al. 2020). Louang Prabang in the north stands out as the province with the highest total forest cover loss but with a low number of CILs and low related forest cover loss. The large area of forest loss must be the result of drivers other than CILs.

Of the 584 CILs, 242 were fully or partially inside of the 3 forest categories and caused 73,879 ha of forest loss (16% of all LUCL change). Most CILs were in protection forests, followed by production and the least were in conservation forests (table 2). Outside of the 3FC, 342 CILs caused 95,337 (27% of all LUCL change). The legality of CILs on forestland can be questioned but it's a complicated matter as different regulations apply to different sectors in or out of forestland and the category of forest. The ability of the government to ensure legal compliance has not been consistent and even the concept of "legality" of forest conversion has been a challenge to define. Approval of CILs and LULC change may depend more on who from which government administration level gives the permission to operate than on the legal basis of the investment (Forest Trends, 2015). As part of European Union's Forest Law Enforcement, Governance and Trade (FLEGT) initiative, Laos and the EU have used the Voluntary Partnership Agreement (VPA) process to refine and narrow down a "Timber Legality Definition" (TLDs) for conversion timber and apply this to the "Timber Legality Assurance System" (TLAS). The Definition states that the National Assembly's approval is required for conversion of national and provincial forest categories[3].

Summary of LULC Change and Recommendations

Policy and decision-makers need to appreciate that CILs inevitably results in LULC change, but the extent to which the impacts effect nature and humans depends on how CILs are governed. Decision-makers need the capacities, tools and information to understand the tradeoffs (i.e. what is lost and what is gained and for whom) when LULC change occurs and how the benefits can be fairly distributed to investors, government and villagers. As CILs will continue as part of the GoL land governance and investment strategy, their impact on the achievement of GoL's national social, economic and conservation goals call for critical analysis. Especially as Laos' natural resources are limited and require more sustainable use (GoL, 2021).

The GoL needs to take LULC change impacts seriously and give greater attention and prominence to this topic in policy design and investment decision-making. Recommendations are provided from two governance perspectives: decision- making and monitoring.

Table 2: Forest loss (ha) inside the 3 national forest categories (# of projects)

	Protection	Conservation	Production	Total Forest loss/ sector
Mining	20,868 (48)	6,422 (25)	7,419 (18)	34,709
Agriculture	5,930 (42)	112 (4)	177 (7)	6,219
Tree Plantations	15,651 (40)	5,278 (28)	12,043 (29)	32,972
Total FC Loss	42,449 (130)	11,812 (57)	19,639 (54)	**73,900**

[3] *https://flegtlaos.com/resources/tlas/*

LAND GOVERNANCE
CILs and land use and land cover change

Recommendations for decision-making

- ☐ The GoL should use a **holistic approach for decision making** that considers social, environmental and economic (SEE) aspects of CILs and resulting LULC change. Decision-makers need to understand the multi-faceted concept of 'overall human well-being' and assess CILs not only from an economic perspective.
- ☐ The **legality of LULC change, prior to CILs**, needs to be assessed to halt illegal forest or agriculture land conversion. Forest conversion must strictly follow regulations and the Timber Legality Definition concluded as part of the Lao – EU FLEGT VPA Timber Legality Assurance System.
- ☐ **CILs governance requires greater informed coordination** within government systems and with all stakeholders, especially involved villages. CILs approval should not be centralized in a single government agency or individual but bring together government offices responsible for the social, environmental and economic aspects of society (e.g. Cross Ministerial/Department, National/Provincial Assembly and Mass Organization "District and Provincial LULC Committees"). Disclosure and discussion at the village level of the proposed CILs and resulting LULC change is essential.
- ☐ To support decision-making, the CILs EIA approval process should include a **cost-benefit analysis (CBA)** to create and evaluate different social, environmental and economic scenarios and outcomes based on the proposed LULC change.
- ☐ A **land tenure analysis** prior to the approval of CILs on the existing land rights status of the proposed land area of LULC change is needed. The land rights of individuals and villages must be legally respected. Fair treatment of informal or customary users on government land is essential to secure the livelihoods of small-holder farmers.
- ☐ Ensure that the legal requirement for investors to allot and guarantee funds to **rehabilitation or restoration of land** (mining sites to forest, banana plantations back to rice paddy etc.) is fulfilled.

Recommendations for monitoring

- ☐ **Monitoring approved CILs at the field level** is critical to avoid unapproved LULC change. CILs implementation requires field level monitoring during land preparation by district forestry, agriculture and environment staff. Involved villages can support monitoring.
- ☐ Apply the FLEGT **Timber Legality Assurance Systems** (production forest, conversion areas, plantation, village use forest,) at the field level to ensure only legal conversion of forest to CILs. Include Department of Forest Inspection field monitoring.
- ☐ The Ministry of Agriculture and Forestry's *National Forest Monitoring System* should be used to **monitor larger CILs to detect LULC** beyond the area approved. Provincial and district response teams of the Department of Forest Inspection need to be made aware of and included in CILs management. For the conversion of cropland, a similar role for the Department of Agricultural Land Management is needed.
- ☐ The Central and Provincial "Committees for Investment Promotion and Management" **need to prioritize CILs monitoring in their mandates** that includes a "quick response mechanism" for unapproved LULC change; MAF and MoNRE are central to this.

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Knowledge for Development (K4D)

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Author: Richard Hackman. CDE Laos Office, Vientiane

Technical outputs: Rasso Bernhard and Yothin Chanthasumlet, CDE Laos Office, Vientiane

Editing and review: Michael Epprecht, Vong Nanhthavong and Phetsaphone Thanasak , CDE Office Laos Vientiane and Peter Thavone, Department of Forestry.

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UNIVERSITÄT BERN

CDE
CENTRE FOR DEVELOPMENT AND ENVIRONMENT

Centre for Development and Environment (CDE)
Country office in the Lao PDR

E-mail: info@k4d.la
Website: www.cde.unibe.ch