Final Report

October 2014

Japan International Cooperation Agency (JICA)

Mitsubishi UFJ Research and Consulting

Japan Forest Technology Association

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Validation and Registration Project on REDD plus through Participated Land and Forest Management for Avoiding Deforestation in Lao PDR

Final Report

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- Annex 3: Analysis Results of Forest Dynamics
- Annex 4: Results of Forest Plot Survey
- Annex 5: Destructive Sampling Survey
- Annex 6: Results of Socio-Economic Survey

- Abbreviation -

| | · · · · · · · · · · · · · · · · · · · | |
|----------|--|----------------------|
| ADB | Asian Development Bank | パンパ開発銀行 |
| AFOLU | Agriculture, Forestry, and Land Use | 農業、林業及び土地利用 |
| ALOS | Advanced Land Observing Satellite | 陸域観測技術衛星だいち |
| A/R CDM | Afforestation/Reforestation Clean Development | 新規植林/再植林クリーン開発メカニズ |
| | Mechanism | Д |
| AUD | Avoiding Un-planed Deforestation | - |
| AWG-KP | Ad Hoc Working Group on Further Commitments | 京都議定書の下での附属書I国の更な |
| | for Annex I Parties under Kvoto Protocol | る約束に関する特別作業部会 |
| AWG-I CA | Ad Hoc Working Group on Long-term Cooperative | 気候変動枠組条約の下での長期的協 |
| | Action under the Convention | カの行動のための特別作業部会 |
| | Ad Hoc Working Group on Durban Platform | は化された行動のためのダーバンプ |
| | | |
| | | ノクトフォーム符別1F未叩去 |
| DAU | | |
| BOCM | Bilateral Offset Credit Mechanism | ー 国间オノセット・クレンット制度 |
| BR | Biennial Report | · |
| BUR | Biennial Update Report | 隔年更新報告書 |
| CDM | Clean Development Mechanism | クリーン開発メカニズム |
| CER | Certified Emission Reduction | - |
| CMP | Conference of the Parties serving as the meeting | 京都議定書締約国会合 |
| | of the Parties to the Kyoto protocal | |
| COP | Conference of the Parties | 締約国会議 |
| DAFO | District Agriculture and Forestry Office | 郡農林事務所 |
| DFRM | Department of Forest Resource Management | 森林資源管理局 |
| DOE | Dsignated Operational Etity | 指定運営組織(第三者認証機関) |
| DOF | Department of Forestry | 林野局 |
| DNA | Designated National Authority | - 指定国家機関 |
| | | インドネシア国家気候変動評議会 |
| ECDE | Foraat Carbon Partnarabin Faaility | |
| | | 林州灰系ハードノーノリノ金金 |
| | | |
| FFORTRA | Facilitating the Implementation of National Forestry | 1ントインア国家麻林計画美施文援ノ |
| | Strategic Plan | |
| FIM | Forest Information Management | : 森林資源情報センター整備計画 |
| FIP | Forest Investment Program | 森林投資プログラム |
| FPIC | Free, Prior, and Informed Consent | 自由意思による、事前の、十分な情報 |
| | | に基づく同意 |
| FPP | Forest Preservation Program | 森林保全計画 |
| FS | Feasibility Study | 実現可能性調査 |
| FSCAP | Forestry Sector Capacity Development Project | 森林セクター能力強化プロジェクト |
| GHG | Greenhouse Gases | 温室効果ガス |
| GIS | Geographical Information System | |
| GIZ | Deutsche Gesellschaft für Internationale | |
| | 7usammenarheit | |
| 000 | Clobal Dapitioning System | 今地球测位细 |
| | i Giobal Positioning System | ,土地场別区码 |
| HWP | marvested wood Products | |
| IJ-REDD+ | Indonesia-Japan Project for Development of | 日本イントネンア REDD+実施メカニス |
| | REDD+ Implementation Mechanism | : ム構築フロジェクト |

- Abbreviation -

| INCAS | Indonecia Carbon Accounting System | - |
|---------|--|--------------------|
| IPCC | Intergovernmental Panel on Climate Change | 気候変動に関する政府間パネル |
| ISO | International Organization for Standardization | 国際標準化機構 |
| JCM | Joint Crediting Mechanism | ニ国間クレジット制度 |
| JICS | Japan International Cooperation System | 日本国際協力システム |
| JST | Japan Science and Technology Agency | 科学技術振興機構 |
| KfW | Kreditanstalt für Wiederaufbau | ドイツ復興金融公庫 |
| LMFC | Land and Forest Management Committee | 土地·森林管理委員会 |
| LULUCF | Land Use, Land Use Change and Forestry | 土地利用・土地利用変化及び林業 |
| MAF | Ministry of Agriculture and Forestry | - 農林省 |
| MONRE | Ministry of Natural Resources and Environment | 天然資源環境省 |
| MoU | Memorandum of Understanding | ; : |
| MRV | Measuring, Reporting and Verification | |
| NAMAs | National Appropriate Mitigation Actions | 途上国における適切な緩和行動 |
| NC | National Communication | |
| NEC | National Environmental Council | |
| NEDO | New Energy and Industrial Technology | 独立行政法人新エネルギー・産業技術 |
| | Development Organization | 総合解発機構 |
| NFMS | National Forest Monitoring System | |
| PAFO | Provincial Agriculture and Forestry Office | |
| PALSAR | Phased Array type L-band Synthetic Aperture | - |
| | Rader | |
| PAREDD | Participatory Land and Forest Management | ラオス森林減少抑制のための参加型 |
| | Project for Reducing Deforestation in Lao PDR | 土地・森林管理プロジェクト |
| PD | Project Description | |
| PDCA | Plan/Do/Check/Act | 計画・実施・検討・対処 |
| PDM | Project Design Matrix | |
| PLUP | Participatory Land Use Planning | |
| PRA | Participatory Rural Appraisal | |
| QA/QC | Quality Assessment/Quality Control | |
| RAN-GRK | National Action Plan Reducing Greenhouse Gas | |
| | Emissions | |
| R-PP | Readiness Preparation Proposal | |
| SAR | Synthetic Aperture Radar | 合成開ロレーダ |
| SBSTA | Subsidiary Body for Scientific and Technological | 科学技術上の助言に関する補助機関 |
| | Advice | |
| SEDP | Socio-Economic Development Plan | 社会経済開発計画 |
| SNV | Stichting Nederlandse Vrijwilligers | オランダ政府援助組織 |
| SPOT | Satellite Pour l'observation la Terre | |
| SUFORD | Sustainable Forestry and Rural Development | - |
| UKP4 | - | 開発管理局(インドネシア大統領直属) |
| UNFCCC | United Nations Framework Convention on Climate | 国連気候変動枠組条約 |
| | Change | |
| UN-REDD | United Nations Collaborative Programme on | |
| | Reducing Emissions from Deforestation and Forest | |
| | Degradation in Developing Countries | |

- Abbreviation -

| USAID | United States Agency for International | 米国国際開発庁 |
|-------|--|----------|
| | Development | |
| VCS | Verified Carbon Standards | - |
| VCU | Verified Carbon Unit | - |
| WCS | Wildlife Conservation Society | - |
| WWF | World Wide Fund for Nature | 世界自然保護基金 |

Chapter 1 Background and Objective

1. Background

1.1 International trends in REDD plus

Under the UNFCCC, international negotiation has continued since the COP 11 in 2005 on the handling of REDD plus. An agreement has been made on the general framework for the implementation of the REDD plus through the meetings that were held so far (COP 16 in 2010) and the parties has been discussing and coordinating the details of the working rules. However, there has not yet been an international agreement regarding the handling of the next framework for 2013 and after. With regard to the coordination among the parties, no country has ever been against the concept of the REDD plus itself. And governments in many developing and developed countries, enterprises, and NGOs have already initiated REDD plus activities on their own initiative, rather than waiting for a UNFCCC international agreement. The project team expects that these leading activities, or early action, might be accepted as formal REDD plus activities after international agreement which was agreed in COP 17 is reached (Figure 1)



Figure 1 Assumed direction under the UNFCCC

At COP 17 in December 2011, in-depth discussions were held regarding the guidance on systems for providing information on how safeguards are addressed and respected in the implementation of REDD plus and on the modalities for establishing forest reference levels. Regarding the first point, it was decided that information should be provided periodically and included in NC or communication channels agreed upon by the COP. For the second point, the parties decided that reference levels should be established in

consistency with GHG inventories and improved through the use of better data and methodologies, and as a future task, comments were invited with a view to sharing experience among the parties. Concerning the role and positioning of national forest monitoring systems, which would serve as an essential tool in gathering the basic information needed for establishing reference levels, the meeting recognized the comprehensive incorporation of safeguard information systems into national monitoring systems as one of the largest challenges for 2012. By the end of February 2012, 18 countries had submitted comments on the national forest monitoring systems, and the latest session of the UNFCCC's SBSTA, held in May, discussed the issue from a technical perspective. In COP 18, modalities of MRV system and national forest monitoring system were discussed deeply.

1.2 Actions by the Japanese Government

In June 2010, the Japanese Cabinet approved the "Blueprint for Revitalizing Japan (Genki na Nippon)" New Growth Strategy, announcing its goals to reduce worldwide GHG emissions by at least 1.3 billion tons (equivalent to the total emissions of Japan) by using Japanese private-sector technologies, along with a roadmap emphasizing the importance of overseas activities. REDD plus is expected to have enormous mitigation potential in this context, and is attracting interest as an activity based on the new growth strategy.

In negotiations concerning the subsequent framework for the UNFCCC from 2013 and on, Japan proposes the bilateral carbon offset mechanism (i.e. JCM), and attract big attention to REDD plus because of its enormous mitigation amount and as an advanced example of NAMAs.

In August 2013, Lao PDR, in which this project has been in progress, and Japan signed JCM agreement. Lao PDR has also been expecting the implementation of REDD plus under JCM. In Japan, there is growing hope for this project as an advanced REDD plus operated by Japan (Figure 2).



Figure 2 Tentative direction of REDD plus

1.3 REDD plus in Lao PDR

1.3.1 Overview of forest in Lao PDR

Around 67% of the land of Lao PDR is covered in forests and most of them are broad leaf forest. About 10% of the forests are natural forests, about 89% are natural regenerated forests and about 1% are plantation forests. Wet half deciduous forests such as Dipterocarpaceae are distributed from the western part to the southern part of Lao PDR and Mixed Deciduous Forests are in the northern part and along the Mekong River. Wet Forests such as Fagaceae and Lauraceae are distributed in the area at altitudes between 800 and 2,000 m above sea level and Mixed Coniferous / Broadleaved Forests of Cupressaceae are distributed at over 2,000 m above sea level.

The proportion of forested land (the proportion of total forest area occupied in the land area) has been reduced from 73% in 1990 to 67% in 2010 (Table 1). The factors are including: the conversion to plantation or commercial crops by private sectors and smallholders, hydroelectric power generation, mining, infrastructure development, illegal logging and slash and burn farming. In particular, there are many poor villagers depending on slash and burn farming in the northern mountain area where the deforestation is significant and such expansion of slash and burn farming plots has become a factor of deforestation. In addition, in recent years, the cultivation of commercial crops such as rubber and corn for animal consumption by foreign investment has spread in the northern part of Lao PDR and land/forest use pattern has changed significantly. As a result, these are becoming concerns over conservation and sustainable use of forests.

| Type of information | 1990 | 2000 | 2010 |
|---|--------|--------|--------|
| Population (middle estimate) (unit: 1,000 persons) | 4,192 | 5,317 | 6,201 |
| GDP (unit: million USD) | 866 | 1,735 | 7,296 |
| GDP per capita (unit: USD/person) | 206 | 311 | 1,048 |
| GDP growth rate (%) | 6.7 | 5.8 | 8.5 |
| Land area (unit: 1,000 ha) | 23,680 | 23,680 | 23,680 |
| Forest area (unit: 1,000 ha) | 17,314 | 16,532 | 15,751 |
| Forest coverage ratio (%) | 73.1 | 69.8 | 66.5 |
| Annual deforestation rate (unit: 1,000 ha/year) | - | 78 | 78 |
| Primary forest area (unit: 1,000 ha) | 1,490 | 1,490 | 1,490 |
| Other naturally regenerated forest area | - | - | 14,037 |
| (unit: 1,000 ha) | | | |
| Planted forest area (unit: 1,000 ha) | 3 | 99 | 224 |
| Carbon stock in living forest biomass (unit: million t) | 1,186 | 1,133 | 1,074 |

Table 1General information in Lao PDR

Sources: UN Statistics

1.3.2 Efforts for REDD plus

Following the process of negotiation concerning REDD plus at UNFCCC, Lao PDR decided to participate in Readiness Fund of the World Bank's FCPF in 2008. The government of Lao PDR established REDD Task Force in 2008 and started approach to political and technological issues towards implementing REDD plus, with the DOF of MAF playing a central part. After that, the support of the same World Bank's FIP was decided in 2010, resulting that the sites to implement the REDD plus pilot

programmes have been selected by FIP.

The director general of DOF, under the control of MAF, serve as chairman in REDD Task Force consisting of multi-sectors, which REDD Task Force consisting of multi-sectors, in which the director general of DOF, under the control of MAF, serves as chairman, coordinates the preliminary activities of REDD plus (Figure 3). The adjustment of high leveled cross sectors and policy guidance will be provided by the NEC consisting of cabinet ministers and vice ministers. Also, the REDD office will be authorized to establish technical working groups for the development of reference level, MRV system, discussions among stakeholders, land use plans, profit distribution and other issues as needed.



Figure 3 REDD plus implementing structure in Lao PDR

As for REDD plus project implementing body in Lao PDR, the REDD Task Force was established in 2008 and the domestic framework for implementation of REDD plus was being developed, centering on DOF. Meanwhile, REDD Office, as a political jurisdiction, was temporarily established in August, 2012 (Table 2) and such REDD plus implementing framework based on REDD Task Force and REDD Office will be established in both central and local governments (Luang Prabang Province is one of the candidates); to facilitate the framework is considered a important matter of REDD plus in Lao PDR. On the other hand, concerning the relationships with international funds, the participation in the Readiness Fund of the World Bank's FCPF was announced in 2008 and the R-PP in 2010 was submitted. It is expected that financial support by the Readiness Fund of the World Bank's FCPF will be started from 2014. Lao PDR declared its participation in UN-REDD, becoming one of the Partnership countries.

| Year | Main activities related to REDD plus |
|------|---|
| 2008 | Participate in FCPF Readiness Fund under the World Bank |
| | • Establish REDD plus task force (November) |
| 2009 | • Fund distribution for R-PP preparation from FCPF (October) |
| 2010 | • Stakeholder meeting related REDD plus (May) |
| 2010 | • FIP decided assistance (November) |
| 2011 | • Ministerial re-construction (June) and start re-arrangement of the Forestry Law |
| 2012 | • Establish REDD Office under the DOF (August) |
| 2013 | • Decided pilot project of REDD plus under the FIP (May) |
| 2014 | • Fund distribution is scheduled for implementing activities under the R-PP |
| | |

Table 2History of REDD plus related activities in Lao PDR

1.3.3 Major REDD plus related projects

Three countries including Japan, Germany and Finland are the main donors addressing REDD plus in Lao PDR and each country are taking measures which are deeply related to the forest classification such as protection forest, conservation forest and production forest. Regarding the implementation of REDD plus, close partnership systems have been created among the donors. As the recent observations, Germany are planning to implement the project aiming at gaining the VCS and Finland/the World Bank are also considering gaining VCS covering production forest in the southern area (Figure 4).



Figure 4 REDD plus project in Lao PDR

1.3.4 Actions by the Lao Government

Over the course of negotiations regarding REDD plus under the UNFCCC, Lao PDR decided in 2008 to join the FCPF administered by the World Bank and is receiving FCPF funds for the readiness phase. The government of Lao PDR established a REDD task force in 2008 and, under the assistance of JICA and other organizations, initiated an approach to addressing political and technical challenges towards implementing REDD plus.

REDD plus, if effectively implemented in Lao PDR in the future, is expected not only to work as a global warming mitigation scheme but also to contribute to establishing a forest management system in the villages, and eventually to achieving poverty reduction and environmental conservation on a global scale.

Against this backdrop, discussions on the reorganization of government ministries have been going on since the June 2011 session of the Laos National Assembly, the outcome of which will have a great bearing on the implementation of REDD plus in this country. So far, decisions have been made to create four new ministries, including the MONRE. Regarding the forest sector, two of the three divisions under the DOF—the forest protection and forest conservation divisions—were moved to MONRE in September 2011; the division that looks after production forests remained with the DOF. As a result, the forest sector is now administered by two ministries, but in November 2011, it was confirmed that the DOF will continue to be in charge of REDD plus and DOF established some working groups of MRV system, reference levels, land use, and other technological challenges. While, MONRE also established REDD office for promoting REDD plus in parallel, then it is unclear which Ministry or department has a charge of REDD plus office that will serve as the general secretariat for REDD plus activities in Lao PDR, as well as working groups under the office to tackle The reorganization of the administrative structure concerning the forest sector will likely be expanded to local levels, in accordance with these changes on the national level.

1.4 Role of Japan International Cooperation Agency (JICA) for promoting REDD plus

With extensive experience in forest conservation projects in developing countries, particularly in tropical regions, JICA has been accumulated technical knowledge and experience and creating networks of personal connections. Reviewing JICA's achievements and problems, grasping the needs of private-sector companies, and considering a system to link them is a highly effective way to persuade private-sector enterprises to invest in forest conservation projects in developing countries and to implement and expand forest carbon credit activities.

For promoting REDD plus, it is encouraged to conduct by step by step approach and based JICA's activities (phased approach in Figure 5). For such a future approach, it is important that JICA and private-sector companies are collaborated, and it is also necessary to fully use JICA's knowledge, experiences and network. In this project, we would suggest following concept of REDD plus in Luang Prabang Province which is based on collaboration between technical cooperation project, "PAREDD" and private-sector companies.



Figure 5 Concept of the process up to the implementation of REDD plus project

At an open seminar, "JICA's REDD plus -the direction of cooperation with private enterprises in Lao PDR and Indonesia", held in September 2012, JICA announced a policy that JICA would collaborate with private enterprises to promote REDD plus in Luang Prabang Province. This also identified that activities taken in Luang Prabang Province are the most advanced case for Japan's REDD plus implementation and supports, and the progress of activities are getting considerable attention in Japan (Figure 6).

Supports for implementing REDD plus by private enterprises



Figure 6 Image of collaboration to promote REDD plus in Luang Prabang Province provided by JICA

1.5 Trend in the JCM in Lao PDR

At the Japan and Mekong countries summit meeting held in November 2011, a summit agreement was made to show that welcoming useful discussions about JCM were being in progress and sharing the importance of further discussions. After that, both governments of Japan and Lao PDR signed a bilateral document for the JCM on August 7, 2013. At the joint committee by the two countries for designing the JCM system, the establishment of such as the detailed rules will be promoted and position of REDD plus in JCM will be clarified. The first joint committee was held by the end of September, 2014 and the members of the REDD Office participated from the Lao side.

As initiatives assuming JCM, Feasibility Study as a REDD plus for forestation project in the central and southern part of Lao PDR was implemented as Global Warming Mitigation Technology Promotion Project by the Ministry of Economy, Trade and Industry in the year of 2010 (implemented by Oji Paper Co., Ltd.). Furthermore, in the year of 2013, Ministry of Economy, Trade and Industry's FS for the Joint Crediting Mechanism for Reduced Emissions from Deforestation and forest Degradation-Plus (aims to visualize the potential contributions of Japanese enterprises in the fields of REDD plus) was implemented and in the year of 2014, a survey for REDD plus activities in the target area in Luang Prabang Province where slash and burn farming was a factor for deforestation was implemented, as a Ministry of the Environment's REDD plus empirical survey 2014 (implemented by Japan Forest Technology Association in 2013 and by Mitsubishi UFJ Research and Consulting in 2014).

2. Goals of this Project

2.1 Validation and registration as a REDD plus project

The goal of this project is to have the Houaykhing Village Cluster (HK-VC) and surrounding area in Phonsay District, Luang Prabang Province, in Lao PDR, which are covered by the PAREDD, validated and registered as a target area of the REDD plus project. Furthermore, the project will be carried out keeping in view areal expansion of the REDD plus project to overall Luang Prabang Province and will be aiming to establish a reference level which covers all over Luang Prabang Province.

The concept of this type of project targeting overall Luang Prabang Province is in accordance with the ideas related to the implementation of the REDD plus that is expected to start in 2020 or later under the UNFCCC. Such project can be considered to be project-based involvement in carrying out and supporting the REDD plus project under such as the JCM in the short term. However, they are likely to be considered as part of the REDD plus under the UNFCCC in the medium to long term (Figure 7).



Figure 7 Concept of to keep consistency between project base and sub-national base REDD plus

Furthermore, through this project, the participating countries are also able to gain experience and knowledge in coordinating project-based involvement and national or sub-national based involvement related to the implementation of the REDD plus project. Such experience and knowledge are expected to contribute substantially to Japan's REDD plus strategies in the times ahead.

2.2 Others

While this project covers the HK-VC and surrounding areas in Phonsay District, Luang Prabang Province, in Lao PDR, as mentioned above, a series of tasks leading to their validation and registration as a REDD plus project are believed to provide useful information for the REDD plus projects not only in the said area but also in other areas in Lao PDR and in other countries in the world, including Southeast Asia. Accordingly, in view of the fact that this project is a pioneering attempt to implement an actual REDD plus project based on the existing activities of JICA, the knowledge and experience to be acquired through the project will be shared in an effective and efficient manner in order to assist the REDD plus projects that Japan will implement and support.

On a medium and long-term basis, this project will be carried out with a view toward expanding the REDD plus activities in the HK-VC (and surrounding areas) to a sub-national based (Luang Prabang Province). At the same time, the methods of cooperation between JICA and the private-sector companies, along with the cooperation between Japanese and Lao governments, and the coordination of their REDD plus strategies, will also be kept in view.

Chapter 2 Project Achievements

I. Organization of the Project Implementation Team

In organizing a project implementation team (involving counterpart organizations and local consultants or NGOs), a system for conducting the project on a long term basis will be important, considering that the REDD plus projects will continue for more than 20 years at least. Furthermore, a joint implementation plan based on the PAREDD activities will be developed in close cooperation between the project implementation team and the counterparts. The joint work plan will include the work processes, the division of roles and responsibilities, dates, attendees and the places of meetings to be held, and will be confirmed or reviewed jointly with the counterparts as needed.

In this project, at point of project start, we had reached to the agreement with PAREDD that private-sector companies and NGOs are assumed to become the project implementers in the final stages. Furthermore, cooperation with local consultants or NGOs will be promoted from the viewpoint of nurturing organizations that are able to independently implement REDD plus projects in the northern part (overall Luang Prabang Province) of Lao PDR (assumed to be an upper-level goal).

For the reasons mentioned above, the framework of cooperation between the project implementation team and the related organizations (FSCAP, FIM and FPP of the Program Grant Aid for Environment and Climate Change.) was agreed with PAREDD (Figure 8).



Note: As a rule, local consultants/NGOs are to go through PAREDD to collaborate with PAFO/DAFO staff members. Depending on the capacity of PAREDD, however, a direct collaboration between local consultants and PAFO/DAFO staff, administered by PAREDD, needs to be considered.

Figure 8 Framework of expected cooperation between the project implementation team and related organizations

II. Structure and Roles of Each Field Survey

This study was developing reference levels for overall Luang Prabang Province and HK-VC in Phonsay District. To develop reference levels, it is required to estimate changes in carbon stock of each forest type by multiplying changes in area size of each forest type, which was obtained through satellite imagery analysis, by carbon stock per hectare of each forest type (i.e. emission factors determined in this project). As a result, increase or decrease in carbon stock (emission or removal) can be estimated when the area of forest type in the target area changes, and that trend is to be the basis of calculating reference level.



Figure 9 Flow of calculating carbon stock in each forest type

Accordingly, amongst factors of carbon sequestration in forests, emission factor is, in a narrow sense, subdivided into stem volume, conversion factor from stem volume to biomass, and conversion factor from stem biomass to branch and leaf biomass (expansion factor), while it refers to carbon stock per area of each forest type. From the both narrow and broad definition perspectives, it is necessary to quantify the carbon stocks in each forest type; therefore, this study conducted forest plot survey.

To develop reference levels, three Technical Cooperation Reports as Annex were utilized. Figure 10 below describes the relationships of these three reports.



Figure 10 Procedures of Reference level development

1. Analysis of Forest Dynamics/Analyzing Satellite Imagery

1.1 Clarification of the monitoring target

The main causes of deforestation and forest degradation in the targeted area of this project are slash-and-burn agriculture with short fallow period and expansion of slash-and-burn area. Shortening of fallow period refers to practicing slash-and-burn again in the lands being fallowed, where forest regeneration is progressing, before the lands restock sufficient amount of carbon. Therefore, carbon stock per hectare increases as fallow period is extended. Inoue et al (2007) reported that the mean carbon stock increases as fallow period is extended to 2 years, 3 years, 5 years, and 10 years (Figure 11). This indicates that repeating slash-and-burn with short fallow period tends to decrease mean carbon stock, and it lowers the productivity of lands.



Figure 11 Dynamics of forest carbon stocks in some shifting cultivation rotation periods¹

Taking account of sustainable forest management, controlling such exploitative agriculture is essential. To do so, it is important to try to extend fallow periods while providing alternative livelihoods such as introducing paddy rice cultivation.

On the other hand, some natural secondary forests have also been converted to slash-and-burn lands in the target area of this project. Interviews with rural people in early March 2012 found out that there was an interest in expanding slash-and-burn lands because the increase in households of individual farmers resulted in shortage of food for family consumption. In addition, for the cash income sake, cash crops cultivation such as gingers, corns, and pineapples etc. was also observed. The suggestion was made from the results that those farmer's behavioral patterns of slash-and-burn may be arose from the effect of the access to the

¹ Cost of the comprehensive promotion of global environment: (Source) Development and assessment of greenhouse gas absorption-controlling technology for agricultural ecosystems (3b), study on methods used to control the ecosystem of shifting cultivation in mountainous areas in Southeast Asia, and the improvement of carbon storage functions (2007)

market. This means that status of opening roads from the central Luang Prabang could be one of the explanatory factors of the expansion of slash-and-burn.

From the above factors and background of deforestation and forest degradation, followings were considered as the essential points of view for forest monitoring:

- 1. Newly conversion of naturally grown secondary forests to slash-and-burn lands
- 2. Fallow periods of slash-and-burn lands
- 3. Opening roads as one of the possible explanatory factors
- 4. Population increase as one of the possible explanatory factors

As the monitoring is mainly taken place by remote sensing, information of the above 4th point "4. Population increase as one of the possible explanatory factors" can only be examined by the socio-economic survey.

2. Policy for Analyzing Satellite Imagery

Methodology of monitoring relies on the targets to be detected, and monitoring targets are consolidated into three viewpoints: 1. transformation of naturally grown secondary forest to newly slash-and-burn land; 2. fallow period of slash-and-burn land; and 3. opening roads as one of the possible explanatory factor. Based on these, monitoring methodology was set as follows:

- 1. In order to monitor the areas newly transformed from natural secondary forests to slash-and-burn lands, requirements are: to prove conserved area of naturally grown secondary forest; and to extract the change of translation to slash-and-burn by the past satellite imagery.
- 2. On the other hand, in order to monitor dynamics of slash-and-burn lands over the past fallow period, it is required to specify slash-and-burn lands by analyzing satellite imagery every year². At that time, in tropical and sub-tropical zones, it is extremely difficult to organize remote sensing information unaffected by clouds disturbance. Therefore, this project examined a system to detect short term cycled slash-and-burn using SAR data.

Provision and analysis of satellite imagery are settled as in Figure 12. In order to meet the consistency of classification of forest distribution map between this project, and environmental grant aid FIM and FPP that are aiming to create the provision of information on forest distribution map at national level, this project decided to use the time series data of forest distribution map in 2010, 2005, and 2000 (Figure 12). The retrospective methodology was taken in accordance with the baseline of VCS.

 $^{^2}$ Because there are short term fallow lands of two year in the targeted area.



Figure 12 Pattern of analysis in satellite imagery considering the fallow periods of slash-and-burn

2.1 Forest dynamics in the whole area of Luang Prabang Province and Houaykhing Village Cluster (HK-VC)

Continuing the result of the first-round field survey implemented from February to April in 2012, analyzing and specifying the forest dynamics in the target area since1994 through satellite images was advanced from November 2012 to March 2013. Cooperating with TA4³ of FPP in analyzing the satellite images, information such as the detailed current status of accumulation by forest classification from the outcome of TA4 was obtained.

Proceeding with analysis of satellite images including the target area from 1994 to 2010 (LANDSAT TM, SPOT4/5, ALOS/PALSAR and RapidEye), the area change of each forest classification in the target area was specified; a field survey was conducted in conjunction with the specification to verify the analysis result of satellite images, and the obtained result was utilized.

Based on the forest dynamics from 1994 to 2004, the forest dynamics covering HK-VC and Luang Prabang Province was quantified (Figure 13 and Figure 14). Also, the forest dynamics of the whole area of Phonsay district which falls under the reference area in the event of targeting HK-VC, and Sobchia Village Cluster and

 $^{^{3}}$ The sub-project for approaching satellite imagery analysis, which assists activities of the PAREDD.



Ponthong Village Cluster which falls under the leakage belt were quantified as well.





Figure 14 Forest dynamics in Luang Prabang Province



Figure 15 Forest dynamics in Phonsay District



Figure 16 Forest dynamics in Sopchia and Phonton Village Clusters

Land use map in Luang Prabang Province and Phonsay District in 1994 and 2010 are shown in Figure 17 to Figure 20.



Figure 17 Land use map of Luang Prabang Province in 1994



Figure 18 Land use map of Luang Prabang Province in 2000



2.1 Results

Results of "Analysis of forest dynamics/Analyzing satellite imagery" are compiled in Technical Cooperation Report "Analysis Results of Forest Dynamics".

3. Socio-economic Survey

3.1 Identification of deforestation and forest degradation's drivers

This project was carried out in two different spatial scales; Luang Prabang Province and HK-VC in Phonsay district in Luang Prabang Province; and was developed in order to implement and support the sub-national based and the project based REDD plus projects respectively.

In an approach to targeting Luang Prabang Province as a sub-national base, a sub-national based reference level was developed considering discussions at UNFCCC and REDD plus mechanism in the voluntary market such as VCS. The socio-economic issues were considered to reflect both National and Regional Circumstances to identify and assess the forest dynamics for developing the sub-national reference level.

Similarly HK-VC was selected as a project base to develop a reference level in the same way as the sub-national base. The socio-economic survey was conducted aiming to identify drivers of deforestation and forest degradation in the target area and to select effective measures (Project Activity) to reduce or mitigate the identified drivers. In other words, in the socio-economic survey targeting the project base, socio-economic survey was carried out to contribute to development of the PDD to ensure the permanency of REDD plus activities and to strengthen project sustainability by considering inherent issues and problems of the local ethnic groups in HK-VC.

The socio-economic survey was complemented by the basic information on land and forest use in the target areas provided by the PAREDD. Accordingly the results of the survey were provided to PAREDD appropriately (Figure 21).



Figure 21 Current state of slash-and-burn land use in the HK-VC

3.2 The approach targeting Luang Prabang Province (sub-national base)

In order to develop sub-national reference level of Luang Prabang Province, it was necessary to assess the temporal forests and carbon dynamics which were drawn from Technical Cooperation Reports "Analysis Results of Forest Dynamics", Technical Cooperation Report "Destructive Sampling Survey" and Technical Cooperation Report "Results of Forest Plot Survey", which were useful to reflect the National/Regional Circumstances in Luang Prabang Province. The socio-economic factors were identified from the survey to calculate a reference level considering National/Regional Circumstances. Both national and regional circumstances were considered to assess reference level (blue line as shown in Figure 22), whether which would become linear regression or curve regression.



Time (year)

Figure 22 Approach to reference level in Luang Prabang Province

The survey considered the SEDP published annually by PAFO, which includes the socio-economic characteristics and understandings of the drivers of deforestation and forest degradation. In addition, statistical information of Luang Prabang Province such as the population, GDP and agriculture were extracted which had a high correlation with the deforestation and forest degradation in the Province. The socio-economic factors which were important for calculating a reference level were analyzed. In addition, the survey used the related socio-economic data (mainly socio-economic and agriculture statistics) were also obtained from various sources and synthesized them to.

3.3 The approach targeting Phonsay District (project base)

Targeting HK-VC in Phonsay district, we advanced an approach assuming the implementation of project-based REDD plus. At the implementation of REDD plus project, the Project Description is required to prepared in advance (refer to Technical Cooperation Report "Project Description (PD) on REDD plus Project") in which the drivers of deforestation and forest degradation in the target area should be identified. We advanced the extraction and analysis of the drivers of deforestation and forest degradation by analyzing the SEDP owned by the district and statistical data related to the population and agriculture, as well as conducting an interview to villagers using survey sheets. Then, in order to identify the effective measures to

inhibit deforestation and forest degradation based on the analysis, with understanding human resources and natural resources in the target area, we performed the selection of demonstration activity in order to understand quantitatively the inhibiting effect of deforestation and forest degradation in case the specific project activity was implemented (Figure 23).



Figure 23 Workflow diagram of conducting socio-economic survey targeting Phonsay district

In addition, the results of the socio-economic survey were reflected in establishing the reference level targeting Phonsay district: we illustrated the over time forest dynamics and carbon dynamics in Phonsay district based on Technical Cooperation Report "Analysis Results of Forest Dynamics", Technical Cooperation Report "Destructive Sampling Survey" and Technical Cooperation Report "Results of Forest Plot Survey" and those were reflected as regional circumstances in Phonsay district which were obtained from this deliverables.

As above, in the socio-economic survey targeting Phonsay district, we aimed at estimating the inhibiting effect of deforestation and forest degradation which was obtained from implementing the project (red line = project scenario), while advancing formulating the reference level (blue line) indicated following Figure 24.



Time (year)

Figure 24 Approach to reference level and project scenario in Phonsay district

From the next page, the socio-economic survey targeting Phonsay district (from survey 1 to survey 4) was detailed based on the workflow indicated in Figure 23.

3.4 Results

Results of socio-economic survey are compiled in Technical Cooperation Report "Results of Socio-Economic Survey".

4. Forest Inventory Survey and Development of Emission Factors

4.1 Expected forest type in the target area before the survey

4.1.1 Temporal forest type

This project was pursuing identifying forest type in the target area to undertake plot surveys, and, to ensure the consistency with the advanced environmental grant aid, namely the FIM, Japan's Grant Aid, which was carried out in Lao PDR, forest type provided by the FIM was temporally systematized. It was because the FIM explained that the land and forest type classification had been organized by Lao PDR and the FIM, and the classification reflected Lao PDR's intention would be preferred. As a result, in this project, vegetation was categorized into the seven types in ascending order of biomass volume as shown in Figure 25: Slash and Burn (SB), Young Fallow (YF) 1, YF2, YF3, Old Fallow (OF), Deciduous Forest (DF), and Evergreen Forest (EF).

Shifting Cultivation Class Items



Figure 25 Forest type in the target area (classification applied temporally)

4.1.2 Carbon pools subjected to be measured in each forest type

Carbon pools measured in this study can be divided into five categories based on the IPCC's definition (Figure 26); however, this study measured the two carbon pools, namely above-ground biomass (stems and branches) and below-biomass (roots). Other carbon pools, namely dead trees, fallen branches and leaves, and soil organic carbon, were excluded from the target.



Figure 26 Five carbon pools in forests

Even if forest type is changed by anthropogenic effects, the amount of carbon emissions or removals by dead trees, and fallen branches and leaves is small, and past researches also revealed that soil organic carbon cannot be a significant emission factor if human activities such as shifting cultivation are occurred. For this reason, these pools were excluded.

4.2 Re-defined forest type in the target area in this project

Based on the field survey undertaken in March 2012, SB was excluded from the measurement as it did not contain carbon stocks (SB was used for agriculture and classified as non-forest). Meanwhile, the below mentioned different two surveys were conducted for YF1 to YF3, and OF, DF and EF. In either way, once dry weight of biomass per hectare was derived, it was converted into carbon stock volume by multiplying it by the carbon content rate of 0.5.

4.3 Young Fallow in the target area

YF1, YF2 and YF3 are the vegetation growing in lands left uncultivated for several years after burning, cultivating, and harvesting, in order to restore fertility. YF3's period of being fallow is longer than YF2 followed by YF1. The volume of carbon stock (biomass) is mostly determined by the number of years that lands lying fallow (the number of years since lands were abandoned); therefore, this study decided to find the correspondence between fallow period and biomass. Satellite imagery analysis classified the vegetation into the three categories, YF1, YF2 and YF3, by using images at a single point of time; however, it aimed to identify the more accurate fallowing duration based on images taken between 1994 and 2010 (counting from November when fallowing period started after harvesting). The field survey was designed to clarify the correspondence between the number of abandoned years and biomass, and the cutting and measuring survey method (estimation by unit area sampling) was mainly used to measure its biomass.

4.4 Old Fallow, Deciduous Forest, and Evergreen Forest in the target area

The other group, OF, DF and EF, is certainly defined as forests. Among these, OF is young secondary forests composed of stands of the same age, which are slightly older than YF but still young. DF and EF, on the other hand, are secondary forests basically composed of trees of various ages, as a result of repeated selective cutting and natural restoration thereafter. DF refers to such forest stand dominated by deciduous trees, while EF refers to the forest stand dominated by evergreens. In view of the difference in stand structure and species composition, survey was made on the forest stands selected at random in each type of forest, and the average value of the respective stands was considered the biomass of the corresponding forest type. The forest biomass survey of OF, DF, and EF was conducted using a method that combines the ordinary technique of researching all individual trees in a plot. For destructive sampling survey, please refer to Technical Cooperation Report "Results of Destructive Sampling Survey".

4.5 Survey methods

4.5.1 Survey of Young Fallow

In this survey, plots were established, and all plants growing in each plot were cut and weighed to measure the biomass. As to the size and number of the plots, one square area with a side length equal to
the vegetation height was established in each forest that was deemed to have a uniform height and density. In forests with different heights and densities, the plot area was expanded to the point where its height and density were considered uniform, or where three or more plots were established in stands with sparse, medium, and dense vegetation, in order to obtain an average value. The cut plants were first divided into assimilatory organs (xylem) and non-assimilatory organs (leaf). Then, their respective weights in raw condition were multiplied by the dry weight ratio to obtain the biomass. The dry weight ratio was obtained by dividing the absolute dry weight of their dried specimens by their weight in a raw condition. The specimens were dried at the temperature of 70°C for more than 48 hours until constant weight. In the cutting and measurement survey, plants were not basically dug up to the roots, and the biomass in the roots was estimated using the ratio between the parts above-ground and below-ground (roots), which was obtained through destructive sampling survey. The amount of biomass in the underground parts becomes larger as the proportion of the parts above-ground becomes smaller; therefore this factor was also considered in estimating the underground biomass. Souphanouvong University in Luang Prabang Province helped the project for drying process of estimating dry weight ratio.

4.5.2 Survey of Old Fallow, Deciduous Forest, and Evergreen Forest (plot survey)

In this survey, plot was established and the breast height diameter of trees in the plots was measured, based on which the biomass of the respective trees was estimated by applying the relative growth formula (allometric equation) of biomass in relation to the tree's breast height diameter obtained by destructive sampling survey. And then the total volume of the biomass was estimated, and it was divided by the total square measure of the area to obtain the biomass per hectare.

Stakes were positioned at the four corners of the plots, and identification tags were attached to the respective measured trees to establish fixed examination plots.

Forests suffered selective cutting by villagers, and the impact of the extent, frequency, and duration of this were believed to be remarkably severe in the areas along pathways. In addition, the growth of trees along the pathways could be unique due to the forest edge effect. For these reasons, areas along the pathways were excluded from the survey area. As areas were more distant from the pathways, it required more time for access and thus became less efficient and more dangerous to conduct survey. Accordingly, in accordance with the methodology VM0015 of the VCS, areas far away from the pathways in excess of a fixed distance were also excluded from the survey area. Thus, the areas distant from the pathways by 50 m or more but 1,000 m or less were finally designated as the survey target. Information on the pathways in the survey area had to be obtained through exploration, as this had not been prepared in sufficient detail.

Two survey teams comprising four-wheeled vehicles, motorcycles, and some on foot were organized, and each team completed its survey in one day. The potential survey area within the distance of 1,000 m from the pathways covered almost half of the total areas of the six villages. Such area was divided into sections of 100 m square each. The dominant covering of each of the sections was identified as the typical vegetation, and candidates for survey points for each forest type were selected at random (Figure 27).



Figure 27 Method for determining plot locations

Coordinates of the center of the 100 m² sections and the satellite images of the adjacent areas were used to access the selected survey points. Certain locations, the access to which required passing through a point of possible rockfall, crossing a river, or cutting a path through a long section of thorny and low vegetation were, based on the methodology VM0015 of VCS, which was applied to this study, excluded from the survey target, as they were considered difficult to reach. Furthermore, the points that were burnt, logged, or otherwise seriously disturbed after the time of satellite imaging (November 2010) were also excluded from the survey target, even when the survey team managed to access these areas.

When the points were successfully reached and found undisturbed, the survey team determined whether or not the vegetation there was the same as the vegetation identified through the satellite images. Even when the vegetation was found to be different, survey plots were established so long as the vegetation was OF, DF, or EF. Survey plots were always established in a single forest type, not across different forest types, as well as on slopes of similar nature whenever possible. Semi-square plots with side lengths of 10, 20, or 30 m in slope distance were established on the slopes. The lengths of the sides were determined to make the plot areas equal to or larger than the square with side lengths equal to the average height of the vegetation, realizing that the square measure of the areas would decrease by about 20% when it was converted into a horizontal square measure. The plots were made larger in size as the height and density of the trees became less uniform. The 3D coordinates of at least one of the four corners of the established plots were registered using a GPS receiver so that their absolute locations and horizontal square measures could be secured, while the slope distance and slope angle between the four sides and one of the diagonal lines were measured and the directional angle of one side was scaled using a compass. Species in the areas with a breast height diameter of 5 cm or more were recorded separately for standing and dead standing trees, and identification labels were attached to each of them. In addition, the tree canopy coverage ratio, degree of disturbance, height and density of low-level vegetation, and surrounding status were observed visually and recorded.

4.6 Redesign survey method

Considering the results of above described field survey, forest dynamics analysis, and satellite imagery analysis, and aiming to develop reference level toward sub-national based REDD plus implementation for Luang Prabang Province, method for survey from October 2012 was redesigned. To redesign the method, this project emphasized again to ensure the competency with the continuing forest monitoring system in Lao PDR, and therefore this project discussed with FIM considering the accuracy of monitoring to be applied, costs, and labor.

In the discussions with FIM, the most important agenda was how to handle deciduous forest (DF) and evergreen forest (EF), which cover most of the forests in northern Lao PDR, or the mixed forest of both DF and EF. The mean above-ground biomass and standard deviation of DF and EF obtained through this research (the biomass of DF and EF in Luang Prabang Province and HK-VC were calculated by using the allometric equations built in Technical Cooperation Report "Results of Sampling Survey") revealed that there was little difference between overall Luang Prabang Province and HK-VC in terms of the carbon stock of DF and EF (Figure 28).



The value in this figure shows Average ± Standard Deviation (ton/ha) Figure 28 Result of comparison of biomass between DF and EF

As a result, it was determined that the same allometric equation could be applied to the both forest types, DF and EF, and this research defined DF and EF as a same forest type, Mixed Forest (MF) (Table 3).

| Table 3 | Relation between | suggested to | entative fore | st classification | n based or | n our filed | survey an | d tentative |
|-------------|--------------------|--------------|---------------|-------------------|------------|-------------|-----------|-------------|
| forest clas | ssification by FIM | | | | | | | |

| Tentative forest classification by FIM | Suggested tentative forest classification | | | | | |
|--|---|--|--|--|--|--|
| Evergreen Forest (EF) | Mixed Forests (MF) (Class name should be | | | | | |
| Deciduous Forest (DF) | considered with Lao government) | | | | | |
| "Mixed Evergreen | | | | | | |
| /Deciduous Forest" | | | | | | |
| Coniferous Forest | | | | | | |
| "Mixed Coniferous | | | | | | |
| /Broadleaved Forest" | | | | | | |
| Dry Dipterocarp Forest | Dry Dipterocarp Forest | | | | | |
| Evergreen Forest Plantation | Plantation Forest | | | | | |
| Deciduous Forest Plantation | | | | | | |
| Bamboo (B) | Bamboo (B) | | | | | |
| Old Fallow Land (OF) | Fallow Land (F) | | | | | |
| Young Fallow Land (YF) | | | | | | |
| Slash and Burn Land (SB) | Slash and Burn Land (SB) | | | | | |

In addition, to apply the new forest type, a support tool for plot survey planning developed by the Forestry and Forest Products Research Institute was utilized to calculate the necessary number of plots.

This project organized the concept of forest type classification in this study, and proposed it to FIM and a successor technical cooperation project, Capacity Development Project for Establishing National Forest

Information System for Sustainable Forest Management and REDD plus.

4.7 Redesigned survey scheme

As described above, to quantify the biomass of overall Luang Prabang Province, the required number of plots was calculated by utilizing the support tool for plot survey planning. This tool can output the number of plots necessary for plot surveys once required information is input, including the total area size of the project target area, area breakdown by land cover and land use type, and average and standard deviation of plot size and biomass obtained through ground biomass measurement, average ground biomass, and standard deviation.

In this project, following data was input: forest area of each forest type, which was calculated through, actually measured above-ground biomass data, data shared by FIM, and data collected by Asia Air Survey Co., Ltd under a project supported by the Forestry Agency of Japan.

4.8 Survey method (additional plots)

With the adoption of the support tool for plot survey planning, it was revealed that a total of 72 points (overall 72 points for MF)—32 points for deciduous forest (DF) and 40 points for evergreen forest (EF)—were required in order to quantify forest carbon stock at a certain level in overall Luang Prabang Province. In estimating biomass from the breast height diameter, an estimation formula developed by Kiyono et al. (2007) based on the tree species growing in other tropical areas was tentatively applied, as analysis of the simultaneously undertaken destructive sampling survey was not completed, thus the number of plots were calculated based on it.

In this formula, B refers to the total biomass (kg) and D refers to the cross section area (m2) at breast height.

As described above, although the survey targets were 72 plots, previous surveys (by the end of September 2012) had already examined approximately 10 plots; therefore, target number of plots in dry season, from October 2012 to March 2013, was set as 60 points. For other relatively young vegetation, biomass was estimated based on the vegetation type and its age obtained through annual satellite image analysis. Even though the target number of points for the plot survey was set at 72 points, this was only based on the result of the trial calculation using the support tool for plot survey planning. In other words, the required number of points was expected to alter depending on the vegetation classification system, the area of each forest type, the average biomass, standard deviation, and plot area obtained as a result of the plot survey.

For this reason, to develop emission factors, it was decided to (1) lower the number of points required by expanding the plot area and (2) apply the so-called PDCA method in which following process was repeated: analyzing data once survey of single plot was finished, calculating the required number of plots by the support tool, and conducting additional plot surveys.

The priority of the survey carried out during the last dry season from February to April 2012 was to make it easy to understand for the staff of PAFO and DAFO, as well as local villagers. For that purpose, square plots of 20 square meters in slope distance were installed using a tape measure. However, as the target area was substantially increased and the number of points grew much larger, it became impossible to complete the survey with the original plot size. Thus, this study planned to expand plot size. Nevertheless, it was obvious to take a significant amount of time and labor to install square plots of 30 or 40 square meters using a tape measure and to conduct an inventory survey. Thus, concentric circular plots were designed for this project. Adopting the following method made it possible to expand the area of installed plots without substantially increasing the time and labor involved. As this method was tested in 2011, it was easier for the staff of the PAFO and the DAFO to understand, and this was another reason for introducing this method.

A concentric circular plot had three circles of a radius of 6 meters, 14 meters, and 22 meters. The measurement targeted a diameter at a breast height of 35 centimeters, 15 centimeters, and 5 centimeters or higher, from outer to inner circles. The area was 113 square meters, 616 square meters, and 1,520 square meters respectively, from the innermost circle. When these figures were converted to the measurement of a square plot, they were equivalent to $113m^2$, $616m^2$, $1,520m^2$, and the side length of them were 10.6 meters, 24.8 meters, and 39.9 meters, respectively, from the innermost circle. When considering diameter of target trees of measurement, these figures were also considered appropriate.

Ideally, a preferable method was repeating following process: firstly, selecting a small number of points from overall Luang Prabang Province randomly, carrying out plot surveys at those points, calculating the necessary number of points to be added based on the result of those surveys, and then selecting a slightly smaller number of points. However, it was not a practical because it was assumed to take so much time to move around across Luang Prabang Province, which has vast land mass (about the same size as Iwate Prefecture in Japan), and it was required to give explanation to districts and villages and hire local staffs. Thus, this study set out several survey periods, and conducted plot surveys in different districts in each period to finally cover the all target 12 districts. Collected survey data was analyzed each time. Although the number of plots in each district was assumed to differ to some extent, it was considered operationally unavoidable. Efforts were made to secure the required number of points while minimizing plots being placed geographically unevenly.

In the pre-survey in 2011 and from March to April 2014, 40 points were examined targeting OF, DF, and EF, while 6 points were researched for YF. In the OF, DF, and EF research, attempts were made to access 28 points. Among them, 23 points were successfully reached, while 5 were not. Three of the unsuccessful accesses were due to difficulty in crossing rivers, while one was due to the danger of falling rocks, and one required a long journey through a bushy area. Among the 23 points successfully accessed, 5 points were found disturbed on a large scale such as by extensive cutting for shifting cultivation, and plot survey was conducted in the remaining 18 points. The most distant survey point from the pathways was 850 m away, while some plots had inclines in excess of 40 degrees. The survey in March led by the writer was conducted by one survey team and covered a maximum of three points a day. Coverage of two points a day was considered satisfactory, as even one point was not covered in a day in some cases.

4.9 Results

Results of "Forest Inventory Survey and Development of Emission Factors" are compiled in Technical Cooperation Report "Results of Forest Plot Survey" and "Destructive Sampling Survey".

5. Development of Methods for Participatory Forest Carbon Monitoring

5.1 Role of participatory forest carbon monitoring

The purposes of participatory forest carbon monitoring can be organized in the same manner as the purposes of Community Forest Inventory development, which is broadly discussed in developing countries. In the international discussion under the UNFCCC, the roles or rights of local residents are positioned as one of the safeguards. This does not mean that deforestation and degradation can be suppressed by merely distributing among the residents the benefits of credits generated under REDD plus projects. Rather, it suggests the importance of bringing changes to the local communities and the awareness of the local peoples and building a long-term forest management system.

With respect to the method to monitor the volume of forest carbon stock, several different methods have been established, and a high degree of expertise is required in keeping the monitoring highly accurate. While REDD plus projects implemented in developing countries require the highest possible reliability in the result of monitoring of the forest carbon volume, it is not practical to expect the local residents to conduct a monitoring requiring professional technique. Accordingly, it will be important to develop a forest carbon monitoring method commensurate with both the accuracy level of monitoring required in REDD plus and the ability of the local residents.

"Manual Technical Issues Related to Implementing REDD plus Programs in Mekong Countries," developed by Winrock International, can be named as an example of precedent studies. "Community Forest Monitoring for the Carbon Market," in which participatory methods of forest carbon calculation are summarized along with the practical activities, is believed to also be a useful reference. In this project, these precedent examples will be reviewed with the characteristics of the northern part of Lao PDR taken into consideration.

Participatory monitoring is included in a project conducted by JICA in Dien Bien Province, Vietnam, to explore a MRV system based on a local residents' organization (commune). The project team will cooperate with these activities and use them in the project.

5.2 Formulation of a forest carbon monitoring plan

The formulation of the plan to monitor the volume of forest carbon stock will be promoted in cooperation with the local residents who will implement the monitoring independently. In more specific terms, the project team believes that, in ensuring continuous monitoring, it will be important to hold a monitoring workshop by the local residents and secure their independence from the planning stage.

With respect to survey items to be included in the monitoring plan, it is expected that different survey items will have different intervals in their implementation. For example, the patrol of forest boundaries and the monitoring and administration of unscheduled slash-and-burn cultivation are believed to be implemented with different frequencies, as they involve different factors. Accordingly, the survey items will be fixed in consultation with PAREDD—with the place, time, and implementer of the survey taken into consideration.

It is important for the project to meet the degree of monitoring accuracy required by the VCS certification system. Accordingly, the monitoring scheme will be developed referring to the materials from existing projects.

5.3 Drafting of a participatory forest carbon monitoring method

A draft of a participatory forest carbon monitoring method will be developed based on the monitoring scheme organized through the activities of "5.1 Role of participatory forest carbon monitoring" and "5.2 Formulation of a forest carbon monitoring plan" In developing the draft, the project team will encourage participation by local residents to secure their independence in the monitoring.

The objects of the monitoring method may include the measurement of the volume of activity (area of forests) using a remote sensing technique as well as the assessment of the volume of carbon stock per unit area through a plot survey. In this project, the project team will, while paying attention to the degree of accuracy required by the VCS certification system, carry out its project based on comparatively simple techniques including the development of a method to estimate timber volume with a single variable or the use of the Bitterlich method.

5.4 Training and trial operation of the participatory forest carbon monitoring method (*draft*)

Training for local residents and trial operations will be conducted using the draft of the participatory forest carbon monitoring method developed in "5.3 Drafting of a participatory forest carbon monitoring method" In this training and trial operation, which are aimed to share the objectives of the monitoring with local residents, it will be important to give explanation to and exchange opinions with the local residents in a workshop.

In view of the implementation of REDD plus on a medium- to long-term basis, it will be necessary that local consultants and NGOs act independently when implementing the monitoring. Accordingly, the development of a forest management system in the target area will be promoted on a comprehensive basis in close cooperation with PAREDD.

5.5 Verification and determination of the participatory forest carbon monitoring method

Through the "5.4 Training and trial operation of the participatory forest carbon monitoring method (*draft*)" the appropriateness of the information gathered for the monitoring will be verified. It is assumed that the verification will be conducted by Japanese experts who will inspect all the information or a limited number of samples. The results of verification will be fed back to the local residents through workshops to see if an improvement can be expected in the future or to see if the monitoring technique must be improved. Consequently, the forest carbon monitoring method will be determined based on the viewpoints of whether the standards required by the VCS certification system are met and whether the technique is practicable to the local residents.

In addition, to increase ownership of local people for forest management through conducting counter measures to deforestation, verification of change of local people's mind will be analyzed.

5.6 Work progress management of participatory forest carbon monitoring

It is difficult to expect that participatory forest carbon monitoring will be implemented smoothly from the beginning, and various challenges will no doubt be presented during the operational phase. In such cases, the monitoring method should not be implemented in a rigid manner. Rather, it should be improved within the scope of standards required by the VCS certification system. The project team will pursue a better monitoring method through the implementation of a PDCA cycle.

For implementing REDD plus, periodically forest monitoring and its implementation structure are required. Especially on biomass survey, participatory manner is effective for these purposes; the project will be carried out in livelihood area of local residents, reducing the budget related to monitoring, and promoting villagers' existential recognition about forest dynamics.

Based on above concepts, this project have been developed monitoring guideline (manual) for implementing participatory forest monitoring. To develop this guideline (manual), trial participatory forest monitoring was done on February 2013, and guideline (manual) draft was written based on this survey result.

From now on, guideline (manual) will be applied in project area as retrial and revised to promote local residents' participation.

5.7 Results

Results of "Development of methods for participatory forest carbon monitoring" are compiled in Technical Cooperation Report "Manual of Participatory Forest Carbon Monitoring".

Chapter 3 Peer-review of the Project Description (PD) of REDD plus Project

1. Selection of Suitable Accreditation Scheme

In implementing REDD plus, sufficient attention must be paid to the trends in Japan and abroad. Regarding the credits assumed to be issuable through REDD plus at present, the VCS is globally recognized as a reliable credit certification system. Accordingly, in this project, the VCS is the certification system that will be assumed to be primarily applicable when a REDD plus-generated credit is issued.

In implementing the project, it is necessary to pay sufficient attention to the characteristics of the processes leading to certification and registration under the VCS certification system. Figure 2 below shows the flow leading to the issuance of a credit (VCU) in the VCS certification system. The project will be carried out with proper attention paid to the challenges each respective step.



Note: Items marked yellow in the chart will be addressed intensively in this project. Items marked pink in the chart will be implemented in cooperation with the implementer of the REDD plus project to be addressed in the project.

Figure 29 Flow of the issuance of REDD plus-generated credits in the VCS certification System

| Challenges | Points of attention | Direction | Future work plans |
|-----------------------|-----------------------------------|--|---|
| Position given to the | Efforts are being made to | In their discussion currently underway, the | Considering a shift to a sub-national-basis |
| credit certification | develop an independent credit | concerned ministries including Japan's | project in Lao PDR and REDD plus in |
| system | certification system based on the | Government are not positive toward a mutual | Vietnam and Cambodia, it will be vital to |
| | JCM. It is necessary to promote | recognition with the VCS certification system. | develop methodologies with extensive |
| | this project keeping the | Accordingly, this project must develop a new | applicability. Future work plans will be |
| | developments in mind. | methodology based on the JCM. | developed in a flexible manner, paying |
| | | | attention to the development of the JCM. |
| Position given to | In the VCS certification system, | As a broad direction, the project will be promoted | It will be studied whether additional |
| REDD plus | VM0006 is approved as a | with the application of VM0015 in mind. | research and work is needed to develop |
| methodologies for | methodology to cover SSBC | However, it must be studied in a flexible manner | methodologies, while the results to be |
| SSBC areas (related | areas. However, there are | regarding whether the PDD should be submitted | obtained in the field research will be |
| to the above | technical difficulties (method of | to the VCS certification system. | concurrently analyzed. |
| challenge) | plot research, etc.) in applying | | |
| | this methodology to the target | | |
| | area of this project. | | |
| Need for an | A new implementing body for | A local staff member working concurrently as an | It has been decided to select a local |
| implementing body | REDD plus activities must be | interpreter and secretary on a long-term contract | consultant as it is deemed vital to |
| for practical REDD | considered based on the | was considered desirable to promote the | implement this project in close |
| plus activities to | PAREDD system and the | implementation of and assistance to REDD plus. | cooperation with such. During the |
| replace SSBC | capability of PAFF and DAFO. | The staff member is expected to play an important | selection, PAREDD will be consulted |
| | | role after this project comes to an end, in | from the viewpoint of enhancing the |
| | | developing an organization for villagers to | relationship between the consultant and |
| | | independently implement REDD plus activities in | PAREDD. |
| | | Luang Prabang Province and adjacent areas. | |
| Consistency between | This project primarily assumes | This project must be implemented in cooperation | System 3 in Chart 3 is deemed most |
| efforts on a | REDD plus on a project basis, | with FIM, which develops forest information | appropriate in the future when JICA and |
| sub-national or | while the REDD plus discussed | charts on a national basis, and reference levels | private enterprises cooperate with one |
| national basis and | under the UNFCCC is based on | must be developed on a sub-national basis in the | another to promote REDD plus under the |
| efforts on a project | a sub-national or national basis. | short term and on a national basis in the medium | JCM. Accordingly, work plans must be |
| basis made in this | Accordingly, REDD plus | term. Systems to implement REDD plus in Lao | developed flexibly in the future in |
| project | implemented in Lao PDR on a | PDR must be studied with the achievements of | cooperation with FSCAP and FIM and |
| | national basis must be | this project and FIM considered comprehensively | implemented on a national basis. |
| | considered in the future. | and with REDD plus by private enterprises | |
| | | studied with flexibility. | |

Table 4Challenges in preparing PD and future work plans

2. Organization of REDD plus Implementation Structure

In organizing a project implementation team (involving counterpart organizations and local consultants or NGOs), a system for conducting the project on a long term basis will be important, considering that the REDD plus projects will continue for more than 20 years at least. Furthermore, a joint implementation plan based on the PAREDD activities in phase 1 and 2 will be developed in close cooperation between the project implementation team and the counterparts (Figure 30). The joint work plan will include the work processes, the division of roles and responsibilities, dates, attendees and the places of meetings to be held, and will be confirmed or reviewed jointly with the counterparts as needed.



Figure 30 Coordination of Business Practices and PAREDD based on Phased Approach

In this project, at point of project start, we had reached to the agreement with PAREDD that private-sector companies and NGOs are assumed to become the project implementers in the final stages. Furthermore, cooperation with local consultants or NGOs will be promoted from the viewpoint of nurturing organizations that are able to independently implement REDD plus projects in the northern part (overall Luang Prabang Province) of Lao PDR (assumed to be an upper-level goal).

For the reasons mentioned above, the framework of cooperation between the project implementation

team and the related organizations (FSCAP, FIM and FPP of the Program Grant Aid for Environment and Climate Change.) was agreed with PAREDD (Figure 31).



Note: As a rule, local consultants/NGOs are to go through PAREDD to collaborate with PAFO/DAFO staff members. It is necessary to consider a direct collaboration between local consultants and PAFO/DAFO staff for future activities related to REDD plus in Lao PDR

Figure 31 Framework of expected cooperation between the project implementation team and related organizations

In addition, the project implementation team found that with PAFO or DAFO staffs' capacity and capability at that time, it was difficult to actually implement REDD plus by November 2012. An ideal framework for implementing REDD plus would have PAFO/DAFO staff organized under PAREDD and local residents involved, but the present capacity of PAREDD seemed not to allow this. Therefore, to implement REDD plus activities efficiently led by PAFO/DAFO, it was decided to establish a framework including local consultants.

The desirable role of local consultants would be to support the efforts made to date by PAREDD, with focus on furthering PAREDD's existing cooperation with PAFO/DAFO. Looking ahead, private companies and other entities will likely start engaging in REDD plus activities in Luang Prabang Province on the platform built through PAREDD activities, and a leading body to anchor local REDD plus activities will need to be organized, mainly comprising local consultants. For these reasons, it was decided that the way in

which local consultants should be involved in PAREDD and this project be further discussed with PAREDD.

3. Identify the Proponent of the Project Description (PD)

In order to implement the REDD plus, it is necessary to identify the proponent who make proposals and have responsibility for the implementation of the project in the project plan. In implementing this project, the priority is on the establishment of a long-term structure, given that the REDD plus will last at least for 20 years. Furthermore, the REDD plus should be carried out under a close alliance between the project implementation team and its counterpart based on the PAREDD work.

Based on agreement with PAREDD, this project has proceeded with activities, which expect private companies and NGOs as the final project implementers since the project launched, and has exchanged opinions with PAREDD regarding its purpose. It was confirmed with PAREDD when the project launched in November 2011 that the alliance with local consultants or NGOs is essential in Northern Laos (overall Luang Prabang Province) in order to develop a structure that can be autonomously become involved in the REDD plus project (which is listed as one of the overall goals). To do so, it was also confirmed with PAREDD that the alliance structure should be based on Figure 32 below with the collaboration of FSCAP, FIM, and FPP.



Note: Basically, local consultant/NGO will consider with PAREDD, this team (PAREDD+) and PAFO/DAFO about the way of cooperation, then future REDD plus implementation institution will be developed.

Figure 32 Supposed cooperation structure between this project and other related institutions

The proponents of the REDD plus project are required to have management capabilities regarding REDD plus work. Such capabilities would include the ability to explain to a third party about the project during project validation, as well as credit verification, and the ability to manage funds with transparency, etc. With such requirements in consideration, it would be difficult to implement the REDD plus project in Lao PDR only with the current structure and capacities of the staff of PAFO and DAFO. Therefore, in the times ahead, it is considered desirable to establish a structure involving local consultants while keeping PAFO and DAFO as the main bodies, in order to efficiently implement the REDD plus activities. It has thus been agreed that field surveys would be carried out in a structure with local consultants from April 2013. Furthermore, in implementing the REDD plus project, it would be essential to give consideration to social and economic safeguards (which is agreement under the UNFCCC). In this project, it would be important to respect the will of the local community or indigenous people in the project target area when they are involved with the REDD plus activities. Local consultants would be important also as a body that can appropriately understand the will of local residents.

4. Implementation and Assessment of REDD plus Activities

In drafting the project plan, the most important task is to explain the activities to tackle deforestation and forest degradation—the objective of the implementation of the REDD plus project (REDD plus activities)—efficiently and with transparency. This project has been working to identify efficient REDD plus activities based on the PAREDD approach that is used in PAREDD.



Figure 33 Idea of REDD plus activities mentioned in PD

5. Components of Project Description (PD)

According to the format of the PD under the VCS and applied methodology of VM0015, components and summary of the PD are shown in Table 5. The details of the PD are compiled in Technical Cooperation Report "Project Description (PD) on REDD plus Project".

| Contents | Summary |
|---|---|
| 1 Project Details | - |
| 1.1 Summary Description of the Project | Typical land and forest use in northern Lao PDR, and impotency for implementing REDD plus project in the |
| | area are described. |
| 1.2 Sectoral Scope and Project Type | As project type, "REDD" is selected from some project type in forestry sector, which is according to VCS |
| | AFOLU Guidelines. |
| 1.3 Project Proponent | As implementer and responsible organization, project proponent(s) implement all of activities motioned in the |
| | PD. PAFO collaborates with private enterprise (Japan's company). |
| | Note: PAREDD suggested the project proponent should be structured by only members of PAFO, but |
| | considering ability of members of PAFO, we decided the project proponent(s) are structured by Joint Venture |
| | of PAFO and private enterprise (Japan's company). |
| 1.4 Other Entities Involved in the Project | LFMC established by support of PAREDD are included as other entities of the REDD plus project. |
| 1.5 Project Start Date | The day when PAREDD had start activities in HK-VC is as "project stat data". Project Start Date is explained |
| | by record of the kick-off meeting in Houaykhing Village in December, 2012. |
| 1.6 Project Crediting Period | According to VCS requirement, Project Crediting Period is from 2011 to 2030 (20 years). |
| 1.7 Project Scale and Estimated GHG | Project Scale is quite a general, which are decided according to total area and forest area in HK-VC. Also |
| Emission Reductions or Removals | estimated GHG emission reductions are described. |
| 1.8 Description of the Project Activity | Project activities which are methodology for reducing deforestation and forest degradation are based in |
| | PAREDD Approach. |
| 1.9 Project Location | Project location including HK-VC and other information are drawn by high resolution figure. |
| 1.10 Conditions Prior to Project Initiation | Conditions in the northern Lao PDR are explained. Information from farmer JICA projects are added |
| 1.11 Ownership and Other Programs | Current situation related to permission system of REDD plus is described, and added additional information |
| | from officials of Lao side. |
| 1.12 Additional Information Relevant to | There was no information. |
| the Project | |

Table 5Components and summary of the PD

| Contents | Summary |
|--|---|
| 2 Application of Methodology | - |
| 2.1 Title and Reference of Methodology | This project addresses unplanned deforestation and applied suitable methodology of VM0015 (VCS). |
| 2.2 Applicability of Methodology | According to applicability condition of VM0015, forest class, soil type and other information are described. |
| 2.3 Project Boundary | According applied methodology (VM0015), all of boundaries are explained by using some figures (maps). |
| 2.4 Baseline Scenario | Baseline Scenario is continuous slash-and-burn activities or expansion of land for slash-and-burn area, which |
| | are based on situation of reference area (Phonsay District) and Governmental future estimate of population |
| | and other general information. |
| 2.5 Additionality | To explain additionality of the project, the PD compared optional 4 scenarios. Also results of comparison |
| | among baseline scenario and optional 4 scenarios, validity of the baseline scenario is validated. |
| 2.6 Methodology Deviations | The PD did not apply deviations according to methodology VM0015. |
| 3 Quantification of GHG Emission | GHG emission reductions are calculated by each step in applied methodology VM0015. All steps are |
| Reductions and Removals | according to methodology. |
| 4 Monitoring | As same as above (3 Quantification of GHG Emission Reductions and Removals) |
| 5 Environmental Impact | As same as above (3 Quantification of GHG Emission Reductions and Removals) |
| 6 Stakeholder Comments | As same as above (3 Quantification of GHG Emission Reductions and Removals) |

Table 5Continued

6. Selection of the Third-organization for the Project Description (PD)'s Peer-review

Through the process of peer review, we assumed to evaluate; completeness of the project, validity of project activities (PAREDD Approach), and estimation methods of GHG emission reductions. Also peer-review was expected to accumulate knowledge of REDD plus PD validation and to share such knowledge into other project implemented in other countries. Then terms of references (ToR) for the third organization were prepared as follows (Box), and proceeded selection of the third-organization.

Box: ToR for third-organization of REDD plus peer review

[Requirements for the Assessment Entity]

The assessment entity is preferable to satisfy all of the following requirements

- 1. To be registered as an entity qualified as a Designated Operational Entity (DOE) with sectoral scope 14 "Afforestation and Reforestation" under the Clean development Mechanism (CDM).
- 2. To be registered as a Validation / Verification Body (VVB) with setoral scope 14 "Agriculture, Forestry, Land Use" under the Verified Carbon Standard (VCS).
- 3. To be registered as an entity registered as a Third-Party Entity (TPE) under the Joint Crediting Mechanism (JCM).
- 4. To be meet the accreditation criteria with sectoral scope of "GHG removal project (Forestry)" according to ISO14065.
- 5. To appoint personnel who have sufficient competence and experience of REDD plus project under VCS (e.g. personnel listed as Approved AFOLU Methodology Experts with REDD category).
- 6. To have experienced at least one VCS validation or verification recently.
- 7. To be peer-reviewed from 26th May to 10th July 2014.

[Specific Tasks]

The tasks of the assessment entity are as follows;

- 1. To conduct desk review of the draft PD in line with the VCS methodology applied in the draft PD
- 2. To submit the peer-review checklist identifying issues to be corrected and/ or clarified (CARs and CLs) to MURC
- 3. To have more than 1 times meeting for explanation of peer-review with members of MURC in Tokyo or other city (meeting in Tokyo is strongly encouraged for deep discussions)
- 4. To prepare peer-review report and submit it to MURC
- 5. To prepare the suggestion paper which includes identifying issues to be corrected and/ or clarified when the project will be submitted to other accreditation scheme (e.g. JCM) in near future, and to submit it to MURC.

[Criteria of Selecting]

- Entity(s) who is/are interested in this task shall submit a proposal(s) pursuant to the above "Requirements for the Assessment Entity" and "Specific Tasks". The Proposal shall be prepared based on the attached form (less than 1 page).
- Submitted proposal(s) is/are assessed by MURC and a third person selected by MURC. Through the assessment, the entity is selected.

7. Schedule of the Project Description (PD)'s Peer-review

After selection of the third-organization, the peer review was conducted, and it took around 2 months (Figure 34). The schedule was according to decision of final evaluation of the PAREDD in March 2014 (Figure 35).



Figure 34 Schedule of peer-review



Figure 35 Scheduled decided in final evaluation of the PAREDD

8. Results of the Project Description (PD)'s Peer reviews

8.1 Results of parts of main components of the Project Description (PD)

The PD submitted to the third-organization had 3 types of comments according to requirements of the VCS and its methodology (VM0015) (Table 6). Types of comments were; Corrective Action Request (CAR), which should be improved (if do not so, the PD is not applicable); Clarification Request (CL); and Recommendation (R). On process of peer-review, we especially focused on improvement of CAR.

| Type of comments | Meanings of the each comment |
|-----------------------------|---|
| Corrective Action | in the case that one of the following occurs: |
| Request (CAR) | a. The project proponents have made mistakes that will influence the |
| i.e., It should be | ability of the project activity to achieve real, measurable additional |
| improved, if do not so, the | emission reductions; |
| PD is not applicable. | b. The VCS requirements have not been met; |
| | c. There is a risk that emission reductions cannot be monitored or |
| | calculated. |
| | d. There is a erroneous description. |
| Clarification Request | in the case that information is insufficient or not clear enough to determine |
| (CL) | whether the applicable. |
| Recommendation (R) | for better presentation of PD and/or for validation process |

Table 6Comment type according to VCS and its methodology (VM0015)

After 3 steps of peer review (first, second and final), we received totally 148 comments to our submitted PD (Table 7). During process on peer review, we had been conducted additional survey, including re-check of calculation process, re-preparation of maps, additional works in line with VM0015 and so on, then we reached to final point which did not have CAR comments. It was to say that we finalized the PD and the PD was improved as "enough level or clear level" as VCS REDD plus project.

| Peer-review's comment | | First comments | | Second | Final | |
|-----------------------|---|----------------|--------|--|----------|--------|
| type | | | | Comments | Comments | |
| | | | Number | Points of comment | Number | Number |
| Re | quirem | ents | 148 | | 154 | 154 |
| | CAR | Easy miss | 10 | Relationship with VCS format and | 3 | 0 |
| | | | | requirements | | |
| | | Confirmation | 2 | Consistency and completeness with | | |
| | | | | applied methodology | | |
| | | Critical | 13 | Requirements to be improved in line | | |
| | | points | | with the methodology | | |
| | CL | Easy miss | 4 | Typing mistakes and so on | 4 | 0 |
| | | Evidence | 2 | Evidences on the process of site visit | | |
| | | | | and real validation | | |
| | | Confirmation | 7 | Additional explanations to reviews | | |
| | | Critical | 16 | Improved and additional documents | | |
| | | points | | for deep review | | |
| | R | Easy miss | 1 | Additional information on technical | 3 | 0 |
| | | | | words | | |
| | Evidence 5 Evidences on the process of site visit | | | | | |
| | | | | and real validation (in case of JCM) | | |
| | Clear (| OK) | 88 | | 144 | 154 |

Table 7 Comments to the PD and process of improvement of the PD

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|-------------------------|--|-----------|-------|---|-------|
| | | in the PD | Conc. | | Conc. |
| 1. Project Details | | | OK | | |
| 1.1 Summary | | | OK | | |
| Description of the | | | | | |
| Project | | | | | |
| 1.2 Sectoral Scope and | | | OK | | |
| Project Type | | | | | |
| 1.3 Project Proponent | Regarding REDD plus operation structure, Provincial and District Governments (PAFO and DAFO) were selected as project proponents. The PD should show evidence or clear explanation why PAFO and DAFO are suitable core player and have enough capability to implement all of activities mentioned in the PD. Under VCS project, capability of proponents is evaluated by "NON-PERMANENCE RISK REPORT" and if the report does not in line with VCS requirements (required scores), applicability of this project should be rejected. | page 4 | CAR | From long-team cooperation between JICA and PAFO/DAFO, capability of PAFO and DAFO as project proponent(s) will be applicable. In addition, this PD propose collaboration with Japan's enterprise(s) as project proponent(s) which have much experiences of management of mitigation project (CDM projects) in developing countries. Therefore PAFO/DAFO and Japan's enterprise will manage all of REDD plus activities by collaboration, it means collaboration should be key points of long-team REDD plus implementation, especially early stage of REDD plus implementation. Project implementation structure will be reviewed by site visit and discussion with all proponent(s) in actual validation process. Regarding non-permanence analysis, we would believe our proposed structure in the PD will ensure suitable capability for implementing REDD plus, which are based on our readiness activities | OK |
| 1 1 Other Entities | | | OK | are based on our readiness activities. | |
| Involved in the Project | | | 0K | | |
| 1.5 Project Start Date | | | OK | | |

8.1 Results of peer-review in Project Description (PD), including resolution from PAREDD

| 1 | D | |
|-----|--------|---|
| าลโ | Report | ŀ |

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|--|---|-----------|-------|---|-------|
| | | in the PD | Conc. | | Conc. |
| 1.6 Project Crediting Period | It is not clear that the project has a credible and robust operating plan covering the project crediting period. | Page 7 | CL | The project will be allowed by REDD Office of Lao PDR before actual validation process and official document regarding crediting period and operation plan will be approval (will be provided to the project validator in validation process). | ОК |
| 1.7 Project Scale and Estimated GHG Emission Reductions or Removals | | | ОК | | |
| 1.8 Description of the Project Activity | Although land use/land change zoning are scheduled to be undertaken on figure 2, PD only provide some data as the zoning results and nothing was mentioned about the management structure (setting rules and regulations, etc.) after the zoning/categorization. It cannot be assessed whether it is effective or not. As for the results of land zoning, Agricultural Area, showed in Appendix 5, of some villages accounts for over 70% of its village size. Agricultural Area (area subjected to slash-and burn) is not so large in the current land use presented in Annex. As the direction of the project, the expansion of slash-and-burn area is supposed to be controlled; however, the results of zoning would be allowing it. | page 8 | CL | Land zoning had been completed in HK-VC. Results of land zoning drown by GIS software, management structure including responsibilities of each household and regulations including penal rules should be provided to the project validator in validation process. Ultimate objective of the project is to reduce deforestation and forest degradation in the target area. Results of land zoning (much agricultural land area) are just status in before the project implementation (i.e. baseline scenario). Through project implementation, the project introduce additional activities to increase ratio of rural people's participants and improve land zoning system (is to reduce agricultural area where are causes of deforestation and forest degradation). | ΟΚ |

| 111 | L | w | T | $\mathbf{\nu}$ |
|-----|----|---|---|----------------|
| Fin | al | R | e | no |

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|--|--|---------------|-------|---|-------|
| | | in the PD | Conc. | | Conc. |
| | Activities have been progressed in accordance with PAREDD approach, and the activities are connected to manage land based on the purpose of the land zoning. Meanwhile, according to Table 2, only 20% of households involve in livelihoods activities related to land use the most (Type 2 activities). How can the land zoning be controlled with low participation of local people? Local people's poor involvement affects on the method for setting buffer rate, and project might not be able to pass the effectiveness assessment in some cases. | page 10 | CL | Ratio of participants into PAREDD Approach is very important to sustain all of activities of REDD plus project. Through implementing activities, the project will introduce additional activities and increase ratio of participants. Therefore, most important aspect of the project "participatory approach" will be guaranteed during project period. | ОК |
| 1.9 Project Location | Though several ethnic groups live in the target area, it remains unclear how ethnicity and gender issues in project area are taken into account in order to apply PAREDD. There is concern if it is sufficient from a safeguard perspective. | Page 13 | CL | According to ownership and resources access/use by all proponent(s) and stakeholder (especially rural people) were complied in documents of all steps in PAREDD Approach. All documents should be provided to the project validator in validation process. | ОК |
| | Has the project location details of each polygon/parcel been included in the project description? | Page 12-17 | CL | Figure 4 in the PD was improved. Row data and other related information will be provided to the project validator in validation process. | ОК |
| | Is the entire project area under the control of the project proponent at time of validation? Is this demonstrated with right of use as specified in VCS Standard Version 3.4? | Page 12-17 | CL | We add sentences from L24 in page 12 of the PD. | ОК |
| 1.10 Conditions Prior to Project Initiation | | | OK | | |
| 1.10.1 Before the Project | | | OK | | |
| 1.10.2 Compliance with Laws, Statutes and Other Regulatory Frameworks | | | OK | | |

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|--|---|-----------|-------|--|-------|
| | | in the PD | Conc. | | Conc. |
| 1.11 Ownership and Other Programs | What relevant local laws and regulations related to the project are identified? What appropriate approaches are taken to ensure complete the identification? Does PD demonstrate compliance with local laws and regulations? | | CL | We add sentences from L14 in page 25 of the PD. | OK |
| 1.11.1 Right of Use | The ownership and resource access/use rights are held by the same of different entities, the PD should clearly describe the relationships of ownership and use rights of various proponents involved in the project. The current description does not address by which law, the proponents are rightful owners, by which agreement the people are agreeing to participate in the project. The following evidences would be required in the validation process: 1) agreement about implementation of REDD plus in the area through participatory consultation process by all the rural people 2) permission received by project proponents to implement REDD plus activities before starting all the project activities | page 25 | CL/R. | According ownership and resources access/use by all proponent(s) and stakeholder (especially rural people) were complied in documents of all steps in PAREDD Approach. All documents should be provided to the project validator in validation process. | OK |
| 1.11.2 Emissions Trading Programs and Other Binding Limits | | | OK | | |
| 1 11 3 Participation | | | OK | | |
| under Other GHG | | | | | |
| Programs | | | | | |
| 1.11.4 Other Forms of | | | OK | | |
| Environmental Credit | | | | | |
| 1.11.5 Projects | | | OK | | |
| Rejected by Other | | | | | |
| GHG Programs | | | | | |

| | | | | | I mai reeport |
|-----------------------|---|-----------|-------|---|---------------|
| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
| | | in the PD | Conc. | | Conc. |
| 1.12 Additional | Nature and eligibility criteria for grouped | page 26 | CL | We revised sentences from L27 in page 26 of the | OK |
| Information Relevant | project. The criteria and mechanism for | 1.0 | - | PD. | |
| to the Project | grouping has not been described | | | | |
| to the Project | The section refers to section 1.8 for project | page 26 | CI | We add sontaneous from L 20 in page 26 of the | OK |
| | activity and there is no description of lashage | page 20 | CL | We add sentences from E29 in page 20 of the | OK |
| | monogement | | | FD. | |
| | | 26 | D | | OV |
| | The evidence that there were no sensitive | page 26 | K. | we add sentences from L4 in page 27 of the PD. | OK |
| | information related the project in target site | | | | |
| | would be required in the validation process. | | | | |
| | Are there any additional relevant legislative, | page 26 | CL | We add sentences from L9 in page 27 of the PD. | OK |
| | technical, economic, sectoral, social, | | | | |
| | environmental, geographic, site-specific and/or | | | | |
| | temporal information? | | | | |
| 2. Application | | | OK | | |
| Methodology | | | | | |
| 2.1 Title and | | | OK | | |
| Reference of | | | | | |
| Methodology | | | | | |
| 2.2 Applicability of | Please refer to check comments regarding the | | - | | |
| Methodology | applicability in ANNEX. | | | | |
| 2.3 Project Boundary | | | OK | | |
| 2.4 Baseline Scenario | | | OK | | |
| Step.1 | "Identification of" is better in accordance with | page 27 | R. | We revised sentences from L32 in page 27 of the | OK |
| | the Step 1 title shown in the tool of VT0001 than | 1.0 | | PD. | |
| | "Identify". | | | | |
| Sub-step 1a. | | | | | |
| Sub-step 1b. | In the 4th line of this section in page 28. | page 28 | CAR | We revised sentences from L17 in page 28 of the | OK |
| | "1.10.2" is correct. not "1.10.3". | r | | PD. | |
| Sub-step 1c | | | OK | | |
| 2.5 Additionality | | | OK | | |
| 2.5 1 Investment | | | OK | | |
| Analysis | | | OIX | | |
| Sub stop 20 | | | OK | | |
| Sub-step 2a. | | | | | |
| Sub-step 20. | | | UK | | |

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|------------------------|---|---------------|-------|---|-------|
| 2520 | | In the PD | Conc. | | Conc. |
| 2.5.2 Common | | | UK | | |
| Practice | | | OV | | |
| Step.4 | | | | | |
| 2.6 Methodology | | | NA | | |
| Deviations | | | | | |
| 3. Quantification of | Please refer to check comments regarding the | | - | | |
| GHG Emission | quantification of GHG emission reduction in | | | | |
| Reductions and | ANNEX. | | | | |
| Removals | | | | | |
| 3.1 Baseline | - | | - | | |
| Emissions | | | | | |
| 3.2 Project Emissions | - | | - | | |
| 3.3 Leakage | - | | - | | |
| 3.4 Summary of GHG | In the last line of this section, "star" is a typo. | page 30 | CAR | We revised sentences from L3 in page 31 of the | OK |
| Emission Reductions | | | | PD. | |
| and Removals | | | | | |
| 4. Monitoring | The data and parameter section 4.1 and 4.2 in PD do not confirm with the VCS requirement. See the table of template from VCS. If the values are applied, the exact values must be written. If certain parameter is not applicable for the project, then such parameter can be excluded. However, parameters cannot be null or N/A. | page 30-34 | CAR | We revised according to VCS format and added some parameters from page 31 to 35 of the PD. | OK |
| 4.1 Data and | In "Description" in the table for "ABSLLKi.t" as | page 32 | CAR | We revised it (in page 32 of the PD). | OK |
| Parameters Available | "Data Unit/Parameter" in page 32, there is a | | | | |
| at Validation | typo; "2011-2030" is correct. | | | | |
| 4.2 Data and | | | OK | | |
| Parameters Monitored | | | | | |
| 4.3 Description of the | It should be specifically described that how | page | CAR | We add sentences regarding QC/QA in page 38 | OK |
| Monitoring Plan | QA/QC procedure will be implemented in the | 34-37 | | of the PD. | |
| | project. | | | | |
| 5. Environmental | | | OK | | |
| Impact | | | | | |

| Section in the PD | Review Comments 1 | Location | Draft | Resolution | Final |
|--------------------|---|-----------|-------|---|-------|
| | | in the PD | Conc. | | Conc. |
| 6. Stakeholder | | | OK | | |
| Comments | | | | | |
| The other comments | Please make sure that the PD document confirms with the PD template from VCS. At this time, the PD does not. Ex) The section 1.12 in the PD corresponds to the section 1.13 in template from VCS. | | CAR | We revised according to recent VCS format, and added edited message "chapter title was improved according current PD format". | OK |
| | The PD does not make reference to equation or even present those equation in Annex which may make assessment difficult. Please make sure that the PD includes applicable equations and tables. | | R. | Regarding some equations for estimating carbon stock or GHG emission reductions, low data and development process should be provided to the project validator in validation process. | OK |

| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
|--|---|---|---------------|---|-------|
| | | ANNEX | conc. | | conc. |
| Part 1 – Scope, applicabil | ity conditions and additionality | | | | |
| Scope of the methodology Applicability conditions | Is the "emitted" correct? The intention to exclude measures against forest degradation in order to apply the methodology, Vm0015, is understandable. However, whether classifying Fallow Land as forest or non-forest should be consistent with the national forest management system in Lao PDR. There is no consideration on this point. Please see following comments for each condition. It is not clear that the reason for justifications is | the second line from the bottom in page 2. | CL - CL | We revised sentences from L12 in page 2 of the Annex. According to definition of Lao PDR, we added explanation about forest and non-forest in page in 2 of the Annex. Fallow land was classified as forest land. | OK |
| | explained for the corresponding condition. | page 3. | CL | Annex. | ÖR |
| | Do all categories of land used in the assessment qualify as forest? For example, scrubs, bamboo, etc do not generally qualify as forest. The PD needs to provide evidence of 'forest qualification'? The methodology prescribes to use the definition adopted by the country i.e. CDM's DNA which excludes certain land categories claimed as forest in PD. This definition is especially important in the context of what is described in the analysis of chain of events leading to deforestation is clear. The process of shifting cultivation is mentioned. Usually shifting cultivation is somewhat temporary loss of forest cover as the forest could regeneration if no more human pressure remains. From the PD it appears that the shifting cultivation is expected to result in permanent forest cover. It needs more documentation. In addition, the process of deforestation must be described in greater details with specific relevant to carbon loss. It is desirable to explain that which different types of forest are included in this project. | Table 2 in page 3. | CL/R | We add sentences in Table 2 in page 3 of the Annex. Also definition of forest and non-forest, and forest classification were explained in page 2 of the Annex. Definitions of each land type are explained in Table 5 (page 13-14). Also we would add following explanation; Fallow is clarified as forests because fallow area has enough potential to recover to forest, which is according to IPCC Good Practice Guidance (LULUCF) in 2003, and slash-and-burn area is classified as cropland because these are used for cultivation in constant and their carbon stocks are almost zero and kept in constant. | OK |

8.2 Results of peer-review in Annex of the Project Description (PD), including resolution from PAREDD

| | | | | 1 | паї кероп |
|---------------------------|--|-----------------------|-------------|--|-------------|
| Section in the ANNEX | Review Comments 1 | Location in the ANNEX | Draft conc. | Resolution | Final conc. |
| | The evidence of categorizing as "forest" for a | Table 2 in | R. | We add sentences in Table 2 in page 3 | OK |
| | minimum of 10 years prior to the project start date | page 3. | | of the Annex. Forest for minimum of | |
| | would be required in the validation process. | | | 10 years is explained by Figure 9. | |
| 3. Additionality | Please Refer to PD check comment for the section of | | - | ž ž ž | |
| - | 2.5, Additionality. | | | | |
| Part 2 - Methodology step | os for ex-ante estimation of GHG emission reductions | | | | |
| 4. Step 1. Definition of | The numbers of chapter after Part 2 in Table of | - | CAR | We revised all of numbers of Chapter. | OK |
| the boundaries of the | Contents are not coincident with those in the main | | | | |
| proposed AUD project | description. | | | | |
| activity of VM0015: | | | | | |
| Have following | | | | | |
| requirements been | | | | | |
| met? | | | | | |
| 4.1 Spatial boundaries | "Spatial" is correct, not "special" | Subtitle in | CAR | We revised from special to spatial. We | OK |
| | The boundary maps do not look correct. The non-forest | table contents; | | improved some maps (Figure 3 of the | |
| | areas that do not qualify within the large geographical | subtitle, the | | Annex), which include village location | |
| | boundaries must be excluded. Likewise, the boundary | first and | | and other information. Area of forest | |
| | for reference regions, leakage area and leakage | second line in | | and non-forest in Project area will be | |
| | management areas must also be checked. For example, | page 4; caption | | clearly identified by Figure 6 of the | |
| | village locations are provided in the map and but their | in figure 3 | | Annex. Additionally, Raw data and | |
| | areas are not excluded from the project area boundary. | | | other related information will be | |
| | The map of spatial boundaries is hard to understand. | | | provided to the project validator in | |
| | Especially it can be drawn as the project area contains | | | validation process. | |
| | non-forest areas. Please make it clear. | | | | |
| 4.1.1 Reference region | It is not clear in this description that the boundary of | Page 5 - 7 | CL/R | We improved explanation regarding | OK |
| | the reference region was defined based on the | | | Reference Region from page 5 to 7 of | |
| | conditions (1-4) shown in page17 of VM0015. It is not | | | the Annex. Regarding "2. Landscape | |
| | clear in this description that it was demonstrated based | | | configuration and ecological | |
| | on tree criteria(a,b,c) that the conditions determining | | | conditions", we mainly improved. | |
| | the likelihood of deforestation within the project area | | | Please re-check page 5 to 7 of the | |
| | are similar or expected to become similar to those | | | Annex. | |
| | found within the reference region. | | | | |
| | The boundary of the reference region must be | | | | |
| | described with proper geographical and | | | | |
| | socio-economic reasons. | | | | |

| | | | | | man reepore |
|-------------------------------|--|-----------------|-------------------|--|-------------|
| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
| | | ANNEX | conc. | | conc. |
| 4.1.2 Project area | | | OK | | |
| 4.1.3 Leakage belt | It is not clear in this description that methodology steps (a-d) shown in page 23 of VM0015 were applied. | Page 10 | CL | We improved explanation regarding Leakage Belt in page 9 and 10 of the Annex. | OK |
| 4.1.4 Leakage management area | Was the permanent crop land in reference region identified based on existing management plans or other plans related to the proposed AUD project activity? As for the leakage management area, maps generated based on GIS information should be added. Currently, the leakage management area seems to be placed inside the project area, the VM0015 requires to set leakage management area outside a project area. | Page 10 | CL/C AR | Present land uses in Lao PDR are not based on a formal land use plan or any AUD project. So we do not need this question. We added Figure 8 in page 10 of the Annex. | OK |
| 4.1.5 Forest | The evidence of a multi-temporal historical analysis of deforestation and an initial Forest Cover Benchmark Map would be required in the validation process. It is not clear in this description that areas covered by clouds or shadows were analyzed. The evidences of a multi-temporal historical analysis are corresponded to figures and tables from p17 to p22. But p11 sentence does not mention to refer them. Do all categories of land used in the assessment qualify as forest? For example, scrubs, bamboo, etc do not generally qualify as forest. The PD needs to provide evidence of 'forest qualification'? The methodology prescribes to use the definition adopted by the country i.e. CDM's DNA which excludes certain land categories claimed as forest in PD. This definition is especially important in the context of what is described in the analysis of chain of events leading to deforestation is clear. The process of shifting cultivation is mentioned. Usually shifting cultivation is somewhat temporary loss of forest cover as the forest could regeneration if no more human pressure remains. From the PD it appears that the shifting cultivation is expected to result in permanent forest cover. It needs more documentation. In addition. | Page 11 | CL/R ./CA R | We improved explanation regarding Forest in page 11 of the Annex. Also definition of forest and non-forest, and forest classification were explained in page 2 of the Annex. | OK |

| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
|-------------------------|--|-----------------|-------|--|-------|
| | the process of deformation must be described in | AININLA | conc. | | conc. |
| | the process of deforestation must be described in | | | | |
| | greater details with specific relevant to carbon loss. | | OV | | |
| 4.2 Temporal | | | ОК | | |
| boundaries | | | | | |
| 4.2.1 Starting date and | | | OK | | |
| end date of the | | | | | |
| historical reference | | | | | |
| period | | | | | |
| 4.2.2 Starting date of | | | OK | | |
| the project crediting | | | | | |
| period of the AUD | | | | | |
| project activity | | | | | |
| 4.2.3 Starting date and | | | OK | | |
| end date of the first | | | - | | |
| fixed baseline period | | | | | |
| 4.2.4 Monitoring period | | | OK | | |
| 4 3 Carbon pools | For "Harvest wood products" as Carbon pool the | Table 3 in | R | HWP is usually not big amount of | OK |
| no curcon poors | result of significance analysis based on "Tool for | nage 12 | 1 | carbon stock comparing A/R CDM | 011 |
| | testing significance of GHG emissions in A/R CDM | puge 12. | | project Also not counting HWP | |
| | project activities" would be required in the validation | | | carbon pool is conservative in a case of | |
| | project activities would be required in the valuation | | | PEDD plus. So it is not pacesary to | |
| | quantitativaly | | | REDD plus. So it is not necessary to | |
| A A Common of CUC | quantitatively. | T-1-1- 4 | CI | We improve describes of Table 4 in | OV |
| 4.4 Sources of GHG | About N2O of Biomass burning, is included correct? | Table 4 In | CL | we improved explanation of Table 4 in | OK |
| emissions | The indication for the gas is shown as "excluded" in | page 12. | | page 12 of the Annex. Biomass | |
| | table 4 of VM0015 (page 28). In addition, the | | | burning requires only CH4, so it in not | |
| | description that "Therefore emission of CH4 is | | | correct to include N2O. CO2 emission | |
| | counted" is wrong in justification/Explanation for the | | | from livestock and paddy field are not | |
| | gas in table 4. About CO2 of livestock emissions and | | | counted as carbon stock changes. So | |
| | paddy field, is the description that "Not counted as | | | these exclusions are correct. | |
| | carbon stock change" correct? The indication for the | | | | |
| | gas is shown as "Not a significant source" in table 4 of | | | | |
| | VM0015 (page 28). The project does not involve | | | | |
| | livestock promotion as stated in leakage section of | | | | |
| | annex. But this section in GHG source includes this | | | | |

| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
|---------------------------|--|-----------------|-------|---|-------|
| | | ANNEX | conc. | | conc. |
| | parameter. Could be an error. Project activities | | | | |
| | associated with leakage prevention do not include | | | | |
| | significant livestock management, therefore emissions | | | | |
| | as result of grazing are not considered. Also activities | | | | |
| | for expanding paddy fields do not include significant | | | | |
| | non-CO2 emissions, therefore emissions are not | | | | |
| | considered. | | | | |
| 5. Step 2: Analysis of | | | OK | | |
| historical land-use and | | | | | |
| land-cover change: | | | | | |
| Have following | | | | | |
| requirements been | | | | | |
| met? | | | | | |
| 5.1 Collection of | The description of the type of data coordinates and the | Page 13 | CL/C | We added all of information based on | OK |
| appropriate data sources | sampling design used to collect high resolution data is | | AR | VM0015 in Appendix 4 (L6 in page 13 | _ |
| | not clear. There is no tabular format (table 5 of | | | of the Annex). | |
| | VM0015, page 30) providing information about the | | | | |
| | data collected. PD should describe sampling design | | | | |
| | and Table 5 of VM0015 | | | | |
| 5.2 Definition of classes | Is any assumption on changing carbon stocks in the | Page 13 | CL | Each country has forest definition | OK |
| of land-use and | baseline case documented at hand of credible and | 1 480 10 | 02 | within IPCC definition rages The | 011 |
| land-cover | verifiable sources of information? | | | forest definition of PD has consistency | |
| | vermable sources of information. | | | to L ao PDR definition | |
| 5.3 Definition of | Table 7 in page 15 is not referred to in the description | Page 15 | CAR | We added Table 7 in page 15 of the | OK |
| categories of land use | Table 7 in page 15 is not referred to in the description. | 1 age 15 | CAR | Anney | OK |
| and land cover change | | | | Annex. | |
| 5.4 Analysis of | It couldn't be confirmed that this analysis has been | Page 15 22 | CL/P | We suppose 24 of VM0015 is too | OK |
| bistorical land use and | adagustaly performed based on 2 stops shown in | 1 age 13-22 | | specific among various remote consing | OK |
| land cover change | adequately performed based on 5 steps shown in 2.4.1.2.4.2 of VM0015. The evidence would be | table 10 | D. | specific alloing various femote sensing | |
| land-cover change | 2.4.1-2.4.5 Of VM0015. The evidence would be | table 10 | ĸ | process. So we had belier to evaluate | |
| | required in valuation process and any description for | | | on each case and a type of remate | |
| | the DD | | | on each case and a type of remote | |
| | Devendence should be growided in Firmer 10.1 | | | sensing data with a flexible way. Also, | |
| | Boundaries should be provided in Figure 10 based on | | | we described explanation in Appendix | |
| | spanal doundary setting. | | | 5 which is according to VM0015. | |
| | 1 | 1 | 1 | Please see Appendix 3. We added | |

| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
|---|---|-----------------|-------|---|-------|
| | | ANNEA | conc. | spatial boundary in Figure 9 (previous Figure 10). | conc. |
| 5.5 Map accuracy assessment | | | OK | | |
| 5.6 Preparation of a methodology annex to the PD | Is the following information documented? a) Data sources and pre-processing b) Data classification and post-processing c) Classification accuracy assessment It would be required in validation process and any description about the documentation may be desirable in this section of the PD. | | CL/R | Yes, we need more detail information of data sources of each step. Data accuracy is summarized Table 8 and 9. Additionally, we described explanation in Appendix 3. Please see Appendix 3. | OK |
| 6. Step 3: Analysis of agents, drivers and underlying causes of deforestation and their likely future: <i>Have</i> <u>following requirements</u> been met ? | | | OK | | |
| 6.1 Identification of agents of deforestation | Is the information about a)-d) shown in page 38 of VM0015 provided? It would be required in validation process and any description about the information may be desirable in the PD. | Page 24 | CL/R | We added explanation from L12 in page 24 of the Annex. | OK |
| 6.2 Identification of deforestation drivers | It is not clear that driver variables explaining the quantity of deforestation and the location of deforestation were distinguished and that the corresponding requirements of 1)-4) shown in page 39 of VM0015 for each of these two sets of variables are fulfilled in this PD. | Page 24 | CL | The weak point of VM0015 is this part. The VM0015 does not clarify a process to identify driver variables. So comment is suitable, but deforestation has been occurred by combination of multiple driver variables. Then it is difficult to evaluate deforestation according to each driving variable. We added some sentences from L24 in page 24 of the Annex, but we suppose it is difficult to correspond to this comment. | OK |
| 6.3 Identification of | It is not clear that that the corresponding requirements | Page 24 | CL | We added some sentences from L33 in | OK |
| | | | | 1, | пат кероп |
|---|---|-----------------------|-------------|---|-------------|
| Section in the ANNEX | Review Comments 1 | Location in the ANNEX | Draft conc. | Resolution | Final conc. |
| underlying causes of deforestation | of 1)-4) shown in page 39 of VM0015 for determined underlying causes are fulfilled in this PD. | | | page 24 of the Annex, but we suppose it is difficult to correspond to this comment. | |
| 6.4 Analysis of chain of events leading to deforestation | It is not clear that the relations between main agent groups, key drivers and underlying causes were analyzed and that the sequence of events that typically has lead and most likely will lead to deforestation based on the historical evidence collected is explained. There is no summary of the result in this PD. | Page 24 | CL/C AR | We revised this section. Please re-check from L2 in page 25 of the Annex. | ОК |
| 6.5 Conclusion | It is not referred to in the description of this section that whether the available evidence about the most likely future deforestation trend within the reference region and project area is "Conclusive" or not, and that whether the weight of the available evidence suggests that the overall trend in future baseline deforestation rates will be "Decreasing", About constant" or "increasing". | Page 24 | CAR | We revised this section. Please re-check from L15 in page 25 of the Annex. If PD adopts Approach "a" baseline, it is important to evaluate future deforestation rate. If PD adopts Approach "b" or "c", a baseline projection show the future deforestation rate of each drivers. Then it is not easy to judge a future trend before to develop a baseline projection. | ОК |
| 7. Step 4: Projection of future deforestation <u>:</u> <u>Have</u> <u>following</u> <u>requirements</u> <u>been</u> <u>met ?</u> | | | OK | | |
| 7.1 Projection of the quantity of future deforestation | | | OK | | |
| 7.1.1 Selection of the baseline approach | The description about "Biophysical constraints" and "Socio-economic constraints" should be written in the section 7.1.2.1. | Page 25 and 26 | CAR | We replaced "Biophysical constraints" and "Socio-economic constraints" into "4.1.2.1 Projection of the annual areas of baseline deforestation in the reference region" | OK |
| 7.1.2 Quantitative projection of future deforestation | | | OK | | |

| Section in the ANNEX | Review Comments 1 | Location in the ANNEX | Draft conc. | Resolution | Final conc. |
|---|---|-----------------------|----------------|--|-------------|
| 7.1.2.1 Projection of the annual areas of baseline deforestation in the reference region | Is "3.1 Clarification of the monitoring target" correct? The title of 3.1 in this PD is "Identification of agents of deforestation". It is not clear that A optimali and A averagei were determined to avoid non-conservative projections of baseline deforestation and that four requirements of page 47 of VM0015 are fulfilled to assess whether there is scarcity of forest land that is accessible to deforestation agents and potentially exposed to the risk of deforestation. | Page 26-28 | CL | We revised this section. Please re-check the section of "4.1.2.1 Projection of the annual areas of baseline deforestation in the reference region" of the Annex. | OK |
| 7.1.2.2 Projection of the annual areas of baseline deforestation in the project area and leakage belt | | | ОК | | |
| 7.1.2.3 Summary of step 4.1.2 | | | OK | | |
| 7.2 Projection of the location of future deforestation | "4.1.1.1" and "4.1.12" are wrong. The section number is not found in the PD. | Page 30 | CAR | We revised according to your comment (L3 in page 31 of the Annex). | ОК |
| 7.2.1 Preparation of factor maps | It is not clear in the description of this section that how the factor maps were created fulfilling with the requirements shown in the 4.2.1 section of VM0015. Was a map representing a proxy of the suitability for future infrastructure development developed to avoid projecting unplanned infrastructure in areas where geographic and socio-economic conditions are unfavorable for infrastructure developments? Was the most plausible rate of unplanned infrastructure development determined for each "suitability" class or gradient based on 3 steps (a-c) shown in page 52 of VM0015? | Page 30 | CL | We added some sentences in this section "4.2.1 Preparation of factor maps". | ОК |
| 7.2.2 Preparation of deforestation risk maps | A list of Factor Maps, including the maps used to produce them and the corresponding sources using table 10 of VN0015 together with a flow-chart diagram illustrating how the Risk Map is generated are | Page 31 | CAR | We added Figure 14, Table 14 and some sentences in page 33 to 34 of the Annex. | ОК |

| | | T (* * 1 | | D 1. | |
|--------------------------|---|-----------------|-------|------------------------------------|-------|
| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
| | | ANNEX | conc. | | conc. |
| | not found in this PD. | | | | |
| 7.2.3 Selection of the | The evidence that the most accurate deforestation risk | Page 32 | CL/R | We added some sentence from L21 in | OK |
| most accurate | map was selected fulfilling the requirements shown in | - | | page 35 of the Annex. | |
| deforestation risk map | the 4.2.3 section of VM0015 would be required in the | | | | |
| 1 | validation process. It is not clear in the PD that the best | | | | |
| | fit assessment for the prediction map was performed. | | | | |
| 7.2.4 Mapping of the | In the second line from the bottom of page 32, "Figure | Page 32 and | CL | We added some sentence from L3 in | OK |
| locations of future | 16" is correct not "table 15". It is not clear in the | 33 | 02 | page 36 of the Annex | 011 |
| deforestation | description of this section that 3steps shown in the | | | Page co or the random | |
| deforestation | 4.2.4 section of VM0015 (page 55) were performed to | | | | |
| | 4.2.4 section of vivioo15 (page 55) were performed to | | | | |
| 9 Stop 5: Definition of | | | OV | | |
| 8. Step 5: Definition of | | | OK | | |
| the land-use and | | | | | |
| land-cover change | | | | | |
| component of the | | | | | |
| baseline <u>: Have</u> | | | | | |
| following requirements | | | | | |
| been met ? | | | | | |
| 8.1 Calculation of | | | OK | | |
| baseline activity data | | | | | |
| per forest class | | | | | |
| 8.2 Calculation of | | | OK | | |
| baseline activity data | | | | | |
| per post-deforestation | | | | | |
| forest class | | | | | |
| 8.3 Calculation of | | | OK | | |
| baseline activity data | | | | | |
| per LU/LC change | | | | | |
| category | | | | | |
| 9 Step 6: Estimation of | | | OK | | |
| baseline carbon stock | | | | | |
| changes and non CO2. | | | | | |
| <i>Have</i> following | | | | | |
| Have Jouowing | | | | | |
| requirements been | | 1 | | | 1 |

| Section in the ANNEX | Review Comments 1 | Location in the | Draft | Resolution | Final |
|-------------------------|---|-----------------|-------|--|-------|
| mat 2 | | AININEA | conc. | | |
| 0.1 Estimation of | | | OK | | |
| baseline carbon stock | | | OK | | |
| changes | | | | | |
| 0.1.1 Estimation of the | The compline design should be summarized in the DD | Dego 25 20 | CAD | Bagarding Table 20 (provides Table | OV |
| 9.1.1 Estimation of the | A map and the apprdimeter of all sampled locations | Fage 55-59 | | 10) Table 21 (previous 20) and Figure | ÛK |
| average carbon stocks | A map and the coordinates of an sampled locations | | /π. | 19), Table 21 (previous 20) and Figure 18 (previous Figure 17), row data and | |
| of each LO/LC class | line of page 20. "Table 24" is correct, not "Table 21" | | | development process should be | |
| | The contion of table 24 in page 20 is wrong Table 10 | | | provided to the project validator in | |
| | Figure 17 (and description) and Table 21 will benefit | | | validation process Effectiveness index | |
| | from source. Without proper sources these values | | | (EI) is identified which based on | |
| | connot be assessed. The EL (affectiveness index) as | | | re survey (DPA and other research) | |
| | well as Leakage Eactors are not properly demonstrated | | | and quantified in Econometric model | |
| | which has potentially huge impact in estimate credits | | | Also regarding leakage ration was | |
| | In my experience in AFOLU projects leakage is | | | identified by PRA in section "8.2 | |
| | aither 0 or fairly high A value of 5% for leakage is | | | Ex ante estimation of the decrease in | |
| | nearly unimaginable in REDD project. Therefore I | | | carbon stocks and increase in GHG | |
| | would seek more justification for using such a low | | | emissions due to activity displacement | |
| | figure The PD states that the below-ground pool is | | | leakage" Ratio of below-ground | |
| | approximately 50% of the above-ground pool section | | | biomass is revised (1.5 in page 57 of | |
| | 9.1 without providing any source or justification The | | | the Anney) | |
| | methodology on the other hand states that this value is | | | the Amex). | |
| | around 15-30% | | | | |
| 912 Calculation of | The forms of table 21 and 22 in page 38 and 39 seem | Page 40 | CL | Information in Table 22 (previous | OK |
| carbon stock change | to be different from those required in the | 1 460 40 | CL | Table 21) and Table 23 (previous | OK |
| factors | corresponding section of VM0015 | | | Table 22) will be enough to explain all | |
| Tactors | corresponding section of vivioo13. | | | of data | |
| 913 Calculation of | What are the differences among table 25a 25b and | | CL | We added explanation in each Table | OK |
| baseline carbon stock | $25c^{2}$ The table cantions are same | | CL | 26a to 26c in page 44 and 45 of the | OK |
| changes | 200. The tuble cuptions are sume. | | | Annex | |
| 9.2 Baseline non-CO2 | | | OK | | |
| from forest fires | | | | | |
| 10 Step 7: Fx ante | | | OK | | |
| estimation of actual | | | | | |
| carbon stock changes | | | | | |

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| | | AININEA | conc. | | conc. |
| and non-CO2 <u>: Have</u> | | | | | |
| following requirements | | | | | |
| been met? | | | | | |
| 10.1 Ex ante estimation | | | OK | | |
| of actual carbon stock | | | | | |
| change emissions in the | | | | | |
| project area | | | | | |
| 10.1.1 Ex ante | | | OK | | |
| estimation of actual | | | | | |
| carbon stock changes | | | | | |
| due to planned activities | | | | | |
| 10.1.2 Ex ante | | | OK | | |
| estimation of carbon | | | | | |
| stock changes due to | | | | | |
| unavoidable unplanned | | | | | |
| deforestation within the | | | | | |
| project area | | | | | |
| 10.1.3 Ex ante | | | OK | | |
| estimated net actual | | | 011 | | |
| carbon stock changes in | | | | | |
| the project area | | | | | |
| 10.2 Ex ante estimation | | | OK | | |
| of actual non-CO2 | | | on | | |
| emission from forest | | | | | |
| fires | | | | | |
| 10.3 Total ex ante | | | OK | | |
| estimations for the | | | 011 | | |
| project area | | | | | |
| 11. Step 8: Ex ante | | | OK | | |
| estimation of leakage: | | | - | | |
| Have following | | | | | |
| requirements been | | | | | |
| met? | | | | | |
| 11.1 Ex ante estimation | Is "Displacement Leakage Factor" (DLF) defined, and | Page 52 | CL | Regarding leakage ration w | as OK |

| Section in the ANNEX | Review Comments 1 | Location in the ANNEX | Draft conc. | Resolution | Final conc. |
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| of the decrease in carbon stocks and increase in GHG emissions due to leakage prevention measures | applied? Is the appropriateness of this factor described? | | | identified by PRA in section "8.2 Ex-ante estimation of the decrease in carbon stocks and increase in GHG emissions due to activity displacement leakage". | |
| 11.1.1 Carbon stock changes due to activities implemented in leakage management areas | | | OK | | |
| 11.1.2 Ex ante estimation of CH4 and N2O emissions from grazing animals | | | OK | | |
| 11.1.3 Total ex ante estimated carbon stock changes and increases in GHG emissions due to leakage prevention measures | There is no table required in the corresponding section of VM0015 (table 33). | Page 52 | CAR | We added Table 40 in page 54 of the Annex. | ΟΚ |
| 11.2 Ex ante estimation of the decrease in carbon stocks and increase in GHG emissions due to activity displacement leakage | Some explanation of the assessment result including the evidence for the estimation would be required in the validation process. | Page 52 | R. | We added sentence from L5 in page 55 of the Annex. | OK |
| 11.3 Ex ante estimation of total leakage | | | OK | | |
| 12. Step 9: Ex ante total net anthropogenic GHG emission reductions : <u>Have following</u> <u>requirements been</u> <u>met?</u> | | | ОК | | |

| Section in the ANNEX Review Comments I Location in the ANNEX Draft ANNEX Resolution Final conc. 12.1 Significance assessment The results of the significance assessment performed should be explained in this section of the PD. Page 55 CAR We added some sentences from L8 in page 57 of the Annex. OK 12.2 Calculation of ex-ante estimation of ex-ante estimation of ex-ante verified Carbon Units (VCUs) The last word "and" in the tilt lie and the description of and the calculation of ex-ante Verified Carbon Units ex-ante Verified Carbon Units (VCUs) Page 55 CAR We revised L15-17 in page 57 of the Annex. OK 12.3 Calculation of ex-ante Verified Carbon Units (VCUs) of HG emissions reduction" in the first line of this section should be deleted. Page 55 CAR We revised L15-17 in page 57 of the Annex. OK 2.43 Calculation of ex-ante Verified Carbon units of Rad re-validation of the baseline Page 55 CAR We revised L34 in page 57 of the Annex. OK 1.1.4 Monitoring of earbon stock changes and GHG emissions for periodical verifications Page 58 CAR We revised L34 in page 51 of the Annex. CA 1.1.4 Monitoring of earbon stock changes and non-CO2 OK | | | | | - | mai reepore |
|---|--------------------------|---|-----------------|-------|-------------------------------------|-------------|
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| and non-CO2 Image: CO2 Image: CO2 </td <td>carbon stock changes</td> <td></td> <td></td> <td></td> <td></td> <td></td> | carbon stock changes | | | | | |
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| and GHG emissions in | | | | | |
| the project area | | | | | |
| 1.2 Monitoring of | | | OK | | |
| leakage | | | | | |
| 1.2.1 Monitoring of | | | OK | | |
| carbon stock changes | | | | | |
| and GHG emissions | | | | | |
| associated to leakage | | | | | |
| prevention activities | | | | | |
| 1.2.2 Monitoring of | | | OK | | |
| carbon stock decrease | | | | | |
| and increases in GHG | | | | | |
| emissions due to | | | | | |
| activity displacement | | | | | |
| leakage | | | | | |
| 1.2.3 Total ex post | | | OK | | |
| estimated leakage | | | | | |
| 1.3 Ex post net | | | OK | | |
| anthropogenic GHG | | | | | |
| emission reductions | | | | | |
| 2. Task 2 Revisiting the | | | OK | | |
| baseline projections for | | | | | |
| future fixed baseline | | | | | |
| period :Have | | | | | |
| following requirements | | | | | |
| been met ? | | | | | |
| 2.1 Update information | | | OK | | |
| on agents, drivers and | | | | | |
| underlying causes of | | | | | |
| deforestation | | | | | |
| 2.2 Adjustment of the | | | OK | | |
| land-use and land-cover | | | | | |
| change component of | | | | | |
| the baseline | | | | | |

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| 2.2.1 Adjustment of the | | | OK | | | | | | | | | |
| annual areas of baseline | | | | | | | | | | | | |
| deforestation | | | | | | | | | | | | |
| 2.2.2 Adjustment of the | | | OK | | | | | | | | | |
| location of the projected | | | | | | | | | | | | |
| baseline deforestation | | | | | | | | | | | | |
| 2.3 Adjustment of the | | | OK | | | | | | | | | |
| carbon component of | | | | | | | | | | | | |
| the baseline | | | | | | | | | | | | |

9. Accumulated Knowledge from Peer-review Process of the Project Description (PD)

9.1 Project proponent

It is because that REDD plus project will be implemented for over 20 years and required continuous management structure, project proponent (responsible organization) was very important to show validity of the project. Especially 2 point of 1) "ability" to manage the land and forest project (REDD plus) in developing country, and 2) "capability" to manage various stakeholders in village level are deeply reviewed (*see* details below).

Review Comments

- The PD should show evidence or clear explanation why PAFO and DAFO are suitable core player and have enough capability to implement all of activities mentioned in the PD.
- Under VCS projects, capability of proponents is evaluated by "Non-Permanence Risk Report" and if the report does not in line with VCS requirements (required scores), applicability of this project should be rejected.

In VCS validation process, ability of the project proponent(s) are very related to applicability of the REDD plus project, because project proponent(s) are evaluated by Non-permanence Score Sheet and if scores are low, the project is not applicable. Then it was clear that project proponent(s) are the most important when REDD plus project is implemented.

In this time, we did not have site visit review process, because of rain reason, but site visit review will ask deep questions to project proponent (in case of the project, PAFO and DAFO). Then site visit review will clarify the ability or applicability of the project.

Followings are our comments to reviews. Also we improved the part of project proponent as follows.

Resolution

- From long-team cooperation between JICA and PAFO/DAFO, capability of PAFO and DAFO as project proponent(s) will be applicable.
- In addition, this PD proposes collaboration with Japan's enterprise(s) as project proponent(s) which have much experiences of management of mitigation project (CDM projects) in developing countries.

9.2 Description of the project activity

In order to implement REDD plus project, the most important activities are methods for reducing deforestation and forest degradation in field level. The PD used the PAREDD Approach Manual which was developed by JICA PAREDD, while activities in HK-VC had not been implemented based on the PAREDD Approach yet, and there were reviewer's comments that it was difficult to verify the validity of the project. In addition, there were critical comments on ratio of participants that only 20% of households in the village participated in activities under the PAREDD Approach (*see* details below).

Review Comments

- Only 20% of households are involved in livelihoods activities (Type 2). How can the land zoning be controlled with low participation of local people?
- As for the results of land zoning, Agricultural Area of some villages accounts for over 70% of its village size. Agricultural Area (area subjected to slash-and burn) is not so large in the current land use.

From peer-review process, it is requested to submit some evidence that our proposed project activities under the PAREDD Approach is to be had effectiveness for reducing deforestation and forest degradation. Also reviews indicated that it is necessary to implement demonstration activities to show the validity of project activities in PD. However, unfortunately, in this PD and situation of JICA PAREDD, we had not reached to point to show the validity of project activities. While, if peer-review process included site visit to check/verify the validity, reviews will be able to check validity of project activities by interviews or discussion with local people or other stakeholders.

Main comments regarding project activity are as follows;

Resolution

- Through implementing activities, the project will introduce additional activities and increase ratio of participants.
- Results of land zoning are just status in before the project implementation (i.e. baseline scenario). Through project implementation, the project introduces additional activities to increase ratio of rural people's participants and improve land zoning system.

9.3 Project location

This peer-review process did not include site visit. Therefore geological information of the project was very important for reviews. Also the PDs submitted to the VCS are always opened in VCS Web site, then geological information on project (location, land use, slope and so on) are very important to keep transparency.

In this peer-review process, reviews checked location and land use by using free tool of satellite imagery (e.g. Google Earth), but additional information on raw LANDSAT data were required.

In order to keep transparency, we submit high resolution map (land use map in each year) and had critical comments to improve resolution of maps (below).



Even in the applied methodology (VM0015) do not request high resolution maps, but reviews requested them as additional information of the project. The reasons why they requested additional information are to use as general information (land use maps) and to check boarder/area of project area, reference area, leakage belts and leakage management area (there were reviewer's comments), but we use many times to share high resolution map with reviews (below).

As accumulated knowledge, the PD should be included high resolution maps from initial submission. In this case, we are not able to conduct additional field survey to improve maps because of rain season, then we used many times to improve resolution. Maps as important information of the PD, it will be better to prepare high resolution map from first stage of PD preparation.

If peer-review process includes site visit, it was very difficult to check all over project area (around 30 thousand ha). Then, from such view, high resolution maps will be important to keep transparency.



9.4 Ownership and other programs

As mentioned above, REDD plus project have to be managed for over 20 years. Therefore all of activities under the project had detailed comments to keep compliance with laws of Lao PDR. Especially permission of land and forest use, and definition of forest classes applied in this PD had very detailed comments (below).

Review Comments

• Do all categories of land use in the assessment qualify as forest? For example, scrubs, bamboo, etc do not generally qualify as forest. The PD needs to provide evidence of 'forest qualification'? The methodology prescribes to use the definition adopted by the country i.e. CDM's DNA which excludes certain land categories claimed as forest in PD.

From comments from reviews, forest definition of fallow area and slash and burn area was very critical. In this PD, we had been discussed with officials of Lao PDR about definition of forest, and clarified fallow area and slash and burn area according to potential to be recovered as forest. Therefore, in this PD, we used such forest definition and improve some description (adding some explanations in the PD and *(below)*.

Resolution

- Definitions of each land type are explained in Table 5 of the Annex.
- Also we would add following explanation;
 - Fallow is clarified as forests because fallow area has enough potential to recover to forest, which is according to IPCC Good Practice Guidance (LULUCF) in 2003;
 - Slash-and-burn area is classified as cropland because these are used for cultivation in constant and their carbon stocks are almost zero and kept in constant.

9.5 Baseline scenario

In this PD, we applied VM0015 under the VCS. According to the methodology baseline scenario is identified by using specific models, but such models were thought to be not applicable in typical land use in Lao PDR. In the target area, distances from road, slopes, altitudes as indicators for identification of deforestation map are analyzed that there were not suitable to be used. But we used specific model because reviews comment ordered to use the model which are according to the methodology.

Review Comments

- The maps used to produce "Factor Maps" and the corresponding sources using VM0015 together with a flow-chart diagram illustrating how the "Risk Maps" is generated are not found in this PD.
- The evidence that the most accurate deforestation "Risk Map" was selected fulfilling the requirements. It is not clear in the PD that the best fit assessment for the prediction map was performed.

From peer review process, we had many comments on consistency with VCS requirements and VCS AFOLU Guidelines. As mentioned above, it was difficult to apply specific model in case of typical land use in northern Lao PDR, but we applied it to keep consistency with the methodology (below).



9.6 Others

In peer-review process, we had 148 comments in total, and all comment are very helpful to improve quality of the PD. It was because that the PD is to explain to third people, therefore we had many improve points to be revised in peer-review process. For example, comments regarding equation to estimate GHG emission reductions are typical to be improved during peer-review process (below).

Review Comments

- The PD do not make reference to equations or even present those equations which may make assessment difficult.
- Please make sure that the PD includes applicable equations and tables in Validation

Also project activities, i.e., activities for reducing deforestation and forest degradation were based on PAREDD Approach developed by JICA PAREDD, but the Approach is not for specific to reduce deforestation and forest degradation, is specific to manage land and forest by participatory approach. Therefore the Approach will be not suitable to use in the PD or the Approach will be have some point to be improved as REDD plus tools.

Peer-review process gave much knowledge to improve all of works regarding PD preparation. Detailed points to be improved during peer review process are mentioned in Technical Cooperation Report "Project Description (PD) on REDD plus Project".

10. Discussions about Project Description (PD)'s Status and Contents

We discussed with Lao side about PD's status and contents in before and after peer-review. Details information

are attached in "Discussions with Lao side about Peer-review of the PD (before peer-review)" and "Discussions with Lao side about Peer-review of the PD (before peer-review)".

Chapter 4 Development of the Reference Level in Luang Prabang Province (Sub-national base)

1. Impotency of Provincial based Reference Level

In this project in the first place, aiming at registering international conformity assessment systems such as VCS, the activities have been promoted on the assumption that project based REDD plus. On the other hand, even though project based REDD plus was implemented and supported in the early stages on or after 2013, it is considered that they will move into national based or sub-national based REDD plus after 2020 in the discussion of REDD plus at UNFCCC.

Therefore, the activities have been promoted, intending an expansion and development to sub-national based REDD plus in the medium term as scope of the project (Figure 36).



Figure 36 Concept of to keep consistency between project base and sub-national base REDD plus (again)

From the above, the development of provincial based (sub-national based) reference level has been promoted covering not only HK-VC which was targeted for project base but also the whole Luang Prabang Province in which the village cluster was located. Specifically, while the satellite images covering Luang Prabang Province had been analyzed over time from 1994 to 2010 and their dynamics was assessed quantitatively and at the same time, the identification of socio-economic factors which related to a series of forest dynamics was promoted. As for the socio-economic factors, they were based on SEDP, which have been announced every year by PAFO.

2. Data used for Provincial based Reference Level

2.1 Satellite imagery data

The forest distribution map covering Luang Prabang Province was identified by analyzing LANDSAT images. The analysis method was just as mentioned in Technical Cooperation Report "Analysis Results of Forest Dynamics", covering form 1994 to 2010 (Figure 37 and Figure 38).



Figure 37 Land use map of Luang Prabang in 1994



Figure 38 Land use map of Luang Prabang in 2010

The dynamics of forest distribution in Luang Prabang Province which was quantitatively assessed by analyzing satellite images are as follows (Figure 39).



Figure 39 Forest dynamics in Luang Prabang Province (again)

2.2 Data obtained from ground-based surveys

Even in the sub-national based activities targeting Luang Prabang Province, Table 8 was applied as a forest classification. On the other hand, Carbon Stock (Emission Factor) by forest classification has been decided to develop separately based on such as climate conditions in Luang Prabang Province, which was identified at the survey plot shown in Figure 40. As for the Emission Factor developed, see Technical Cooperation Reports "Results of Forest Plot Survey" and "Results of Sample Trees Survey".

| Table 8 | Relation between | suggested t | tentative | forest | classification | based of | n our filed | survey | and | tentative |
|------------|--------------------|-------------|-----------|--------|----------------|----------|-------------|--------|-----|-----------|
| forest cla | ssification by FIM | (again) | | | | | | | | |

| Tentative forest classification by FIM | Suggested tentative forest classification | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|
| Evergreen Forest (EF) | Mixed Forests (MF) (Class name should be | | | | | | | | | | |
| Deciduous Forest (DF) | considered with Lao government) | | | | | | | | | | |
| "Mixed Evergreen | | | | | | | | | | | |
| /Deciduous Forest" | | | | | | | | | | | |
| Coniferous Forest | | | | | | | | | | | |
| "Mixed Coniferous | | | | | | | | | | | |
| /Broadleaved Forest" | | | | | | | | | | | |
| Dry Dipterocarp Forest | Dry Dipterocarp Forest | | | | | | | | | | |
| Evergreen Forest Plantation | Plantation Forest | | | | | | | | | | |
| Deciduous Forest Plantation | | | | | | | | | | | |
| Bamboo (B) | Bamboo (B) | | | | | | | | | | |
| Old Fallow Land (OF) | Fallow Land (F) | | | | | | | | | | |
| Young Fallow Land (YF) | | | | | | | | | | | |
| Slash and Burn Land (SB) | Slash and Burn Land (SB) | | | | | | | | | | |



Figure 40 Points of ground-truth survey in Luang Prabang Province

3. Identification of Drivers of Deforestation and Forest Degradation

In establishing a reference level, to reflect the socio-economic index as National/Regional Circumstances, statistical information that was correlated with the deforestation (change of the forest area) in Luang Prabang Province has been extracted.

It was revealed that there was a positive correlation between the area of rotational upland rice obtained from SEDP and the deforestation. On the other hand, there was a negative correlation between the deforestation and the productions of cash crops, such as irrigated rice, job's tear and sesame (the production of such crops was effective in slowing deforestation) (Table 9).

| | | NC 1 | NC 2 | NC 3 | NC 4 | NC 5 | NC 6 | NC 7 | NC 8 | NC 9 | NC 10 | NC 11 | NC 12 | NC 13 | NC 14 | NC 15 | NC 16 | NC 17 | NC 18 | NC 19 | NC 20 | NC 21 | NC 22 | NC 23 | NC 24 | NC 25 | NC 26 | NC 27 | NC 28 | NC 29 | NC 30 | NC 31 | NC 32 | NC 33 | NC 34 |
|-------|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| NC 1 | Forest area | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 2 | No. of Villages | -0.30 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 3 | Total | -0.40 | 0.68 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 4 | Male | -0.59 | 0.61 | 0.65 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 5 | Female | -0.58 | 0.61 | 0.65 | 1.00 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 6 | No. of HHs | -0.30 | 0.81 | 0.56 | 0.47 | 0.47 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 7 | Rain-fed rice - napii (ha) | -0.95 | 0.30 | 0.36 | 0.70 | 0.70 | 0.27 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 8 | Rain-fed rice - napii (production) | -0.97 | 0.32 | 0.38 | 0.65 | 0.64 | 0.35 | 0.97 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 9 | Irrigated rice - naxeng (ha) | -0.84 | 0.38 | 0.43 | 0.54 | 0.53 | 0.45 | 0.77 | 0.80 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 10 | Irrigated rice - naxeng (production) | -0.76 | 0.29 | 0.41 | 0.58 | 0.58 | 0.36 | 0.78 | 0.79 | 0.88 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | | |
| NC 11 | Rotational upland rice (ha) | 0.64 | -0.29 | -0.68 | -0.20 | -0.19 | -0.30 | -0.48 | -0.56 | -0.57 | -0.49 | 1.00 | | | | | | | | | | | | | | | | | | | | | | | |
| NC 12 | Rotational upland rice (production) | 0.64 | -0.32 | -0.71 | -0.23 | -0.22 | -0.34 | -0.50 | -0.58 | -0.55 | -0.50 | 0.99 | 1.00 | | | | | | | | | | | | | | | | | | | | | | |
| NC 13 | Sweet corn (ha) | -0.23 | -0.12 | -0.23 | 0.29 | 0.29 | -0.26 | 0.36 | 0.32 | -0.01 | 0.11 | 0.32 | 0.28 | 1.00 | | | | | | | | | | | | | | | | | | | | | |
| NC 14 | Sweet corn (production) | -0.47 | -0.02 | -0.02 | 0.43 | 0.43 | -0.18 | 0.57 | 0.52 | 0.19 | 0.29 | 0.05 | 0.02 | 0.93 | 1.00 | | | | | | | | | | | | | | | | | | | | |
| NC 15 | Jobs tear (ha) | -0.91 | 0.28 | 0.28 | 0.71 | 0.71 | 0.21 | 0.96 | 0.91 | 0.75 | 0.76 | -0.35 | -0.36 | 0.40 | 0.59 | 1.00 | | | | | | | | | | | | | | | | | | | |
| NC 16 | Jobs tear (production) | -0.85 | 0.26 | 0.26 | 0.64 | 0.64 | 0.33 | 0.88 | 0.85 | 0.78 | 0.77 | -0.37 | -0.38 | 0.16 | 0.32 | 0.90 | 1.00 | | | | | | | | | | | | | | | | | | |
| NC 17 | Roots (ha) | -0.57 | 0.22 | 0.04 | 0.53 | 0.54 | -0.09 | 0.67 | 0.59 | 0.35 | 0.38 | 0.00 | -0.03 | 0.56 | 0.60 | 0.76 | 0.58 | 1.00 | | | | | | | | | | | | | | | | | |
| NC 18 | Roots (production) | -0.60 | 0.32 | 0.19 | 0.58 | 0.59 | -0.06 | 0.68 | 0.60 | 0.39 | 0.39 | -0.14 | -0.16 | 0.44 | 0.52 | 0.76 | 0.61 | 0.97 | 1.00 | | | | | | | | | | | | | | | | |
| NC 19 | Vegetables (ha) | -0.49 | 0.15 | 0.01 | 0.37 | 0.37 | 0.14 | 0.56 | 0.55 | 0.36 | 0.42 | -0.09 | -0.09 | 0.44 | 0.52 | 0.56 | 0.41 | 0.52 | 0.48 | 1.00 | | | | | | | | | | | | | | | |
| NC 20 | Vegetables (production) | -0.51 | 0.29 | 0.22 | 0.51 | 0.51 | 0.25 | 0.58 | 0.58 | 0.38 | 0.42 | -0.19 | -0.19 | 0.38 | 0.48 | 0.53 | 0.42 | 0.50 | 0.50 | 0.93 | 1.00 | | | | | | | | | | | | | | |
| NC 21 | Peanuts (ha) | -0.48 | -0.05 | -0.24 | 0.44 | 0.44 | -0.08 | 0.58 | 0.55 | 0.37 | 0.39 | 0.25 | 0.23 | 0.74 | 0.69 | 0.66 | 0.60 | 0.71 | 0.61 | 0.63 | 0.56 | 1.00 | | | | | | | | | | | | | |
| NC 22 | Peanuts (production) | -0.72 | 0.11 | 0.04 | 0.65 | 0.65 | 0.07 | 0.80 | 0.75 | 0.60 | 0.60 | -0.03 | -0.04 | 0.62 | 0.70 | 0.86 | 0.80 | 0.72 | 0.68 | 0.66 | 0.63 | 0.92 | 1.00 | | | | | | | | | | | | |
| NC 23 | Soy bean (ha) | -0.39 | -0.11 | -0.00 | 0.39 | 0.40 | -0.25 | 0.46 | 0.38 | 0.26 | 0.33 | 0.08 | 0.07 | 0.70 | 0.80 | 0.51 | 0.40 | 0.46 | 0.43 | 0.28 | 0.24 | 0.59 | 0.66 | 1.00 | | | | | | | | | | | |
| NC 24 | Soy bean (production) | -0.46 | -0.05 | 0.06 | 0.43 | 0.44 | -0.25 | 0.53 | 0.45 | 0.27 | 0.34 | -0.01 | -0.02 | 0.71 | 0.83 | 0.57 | 0.40 | 0.56 | 0.53 | 0.36 | 0.33 | 0.56 | 0.65 | 0.98 | 1.00 | | | | | | | | | | |
| NC 25 | Tobacco leaf (ha) | 0.10 | -0.03 | -0.26 | 0.16 | 0.16 | -0.04 | 0.02 | -0.01 | -0.16 | -0.02 | 0.48 | 0.39 | 0.31 | 0.12 | 0.11 | 0.21 | 0.46 | 0.36 | 0.03 | 0.03 | 0.49 | 0.28 | 0.12 | 0.07 | 1.00 | | | | | | | | | |
| NC 26 | Tobacco leaf (production) | -0.23 | 0.15 | 0.06 | 0.33 | 0.33 | 0.20 | 0.30 | 0.33 | 0.12 | 0.18 | 0.05 | -0.05 | 0.29 | 0.17 | 0.27 | 0.41 | 0.44 | 0.41 | 0.21 | 0.31 | 0.54 | 0.41 | 0.06 | 0.03 | 0.79 | 1.00 | | | | | | | | |
| NC 27 | Sesame (ha) | -0.86 | 0.25 | 0.33 | 0.73 | 0.73 | 0.18 | 0.92 | 0.88 | 0.66 | 0.70 | -0.35 | -0.35 | 0.53 | 0.75 | 0.92 | 0.81 | 0.65 | 0.66 | 0.60 | 0.62 | 0.65 | 0.87 | 0.70 | 0.75 | 0.00 | 0.20 | 1.00 | | | | | | | |
| NC 28 | Sesame (production) | -0.89 | 0.32 | 0.39 | 0.79 | 0.79 | 0.26 | 0.95 | 0.91 | 0.70 | 0.73 | -0.38 | -0.39 | 0.47 | 0.68 | 0.95 | 0.85 | 0.70 | 0.71 | 0.61 | 0.65 | 0.65 | 0.86 | 0.61 | 0.66 | 0.07 | 0.28 | 0.98 | 1.00 | | | | | | |
| NC 29 | Cow | -0.68 | 0.25 | 0.09 | 0.73 | 0.72 | 0.31 | 0.81 | 0.78 | 0.55 | 0.61 | -0.01 | -0.03 | 0.45 | 0.50 | 0.83 | 0.83 | 0.67 | 0.62 | 0.55 | 0.58 | 0.76 | 0.84 | 0.37 | 0.37 | 0.40 | 0.51 | 0.78 | 0.83 | 1.00 | | | | | |
| NC 30 | Buffalo | -0.16 | -0.14 | -0.48 | 0.33 | 0.33 | -0.07 | 0.35 | 0.28 | 0.10 | 0.19 | 0.60 | 0.58 | 0.55 | 0.43 | 0.44 | 0.46 | 0.50 | 0.37 | 0.35 | 0.28 | 0.80 | 0.67 | 0.42 | 0.35 | 0.59 | 0.42 | 0.40 | 0.40 | 0.75 | 1.00 | | | | |
| NC 31 | Pig | -0.30 | -0.04 | -0.33 | 0.46 | 0.46 | 0.03 | 0.49 | 0.43 | 0.22 | 0.34 | 0.44 | 0.42 | 0.56 | 0.47 | 0.55 | 0.57 | 0.57 | 0.46 | 0.49 | 0.45 | 0.83 | 0.75 | 0.42 | 0.37 | 0.58 | 0.49 | 0.52 | 0.54 | 0.85 | 0.97 | 1.00 | | | |
| NC 32 | Goat | -0.70 | 0.25 | 0.14 | 0.75 | 0.74 | 0.32 | 0.82 | 0.80 | 0.59 | 0.65 | -0.05 | -0.07 | 0.48 | 0.54 | 0.83 | 0.83 | 0.62 | 0.58 | 0.61 | 0.66 | 0.78 | 0.88 | 0.44 | 0.43 | 0.29 | 0.46 | 0.83 | 0.87 | 0.98 | 0.71 | 0.83 | 1.00 | | |
| NC 33 | Poultry | -0.64 | 0.16 | -0.03 | 0.67 | 0.67 | 0.20 | 0.78 | 0.73 | 0.50 | 0.55 | 0.09 | 0.07 | 0.51 | 0.55 | 0.82 | 0.82 | 0.69 | 0.63 | 0.54 | 0.56 | 0.82 | 0.88 | 0.46 | 0.45 | 0.43 | 0.51 | 0.77 | 0.81 | 0.98 | 0.83 | 0.90 | 0.96 | 1.00 | |
| NC 34 | Horse | -0.45 | -0.31 | -0.37 | -0.05 | -0.04 | -0.32 | 0.37 | 0.33 | 0.43 | 0.26 | -0.00 | 0.06 | 0.24 | 0.32 | 0.46 | 0.37 | 0.30 | 0.25 | 0.24 | 0.07 | 0.46 | 0.50 | 0.40 | 0.41 | -0.22 | -0.21 | 0.37 | 0.31 | 0.20 | 0.32 | 0.25 | 0.22 | 0.31 | 1 |

Table 9 Statistic analysis of land use related to dynamics of forest size

 \times These values in this table showed the correlation coefficient between deforestation and each land use (range - -1.0 to +1.0). If the correlation coefficient is close to +1.0, there is a strong positive liner relationship between deforestation and such land use. If the correlation coefficient is close to -1.0, there is a strong negative liner relationship between deforestation and such land use.

4. Applying Econometric Model

It was able to confirm that the forest area has been reduced at roughly the same pace according to the forest dynamics shown in Figure 39. However, the effectiveness of livestock breeding and rice cropping as alternative livelihoods to slash and burn farming was confirmed, according to the socio-economic survey implemented in order to identify measures against the reason for deforestation.

Therefore, in estimating the future deforestation covering Luang Prabang Province, adding the effectiveness of two alternative livelihoods such as livestock breeding and rice cropping in addition to area of slash-and-burn, a reference level was established using econometric model. The established reference level was as follows:

| $For Area_{t} = -0.0725 \times For Area_{t-1} - 0.889 \times FA_{t} - 0.884 \times SBA_{t} + 1,708,039$ | |
|---|-------------------|
| $FA = 0.953 \times FA_{t-1} + 1.38 \times SBA_{t-1} - 65,867$ | econometric model |
| $SBA = -0.577 \times FA_{t-1} - 23.7 \times PF + 2.09 \times POP - 0.390 \times Cow - 560,942$ | |

| $ForArea_t$ | Total forest area of Mixed forest, Dry dipterocarp forest and Teak plantation within the |
|-------------|--|
| | reference region at year t; ha |
| FA_t | Area of fallow at time t within the reference region; ha |
| SBA_t | Area of slash-and-burn at time t within the reference region; ha |
| PF_t | Area of paddy field at time t within the reference region; ha |
| POP_t | Population of within the reference region at time t |

- *Cow*_t Number of cow as livestock at time t within the reference region
- *t* 1, 2, 3 ... T, a year of the proposed crediting period; dimensionless

The dynamics of forest, fallow land and slash-and-burn so far were estimated with greater accuracy when applying this econometric model (from Figure 41 to Figure 43).



Figure 41 Comparison between actual and estimated forest area dynamics in Luang Prabang Province



Figure 42 Comparison between actual and estimated fallow area dynamics in Luang Prabang Province



Figure 43 Comparison between actual and estimated slash and burn area dynamics in Luang Prabang Province

5. Results of Developed Reference Level

5.1 Future forest dynamics based on developed reference level

In the reference level which was applied econometric model, as slash-and-burn farming would be flourished by such as future population growth, as a result, the area of forest would be decreasing. On the other hand, if livestock breeding and rice cropping are introduced as alternatives for slash and burn farming, the dependence on slash and burn farming would be reduced and as a result, it was indicated that the decrease of the area of forest would be reduced (Figure 44).



Reference: Reference level

Scenario 1: Heads of livestock and area of paddy fields are improved (10% improvement up to 2030), Scenario 2: Heads of livestock and area of paddy fields are improved (20% improvement up to 2030)

Figure 44 Estimated future forest dynamics in Luang Prabang Province up to 2020

5.2 Future GHG emission reduction estimated by developed reference level

A trial calculation of the GHG emission reduction obtained from reduction of the decrease of the area of forest was performed for each Scenario 1 and 2, if above-mentioned reference level and alternative livelihoods are introduced. As a result, the GHG emission reduction was estimated: 7,389 GgCO2e/yr for Scenario 1 and 14,781 GgCO2efor Scenario 2, indicating that the enormous GHG emission reduction would be expected from the sub-national based activities in Luang Prabang Province (Figure 45).



Reference: Reference level

Scenario 1: Heads of livestock and area of paddy fields are improved (10% improvement up to 2030), Scenario 2: Heads of livestock and area of paddy fields are improved (20% improvement up to 2030)

Figure 45 Comparison between actual and estimated forest area dynamics in Luang Prabang Province

As for Scenario 1 and 2 applied to the trail calculation of GHG emission reduction, the random future prediction in both number of livestock and area of paddy field (10% or 20% by 2030) were set. The feasibility is not evaluated in this project.

Chapter 5 Discussion points of REDD plus Strategic Meeting in Lao PDR

It is important to approach comprehensively to both technical and institutional issues in implementing REDD plus. It is required to establish close cooperation with Technical Cooperation Project PAREDD and FSCAP that are underway in Lao PDR, with environmental programmes gratis FIM and FPP, and furthermore, with the Lao government and Luang Prabang Province government. However, in the current situation, it is difficult to say that the entities related to REDD plus have established cooperation systems effectively.

In addition, as for REDD plus, considerations inside and outside the country are in progress at high speed such as discussions at UNFCCC and discussions about JCM; it has also become important that these movements should be introduced to the technical cooperation in Lao PDR. In UNFCCC, for example, the submission of GHG emission / absorption inventory in the field of LULUCF in BUR from 2014 and the establishment of national forest monitoring system has become a major issue. Also, in JCM, the registers that manage the credit in Lao PDR and the development of entities which evaluate the credit, etc. are becoming the problems; however, these international tendencies are not effectively shared with stakeholders in Lao forest sector.

Based on the above, in this operation, strategy review meeting (tentative name) will be held on a regular basis to strength the partnership and to promote sharing direction with JICA and such as projects that are implemented by the Japanese government. The members of this operation are familiar with the negotiation process about REDD plus, the positioning of REDD plus project in their own markets, the technical problems related to REDD plus and coping strategies and also JCM. Therefore, first of all, domestic and international movements are going to be provided to the activities in Lao PDR. In addition, in implementing REDD plus, along with introducing the outcomes of remote sensing technology in FIM and FPP, the partnership with Lao government that are advancing by FSCAP will become important (e.g., the approach to profit sharing). In strategy review meeting (tentative name), cooperation with multifaceted projects in Lao PDR will be deepened, promoting the support to be more effective.

If noticeable changes were found in the trend of REDD plus at UNFCCC, trend of REDD plus strategy of the Lao government and trend of such as private enterprises related to REDD plus, they will be dealt with flexibly after discussing with JICA.

1. First Meeting of the REDD plus Strategic Meeting in Lao PDR

The first meeting of the REDD plus strategic meeting in Lao PDR was held in 15 June 2012. Agenda and participants are as follows (Table 10 and Table 11).

| Agenda | Material explainer |
|--|--|
| 1. Situation of forestry sector in Lao PDR | Kota Hiranuma (FSCAP) |
| | Kazunobu Suzuki (JICA HQ) |
| 2. Progress of each project | Ryota Kajiwara (FIM & FPP (Kokusai Kogyo)) |
| | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 3. Situation of REDD plus in Japan and | Masahiro Amano (PAREDD, Consultation team (this project)) |
| others | |
| 4. Others | Nothing |

Table 10 Agenda and explainers of each agenda's materials in the first meeting

| Table 11 | Participants | of the | first | meeting |
|----------|--------------|--------|-------|---------|
|----------|--------------|--------|-------|---------|

| Participants | Affiliation |
|-------------------|--|
| Shuichi Ikeda | JICA HQ |
| Kazunobu Suzuki | JICAHQ |
| Kota Hiranuma | FSCAP |
| Satoshi Fujita | FSCAP |
| Makoto Daimon | PAREDD |
| Takayuki Namura | PAREDD |
| Goro Nishimoto | PAREDD |
| Ryota Kajiwara | FIM & FPP (Kokusai Kogyo) |
| Motoshi Hiratsuka | PAREDD, Consultation team (this project) |
| Kei Suzuki | PAREDD, Consultation team (this project) |
| Masahiro Amano | PAREDD, Consultation team (this project) |

In the meeting, objective of the meeting and direction to be implemented by JICA projects were discussed, and continuous meeting in Vientiane base were agreed by all of participants. Also it was agreed that activities by the project should be in line with direction of JCM.

2. Second Meeting of the REDD plus Strategic Meeting in Lao PDR

The Second meeting of the REDD plus strategic meeting in Lao PDR was held in 23 July 2012. Agenda and participants are as follows (Table 12 and Table 13).

| Agenda | Material explainer |
|--|--|
| 1. Discussion policy of REDD plus | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| strategic meeting | |
| 2. Schedule of satellite imagery analysis in | Kei Suzuki (PAREDD, Consultation team (this project)) |
| Lao PDR | |
| 3. Progress of satellite imagery analysis | Ryota Kajiwara (FIM & FPP (Kokusai Kogyo)) |
| 3. Progress of socio-economic analysis | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 4. Direction of biomass survey | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 5. Others | Nothing |

 Table 12
 Agenda and explainers of each agenda's materials in the second meeting

| Participants | Affiliation |
|---------------------|--|
| Akira Mizuno | JICA Office in Lao PDR |
| Kota Hiranuma | FSCAP |
| Satoshi Fujita | FSCAP |
| Takayuki Namura | PAREDD |
| Ryota Kajiwara | FIM & FPP (Kokusai Kogyo) |
| Masamichi Haraguchi | FIM & FPP (Kokusai Kogyo) |
| Hideto Yamasaki | FIM & FPP (Kokusai Kogyo) |
| Motoshi Hiratsuka | PAREDD, Consultation team (this project) |
| Kei Suzuki | PAREDD, Consultation team (this project) |

 Table 13
 Participants of the second meeting

In the meeting, land and forest classification in Lao PDR, land use and land cover concept and direction of the JCM were discussed. Especially land and forest classification are discussed and all of participants agreed that all scale of REDD plus activities (project base by PAREDD, sub-national base by PAREDD and national base by FPP and FIM) should keep consistency of land and forest classification. Also PAREDD and FIM agreed to discuss with GIZ and other donors regarding land and forest classification.

3. Third Meeting of the REDD plus Strategic Meeting in Lao PDR

The Third meeting of the REDD plus strategic meeting in Lao PDR was held in 16 October 2012. Agenda and participants are as follows (Table 14and Table 15).

| Agenda | Material explainer |
|--|--|
| 1. Discussion points identified by first | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| meeting | |
| 2. Issues for assisting and implementing | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| REDD plus in Lao PDR | |
| 3. Schedule | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 4. Others | Nothing |

 Table 14
 Agenda and explainers of each agenda's materials in the third meeting

| Participants | Affiliation |
|---------------------|--|
| Akira Mizuno | JICA Office in Lao PDR |
| Kota Hiranuma | FSCAP |
| Takayuki Namura | FSCAP |
| Kenji Nakajima | PAREDD |
| Makoto Daimon | PAREDD |
| Kyounen Yamada | PAREDD |
| Masamichi Haraguchi | FIM & FPP (Kokusai Kogyo) |
| Ryota Kajiwara | FIM & FPP (Kokusai Kogyo) |
| Hideto Yamasaki | FIM & FPP (Kokusai Kogyo) |
| Kunihiro Ishii | FIM & FPP (Kokusai Kogyo) |
| Takuya Mori | FIM & FPP (Kokusai Kogyo) |
| Mayumi Mizobuchi | FIM & FPP (Kokusai Kogyo) |
| Ko Takeda | FIM & FPP (Kokusai Kogyo) |
| Motoshi Hiratsuka | PAREDD, Consultation team (this project) |
| Marie Iwadare | PAREDD, Consultation team (this project) |

Table 15Participants of the third meeting

In the meeting, land and forest classification in Lao PDR was mainly discussed by all of participants and impotency to keep consistency of applied land and forest classification in all of scales of REDD plus. Also all f participants pointed out some issues to be resolved when REDD plus projects under the JCM were implemented.

4. Fourth Meeting of the REDD plus Strategic Meeting in Lao PDR

The fourth meeting of the REDD plus strategic meeting in Lao PDR was held in 1 February 2013. Agenda and participants are as follows (Table 16 and Table 17).

| Agenda | Material explainer |
|--|--|
| 1. Results of UNFCCCCOP18 | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 2. Progress of BOCM | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 3. Issues to be solved for preparing PDDa. Forest clarificationb. Identification of project proponent(s)c. others | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 4. Others | Nothing |

Table 16Agenda and explainers of each agenda's materials in the fourth meeting

| Participants | Affiliation |
|---------------------|--|
| Takanori Yamamoto | Japan's Embassy in Lao PDR |
| Hideaki Takai | FSCAP |
| Takayuki Namura | FSCAP |
| Kenji Nakajima | PAREDD |
| Makoto Daimon | PAREDD |
| Masamichi Haraguchi | FIM & FPP (Kokusai Kogyo) |
| Ryota Kajiwara | FIM & FPP (Kokusai Kogyo) |
| Motoshi Hiratsuka | PAREDD, Consultation team (this project) |

 Table 17
 Participants of the fourth meeting

In the meeting, situation of negotiation regarding JCM were shared with all of participants. Also participatory approaches as one of the tools for implementing REDD plus activities were discussed.

5. Fifth Meeting of the REDD plus Strategic Meeting in Lao PDR

The fifth meeting of the REDD plus strategic meeting in Lao PDR was held in 16 March 2013. Agenda and participants are as follows (Table 18and Table 19).

| Agenda | Material explainer |
|---|--|
| 1. Situation of REDD plus in Japan | Masahiro Amano (PAREDD, Consultation team (this project)) |
| 2. Situation of REDD plus in Lao PDR | Tomomi Fujisawa (Japan's Embassy in Lao PDR) |
| 3. Direction of integrated forestry project | Nothing |
| in Lao PDR | |
| 4. Results and direction of PAREDD | Motoshi Hiratsuka (PAREDD, Consultation team (this project)) |
| 5. Others | Nothing |

 Table 18
 Agenda and explainers of each agenda's materials in the fifth meeting

| Table 19 Participants of the fifth meeting |
|--|
|--|

| Participants | Affiliation | | |
|-------------------|--|--|--|
| Tomomi Fujisawa | Japan's Embassy in Lao PDR | | |
| Akira Mizuno | JICA Lao Office | | |
| Hideaki Takai | FSCAP | | |
| Takayuki Namura | FSCAP | | |
| Kenji Nakajima | PAREDD | | |
| Makoto Daimon | PAREDD | | |
| Hideto Yamasaki | FIM & FPP (Kokusai Kogyo) | | |
| Tokunori Kitamura | FIM & FPP (Kokusai Kogyo) | | |
| Ryota Kajiwara | FIM & FPP (Kokusai Kogyo) | | |
| Motoshi Hiratsuka | PAREDD, Consultation team (this project) | | |
| Masahiro Amano | PAREDD, Consultation team (this project) | | |

In the meeting, direction of activities of forestry sector in Lao PDR was discussed. Especially REDD plus project under the JCM was discussed. Some of participants mentioned that some gap between PDM of the project and activities under the JCM REDD plus will be considered to promote all of activities in Lao PDR.

6. Results of the REDD plus Strategic Meeting in Lao PDR

From 5 times strategic meeting in Vientiane, we reached to consensus to collaborate and keep consistency of the strategy in forestry sector in Lao PDR.

There were some projects o activities related forestry sector in Lao PDR, but the direction had been common. Therefore, discussions in REDD plus strategic meeting were very helpful to share ideas and opinions from each project and useful to consider common direction in forestry sector in Lao PDR.

Chapter 6 Public Seminar on JICA's REDD plus Collaborated with Private Enterprises

1. Overview of the Public Seminar

[Date] 10, September 2012

[Participants] 150 person in total (stakeholders of REDD plus; Private enterprises, University, Organization and so on)

2. Results of the Public Seminar

In this task, with the target of widely exhibiting the initiatives of REDD plus in Lao PDR, we held a public seminar "Initiative of REDD plus by JICA-The directions in cooperation with private sectors in Laos and Indonesia". There was an attendance of about 130 people from private sectors and related ministries and government offices engaged in REDD plus at the workshop, and a debate was performed focused on implementing REDD-plus under BOCM proposed by the Japanese government as measures against global warming after 2013.

Exchange of opinions took place in particular concerning how JICA and private sectors will cooperate upon the implementation and support of REDD plus in the future. At discussion, the fact that the initiatives on a field level will become important, given that REDD plus is a forestry project proceeding in developing country, and also the fact there are many issues on implementation by a single organization, were both raised as a common understanding amongst the participants. An exchange of opinions was conducted hypothesizing initiatives at a field level, concerning how it will be connected with the REDD plus that private sectors take part in putting the basis on the experience, expertise and network accumulated in the developing countries by JICA.

Materials of the Public Seminar on JICA's REDD plus Collaborated with Private Enterprises

[Flyers of the Public Seminar]



お申込み方法は高層をご覧ください。 ※参加費は無料です。

主催:独立行政法人 国際協力機構 事務局:三菱UFJリサーチ&コンサルティング株式会社

| ぐさ ロガラム | (※ついうより書はまえとなるの論語の | 280±4.10 | | |
|---|--|---|--|--|
| 同会 | | (Charles and | | |
| 13:00-13:10 | 供授 | 不该 重美[JICA 地球環境學 鼻長] | | |
| 13:10-15:40 | 【基調講演】二個間オラセット クレジット病度の集白 | | 上田 亲生于(外获者)国族協力局 気候 変素器 蓄肃事获言(| |
| 去典 | | | | |
| 13:40-14:00 | ucaによる#200ブラスへの利用 | | 池田 條一 (JICA 地球環境學 次長) | |
| 14:00-14:50 | ラオス 気命 における森林 派小御 樹のための夢知星 主地・森林菫思ブロジェクトと#500ブラスの方向性 | | 天爱 正備(早祥田大学 教授) | |
| 14:50-15:00 | ラオス国ルアンブラバン県におけるMecoブラス実施 (JICAと民間事実体との連携) | | 鈴木 圭(日本森林枝梢協会) | |
| 15:00-15:50 | インドネシアにおける****プラスの現在と5時性 一回カリマンタン世での実施計算一 | | 高原 茶(インドホシア国家身体計画実施 支援フロジェクトチーフアド/(イサー) | |
| 15:50-15:50 (| 休憩」 | | | |
| パネルティスク | 19930 | | | |
| 15:50-16:50 | JICAと民間事業体によるSOCMを見得えたMSDDブラ ス | | モテレーター: 天野 正備 パネリスト 池田 後一、鈴木 主、高尽 旅。 各村 隆行(JICA専門家)、平畑 基志 | |
| 雨会 | | | | |
| 16:50-17:00 | 快楼 | | 池田 條一(JICA地球環境部 次長) | |
| ◆アカセス◆ 会場、大学町ファーストスクエアカンファレジス 位所:東京都干代田区大学町1-4-1 ファーストスクエアイーストウロニョ <u>MEE.//www.16%にjp/Excent</u>/ 地下放、大学町駅(cs(cs1.2/cs2.8/口度核) ・東京×八山 干代田袋,東居強,半都門強,丸、四弦 ・事業地下放 三田焼 車東京駅(丸の四式口 枝歩4分) | | | | |
| ◆中遇方法 下記の[個人! (月)12:00ま で、メールに7 記入内容: 在 | ◇ 情報の現扱いについて】に同意いただいた で簡子目に以下の内容をご起入いただき。 ごお申し込み(ださい。 乗・回体名、従業名、氏名、道修う(Tala) | :L⊽,s⊟s⊟ <u>redd@murc.jp</u> ‡ Emeil7NU2I | ◆2月10日8日で◆ 三月UN13→Aコン14か(20) 株式会社 1 環境: エネルギータ セ当: 平原、多香、山崎 電子メールアドレス: <u>redd@mure.jp</u> | |
| E.(J. A.(Babelag) 1、多たなナーの(3) ムカンサルネッシンプ) マサリム、(3)(5)(1-5)(5) 2、からたいしたの) 4、かゆうふか(5)(5) 2、からたいしたの) 4、かゆうふか(5)(5) 2、からたいしたの) 4、かゆうふか(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(5)(| | ロンサルネッシグが優勝 明明 1931年11月13日 明明 1931年11月13日 明月 1931年11月13日 明日 1931年11月13日 第二 11月13月13日 第二 11月13月13日 | いたします。おおかはし、小学校会社会が認知して言いよりやーム 、美人時間に対しては三日よりパキーキュロングルネッシックにはない an <u>alastic (analastic)</u> は2015年1月日間のため、からないで (All からだいない時代)は、中心人のな品でながないによびないます。 時からがないため、時代には、中心人のな品でながないようがあいます。 日本の分析がなかした。その代の時、今日のどになどなしては、三日 | |

[Keynote Speech] Trends in Joint Crediting Mechanism

Ms. Naoko Ueda (Top Administrative Official, Climate Change Division, International Cooperation Bureau, Ministry of Foreign Affairs)



アプローチ

二国間オフセット・クレジット制度については、

- 以下を考慮して制度の設計と実施を進める。
- (1)環境十全性と透明性を確保すること
- (2) 簡易で実用的な制度を維持すること
- (3) 温室効果ガス排出削減・吸収を促進する具体的なアクションを推進すること
- (4) 二国間オフセット・クレジット制度の下で登録された緩和 プロジェクトを他の国際的な緩和メカニズムに重複して使 用することを回避すること
- (5) 二国間オフセット・クレジット制度がクレジットが取引可能 な制度に移行された後、同制度を通じ途上国の適応努 力を支援すること



二国間オフセット・クレジット制度のスキーム

- (1) 二国間オフセット・クレジット制度はクレジットが取引 不可能な制度として開始する。
- (2) 二国間オフセット・クレジット制度の実施状況を踏まえ、 クレジットが取引可能な制度へ移行するため二国間 協議を継続的に行い、出来るだけ早期に結論を得る。
- (3) 二国間オフセット・クレジット制度はまずは、国連気候 変動枠組条約(UNFCCC)の下での新たな国際的枠 組みが発効されるまでの期間を対象とする。


JFY2011

間さつりた: ・セメント工場における省工学

イシド、 「朝鮮市における省まされ。 マイクロスかゆう、 HHON線を用いた。モスマダ目地の意及 ・ 地名英格里の変更を見なりまのの本人、 イデータセンターに足ける変換をサーバー最大 通く起意をしたいたまでありまた。 朝鮮市における実効単色料料用

JFY2012

| | | (今後さらなる検討が必要) |
|----------------------------|---|---|
| | ニ国間オフセット・クレジット制度 | COM |
| ガバナンス | -分種的 (各国政府、合同委員会) | - 中央集権的 (京都議定書締約国会合、CDM 理事 会) |
| 対象セクター /プロジェクト の対象範囲 | -より広範な対象範囲 | -特定プロジェクト・セクターは実施す るのが困難 (e.g. 超々臨界 石炭火力発電) |
| 対象プロジェ クトの適格性 判断基準 | -簡素で明確なアプローチの提唱 <「ボジティブ・リスト」 <「ベンチマーク」等 | - 「追加性」アプローチ (対象プロジェクトの実施にとり、CDM が不可欠であることの証明が厳格に 問われる。) |

| 二国間オノセット・クレンット制度に関わる動向 | | |
|------------------------|---------------------------------------|--|
| 二国間協議の現状 | | |
| インド、インドネシア、ペト | ナム、タイ、カンボジア、ラオス、ミャンマー、バングラデシュ、モンゴルと、本 | |

- 制度に関する政府間協議を開始している。またその他の国とも、国際会議等の機会を活用して関係 省庁との意見交換を行っている。 インド(2010年10月及び2011年12月)、メコン諸国(2010年10月及び2011年11月)、ペトナム(2010年
- 10月及び2011年10月)、タイ(2012年3月)との首脳共同声明において気候変動分野における協力及 び二国間オフセット・クレジット制度の協議に関する記述がある。
- インドネシアとは政府間文書で本制度の協議推進に言及(2011年11月)。

国内での取組の現状

- 外務省、経産省、環境省は本制度に関して国内外の理解を得るための広報活動、アジア・中南米・ア フリカ諸国等を対象に、本制度実施に向けたキャパシティ・ビルディングを行っている。
- 経産・環境両省で連携して実現可能性調査(フィージビリティ・スタディ)を実施中。2010~2012年度ま でで31か国において実施(2010年度は経産省30件、環境省3件、2011年度は経産省50件、環境省29 件、2012年度(MRVモデル実証調査含み)は経産省54件、環境省25件をこれまで採択済み)。具体的 には以下のような案件がある。
 - インド鉄鋼ブラントにおける省エネ対策
 - インド・ベトナムにおける高効率石炭火力発電
 - インドネシア・タイにおける制御技術による工場の省エネ
 - インドネシア・ベトナム・タイにおけるMRT(公共交通機関)の導入による交通対策
 - インドネシア・ベトナム・カンボジア等におけるREDD+ 他



急病面・治疗面: 為決定部大多段利用

31-24/45 「簡約者エネ(コンビニエンスストア) マイクロ水力発電設備

ペトナム パミャンマーノカンポジア: ・超々雄界モ(USC) 石炭火力を電用書及

マレーシアンインドネシア: ・コーティング世界性様によるNIO財団和道

ロードマップ

JFY2013

・量効率水力を電気符 ・電力のに含まし、 ・プラントは意うステムの含濃化 ・プラントは意うステムの含濃化 ・見知える高化になまり発電 ・考理型大力増速的によるた刻現象電 ・パームオイル工程・パイオス発電 ・SNG ・COS 10.00地下存在1 ・パイズ世界4 ・日本ノー経過気等を飲みまた、小水力発音

(注影全型) (适品位发言料得热影響





1. Questions and Answers of the Keynote Speech "Trends in Joint Crediting Mechanism"

(Q) Although JCM has various areas, which area does have a great desire in developing countries? For example, as for energy resources, is there a greater desire for thermal power or nuclear power generation rather than for utilizing their own forest resources? Or how about a desire for solar power that create an industrial base?

(A) Considering feasibility studies (FS) implementing under the Ministry of Economy, Trade and Industry (METI) or the Ministry of the Environment (MOE), the desires are vary according to the countries. For example, in Indonesia, small and medium-sized hydroelectric power or industrial-based projects such as introduction of high-efficient air conditioning are being addressed and in Bangladesh thermal power projects are being promoted. Therefore, the construction of the JCM system is going to be promoted, while grasping the needs including REDD plus.

(Q) I can't understand the consistency of JCM with the system under UNFCCC. Three phases are being considered and the credit will be finally issued at phase 3 (phase of full implementation). Furthermore, taking into account the fact that it is only after 2020 when REDD plus starts under UNFCCC, how does JCM consider the consistency of the time shift?

(A) REDD plus adopts a phased approach and we do not take the situation optimistic about how many countries are going to transfer to Phase 3 by 2020. The point that JCM operates by 2020 does not mean that JCM will be no longer necessary after 2020, but because the possibility of integration to the new framework which starts under UNFCCC is unclear. Although the JCM does not cover only REDD plus, we would like to consider how to deal with the countries in which efforts of REDD plus have not promoted yet.

(Q) In CDM, it was often the case that the Japanese government bought the credit issued by private operator's projects, aiming at reduction targets of Japan. In JCM, do you have an image that the government will finally buy carbon dioxide emission reduction generating from private operator's projects, or plan to establish a mechanism that the new market mechanism or private operators themselves are able to have an incentive?

(A) It is difficult to answer your question accurately at this stage, as it's going to be a long time before the operation of JCM within Tradable starts (for the time being, Un-tradable \Rightarrow offset, not credit).

[Subject] JICA's Approach to REDD plus

Mr. Shuichi Ikeda (Vice-Director, Global Environment Department, JICA)





森林セクター能力強化プロジェクト(FSCAP) (技プロ 2億円) 【期間】2010年10月~2014年9月 (目的)ラオス政府の「森林戦略2020」やREDD+に関する取り組みの実施に 能力強化のための支援や、REDD+に係る実施体制の整備・鍵整活動を実施 【活動]農林省6ヵ年計画策定支援、県5ヵ年計画策定支援、REDD+ 関連活動支援、 ドナー等関係者間協議調整、我が国の活動の促進・総合調整 等 森林減少抑制のための参加型土地・森林管理ブロジェクト {PAREDD} (技プロ 4億円) 【期間】2009年8月~2014年8月 ブロジェクト 【目的】ラオス北部の山岳境帰地域を対象に、参加型土地・森林管理を通じた森林減少 抑制システムを開発 【活動】資林減少得制システムの設計、資林減少抑制活動(資林管理や生計向上活動 等)の実施、資林減量・炭素量及び社会経済状況変化のモニタリング、ラオスREDD・ヘ 森林保全計画(FPP) (無償 10億円) 技術支出 【期間】2011年~2013年(計画中) 【目的]ラオス森林セクターにおける森林保全計画に必要な資機材供与と技術支援を通 して、森林慎報の利活用にかかる能力向上を支援 して、課時情報の利用のにあるのありませんは 【活動】機材操作・維持管理指導、森林情報ネットワークシステム開発、PAREDDの補 完的技術支援(参照接出レベルの算定)、保護林管理計画ガイドライン(案)の策定(等 9 森林情報センター整備計画(FIM)(無償 5億円) 【期間】2010年~2012年 【目的】資林の速少・劣化の抑制活動の実施の基礎となる、全国レベルの森林基盤 タの整備および管理にかかる技術支援 【活動】森林資源情報センターの建設、森林基盤図の整備/衛星面像解析に必要な資 機材の供与、森林資源調査および衛星面像解析に関する技術支援 等

REDD+支援の取り組み上の課題(2)

- ●森林保全活動の蓄積・経験はあるが、成果として確実に森林減少抑制 につながるアプローチについては手さぐり
- コミュニティへのREDD+の説明、同意取り付け、将来的な便益の分配 など、より複雑なエントリー活動が必要。
- セーフガード(社会面)実施上の限界
- クレジットが発行され、利益が発生するまでに必要な初期投資、住民 インセンティブ、活動経費を捻出する資金の確保
- プロジェクト実施者として長期に亘り現場活動を支援できるプレー ヤーが必要 (NGOなど)

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ヤーの参画の促進。

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✓REDD+に対する日本国内の関係機関の取り組み成果の相乗 効果を上げる役割。

*11

[Subject] Project on Participatory Land and Forest Management for Avoiding Deforestation in Northern Lao PDR and Direction of REDD plus Mr. Masahiro Amano (Professor, Waseda University)



ドナー

間での協調









Requirements for issuing REDD+ credits

- To establish a project boundary
- To develop Reference Emission Level(RL/REL)
- To develop MRV
- To organize/coordinate entities to implement REDD+ activities

Governance Capacity Building





To organize/coordinate entities to implement REDD+ activities

- ・ 民間セクターの投資があった際に、JICAで得られたノウハウを展開していく組織
 - JICA自体はG-Gベースでの援助機関
 - 民間資金を相手国政府に委託し、特定の事業を 委託する手続き的、時間的難しさと煩雑さ
 - -途上国における末端の行政組織の脆弱性



Schedule of the Project

結論

- REDDプラスは当面、プロジェクトベース主体での 活動だが、2020年以降は準国、国ベースでの活動に吸収させていく必要がある。
- ルアンプラバン県のJICAプロジェクトは将来的に は準国レベルでのREDDプラス活動を目指し、 フェーズ1、2のプロセスを進めている。
- ・途上国一般の現状として、REDDプラス活動を実施する組織の脆弱性が問題となっている。
- プロジェクト・レベルでのREDDプラス活動は、上位レベルでのREDDプラスを目指した動きと一貫性を持つ必要がある(Nested Approach)

[Subject] Implementation of REDD plus in Luang Prabang Province of Lao PDR (Cooperation between JICA and Private Sectors)

Mr. Kei Suzuki (Japan Forest Technology Association)









[Subject] Approach to REDD plus in Indonesia and its Direction -Implementation Plan in West Kalimantan-

Mr. Shigeru Takahara (Chief Advisor, Implementation Support Project for National Forest Plan in Indonesia)











2007

Final Report











[Subject] Outline of Methods to Reduce Deforestation and Forest Degradation at Village Level (PAREDD Approach)

Mr. Takayuki Namura (Former PAREDD/JICA Long-Term Dispatch Specialist (in Forest Resources Management)



森林減少抑制のための参加型土地森林管理プロジェクト Participatory Land and Forest Management Project for Reducing Deforestation in

2009年8月24日~2014年8月23日(5年間)

- 農林省林野局(主管カウンターパート機関)
- ルアンプラバン県農林事務所

1. PAREDDプロジェクト概要

REDD+に貢献するために、参加型土地森林管理を通じた森林減少及び

- 村落及び村落クラスターレベルにおいて、森林減少・劣化に由来する炭 素排出を抑制するための手法(PAREDDアプローチ)の開発。
- 村落及び村落クラスターレベルにおけるREDD+パイロット事業の実施
- プロジェクト対象地域におけるRIDD+活動の実施を通じたカウンター パート及び村人に対する能力強化。



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2. Discussions on Panel Discussion

- 2.1 Questions about Lao PDR: issuing time of credits and effects of project
 - In PAREDD, when will credits be issued from REDD plus activities by reducing slash and burn?
 - When the credits are issued is related to when the monitoring starts. As the business will be started in 2013 in project target area, the issuing time depends on the time when the monitoring starts on or after 2013. For example, if it is three years after the activity starts, it will be 2015. If it is five years after the commencement, credits will be issued on or after 2018.
 - Could you also provide an answer about how soon you can expect to see effects of the PAREDD approach?
 - As reducing slash and burn farming will directly affect the activities of villager's everyday lives, we will take the time to promote the activities. As for technical approach, because the zoning for land use and management is under process while having discussion with local communities about effective utilization of slash and burn plot, therefore, the verification of the effectiveness can be immediately performed. On the other hand, because it takes time to support improving livelihood by introducing alternative livelihood to slash and burn, the effectiveness can be verified two years later at earliest.

2.2 Questions about Lao PDR: incentives to local people

- Is it possible to give small farmers incentives practically to do the activities to stop lengthening rotation of slash and burn or slash and burn itself, while they are conducting slash and burn farming?
- Although it is difficult to follow the changes of land use for slash and burn of each farmer, it is possible to grasp the changes of whole village. It is likely to become possible to give incentives by establishing such as village fund for what the whole village implemented and distributing the profit from it.

2.3 Questions about Lao PDR: establishment of reference level

- In relation to reference level, there was an explanation that the past trend should be referred to BAU and for the future trend, the data of population or GDP provided by socio-economic survey should be used. Could you describe in more specific way how to reflect these data to the reference level?
- It is very difficult to forecast the future adding socio-economic data and even the general method for developing reference level has not been established yet at this stage. We are considering a method; after finding a reference area and collecting its data, then assuming that the changes occurred in reference area would also occur in target area and applying the changes to target area as a future reference level.
- I hear that the technical issues such as establishing a reference level were also discussed at workshop hosted by REDD development and research centre on September 5; the development will be promoted by reference to the discussion there.
- Which method are you going to use to analyze the past BAU in the case of Lao PDR?
- Using LANDSAT and PALSAR annually from 1996, the part of forest will be interpreted and the past changes of forest will be clarified on an area basis. As the credit is in amount of carbon equivalent, we will investigate the existent amount of forest per ha from surface study and will illustrate the forest dynamics by multiplying the forest area and the basic unit. However, in remote sensing, it is rare to

collect data annually. In Lao PDR, collecting every year's satellite images not being obscured by cloud, we could adopt the method which keeps track of the annual changes.

- As not being able to lead in a simple context to which indicator affect the deforestation such as population growth, improved access to markets by road construction, we are going to make several scenarios and choose the most appropriate indicator while referring to the reference scenario. Although it is naturally desirable to make a model first and refer to a reference level, we need to repeat a process to revise the model after collecting socio-economic data.
- As going forward the socio-economic survey from dry season this year, we are going to consider what kind of scenario we can utilize as a result of the survey. The result of the analysis is going to be completed in spring next year.

2.4 Questions about Lao PDR: safeguard

- What is specifically assumed as a safeguard to farmers in PAREDD?
- As PAREDD is promoted with the villagers who are directly affected by forest conservation activities, the safeguard is very important. Particularly, how to explain to villagers and how to obtain their consents are important points.
- In implementing the project, it is ideal to obtain the consents from local people while they recognize that the project is a REDD plus project and discuss such as risks. Although they understand that their life will improve and obtain benefits by conservation of forest that are close to their daily life, they are not able to understand when it comes to the explanation of REDD plus or global warming countermeasures. Therefore, as methods for coping with this problem, there are two methods including: to continue the explanation about REDD plus and global warming countermeasures until they understand or to reduce the level of safeguard, and both approaches are under consideration.

2.5 Question about Lao PDR: additionality by REDD plus activities

- Has any activity conducted in target area to reduce slash and burn farming before PAREDD project commenced? Also, if any activities to reduce slash and burn farming have been conducted, what is the state of the relationship between those activities and PAREDD activities?
- A policy to promote the settlement for reducing slash and burn shifting cultivation has been implemented since 1990s. Generally, two ways of approaches to reduce slash and burn farming are considered: one is to impose regulation on slash and burn land, and the other is to guide the villagers to alternative livelihood. Not having enough budget, the Lao government has been made efforts inclining to top-down regulation of land use. In PAREDD approach, we are going to implement both participatory zoning of land and giving alternative livelihood in a well balanced manner.

2.6 Questions about Lao PDR: carbon accumulation of slash and burn

- Both in Indonesia and Lao PDR, each farmer is doing slash and burn at a small scale, but how do you measure the effect of carbon accumulation of slash and burn farming?
- About measuring carbon accumulation, although some people consider the accumulation becomes zero because slash and burn land is burnt down, it is a point that convert the carbon amount with grasping the

area of slash and burn land.

- If slash and burn cycle is short, the whole accumulation amount will be reducing before the carbon is accumulated. On the other hand, if the cycle is extended, the carbon of slash and burn land will be accumulating. Therefore, each accumulation amount should vary considerably depending on the average of each amount.
- The amount of carbon accumulation in slash and burn land will increase not only in the case of stopping the slash and burn to expand into natural forest, but also in the case of doing traditional slash and burn farming by adding land restoration.

2.7 Questions about Lao PDR: credits expected in the project

- According to the results of calculation by Mr. Suzuki, it is expected to reduce GHG emission by 4 million t-CO2e per year in Luang Prabang Province. Unlike CDM, as REDD plus is the activities which reduce GHG emission, the amount of carbon generated is extremely large. In VCS as well, trading are performed in voluntary markets related to forest, and most of the credits traded are occupied by two REDD plus projects.
- Large amount of carbon credits in REDD plus compared to CDM is both an advantage and a disadvantages of REDD plus. While taking this point into account, I hope that REDD plus projects will be promoted.

2.8 Questions about Indonesia: how to deal with peatland in REDD plus

- Indonesia has large area of peatland, but is peat soil carbon covered by REDD plus? Also, could you introduce some specific efforts related to peatland carbon that is currently assumed?
- Forest and peatland are not distributed separately, but they are dealt with as a group, that is, peatland forest ecosystem. As the decrease of peatland forest and the carbon emissions from peat soil are closely related, REDD plus and peat soil issue can be associated with each other.
- The measurement of carbon emission amount in normal forest is considered by classifying to above-ground part and under-ground part. In peat land, the amount of emission from under-ground tends to become large. In other words, it is a mechanism that the decomposition of organic matter in the soil are being accelerated by deforestation and the emissions from under the peatland are also becoming large.
- Unlike the measurement of above-ground part in forest, it is a point that there is no clear standard in the measurement of soil carbon. The amount of carbon emission in normal forest is calculated by multiplying the change of deforestation measured by using activity data and the amount of carbon stock per unit area. However, because it is not be able to measure the amount of carbon emission under-ground from the sky, carbon amount in peat should be measured first. The whole amount of carbon can be calculated by multiplying the amount of carbon contained per m3 and the depth of peat.
- Three major methods are considered to measure the amount of carbon emissions within a period of time. The first method is to estimate the amount of emission by the depth of peat sinking. As peat sink by fire or decomposition of organic matter, the amount is estimated by measuring the depth of peat soil sunk using radars such as LiDAR. The second method is to measure by fluctuation of water level. The water

level sinks down by building drainages for agricultural land conversion and deforestation, and CO2 is emitted into the air as fires and organic matter decomposition are advanced. The fluctuation of water level is measured by monitoring, and the amount is estimated by referring to data table which indicates level of carbon decomposition according to the fluctuation of water. The third one is to estimate the amount of emission from soil by directly measuring the CO2 level being emitted to the atmosphere. The research has proceeded at Hokkaido University, etc.

2.9 Questions about Indonesia: relationships between existing private enterprises

- In West Kalimantan, private enterprises have already proceeded with planting palm oil and mine development. How do you consider a balance with those projects?
- There are some private enterprises aiming at industrial afforestation around the project target area. As the emission from there is large, taking action to deal with it is a challenge. As one of the activities outside of Gunung Palung National Park, we would like to consider to proceed with some sort of efforts cooperating with those enterprises' activities.

2.10 Relationship between JCM and REDD plus

- The PAREDD project has started its project by assuming VCS. The Lao government is also examining a policy of implementing project by VCS.
- VCS requires the development of method in a strict scheme. Even the negotiation officers in charge of international negotiation proceed to a discussion by reference to VCS and any modalities that are stricter than VCS will not be developed in REDD plus. If the standard becomes stricter than VCS, that will not apply to projects, but to national or sub-national level.
- The JCM considers developing a more simple method, focusing on the reduced amount of carbon, not on shortening of verification period or additionality. What you should be careful about, if implementing with JCM in mind, is to implement the monitoring appropriately.
- The reference level would be OK if it is not developed in a very strict manner, because it will definitely need to be revised, considering that REDD plus starts on or after 2020 and that population and GDP in developing countries fluctuate.
- Even if a problem occurs in the transition to REDD plus, as long as monitoring is implemented appropriately, you can address the problem by complementing based on the monitoring; so that it would not be difficult even if proceeding with REDD plus project under the JCM. Also, in a Lao project, monitoring tailored to the VCS standard is going to be implemented.
- Too much simplified monitoring method is not desirable, assuming that how large the credit generating from REDD plus activities and they will be transferred in future compliance market. However, even if the monitoring is simplified, it would be possible to trade credits in a compliance market.
- In the case of simplifying the monitoring in view of the cost which can be used for monitoring, it is necessary to conservatively calculate the credits accordingly.

2.11 Benefit distribution

• Could you tell me how much benefit are distributed to farmers in cases of Indonesia and Lao PDR?

- As for benefit distribution in Indonesia, the outline of benefit distribution ratio (government 20%, local communities 20% and project operators 60%) is being determined by ordinance of minister of forest (P.36/Menhut-II/2009). However, it has not happened so far the benefit distribution according to this ordinance of minister of forest.
- It has not concluded yet in Lao PDR about identifying owners of carbon rights or how to distribute the benefits. In the project of natural production forests management jointly undertaken by the World Bank and Finland, the activities of benefit distribution to local communities have been implementing specifically by establishing village funds. Although I am not sure about the exact figures of benefit distributed to local communities and the rest is to the relevant ministries
- It would be OK to consider the situation of the benefit distribution rate in both examples is that 20~30% are distributed to local communities.

2.12 Difference with the previous forest conservation activities

- Although the safeguards themselves seem to be focused, as improvement of the livelihood is the central issue, are there any differences with the previous forest conservation approach by JICA?
- The programmes for improving livelihood in Lao PDR are characterized by being developed based on villagers' needs. By supporting activities that are desired by villagers, it is aimed at securing sustainability of the activities. However, whether those activities by villagers are connected to the forest conservation will become issues.
- In PAREDD, from the next dry season, efforts aimed at reducing deforestation are going to be considered. For example, such as extension of paddy alternative to rice cropping by slash and burn, support for ecotourism are considered; and we are going to implement on a trial basis that supporting alternative livelihood by managing forest directly.
- If the efforts are different from villagers' needs, it is considered to be difficult that to what extent they are accepted among the villagers, so some ideas must be directed.
- In the previous forest conservation projects, the efforts have been developed aiming individually both conservation activities and improvement of livelihood. In PAREDD, a new point is that we are going to support improving livelihood based on the activities that are selected by needs base and promote zoning for participatory land use and management by using participatory land-use planning.
- Clarifying the regulations by forest conservation and the incentives for villagers, how to connect needs-based efforts to forest conservation will become issues.
- JICA has previously promoted efforts to develop forest conservation models depending on government's ability. However, as there is a limit to what governments can implement with their ability, it was necessary to simplify the efforts considerably. Therefore, even though the operation of forest conservation models was successful during the project, it has not been connected to sustainable development and dissemination. The areas where NGO or local consultants have been working for many years are exception, but the activities that only government becomes engaged has a limit.
- In the cases of REDD plus, you need to enter local, promote sufficient discussion with the local villagers and obtain the acknowledgement by them; it is difficult to implement projects only depending on ability

of government. In PAREDD approach, therefore, projects will be implemented with executing a change of direction so that local outside players or private sectors enter and address the field of forest conservation.

- Although there is no specific design, as a national strategy of Indonesia, FPIC, which is being advanced development by UN-REDD, is considered to become a standard and the activities are going to be promoted referring to FPIC.
- In an effort in Gunung-Halimun-Salak national park that has been promoted by JICA, some villagers are doing farming activities entering into the park; the park and the local villagers are jointly implementing the management activities in exchange for admitting the villagers to use the restricted area as farmland, obtaining the agreement between them. At the moment, we are making efforts to
- To what extent we should explain REDD plus to the villagers would be troubling in this project. In other institutions implementing activities in Indonesia, there seem to be a number of cases that explain REDD plus while placing the forest conservation as a broad theme. Meanwhile, because the benefit obtained from the activities is not only from the credits but also from alternative livelihoods or wages by participating social-infrastructure improvements, forest monitoring, etc., it may not be able to simply proceed with explanation of benefit.

2.13 Role of the JICA and collaboration with private enterprise

- We have got a number of questions about the role of JICA playing in REDD plus. They can be divided into three; divisions of roles among each related parties, synergy effect being created by cooperation between JICA and private entities, and when JICA and private entities are going to cooperate or when the efforts of JICA are going to be taken over to private entities.
- In implementing REDD plus project, it is important how to ensure consistency with REDD plus strategy within the international framework and JICA will implement support for ensuring consistency with Province or national based REDD plus. One of the specific efforts is the development of reference level covering the whole Province.
- As synergy effects by a cooperation between JICA and private entities, JICA has a role to give technical support including infrastructure development looking ahead to Nested Approach, development of reference level at Province level and capacity building activities for local villagers. As REDD plus is a long-term effort continuing 10 or 20 years, it will become necessary to give financial supports to each developing countries for implementing REDD plus activities sustainably.
- As for the timing of cooperation with private entities, first of all, when private entities decide target area to implement REDD plus activities, please pay attention to the area where JICA has been implementing REDD plus activities and the direction of our efforts. Also, when implementing project, we would like to ask you private entities that not to implement REDD plus activities as just a business but to consider securing the structure that entering into MOU with state, the knowledge accumulated in project contributes to forest conservation in the whole state, while sharing the information. If there are such efforts, it is sufficiently possible for us to cooperate with the activities of private entities by actively supporting development of reference level covering whole Province, etc.

JICA is advancing state-based REDD plus activities in West Kalimantan or Central Kalimantan and sub-national based activities in Dien Bien Province in Vietnam and Luang Prabang Province in Lao PDR. In Cambodia, it is possible to promote state-based activities in the area designated by the government as REDD plus activities. Although it is difficult to cooperate with private entities in the area where JICA is not implementing activities at all, it is possible to cooperate in such as sharing satellite images in the areas mentioned above or utilizing the state-based reference level that are developed by JICA.

2.14 Distribution of credits

- How are the credits issued by projects distributed in the case of cooperating with JICA?
- Although JICA has been advancing investment, we do not share credits with private entities, as there is no way of utilizing them as JICA. The thing you can think of is that the Japanese government buys out credits for achieving reduction targets. In this case, however, there will be a discussion and consideration to distribute benefit between private entities who implementing projects and the Japanese government.

2.15 Comments from Presentations

(Mr. Ikeda, Vice-director) As there are some unclear points such as when the JCM starts or how the ongoing FS projects continue, as JICA, we are wondering how to get along with the JCM. While the future direction of JCM is not clear, as the status is such that we are addressing voluntarily, there is a limit in providing support for private entities and others. However, I would like to promote efforts or sharing the information so that I can contribute to design the systems of JCM which the Japanese government promotes or to support private entities.

(Mr. Suzuki) The area we address is technical, and there are a number of points to be improved. We would like to advance development while exchanging views with various other technical experts. As we collected the data necessary for implementing projects, we would like you to consider implementing projects in Luang Prabang Province.

(Mr. Takahara, Chief advisor) By addressing IJ-REDD plus which starts now, I would like to contribute to the development of REDD plus system.

(Mr. Namura) Ten years have passed since I got involved in the forest conservation projects in Lao PDR, so I have seen ups and downs of various projects. When projects are finished, in most cases the activities are finishing due to lack of funding or machinery. What I expect in REDD plus is that efforts become sustainable by being injected financial support of private entities, contributing to improve livelihoods of the villagers in Lao PDR.

(Prof. Amano) It is important to successfully incorporate REDD plus into the JCM that Japan promotes. For that, JICA is dealing with the activities enthusiastically. Also in REDD Research and Development Center, the lower organization of Forestry and Forest Products Research Institute, the efforts around technical issues are being promoted. On September 5, REDD Research and Development Center gathered entities participating in FS projects, promoted networking and had a discussion about technical issues toward promoting REDD plus. Even for the entities hoping to enter the market, REDD plus expands options for obtaining the credits. Unlike at the start of CDM, I think that REDD plus project is easy to enter because

there are a lot of organizations or institutions that promote and support the project. As for JICA, the know-how, which have been accumulated not only in the REDD plus projects in Lao PDR, Cambodia, Indonesia and Vietnam, but also in forest conservation activities that have been implemented so far, will be extremely useful in spreading other REDD plus activities. At the end, I would like to ask private entities to cooperate so that JICA can develop its effort to sub-national level.

Discussions with Lao side about Peer-review of the PD (before Peer-review)

20th May 2014

Overview of Project Description (PD)

Participatory Land and Forest Management Project for Reducing Deforestation in Lao PDR (PAREDD)



What is Project Description (PD)?

- The PD is for explanation of validity of the REDD+ project.
 - Explain the project site (where),
 - Explain the project start and end (when),
 - Explain responsible person (or organization) of the project (who),
 - Explain methods to reduce deforestation and to estimate GHG emission reductions (*how*),
- To explain details of the project, the proponent(s) have to compile all of information of the project (estimation of GHG emission reductions, responsibility of the project and so on).
Outline of Project Description (PD)

1 Project Details

- 1.1 Summary Description of the Project
- 1.2 Sectoral Scope and Project Type

1.3 Project Proponent (details are as follows)

1.4 Other Entities Involved in the Project

1.5 Project Start Date (details are as follows)

- 1.6 Project Crediting Period
- 1.7 Project Scale and Estimated GHG Emission Reductions or Removals

1.8 Description of the Project Activity (details are as follows)

1.9 Project Location (details are as follows)

- 1.10 Conditions Prior to Project Initiation
- 1.11 Ownership and Other Programs
- 1.12 Additional Information Relevant to the Project

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Outline of Project Description (PD) (continued)

2 Application of Methodology (details are as follows)

- 2.1 Title and Reference of Methodology
- 2.2 Applicability of Methodology
- 2.3 Project Boundary
- 2.4 Baseline Scenario
- 2.5 Additionality
- 2.6 Methodology Deviations

3 Quantification of GHG Emission Reductions

and Removals (details are as follows)

4 Monitoring (details are as follows)

5 Environmental Impact (details are as follows)

6 Stakeholder Comments (details are as follows)







| Use of natural resources | Problem | Cause | Solution |
|--|--|---|--|
| Forest | Villagers still do not understand how to protect the forests | Villagers practice unregulated shifting cultivation | Allocation of forest and agricultural production area |
| Non-timber forest products (NTFPs) | Forests are cleared for NTFPs | No proper management and protection | Introduction of forest management regulations |
| Wildlife | Villagers are not willing to protect the forest | No permanent job and increased population | Make and enforce wildlife management regulations |
| River | Forests are cleared for cultivation | No permanent job and no protection of the water- shed forest/water source | Introduction of alternatives such as livestock raising |
| ■Results of p | roblem analysis, which | was undertaken to selec | t actual activities |

against shifting cultivation in Houaykhing Village.

1 Project Details -1.8 Description of the Project Activity-

| Use of natural resources | Problem | Cause | Solution | |
|--|--|---|--|--|
| Forest | Villagers still do not understand how to protect the forests | Villagers practice unregulated shifting cultivation | Allocation of forest and agricultural production area | |
| Non-timber forest products (NTFPs) | Forests are cleared for NTFPs | No proper management and protection | Introduction of forest management regulations | |
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| ■Results of p against shift | roblem analysis, which ing cultivation in Houay | was undertaken to selec khing Village. | t actual activities | |

| Category | Houaykhing | Phakbong | Houaytho | Houayha | Sakuan | Longlath |
|------------------------|------------|----------|----------|---------|--------|-------------|
| Conserv. forest area | 4 | 231 | 92 | 78 | 627 | in progress |
| Protection forest | 2,359 | 1,206 | 165 | 3,990 | 1,223 | in progress |
| Manageduseforest | 124 | 76 | 90 | 105 | 51 | in progress |
| Tree plantation area | 6 | 2 | 4 | - | - | in progress |
| Cemetary forest | 11 | 10 | 26 | 3 | 4 | in progress |
| Sacred forest | 5 | | 2 | - | 6 | in progress |
| Buildingland | 73 | 4 | 7 | 7 | 9 | in progress |
| Fruit plantation area | 6 | 1 | 5 | 1 | 1 | in progress |
| Agriculturalarea | 4,036 | 2,152 | 2,290 | 2,040 | 2,830 | in progress |
| Livestock raising area | 1,257 | 297 | 364 | 2,077 | 801 | in progress |
| Paddy field | 89 | | | | | in progress |
| Total (ha) | 7,970 | 3,979 | 3,045 | 8,301 | 5,552 | in progress |

Results of participatory land zoning in target villages (work is in progress in Longlath Village).

1 Project Details -1.8 Description of the Project Activity-

| Village | Туре | Activities | Number of participating household |
|--|----------------------------|---|---|
| | 1 | Fruit tree plantation (5.3 ha) | Whole households |
| | 1 | Planting for reforestation (6.2 ha) | Whole households |
| | 1 | Equipment | Whole households |
| | 2 | Goat raising | 13 |
| Houaykhing | 2 | Pig raising | 13 |
| | 2 | Poultry raising | 19 |
| | 2 | Fish raising | 4 |
| | 3 | Repaired the village's water supply (equipment, popes and faucet) | Whole households |
| ■Participan Village. Ar livelihood | ts in th ound to shi | ne project activities (i.e. the PAREDD Appro 30% of households conduct activities of Typ fting cultivation) | ach) in Houaykhing be 2 (alternative |



1 Project Details -1.9 Project Location-



Project area is "HouaiKhing Village Cluster (KB)" in Phonsay District, Luang Prabang Province, which area is approximately 30,000 ha.

Reference area for developing Reference Level is allover Phonsay District, and

Leakage belt is both sides of Village Clusters (KB) of the project area.





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3 Quantification of GHG Emission Reductions and Removals



3 Quantification of GHG Emission Reductions and Removals

| (Reference) | Forest Class | according to | National | Forest Base Map |
|-------------|--------------|--------------|----------|-----------------|
|-------------|--------------|--------------|----------|-----------------|

| Forest classification applied into forest map in LPQ | Relationship with Forest classification (<i>tentative</i>) designed by National Forest Base Map |
|--|---|
| Mixed Forest | Evergreen Forest |
| | Deciduous Forest |
| | Mixed Evergreen / Deciduous Forest |
| | Coniferous Forest |
| | Mixed Coniferous / Broadleaved Forest |
| Dry Dipterocarp Forest | Dry Dipterocarp Forest |
| Plantation Forest | Evergreen Forest Plantation |
| | Deciduous Forest Plantation |
| Bamboo | Bamboo |
| FallowLand | Old Fallow Land |
| | Young Fallow Land |
| Slash and Burn Land | Slash and Burn Land |

National Forest Base Map in Lao PDR which was supported by JICA was applied in this Reference Level. In accordance with international requirement of REDD+ implementation, over 80% of accuracy in forest class classification was kept.

| LU/LC class | Mean carbon stock per hectare + 90% CI | | | | | |
|---------------------------|--|---------------------------------------|--|---------------------------------------|---------------------------------------|---------------------------------------|
| Name | Mean AGC (t CO²e ha ^{`1}) | +90% Cl (t CO=e ha ⁻¹) | Mean BGC (t COªe ha ⁻¹) | +90% Cl (t CO²e ha ⁻¹) | Mean TC (t CO≊e ha ^{°1}) | +90% CI (t CO=e ha ^{`1}) |
| Mixedforest | 291.8 | 38.6 | 79.6 | 8.2 | 371.4 | 46.5 |
| Dry dipterocarp forest | - | - | - | - | - | - |
| Teak plantation | 310.2 | 93.1 | 74.4 | 22.3 | 384.6 | 115.4 |
| Fallow | - | - | - | - | According to growth-mod | o specific Jel |
| Slash-and-burn | 27.7 | 8.3 | - 10 | | 27.7 | 8.3 |
| Bamboo | 200.8 | 60.2 | - | - | 200.8 | 60.2 |
| Scrub | 144.8 | 43.4 | | | 144.8 | 43.4 |
| Grassland | 27.7 | 8.3 | - | - | 27.7 | 8.3 |
| Rice paddy | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| Other land uses | 0.0 | 0.0 | - | - | 0.0 | 0.0 |
| According to f | ield survey | of JICA PA | REDD and I | PCC Emiss | ion Factor [| DataBase, |

3 Quantification of GHG Emission Reductions and Removals

we applied above factors (Mean carbon stock per hectare).

| Years | Estimated GHG emission reductions (tCO2e) |
|------------------------------------|--|
| 2011 | 10,975 |
| 2012 | 17,475 |
| 2013 | 25,244 |
| 2014 | 33,358 |
| 2015 | 42,673 |
| 2016 | 53,309 |
| 2017 | 65,409 |
| 2018 | 79,121 |
| 2019 | 94,620 |
| 2020 | 112,107 |
| Total estimated Ers | 534,290 |
| Total number of crediting years | 10 |
| Average annual ERs | 53,429 |

3 Quantification of GHG Emission Reductions and Removals







[Discussions]

The consultation meeting on REDD plus Project Description for JICA PAREDD Project took place on 20 May 2014 at SETHA Palace. The meeting was chaired by Mr. Khampahy MANIVONG, Deputy Director General, Department of Forestry, Ministry of Agriculture and Forestry. There were fifty two participants from the relevant government agencies both at the central and local levels (in particular the Ministry of Agriculture and Forestry and Ministry of Natural Resources and Environment), Lao Front for National Construction, Lao Women's Union, Japan International Cooperation Agency.

The discussion session aimed to verify the draft PD in key points: (1) the project proponent(s) or key actor(s) and (2) others;

The Project Proponent(s): The whole point of discussions about the "project component" focused on who would be a relevant and suitable key or main actor(s) in the PD. According to the presentations of the project implementation structure, the PD proposed that there would be, at the local level, the Rural People Group and DAFO overseeing the project implementation and forest monitoring whereas the XXX Co. Ltd (not identified) and PAFO would oversee the overall management of the project, and that at the central level, there would be DOF/REDD Office and DFRM supporting project activities from the policy level.

Other recommendations were: (i) Considering the project duration (over 20 years), the long-term commitment of the government is important as it would pose challenges to the project implementation. Therefore, allocating and selecting personnel should be properly done and responsibility should be clearly defined. Before these were not properly done. For example, what role should the actor(s) at the district level do and what role should the actor(s) at the provincial level do. The project should also attach the importance to qualified human resources to be assigned to work with the project; (ii) PD should address the issue of information exchange, better coordination system or mechanism; (iii) Implementing any activities should include relevant actor(s). For instance, if an activity were to deal with gender for instance, PD should include

the role of LWU; (iv) Disseminating the project information should be done sector-wide to ensure that people understand and get ready to cooperate with the project through organizing workshops and lessons learned should be drawn and shared with stakeholders, especially policy-makers for advice if necessary; (v) Biogas, livestock, and irrigation expansion, for instance, should be included. The PD team responded by saying that the project would implement activity by activity. More new activities would be discussed with the community members or people in the target area as it was important to consider their actual needs; (vi) Land use planning management to be carried out by PD would start at the household level believed to be a driving factor to deforestation. PD had classified land into various types for agriculture or conservation. For the agriculture land type, soil analysis should be done to determine a degree of soil productivity; (vii) PD should look at if the project would have any negative impacts to the environment. For example, expanding farms resulted in chemical uses which would potentially harm environment and community's health.

Discussions with Lao side about Peer-review of the PD (after Peer-review)

31st October 2014

Results of Peer-review of the Project Description (PD)



Activities for preparing REDD+Project Description(PD)

Our Terms of References (ToR) mentioned;

- The target site of REDD+ project is HouayKhing Village Cluster, Phonsay District, Luang Prabang Province.
- The PD of the REDD+ project contained following activities should be prepared, and should be keep international requirements.
 - Implementing land and forest management plan;
 - Awareness rising related to forest conservation;
 - Village fund establishment and management.
- In some international standards, PAREDD would selected "Verified Carbon Standard (VCS)" as most common and credible standard.



Before Discussion -Situation of Voluntary Market-





4



What is Project Description (PD)?

- The PD is for explanation of validity of the REDD+ project.
 - Explain the project site (where),
 - Explain the project start and end (when),
 - Explain responsible person (or organization) of the project (who),
 - Explain methods to reduce deforestation and to estimate GHG emission reductions (how),
- To explain details of the project, the proponent(s) have to compile all of information of the project (estimation of GHG emission reductions, responsibility of the project and so on).

5

Outline of Project Description (PD) under the VCS

1 Project Details

- 1.1 Summary Description of the Project
- 1.2 Sectoral Scope and Project Type
- 1.3 Project Proponent
- 1.4 Other Entities Involved in the Project
- 1.5 Project Start Date
- 1.6 Project Crediting Period
- 1.7 Project Scale and Estimated GHG Emission Reductions or Removals
- 1.8 Description of the Project Activity
- 1.9 Project Location
- 1.10 Conditions Prior to Project Initiation
- 1.11 Ownership and Other Programs
- 1.12 Additional Information Relevant to the Project

- 2 Application of Methodology
- 2.1 Title and Reference of Methodology
- 2.2 Applicability of Methodology
- 2.3 Project Boundary
- 2.4 Baseline Scenario
- 2.5 Additionality
- 2.6 Methodology Deviations
- 3 Quantification of GHG Emission Reductions and Removals

6

- 4 Monitoring
- 5 Environmental Impact
- 6 Stakeholder Comments

Results of Peer-review

Selected third-organization for peer-review

 From comparison of some organizations, we selected "Japan Quality Assurance Organization (JQA)".

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Process of peer-review

The PD had been reviewed by three steps.



Requiems under the peer-review

■ Peer-review had been conducted based on following requirements.

| in the case that one of the following occurs: a. The project proponents have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions; b. The VCS requirements have not been met; c. There is a risk that emission reductions cannot be monitored or calculated. d. There is a erroneous description. | |
|---|---|
| in the case that information is insufficient or not clear enough to determine whether the applicable. | |
| for better presentation of PD and/or for validation process | |
| | in the case that one of the following occurs: a. The project proponents have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions; b. The VCS requirements have not been met; c. There is a risk that emission reductions cannot be monitored or calculated. d. There is a erroneous description. in the case that information is insufficient or not clear enough to determine whether the applicable. for better presentation of PD and/or for validation process |

Summary of the result of peer-review

| Peer-review's | | | First Review | Second Review | Final Review | |
|---------------|--------|--------------------|--------------|---|-----------------|-----|
| C | omme | птуре | No. | No. Points of comment | | No. |
| R | equire | ments | 148 | | 154 | 154 |
| | CAR | Easy miss | 10 | Relationship with VCS format and requirements | 3 | 0 |
| | | Confirmation | 2 | Consistency and completeness with applied methodology | | |
| | | Critical points | 13 | Requirements to be improved in line with the methodology | | |
| | CL | Easy miss | 4 | Typing mistakes and so on | 4 | 0 |
| | | Evidence | 2 | Evidences on the process of site visit and real validation | | |
| | | Confirmation | 7 | Additional explanations to reviews | | |
| | | Critical points | 16 | Improved and additional documents for deep review | | |
| | R | Easy miss | 1 | Additional information on technical words | 3 | 0 |
| | | Evidence | 5 | Evidences on the process of site visit and real validation. | | |
| | Clear | (ОК) | 88 | | 144 | 154 |
| | | | | | | 1 |



Results of peer-review

After peer-review (improved points)

Review Comments (CAR - Critical)

- The PD should show evidence or clear explanation why PAFO and DAFO are suitable core player and have enough capability to implement all of activities mentioned in the PD.
- Under VCS projects, capability of proponents is evaluated by "Non-Permanence Risk Report" and if the report does not in line with VCS requirements (required scores), applicability of this project should be rejected.

Resolution (OK)

- From long-team cooperation between JICA and PAFO/DAFO, capability of PAFO and DAFO as project proponent(s) will be applicable.
- In addition, this PD proposes collaboration with Japan's enterprise(s) as project proponent(s) which have much experiences of management of mitigation project (CDM projects) in developing countries.

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Results of peer-review

After peer-review (improved points)

Review Comments (CL - Critical)

- Only 20% of households are involved in livelihoods activities (Type 2). How can the land zoning be controlled with low participation of local people?
- As for the results of land zoning, Agricultural Area of some villages accounts for over 70% of its village size. Agricultural Area (area subjected to slash-and burn) is not so large in the current land use.
- There were other comments on indigenous people/local communities.

Resolution (OK)

- Through implementing activities, the project will introduce additional activities and increase ratio of participants.
- Results of land zoning are just status in before the project implementation (i.e. baseline scenario). Through project implementation, the project introduce additional activities to increase ratio of rural people's participants and improve land zoning system.



2 Application of Methodology 2.2 Applicability of Methodology

| The project applied "VM0015 "Me Unplanned Deforestation". | thodology for Avoided | |
|---|--|-----|
| Applicability Conditions of VM0015 | Reasons for justifications | Urs |
| c) The project area can include different types of forest, such as, but not limited to, old-growth forest, degraded forest, secondary forests, planted forests and agro- forestry systems meeting the definition of "forest". | The Lao PDR's Government has adopted parameters to define forest under Forestry Strategy 2020 and forest classification, and the project includes different types of forest. | |
| d) At project commencement, the project area shall include only land qualifying as "forest" for a minimum of 10 years prior to the project start date. | From results of satellite imagery analysis from 1994 to 2004, we confirmed that land use of the project area is categorized as "forest". | |

Results of peer-review

After peer-review (improved points)

Review Comments (CL - Critical)

- Do all categories of land use in the assessment qualify as forest? For example, scrubs, bamboo, etc do not generally qualify as forest. The PD needs to provide evidence of 'forest qualification'? The methodology prescribes to use the definition adopted by the country i.e. CDM's DNA which excludes certain land categories claimed as forest in PD.
- There were some comments on definition of forest, forest classification, and difference of deforestation and forest degradation.

Resolution (OK)

 Definitions of each land type are explained in Table 5 of the Annex.

- Also we would add following explanation;
 - Fallow is clarified as forests because fallow area has enough potential to recover to forest, which is according to IPCC GoodPractice Guidance (LULUCF) in 2003;
 - Slash-and-burn area is classified as cropland because these are used for cultivation in constant and their carbonstocks are almost zero and kept in constant.



Results of peer-review

After peer-review (improved points)

Review Comments (CAR - Critical)

- The maps used to produce "Factor Maps" and the corresponding sources using VM0015 together with a flow-chart diagram illustrating how the "Risk Maps" is generated are not found in this PD.
- The evidence that the most accurate deforestation "Risk Map" was selected fulfilling the requirements. It is not clear in the PD that the best fit assessment for the prediction map was performed.

Resolution (OK)

 According to VM0015, deforestation "Risk Maps" were revised and re-prepared; see next page.

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3 Quantification of GHG Emission Reductions.. and 4 Monitoring





[Discussions]

The consultation meeting on REDD plus Project Description for JICA PAREDD Project took place on 30 October 2014 at Vientiane Plaza. The meeting was chaired by Mr. Khampahy MANIVONG, Deputy Director General, Department of Forestry, Ministry of Agriculture and Forestry. There were twenty four participants from the relevant government agencies at the central levels (in particular the Ministry of Agriculture and Forestry and Ministry of Natural Resources and Environment).

The discussion session aimed to verify the draft PD in key points: (1) Permission for implementing REDD plus Project and (2) Benefits share among Lao PDR and between Lao PDR and Japan;

Permission for implementing REDD plus Project: Lao PDR have not arranged such institution, law or regulation. Then when REDD plus project is started by investor from oversea countries, alternative agreement will be necessary. Especially from experiences in other countries including Vietnam and others, one of the options is a Memorandum of Understanding between investor (Japan's enterprise company) and Lao PDR (Central or Provincial Government). As Lao PDR, past example of the MoU, which Japan's enterprise company had with host countries will be essential to consider future institutional arrangement related to REDD plus project. Also all participants discussed about example in Indonesia which already had permission system according to the Ministry of Forestry, and all participants agree to consider such institutional arrangement for promoting REDD plus project by collaboration with developed county and/or investor companies.

Benefits share among Lao PDR and between Lao PDR and Japan: All participants understand impotency of the benefit share among all stakeholders (Central Government, Provincial Government, District Government, village authorities and so on). Lao PDR had not established such institution, but all participants understood such impotency. Also regarding benefits (GHG emission reductions) between Lao PDR and Japan was discussed. As Japan's side (Japanese enterprise company), it will be helpful to decide quantitative

procedure of the GHG emission reductions, because their investing activities will be based on such decision. All participants understood impotency of the benefits share between Lao PDR and investor.

Materials for Introducing REDD plus and Activities of PAREDD

[Biomass survey]

Introduction of Biomass Surveys



[Fundamental direction of REDD plus]



[Importancy of the REDD plus in Lao PDR]

