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Lessons from project-scale reducing emissions from deforestation and forest degradation: A case study in northern Lao People's Democratic Republic

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The reducing emissions from deforestation and forest degradation (REDD+) framework has been implemented over the past decade, and has led to a restructuring of forest governance systems in host countries. In the case of Lao People's Democratic Republic, which is promoting REDD+, activities have been implemented at project, sub-national, and national scales. Project-scale REDD+ is assumed to be compatible with small-scale forestry, and usually targets local people to enhance participatory forest management through technology transfer. Such projects were also supported by foreign governments under bilateral cooperation or by private funding. In the case of sub-national- or national-scale REDD+, the Lao People's Democratic Republic government aims to develop a system of forest monitoring, as well as related structures required by international REDD+ entities. These activities are supported by substantial funding from multilateral organizations. Lessons learned from project-scale REDD+ in northern Lao People's Democratic Republic showed a gap in expectations among different donors and recipients regarding how to implement REDD+, in particular how to reduce dependency on forest resources in rural areas, and how to estimate and account for greenhouse gas emissions reductions with consistent methodologies at different scales. Such differences are related to the attitudes of local people toward participation, and those of the private entities that fund projects and ground-based activities. In future REDD+ schemes, the structural network or structural social capital among project-, sub- national-, and national-scale

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activities should be reconsidered to enhance the continued participation of stakeholders and make use of their accumulated experience and knowledge of small-scale forestry management.

KEYWORDS

carbon stock change, alternative livelihood, participatory forest management, social capital, sustainable development goals

Introduction

Among climate change countermeasures in the land-use sector, afforestation or reforestation (A/R) projects were promoted as a Clean Development Mechanism (CDM) under the 1997 Kyoto Protocol (Murdiyarso et al., 2008; Thomas et al., 2010). Subsequently, under the 2015 Paris Agreement, a framework for reducing emissions from deforestation and forest degradation, and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries (REDD+) was widely expected to mitigate climate change (Hein et al., 2018). Both approaches aimed to address either greenhouse gas (GHG) removal or emissions reduction targets in the land-use sector in developing countries. The A/R CDM operates at the project scale and focuses on relatively small-scale projects. Although REDD+ is supposed to be promoted at the national scale under the United Nations Framework Convention on Climate Change (UNFCCC), it also appeals to a "voluntary market," and thus can be implemented by private enterprises at the project scale.

Because private enterprises are the proponents of A/R CDM projects, it is expected that private funds will be invested, and thus project implementation using public funds, that is, official development assistance (ODA), is excluded from the program (UNFCCC, 2001). However, in relation to REDD+, the application of both multilateral and bilateral public funding, including ODA and private enterprise funding, is important, and the 26th Conference of the Parties to the UNFCCC (COP26) in 2021 decided that such a design was to be encouraged in an effort to address climate change (UNFCCC, 2021). However, it has been pointed out that existing methods for using private funds for implementing REDD+ under the UNFCCC are inadequate, and it remains unclear whether a synergistic relationship exists between the public and private sectors (Streck, 2020). In other words, under the UNFCCC, REDD+ programs at the national scale do not currently have a mechanism in place to include private sector participation.

Prior to the Paris Agreement (UNFCCC, 2016), a report prepared by the Meridian Institute (Streck et al., 2009) emphasized the importance of maintaining a balance of investments in REDD+ based on the characteristics (e.g., forest cover ratio or human resources) of each developing country in the early stage of REDD+-related negotiations. The notion of a phased approach, which consists of both establishing readiness using public funds and, subsequently, full implementation using private funds, has been suggested. The full implementation of REDD+ at the national scale under the UNFCCC was expected to be similar to the CDM, and was not always envisioned as a program solely for private funds and/or small-scale projects. However, while REDD+ under the UNFCCC is led by the government entities managing the GHG account at the national scale, private enterprises that manage low-carbon international supply chains or are interested in carbon credits have a motivation to implement REDD+ with evidence of their contributions used for the Carbon Disclosure Project, the Science Based Targets initiative, or other GHG management schemes or contributions to the Sustainable Development Goals (SDGs) (Ehara et al., 2019). Thus, the primary concern of the private sector is related to how to design project-based REDD+ within or alongside national-scale REDD+ in developing countries.

Therefore, this perspective examined Lao People's Democratic Republic (hereinafter Lao PDR) as a host country for sub-national- and national-scale REDD+ under the UNFCCC and the World Bank, as well as project-scale REDD+ supported by private enterprises and had accumulated many lessons in this field. Two conclusions were reached regarding future REDD+ implementation. First, REDD+ should be promoted in parallel with a participatory approach involving local people (i.e., small-scale forestry). Second, future REDD+ schemes should involve both the public and private sectors in support of the SDGs.

Progress of reducing emissions from deforestation and forest degradation readiness and implementation in Lao People's Democratic Republic

Lao PDR is classified as a least developed country, and the contribution of the agricultural sector (including forestry

and logging) to the country's gross domestic product was approximately 16.5% in 2020 (Lao Statistics Bureau, 2021). Thus, the land-use sector is highly dependent on natural resources, especially in the northern mountain regions, where shifting cultivation is the main form of livelihood, and its expansion has been identified as a driver of deforestation and forest degradation. Therefore, the sustainable use of forest resources has become a major concern from the viewpoint of maintaining a balance between forest conservation and the improvement of people's livelihoods. Lao PDR has been among the preferred recipient countries since the early stages of REDD+, and has received steady support from the World Bank's Forest Carbon Partnership Facility (FCPF) Readiness Fund since 2007 and from the FCPF Carbon Fund since 2016. Projects are also underway as a result of bilateral cooperation with Japan, Germany, and other countries, and significant amounts of ODA have been invested in the country's forestry program (Government of Lao PDR, 2016). At the same time, project-scale REDD+ activities have been implemented using private funding from foreign countries for the purpose of creating carbon credits. As of 2021, two projects registered by the Verified Carbon Standard (VCS) had been implemented (VERRA, 2022), and the Joint Crediting Mechanism (JCM) that was agreed between Lao PDR and Japan is also expected to lead to the issuance of carbon credits (JCM, 2022; **Figure 1**).

The direct recipients of public funds are governments at each level, which often results in a delay of several years before local people receive ground-based support and public funds to implement activities (e.g., the introduction of alternative livelihoods to shifting cultivation) because of budget coordination issues relating to the central government. In the case of Lao PDR, funds from the FCPF Carbon Fund were to be invested in projects aimed at achieving future benefits for local people (Government of Lao PDR, 2020), yet it has been more than 10 years since the REDD+ initiative commenced after receiving support from the World Bank.

The question is whether the two streams can achieve synergistic effects in relation to climate change mitigation and the achievement of the SDGs. As a result of REDD+ readiness being promoted at the national scale in Lao PDR, specific outcomes such as a national forest monitoring system, a safeguard information system, and an analysis of drivers of deforestation and forest degradation have been achieved, but no program is currently utilizing these outcomes in project-scale REDD+ activities. Thus, funds related to REDD+ activities at the national scale are not being used to support ground-based activities. Furthermore, from the perspective of local people and their collaborators at ground level, outcomes from the national-scale REDD+ programs are not aligned with ground-based activities. Although training of local people is necessary to reduce deforestation, forest degradation, and excessive dependence on forest resources through the introduction of alternative livelihoods, the number of trainers who were qualified to carry out this training remained insufficient in 2021, more than 10 years after the commencement of the REDD+ initiative.

Outcomes of project-scale reducing emissions from deforestation and forest degradation activities in northern Lao People's Democratic Republic

A project-scale REDD+ activity in Phonxay District, Luang Prabang Province in northern Lao PDR, which covers approximately 30,000 ha, aimed at reducing pressure on forest resources and promoting rural development. It sought to do this by introducing alternative livelihoods for local people and conducting appropriate training, and the locals were supportive (Hiratsuka et al., 2021b). The project was led by private Japanese organizations with support from the Japanese government, in collaboration with the National Agriculture and Forestry Institute of Lao PDR and the District Agriculture and Forestry Office of the target site. The project was conducted from 2013 to 2018, with a budget sufficient to provide materials and conduct training for local participants.

Based on an evaluation of carbon stock changes (conversions from living biomass in different years) at the target site compared with those at a neighboring site, the project showed positive results (Hiratsuka et al., 2021b). In addition, the livelihoods (income generation) of local people improved significantly during the project period (Hiratsuka et al., 2021b). In other words, the project can be seen as a successful project-scale REDD+ activity in terms of both GHG emissions reductions (SDG 13, "Take urgent action to combat climate change and its impacts" and SDG 15, "Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss") and socioeconomic progress (SDG 1, "End poverty in all its forms everywhere"), with outcomes benefiting the local people's livelihoods.

From the viewpoint of participating private enterprises, it is important that their funding provides direct support for ground-based activities, because private enterprises are often reluctant to provide support for local people *via* governments because of corruption (Miah and Aturo, 2021). In addition, accumulated experience in small-scale forestry projects suggests that the design of REDD+ projects based on small-scale activities involving local people should be tailored for each site based on characteristics such as forest cover type and ratio, and the capabilities of various ethnic groups. In this case, there were two ethnic groups in the area, the Khmu and the Hmong, whose capabilities differed significantly (Hiratsuka et al., 2021a; Kobayashi et al., 2022). Thus, the project design needed to

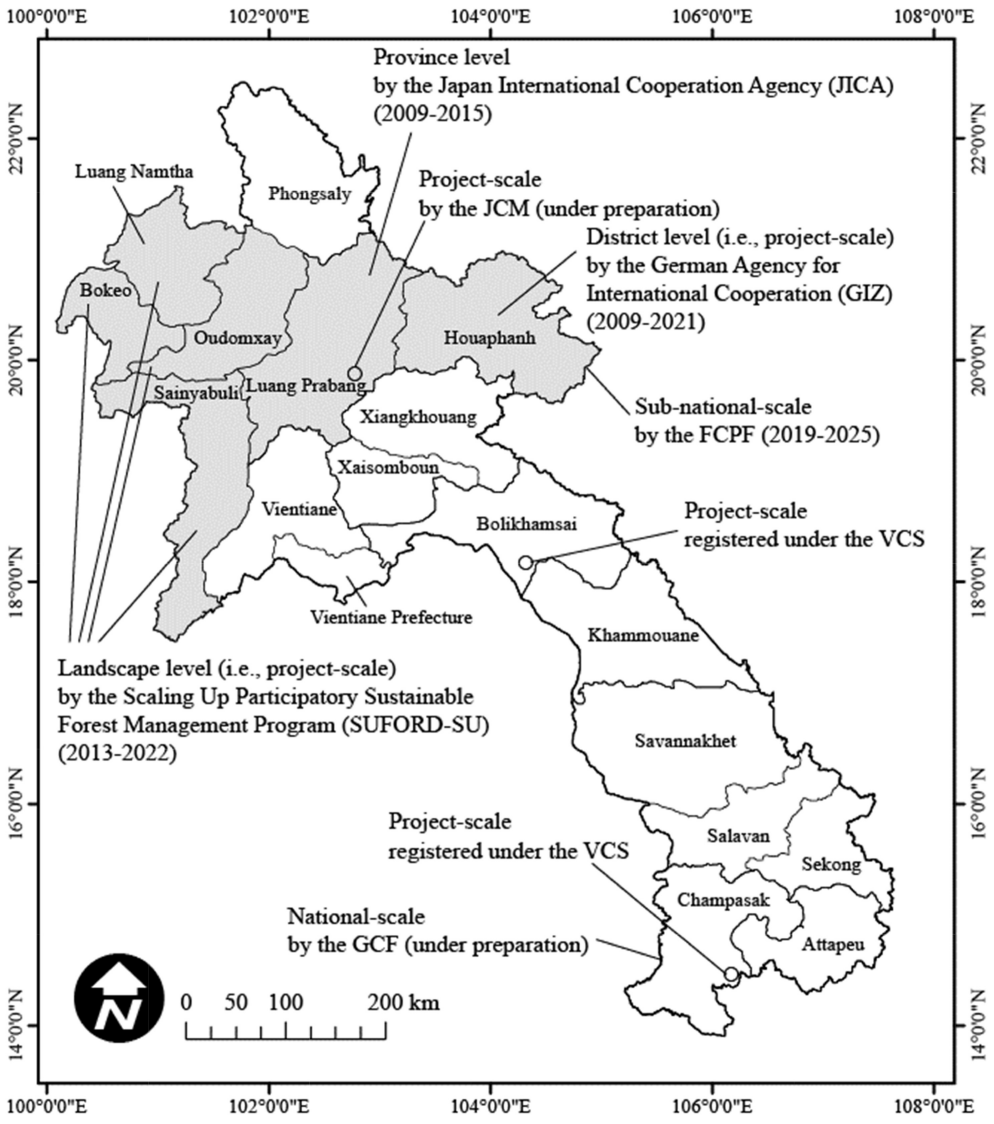

FIGURE 1
Reducing emissions from deforestation and forest degradation (REDD+) activities in Lao People's Democratic Republic. National-scale REDD+ activities have been introduced under the Green Climate Fund (GCF), sub-national-scale REDD+ programs in the six northern provinces have been developed under the World Bank's forest carbon partnership facility (FCPF) Readiness Fund and Carbon Fund, and project-scale REDD+ activities including technical support and projects aimed at creating carbon credits have been implemented by the joint crediting mechanism (JCM) and the verified carbon standard (VCS), with REDD+ activities at various scales overlapping in some provinces.

accommodate these differences in terms of activities, and to consider cultural differences in relation to capabilities and land-use. Addressing social safeguards while implementing REDD+ activities was also a consideration (Sarmiento Barletti et al., 2021). The process of preparing and developing procedures for REDD+ projects is an important consideration for the private sector when deciding whether to invest in REDD+ because it affects the costs/benefits analysis in relation to their investment (Sheng, 2020), as well as risk assessment (Ehara et al., 2019).

Regarding the estimation of GHG emissions reductions, this project applied similar methods to those used by the A/R CDM, and significant costs were involved in procuring and analyzing high-resolution satellite images. From an investment perspective, the carbon credits that could potentially be claimed are estimated to be substantial. However, given current trends and a carbon credit price of only US$5 per Mg assumed by the FCPF Carbon Fund and the GCF, it will be difficult to promote further REDD+ activities based on the company's current budget. The abovementioned REDD + project under the JCM was not implemented following this project, and has come to be seen as a scheme that does not provide sufficient incentives for the participation

of private enterprises in projects that emphasize small-scale forestry.

Discussion

Utilization of the effectiveness of small-scale forestry in reducing emissions from deforestation and forest degradation

As mentioned above, small-scale forestry allows REDD+ projects to be designed based on local land-use characteristics and people's capabilities. This is a key advantage of participatory forest management, and significantly affects the sustainability and robustness of projects. With regard to the bottom-up participatory forest management system that has been emphasized since 1990, a growing number of studies have shown that community-based forest management is a useful approach (Gilmour, 2016), especially in cases such as Lao PDR where various ethnic groups have a stake in both current and future forest management (Hashiguchi et al., 2021; Hiratsuka et al., 2021a; Nambiar, 2021). Small-scale forestry is important for forest dwellers, and forest conservation projects that neglect this approach are unlikely to be particularly effective (Newton et al., 2015). Centrally developed forest management policies do not always reflect local conditions and lifestyles (Hashiguchi et al., 2016). However, the small-scale forestry approach is not always consistent with REDD+, which is often based on the top-down approach favored by governments.

In an effort to consider local land-use systems and bottom-up approaches to REDD+, the UNFCCC is careful to respect the sovereignty of each country, although not each individual village, and tends not to become involved in domestic concerns in developing countries. For example, it emphasizes the importance of introducing safeguards, but does not intervene in the selection of specific measures (Rey Christen et al., 2020). Thus, the current situation is dependent on each country's way of thinking and ability to implement specific policies at the national level. However, in relation to ground-based activities supported by the private sector, the core concern is the local response to various issues (Paudel et al., 2018).

Elsewhere in the world, REDD+ projects have supported collaborative approaches allowing relevant local knowledge and experience to be gradually accumulated through the implementation and integration of both top-down and bottom-up approaches. For instance, a REDD+ scheme in South America, the Amazon Fund, has received approximately US$1.4 billion over 12 years, and the Amazon Fund Guidance Committee (COFA) consists of representatives from the federal government, state governments, and the public, with each sector having been allocated a budget across a total of 102 projects up to 2020 (Amazon Fund, 2021). Such a collaborative approach should be able to consider both top-down and bottom-up perspectives when assessing the characteristics of each REDD+ site. In the future, if a REDD+ liaison conference similar to the Amazon Fund's COFA were to be held involving government and public representatives in REDD+ host countries, the lessons learned by businesses involved in REDD+ projects could be shared in a transparent way, and it is likely that international funds (both public and private) would respond favorably. Building on the experience of the Amazon Fund (van der Hoff et al., 2018; Correa et al., 2019), and looking to the future, it is considered essential to create a "roundtable for dialogue" enabling the exchange of information, experience, and knowledge between national-scale and project-scale REDD+ programs (i.e., enhancing the structural network or structural social capital between each scale of REDD+), which will also support SDG 17, "Revitalize the global partnership for sustainable development" (see **Figure 2**).

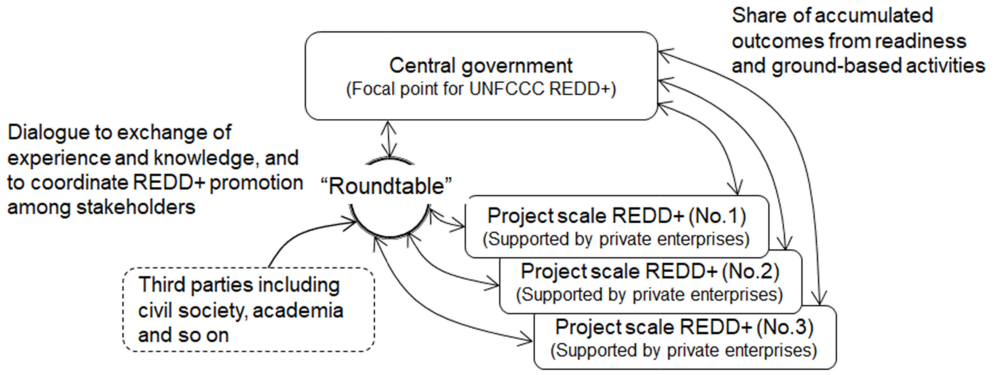

FIGURE 2
Proposed future roundtable involving national-scale and project-scale reducing emissions from deforestation and forest degradation (REDD+) stakeholders.

Public–private partnerships based on accumulated experience and knowledge

As a party to the UNFCCC's Paris Agreement, Lao PDR is required to submit nationally determined contributions as evidence of its efforts to counter climate change at the national scale, and national accounting is part of this process. This reporting is compatible with the sub-national- or national-scale efforts supported by the World Bank. However, it will be difficult to include the carbon credits from project-based initiatives involving private enterprises in the land-use sector because of concerns regarding double estimation and/or double accounting of GHG emissions reductions (Streck et al., 2017). Thus, these issues should be addressed not only by technical means, but also by communication of GHG estimations among the various proponents at the different scales. In addition to the abovementioned REDD+-related technical outcomes, more than 50 countries submitted national forest reference emission levels and/or forest reference levels at the national or sub-national level to the UNFCCC on 19 January 2022. Thus, numerous REDD+ host countries have established robust GHG estimation methods for their land-use sectors under the UNFCCC, which is a significant advance from the approach under the A/R CDM, both in Lao PDR and globally. Again, effective use of technology in estimating GHG emissions reductions (e.g., satellite imaging) will enhance the effectiveness of funding by reducing costs (Dargusch et al., 2010), especially in cases where the outcomes are shared across projects.

Looking to the future, there is an urgent need for increased collaboration between the public and private sectors with a view to strengthening the social and professional bridges between the sectors (i.e., bridging social capital). The accumulated experience obtained from REDD+ implementation at various scales in other countries should be helpful in this regard (Pinsky et al., 2019). While the private sector faces challenges addressing various technical issues, the public sector has accumulated experience and knowledge regarding ground-based activities aimed at reducing dependence on forest resources. Therefore, it is essential to introduce a roundtable for dialogue to facilitate the exchange of information, experience, and knowledge with the aim of addressing these technical issues and coordinating the efforts of both the public and private sectors toward achieving SDG 17.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

MH and MY initially conceptualized this study. HH and MT helped with diagram design and helped to improve the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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