Practical Guideline



Community-based management of natural bamboo forests

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Éditions du Gret

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A Six Years Case Study in the Lao PDR
Houaphan Province

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Content

Acronyms and abbreviations

BBTF	Bamboo Task Force
BSO	Bamboo Service Organization
CIFOR	Center for International Forestry Research
CLT	Communal Land Title
CM	Combined Method
DAFO	District Agriculture and Forest Office
DLMA	District Land Management Authority
DOIC	Department of Industry and commerce
DONRE	District Office of Natural Resource and Environment
DPI	Department of Planning and Investment
E&D	Experimentation and Demonstration
FM	Forest Management
FMP	Forest Management Plan
FPIC	Free Prior and Inform Consent
FSRC/NAFRI	Forest Science Research Center/National Agriculture and Forestry Research Institutes
GDP	Gross Domestic Products
GIS	Geographic Information System
GIZ	German Cooperation
GPS	Global Positioning System
Gret	French iNGO: Professional for fair development
ha	Hectare
HH	Household
iNGO	international Non-Governmental Organization
IRD	Institut de Recherche pour le Développement
kg	Kilogram
Lao PDR	Lao People's Democratic Republic
LF	Labor Force
LUP	Land Use Planning
LWU	Lao Women Union

m	Meter
m^2	Square meter
MAF	Ministry of Agriculture and Forestry
NAFRI	National Agriculture and Forestry Research Institute
NGO	Non-Governmental Organization
NLMA	National Land Management Authority
NPA	Non-Profit Association
NRM	Natural Resources Management
NTFP	Non-Timber Forest Product
NUDP	North Upland Development Program
PAFO	Province Agriculture and Forest Office
PC	Production Capacity
PG	Producers group
PGC	Producers Group Committee
PLF	Permanent Labor Force
PLMA	Provincial Land Management Authorithy
PLUP	Participatory Land Use Planning
PONRE	Province Office of Natural Ressource and Environnement
R&R	Rules and Regulations
SNV	Netherlands Development Organisation
t	Ton
TLF	Temporally Labor Force
VBC	Village Bamboo Committee
VBF	Village Bamboo Fund
VC	Value chain
VDP	Village Development Plan
VLMC	Village Land Management Committee
VFMT	Village Forest Management Technician
V	Villagers
VV	Villagers Volunteer
Wd	Working day
y	Year
Z	Zone of the bamboo forest

Definition

Density: Cover of bamboo in the forest.

Plot: Identification and delineation of the bamboo plot in the village territory.

Subzone: Sub area in the plot that is divided according to the density or the shoots size.

Sample plots: Plots with common size to be surveyed in the forest.

Allocation: Assignment or distribution of the bamboo plot to the village.

Village production capacity: The quantity that a village can collect and process, based on the number of village's labor force and time spent on specific bamboo production activity.

Forest production capacity: The quantity that the identified forest plots can produce.

Forest production capacity for a sustainable use: The quantity that is available in the forest and can be collected and processed in a manner that does not destroy the forest or its regenerative capacity.

Free Prior and Informed consent: The principle that a community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use.

Current Land Use: Zoning of the village's land based on village's activities.

Preface and Introduction

Preface

by Jean-François Kibler

Promoting and supporting the process for developing "sustainable and fair" bamboo-based value chains from villages' forests.

This practical guide has been developed for development practitioners and those wishing to develop such value chains. It provides "key methods" based on the analysis of the experiences derived from developing the bamboo sector in Houaphan Province, a mountainous province situated in the northeast of Laos. These lessons-learned and experiences, cumulated since 2010, has been documented within this guide by Sara Melki (Project manager) and the "Bamboo" project Team. Culminating from the efforts of Gret, together with villagers and provincial authorities, this guide is a reflection of how this process was conducted, experienced and perceived in the field.

It shows and illustrates in a remarkable way, how the support given through this innovative collective learning process enabled the actors of these bamboo-based value chains (villagers, private and public sectors) build together sustainable value chains. Now, these value chains can generate significant annual incomes, with 2015 estimation at more than half a million US Dollars for 2,800 families, representing an annual additional income of 200 US Dollars per household. Within Lao PDR, this represents the equivalent of almost twice the minimum wage and the equivalent of the cost to support monthly consumption of a 6-person household.

This guide shows how the development of these bamboo-based value chains, and particularly the sustainable management of natural bamboo forests, relies first on the villagers, their empirical knowledge of bamboo forests and their know-how, were cumulated through discussions and cooperation established between villagers, the Government and the private sector. This development was made possible through the "Provincial Bamboo Sector Development Strategy for 2011-2015", which impact was amplified through the establishment of exchange, experimentation and trial and error based learning mechanisms.

- The first part of this Guide outlines the learning approach adopted by the Project. After recalling some specific characteristics of these "giant grasses", particular highlights will be laid on the potential of these forests for the socio-economic development of Laos, emphasizing farmers' roles as the heart of the value chain development. A more detailed description of Houaphan province provides a better understanding of the context in which the experience of developing this sector has been conducted since 2010. Finally, this first part thoroughly introduces the concept of participatory learning loop, illustrating the tools and methods that were produced to be essentially applicable toward sustainable forest management while remaining crucially relevance toward the development of the value chains.

- The second part of this Guide, in detail introduces a more practical way, methods and tools developed by the Project Team and key players of these value chains during the innovative learning process. Presented in the form of guidelines, these proposed tools cover four thematic areas: the development of forest management plans in the villages, the development of experimentation and demonstration plots (E&D) on forest management techniques, the annual village assessment of the rules' compliance and their impact on bamboo forests and finally, the formation of village producer groups. These documents are practical due to their educational aspect as exhibited through the Project team's thoroughness of detailing each step and calculation methods. Altogether, this proves that the support given to this learning process is quite demanding, leading to the development of specific methods and tools that appropriately responds to the living conditions and needs of the actors of these value chains. Of course, while the techniques used may not be entirely innovative (3D maps or role-playing games), their inherent innovation rests in the way the methods were developed, such as the collaborative process designed to be direct-to-action while utilizing continuous exchanges between the different value chains and the Project team.

This guide does not claim to offer "turnkey solutions" with easy and encompassing applications. Instead, these solutions must be tested and adapted to best fit with the local context, the configuration between natural resources, the existing linkages between the players involved in the whole value chain process, the relations between producer groups and Government officers, and the regulations and informal practices, etc. Most crucial is that methods must at least take into account the needs expressed beforehand by the value chain actors.

In a more relevant but also more ambitious way, this guide invites readers to understand the benefits and challenges of a collective learning approach for developing sustainable and socio-economically balanced value chains. This guide is only the beginning paving the way for anticipated development of future practical guides by other actors and in other places.

Why this guide?

The goal of the "Bamboo Project" implemented since 2010 by Gret in Houaphan province is to reduce poverty of local populations and preserve natural forests. It is based on the assumption that the development of Bamboo-based value chains reliant on natural forests will contribute to the achievement of these objectives.

Like any "sustainable" development project that sought to combine social, economic, environmental and governance criteria, actions to be undertaken encounter immediate and specific constraints that are related to bamboo natural resources and to the role of village "communities" in the management of these resources, especially in identifying land and customary rights.

Taking into account of these constraints, this Project is designed to develop value chains in a "sustainable" and "equitable" way for all actors and at all levels. To do so, some tools to support the collaborative learning process on bamboo management have been designed in order to strengthen producers' capacities in managing bamboo forests and better articulate them with other stakeholders in the value chain, Government officers and private sector. Therefore, the challenge for this Project has been to develop and progressively implement management tools that would take into account the participation and consent of producers and public and private sector actors, to enable a fair competition between economic actors.

This guide describes the collective learning approach adopted by the Project to support the achievement of the value chain development objectives. It presents some developed methods and tools, especially methods for forest identification, inventory, control, experimentation, demonstration and the formation of producer groups. Applied first in Lao PDR, this guide can be useful in other situations or even for other natural resources.

Local challenges and methods to develop bamboo-based value chains

Challenges related to the development of bamboo-based value chains in Laos

› Bamboo and natural resources in the economy of Laos

Lao People's Democratic Republic is a tropical and subtropical country located in Southeast Asia and surrounded by five other countries: Myanmar, Cambodia, Vietnam, Thailand and China. Its population is nearly seven million inhabitants, making it the least populated country in Southeast Asia.

Laos heavily relies on an agricultural economy: the population is comprised of 70% of rural population whose livelihood earning relies on agriculture and the use of natural resources. The natural forest covers around 9.5 million hectares out of total national surface area of 24 million hectares. The natural bamboo forest occupies around 0.5 million hectares (2.3%), supporting fifty different bamboo species, of which thirty are used for commercial purposes.

Estimation in 2000 identified the substantial economic benefits derived through natural resources to be between 20 and 30% of the gross value added for the country (Foppes and Ketphanh). For the Government, these natural resources represent a real treasure for the economic development of the country and are seen as means to speed up the country's access to the rank of regional economic power. Long considered as an unattractive country from an economic viewpoint, Laos relies now on its comparative advantage of exploiting these resources that are widely depleted in neighbouring countries. Through concerted diplomatic relations with these countries, Laos introduces itself as an economic and diplomatic hub in addition to serving as a platform for burgeoning foreign investment strategies. In this sense, the boon associated with valuable natural resources is also recognized as contributors to multiply power struggles and rivalries. The countering effect between these tensions and developed policies to attract foreign investors have resulted partially or wholly to the granting of land concessions of limited duration for the development of – among other activities – hydropower and mining activities, which represent a high percentage of the gross domestic products (GDP), as well as industrial production of rubber and bananas.

Frequently used for food, as building material and processed into handicraft products, household utensils such as chopsticks, drinking cups, etc., bamboo is a crucial source of complementary income for farming families. Through bamboo, generated incomes can amount up to 200 US Dollars/year/family, as observed with the development of the Bamboo-based value chain in Houaphan province. This additional income represents the equivalent of 1.5 to 2 months of minimum wage or equivalent to the cost to support monthly consumption of a 6-person household. At the national level, the forest sector contributes to 3.2% of the gross domestic product (GDP) and represents 25% of the net exports in 2001. In 2011, the trade of bamboo products is estimated to be about four million US Dollars, making its business value interesting to domestic and international manufacturers.

Bamboo, a giant grass with poorly known cycles

› A giant grass

Bamboo is a grass - just like wheat, rice, palm or reed - hence its name of "giant grass". It is part of the angiosperms, or flowering plants and belongs to the class of monocots, in the Poaceae family or a grass in the Bambusoidae subfamily. Without any real trunk, and in the absence of secondary growth wood, it sometimes develops an arborescent ligneous stem. Unlike trees, bamboo doesn't become "larger" with time. The size of a culm is determined from the day a fully developed shoot appears and the culm grows in height, with little to no additional growth to its diameter. Change occurs in the composition of fibers of a culm with aging directly corresponding to increased fiber dryness until hardened state. From an ecosystem viewpoint, bamboo is an easy growing plant, adaptable to any kind of soil, even the most degraded ones, while restoring the soil it inhabits. As bamboo growth rate exceeds other tree species, bamboo forests exhibit greater biomass than any ligneous forest.

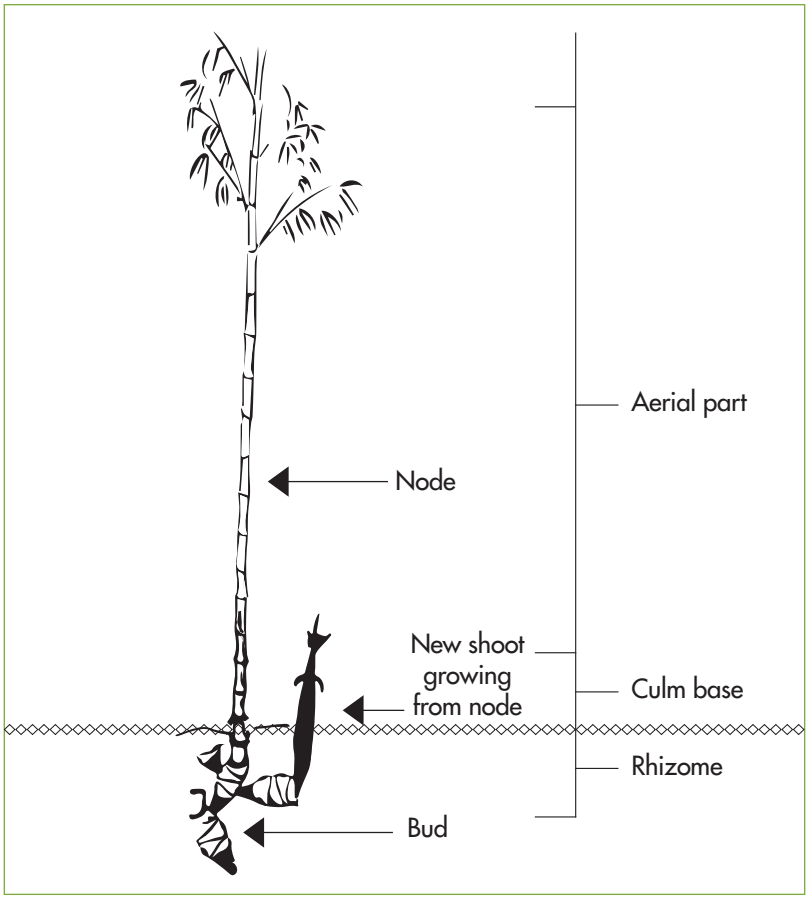
Bamboo, considered a non-timber forest product (NTFP), is subject to some regulations or standards imposed by forestry departments for timber in addition to specific legislations related to quotas. In Laos, a quota is an authorization given by the State to a company who is then entitled to purchase a quantity of non-timber forest products or wood in some specific areas. It imposes a limit on the purchasing volume in a designated collection area that is assigned to the company.

Bamboo grows in many natural or man-made ecosystems. These provide food and basic necessities for consumers, as well as several environmental "services" such as flood control and reduction of soil erosion on sloping grounds or along rivers. Possessing phytoremediation characteristics, bamboo is also used for sewage treatment or as windbreaks.

› A fast regenerating properties

The bamboo anatomy consists of three parts:

- The aerial part (the culm).
- The culm base at the ground level.
- The underground part: rhizome.



Different parts of bamboo

Bamboo has several root systems: the sympodial, monopodial and mixpodial systems. The sympodial system is characterized by a rhizome in compact and tufted culms. The monopodial bamboo (the runner) is characterized by rhizomes extending horizontally, with culms growing in a very scattered state. The diversity of bamboo root systems provides different settings from one forest to another.

Bamboo rhizome is special in the sense that it can regenerate very quickly. Bamboo produces shoots that become new culms in the year, and become mature after three years. If a shoot is cut, another bud will grow. An interesting characteristic of bamboo that contributes to the forest cover preservation is that during the bamboo season, the rhizome produces shoots indefinitely (according to farmers). In case of sustainable management, forests are not clear-cut, and only mature culms are extracted for commercial purposes.

› An unpredictable resource

Bamboo flowering, an exceptional phenomenon caused by unexplained factors, can occur when the culm is between fifteen and one hundred years, depending on the bamboo species. Difficult to foresee, it leads to the bamboo's death. All the bamboos from the same species blossoming at the same time will almost completely disappear from the landscape after flowering. Bamboo is therefore an unstable and unforeseeable plant, with resources that can disappear from year to year. Although no scientific study has explained the reasons behind bamboo flowering, village elders can nevertheless predict this phenomenon within a few years. Scientists don't know either the reasons why one bamboo species can blossom in a specific place and not in another one.

In summary

- Bamboo is an abundant resource, with very diverse and heterogeneous species in terms of spatial distribution and physiognomic and physiological characteristics present in mixed forest.
- Scientific knowledge about these characteristics must be further studied, especially on the unpredictable rate and episode of flowering.
- Always used by rural "communities" of Laos, and even in Southeast Asia, bamboo contributes to the forest continuity thanks to its fast renewal feature.

Challenges related to the management of community-based bamboo forests

Through this Guide, we believe that the sustainable development of bamboo-based value chains, preserving both farmers' benefits and the environment, can be achieved if producer groups can control the forest management and resolve multiple challenges faced by the value chains.

If the governance systems of the bamboo-based value chains are varied, the natural resources will be preserved, managed and protected thanks to the great value given to the community. To further develop these value chains and on a long-term basis, relations between actors must be balanced in order to create the space for most equitable multi-actor negotiation. While the "community" in Laos is in the most suitable position to manage its own resources, the lack of recognition by the State of the "community" rights and legitimacy, makes it a fragile actor in these negotiation processes. One of the main challenges of this project in developing bamboo-based value chains for all actors and at all levels is strengthening the "community" level.

In order to get a better understanding of the governance issues and relations between producer groups and other actors in the value chain such as the Government, we will shed light on rural governance and its relations with the Government of Lao PDR in terms of natural resources and forest land management.

› Specific context of the natural resources management

Laos is governed by a single Marxist-Leninist Party-State for nearly forty years, the Lao People's Revolutionary Party. According to a saying, "Pak si nam, lat nam pha, pasason pen chao", the Party shows the way, the Government directs and the People leads. Government and Party are inseparable forming a Party-State that designs and applies public policies.

Although organizations that exist from the national to the "community" level make up what is considered to be a civil society, they remain dependent on the Party-State. However, there appears to be recognized signs of a more autonomous civil society. The Constitution offered a first opportunity for civil society to exist since 1991. From 1997 to 2000, the legal framework started to be developed, with the issuance of two decrees favourable to the recognition of civil society. In 2003, the Law on Local Administration recognized that social organizations have a significant role toward the country's development. In collaboration with nine ministries, in 2008, the Public Administration and Civil Service Authority were mandated by the Prime Minister to prepare the draft of the National Decree on Civil Society, a decree which remains under discussion until now. In 2010, 51 associations and four foundations were registered.

Despite these first hints of recognition, the Party-State continues to hold tight control over agricultural and investment policies and resources distribution at the local level. This has restricted the opportunities for civil society and local actors in their decision-making process and management of their natural resources. The implementation of combined policy to attract investors and the policy to set-up of "quota" on bamboo trade has become a barrier to the valuation process of local communities. The quota policy is supposed to ensure a control of the quantity of bamboo collected in order to avoid any overexploitation of bamboo forests, and to forecast the annual state revenues through tax collection. This policy is not related to the actual availability of bamboo nor the production capacity of villagers. In fact, the allocation of quotas to investors is exclusively decided by senior Government officials without the involvement of village communities. The quota system helps the Government to forecast taxes it will manage to collect. Moreover, as seen today with the actual geographic breakdowns made for investments, this system has afforded entrepreneurs monopoly over the natural resources and villages.

› Unequal forest tenure rights

Forest legislation in Laos is clear: the State has the ownership of the forests. According to the Government and donors' logic, a resource classification would support the development of a market economy. Since 1990, experimentation was initiated on the implementation of land management plans accompanied by the allocation of lands to farmers. The rural "communities" then relies on an agricultural and forestry crop-livestock system for food self-sufficiency. Their members are organized into institutions responsible for regulating equitable access to land through well-defined rules and allocation of individual rights that would support the enhancement of farmers productivity. Supported by FAO and the Swedish Cooperation, the land allocation process was extended in 1994 and upscale to the whole country. It included land zoning and the publication of maps and documents which, once endorsed by the village and District authorities, serve as a contract granting land tenure rights to farmers. Although zoning techniques do not give any consideration to customary practices of rural populations, this is nevertheless the first time that farmers have official recognition by the State on their right over land. However, in the absence of a judicial system or regulation of independent conflicts compounded by absence of a structured civil society, the Government could freely interpret existing public policies to fit varying agendas while un-encumber to fulfill its promised obligations, especially those requiring technical support. Instead, without technical follow-through, the Government encourages people to self-manage and use resources in an "effective" and "sustainable" way, delineating a clear and precise zoning of the exploited village areas. With such unbalanced power relations, the land allocation process does not ensure the tenure of individual, collective or communal resources of the communities. Finally, people who have links with political bodies at the national, provincial or district level, can bypass these local agreements,

consequently limiting the legal rights of "communities" to use and manage lands. Therefore, the Government land and forest policies are seen to have overly strong impact on the customary land management system of "communities" in Laos.

While legislation about land has contributed to the institutionalization of village forest management, it has not allowed "communities" to take ownership of the planning process for resource management. Where land allocation has been implemented with the purpose of combating poverty and deforestration, it has most often led to the impoverishment of the most disadvantaged farmers and has increased inequalities within villages.

In summary

In theory, a situation where a few steps towards the legal recognition of civil society in Laos are made would be favourable to the recognition of the villagers' role in the management of bamboo forests.

In practice

- The application of quotas and trade procedures for natural resources (and bamboo) create disadvantages to the development of bamboo-based value chains;
- The zoning techniques used for the allocation of land tenure and exploitation rights to farmers, do not take customary rights into account and do not secure tenure of individual, collective or communal resources.

=> Considering the current legal and technical aspects, there still needs to recognize and secure rights to allow exploitation of forest resources by farmers for commercialization purposes at the village level.

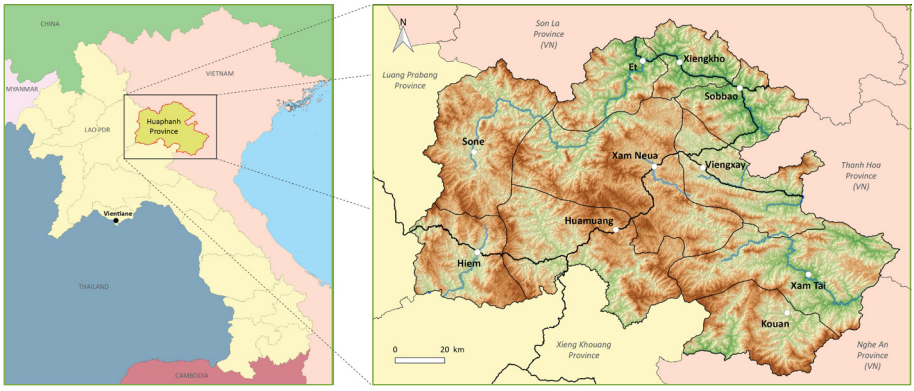
Development of bamboo-based value chains for farmers in Houaphan province

Bamboo in Houaphan province

› Houaphan province

Houaphan province is located in the northeast of Laos. Sharing borders with Vietnam, Houaphan province is a rugged mountain area and not easily accessible from remote urban areas. The province has three seasons: the rainy season, the dry and cold season and the dry and hot season. It is one of the less developed provinces in the country, with a poverty rate estimated to almost 40% in 2013.

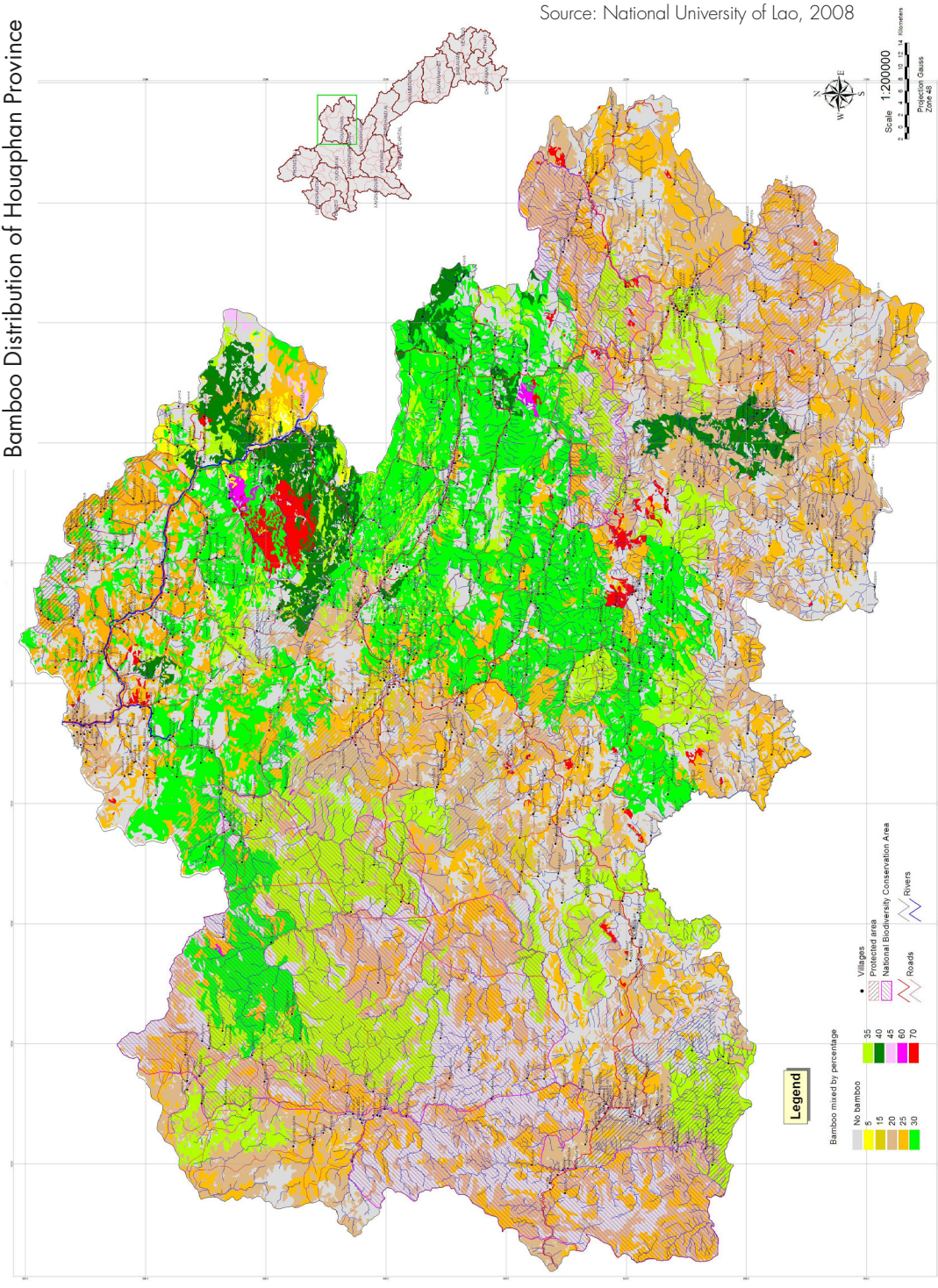
Local people mainly earn an income from livestock rearing, agriculture production and non-timber forest products (bamboo, rattan, cardamom, benzoin, etc.). The province has abundant natural forests with mixed forest area where bamboo can be found is estimated to be over 508,000 hectares. The forest surface area exclusively composed of bamboo is estimated at 17,870 ha or a total of 77 million bamboo culms (Lastamy and Somvang, 2006). These natural resources are real treasures for the development of the province, so one of the challenges is supporting the economic development of these resources while respecting all social, environmental, cultural and good governance aspects of sustainable development. Particularly as the region and its society remain free to industrialization, but in process of being industrialized, it is crucial to integrate all these different aspects at the earliest stage, in order to maintain a sustainable preservation of natural resources.



Geography of Houaphan province, Lao PDR

Bamboo Distribution of Houaphan Province

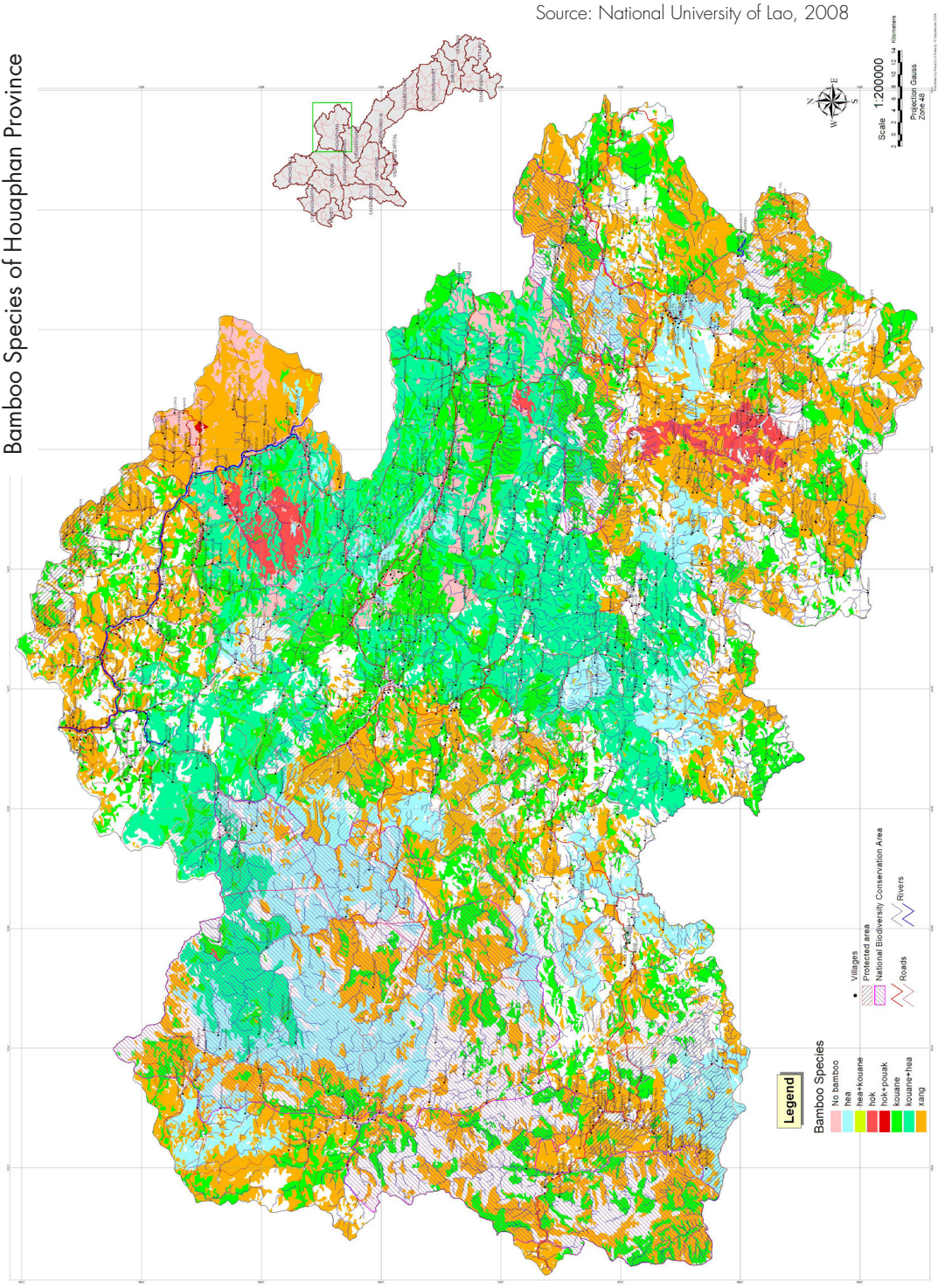
Source: National University of Lao, 2008



Mixed bamboo forests in Houaphan province

Bamboo Species of Houaphan Province

Source: National University of Lao, 2008



Distribution of bamboo species in Houaphan province

› Natural forest diversity

Forest in the North of Laos is an evergreen forest, where bamboo grows on often depleted lands of secondary or even tertiary forests. The different species are distributed according to altitude, climate, soil and agricultural use of the land.

The natural distribution of bamboo species is uneven, as the map on the concentration of bamboo trees in Houaphan province clearly show this large concentration existing in natural forests. Some of the forests have a higher density compared to others, even on a same forest plot. Such map indicates that bamboo distribution is subject to rapid expansion and changes due to the shifting cultivation practices of farmers, and the flowering of some bamboo species such as Mai Hea and other sub-species of Mai Hok. This map also well documents the unequal distribution of these resources in different communities, which might lead to conflicts between villages on the land use and varying access to resources.

› Bamboo species diversity

There is great bamboo species diversity, as illustrated in the map (figure above). Some exploited species are not listed. The distribution of species in a specific area leads to the development of "management hubs" as zoning is not always consistent with the administrative breakdown, which makes institutional management more complex.

In Houaphan province,among the thirty species listed in Laos, six are mainly used for commercial purposes. In terms of physiognomy, these species have different characteristics: rhizome, stem length, diameter, thickness, internode length, thorns, leaves and branches.

› The multiple uses of bamboo

The physiognomic diversity of these species offers several ways in giving more value to bamboo. Bamboo goes through a value-added manufacturing process for commercial purposes which can be divided into two categories:

- For consumption as food (bamboo shoots).
- For the production of household utensils (handicraft, furniture, sticks, chopsticks, pulp paper, etc.).

Financial incomes from these bamboo activities are not permanent and depend on the physiological aspects of the bamboo species.

Physiognomic characteristics of bamboo species.

Species	Type of rhizome	Physiognomic characteristics
Mai Hok – Dendrocalamus hamiltonii	Sympodial	Culm height: 12 to 18 m. Large diameter: 6 to 8 cm. Thickness: 1 to 2 cm. Average internode length: 33 to 40 cm.
Mai Kouane – Dendrocalamus longifimbriatus Mai Hia – Shizostachyum virgatum	Sympodial	Culm height: 14 to 17 m. Diameter: 4 to 6 cm. Internode length: 50 to 120 cm.
Mai Xang – Dendrocalamus brandisii	Sympodial	Culm height: 10 to 15 m. Twisted and thorny stems.
Mai Khom – Indosasa sinica	Monopodial	Culm height: 10 to 15 m. Diameter: 4 to 10 cm. Grows in cold weather.
Mai Dja ou May Lan – Sirundinaria microphylla	Monopodial	Culm height: 7 to 10 m. Thin and straight culms. Diameter: 2 to 4 cm. Internode length: 39 to 63 cm. Grows in cold weather.

Source: Lao Bamboo Book IDCR and DoF, 1994.

The commercial use of different bamboo species

Bamboo species	From the forest...	... to the product
Mai Hok • Dried bamboo shoots used as food. • Potentially processed into chopsticks.		 Harvesting period for bamboo shoots: august and september.
Mai Kouane **Mai Hia** • Sticks. • Handicraft products.	 Harvesting period for bamboo stems: November to July.	 

Source: Khamsay, Sara Melki,Gret.

N.B.: *There are more bamboo-based value chains in the province than those mentioned here, but the "Bamboo Project" only focuses on these five main value chains of high economic development potential.*

Bamboo species	From the forest...	... to the product

Mai Xang

- Paper pulp.

Harvesting period for bamboo culms: November to July.

Mai Khom

- Bamboo shoots.

Harvesting period for bamboo shoots: December to March.

Mai Dja

- Shoots.
- Furniture.

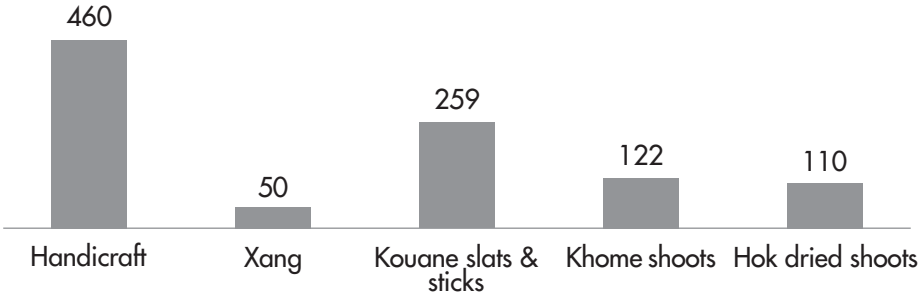
Harvesting period for stems: depending villages could be August to November or April to July.

Harvesting period for bamboo shoots: depending on early or delayed shooting villages. This can be March to End of May or May to August.

› An important economic potential

In the project-focused areas (three districts and approximately 70 villages and 2,800 households), in 2015, these value chains represent an average income of 200 US Dollars per household. It is the main source of cash income for households coupled with other non-monetary earnings that they receive from rice farming, livestock production and collection of other forest products.

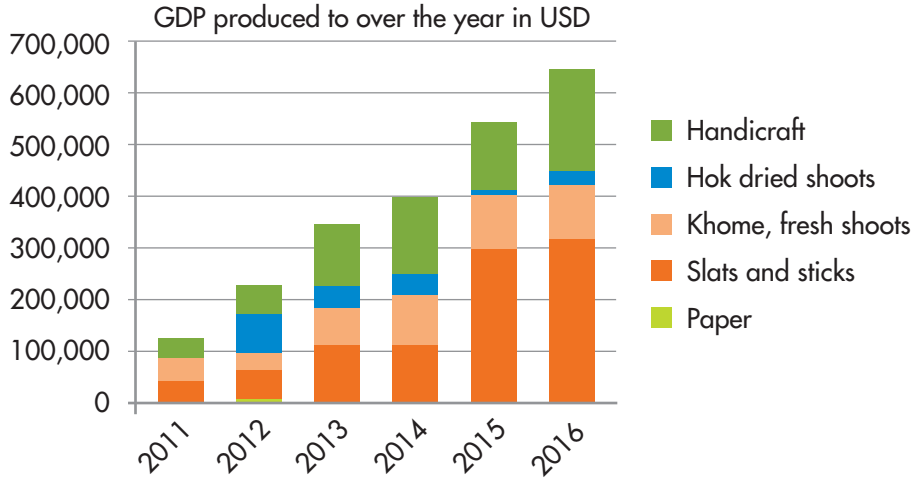
Overview of the average annual additional incomes from bamboo activities, per household, in 2015 and in US Dollars



Source: Bamboo Project, Gret

Finally, since 2011, value created at every step of each value chain has seen an increase demonstrating that the potential for bamboo development has not been fully exploited.

Value added per value chain from 2011 to 2016



Source: Bamboo Project, Gret.

Since 2011, the value chains have seen evident progress due to the remedial actions taken by the Government to create an enabling environment for the development of the Bamboo sector and to attract investors. Despite these actions that benefit the producers, they also impose greater pressure on resources' availability and introduce greater risks for overexploitation. Until now, bamboo forests for village communities have been under-utilized compared to their potential, essentially due to administrative restrictions or low availability of villagers for most of the year, as villagers prioritize their labour activities toward securing their daily subsistence. In 2015, only 5,700 ha[1] of exploited bamboo forest had a management plan in the three districts.

In summary

- Source of additional and temporary income for the rural populations in Houaphan province, bamboo has a strong economic potential and the development of value chains is experiencing significant progress.
- Now, the production capacity of forests is high. Their exploitation is likely to experience an increasing development while the social and environmental impacts are not much addressed.

=> The use of non-timber forest products in Laos is characterized by a strong potential for socio-economic growth.

The objective of the project: to support the development of farmer-based value chains

To support the sustainable development of value chains for non-timber forest resources in Laos, the project has to combine economic, social, environmental and governance criteria and define a framework of specific constraints for actions to be undertaken:

- Lack of knowledge about the biological rhythms of bamboo species (flowering), which makes it more difficult to define natural forest management rules.
- Despite some efforts that have been made, there is too little consideration and recognition of customary and property rights for communal lands, especially for forests.
- Unbalanced negotiation power between actors of the value chains.

1. Estimations made from the project and the District Agriculture and Forestry Offices of Sam Neua, Viengxay and Sobbao districts.

› A working hypothesis: a trial-and-error based collective learning

Several questions appear at this stage for Gret stakeholders. In a vague legal context, it is still possible to organize discussion workshops with value chains actors to address, in an iterative way, the formalization of mechanisms, tools and regulatory frameworks based on the acceptance of errors made. The question is to know if it is possible to rebalance negotiation terms that would benefit farmers. Another question is to know, as development practitioners, reliable methods and interactive tools capable of supporting the learning process and augment the emergence of new regulation modalities regarding natural resources by balancing power relationships.

› **We assume that the trial-and-error based learning process is the basis for a sustainable local development process.** This approach gives some flexibility to the implementation and thus amendable to respond to arising opportunities. The concept of "commons".

The conditions of a trial-and-error based learning approach for the definition of rules for the management of a collective property are spelt out with the concept of "commons" developed by Ostrom.

According to this concept, individuals can better create and preserve commons when they have reliable and credible information about costs and benefits of the resources and when they have the opportunity to decide about the rules of the game. Eight principles have been identified to increase efficiency and sustainability of the system of commons:

- Clear demarcation of resources.
- Clear membership rules for members.
- Relationship between rules and the appropriation of local conditions.
- The existence of discussion hubs for collective choices.
- The conduction of mutual evaluations.
- A graduated sanction mechanism.
- A conflict resolution mechanism.
- A State capable of recognizing local rights to organizations.

The inherent challenge of the project in developing bamboo-based value chains is rebalancing governance arrangements between all the actors and at each level of the value chain, by respecting the management terms related to the "commons" as mentioned by Ostrom.

Based on legal, technical, economic and organizational inputs, the main objective of the Project is to strengthen the "community" level. Producers interested in the utilization of bamboo resources are organized into production and marketing groups, managed by elected committees. From their side, village authorities will secure the management of resources by establishing rules and management plans for the commons. These rules are defined both based on the empirical knowledge of farmers but also on the analysis of the forest experimentation.

The approach of the project is, as we have mentioned, a collective learning approach "based on trial-and-error," through a multi-sectoral discussion with multiple actors facilitating a critical analysis of decisions and results. This type of learning works through the definition of rules based on experience, on their implementation and questioning, to reach further improvements through iterative experimentation processes. The reaction to errors is one of the best indicators of an organization's learning quality. The situation of the project is in fact never completely stable or linear, and the experimentation often leads to others, which are in turn sources of returns, challenging the method of intervention in a stimulating way. Learning takes place during meetings where information is shared or decisions made in discussion forums, places of controversies and deliberations to assert interests, which in turn crystallises a shared knowledge. As part of the project, discussions are being held between Lao authorities, the private sector and village "communities" ensuring everyone's interest is expressed in a shared vision: economic development via the bamboo sector.

We must note that there is inherent difficulty associated with the learning process based on trial-and-error adopted by Gret, in which error is accepted and exploited in order to change working methods. This approach can be continuously subject to questioning during the project implementation. Time consuming, its implementation is never systematic and must always be adapted. Finally, development assistance is often under pressure to obtain quick results, and this makes it difficult to work on the institutional strengthening via this trial-and-error based learning approach.

Collective learning approach

This part presents the collective learning approach adopted by the Project between 2010 and 2016 to support the creation of bamboo-based value chains through the concept of "learning loops".

The key conditions for implementing this working method that is based on collective learning of learners are: listening, willingness to learn, analysis and valuation of empirical knowledge. This working method has contributed to the development of tailored working tools on forest management and bamboo-based value chain development.

After recalling about the prerequisites of such approach, we will first describe the typical and theorized sequence of a "learning loop". To illustrate this, we will use it to develop methods and tools used for a sustainable forest management (development of forest management plans, experimentation on management techniques, annual assessment of rules and their impact on forests), secure villagers' rights on their lands and develop accessible and profitable business models.

Collective learning: prerequisites and learning loops

› Prerequisites: create conditions for learning, under the umbrella of a provincial strategy

In 2010, at the request of the provincial Governor, NGOs[2] and provincial authorities met to reflect on the bamboo resource valuation exercise in Houaphan province. In 2008 and 2009, through the mapping on bamboo diversity and concentration in natural forests, the National University of Laos highlighted the potential of bamboo for the socio-economic development. After several visits to Vietnam and China, senior officials were convinced that the development of bamboo-based value chains can be an asset for poverty reduction in the province.

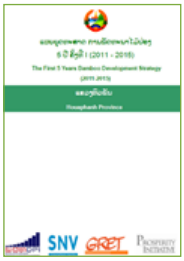
Under the lead of the provincial Governor, the various ministry departments working on forests and value chains met: the Department of Planning and Investment (DPI), the provincial Agriculture and Forestry Office (PAFO) and the Department of Industry and Commerce (DOIC). They formed the Bamboo Task Force (BBTF), a working group that aims to create an enabling environment of the bamboo sector by meeting to discuss the provincial bamboo sector development strategy.

2. SNV (The Netherlands cooperation), Gret, Prosperity Initiative.

The BBTF produced a strategy document called "The First Five-Year Bamboo Development Strategy – 2011-2015", which served as a framework for the development and sustainable management of the Bamboo industry in the province. The explicit objectives of the strategy are part of a national policy for the preservation of the environment and rural economic development. These objectives consist in developing:

- A sustainable management of bamboo resources.
- Bamboo markets.
- A stable political and institutional environment.

A second strategy 2016-2020 has been developed and approved by the BBTF for the second phase development of the sector.



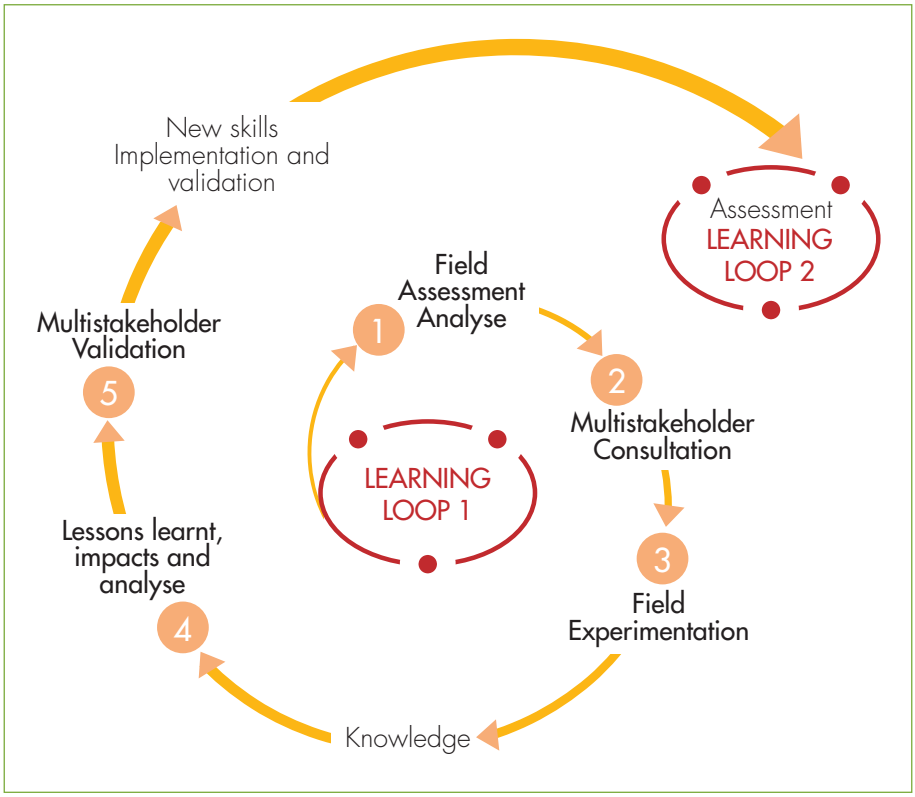
The First Five-Year Bamboo Development Strategy, 2011-2015.

Official and in line with the country's planning mechanisms, this Five-Year Provincial Strategy has been and continues to be valuable: it sets common objectives that the province intends to achieve, creates spaces for coordination and pilot (the BBTF is formalized), encourages and authorizes departments to work together, authorizes and encourages village authorities to promote value chains for bamboo collected from village forests and finally recognizes the supporting and accompanying role of the "Bamboo" Project. Under the umbrella of this strategy, Gret adopts and implements the collective learning process.

› The learning loop in five steps

A learning loop takes place in five steps according to the following diagram, theorized with Paul Sfez during the 5 years project's evaluation in September 2015.

Analysis of the collective learning process implemented by the Project



Source: Paul Sfez, 2015

The steps alternate between field activity, consultation meetings, experimentation, analyses, validation workshops, etc. with steps having a crucial role to play within the loop . One loop takes a minimum of two years to be realized.

Step I – Field: assessment of the situation

In the field, work is carried out in liaison with technicians from different departments. The assessment of the situation is based on the villagers' empirical knowledge of natural resources, their know-how and market analysis. Team members listen, ask

questions and learn from the farmers, before conducting their own analysis through holistic methods such as an agrarian diagnosis and market and value chain studies.

The project team describes the activity systems of the villagers and evaluates the bamboo sector as an economic activity. The evaluation and analysis of the situation make it possible to propose pilot methods at both technical and political levels, which are then discussed during multistakeholder meetings, especially in "value chain workshops". Field work is almost a permanent component of the project member's work, and always accompanied by technicians from the Agriculture and Forestry, Industry and Commerce and Environment offices.

Step II – Annual multistakeholder consultation meeting for each value chain

The Project has facilitated the organization of "value chain workshops"since 2012, covering cross-sectoral and sectoral topics. These workshops are organized each year, for each value chain (i.e, workshop for the Mai Khom bamboo shoots' value chain sold on the domestic market, another workshop for the dried Mai Hok shoots which are exported to Vietnam, etc.).

Each "value chain workshop" lasts one day and brings together all actors: villagers, producers, private sector and the Government. The "value chain workshop" facilitates linkages between people and knowledge.

During the morning session, the project team communicates information collected and analyses done on the value chain, presents topics for discussion, presents problems and formulates proposals for potential scenarios which are then debated, thus "feeding" the learning process. The other half day is dedicated to group discussion between actors and discussions on challenges identified in order to find an equitable solution for all.

Since 2012, the challenges identified included forest management and governance, forest security, the adaptation of public policies (taxes, quotas, and procedures), organization of products sale and price negotiation, quality of products and finally the collection of village taxes to feed the village fund. These workshops are real discussion and decision making arenas, offering the actors the possibility to find a consensus around a proposal and to agree to experiment on it.

Step III – Experimentations

In addition, experimentations are also conducted concerning new public policies, working methods, forest management techniques and the development of new processing and marketing arrangements (business model). These are implemented by the actors (villagers, producers, private sector or the Government) with the support of the Project Team.

Step IV – Analysis, lessons learned and improvement

The results from the evaluations of the experimentations give opportunity for developments that the sector's stakeholders may not have envisaged. The analysis of errors makes this possible, which suggestions for improvements could be made during subsequent meetings.

Step V – Annual multistakeholder meetings: validation

The analysis of the experiments is discussed during the annual "value chain workshops" involving all the stakeholders. Thanks to this learning "through error" method, public policies, business models and implementation methods are eventually adapted and validated by actors and provincial and district authorities. This validation is not only about the implementation and methods but also about the improvement of rules for the development of the sector. Once these methods and rules have been adapted and validated, the Project Team can scale and apply it to a larger number of villages.

If the project enables the creation of a space for discussion, the challenges, which are often sensitive in terms of public policies – such as quotas and taxes –, are subject to the goodwill of state representatives, who may, at their own pleasure, interpret the rules in order to adapt them.

The diversity of skills among the team members is a real strength, as this makes it possible to work with all value chains' players. Each discipline complements each other. Since the team members have different backgrounds (economics, agronomy, forestry), the interpretations can be diverse and the language used needs to be redefined each time.

All the information shared is carefully saved and used for the analysis and assessment of the value chains. Each actor, internal or external, must be able to think globally. The collective learning process encourages everyone to learn to think "collectively" without imposing his/her own vision and work with others through compromises and adjustments.

Implementation of learning loops for a sustainable management of bamboo forests

In this section, we show how, through the learning process, several tools and methods have been decided, developed and implemented to gradually create conditions for a sustainable management of natural bamboo forests. These methods are about the development of forest management plans, the implementation of experimentation and demonstration plots and the annual village assessment of management rules and their impact on bamboo forests.

› Loop I. The right to market non-timber forest resources

The right to use village forests for commercial purposes requires two compulsory stages: the identification and demarcation of bamboo forests in the village areas, and the participatory development of forest management plans (FMPs) in these bamboo plantations. The final product will be a management plan which, once endorsed by the district authorities, will concede to "communities", a right to use and market these resources.

Until 2011, the bamboo forest demarcation and the preparation of forest management plans were carried out based on the preliminary village land use planning, conducted by the Government technical offices. In view of the weakness of the village management plans carried out by the Government technical offices, the Project trains them on Participatory Land Use Planning (PLUP), a method developed by NAFRI/CIFOR/IRD[3] consortium (See PLUP steps below). Two teams work side by side, one on the village land use planning with forest demarcation, and the other on the development of forest management plans on bamboo forests. These two methods proved to be very time consuming compared to the rapid development of these value chains. In response, a method combining some elements about territorial planning and formulation of forest management plans, the "combined method" was then developed, experimented and approved.

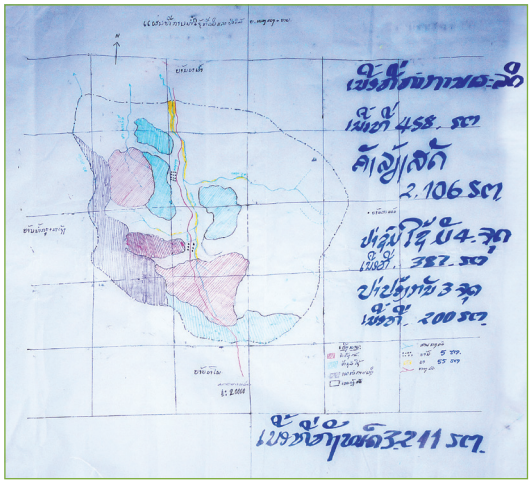
The preparation of forest management plans (FMP): a first method

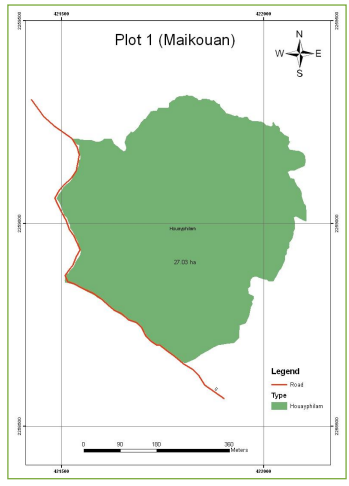
This method starts with the creation of a Village Bamboo Committee (VBC) which belongs to an official village governing body and whose mission is to prepare the forest management plan and ensures the implementation and respect of the management plan. The VBC guarantees the good utilization and management of forests by the villagers. The role of each member and rules are defined during meetings, while forests are identified and delimited with the VBC and technicians from the District Agriculture and Forestry Office (DAFO). A minimum forest inventory (1% of the identified and delimited plots area) is carried out in order to evaluate the production potential, and then households are allocated one plot of forest land. Each household counts and mark the number of culms present annually on their plot. This inventory helps to quantifying the number of stems that will be produced in the future. Simultaneously, the VBC defines rules for the forest management. The final paper (forest management plan) containing reports and maps, is then endorsed by the district authorities and gives right to the villagers to exploit these forest areas for commercial purposes. The table below summarizes the different stages of the task performed by the forestry team.

3. Established by NAFRI/CIFOR/IRD Consortium – NAFRI: National Agriculture and Forestry Research institute, CIFOR: Center for International Forestry Research, IRD: Institut de recherche pour le développement.

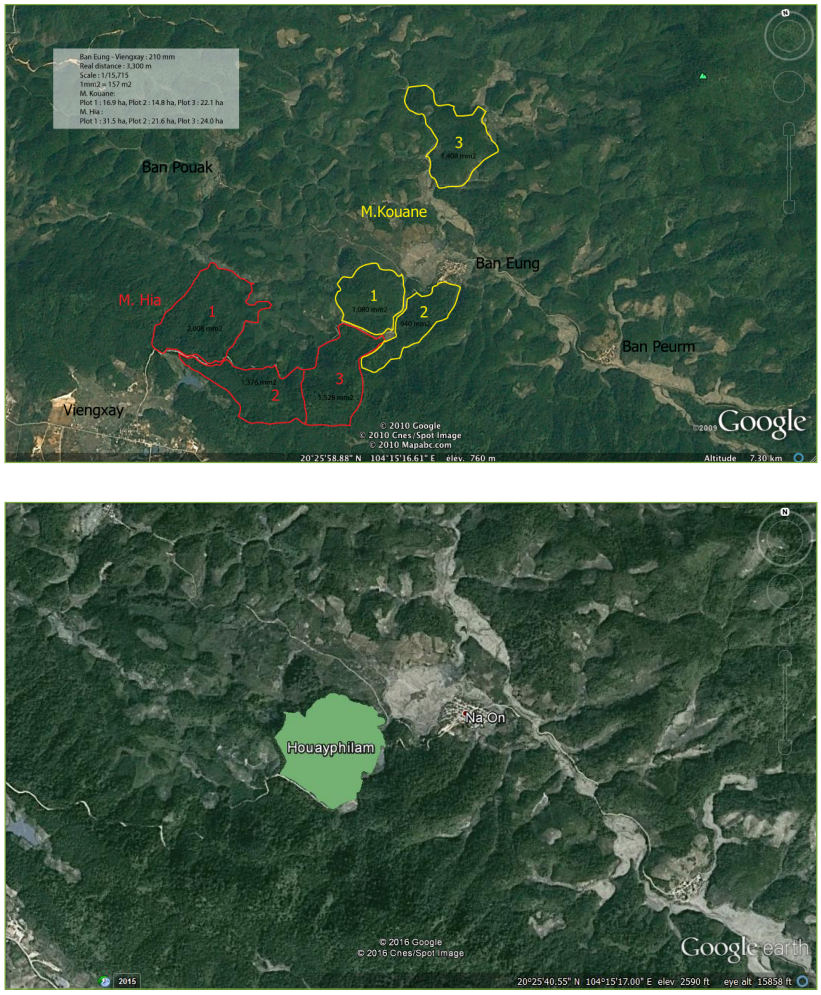
Eight stages of developing FMPs (2012)

1. Establishment of the Bamboo Forest Management Committee.
2. Identification of bamboo forest plots.
3. Demarcation of forest plots, GPS accuracy.
4. Forest inventory.
5. Resources allocation to each household by culms.
6. Inventory of the number of culms, cleaning, culms marking.
7. Definition of management rules and forest management plan.
8. Finalization of the forest management plan, approved by the District Agriculture and Forestry Office.





Maps of the delimited bamboo plot with a FMP in Eurn village, Viengxay District



Maps of the delimited bamboo plot with a FMP in Eurn village, Viengxay District

This experimental method is operational for the development of FMPs. However, it has two disadvantages:

- It is time consuming.
- It does not sufficiently ensure that the selection of identified bamboo trees is part of a village land use planning, and in particular, incurs the risk of creating conflicts with neighbouring villages located along the village's borders.

The development of a land use plan: a second method

As of 2011, the identification and demarcation of bamboo forests have been carried out during the village planning exercise, which includes a preliminary verification phase of the village limits. With technicians from DAFO and DONRE, the project team then develops a specific method to support the village land and forest management committees in the formulation of the "land use development plans at the village level". It is based on the Participatory Land Use Planning (PLUP) method, which uses innovative tools for Laos, such as the 3D map or role-playing game. The project team and technicians from DAFO and DONRE were initially trained on this method by participating for more than ten days to the implementation of a PLUP in a village of Luang Prabang, a neighbouring province. They then adapted the PLUP to fit with the situation in Houaphan province and to the development objectives of the bamboo-based value chains. In particular, this PLUP is also based on the results of the Participatory Rural Appraisal, conducted in 2009 in a few villages, and on the results of an agrarian survey conducted in 2011 in four representative villages. The method that was developed and presented to the provincial and district authorities during exchange workshops subsequently received authorities approval for its piloting.

Following a preparation phase for the tools, this method was tested on a first village in early 2012. It was then improved based on the first experimentation, and, in the same year, four new land use plans were implemented and endorsed by the Government authorities. This method has ten steps.

This method proves that it works and gives satisfying results in terms of forest identification aimed at being used for commercial purposes while mitigating conflicts that may occur between villages regarding resources. However, the implementation of this method is time consuming (between two and three weeks per village), and the forest management plan has yet to be developed.

The combined method

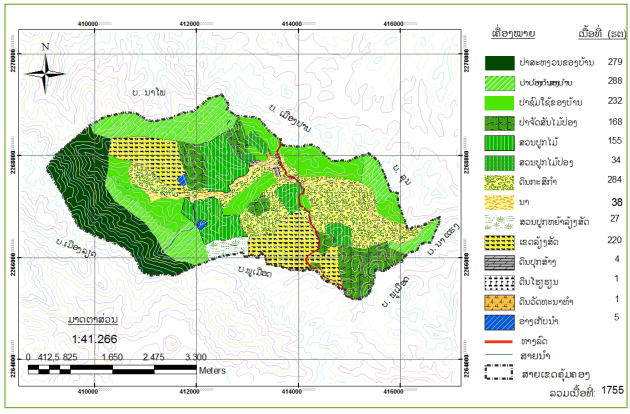
At the end of 2012, the increasing involvement of entrepreneurs in the bamboo-based value chains imposed increasing risk of over exploitation of the natural resource. It thus became urgent to boost the implementation of forest management rules, which normally involves the development of land use plans and forest management plans. Both methods (PLUP and FMPs) are considered to be too slow and complex, and difficult to adopt by the district technicians.

Twelve steps of the PLUP method developed and applied by the project in 2012

1. Construction of the 3D model.
2. Opening ceremony with the District authorities and election of the village land management Committee.
3. Delimitation of the village limits on a 3D map with the representatives of all villages and GPS inventory.
4. Delimitation of the current land use on the 3D map with the village committeee.
5. Village historical background.
6. Collection of socio-economic data for each village activity.
7. Collection of data on agricultural activities, cultivation systems, livestock production systems and use of non-timber forest products.
8. Role-playing games on spatial planning in order to achieve the development of a land use plan that would be the most efficient from a socio-economic viewpoint.
9. Demarcation of the village land use plan by activity zones on the 3D map.
10. Village land use planning, definition of the development plan, land use rules and regulations. Land use plan endorsed by the District Governor.
11. Creation of digital maps and panels.
12. Closing ceremony.

Thanks to a reflection exercise conducted at the end of 2012 during the "value chain workshops", a method combining PLUP and FMPs was developed: the "combined method." Shorter and easier to apply, it includes in a single sequence, the participatory bamboo forest allocation and the development of forest management plans.

3D Map



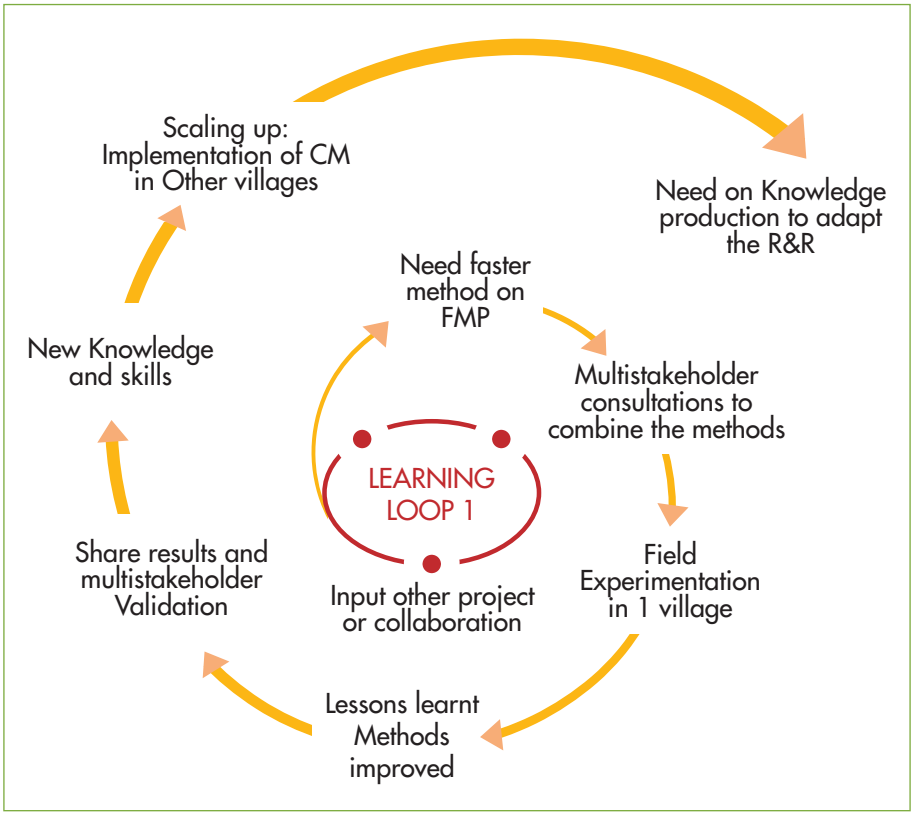
Digital Map

Panel

The first learning loop applied to forest management: a faster way to respond to the market development

During the provincial annual planning workshop, the method is approved in early 2013 by the provincial authorities who gave their green light for the experimentation. Technicians from DAFO and DONRE were then trained. Finally, sixteen plans were approved in 2013. In 2014, the provincial authorities adopted this method, based on the satisfactory assessment of the results.

Learning loop on land use planning methods and forest management plans for the development of the combined method
(Flow chart created with Paul Sfez, 2015)



Twelve steps of the combined method

Preparation: topographic map, material, team preparation, sending invitation letters.

1 Creation of a 3D map for the village.

2 Opening ceremony with the local authorities and election of the village bamboo forest management committee.

3 Demarcation of the village limits on a 3D map (GIS) + GPS points.

4 Demarcation of the potential bamboo forests on a 3D map, after a rapid diagnosis on land use, potential markets, tonnages and villagers' capacity to produce bamboo products.

5 Fields, GPS points and modification of the digital map via a mapping software.

6 Zoning in the plots identified earlier for the forest inventory.

7 Forest inventory.

8 Calculation and inventory data entry with the software in order to determine the forest potential, and present the results to the villagers.

9 Discussion on forest plot allocation (community, collective, individual status), and definition of rights, rules and regulations to implement regarding resources.

10 Preparation of 3 maps: panel, 3D, digital.

11 Preparation of the forest management plan.

12 Closing ceremony, presentation and request villagers and district authorities to endorse the forest management plan, rules and regulations. The forest management plan is approved by the District Governor, DAFO and DONRE and the villagers.

› Loop II. Knowledge development and adaptation of the management rules based on a trial and error based learning approach

In loop II, in response to the lack of scientific knowledge about natural bamboo management, some experimentation and demonstration plots were set up, followed by an annual village assessment of the rules and their impact on forests.

Experimentation and demonstration protocols

Management rules developed during the preparation of the forest management plans are essentially based on the empirical knowledge of villagers. In fact, academic knowledge in the forestry field related to the physiology and physiognomy of natural bamboos is still poorly developed in the world, and particularly in Laos. Therefore, there are no known and validated rules to ensure a sustainable management of bamboo forests, especially since different rules are applicable to different species based on how the species are used. Therefore the learning process is more reliant on farmers' knowledge.

In order to increase knowledge on forest management, in 2012, the Project invited the Forest Science Research Center (FSRC) to provide scientific expertise to reinforce the villagers' empirical knowledge. The Project asked FSRC to conduct an assessment of the different ways in which forests are managed or in the process to be developed in the villages, and to build a long-term cooperation programme that will provide answers to these two questions:

- Since forest management is a fairly new concept in Laos, is it be possible to explore and experiment several models of bamboo forest management?
- Since the technical steps for setting up a Forest Management Plan (FMP) is quite a long process, is it be possible to develop a model with faster procedures?

This is how the Project and researchers from FSRC decided to set up some experimentation and demonstration plots (E&D) to test and document several techniques for a sustainable bamboo forest management on five bamboo species (two plots per species).The FSRC researchers developed experimentation protocols with village volunteers and proceeded to conduct analysis of the results. The E&D plots were implemented in several villages. The measurements were regularly conducted by the villagers, under the supervision of the project team. Each year, the partial results were shared and analysed during the "value chain workshops". The protocols were implemented for several years, which meant waiting for at least three years before receiving the first exploitable results.

Monitoring-assessment and flexibility of forest management rules

Compensating for the slow pace of the E&D plots (whose results required a waiting period of at least a number of years) while boosting the formulation of management rules in villages that have not had any forest management plans (which requires a lot of time), the Project team proposed to villagers and DAFO technicians to

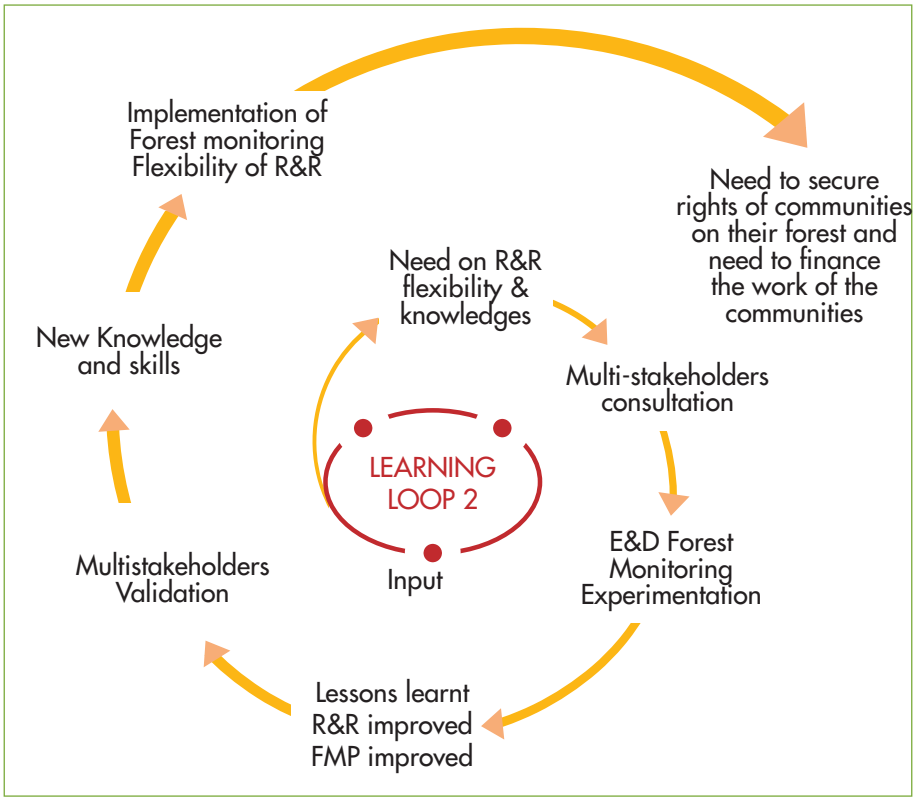
carry out annual monitoring/evaluation of the management rules and their impacts on the bamboo forests. These evaluations would be conducted before and after each bamboo season. This proposal was accepted by the villagers and authorities and contracts were signed between the village committeees, DAFO and the Project recognizing the villages' responsibilities on their forests. This enabled the management rules to evolve year after year.

This annual forest assessment is carried out by the village committeeee. The Committee receives a financial compensation as support via the Village Bamboo Fund, with is essentially derived from taxes the village collected from traders.

This annual forest assessment contributes to define the production quantities for the coming year. The idea is for this estimation to be correlated with the volume purchased by traders.

Second learning loop applied to forest management. Progressive improvement of rules and regulations on bamboo forest community-based management.

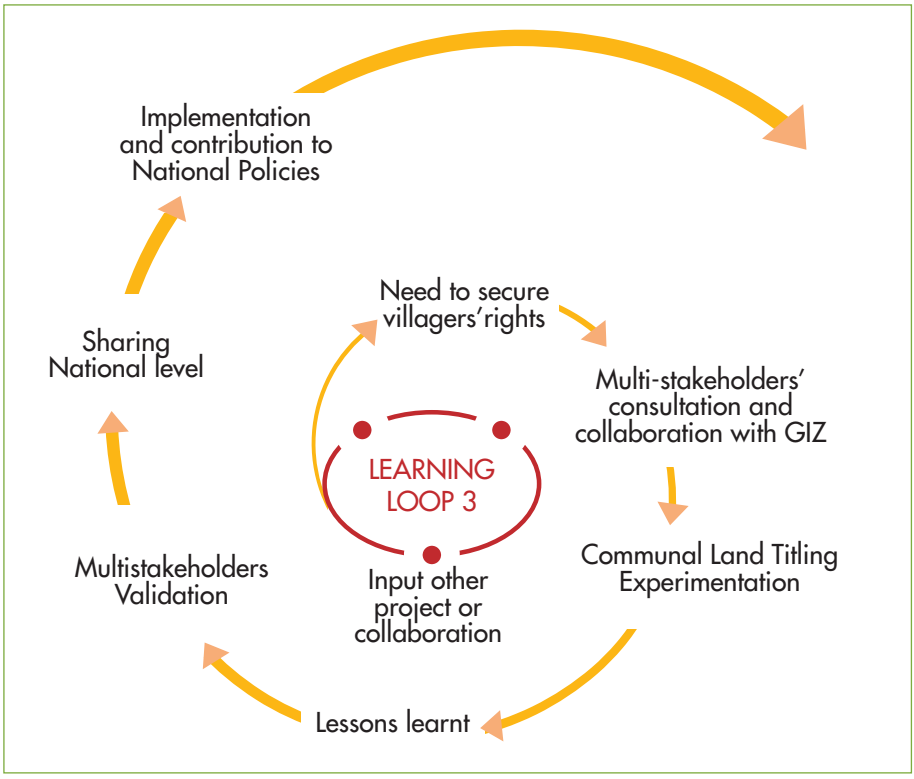
Second loop linked to the forest management



› Loop III. Securing tenure rights for the villagers

In order to secure exclusive tenure rights for the "communities", a land registration and titling process has been established, carried out in cooperation with GIZ Project since 2014.

Third learning loop applied to forest management - to secure tenure and exploitation rights of villagers on "communal" on bamboo forests



The Project have sensitized the Government on the protection of farmers' rights with respect to forests through the communal land registration and titling on natural forest and individual land titles on bamboo plantations. While permanent land titles on agricultural and forest land plots do not yet exist in the province, there have been other attempts to establish communal land titling in others. Some alliances have been made in this direction with relevant international and national organizations. In particular, alliance with the German cooperation, GIZ, has resulted in efforts to cooperate with the central Government on a land titling project for individual households.

Other examples regarding the implementation of learning loops

› Valorisation of resources and private sector's involvement in the resources' management

The business model

From mid-2012, teams started to reflect on a strategy for each value chain that was presented and discussed during the first value chain workshops. Using the analysis of the value chain logbooks, operators reflected on the best marketing model, or "business model", in a win-win approach, in order to generate incomes while ensuring the forests' protection. These value chain models, while being less risky for the resources, benefit all the actors. Together with the producer groups, teams have been considering the best model for developing bamboo activities within their village and continuing to work toward strengthening the negotiation power on prices. The selected model goes through the improvement of products' quality, which supports to increase prices by controlling the sampling. To do so, the team set up training sessions and tested tools and equipment. This incurs positive impact on natural resources management, while allowing for emergence of new markets, thus benefiting all actors in the value chain.

Organisation of the production and quality

Some business plans have been developed with producer groups and local traders for three value chains: dried *Mai Hok* bamboo shoots, fresh *Mai Khom* bamboo shoots and handicraft products.

While sensitizing the groups to the conditions toward economic sustainability, the *business plans* also revealed problems related to production quality, low prices and a lack of organization for supply. At the beginning of 2012, the team started to conduct diagnoses to assess the groups' needs. Subsequently, the team focused on strengthening the structuring of producers and traders groups. Study tours on village organizations were organized in several provinces and with coffee producers' cooperatives, located in Xiengkhouang province and in the Bolovens' Plateau.

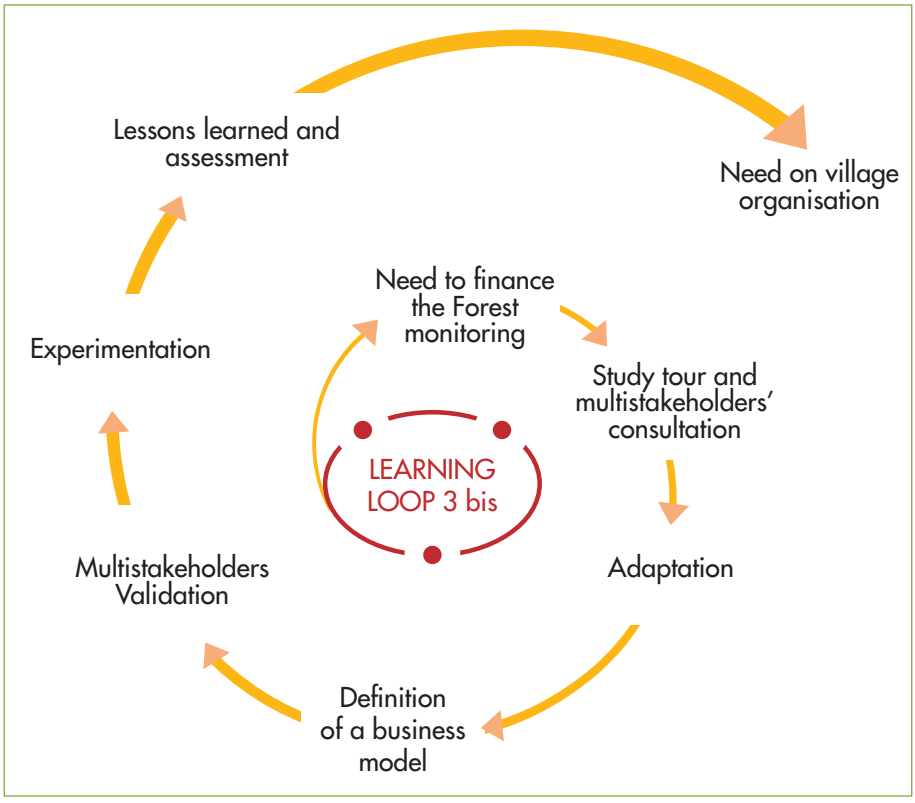
The groups then set up production management rules based on several rules studied, created logbooks to monitor and evaluate sales and started to collect village taxes from sold products which are used toward building up the villages' development funds. These funds help to cover administrative and salary costs related to the trade of bamboo products and forest management activities. These "model" villages have and continue to serve as examples for neighbouring villages and the team utilizes their representatives as sources of experience-sharing.

At the national level, traders organize around networks and try to set up a traders' network for the handicraft value chain and create a catalogue for the handicraft products of the three provinces. To overcome recurring issues with respect to product quality, the Project organized training sessions for villagers to work with producers

groups. Products often win quality prizes during trade fairs such as the successful giant sticky rice baskets manufactured in the province and garnering the prestigious national One district one production certification. The success has resulted in the handicraft products being considered the "flagship products" for Houaphan province, and fostering the expansion of the handicraft market throughout the country.

Another example about the development of a high quality dried bamboo shoots value chain.

Learning loop linked to the improvement of the business model



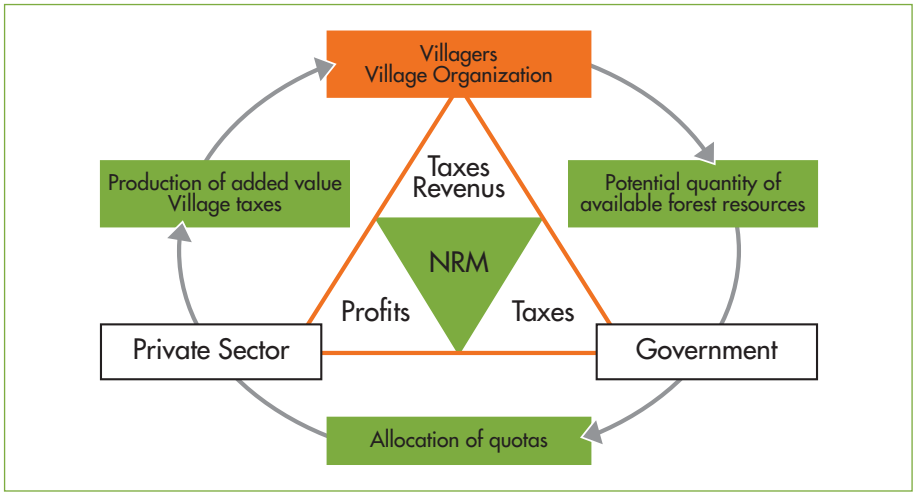
Loops forming a learning spiral

The results and successes of a loop necessitates another one, or several others, proportional to the knowledge produced. So the loops multiply to form learning spirals.

In order to improve the organization and efficiency of the handicraft and bamboo shoots value chain operators, a business plan study is carried out in the villages selected as "models". It assesses the nature of links between the different operators, identifies risks, and opt for solutions and monitors and evaluates their implementation. Facilitating such traders and entrepreneurs' networks builds trust between the market and producer groups.

The process helps to build trust among actors and the Project. This equal footing has facilitated discussions on some new "sensitive" topics, such as communal land titles or taxes. Moreover, it also allowed the reopening of some value chains prohibited in the past, such as dried Mai Hok bamboo shoots for the Vietnamese market.

The project acts as the process facilitator for 3 actors: villagers, private sector and the Government



As a conclusion: for the strengthening of a good value chain governance

At the end of these learning loops, the rules, tools and forest management bodies have now been developed, implemented, tested, improved, endorsed or even duplicated.

This process enabled the structuring of the value chain groups. Entrepreneurs thus participate in the bamboo forest management, provide economic support to the "communities" toward the establishment of management rules, their application, control and evolution.

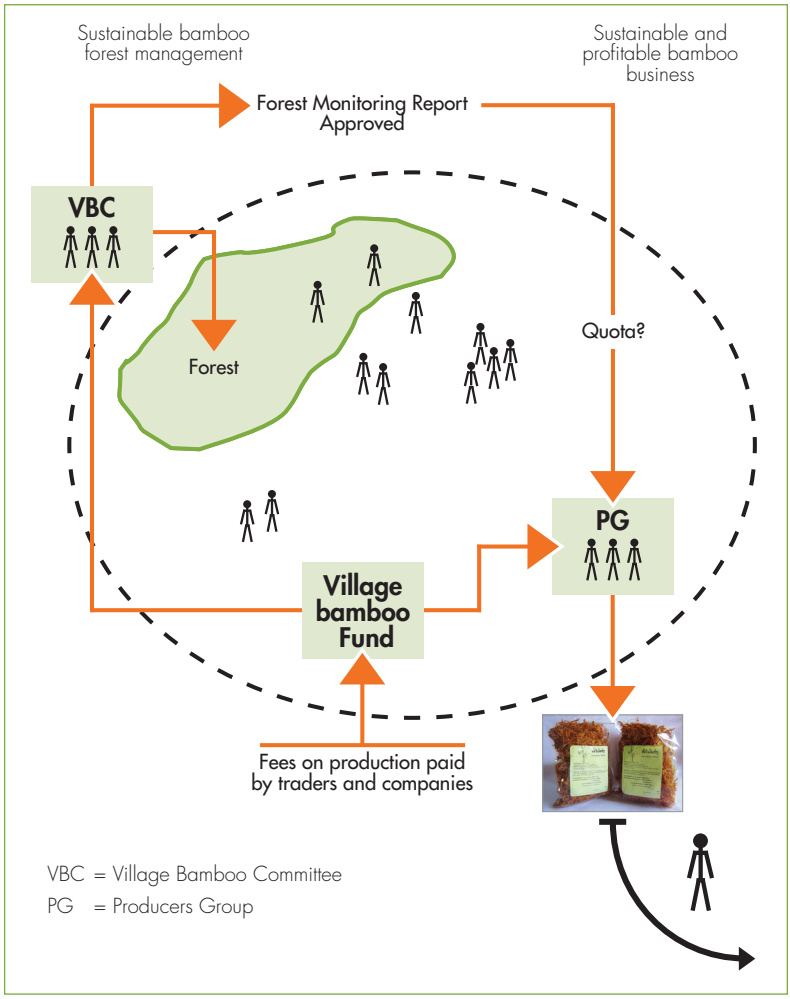
At the village level, producers are organized into groups managed by an elected committee with defined roles and responsibilities.

For their part, the village authorities are organized in such a way that they can secure the sustainable management of resources, thereby establishing resource management rules and plans for the common good. These rules are defined based on the empirical knowledge of villagers and following the implementation of forest experimentations.

However, despite these learning and adaptation capacities, there remains a need to establish an homogeneous governance system between villages dealing with the same value chains in order to better balance relations between village groups and the private sector.

Therefore, other perspectives in terms of learning through loops and spirals are expected…

Village organizations



Source: Sara Melki, Presentation made for the Agroecology Alisea/Grey Workshop, June 2016

Experimentation and Demonstration manual

The Results of Experimentation and Demonstration research for three bamboos species in collaboration with the Forest Science Research Center under NAFRI

The Project aims at developing trade oriented sustainable use of bamboo resource by the villagers, through natural bamboo forest management and bamboo plantations. The project provides support in 3 districts of Houaphanh Province (Viengxay, Sobbao, Sam Neua). The Project covers over 70 villages and promotes sustainable bamboo forest management for developing 5 bamboo based value chains: fresh bamboo shoots (Nor khome – *Indosasa sinica*), dried bamboo shoots (Nor hok – *Dendrocalamus hamiltonii*), slats and sticks (Mai kouane – *Dendrocalamus longifimbriatus*), handicraft (various bamboo species) and paper pulp (Mai xang – *Dendrocalamus brandisii* abandoned due to pollution and factory stopped processing).

One of the Project's main objectives is to facilitate a comprehensive and holistic multistakeholders' approach for promoting, supporting and monitoring the bamboo sector in Houaphanh Province. Main stakeholders at the moment are: villagers, provincial and district Government's heads and technicians, traders and investors.

The Project wishes to facilitate the involvement of Lao research sector in the process, through the conduction of join research programs, aimed at supporting the stakeholders' efforts for developing the bamboo sector development.

The Forest Scientific Research Center (FSRC) has been engaged from 2012 to 2015 with the Project in the design and running of a joint program of research aimed at supporting the villagers and the stakeholders' efforts for developing the bamboo sector in Houaphanh province.

In initiative cooperation period, FSRC has prepared and designed experimentation and demonstration of forest management technical protocols of six bamboo species consisting of (1) Mai Nor khome (*Indosasa sinica*), (2) Mai Nor Dja (*Sirundinaria microphylla*), (3) Mai hok (*Dendrocalamus hamiltonii*), (4) Mai Kouane (*Dendrocalamus longifimbriatus*), (5) Mai Xang (*Dendrocalamus brandisii*) and (6) Mai Hia (*Shizostachyum virgatum*). In the duration of 2012-2015, those protocols have been effectively utilized except for the Mai Hia protocol which was implemented later. E&D plots installation and data collection have been implemented by Villageers Volunteers (VVs) under the guidance of the Bamboo Project team in close partnership with DAFO technical staff.

To this day, FSRC has continued its cooperation with Gret, playing the role of a main actor in back up for the E&D plot implementation, data analysis and report writing. During the annual report writing of yearly operation, the pre-analysis of data collected on E&D plot is prepared along with analysis of the conducted field monitoring of the E&D plot of five bamboo species. All together, this served to present: the result of the final analysis, E&D plots observation, comments and feedbacks from concerning Project staff, involved DAFO and Village Volunteers, and results from retraining sessions. This report finalized the findings of E&D plots implementation in 2012-2015 as well as all pertinent lessons learnt which are included in the five chapters described below.

Objective

1) To present the final result on data collected in 2012-2013-2014-2015 of 5 bamboo species "Mai Dja (*Sirundinaria microphylla*), Mai khome (*Indosasa sinica*), Mai Hok (*Dendrocalamus hamiltonii*), Mai Kouane (*Dendrocalamus longifimbriatus*) and Mai Xang (*Dendrocalamus brandisii*)" in each treatment plot location.
2) To provide recommendations on the best techniques to sustainably manage the forest of 5 bamboo species for concerning stakeholders within the province and within Lao PDR.
3) To share lessons learnt gathered from E&D and FMP implementation to further improve of bamboo forest management research techniques.

Expected output

1) Project, DAFO and village volunteers realize, recognize, clearly understand, and accept the final results of E&D from 5 bamboo species using forest management techniques implemented in 2013-2015: Mai Dja, Mai khome, Mai hok, Mai kouane and Mai xang.
2) Developed the best practice on bamboo forest manage techniques as a tool to support local authorities and villagers for the sustainable forest management.
3) The concerning stakeholders analyze for themselves and derive lessons learnt's key messages to improve future research on bamboo forest management techniques.

The following are the results of E&D plots for 3 species: khome,kouane, hok. These data are used for the calculation of the bamboo yield.

Khome E&D

The installation of the khome Experiment and Demonstration plots

The Mai khome E&D plot is located in natural forest area of two villages Ban Napho and Ban Meuth, Viengxay district, Houaphanh province.

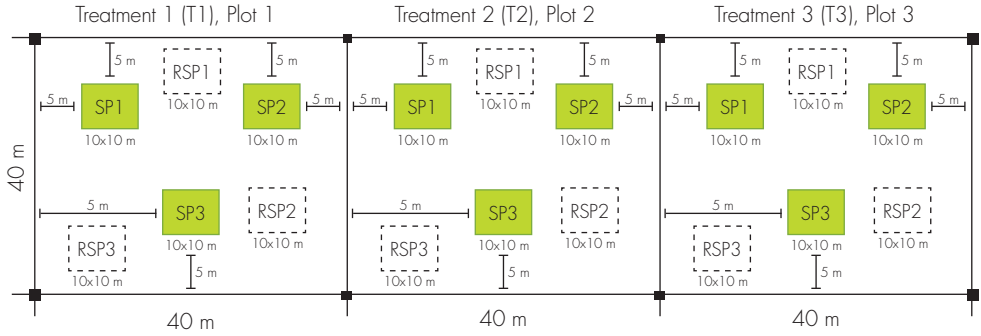
The location of each treatment was randomly designated.

- T1: 100% of the Mature Mai khome culms that are more than 3 years old were cut out every year during the off-season, following the shoot harvesting season (Suitable time for cut off the Mai khome mature canes are on October).
- T2: 100% of the Mai khome culms that are more than 3 years old were cut out every two years during the off-season, following the shoots harvesting season (Suitable time for cut off the Mai khome mature canes are on October).
- T3: Control plot where Mai khome culms are not cut.

The plot size and area: 40 x 40 m or 1,600 m^2.
Each main plot composed of 3 sub-plots = 10 x 10 m or 100 m^2 also composed of 3 Representative Sub-Plot (RSP), each RSP = of 10 x 10 m or 100 m^2.

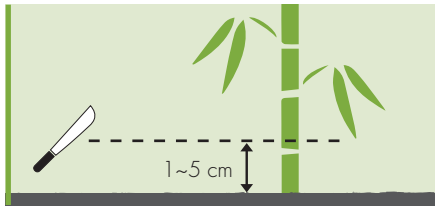
Plots lay out: in each village, the plots will be next to each other with each plot and sub-plot surrounded by bamboo fences.

Plot khome layout



Note: SP=Sub-Plot; RSP=Representative Sub-Plot.

Method of cutting: use the sharp knife to cut the culm at about 1 to 5 cm from the top of the soil surface.



Cleaning: after cutting, cut poles are removed from the plots but they are not burnt or use as plots' fencing.

Number of Experimental plots: each experimentation element is composed of 1 simple plot which means that there are 3 plots next to each other. In each plot, there are 2 types of sub-plot: (a) Representative Sub-Plot and (b) Sub-Plot. See detail below:

a. Representative Sub-Plot (RSP): built for harvest all new shoots (marketable size), count the number of shoots, and measure size of each shoot (Diameter, Length) and total weight of shoots (Weight) for each RSP, count and measure the regeneration shoots (number of shoots, Diameter and Height).

b. Sub-Plot (subP): created for monitoring and data collection or measurement elements such as number of new shoots and size of shoots. These sub-plots would be strictly protected from outside disturbance, and also in each sample plot.

Khome Experiment and Demonstration plot data collection

After the E&D plots and Sub-Plots have been established, the main data elements are:

- Type of data collection: the data have to be collected in the E&D plots. Especially, in each treatment plot: (1) number of new shoots with their size (Diameter and Height), (2) number of harvested shoots with their size (Diameter and Length) and total weight, (3) Number of harvested shoots weight per kilogram (overall grade, big shoots and small shoots) and (4) Number regeneration shoots with their size (Diameter and Height).

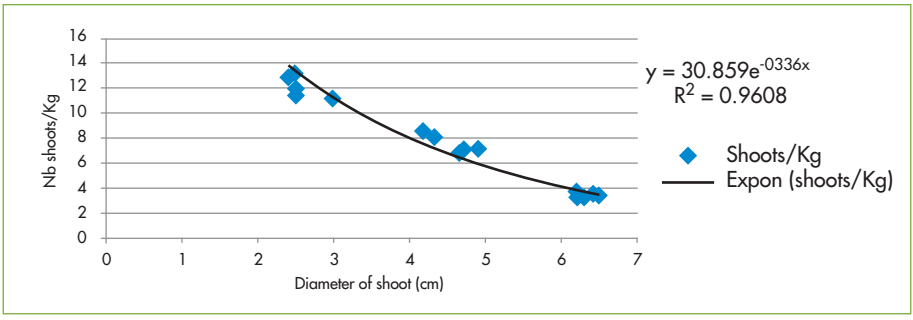
Results and data used for Combined Method and Forest monitoring

The table below shows the average data from the E&D plots and the survey done during forest management in 7 villages and 22 plots wherein 1% of the cumulative 690 ha was surveyed.

	Number pole 1 y/ha	Number pole 2 y/ha	Number pole 3 y/ha	Average Number shoot/ha	Shoot/ pole average (Number pole 1&2 y)	Weight of shoot kg/ha	Diam pole 1 y in E&D, average diam pole 1&2 y in CM	Average shoot/ kg	Average kg/shoot
CM villages	1,915	3,240	6,038	12,888	5.00	2,430	5.11	5.30	0.19
E&D Napho	1,799	2,251	2,266	9,785	4.46	2,004	3.91	6.63	0.15
E&D Meuath	1,422	1,278	1,552	7,504	5.52	1,856	4.32	4.24	0.24

The correlation between the weight and the diameter is as follow:

Correlation weight x diameter khom shoots



Data used from E&D, FSRC report

These data is used for implemented Combined Method (CM) and monitoring. In addition, it is used for estimating the quantities of shoot in the whole khome area for village's sustainable forest use and for villagers' business plan development.

Recommendation on the forest management

1) Base on the data on natural Mai khome, when 100% of the bamboo culms that are older than 3 years are cut off, every year or every two years and no shoots were harvested during the season resulted in reduced shoot regeneration during the off-season.

2) Techniques by cut off all mature culm that are older 3 years every year and designate shoot harvesting season to be between December to March is the best technique for ensuring bamboo forest sustainability.

Bamboo fence planning

Bamboo fence line setting

Bamboo fence setting

Sample plot 1 wooden sign

Wooden sign

Bamboo khome shoot

Kouane E&D

The installation of the kouane Experiment and Demonstration plots

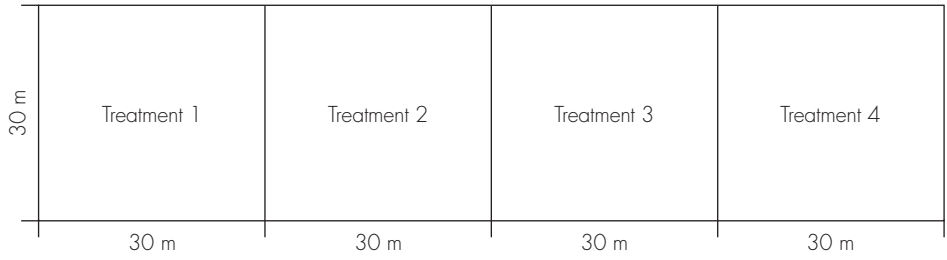
Mai kouane E&D plot is located in natural forest area of two villages Ban Eurn and Ban Xiengmaen, Viengxay district, Houaphanh province.

The position of each treatment is selected based on representation of the surrounding forest, divided into 4 treatments thus totally 4 treatment plots.

Treatment Plot size and Area 30 x 30 m or 900 m^2 = 3,600 m^2 in total.

Plots layout: in each village, the sample plots will be located next to each other.

Plot kouane layout

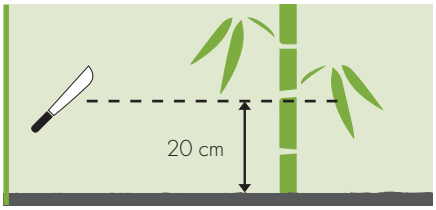


There are bamboo fences around each plot to prevent disturbance from animals and village bamboo collectors.

The 4 Treatments plots location and experimental approach

- T1: 100% of the mature culms more than 3 years old are cut off every year in January.
- T2: 100% of the mature culms more than 3 years old are cut off every two years in January.
- T3: 100% of the mature culms more than 3 years old and 20% of the immature culms that are 1-2 years old are cut off every year in January.
- T4: Control plot which means bamboo are allowed to grow naturally and no culms are cut.

Method of cutting: use the sharp knife to cut the culm at about 20 cm from the top of the soil surface.



Cleaning: after cutting, cut poles are removed from the plots but they are not burnt or use as plots' fencing.

Kouane Experiment and Demonstration plot data collection

Type of data collection: the data was collected in the E&D plots wherein each treatment plot produced 3 types of data. See detail below:

(1) Number of new shoots/culms with their size (Diameter and Height) and weight (new culm),

(2) Number of harvested culms more than 3 years old with their size (Diameter and Length) and weight,

(3) Number of harvested culms 1-2 years old with their size (Diameter and Length), weight and shape.

Results and data used for Combined Method and Forest monitoring

From the E&D results and inventory done in 6 villages and 10 plots covering 142 ha (based on Forest Management Plan) showed that:

	Weight of slats	Diam	Number inter-node	Lengh inter-node	Number of clump/ ha	Number pole 1 y/ha	Number pole 2 y/ha	Number pole 3 y/ha	Number pole = and more 3 y/ha
CM villages	10.9	7.4	11.4	83.3	203	1,153	1,489		3,948
E&D Eurn		7.25			122	1,707	1,679	1,804	4,364
E&D Xiegmen		5.6			85	2,276	2,385	2,799	5,244

Recommendation on the forest management

1) Naturally, the young Mai Kouane shoots are usual affected by insect larvae which cause bamboo destruction and death especially in the raining season. So the thinning of bamboo culms older than 3 years old is the reasonable method for industrial purposes but it should be implemented during dry season or from November to April. This could also support the prevention of forest wildfire and allow for forest patrolling.

2) Thinning 100% of culms that are more than 3 years old while also cutting off 20% of the immature culms that are 1-2 years old is appropriate and recommended for villagers because the older bamboo poles could be used for handicraft production, while the younger poles (1-2 years old) could be used for other specific daily handicraft production.

3) It is recommended that further research needs to be done on thinning the proper young poles within the appropriate season to ensure that the young shoots are not affected during pole cutting.

Bamboo numbered

Treatment 1 wooden sign

Treatment 3, sample plot 3 wooden sign

Treatment 4 wooden sign

Hok E&D

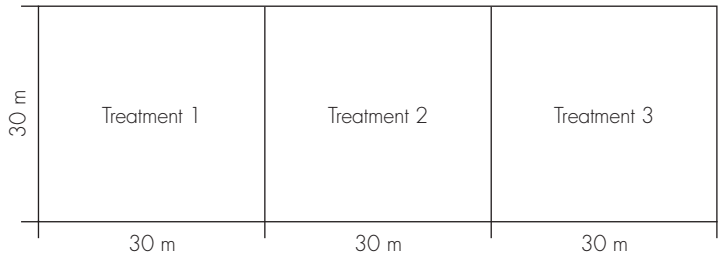
The installation of the Nor hok Experiment and Demonstration plots

Nor hok E&D plot is located in natural forest area of two villages Ban Napho and Ban Fath, Viengxay district, Houaphanh province.

The position of each treatment is chosen according to the representative area of the surrounding forest.

- Number of sample plot: there are 3 treatments totaling 3 samples plot.
- Treatment plot size and Area: 30 x 30 m or 900 m^2 = 2,700 m^2 totally.
- **Plots layout:** plots are fenced.

Plot hok layout



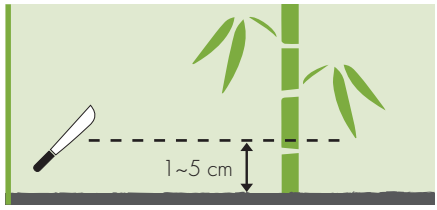
Treatments design in Ban Napho's bamboo forest

- T1: 100% of the mature culms that are more than three years old are cut off every year and allow shoots to be harvested from June to 15th September of every year. Fell and dead branchs or stumps are removed from the plot.
- T2: 100% of the mature culms that are more than three years old are cut off every year and allow shoots to be harvested from June to 20th October of every year. Fell and dead branchs or stumps are removed from the plot.
- T3: Mature culms more than three years old are not cut out every year and allow shoot to be harvested from June to 20th October of every year.

Treatments design in Ban Fath's bamboo forest

- T1: 50% of the mature culms that are more than three years old are cut off every year and allow shoots to be harvested from June to 15th September of every year. Fell and dead branchs or stumps are removed from the plot.
- T2: 50% of the mature culms that are more than three years old are cut off every year and allow shoots to be harvested from June to 20th October of every year. Fell and dead branchs or stumps are removed from the plot.
- T3: Mature culms more than three years old are not cut out every year and allow shoot to be harvested from June to 20th October of every year.

Method of cutting: use the sharp knife to cut the culm at about 5 to 10 cm from the top of soil surface.



Cleaning: after cutting, cut poles are removed from the plots but they are not burnt or use as plots' fencing.

Mai hok Experiment and Demonstration plot data collection

Type of data collection: The data collected in the E&D plots consisted of 2 types: (1) Number of regeneration shoots with their size (Diameter and Height) and (2) Number of harvested shoots with their size (Diameter and Length) and weight and (3) Number of culms > 3 years with their size (Diameter, Height and Weight).

Results and data used for Combined Method and Forest monitoring

The table bellow shows the average data from the E&D plots and the survey done during forest management plan in 6 villages and 14 plots, totaling 1% of the 560 ha surveyed.

	Number of clumps/ ha	Number pole 1 y/ha	Number pole 2 y/ha	Number pole 3 and >3 y/ha	Av number shoot/ ha	Weight of fresh shoot kg/ha	Number pole 1 y/ clump	Number pole 2 y/ clump	Number shoot/ clump	Number shoot/ 1mother culm av 1 and 2 year	Number shoot/ mother culm 1 year
CM villages	185	564	924	2,874	5,636	5,636	3.05	5.00	30.49	7.58	
E&D Napho	189	431	359	2,610	1,969	1,888	2.28	1.90	10.42	4.98	4.6
E&D Fath	126	407	316	1,943	2,674	2,317	3.24	2.51	21.24	7.39	6.6

Recommendation on the forest management

1) The most appropriate forest management technique for Nor hok forest is the cut off of 50% mature culms that are more than 3 years old in every two years with shoot harvesting allowed every year from June to September.

2) Establish and improve the existing village regulation to ensure sustainable forest management.

Bamboo weighting

Bamboo counting

Bamboo forest wooden sign

Bamboo forest data collecting

Combined Method manual

Bamboo forest land identification, inventory and management Method at village level

Combined Method introduction

This Guidebook was developed in the framework of the Houaphanh Bamboo Sector Development Project (hereafter refer to as the Bamboo Project), with the objective of developing the bamboo sector in Houaphan Province. Since 2011, Gret (French iNGO) in partnership with SNV, supported the development and realization of the Houaphanh province's strategy for the bamboo sector in three districts: Viengxay, Sobbao and Sam Neua. Currently, the project's interventions are focused on the development of four bamboo value chains, which in turn are depended on three different bamboo species:

- Kouane (*Dendrocalamus longifimbriatus*) which serves as supply for factories processing slats and sticks to be exported to the Vietnamese market.
- Khome (*Indosasa sinica*) which provides fresh bamboo shoots for Lao domestic markets and consumers.
- Mai hok (*Dendrocalamus hamiltonii*) which shoots are processed into dried bamboo shoots for domestic market in Vientiane trade fairs and Vietnamese markets.

To ensure sustainable use of the bamboo forests in villages supported by the Project, one main components of the Project is the forest management of these bamboo forests. To meet the goal of this component, bamboo forests at the village level need to be identified and their plans made for their management. This document is a Guidebook designed to successfully perform these activities (forest identification, inventory and management plan).

It aims to be used during trainings on forest identification and inventory in the context that designing, planning and conducting trainings on sustainable management of bamboo forest involves villagers' active participation. This manual is intended for trainers, extension workers, students, practitioners, learning and training institutions, Government agencies and Non-Government organizations dealing with sustainable bamboo forest management.

Despite the breadth of this manual, it does not cover auxiliary topics such as training of trainers, communication skills, facilitation skills, and GIS software training.

This Guidebook should be accompanied with the following complementary files:

- A training session.
- Tables or files of the survey by plot for each species of bamboo.
- Excel file containing summary of all data collected in the village (village discussion and inventory).
- Training on GIS and GIS software.

The method used in this guideline refers to the Lao National Law and guidelines:

– Local administration law, Art 3 of the Lao National Assembly, 10/21/2003, article 27;

– The forestry law, 2007;

– The Land law, 2003;

– The water resource an environment law N4;

– Manual "Participatory Agriculture and forest land use planning at village and cluster level" MAF/NLMA 2010;

– 2012. Handbook on Participatory Land Use Planning. Methods and tools developed and tested in Viengkham District, Luang Prabang Province. NAFRI-IRD-CIFOR, Vientiane, Lao PDR.

Combined Method background

To achieve the objectives of bamboo forest management component, the Bamboo Project team in collaboration with district technical services initially developed and implemented the Participatory Agriculture and Forest Land Use Planning (PLUP) to ensure that different land use, including the bamboo forest, at the village level are identified and planned accordingly.

Since 2009, DLMA (today part of DONRE) and DAFO conducted Land Use Planning (LUP) in Viengxay and Sam Neua districts, mainly focusing on village boundaries and agriculture lands.

In 2011, PAFO conducted LUP in the villages targeted by the Bamboo Project in Sobbao and Viengxay districts, mainly focusing on forests.

Finally in 2011, it was agreed that the PLUP method would be adopted and used in Vengkham district, Luang Prabang Province. This required the facilitation for coordinating between DAFO and DLMA. This successful PLUP implementation also resulted in the development of the Village Development Plan (VDP). VDP became a useful tool for DAFO to design and submit project proposals, such as proposals to the NUDP Project.

In 2012, the Bamboo Project in collaboration with DAFO, DLMA, PAFO and PLMA applied this PLUP method in several target villages. All the steps were performed with participation from the Village Land Management Committee (VLMC), a body drawn from 10 elected members of each village. The objective of the Bamboo Project in applying the PLUP method in these target villages was to identify and delineate the natural bamboo forest and other village activities (areas where bamboo activities cannot be developed sustainably, such as livestock area, agriculture area, and construction area). Although this method showed positive results, it was greatly limited by the large amount of required financial, human, and time resources.

In addition, after the PLUP is implemented in the village, the forester of the Bamboo Project in collaboration with the villagers, also developed the forest management plan. Therefore, in 2012, the method was actually divided into 2 implementations: identification and delineation of the bamboo forest and land used for other village activities and forest management plan. This time-consuming and resource consuming process required a concerted effort for modification and simplification especially in lieu of the fact that in 2012, the Bamboo Project was urged by the Government to speed up the implementation of forest management plans to significantly greater number of villages in Huaphanh. This rapid ramp-up of forest management plans to more villages were a result of the rapid market expansion of all four bamboo value chains. Despite the initial challenges, this gave the Bamboo Project a great opportunity to re-evaluate, assess and develop a new and more complementary method that would be less resource intensive yet yield equally effective outcomes as the combination of PLUP and forest management plan.

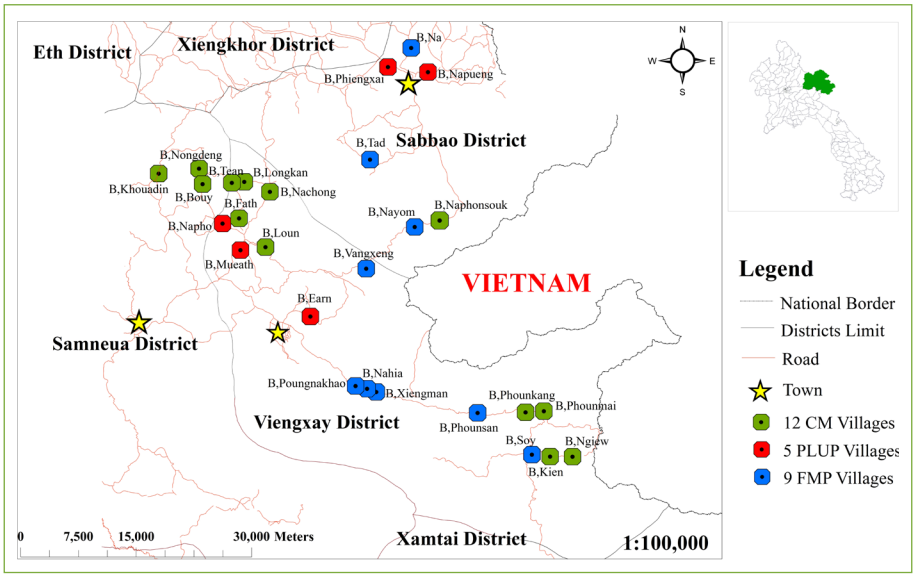
To re-evaluate, assess and develop a new complementary method, in December 2012, the Bamboo Project organized a "Forest management workshop" held for each value chain (fresh bamboo shoot khome, dry bamboo shoot hok, handicraft and furniture, May xang pole for the paper pulp factory and Mai Kouan pole for slats and sticks) in Viengxay and Sobbao Districts, Houaphanh Province. One of the topics of the workshop was to develop a quicker but efficient forest identification and management method. Brainstorming sessions were conducted with all stakeholders (villagers, traders and Government). Through these sessions, the Bamboo Project team proposed a new method named "Combined method" (CM) that combined the steps of forest identification (PLUP) and forest management (Inventory, planning and rules and regulations). These steps would remove redundant activities, accentuate important activities, and reduce spent resources while achieving similar outcomes as that of the combined PLUP and forest management plans.

Since the beginning of 2013, CM has been implemented in 12 villages. Initially, the Bamboo Project decided to first focus on Nor hok and Nor khome bamboo shoot value chains with involved villages locating mainly in Muangphan Cluster, Viengxay district. Following this, the second focus was with the Mai Kouane bamboo pole value chain villages (for producing slats and sticks) which are located mainly in the South and Northeast of Viengxay district.

Next page is a map showing the development of the bamboo forest identification and management since 2011. In 2011 and 2012, the Bamboo Project supported the establishment of forest management plan in 9 villages (shown in Blue). Concurrently in 2012, the Bamboo Project supported the development of PLUP for 5 villages (shown in red). Starting in 2013 to 2015, the Bamboo Project has implemented the "Combined Method" in 12 villages (shown in green).

Map of development of bamboo forest identification and management since 2011

Blue: villages with Forest Management Planning in 2011-2012.
Red: villages with PLUP in 2012.
Green: villages with combined method since 2013.



Bamboo villages CM-PLUP-FMP
Samneua Sabbao Viengxay Districts – Houaphan Province – Lao PDR 2011-2015

Following the implementation of the CM in 12 villages between 2013 and 2015, the Bamboo Project has improved the method and continues to improve the method fitting the principle:

> "This is a learning process and thus the method will never be stabilized but should be adapted to best fit with current context within which the method is applied. However, it is relevant and important to share with other projects the method and lessons learned from this learning process."

From experiences and improvements, the current CM includes 11 successive steps is presented in the following table. Specifically, each step has its own rationale, objectives and the approximate duration. This guideline describes in detail each step in a manner that trainers can use to train CM novices.

The steps are:

Steps	Step Description	Duration	Rationale	Objectives
	Preliminary			
1	3D map creation.	1 day	Need a tool that is understood by all.	Creation of the participatory map tool.
2	Open ceremony and Selection of VBC.	Half day	To make it participatory need to elect a team of villagers that will work and be responsible for the bamboo forest management.	Present the implementing team, the objectives and method of the bamboo forest identification and management to all villagers. Elect the VBC that will work on forest identification and management.
3	Delineation of the village limits.	Few days	Villages limit are often not clear and needs clarification and delineation.	To avoid conflict on village-village borders in case the bamboo forest is on the border.
4	Selection of the Bamboo species to be managed in the village.	Few hours	To link profitable value chain to the bamboo forest resource management.	One or several species of bamboo are selected and will be included as the forest to be managed.
5	Production Capacity of the village.	Few hours	The labour force is limited in the villages.	To calculate with the VBC the production capacity of the village.
6	Delineation of the bamboo forest to be managed and the bamboo plantation area.	Few hours	Use the 3D map to delineate roughly the bamboo plots based on criteria.	To have a first identification of the bamboo plots in the village territory.
7	Subzoning and samples plots of each bambo plots.	Half a day	The forest is not homogeneous, the sample plots should be selected based on bamboo density criteria.	To identify sub area and the sample plots area that will be surveyed.

Steps	Step Description	Duration	Rationale	Objectives
8	Field inventory of the sample plots.	Few days	1 percent of the forest is surveyed.	To calculate the bamboo forest production capacity.
9	Forest management discussion.	1 day	Communal management of a natural resource needs rules and regulations (Ostrom).	Set up the rules and regulations on the bamboo forest management.
10	Elaboration of the management plan and maps.	Few days		To have a document summarizing all the results of the implementation approved by the relevant authorities.
11	Closure ceremony and approval of the CM agreement.	Half a day	All villagers should be aware about the management of their forest and all decisions made by the VBC.	Present the implementation and results of the forest management plan to all participants.
	Management plan approved and distributed to all authorities and villages.	Few days	Gathering of documents and information derived from the implementation steps.	The final agreement is approved and distributed to all authorities and to the village.

The guideline/manual will present each step according to the following structure:

- Objective
- Participants
- Duration
- Equipment and document
- Methodology
- Results
- Recommendations

Preliminary steps

Preparation of the field

- Free, prior and informed consent[4] (FPIC) in the village.
- Communicate with villagers for their availability and explain the agenda and objective of the work. The selected villages had previously expressed their need for the forest management of their villages' forests.
- Apply for and obtained official letter from the district Governor granting official recognition from the relevant authorities to implement bamboo forest identification, inventory and management plan.
- Present the method and set up the work plan with technicians from DAFO and DONRE. These technicians will be part of the implementation and therefore they should be trained before implementation in the village.
- Prepare, print and distribute invitation letters to villagers and authorities to participate in the open ceremony day.
- Prepare and distribute the invitation letters to villages neighbouring the selected villages to explain the objectives of the village limit delineation. At the same time, request these villages' authority representatives to bring all documents pertaining to past delineation agreement along with the village stamp. The invited village authorities from the neighbouring villages should be 3 persons, two of which should be 2 village chiefs and a person from Lao Front who knows very well the limits of the village.
- Prepare material and budget (list of material in Annex 5).

4. http://www.forestpeoples.org/guiding-principles/free-prior-and-informed-consent-fpic

Creation of the topo map, a step to the 3D map

Initial, creating the topo map to be used for PLUP was done by the team working with the villagers to draw rough maps along with satellite imagery. However, using this method, the environment constraints were not taken into consideration and the villagers could not easily recognize the forest areas. In 2011, following a training by the Agrisud project[5] in Luang Prabang to build a 3D map, the team realized that this tool greatly enhanced the participation of the villagers through their increased understanding of landscape. Importantly, the 3D map presented an advantage in showing the relief of the landscape. As a result, the villagers can easily localise the forest, the village land and other topographic attributes of the village and its lands. In addition, the picture of the 3D map can be geo-referenced on ArcMap and can be an excellent tool during discussions.

Thus, the first step in implementing the Combined Method was determined to be the creation of the 3D map. In order to create this map, first, it is necessary to obtain the topo map made from mapping software using the data from the National Geographic Office (Vientiane). This topo map is then printed on A0 format on waterproof paper. The displayed contour lines or topo lines represent differences of 40 m altitude and are represented by different colors with dark and thick lines. Each topo line is accompanied with its designated altitude name.

One main challenge in producing the topo map is localizing the village land and limit on the map. Therefore, it is preferable to get some information from the village, DAFO and DONRE in advance and use this information to supplement topo map's creation.

Once the preparation steps are finished the implementation can start in the village.

5. 2012. Handbook on Participatory Land Use Planning. Methods and tools developed and tested in Viengkham District, Luang Prabang Province. NAFRI-RD-CIFOR, Vientiane, Lao PDR.

STEP 1

3D map creation

Objective

Build a 3D map that allows the participants to explain the land use situation of the village (issues, challenges, etc.). This will be the basis for the discussion on land use planning.

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>• Village LWU
• Village Youth organization
• DAFO and DONRE technicians
• Project team</td><td>• Topo map with A0 format
• Cardboard/carton: the amount of cartons needed is the same number of topo lines on the topo map. The carton should be about 1 cm thick and equal to the topo map size
• Use of small tools: cutter, glue, needles
• Carbon paper
• Paper tape
• Plaster band</td></tr>
<tr><td>Duration
1 day
Place
Village meeting room</td><td></td></tr>
<tr><td colspan="2">Expected Budget
3D map cost is around $100 to build</td></tr>
</table>

Methodology

Gathering the team

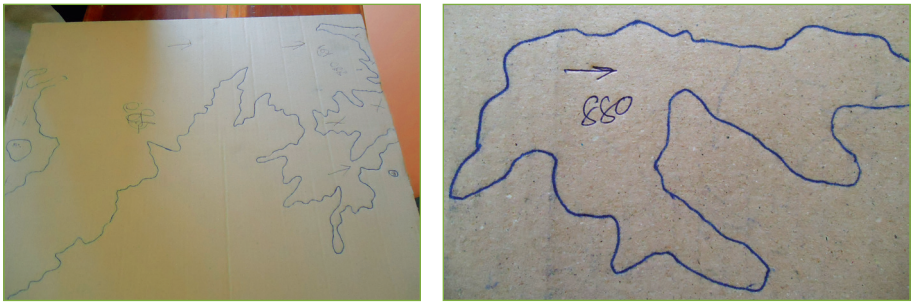
A group of 5 or 6 people can build the 3D map easily in a single day.

Generating contour lines

The cardboard is first cut to the size of the base map. Enough sheets of carbon paper are placed and taped together to cover the base map area. The carbon paper aggregate is put between the printed topographic map and the cardboard. These three layers are pinned together to avoid any slippage during the drawing of the contour lines which are drawn by using a pen to trace over the contour line se lected on the topographic map on one cardboard. This is performed layer after another from the lowest to highest elevation with each layer corresponding to different elevation a different contour line drawn on a different cardboard.

Once the topo line has been drawn on the cardboard, the north arrow and the number of the line drawn are written (arrow + number) to avoid mistakes during the gluing.

Drawing on the cardboard the topo line from the printed Topo map



Lines drawn on the cardboard from the printed Topo map

Drawing on the cardboard the topo line from the printed Topo map

Cardboard contour layers are cut and pasted

The contour layers are cut out and pasted one layer after another onto the base-board beginning with the lowest altitude and finishing with the highest altitude. Once all contours layers have been pasted, a relief model is generated.

3D map creating – cutting the Topo line of the board and glue

3D map creating – cutting the Topo line of the board and glue

Last layer

The relief model is covered with sticky tape to protect the carton. This 3D model shows the 3D landscape of the village, its limits, and immediate neighboring villages. Plaster bandage strips are laid over the model to cover detailed parts of the model to create a smooth surface. Once the 3D model has dried, geographic features such as rivers and roads are painted on and the names of the mountains and rivers written on small papers are stuck to the map.

3D map creating – layering, taping of layers and plasters

Results

The outcomes of this step should be:

- A true representative 3D map of the village with the local names of the mountains, rivers, and roads.
- The generated 3D map will be used for subsequent steps of this manual and will stay with the village.

3D map creating

3D map true representation of the village and geographical features.
3D map is used for subsequent steps of the manual.

Qualitatively, this step does present some challenges and benefits:

Disadvantages	Advantages
It takes time to create the 3D map (preparation and creation, 2 days).	1. Participatory tool. 2. Good understanding by villagers of the land use and the slope degree. 3. Can be used by other projects. 4. It is the first contact with the village.

Recommendations

- The topo map should be based on previous LUP or PLUP done by other projects to avoid conflict resulting from being "out of the map".
- Note well the topo line numbers and the north direction on the map to prevent confusion.

STEP 2

Open ceremony and selection of Village Bamboo Committee

Objective

Open ceremony will allow all villagers to understand bamboo activities at the village level and the information required to start them. Concurrently, members of the Village Bamboo Committee (VBC) will be elected and they will be in responsible for the bamboo forest management in the village.

Participants	Equipment and Document
• All villagers • PAFO and PONRE representative • DAFO and DONRE representatives • District Governor • 2 representatives of neighbor villages (Naiban) • DAFO and DONRE technician • Project team	• None
Duration	
Half day	
Place	
Village meeting room	

Methodology

Agenda of the Open ceremony

An Agenda of the open ceremony should be drafted and presented at the start of this activity. It has 3 components:

1. Introduce and present the objectives and the agenda of the ceremony.
   - instruction for the implementing team;
   - inform the objectives of the ceremony day;
   - introduction of the district Governor (or deputy) that officially opens the process;
   - objectives of the CM activities in the village;
   - presentation of the method;
   - presentation of the working agenda;
   - present relevant laws by DAFO and DONRE.
2. Election of the VBC members and approval of the document by the Governor of the District.
3. Conclusion by the district Governor (or deputy, whoever is in attendance).

Open ceremony

The open ceremony that is conducted is divided into 2 parts:

1. The first part is to introduce and present the objectives and agenda of the bamboo forest identification and management implementation.
2. The second part is to elect the Village Bamboo Committee (VBC).

Introduction and presentation

In general the concept of Forest management is a novel and complex concept for many villagers. Therefore, it is imperative that the implementation team explains thoroughly the needs for forest management. Specifically:

- To have a clear delineation of the village limits to avoid conflicts.
- To identify the bamboo value chain(s) that need(s) forest management for sustainable development.
- To identify the bamboo forest plots in the village territory for clear allocation, management, and monitoring.

- To estimate the production capacity of the village producing bamboo product for the value chains.
- To inventory the bamboo forest to estimate the true production capacity of the village forest.
- To set up rules and regulations on a sustainable use of the bamboo forest for each species of bamboo to ensure long term use by villagers.
- To create maps of the bamboo plots of the village for villagers' clear understanding of their natural resources.
- To compile all the data to the "forest identification and management plan" to be approved by the district Governor.

Creation of the VBC

VBC is the Village Bamboo Committee (in Lao: Kanac Kama kan May pong Kran ban) that is composed of 9 to 11 persons with the following roles within the village:

- the village chief or representative;
- the village Forest management unit;
- the village agriculture and livestock Unit;
- LWU;
- Youth Union;
- Lao Front;
- representative of minorities;
- and members of the bamboo producer group.

The VBC should be composed of 50% man and 50% women. Bamboo activities are often implemented by women especially in bamboo collection and processing and thus their contributions to the CM implementation would be valuable.

Elected members of the VBCs must possess the following competences and personal qualities to effectively carry out their roles:

- Should be villagers who are hardworking and energetic.
- Respected by the villagers.
- Not too young / not too old.
- Can read and write.
- Can communicate effectively with villagers.
- Honest / Intelligent / Healthy / not sickly / not drunkards.
- Have experience working in forest.

Once elected, the VBC members are tasked with the following responsibilities for managing the village's bamboo:

- Identification and inventory of the bamboo forest plots.
- Rules and regulations on forest management.
- To solve conflict among the forest.
- The bamboo forest monitoring.
- The bamboo forest Control.
- E&D.

With clear understanding of the requirements and responsibilities of the VBCs, villagers elect and all the villagers should approve the roster of elected VBC members. These VBCs are then officially recognized by the district Governor.

Result

Agreement of the elected VBC members and their responsibilities approved by the district Governor. This approved agreement will be added to the final document.

Recommendations

- The place to organize meeting for open ceremony should be a large room with enough space for all villagers, neighbourhoods' villages and representatives from authorities.
- VBCs should not be elected annually but they need to be trained annually.
- VBCs should be motivated people that are elected and not designated.

STEP 3

Delineation of the village limits

Objective

To agree on the clear physical boundaries of the village with other neighbouring villages.

Participants	Equipment and Document
• VBC • Neighbouring villages (3 representatives per village) • DAFO and DONRE technician • Project team	• 3D map • Computer or laptop • ArcMap • GPS • Camera • Color cotton strings
Duration	
Half day to 5 days or more as needed.	
Place	
Village meeting room.	

Methodology

Team composition

Participating village and neighboring villages should be represented by three people such as the village chief (naiban), vice village chief and a person from Lao Front that knows very well the village's limit.

The villages' representatives need to bring with them previous documents on their village limits and the stamps of the village.

The work on this step can be divided into 3 teams:

- One team work on the 3D map, facilitating exchange between the villagers and delineating the village's limits with cotton strings while taking oral descriptions of the limits.
- One team will be involved with the villagers in taking GPS points in the field.
- One team will work on the computer to record the agreement format, the description of the limits, and the reported GPS coordinates.

Delineation and description of the village limit

The village's limits are marked with black color cotton strings and needles on the 3D map.

- 3 representatives from the villages are invited to join the delineation.
- The limit is described orally by the villagers.
- A technician takes note and includes the note on the village limit agreement.

When the agreement is finalized, the technician reads it to everybody and makes corrections to arising mistakes or clarifications by villagers.

Collection of GPS points and map of the village limits

At the same times, the first village that completed delineating the limits and description goes with a villager to the field and identify the physical limit using GPS.

- The technician takes GPS points of the village limits.
- The GPS points are written in the agreement of the village limit.

Pictures of villagers delineating the village limits

Two villagers at the village limit and taking a GPS point for specific village limit

Creation of the digital map of the village limit

The picture of the 3D map is input into a map software and GPS points are downloaded to exactly situate the limit.

The final 3D map that is generated contains identified village limits with corresponding GPS points.

Approving village limits agreement

- At the end of the process, the team read the agreement containing the identified village limits.
- After all villages' representatives agree with the limit description and delineation, the agreement is printed.
- The agreement should be signed and stamped by the villages' representatives.
- This agreement is included in the final "forest bamboo identification and management plan."

If there are conflicts among the different villages, the implementation team should facilitate the process of conflict resolution to encourage the participants to reach collective decisions on their villages' limits. Tool for facilitating reaching collective agreement can be using the previous agreement or go to the field and take GPS points where the 2 villages agree on their villages' limits. In some cases, facilitating the resolution of conflict in village limits may take several days.

Recommendations

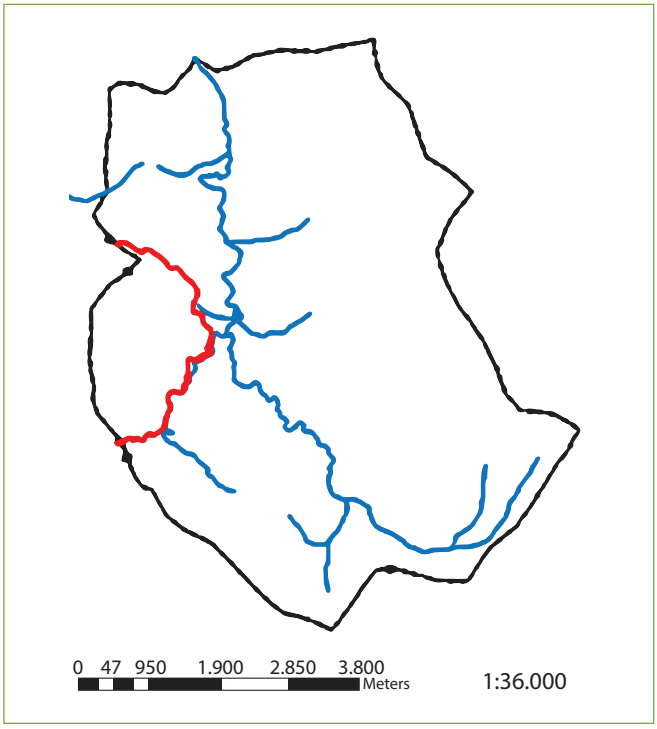
- Need to spend time for recording with GPS in forest areas that are far from village.
- A good facilitator with patience and skills in resolving conflict arising from identifying village limit conflicts. These conflicts may be between villages (sometimes between different districts). In the case that conflicts cannot be resolved, the facilitator must be willing to request the support from the district Governor and willing to take the time necessary (even several days) to reach amicable and collective decisions by all villages.

Results

The outcomes of this step should be:

- Area (hectare) of the village territory.
- 3D and Digital map with GPS of the village limit (attached to the village limit agreement).
- Delineation of the village without conflicts resulting in an agreement. This agreement is signed by all villages' representatives and is enclosed in the final document.

The digital map of one village limit



STEP 4

Selection of the bamboo species to be managed in the village

Objective

To determine which bamboo-related value chain the villagers would like to develop.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• Computer or laptop • Excel file of FM for village "14…. BAN_SUMMARY_FM_Ban…" • Excel Sheet on bamboo species in the village (e.g. "bamboo in the village") • Paper board
Duration	
Half day	
Place	
Village meeting room	

Methodology

Selection of the bamboo forest to be managed

Within the village territory there are a diverse amount of natural bamboo species. Several species of bamboo are customary used by villagers for household purposes while others are traded. Selection of the bamboo forest that needs to be managed within the village begins with the team's assessment on the specific species used and traded. For this part, the marketing of a specific species of bamboo is directly linked with the need on forest management for that species. A forest management plan for a bamboo species is developed after that species has been selected based on the following criteria:

- The size of the bamboo forest species.
- Profitability of this bamboo activity.

Some bamboo species have high level of economic profitable and thus have been known to be susceptible to overharvesting. To alleviate this risk, the team needs to help the selection of the main value chain linked to the species needing support on forest management.

History of the value chain selected

The objective is to discuss the history of the value chain.

These open questions are asked to the VBC:

- Quantity sold during previous years.
- When the village first started selling the bamboo product? Why? (road creation, etc.).
- Evolution of the quantity sold of the bamboo product in the previous years until now.
- Where did the traders come from? And where are the products target markets?
- Number of households involved in the value chain.
- Approximation of the income generated by the value chain.
- Period of production.

The collected data are then used to develop a basic knowledge and understanding of the market, the income generated in the village and the quantity sold.

Bamboo plantation

Open the discussion and reflect on whether the villagers would like to start developing bamboo plantations to support bamboo value chains.

- Which value chain could benefit from developing bamboo plantation?
- Which species should be planted within the bamboo plantation?
- How many household within the village are interested in developing the village bamboo plantation?
- How many hectares needed to be planned by the household or for the village?

Identification of problem and solutions of each value chain

The technician asks the VBC to list the problems they have on the value chain. They are asked about the possible solutions and who could help them. This information will be relayed to the team.

The information is also recorded in the excel file containing forest management of the village (e.g. "14….BAN_SUMMARY_FM_Ban…"), and a sheet containing the village development plans for each species (e.g. "VDP khome", "VDP hok", "VDP Kouane").

Results

- Selection of the valuable bamboo species present in the village forest.
- Identification of the weakness and strong points of selected bamboo value chains.

Recommendations

The implementation requires investment in time and human resource, therefore, the bamboo forest species selected to be managed should be relevant.

STEP 5

Production capacity of the village

Objective

To estimate the production that the village can produce according to the labour force available in the village.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• 3D map • Computer or laptop • Excel file of FM for village "14…. BAN_SUMMARY_FM_Ban …" • Excel sheets on village production capacity (e.g. "vill cap Prod khome", "Vill cap Prod vill hok", "Vill cap Prod vill Kouane")
Duration	
Half day	
Place	
Village meeting room	

Methodology

For each bamboo species selected in step 4, the team will assess the village's production capacity.

Village production capacity by Value chain

Team and VBC estimate the production capacity of the village based on the principle that the villagers cannot produce more than the village's available labour force. This result will determine the minimum number of hectares of bamboo forest needed to be managed to match the forest production capacity to that of the village's production capacity from its labour force. This data must be considered and linked within the contract and quota of the trader.

The work can be divided into 2 teams:

- Facilitation team responsible for asking questions to VBC and explaining the calculation on white paper board.
- Computer filing team responsible for recording the comments and outcomes.

The calculation for the village production capacity is explained below, step-by-step:

- Number of households (HH) and labour forces dedicated to the value chain in the village.

Calculation of the number of permanent labour force (PLF) per household

	Unit	Results
Number of HH dedicated to the value chain	HH	
Number of full time workers in bamboo on the value chain (Permanent Labour Force PLF) in each household	PLF/HH	
Number of temporary workers in bamboo on the value chain (Temporaly Labour Force TLF) in each HH	TLF/HH	1 TLF
Total number of PLF per household	PLF/HH	PLF + TLF/2

- Quantity that 1 PLF can harvest per day.

Quantity collected by day during 1 day by one permanent labour force

	Unit	Results
Average quantity collected per day per Permanent Labour Force	kg/wd/PLF	

- If the villagers process the bamboo, how many hours to process the quantity harvested by each PLF per day:

Number of hours spent to process the quantity collected in 1 day

	Unit	Results
Hours to cut the quantity collected in per day per PLF	Hours/PLF	
Hours to process the quantity collected in per day per PLF	Hours/PLF	

- Number of days dedicated by each PLF for this bamboo activity per season.

Total of days spent by one permanent labour force on this activity during the season

	Unit	Results
Days spent by each PLF for this activity during the season	Days/LF	

- Production capacity of the village to collect and process bamboo. The production capacity of the village is the estimation of the quantity of bamboo the village can sell per year.

Calculation of the village production capacity

	Unit	Results
Production capacity of the village to collect and process bamboo (PC)	kg/ village	Formula below

Formula for calculating **production capacity (PC) of the village to collect and process bamboo:**

PC of the village per season = [Number of **PLF** per household **X** number of HH in village] X Quantity harvest per day per **PLF** X [Number of days dedicated by each **PLF**/season / Number of days for processed and collect]

The production capacity of the village to process is an important data to consider. It will be compared with the quantity available in the forest (Production capacity of the forest for a sustainable use). Overall production can be limited by lack of labour force or lack of forest.

Estimate the minimum number of hectares needed to have FMP

VBCs are first asked for the average quantity of bamboo each PLF can collect per hectare.

According to the total village labour forces and the production capacity of each labour force to harvest per hectare (kg per ha), we calculate the number of ha needed so that each labour force can harvest according to capacity. This is the minimum number of hectares needed for the FMP. This area is dependent on the real bamboo forest cover in the village territory.

Kg of bamboo required per ha = PLF in village x kg can be harvested per ha by each PLF.

Minimum number of hectares needed for FMP = Production capacity of village / kg of bamboo required per hectare

If the forest in the village is smaller than the minimum calculated here, then there is a high risk of over harvesting.

To ensure not over harvesting of some areas of the forest, the next steps will be to identify and determine the area of the bamboo forest in the village.

Results

- Village bamboo production capacity per year (attached to the final document).
- Number of minimum hectares of bamboo forest needing FMP.
- Participation and Understanding of villagers on the calculations.

Recommendations

The village production capacity will change year after year according to the number of labour force and time spent on this activity.

STEP 6

Delineation of the bamboo forest to be managed and the bamboo plantation area

Objective

To identify the different land use in the village and delineate the bamboo forest that is used by the villagers.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• 3D map • GPS • Computer or laptop • ArcMap • Excel file for summary of village's FM (e.g. "14..BAN_SUMMARY_FM_ Ban..") • Excel sheet: "sample" of each species of bamboo
Duration	
One day	
Place	
Village meeting room and forest plots	

Methodology

Current land use and village activities assessment

To understand the village's activities, it is necessary to assess the village activities using different types of land such as *area of paddy field (na), upland paddy field (hai), livestocks, corn, makao, tree plantation…*

On the 3D map make a current land use delineation using different cotton colour lines in this order:

1. Conservation forest.
2. Protected forest.
3. Livestock area.
4. Agriculture area.
5. Tree plantation area.
6. Bamboo plantation area (if villagers want bamboo plantation).
7. Forest for use.
8. Bamboo forest for each species.

Delineation of the bamboo forest on the 3D map is crucial as in many cases is in direct competition with activities such as livestock activities, shifting cultivation practices and constructions. At the very least, these activities will destroy the bamboo forest. Therefore to fully understand the potential negative impacts of overlapping land usage, all areas must be delineated.

Note:

- Legends of the colour lines should be included in the 3D map.
- With small pieces of paper, each delineated land use area should be named.

Delineation of the bamboo plantation area

With a specific cotton color line, delineate the bamboo plantation area. This area needs GPS points to localise more precisely the area on the map.

Delineation of the forest plot to be managed

In identifying the area of the bamboo forest that needs to be managed, 5 criteria should be taken into consideration:

- Density of the bamboo in the forest and the frequent usage by villagers.
- The access, by a road or a good path.
- No livestock activities/grazing.
- No shifting cultivation activities in the area or its immediate surroundings.
- Take in account the future district, cluster or village project such as electricity line construction, roads, etc.

The bamboo forests to be managed are delineated with a specific colour cotton line. Each plot is enumerated and characterized by the species that is the source of bamboo.

Take oral description of the plots to be managed, this will be included in the final plan. The team should be aware that the plots described may change (reduced or increased) based on the outcomes of the discussions and villagers' feedbacks of villagers corroborated by GPS points. All three sources are used to improve the description and the map.

Picture of the 3D map with the village limit, types of forests, livestock area, agriculture area and bamboo plots delineated with color cotton lines.

The GPS points of the plot

A minimum of 4 GPS points (4 corners) should be taken for each plot and marked. These points will exactly situate the plot on the digital map. The delineation of the plot should be adjusted based on these GPS points. The area should also be updated for the final agreement.

Summary of the GPS points of one bamboo plot

Name of the point	Orientaton of the point	Y LONG	X LAT
Point 1	North west, North east, south west, south east		
Point 2			
Point 3			
Point 4			
Point 5			
...			

Table can be generated and updated on an excel file on a separate sheet such as "sample of each species of bamboo" sheet.

Digitalization of the bamboo plots identified

The Delineation on the 3D map is input into the Map software. (See guidelines of ArcMap). Steps are:

- take picture of 3D map and transfer/geo-reference onto Arcgis;
- input the GPS points;
- adjust the limits of the forest plots;
- calculate the exact area of the plots.

With the polygon function in ArcMap, calculate the area of each bamboo forest plot to be managed. In the computer, all plots are also characterized (area, name, etc.). The generated map will be printed and attached to the final agreement/plan.

Summary of the delineation and area of each bamboo plot

Plot Number	Bamboo species	Area (ha)	Name of the place and oral description of the limit	Value chain linked to this plot
1				
2				
...				

Results

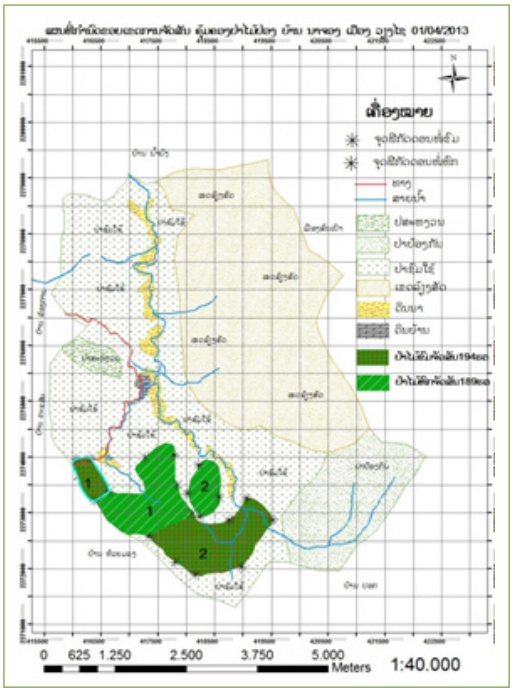
- Delineation of the bamboo forest plots in the 3D map.
- Delineation of the bamboo plantation plots in the 3D map.
- Exact delineation of the bamboo forest and plantation plots mapped with the GPS points and 3D maps.
- Sign board hang on the entrance of the bamboo plot.
- Exact Area of each bamboo plots (ha) and plantation area (ha).

Recommendations

- Delineation of the bamboo forest plots should be approved by all villagers in order to avoid future conflicts.
- In case the forest identified is a small plot, it is difficult to name and describe the limit of the plot.

Recommendations on ArcMap

- Make sure the geo-referencing is well conducted. Make sure the pictures of the map are at the good location. This can be crossed referenced with rivers and the topo line.
- Make sure there is agreement on the limits of neighbouring villages (using previous CM results) and discuss with VBC. Once there is collective agreement, adapt on 3D map.
- On 3D map, write description of each area on sticker so it can be seen easily on ArcMap.
- Make sure all results and work are recorded and saved well on the computer or laptop.
- Make sure the coordinate system are the same for each layer (property, source, coordinate system).



Digital map of the bamboo plots within the village territory

STEP 7

Subzoning and samples plots of each bamboo plots

Objective

To characterize each plot of bamboo area within the village limits in order to develop the adapted forest management plan.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• 3D map • GPS • Computer or laptop • ArcMap • Paper board • Square transparent paper • Excel file for summary of village's FM (e.g. "14..BAN_SUMMARY_FM_Ban...") • Excel sheet: "sample" of each species of bamboo
Duration	
Half day	
Place	
Village meeting room	

Methodology

Subzoning of the forest plots

After drawing the plots on ArcMap using the 3D map and the GPS point, each plot map is projected with the video projector to a paperboard on the wall. The plot is drawn on the board, including rivers and roads. Subsequently, *Google-earth* map of the area is projected on the paper board to see if there are used areas (agriculture).

Explain this projected map to participating villagers, including locations of the rivers, the mountains, etc. At the same time, refer to the 3D map to cross-reference.

The subzoning will depend on the specific bamboo species. For example, khome is a sympodial species while Kouane and Hok are monopodial.

>>> For **khome** species (**Sympodial**), the plot is divided into 4 subzones according to the circumference size of the shoots: No bamboo shoots, big, small, and medium size. The circumferences of the shoots are directly linked with the weight of the shoot (based on E&D results).

For subzoning of khome, it is crucial to clearly define No shoots, big, medium and small size of shoots[6]:

- Big size of shoot = the circumference of the shoot are big.
- Medium size of shoot = the circumference of the shoot are medium.
- Small size of shoot = the circumference of the shoot are small.
- No poles/shoots, no bamboo in this area.

>>> For **Kouane** and **Hok** species (**Monopodial**), the plot is divided into 4 subzones according to the **density** of clumps/shoots in the plot: No bamboo, high, medium, and low density of clumps.

For subzoning of kouane and hok, it is crucial to clearly define No bamboo, High-, Medium- and Low-density of shoots[7].

- High density = a lot of clumps and culms.
- Medium density = medium quantity of clumps.
- Low density = very few clumps and culms.
- No clumps, no bamboo in this area.

6-7. The definition is given by villagers according to the diameter (in cm) and to the quality the market required.

Drawing and delineation of the different subzones of the plot
(B.Fath – Feb 2013)

With a squared transparent paper, technician counts the number of squares of the plot. From the previous step we know the area of the plot.

From this, the correspondence of the area of 1 square.

Count the number of squares of each subzone and determine the area of each subzone.

Number of square and calculation of the area (Ha) of each subzone of the plot

Zone	Number of squares	Area (ha)
Big/high		
Middle/medium		
Small/low		
No bamboo resource		
Total plot		From ArcMap

Number of sample plots by subzone

The survey should be conducted at the minimum, 1% of the area of the plot which corresponds to the minimum of 1% of the area of each subzone. Using the known area of the subzone, 1% is calculated. In addition, the sample plot area is dependent on the bamboo resource because of the characteristics of the bamboo species:

- **Sympodial species:** Hok and kouane: 32 m x 32 m = 1000 m^2, minimum 3 sample plots per subzone.
- **Monopodial species:** khome: 10m x 10m = 100 m^2, minimum 5 sample plots per subzone.

Example calculation of number of sample plots per subzone for sympodial species

Density	Area (ha)	Number sample plots (1%)	Corrective number of sample plots
High	10	1	3
Medium	41	4	4
Low	40	4	4
No bamboo	10	no	no
Total	101	9	11

From the calculation, estimate the number of sample plots needed per subzone.

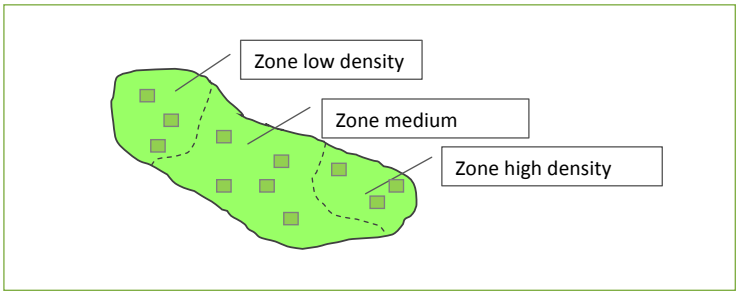
Place of the sample plots by subzone

Two criteria are used to select the location of the sample plots in each subzone:

- Area that provide good representation of the subzone.
- Area where farmers did not harvest during the previous year.

Draw the sample plot in the paperboard map. This map is very important. Take a picture of the map and include it in the Excel file.

Digital drawing of sample plots by subzone.



Results

- Division of the plots in homogeneous subzone.
- Number of sample plots per subzone.
- Place of the sample plots to be surveyed in the subzones.

Recommendations

- It is raw delineation of the subzone based on villagers' perception, that can be wrong.

STEP 8

Field inventory of the sample plots

Objective

To assess the bamboo resources in quantity and quality.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• Templates • Mater • Line • Paper board • Excel file "survey/assessment"
Duration	
Half-a-day to 2 days, according to the plot area and the number of plots	
Place	
Village meeting room and forest plots	

Methodology

The inventory method will be different according to the specific physiology of the bamboo species and to the bamboo part collected (poles or shoot).

In the Bamboo Project, there are 3 cases:

- Khome sympodial species for trading fresh shoots (Annex 1).
- Kouane monopodial species for trading poles (Annex 2).
- Hok monopodial species for trading shoots and pole (Annex 3).

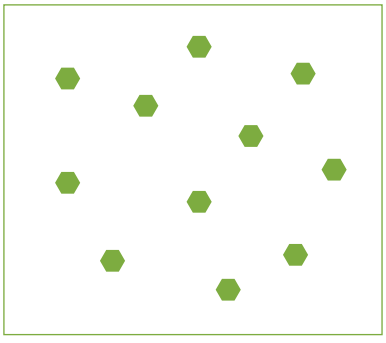
Training on data collection

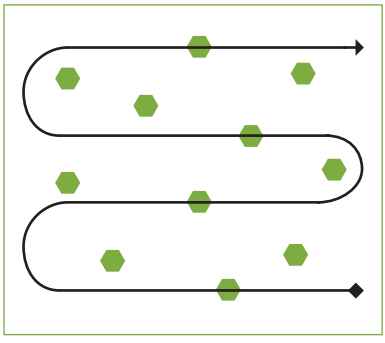
According to the species, chose the adequate template and explain it to the participants. This is a *learning by doing process* wherein one part of the training is in the village's meeting room and another part is be done in the field. When everything is clear for everybody, the field survey can start, based on the place chosen for each sample plot.

The inventory can be divided in team.

In the field set up the sample plots based on the place determined during the previous step: = bamboo clump/pole.

Draw of the sample plot and the way of counting in the sample plots.





The data to be collected is dependent on the information we need for the value chain linked to the bamboo species. The method will differ for each value chain and its bamboo species. If the value chain is linked to bamboo shoots, assessment is done on the quantity of shoots available each year. If it is linked to bamboo poles, assessment is done on the number of poles available each year.

Picture of the measurement of khome bamboo circumference by villagers (B.Fath – Feb 2013).

For assessment of plots linked to bamboo shoots, data collection is as follows:

Data collected for bamboo shoot value chain in sample plots to estimate the forest production capacity

Data collected in the sample plots	Rationale	Formula E&D
The number of clumps	Density of bamboo per hectare.	We know the area of the sample plots and area of the plot.
Number of poles from clumps 1 year old	Density of bamboo poles per year per hectare of clumps of different age that will be mother to new shoots. Count the number of shoots of the 3 previous shooting season.	Estimate the shooting of the 3 previous season to determine how many shoots per clumps or per hectare for the next season.
Number of poles from clumps 2 years old		
Number of poles from clumps 3 years old		
Number of poles from clumps older than 3 years		
Diameter of the poles 1 year old	The diameter of the poles correlates with the weight of the shoots. Producers sell the shoots to trader based on shoot weight.	The correlation depends on the resource and experimentation. For example the khome shoot correlation is shoot/kg = 30.85 e (-0.33x (diameter of shoots in cm)) (r^2 = 0.96).
Diameter of the poles 2 year old		

For assessment of plots linked to poles (i.e Sticks value chain), data collection is as follows:

Data collected for bamboo pole value chain in sample plots to estimate forest production capacity

Data collected in the sample plots	Rationale	Formula E&D
The number of clumps	Density of bamboo per hectare	We know the area of the sample plots and area of the plot.
Number of pole 1 year old	Density of bamboo 1 year per hectare of per clump that are mother to new shoots. Count the number of shoot of the 3 previous shooting season. Estimate number of pole that can be harvested for the next 3 years.	Estimate the shooting of the 3 previous season to determine how many shoot per clumps or per hectare for the next season. The pole 1 year can be harvested when they are more than 3 years old, they are the stock for current reservoir of poles more than 3 years old (y + 3). Same logic for the pole 2 and 3 year old.
Number of pole 2 year old		
Number of pole 3 year old		
Number of pole more than 3 year old		
Diameter of pole	Depends on the quality requirement of the Value chain.	Great diameter means more slats can be produced per pole.
Weight of the pole	Depends on the quality requirement of the Value chain.	For sticks value chain, the slats are sold by producers based on weight.
Number of internodes	Depends on the quality requirement of the Value chain.	percent of the pole can be used for the value chain after discarding internodes (non-processible).
Length of internodes	Depends on the quality requirement of the Value chain.	For the stick value chain the slats must meet length requirements.

Annex 1, 2 and 3 contain in greater details the data collection's tables to best fit with specific bamboo species and their value chains.

Forest production capacity

After in the field data collection, the data are entered into excel file where calculations will be done depending on the information that are needed: quantity of shoots or quantity of pole available in the village. This can provide deeper analysis, calculating the yield for each zone.

Annex 1, 2 and 3 contain in greater details the data collection that best fit with specific bamboo species and their value chains.

Setting up wooden signs for the plots

At the same time when GPS points are taken, the team can set up a small sign to delineate the plots in the forest. These wooden signs can be painted.

Pictures of wooden signs.

Presentation of the results and recommendations

Present the results of the assessment to villagers. These data will be compared with the data obtained in step 5. The data can also be compared with the E&D plots already set up in other villages for the same bamboo species.

The 4 types of data that should be compared and discussed by all participants:

- Calculation of potential quantity processed and sold based on village's labour force.
- Calculation of the quantity available in the forests.
- E&D results on yield.
- Previous monitoring results.

The discussion with the VBC should focus on the results of the village production capacity and the Forest production capacity for sustainable use. The team compares these data with the E&D results and the previous monitoring conducted for the village or in based on E&D plots of other villages for the same bamboo species.

For example, recommendations for khome bamboo shoot after assessments may look like:

Example of recommendation table based on data calculated with villagers, recorded and collected in the field

	Unit	Total
Estimated sustainable harvest of shoots / year from forest plots	.../T	20
Estimated harvesting capacity of villagers / year	.../T	15
Harvested quantity recorded by VBC in 2013	.../T	5
Harvested quantity recorded by VBC in 2014	.../T	10

In this example, after collective comparison, the recommendations to the villagers are that the villagers can collect a maximum of 15 tons of shoot during the season because this is the maximum production capacity of the village (from its labour force) while within the sustainable production capacity of the forests. The difference between harvested quantity recorded in the previous years (2013 versus 2013) may be due to yearly climate differences. In the case where the forest production capacity is lower than the village production capacity, recommendations on harvest quantity for the current year should discourage overharvesting.

All data are compiled on the excel file and should be shown in the final agreement.

Results

- Estimation of the forest capacity production for plots identified for a sustainable use.
- Number of shoots or pole or clumps by hectare and estimated production per hectare.
- Recommendation of the sustainable production that the village can follow for trading purposes.

STEP 9

Discussion on forest management rules and regulations

Objective

To discuss forest management rules and regulations and to plan village's forest monitoring for sustainable forest management.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • project team	• Paper board
Duration	
Half-a-day	
Place	
Village meeting room	

Methodology

In the village, technicians discuss with the VBC about the forest management rules and regulations as well as the manner in which the village would like to manage and allocate their forest: Individual or communal allocation and management.

Rules and regulations

>>> What are the rules?

To have a "good" management of the forest some rules have to be respected in the village. With the VBC, the team opens the discussion during which villagers identify rules needing to be respected and enforced to have a sustainable forest management for future generations.

The project team already possesses previous experiences on the technical rules needing to be respected. They can use these experiences to facilitate this participatory discussion.

Learning process

>>> How ensure respect of the rules by villagers?

To respect the rules, the team should discuss on the way the villagers will self organize to diffuse the rules and regulations while ensuring all villagers consider and apply the rules.

- When and how to diffuse the rules?
- Need sanction if the villagers do not respect the rules?
- What type of sanctions for disrespecting the rules? (e.g. monetarily, how much?)
- Who is responsible for enforcing and regulating the rules?

The discussion outcomes from this step are then included in the final document. In addition, the team should share experiences about previous rules and regulations of other villages. Once completed, there should be a summary of rules and regulations for each bamboo species.

Plan on forest monitoring (specific manual)

Forest monitoring is to verify if the rules and techniques that villagers decided to apply in the village effectively ensure sustainable forest management and sustainable use of the forest. This verification process that is conducted every year is called **monitoring**.

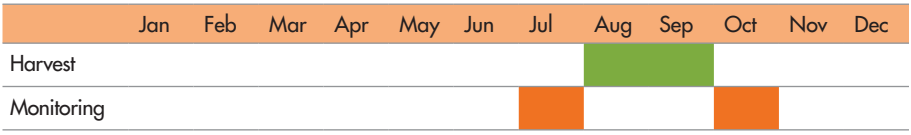
The results of monitoring help to improve the techniques and rules every year, wherein through a learning process, lessons learned can be adapted and include in subsequent years' implementation.

The forest monitoring should be planned by the VBC for each species of bamboo and identify the frequency of the monitoring for each year (i.e once or multiple monitoring of the forest).

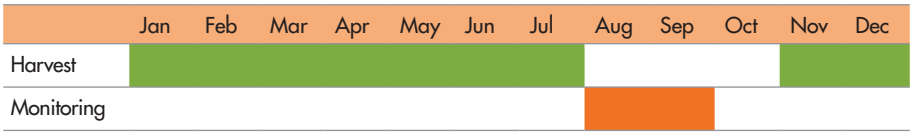
The team should also plan the follow up of the villages' monitoring with the village.

Example of tables of the calendar of the monitoring plan for hok, kouane and khome forest

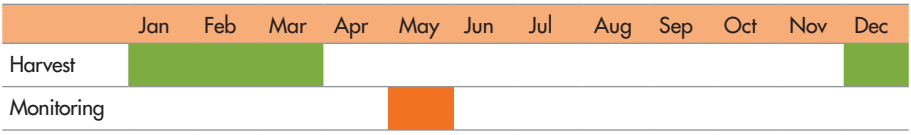
Hok



Kouane



Khome



The cost of the monitoring should be paid by taxes or fees collected through the trade of respective bamboo products (work and material).

The table should be included in the agreement.

Plan of forest allocation

Discussion on the manner to allocate the plots to villagers: communal or individual allocation.

In case of individual allocation, it is important to deeply discuss with villagers on the manner of allocation in order to find an easy and implementable method for individual allocation. The discussion and proposed plan is then included in the management plan.

The discussion should explain the weak and strong points of Individual and communal allocation. In addition, it should be explained that the monitoring is different for the different types of forest allocation.

Finally, the team needs to discuss with the VBC on the rights on the bamboo and other resource present in the plots.

Results

- Rules and regulations of each bamboo forest.
- Action plan of the monitoring all along the year.
- Discussion on allocation of the forest.

Recommendations

- In case off individual allocation, it is not easy to divide the forest equitability between all villagers, could appear conflicts.
- How to secure the forest?
- If the allocation is communal or individual, the monitoring is different.
- If individual allocation, will the households have a land title in the future? Or the forest stay communal?

STEP 10

Elaboration of the management plan and maps

Objective

To develop the final document to be approved by the relevant authorities.

Participants	Equipment and Document
• VBC • DAFO and DONRE technician • Project team	• Excel files • Notes • Computer • ArcMap
Duration	
One day	
Place	
Village meeting room and Bamboo Project office	

Methodology

The 3 types of map

The legend of the 3 kinds of map should be the same (board, digital, 3D map).

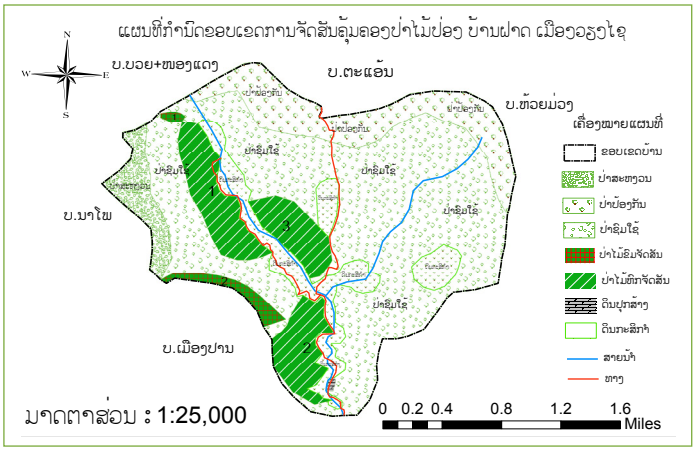
3D map

Paint the 3D map, only the village limit and the plots to be managed. Include the legend with drawn lines in green to show forest locations (protected, conservation, etc.) and in yellow to show agriculture area.

Picture of the 3D map painted

Digital map

There should be a map for each type of bamboo forest to be managed. Generate a general map of the plots of 1 species of bamboo in the village territory and a specific map per plot with area.



Digital map of the village with the bamboo plots

Wooden-board map

The created wooden-board map shows the limit of the village, river, roads and plots to be managed, with a proper legends, scale, direction arrows and area.

Title of the maps should provide clear description of the map such as "Identification and allocation of the bamboo forest hok and khome of Fath village".

Picture of the 3D map painted

Summary of the maps needed:

1. Limit of the village:
   - 1 map with topo line;
   - 1 map without topo line;
   - 1 map with Google Earth.
2. Map with all area (layer "LU_Village"):
   - 1 map with topo line;
   - 1 map without topo line.
3. Maps specifically for each species of bamboo in the village:
   - 1 map with all the plots without topo line;
   - 1 map with Google earth;
   - 1 map by plots without topo line.

Note: all maps should include legends, direction arrows, scale bar and text, grids, title, names of neighbouring villages and names of the plots.

Management plan document finalized as agreement

The Management plan document to be finalized is a report or compilation of all the information collected the previous days. This document will need to be approved by the district authorities after which, the document allows villagers to use the forest.

It is important that the contents of the document, once approved is known as CM agreement, are explained fully and well understood by all participants. If tables need to be included in this agreement, there should be a section previous to the tables explaining the source of the data presented in the tables. Following the tables, there should also be a decription and method of data analysis to generate the tables. It is crucial that the included tables and their presented data are well explained to ensure deep understanding of the readers (especially villagers) the main points of the tables.

A title of the document/Agreement should be given to appropriately describe its content such as: "Identification, allocation and management bamboo forest of the village".

Concretely, contents of the document/Agreement are (in example next page Bamboo is the intended target).

Content of the CM document/Agreement:

Introduction

Small story of the method

1. Village working plan done/agenda.
2. VBC election criteria.
3. Agreement of the district Governor to approve VBC to be responsible for the bamboo forest management.
4. General information and situation of the village and district map with village location.
5. Village limit agreement with two maps and GPS points.
6. Mapping and description of the bamboo forest plots to be managed and two maps.
7. Forest management for Nor hok shoots.
   - *a.* Harvest capacity of the village and area needed
   - *b.* Map of the hok plots in the village
   - *c.* Production capacity of the forest
     - *i.* Hok plot 1
     - *ii.* Hok plot 2
     - *iii.* Summary of the sustainable hok production capacity of the hok forest of the village
     - *d.* Harvest recommendations
   - *e.* Rules and regulations
   - *f.* Monitoring plan
   - *g.* Activity for developing value chain
8. Forest management for Nor khome shoots.
   - *a.* …. Same plan as hok
9. Forest management for Mai kouane bamboo poles.
   - *a.* …. Same plan as hok
10. Improving this rules and regulations.
11. Approval of the CM agreement.
12. Conclusion.
13. Annexes.

STEP 11

Closure ceremony and approval of the Combined Method agreement

Objective

To validate the forest management plan by all villages, and authorities.

Participants	Equipment and Document
• All villagers • VBC • PAFO and PONRE • District Governor • Representatives of Neighbour villages • DAFO and DONRE technician • Project team	• The bamboo forest management plan and all official documents approved/ or to be approved • 3 Maps
Duration	
Half-a-day	
Place	
Village meeting room	

Methodology

The final document with the agreement on village's limits, maps, agreed forest management plans, and the forest management rules and regulations are printed and distributed to the participants.

A closure ceremony is then held with the following agenda:

Introduction of the participant:

- Inform the objectives of the ceremony.
- Presentation of the work done in the village (working date and descriptive activities, results).
- Introduction of the Governor who then officially opens the closure ceremony.
- Villagers read the final document and present the forest management plan to villagers and authorities, using the 3D map.
- Open for remark and questions by all participants.
- Approval of all villagers of the final document.
- Conclusion by the Governor.

Conclusion

This manual is the progress done during the 4 years by the Bamboo Project on bamboo forest identification and inventory. All the agreements approved during the implementation and the data from villagers and the forest are compiled in a "Bamboo forest management plan". This document is approved by the district Governor and gives the legitimacy of the village to use and trade bamboo from natural forest.

This manual does not include all courses that should also be done in order to successfully implement the Combined method. A list of courses that should complement this manual are:

- On ensuring Participation, it is recommended to read this document: "Building sustainable landscape management in the Lao PDR, The landscape mosaic project, Brief" by NAFRI CIFOR, Dec 2010.
- Course on Financial Management covering financial aspects such as simple financial record keeping and simple calculations including accounting: to manage the fund derived from bamboo which can finance the bamboo work done by VBC members.
- The different types of rules and regulations, fund, reporting, use of the fund, etc.
- General record keeping for forest inventory, production and trade inventory, etc.
- And more…as villagers' needs arise to effectively manage the forest for sustainable use.

The data obtained during the CM process should also be used to identify and capitalize on potential markets. It is linked with the quota given by the province to traders or companies. By understanding and demonstrating pertinent data and capacities to market, villagers can capitalize on their advantages as leverage.

An emphasis beyond this manual is the securing of the village bamboo forest land through the implementation of communal land title with the collaboration of GIZ and PONRE. This can be part of a new manual.

ANNEX 1

Nor khome bamboo forest inventory

Value chain: Fresh Shoot value chain

We have:

- The exact delineation of each plots on ArcMap/3D map and GPS points.

Expected results:

- Delineation of the different density area of the plots.
- Potential bamboo production of the forest plot (tons of bamboo shoots in the forest).

The following method is to be used plot by plot:

- The following data need to be recorded for each sample plots:
  - the number of pole of 1 year old;
  - the number of pole of 2 years old;
  - the number of pole of 3 years old and more than 3 years old;
  - diameter (circumference) of pole 1 year old;
  - diameter (circumference) of pole 2 years old.

Size of the sample plot: 10 x 10 m for sympodial sp. (khome).

> Explain to villagers the template on data records.
> One template per sample plot.

Then in the sample plot, choose 10 poles of 1 year and measure circumference. Then in the sample plot, choose 10 poles of 2 years and measure circumference.

Calculation and record data on Excel file

After the field survey, it is very important to explain to VBC the methods to perform calculations. Calculations should be done together between the team and the VBC (even if the excel file gives the answer). This ensures the villagers understand the results so they can discuss the results. It is very important to discuss the results.

The table below explains the excel file and in the same time the logic of the calculations.

For one plot:
In the big shoots subzone

	Sample plot	Number of pole 1 y	Number of pole 2 y	Number of pole 3 y and more	Total number of pole
	1	2	3	10	15
	2				
	...				
Total	15	60	55		

In the medium shoots subzone

	Sample plot	Number of pole 1 y	Number of pole 2 y	Number of pole 3 y and more	Total number of pole
	1				
	2				
	...				
Total	13	55	60		

In the small shoots subzone

	Sample plot	Number of pole 1 y	Number of pole 2 y	Number of pole 3 y and more	Total number of pole
	1				
	2				
	...				
Total	16	70	50		

Template Excel "KHOME ban Survey"

For circumference: average of all circumferences of pole by subzone.

> Record the total number of pole 1, 2, >3 years.

	Big	Medium	Small
Number of sample plot			
Number of pole 1 year old in the sample plot			
Number of pole 2 years old in the sample plot			
Number of pole 3 years older in the sample plot			
Average diameter of pole 1 year			
Average diameter of pole 2 years			

Template Excel "KHOME ban Survey" sheet: "Analyse"

At the end we have the total number of pole 1, 2 and >3 years for each subzone.

1 plot 1 khome		Subzone		
	Unit	Big	Medium	Small
General information				
Area of each subzone (ha)	ha			
Number of sample plots (1 sample plot = 100 m²)	Sp			
Area of sample plots in each subzone (ha)	ha	-	-	-
Data collected in the samples plots				
Number of pole 1 year Number of pole 2 years Number of pole 3 years and more	Pole Pole Pole			
Av diam of pole 1 Year Av diam of pole 2 Years	cm cm			

To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet "KHOME plot 1".

To calculate the number of 1-year-old poles in the plot:

$$\frac{\text{Number of 1 year old poles in big subzone x Number of ha of big subzone}}{\text{Area total of surveyed}}$$

This equation can be used for the number of 2 and >3 years old poles in the subzone. **Same method is used for each and every subzone.**

Data for each subzone	
Number of pole 1 year	Pole
Number of pole 2 years	Pole
Number of pole 3 years and more	Pole

To have the total number of clumps in the plot: add the number of clumps in each subzone. Same method is used for total number of clumps with 1,2 and >3 years old poles for the plot.

Data calculated for the whole plot		
1 Total area of plot 1 WITH BAMBOO	ha	Area big + area medium + area small
Total area of sample plots for inventory	ha	Sum of the sample plot area surveyed in each suzone
% inventory	%	Total Area of the sample plot/ total area with bamboo x 100
Total number of pole of 1 year	Pole	Sum (number pole 1 y) of each subzone
Total number of pole of 2 years	Pole	Sum (number pole 2 y) of each subzone

To estimate the number of shoots next season:

1 plot 1 khome		Subzone		
	Unit	Big	Medium	Small
According to E&D plots 2013 (FRC), nb shoots per year / (average nb culms 1 and 2 years) is:				5
Av nb of poles 1 and 2 years	Poles	Average number pole 1 and 2 y	Average number pole 1 and 2 y	Average number pole 1 and 2 y
Nb shoots / year	Shoots	Number pole x 5	Number pole x 5	Number pole x 5
According to E&D plots 2013 (FRC): shoot / kg = 30.85 e (-0.33x (diameter of shoots in cm)) (r^2=0,96)				
Av diam of poles 1 and 2 years	cm	Average number pole 1 and 2 y	Average number pole 1 and 2 y	Average number pole 1 and 2 y
Average shoots / kg	Shoot/kg	Formula		
Average weight of shoots / year	Kg	Number shoot per year / number shoot by kg	Number shoot per year / number shoot by kg	Number shoot per year / number shoot by kg
Average weight of shoots / year	Ton	/ 1,000	/ 1,000	/ 1,000
Estimated production of whole plot / year				
Total nb shoots / year	Shoot		Sum of eash subzone	
Total weight of shoots / year	Ton		Sum of eash subzone	

Same method above can be used for each khome plot

Now we have estimated total forest production of fresh shoot of the plot. However, some shoots in the forest need to be left for regeneration and not all should be harvested each year. These shoots will matured into poles for the next season and from which new shoots are generated. To calculate the true potential sustainable harvest of fresh shoot per season, it is assumed that 80% of the total forest production can be harvested allow 20% to be source for next season's regeneration.

Data for the village	Unit	1 Plot 1	2 Plot 2	Total
Estimated forest production of fresh shoots / year	Tons (fresh shoots)	Copy	Copy	Sum -
Hypothesis on% of production that can be harvested				80%
Estimated sustainable harvest of fresh shoots / year from forest plots	Tons (fresh shoots)	Forest production x 80%	Forest production x 80%	Sum -

To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet 'KHOME all plots".

This data is to be compared with the village production capacity and the quantity harvested the previous year.

	Units	Total
Estimated sustainable harvest of fresh shoots / year from forest plots	Shoots (ton)	
Estimated fresh shoots harvesting capacity of villagers / year	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2012	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2013	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2014	Shoots (ton)	

ANNEX 2

Mai kouane bamboo forest inventory

Value chain: sale of poles for slats and sticks value chain

We have:

- The exact delineation of each plots on ArcMap/3D map and GPS points.

Expected results:

- Delineation of the different density area of the plots.
- Potential bamboo production of the forest plot (number of pole and tons of bamboo.

The following method is plot-by-plot:

- The following data need to be recorded for each sample plots:
  - the number of 1 year old poles;
  - the number of 2 years old poles;
  - the number of 3 years and more than 3 years old poles.
- Measure for 5 poles by subzone:
  - weight without the leafs;
  - weight of the slats;
  - circumference (diameter);
  - number of internodes;
  - length of internodes.
- Size of the sample plot: 32 x 32 m for monopodial sp. (kouane and hok).

> Explain to villagers the template on data records.
> One template per sample plot.

For measurements the following table can be used:

Zones					
(Weight, slats, circumference, internodes, length of internodes)					
Measure by subzone	Pole 1	Pole 2	Pole 3	Pole 4	Pole 5
Weight without the leafs					
Weight of the slats (kg)					
Circumference (diameter)					
Number of internodes					
Length of internodes (cm)					

One template is used for each subzone.

Calculation and record data on Excel file

After the field survey, it is very important to explain to VBC the methods to perform calculations. Calculations should be done together between the team and the VBC (even if the excel file gives the answer). This ensures the villagers understand the results so they can discuss the results. It is very important to discuss the results.

The table below explains the excel file and in the same time the logic of the calculations.

In the low density subzone:
Sample Plot 1

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1	2	3	10	15
	2				
	...				
Total	15	60	55		

Sample Plot 2

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1				
	2				
	...				
Total	13	55	60		

Sample Plot 3

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1				
	2				
	...				
Total	16	70	50		

Record the number of clumps/ pole that are 1, 2, 3 and >3 years old for each the Subplot.

Template excel "Kouane ban Survey."

	Number of clumps	Number pole 1 year	Number pole 2 years	Number of pole 3 years and more	Total number of pole	Area
SP 1						1,000
SP2						1,000
SP 3						1,000
Total						3,000

Template excel "Kouane ban Survey" sheet: "Analyse HIGH density"

Same method to be done with middle and high density subzone

At the end we have the total number of clumps and number of poles that are 1, 2, 3 and >3 years old for each density subzone.

To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet 'Kouane plot 1".

1 plot kouane		Subzones		
	Units	Big	Medium	Small
Area of subzone and sample plots				
Area of each subzone (ha)	ha			
Number of sample plots (1 sample plot = 1000 m²)	nb			
Area of sample plots in each subzone (ha)	ha	-	-	-
Data collected in the samples plots				
Number of clumps	Clump			
Number of pole 1 year Number of pole 2 years Number of pole 3 years and more	Pole Pole Pole			

The following equation is used to calculate the number of clumps:

$$\frac{\text{Number clumps in low density subzone x Number of ha of the area of the low density}}{\text{Area total of surveyed}}$$

Same method can be used for the number total of poles that are 1, 2, 3 and > 3 years old in every subzone within the village's bamboo forests.

Data for each subzone	
Number of clumps	Clump
Number of pole 1 year	Pole
Number of pole 2 years	Pole
Number of pole 3 years and more	Pole

To have the total number of clumps in the plot: add the number of clumps in each subzone. Same method is used for total number of poles that are 1, 2, 3 and>3 years old for every Mai kouane plot inside the village's bamboo forest.

Data calculated for the whole plot		
1 Total area of plot 1 with bamboo	ha	Area high density + area medium density + area low density
Total area of sample plots for inventory	ha	Sum of the sample plot area surveyed in each suzone
% inventory	%	Total Area of the sample plot/ total area with bamboo x 100
Total number of clumps	clp	Number clps high density + number clps medium density + number clps Low density
Total number of pole of 1 year	Pole	Sum (number pole 1 y) of each subzone
Total number of pole of 2 years	Pole	Sum (number pole 2 y) of each subzone
Number of pole 3 years and more	Pole	Sum (number pole more 3 y) of each subzone

Now we have the total number of poles of each year by plot. The rules say that cannot harvest the pole less than 3 years old (because they are mother of new shoots).

Based on this rule

- If the survey is done 2014, the poles that can be harvested in 2014 are poles 3 years or older.
- If the survey is done in 2014, the poles that can be harvested in 2015 are poles 2 years old in 2014.
- If the survey is done in 2014, the poles that can be harvested in 2016 are poles 1 year old in 2014.
- If the survey is done in 2014, the poles that can be harvest in 2017 are the new shoots in 2014.

Data for the village	Number of Ha	Quantity of pole can be harvested in the plot 2014	Quantity of pole can be harvested in the plot 2015	Quantity of pole can be harvested in the plot 2016	Quantity of pole can be harvested in the plot 2017
Plot 1					
Plot 2					
Plot 3					
Total	-	-	-	-	-

To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet 'KOUANE all plots".

This data is to be compared with the village production capacity and the quantity harvested the previous year.

Total Tons of kouane (1pole = 7kg)	
Ton can be processed 2014	ton
Ton can be processed 2015	ton
Ton can be processed 2016	ton
Ton can be processed 2017	ton
Quantity village can harvest and process	ton

ANNEX 3

Nor hok bamboo forest inventory

Value chain: fresh and dry shoot, poles potential value chain

We have:

- The exact delineation of each plots on ArcMap/3D map and GPS points.

Expected results:

- Delineation of the different density area of the plots.
- Forest capacity and potential bamboo production of the forest plot of poles and shoot production (tons in the forest).

The following method is plot-by-plot:

- The following data need to be recorded for each sample plots:
  - the number of 1 year old poles;
  - the number of 2 years old poles;
  - the number of 3 years and more than 3 year old poles.
- Size of the sample plot: 32 x 32 m for monopodial sp. (kouane and hok).

> Explain to villagers the template on data records.
> One template per sample plot.

Calculation and record data on Excel file

After the field survey, it is very important to explain to VBC the methods to perform calculations. Calculations should be done together between the team and the VBC (even if the excel file gives the answer). This ensures the villagers understand the results so they can discuss the results. It is very important to discuss the results.

The table below explains the excel file and in the same time the logic of the calculations.

In the low density subzone:
Sample Plot 1

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1	2	3	10	15
	2				
	...				
Total	15	60	55		

Sample Plot 2

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1				
	2				
	...				
Total	13	55	60		

Sample Plot 3

	Number of clump	Number of pole 1 year	Number of pole 2 years	Number of pole 3 years and more	Total number of pole
	1				
	2				
	...				
Total	16	70	50		

Record the number of clumps/ pole that are 1, 2, 3 and >3 years old for each the subplot.

Template Excel "Hok ban Survey"

	Number of clumps	Number pole 1 year	Number pole 2 years	Number of pole 3 years and more	Total number of pole	Area	
SP 1							1,000
SP2							1,000
SP 3							1,000
Total							3,000

Template excel "Hok ban Survey" sheet: "Analyse low density".

Same method to be done with middle and high density subzone

At the end we have the TOTAL number of clumps and number of poles that are 1, 2, 3 and >3 years old for each density subzone.

> To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet 'hok plot 1".

1 plot hok		Subzones		
	Units	Big	Medium	Small
Area of subzone and sample plots				
Area of each subzone (ha)	ha			
Number of sample plots (1 sample plot = 1000 m²)	Nb			
Area of sample plots in each subzone (ha)	ha	-	-	-
Data collected in the samples plots				
Number of clumps	Clp			
Number of pole 1 year Number of pole 2 years Number of pole 3 years and more	Pole Pole Pole			

The following equation is used to calculate the number of clumps:

$$\frac{\text{Number clumps in low density subzone x Number of ha of the area of the low density}}{\text{Area total of surveyed}}$$

Same method is used for the total number of poles that are 1, 2, 3 and >3years old in every subzone.

Data for each subzone	
Number of clumps	Clp
Number of pole 1 year	Pole
Number of pole 2 years	Pole
Number of pole 3 year and more	Pole

To have the total number of clumps in the plot: add the number of clumps in each subzone. Same method is used for total number of poles that are 1,2, 3 and>3 years old for the plot.

Data calculated for the whole plot		
1 Total area of plot 1 with bamboo	ha	Area High density + area medium density + area Low density
Total area of sample plots for inventory	ha	Sum of the sp area surveyed in each suzone
% inventory	%	Total Area of the sp/ total area with bamboo x 100
Total number of clumps	clp	Number clps High density + Number clps medium density + Number clps Low density
Total number of pole of 1 year	Pole	Sum (number pole 1 y) of each subzone
Total number of pole of 2 year	Pole	Sum (number pole 2 y) of each subzone

1 plot hok		Subzones		
	Units	High	Medium	Low
According to E&D plots 2013 (FRC): number of shoots per year / nb culms 1 year is				10
Number of pole 1 year	poles	copy	copy	copy
Nb shoots / year	shoots	Number pole 1 y x 10	Number pole 1 y x 10	Number pole 1 y x 10
According to E&D plots 2013 (FRC): Av weight in kilo of 1 shoots is:				10
Av weight of shoots / year	kg	Copy Number of shoot	Copy Number of shoot	Copy Number of shoot
Av weight of shoots / year	Ton	Number shoot x 1 kg	Number shoot x 1 kg	Number shoot x 1 kg
Estimated production of whole plot / year				
Total nb shoots / year	shoot	Sum of density subzone		
Total weight of shoots / year	Ton	Sum of density subzone		

Same method is used for each hok plot

Now we have estimated total forest production of fresh shoot of the plot. However, some shoots in the forest need to be left for regeneration and not all should be harvested each year. These shoots will mature into poles for the next season and from which new shoots are generated. To calculate the true potential sustainable harvest of fresh shoot per season, it is assumed that 60% of the total forest production can be harvested allowing 40% to be source for next season's regeneration.

Data for the village	Units	Plot 1	Plot 2	Total
Estimated forest production of fresh shoots / year	Shoots (ton)	copy	copy	sum -
Hypothesis on% of production that can be harvested				60%
Estimated sustainable harvest of fresh shoots / year from forest plots	Shoots (ton)	Forest production x 60%	Forest production x 60%	sum
Kilo of fresh shoots to produce 1 kg of dry shoot				15
Equivalent potential dried shoot / year from forest plots	Shoots (ton)	Est sust harvest production/15	Est sust harvest production/15	sum -

To be recorded in the excel file: "1406_BFLUP_FMP_B." sheet 'HOK all plots".

This data is to be compared with the village capacity production and the quantity harvested the previous year.

	Units	Total
Estimated sustainable harvest of fresh shoots / year from forest plots	Shoots (ton)	
Estimated fresh shoots harvesting capacity of villagers / year	Shoots (ton)	
Quantity can be harvest and processed in the village	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2012	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2013	Shoots (ton)	
Harvested quantity of fresh shoots recorded by VBC in 2014	Shoots (ton)	

ANNEX 4

Agenda of Combined Method implementation in Ban Fath

(February-March 2013)

Date	Steps	Activities	Results	Person
02/20/13	Step 1	3D creation	3D map	
02/21/13	Step 2	Open ceremony	Officially start activity in the village	DAFO, PAFO, DLMA, PLMA, Governor, villagers
	Step 3	Delineation of the village limit	Clear delineation of the Village limit	3 representative / villages
02/22/13	Step 4	Delineation of the rough CLU and delineation of plots of bamboo forest to be managed	Rough CLU delinea-ted. Delineation of the bamboo forest plots to be manage	Vill authorities + VBC + team + DAFO + DONRE
	Step 5	Socio economic cal-culation and analyses concerning bamboo activities	Socio economic data Village production capacity	Vill authorities+ VBC + team + DAFO + DONRE
02/25/13	Step 6	Identification of the zones and samples plots 3 plots for Hok bamboo 2 plots for Khome bamboo		Vill authorities + VBC + team + DAFO + DONRE
	Step 7	Training on Hok bamboo survey Training on Khome survey		Vill authorities + VBC + team + DAFO
02/26/13	Step 3 bis	Village limit conflict resolution with ban Boay	GPS points with ban boy, ban Tean and Ban fath	Villagerss and and DAFO + DONRE 2 districts

Date	Steps	Activities	Results	Person
02/26/13 To .../.../13	Step 8	Field survey on forest management assessment	Field survey 2 team = 1 khome plot number2 Field: 3 team = 1 gps team + 2 survey team	Vong Sith villagers Vong, sith, DAFO villagers
03/06/13	Step 9	Forest management discussion	Rules and regulations and allocation of the forest management	Vill authorities + VBC + team + DAFO + DONRE
03/07/13	Step 10	Creation of the management plan and the maps	Maps, Digital, 3D, wooden board	Vill authorities + VBC + team + DAFO + DONRE
03/08/13	Step 11	Closure ceremony	Approval of the plan and closure ceremony	DAFO, PAFO, DLMA, PLMA, Governor, villagers

ANNEX 5

List of materials and equipment needed

Material	Number	Need to buy for village	Price (Kip)	Cost
Topo Map	1		100,000	
Carton paper (1x1x0,01)	According to nb of TOPO line		20,000	
Plaster	2 m^2		25,000	
Sub total 3D Map				
Cabel for the lamp (extension) 10 m	1		250,000	
2A battery	2		25,000	
Meter line (50m)	3			
Caliper	3			
Sub total small equipt				

Material	Number	Need to buy for village	Price (Kip)	Cost
Water paint White color	1		7,000	
Water paint Black color	1		7,000	
Water paint Red color	1		7,000	
Water paint Yellow color	1		7,000	
Water paint Blue color	1		7,000	
Water paint Green color	1		7,000	
Water paint Orange color	1		7,000	
Oil paint White color	1		18,000	
Oil paint Black color	1		8,000	
Oil paint Blue color	1		8,000	
Oil paint Yellow color	1		8,000	
Oil paint Green color	1		30,000	
Oil paint Red color	1		8,000	
Oil paint Ligh blue color	1		8,000	
Oil paint Brown color	1		8,000	
Oil paint Light green color	1		8,000	
Oil paint Light blue color	1		8,000	

Material	Number	Need to buy for village	Price (Kip)	Cost
Color painter (brush)	5		8,000	
	2		4,000	
Color painter (brush)	1		6,000	
Big color painter (brush)				
Sub total paint				
wooden board 120 x 150 cm	1		400,000	
wooden board 20 x 400 cm				
Nail 5, 8, 10	Depend on nb of plot		0	
Cap nail				
Transparent color	1 Kg		12,000	
Metal roof	1 box		15,000	
	1		20,000	
	4		40,000	
Sub total wooden board				
Staples	1			
Big cutter	4		10,000	
Small cutter	10		15,000	
Latex glue	2		20,000	
Scott tape	6		15,000	
Needle	1 pack		4,000	
Small needle	10 boxes		3,000	

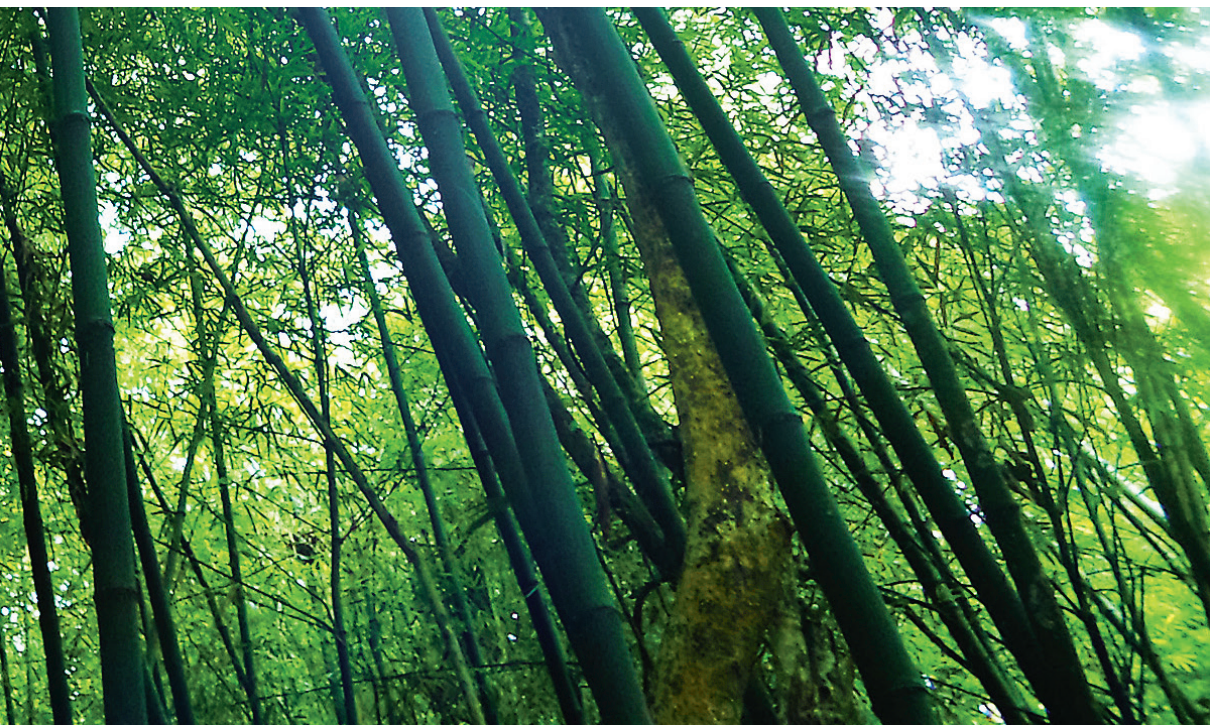
Material	Number	Need to buy for village	Price (Kip)	Cost
Note book for VBC	12		8,000	
A0 Paper	30		1,000	
Carbon paper	1 pack			
A4 paper	2 packs		35,000	
Permanent Marker 3 color	2 boxes		45,000	
Pen	12		1,000	
Pencil	1 box			
Color string 3 color	36 balls		4,000	
Color string 12 color	12 (1 ball each)			
Printer' Black and white ink	1		350,000	
Sub total small material				
Making agreement for authorities				
Print documents	Estimate		500,000	
Sub total agreement				

Big equipment	Number	Comment
Generator	1	In case there is no electricity
UPS + cable	1	
Long cabel	1	
computers	2	
ArcMap / Qgis	1	
Printer	1	
Projector	1	
GPS	3	
Digital camera	1	

Small equipment	Number	Comment
Calculator	4	
Stapler	2	
Scissor	2	
Big Ruler	2	

Annual forest monitoring manual

Samneua, Viengxay and Sobbao District
Houaphan Province, Lao PDR



Forest monitoring introduction

This technical manual was developed in the framework of the houaphanh bamboo sector development project (hereafter refer to as the bamboo project), with the objective of sustainable development of the bamboo sector in houaphan province. Since 2011, Gret supported the development and realization of the houaphanh province's bamboo strategy in three districts: Samneua, Viengxay and Sobbao. The project's activities focus on the development of four bamboo value chains, which depends on three different bamboo species coming from natural forest:

- Kouane (*Dendrocalamus longifimbriatus*) which serves as supply for factories processing slats and sticks to be exported to the vietnamese markets; and handicraft value chain.
- Khome (*Indosasasinica*) which provides fresh bamboo shoots for Lao domestic markets and consumers.
- Mai hok (*Dendrocalamus hamiltonii*) which shoots are processed into dried products for domestic market in vientiane trade fairs and vietnamese markets.

To ensure sustainable use of the bamboo forests in supported villages, one key components of the project is to facilitate the process of the community forest management plan of the natural bamboo forests. The forest management plan is a document certifying the good use of the forest for trade purpose through a participatory approach (see manual on *bamboo forest land identification, inventory and management*).The idea is that by ensuring communities having sustainable use of their natural bamboo forest, this would be the initial step toward the emergence of sustainable and profitable value chains.

A method ensuring the village's sustainable forest management is the "annual forest monitoring" implemented by established village-based village bamboo committee (VBC). The specific roles of this VBC are to:

Monitor the bamboo forest plots and trade

- Enforce the forest rules and regulations to ensure the forest rules and regulations are respected by the villagers.
- Monitor the bamboo forest during harvesting period and annual monitoring.

Investigate and solve problems related to the village's bamboo forest

- Conflict resolution and instructed non-compliant villagers to respect the forest rules and regulations.
- Fined the villagers not respecting the forest rules and regulations.

Accounting and management

- Recording the quantities harvested by the villagers and bookkeeping.
- Management the forest monitoring fund/expenditures of the VBC.

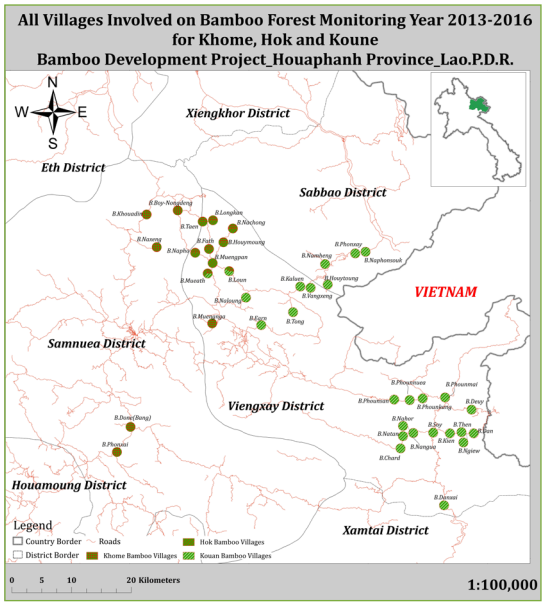
To facilitate the VBC and relevant forest technicians in implementing this annual forest monitoring, this manual is one of three manuals providing instructions on monitoring:

- Kouane bamboo forest (*Dendrocalamus longifimbriatus*).
- Hok bamboo forest (*Dendrocalamus hamiltonii*).
- Khome bamboo forest (*Indosasasinica*).

Primarily, this technical manual should be used by technicians implementing bamboo forest pre/post-harvest monitoring. It serves as a reference to design, plan and conduct trainings on sustainable bamboo forest management with active participation of the villagers. Therefore, the VBCs acting as main facilitators for implementing the forest monitoring by using this technical manual should have the capacity, basic bamboo knowledge, and clear understanding of all figures of this manual. This manual can also be used by trainers, extension workers, students, practitioners, learning and training institutions, government agencies and NGOs or NPAs dealing with sustainable bamboo forest management.

Forest monitoring background

To achieve the objectives of the forest management components of the bamboo project, since 2013 the project designed bamboo forest monitoring methods and by collaborating with technicians from PAFO and DAFO of Viengxay and Samneua district started to train the village authorities responsible for managing village's bamboo resources. These members are referred to as the village bamboo committees (VBC). The bamboo forest monitoring methods that were developed consisted of the pre-harvest monitoring and post-harvest monitoring. These two methods were designed to appropriately address the forest management needs fitting for each village and their respective bamboo value chains. Pre-harvest monitoring method was developed for the nor hok value chain villages while the post-harvest monitoring method was developed for the Nor khome and the Mai kouane value chains. For each respective village, VBCs' main roles include implementing the post-harvest monitoring in their villages. In 2014, post-harvest monitoring was implemented in 11 khome villages and 17 kouane villages, while pre-harvest monitoring method was implemented in 9 Nor hok villages.



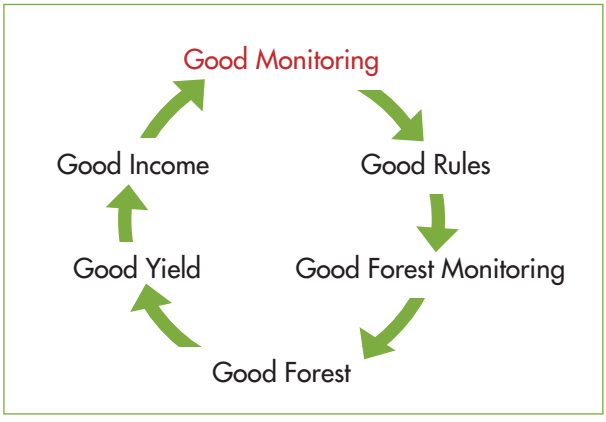
Map of villages where bamboo forest monitoring was conducted

In 2016, based on the lessons learned from 2013 to 2016, both forest monitoring methods were updated and implemented in 13 khome villages, 26 kouane villages, and 9 hok villages.

In addition, the project is facilitating the development of the Huaphanh bamboo sector through a collective learning process approach. Through this approach, the forest management (FM) agreement was developed between villages' VBC and DAFO which consists of a set of documents resulting from participatory discussion and implementation on the identification, survey, and definition of the rules and regulations for sustainable bamboo forest use. Important to the process of developing this agreement is the incorporation of villagers' knowledge about their natural bamboo forest. In addition, to supplement and increase the knowledge on forest management techniques and practices, the project started in 2012 to collaborate with FSRC/NAFRI on experimentation and demonstration plots of 5 bamboo species in 8 villages (E&D). The product of this collaboration was then included in the fm agreement to provide scientific basis for the techniques.

There is an expected direct linkage between the sustainable use of bamboo forests and persistent good annual yield from the bamboo forest which in turns ensure a sustainable and long term income generation for villagers. To ensure this resource and economic sustainability, the villagers have to maintain their bamboo forests by respecting the developed and agreed-upon forest management rules and regulations.

Learning process for managing the bamboo forest



Indicative of the evolving learning process the forest monitoring method has been improved since 2013. This has allowed the villagers/VBCs the ability to monitor and improve the rules and regulations year-after-year based on their lessons learned and experiences.

Therefore, this forest monitoring manual is a product of the learning process approach strengthened by the participatory contributions and feedbacks of the villagers since 2013.

Objectives of the forest monitoring manual

The objectives of the manual are to:

1. Ensure the understanding of the bamboo forest monitoring methods by the villagers.
2. Provide mechanisms for accountability in terms of sustainably managing the bamboo forests.
3. Build capacity of villagers to implement bamboo forest monitoring tools and techniques.
4. Ensure the bamboo forest management rules and regulations are respected by the villagers to ensure their sustainable use.

Bamboo forest monitoring strategy

The strategy and general method of the forest monitoring

In 2015, for strengthening the village committee (VBC), village forest management technician (VFMT) was selected during the value chain multistakeholders meetings on khome, hok and kouane value chains held in Viengxay district on 10-12/18/2014 (see the table in annex 1). VFMTs are village representative trained by the bamboo project to become forest management technicians with expertise on the implementation of bamboo forest monitoring methods. The responsibilities of the VFMTs are: to train and support VBCs on implementing the bamboo forest monitoring in the village. Thus, the VFMTs essentially play the role of village-level forest management service providers.

Through successfully implementation of their responsibilities, the VFMTs are able to facilitate villages' successful implementation of their bamboo forest monitoring. This monitoring is part of a strategy employing a comprehensive approach to ensure proper bamboo forest monitoring and reporting. This strategy employs village level monitoring which is then cross-checked and validated by external team monitoring and auditing.

Important to the sustainability of forest monitoring in villages is the long term development of VFMTs. In time, with greater capacity and coordination, they will be a component of the bamboo service organization (BSO) which will provide services aiming at developing the bamboo sector in Houaphanh through capacity building of stakeholders for the purpose of implementing the provincial bamboo strategy (2016-2020). Among its services will be bamboo forest monitoring and combined method (CM) in the bamboo project's current target districts (Samneua, Viengxay, and Sobbao) and potentially future target districts of Houaphanh province as well as other provinces.

Technically, the bamboo forest monitoring is a verification and a reminder of the rules and regulations of the FMP. Within this context, the objectives of the VBCs implementation are:

1. To check the sustainable use of the bamboo forest before and/or after the harvesting season.
2. To check and revise the rules and regulations.

From experiences and improvements, the current forest monitoring method includes three successive main steps, each step consisting common structure of:

- Objectives
- Participants
- Duration
- Equipment and document
- Methodology
- Results
- Recommendations

Table of bamboo forest monitoring steps

Step	Description	Duration	Imple-menters	Rationale	Objectives	Method
1	Field inventory	According to the numbers of bamboo forest plots	VBC	Assess and record the condition of the bamboo forest plots before/after harvesting season	• Assess condition of khome bamboo forest before/ after the harvesting season. • Ensure villagers' respecting of the rules and regulations	Count number of poles each class of age, bamboo size, damage area and soil fertility
2	Meeting with villagers	Few hours	VBC and all produ-cers	Open space to discuss potential issues	• To present field inventory results to the villagers. • With villagers, discuss rules and regulations and get approval on bamboo forest monitoring results.	Participatory meeting explaining field observation and discuss about possible improve-ment of the rules and regulations.
3	External team evaluation	According to the num-bers of the villages	VFMT, DAFO	Need to know the methods and management system the villagers use to manage their bamboo forest.		Collect and eva-luate the report. Approval of the reports, produce an evaluation report and send back to villages.

The budget for village bamboo forest monitoring

Although the cost incurred to conduct a village bamboo forest monitoring is not high in comparison to other land/forest management activities (PLUP, CM etc.), there is a cost to compensate the VBCs for their participation instead of other livelihoods work (farming, bamboo-based production, livestock rearing, etc.).The funding source for this compensation could be from the village bamboo fund. This fund, if collected effectively can be an adequate source to subsidize all village bamboo forest monitoring activities.

Depending on VBC's effectiveness, the Village Bamboo Fund (VBF) could come from:

- Fees collected from traders who come to buy the bamboo products in the village.
- Funds contributed to the fund from other livelihood components in the village.
- Contract negotiation (ex. trader subsidize bamboo forest monitoring costs), etc.

Once collected, a VBF could be managed depending on the needs of the village, for example:

Learning process for managing the bamboo forest

In cases where the village does not have a VBF or the VBF is inadequate, the village authority should consider mobilizing the VBCs to conduct the bamboo forest monitoring activity as a village communal work (VBC/forester participants are rotated each year).

Khome bamboo forest post-harvest monitoring technical manual

In total, the post-harvest monitoring of the khome bamboo forest implemented by VBCs involve 3 steps: two steps conducted in the village with the participation of villagers and the third step is the external team evaluation. Specifically, the first step involves the field inventory of the khome bamboo forest by the VBC and foresters while the second step involves the VBCs meeting with villagers after the field inventory to present field results and discuss on the rules and regulations. Finally, the third step involves the external team's evaluation of the results from step 1 and 2.

STEP 1

The field inventory

Step 1's field inventory of the khome bamboo forest plots in the village

Field observation in every khome bamboo plot

Discussion on khome bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

- To know numbers of poles for each bamboo age group, and VBCs estimate quantity of poles that can give bamboo shoots each year.
- Representative size of poles for each bamboo age category.
- To know the damaged area of khome bamboo forest plot.
- To know soil fertility in khome plot, and existing challenges and constraints of bamboo forest management and monitoring.

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>• VBCs
• Foresters</td><td rowspan="4">• Form 1: field inventory (see Annex 2)
• Pen
• Diameter measure tool
• Lines</td></tr>
<tr><th>Duration</th></tr>
<tr><td>According to the number of plots (e.g: Ban fath 18 ha, and it takes 2 days).</td></tr>
<tr><th>Place</th></tr>
<tr><td>Village khome bamboo forest plots.</td><td></td></tr>
<tr><th colspan="2">Expected Budget</th></tr>
<tr><td colspan="2">According to the decision of VBCs</td></tr>
</table>

Methodology

› Importance of field inventory

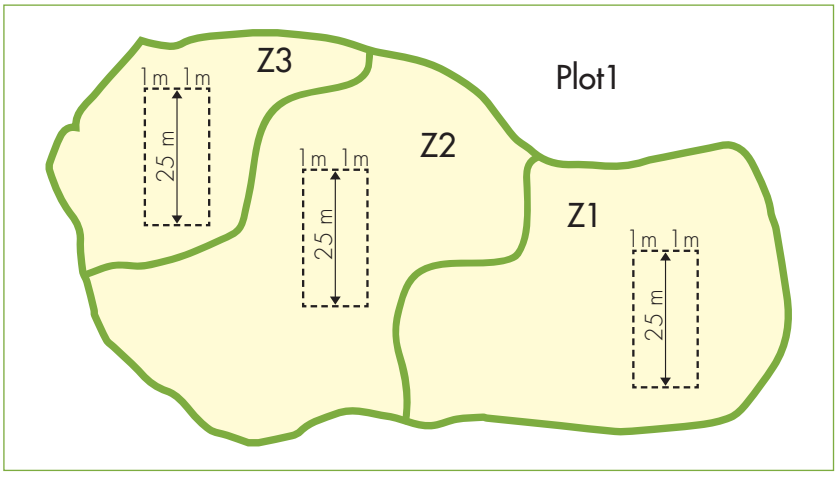
- Know the conditions of the khome plot after harvesting season.
- Area damaged by harvesting: techniques, tools, livestock, etc.
- Quantities of shoots can be harvested in next season.

Villagers conduct field inventory

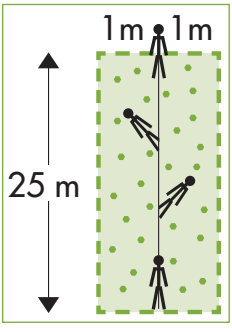
› Field inventory method

- Participations of the VBC in the village;
- Select the khome plots where villagers harvested, according to the density zone (see CM manual), divide khome plot into 3 subzones: subzones containing mainly big shoots, medium shoots and small shoots.

Subzones of big shoot, medium shoot and small shoots (Z1, Z2, Z3) for field inventory



- For each identified subzone, VBC makes at least 2 straight lines, each line 25 meter in length. Each line will indicate a measurement area in which the area is determined by 1 m going out from the left and right side of the 25 m line. This gives the measurement area of 25 x 2 = 50 m^2.



25 m measurement line and corresponding measurement area

• Once the 25 m lines and corresponding measurement areas for each subzone have been identified (at least 2 lines per subzone with each measurement area for each line 50m^2), VBCs record the number of lines for each subzone (big shoots, medium shoots, and small shoots subzones)using the table below:

Recording number of lines identified in each subzone

PLOT 1	Big shoots	Medium shoots	Small shoots	Total
Number of lines (50 m^2)				

• Recording number of existing poles per subzone by poles' age

– VBCs walk along the measurement area of each line in each subzone and record the number of poles corresponding to their age for the entire area.

– VBCs record the number of 1 year old poles in each line per subzone.

– Record the number of 2 years old poles in each line of each subzone.

– Record the number of poles more than 3 years old in each line per subzone.

VBC count the poles in each age group.

Recording number of poles identified in each subzone

Number of lines	Subzone	Poles age		
		1 year	2 years	>3 years
line 1	Big shoot			
line 2				
line 1	Medium shoot			
line 2				
line 1	Small shoot			
line 2				
Total				

This information will be used for quantifying shoots that will be generated by the plot in the next season by combining the E&D findings with this data (e.g. FSRC analysis in 2015 demonstrated that on average, 1 khome pole can generate 5 shoots/year).

- Measuring poles diameter in the khome plot
  - VBC will measure the diameter of the poles for only 1 line for each subzone. This selected line should best represent the subzone.
  - For each pole, measure at the 4th internode from the bottom.
  - Measure size of 1 year old poles subzone's represented lines.
  - Measure size of 2 years old poles from each subzone's representing lines.
  - Measure size of poles more than 3 years old from each subzone's representing lines.
  - For the measurement VBCs will measure representative poles 3 poles by age (e.g.: pole 1 year, VBC need to measure 1 biggest pole, 1 medium pole and 1 smallest pole).

Diameter measurement

Recording of these measurements should be done on the table below:

Table for recording the size of poles each class of age

	Size of shoot								
	Big shoot			Medium shoot			Small shoot		
	1 y	2 y	>3 y	1 y	2 y	>3 y	1 y	2 y	>3 y
Line 1									
Total									
Average									

The diameter of khome bamboo poles is directly link to the weight of the khome shoot.

- Measuring bamboo forest's damaged area for the plot

VBC walks throughout the entire plot and make observations on the condition of the bamboo forest. Specifically:

– Check the damaged area caused by livestock;

– Document damaged areas by forest fire;

– Damaged area caused by felling of old bamboo poles dying or broken;

– Damaged area caused by soil erosion;

– Damaged areas caused by poor harvesting techniques (big hole and deep), etc.

Diameter measurement

The documentation of all bamboo forest damages should be recorded in the table below:

Table for recording the damaged area of khome bamboo forest plot

	Damage criteria	Yes/No	Area (ha)	Causes	Solution
Observation of the damage in the area	Damaged by livestock				
	Fire forests				
	Pole broken and fall				
	Soil erosion				
	Big hole and deep				

The damaged area of the khome bamboo forest plot is directly link to the reduction in forest production capacity. This will be taken into account for forest capacity calculation.

- Measuring and calculating soil fertility of khome bamboo forest plot
  - At the same time during which the VBCs walk and check for the conditions of the khome bamboo forest plot, VBC also need to check on the soil fertility of the plot.
  - Measure moisture inside the khome plot.
  - Based on measurement, VBC need to determine if the soil fertility and moisture level are the same, have increased, or have decreased in comparison to previous year.
  - In the case that it was determined soil fertility or soil moisture was decreased, VBCs need to indicate the cause and propose solutions.

These observations and determinations need to be recorded in the table below:

Table for recording the fertility and moisture in the khome bamboo forest plot

		Observation	Causes	Solution
Observation on organic materials in the area	Organic/leaves			
	Moisture			

It should be recognized that climate change (weather, rain, etc.) effects of each year can be a main determinant of bamboo shooting for the khome bamboo within the forest plot.

› Quantities can be harvested in next season

- Once VBCs completed the field inventory, VBCs need to calculate and estimate the quantities that can be harvested of each khome plot for next season based on the results from field inventory:
  - We know the total area of whole plot is……ha.
  - We know the total poles 1 year and 2 years from step 1 (field inventory) is…… poles in the area of 300 square meter (300 m^2) where was surveyed.
  - We know that poles of 1 year or 2 years old can give 5 shoots/year (based on E&D data).
  - We know that on average, each shoot is 0.19 kg (based on E&D data).
  - Through the monitoring know area was damaged…… is……ha. Therefore the calculation of the quantities can be harvest in the next season is:

Area of the plot……ha **–** Area damaged……ha **=** Remain area……ha or……m^2

300 m^2 ➔ number of poles from monitoring……poles

Remain area……m^2 ➔ x ?

$$X = \frac{\text{Remain area……m}^2 \textbf{ X } \text{number of poles from monitoring……poles}}{300}$$

= Number of poles remain area……poles

We know poles of 1 year or 2 years old can give 5 shoot/year (E&D), therefore:

1 pole ➔ 5 shoots

Number of poles all area……poles ➔ x ?

$$X = \frac{\text{Number of poles all area.....poles} \times 5 \text{ shoots}}{1 \text{ pole}}$$

= Number of shoots.....shoots

We know 1 shoot is 0.19 kg (E&D), therefore:

1 shoot → 0.19 kg

Number of shoots.....shoots → x ?

$$X = \frac{\text{Number of poles all area.....poles} \times 0.19 \text{ kg}}{1 \text{ shoot}}$$

= Weight of shoot.....kg

1,000 kg → 1 t

Weight of shoot.....kg → x ? t

$$X = \frac{\text{Weight of shoot.....kg} \times 1 \text{ t}}{1{,}000 \text{ kg}}$$

= Weight of shoot.....tons

For sustainable use of the forest, villagers will harvest only 80% of the shoots, therefore:

100% → Weight of shoot.....tons

80% → x ?

$$X = \frac{80\% \times \text{Weight of shoot.....tons}}{100}$$

= Number of tons that can be harvested in next season is..... tons

› Difficulties and recommendations

During the field inventory, VBCs may need to indicate:

- The difficulties encountered during the field inventory.
- Improvements for future khome bamboo forest monitoring.
- VBCs' recommendations to improve and/or modify the method, etc.

(Form inventory can be seen in Annex 2.)

Results

Once completed, the results of this step should be:

- Number of poles by ages represented in each subzone are recorded.
- Diameter poles represented by each age group recorded.
- The damaged area in the khome bamboo forest plot, if any.

Once completed, the VBCs and Producers group (PG) are able to use this data to estimate the bamboo forest production capacity for the next season, specifically shoots production. Therefore, auxiliary results from this step and the calculations derived from this step include:

- Forest production capacity are used for contract negotiation with the traders.
- Linkage between Government's quotas given to traders and planned trading.
- Monitoring and ensuring villagers' khome bamboo forest management and use in a sustainable and long term manner.

Recommendations

- Outcomes should be based on the reality of the villagers and their forests.
- All information should be clear and transparent as the information derived from this step will be used for analysis and evaluation by the external team.

STEP 2

Village meeting

Village meeting for discussing on the khome bamboo forest plot and rules and regulations

Field observation in every khome bamboo plot

Discussion on khome bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

- To present the field observation and inventory results of the post-harvesting monitoring.
- To conduct open and participatory discussion with villagers on khome bamboo forest plots, trade planning and forest management rules and regulations.
- To get participating villagers' approval on the results of post-harvest monitoring before generated report is sent to external team for evaluation.

Participants	Equipment and Document
• Village chief • VBCs • Foresters • Villagers in the village	• Results of field inventory • Form 2: discussion on khome bamboo forest status and discuss on the rules and regulations • Pen
Duration	
2-4 hours	
Place	
Village meeting room	
Expected Budget	
According to the decision of VBCs	

Methodology

› Importance on meeting with villagers

- Present the results from field inventory to the villagers.
- Open discussion with villagers on the khome bamboo forest status, management and trade conditions.
- Discussion and calculation the potential production in the next season with the villagers.
- Discussion on the rules and regulations.
- Get approval of the villagers to the summary report before sending to external team evaluation.

› Method for the meeting with villagers

- VBC prepare the results from field inventory then presented to all villagers.
- This step should encourage and ensure the involvement and active participation of everyone from the village through VBCs' and village's chief strong coordination with all villagers.
- During the village meeting, VBCs should clearly present the objectives of the meeting followed by methodological and easy to understand review of the results from the field inventory to all participants.

• Once the review of results is completed, there should be space to encourage open discussion by all participants on the khome bamboo forest plots, management and trade. To facilitate the participatory discussions, some questions that could be used:

- Are there any village bamboo fund in the village use for bamboo forest monitoring activity? If yes, how much per person per day for implementing the bamboo forest monitoring activity? If no, how do they consider for conducting bamboo forest monitoring activity?
- How many tons of khome shoots sell in this year compare to last year (can see logbook of producer groups in the village)?
- How many kg/person/day villagers can harvest during highest shooting period?
- How different size of shoot this year compare to last year, how many shoots/1 kg?
- Do you think the yield in this year is better than last year? Yes or No? What changed, and why?
- Do you need to go farther and farther year after year to collect khome shoots in the forest?
- If in the field VBCs saw some livestock destroyed and fire forest, what can be the solution from villagers?
- Statement of the villagers on their forest management? Do they think the bamboo forest is well managed by themselves? If not, what are the solutions?

• Participatory discussion with all villagers should be held on their understanding, implementing and managing of the forest management rules and regulations.

• Finally, from the field observations, VBCs may have seen unsustainable practices being used in the bamboo forest. The VBCs may openly discuss about the issues on respecting the rules and regulations, specifically:

- If the rules and regulations were not applied, the VBC and villagers should discuss and understand why they were not applied.
- Which rules did not fit with the village's reality and need to be improved?
- Which new rules the villagers deem necessary to be added and why?

Form 2: discussion on the khome bamboo forest and rules and regulations can be seen in Annex 3.

Results

Once completed, the results of this step should be:

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and report which can be sent to the external team.

Recommendations

- Take time to discuss with the villagers to get the certain information.
- Read clearly the rules and regulations to the villagers and ask if the rules and regulations need to be improved to fit with the villagers' reality.
- The report generated should be understood and approved from the villagers.
- Approved report should be signed and stamped by the village chief before it is sent to the external team for evaluation.

STEP 3

External team evaluation

Step 3 external team evaluation the reports of bamboo forest.

Field observation in every khome bamboo plot

Discussion on khome bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

To evaluate the reports of khome bamboo forest post-harvest monitoring of all villages, with the purpose of ensuring that the khome bamboo forests were well managed by the villagers.

The external team is carried out by an outside team, which is not directly responsible for the management or implementation of the bamboo forest monitoring. VFMTs and DAFO technicians comprise this external team and is responsible for the external monitoring and evaluation. The external team monitors are trained by the bamboo project every year. External team evaluations can only take place once the bamboo forest monitoring has been implemented and the village forest monitoring report has been generated. This external team is responsible for collecting and assessing monitoring reports from VBCs with the purpose of determining VBCs' effectiveness. From the assessment, the external team also produces a full report which indicates if the village monitoring is well done. Once the analysis and final assessment is made, the external team then approves all VBCs' reports and gives back to the villages with their conclusions and recommendations.

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>The external team composed of:
• VFMTs (charge of external team)
• DAFO technician</td><td rowspan="4">• Form 1 and Form 2 (see Annex 2 and 3)
• Templates for evaluation (see Annex 4)
• Pen</td></tr>
<tr><th>Duration</th></tr>
<tr><td>According to the number of villages (e.g: normally 1 village takes 2-4 hours).</td></tr>
<tr><th>Place</th></tr>
<tr><td>External team's house, village meeting room.</td><td></td></tr>
<tr><th colspan="2">Expected Budget</th></tr>
<tr><td colspan="2">Will be determined</td></tr>
</table>

Methodology

› Importance of external team evaluation

- To make sure VBC implemented the khome bamboo forest monitoring method in the village.
- To make sure the khome bamboo forest monitoring was well done by the villagers.
- To know how is the khome bamboo forest plots in each village after harvesting season.

› Method for evaluations

- Prepare the templates of the external team evaluation.
- Collect all reports of khome bamboo forest monitoring from VBC.
- Evaluate the report village by village.

For evaluation the reports of khome bamboo forest monitoring, external team need to evaluate five main parts as follows:

1. *Main finding on forest monitoring method*
   - Have the two forms of bamboo forest monitoring been conducted by the VBCs?
   - Who attended the activities?
   - How many plots have been surveyed?
   - Are there any fund in the village for conducting forest monitoring?
   - Do the villagers approve the bamboo forest monitoring report?

2. *Main finding on forest assessment*
   - How many lines have been surveyed in each plot?
   - How many regeneration shoots in each plots, (Total number of poles 1 year and 2 years)?
   - How many hectares have been damaged by livestock, fire forest, poles broken, soil erosion?
   - How many tons sold in this year?
   - Could harvested how many kg/person/day?
   - How is the size of shoot? How many shoots/kg?
   - How is the yield compare to previous year?
   - Quantities can be harvest in next season how many tons?
   - How far villagers go to harvest in the forest plot, (go in the same place or need to go farther and farther)?
   - What are the difficulties villagers faced during the field surveyed and what are the best solutions of the villagers on the forest management?
   - What is the forest governance in the village?

3. *Main finding on the rules and regulations for sustainable bamboo forest management*
   - The rules and regulations were respected by the villagers.
   - The techniques for harvesting.
   - Do we need to improve the rules and regulations.
   - Any rules and regulations need to be added.

4. Recommendation to the VBCs

External team evaluate the summary report and if some issues need to be improved, suggestions are made to the VBCs such as: techniques for harvesting, report writing, data filling, etc.

5. Recommendation to the Government/project

External team assesses villagers' recommendations and based on appropriateness, relay the comments or recommendations to relevant governmental departments (district or provincial) for feedback and/or support.

› External team and DAFO approve the report

Finally, once the evaluation report have been generated and verified by the external team, both the external team and DAFO have to certify the reports of all villages to make the reports official. Once these reports have been certified, they are sent back to the village to act as reference at the village level.

Results

Once completed, the results of this step should be:

- Know how villagers managed the khome bamboo forest plots.
- Know that the rules and regulations were respected by the villagers or not.
- Know what need to support/improve for next monitoring in the future.
- Khome evaluation reports certified/approved by DAFO and send back the reports to the village.

Recommendations

- External team should take time to evaluate the khome reports clearly.
- The evaluation of all reports should be based on the reality of the VBCs' reports from all villages.
- The external team report should be signed by external team members and DAFO offices.

Conclusion

This technical manual is in-process and its current methods includes lessons learned and experiences gathered from the previous 3 years. Its methods and associated agreements have been vetted, agreed upon, approved and implemented by the villagers since 2013. However, each year, the methods are re-evaluated and improved by all those involved to ensure the methods are appropriate for the existing situation in the villages' bamboo forests.

Through the participatory approach on conducting bamboo forest monitoring, the outcomes of this technical manual should be 3 parts.

› Field inventory

- Number of poles by ages represented in each subzone are recorded.
- Diameter poles represented by each age group recorded.
- The damaged area in the khome bamboo forest plot.

› Meeting with villagers

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and report which can be sent to the external team.

› External team evaluation

- Know how villagers managed the khome bamboo forest plots.
- Know that the rules and regulations were respected by the villagers or not.
- Know what is needed of the villagers, and what need to be improved for next monitoring.

These outcomes are to facilitate the villagers and their VBCs managing and monitoring their Nor khome bamboo forests for sustainable use. Of course, it is expected that difficulties and challenges will arise. But with increase capacity and experience gathered by the yearly implementation of the monitoring method described in this manual, the VBCs and villagers will gain increased ability to resolve and overcome these challenges and difficulties. Importantly, in time, the expertise of dynamic VBCs will lead to the development of some service providers belonging to organized groups such as the Bamboo Service Organization or Association which could use this manual to provide forest monitoring services and/or training of villagers to self-implement their own villages' annual bamboo forest monitoring. Finally, in line with the characteristics of all technical manuals, this forest monitoring manual should be improved, updated, and revised each year to incorporate the experiences and lessons learned of implementers as well as ensuring that the methods continue to best fit the realistic situation of the bamboo forests in implementing villages.

Kouane bamboo forest post-harvest monitoring technical manual

In total, the post-harvest monitoring of the kouane bamboo forest implemented by VBCs involves 3 steps similar to the khome post-harvest monitoring: two steps conducted in the village with the participation of villagers and the third step is the external team evaluation. Specifically, the first step involves the field inventory of the kouane bamboo forest by the VBC and foresters while the second step involves the VBCs meeting with villagers after the field inventory to present field results and discus on the rules and regulations. Finally, the third step involves the external team's evaluation of the results from step 1 and 2.

STEP 1

The field inventory

Step 1's field inventory of the kouane bamboo forest plots in the village

Field observation in every kouane bamboo plot

Discussion on kouane bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

- To know the numbers of poles for each bamboo age group, and VBCs estimate quantity of poles that can be harvested each year.
- Representative size of poles (diameters) for each bamboo age category.
- To know the length between internodes represented in each age category.
- To know the damaged area of kouane plot due to different factors such as harvesting, livestock, etc.
- To know soil fertility in kouane plots, and existing challenges and constraints of bamboo forest management and monitoring.

Participants	Equipment and Document
• VBCs • Foresters	• Form 1: for field inventory (see Annex 5) • Pen • Diameter measure tool
Duration	
According to the number of plots (e.g: Ban loun 18 ha, and it takes 2 days).	
Place	
Village kouane bamboo forest plots.	
Expected Budget	
According to the decision of VBCs	

Methodology

› Importance of field inventory

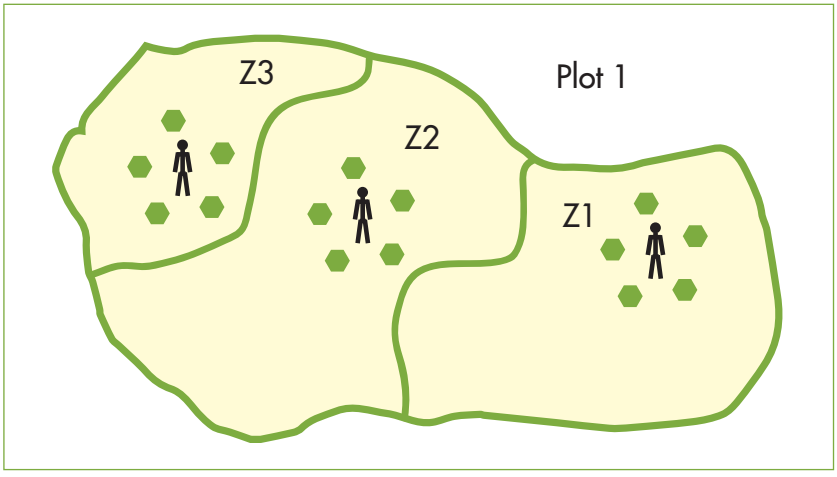
- Know the conditions of the kouane plot after harvesting season.
- Area damaged by harvesting (i.e poor techniques and tools), livestock, etc.
- Quantities of poles can be harvested during the next season.

Villagers conduct field inventory

› Field inventory method

- Participations of the VBC in the village.
- Select the kouane plots where villagers harvested, according to the density zone (see CM manual), divide kouane plot into 3 subzones: subzones containing mainly high, medium and low density.

Subzones of high density, medium density and low density (Z1, Z2, Z3) for field inventory



- For each identified subzone, VBC counts the numbers of representative clumps.
- Once the representative clumps in each subzone have been identified (at least 3 clumps per subzone), VBCs record the number of clumps for each subzone (high, medium and low density subzones) using the table below:

Recording number of clumps identified in each subzone

Plot type	Number of clumps
High density	
Medium density	
Low density	
Total	

- Recording number of existing poles per subzone by poles' age
  - VBCs walk to the middle of the representative clumps in each subzone and record the number of poles corresponding to their age.
  - VBCs record the number of 1 year old poles in each clump (3 clumps) per subzone.
  - Record the number of 2 years old poles in each clump (3 clumps) per subzone.
  - Record the number of poles more than 3 years old in each clump (3 clumps) per subzone.

VBC count the poles in each age group

Table for recording the number of pole by each age categories

Number of clumps	Subzone	Poles age		
		1 year	2 years	>3 years
line 1	High density			
line 2				
line 1	Medium density			
line 2				
line 1	Medium density			
line 2				
Total				

This information will be used for quantifying poles that can be harvested by the plot in the next season.

- Measuring poles diameter in the kouane plot
  - –VBC will measure the diameter of the poles for only 1 clump for each subzone. This selected clump should best represent the subzone.
  - – For each pole, measure at the 4th internode from the bottom.
  - – Measure size of 1 year old poles subzone's represented clump.
  - – Measure size of 2 years old poles from each subzone's representing clump.
  - – Measure size of poles more than 3 years old from each subzone's representing clump.

Diameter measurement

Recording of these measurements should be done on the table below.

Table for recording the size of poles each class of age

	Diameter of kouane poles								
	High density			Medium density			Low density		
	1 y	2 y	>3 y	1 y	2 y	>3 y	1 y	2 y	>3 y
Clump 1									
Total									
Average									

- Measuring the kouane pole's internode
  - VBC observes the internode of representative poles in the whole plot.
  - VBC measures the internode of represented 1 year old pole.
  - VBC measures the internode of represented 2 years old pole.
  - VBC measures the internode of represented pole more than 3 years old.

The observation need to be recorded to the table below:

Table for recording the representative internode

Clump	Observation
Pole 1 year	
Pole 2 years	
Pole > 3 years	

NOTE: the observation should indicate long internode, medium internode and short internode.

- Measuring bamboo forest's damaged area for the plot

VBC walks throughout the entire plot and make observations on the condition of the bamboo forest. Specifically:

- Check the damaged area caused by livestock.
- Document areas damaged by forest fires.
- Document damaged areas caused by felling of old, dying or broken bamboo poles.
- Damaged areas caused by unapproved cutting of trees in the plot.
- Damaged area caused by soil erosion.
- Damaged areas caused by poor harvesting techniques (clear cut and high stump), etc.

VBC documenting bamboo forest damaged in plot

The documentation of all bamboo forest damages should be recorded in the table below.

Table for recording the damaged area of kouane bamboo forest plot

Observation of the damaged in the area				
Damage criteria	Yes /no	Area (ha)	Causes	Solution
Damaged by animal				
Fire forests				
Pole broken and fall				
Not approved cutting of trees				
Soil erosion				
Poor harvesting techniques				

The damaged area of the kouane bamboo forest plot is directly link to the reduction in forest production capacity. This will be taken into account for forest capacity calculation.

- Measuring and calculating soil fertility of kouane bamboo forest plot
  - At the same time during which the VBCs walk and check for the conditions of the kouane bamboo forest plot, VBC also need to check on the soil fertility of the plot.
  - Measure moisture inside the kouane plot.
  - Based on measurement, VBC need to determine if the soil fertility and moisture level are the same, have increased, or have decreased in comparison to previous year.
  - In the case that it was determined soil fertility or soil moisture was decreased, VBCs need to indicate the causes and propose solutions.

These observations and determinations need to be recorded in the table below:

Table for recording the fertility and moisture in the kouane bamboo forest plot

Observation of organic meter in the area			
	Observation	Causes	Solution
Organic/leaves			
Moisture			

- Quantities can be harvested in next season

Once VBCs have completed the field inventory, they need to calculate and estimate the quantities of poles that can be harvested for each kouane plot for next season based on the results from field inventory:

– We know the total area of the plot is……ha.

– We know the total poles 3 years old from step 1 (field inventory) is……. poles in the representative clumps where have been surveyed (3 clumps / subzone. Total 9 clumps).

– We know on average poles 3 years old is 3553 poles/ha (based on E&D data).

– We know on average 1 pole is 12 kg (based on E&D data).

Through the monitoring we know the area was damaged……ha was damage by livestock and ……

Therefore, the calculation of the quantities can be harvest in the next season is:

Area of the plot……ha **–** Area damaged……ha **=** Remain area……ha or……m^2

3,553 poles ➔ 1 ha

Number poles 3 years from surveyed (step 1)……poles ➔ x ? ha

$$X = \frac{\text{Number poles 3 years from surveyed (step 1)……poles } \mathbf{X} \text{ 1 ha}}{\text{3,553 poles}}$$

= Area surveyed……ha

Area surveyed……ha ➔ Number poles 3 years from surveyed (step 1)……poles

Total area……ha ➔ x ? poles

$$X = \frac{\text{Total area…….ha } \mathbf{X} \text{ Number poles 3 years from surveyed (step 1)……poles}}{\text{Area surveyed……..ha}}$$

= Number of poles all area……poles

We know 1 poles is 12 kg (E&D), therefore:

1 pole ➔ 12 kg

Number of poles all area.....poles ➔ x ? kg

$$X = \frac{\text{Number of poles all area.....poles } \mathbf{X} \text{ 12 kg}}{\text{1 pole}}$$

= Weight all poles.....kg

1,000 kg ➔ 1 ton

Weight all poles.....kg ➔ x ? tons

$$X = \frac{\text{Weight all poles.....kg } \mathbf{X} \text{ 1 ton}}{\text{1,000 kg}}$$

= Weight all poles.....tons

For sustainable use of the forest, villagers will harvest only 50% of the bamboo forest, therefore:

100% ➔ Weight all poles.....tons

50% ➔ x ? tons

$$X = \frac{\text{50\% } \mathbf{X} \text{ Weight of poles.....tons}}{\text{100\%}}$$

= Tons can harvested in next season.....tons

› Difficulties and recommendations

During the field inventory, VBCs may need to indicate:

- The difficulties encountered during the field inventory.
- Improvements for future kouane bamboo forest monitoring.
- VBCs' recommendations to improve and/or modify the method, etc.

Form inventory can be seen in Annex 5.

Results

Once completed, the results of this step should be:

- Number of poles by ages represented in each subzone are recorded.
- Diameter poles represented by each age group recorded.
- Kouane internode represented by age group recorded.
- The damaged area in the kouane bamboo forest plot, if any.
- Quantities can be harvested in next season.

Once completed, the VBCs and Producers group (PG) are able to use this data to calculate and estimate the bamboo forest production capacity for the next season. Therefore, auxiliary results from this step and the calculations derived from this step include:

- Forest production capacity are used for contract negotiation with the traders.
- Linkage between Government's quotas given to traders and planned trading.
- Monitoring and ensuring villagers' kouane bamboo forest management and use in a sustainable and long term manner.

Recommendations

- Outcomes should be based on the reality of the villagers and their forests.
- All information should be clear and transparent as the information derived from this step will be used for analysis and evaluation by the external team.

STEP 2

Village meeting

Village meeting for discussing on the kouane bamboo forest plot and rules and regulations

Field observation in every kouane bamboo plot

Discussion on kouane bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

- To present the field observation and inventory results of the post-harvesting monitoring.
- To conduct open and participatory discussion with villagers on kouane bamboo forest plots, trade planning and forest management rules and regulations.
- To get participating villagers' approval on the results of post-harvest monitoring before generated report is sent to external team for evaluation.

Participants	Equipment and Document
• Village chief • VBCs • Foresters • Villagers in the village	• Results of field inventory • Form 2: discussion on kouane bamboo forest, rules and regulations • Pen
Duration	
2-4 hours	
Place	
Village meeting room	
Expected Budget	
According to the decision of VBCs	

Methodology

› Importance on meeting with villagers

- Present the results from field inventory to the villagers.
- Open discussion with villagers on the kouane bamboo forest status, management and trade conditions.
- With villagers, discussion and calculation on the potential production for next season.
- Discussion on the forest management and monitoring rules and regulations.
- Get approval of the villagers to the summary report before sending to external team evaluation.

› Method for the meeting with villagers

- VBC prepare the results from field inventory then presented to all villagers.
- This step should encourage and ensure the active participation and involvement of everyone from the village through VBCs' and village' chief strong coordination with all villagers.
- During the village meeting, VBCs should clearly present to all participants the objectives of the meeting followed by methodological and understandable review of the results from the field inventory.

• Once the review of results is completed, there should be space to encourage all participants to openly discuss on the kouane bamboo forest plots status, kouane management and trade. To facilitate the participatory discussions, some questions that could be used:

- Are there any village bamboo fund in the village use for bamboo forest monitoring activity, if yes, how much per person per day for implementing the bamboo forest monitoring activity? If no, how do they consider for conducting bamboo forest monitoring activity?
- Do they assess the yield from this year was better than previous year, how has things changed and why?
- How many tons of kouane slats they estimate villagers in the village can harvest and sell in this year (logbook)?
- Comparison between kouane diameter size observed this year to the previous year and how many kilograms of slats can be obtained from one pole?
- How many kilograms of slats each person can produce per day during the harvesting season this year and compare that to previous year?
- Do villagers need to venture further into the forest to harvest kouane poles this year as compare to previous year?
- If in the field VBCs witnessed animals destroying the forest or see forest fire, what would be the villagers' solutions to these bamboo forest destruction problems?
- Villagers' comments and assessment of their forest management. Do they think the bamboo forest in their village is well managed? If not, what solutions can they propose?

• Participatory discussion with all villagers should be held based on their understanding of implementing and managing forest management rules and regulations.

• Finally, from the field observations, VBCs may have witnessed unsustainable practices being used in the bamboo forest. The VBCs may openly discuss about the issues on respecting the rules and regulation, specifically:

- If the rules and regulations were not applied, the VBC and villagers should discuss and understand why they were not applied?
- Which rules did not fit with village's reality and need to be improved?
- Which new rules the villagers deem necessary to be added and why?

Form 2: discussion on kouane bamboo forest and rules and regulations can be seen in Annex 6.

Results

Once completed, the results of this step should be:

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and report which can be sent to the external team.

Recommendations

- Take time to discuss with the villagers to obtain clear and concise information.
- Read clearly the rules and regulations to the villagers and ask if the rules and regulations need to be improved to fit with the villagers' reality.
- The report generated should be understood and approved from the villagers. Approved report should be signed and stamped by the village chief before it is sent to the external team for evaluation.

STEP 3

External team evaluation

Step 3 external team evaluation the reports of kouane bamboo forest.

1 Field observation in every kouane bamboo plot

2 Discussion on kouane bamboo forest, rules and regulations and village validation of the report and send to external team

3 External team evaluation the reports of bamboo forest monitoring

Objectives

To evaluate the reports of kouane bamboo forest post-harvest monitoring of all villages, with the purpose of ensuring that the kouane bamboo forests were well managed by the villagers.

The external team is carried out by an outside team, which is not directly responsible for the management or implementation of the bamboo forest monitoring. VFMTs and DAFO technicians make up this external team and are responsible for the external monitoring and evaluation. The external team monitors are trained by the Bamboo Project every year. External team evaluations can only take place once the bamboo forest monitoring has been implemented and the village forest monitoring report has been generated. This external team is responsible for collecting and assessing monitoring reports from VBCs with the purpose of determining VBCs' effectiveness. From the assessment, the external team also produces a full report which assesses if the village monitoring is well done. Once the analysis and final assessment is made, the external team then approves all VBCs' reports and gives back to the villages with their conclusions and recommendations.

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>The external team composed of:
• VFMTs (charge of external team)
• DAFO technician</td><td rowspan="4">• Form 1 and form 2 (see Annex 5 and 6)
• Form for evaluation (See Annex 7)
• Pen</td></tr>
<tr><th>Duration</th></tr>
<tr><td>According to the number of villages (e.g: normally 1 village takes 2-4 hours).</td></tr>
<tr><th>Place</th></tr>
<tr><td>External team' s house, village meeting room.</td><td></td></tr>
<tr><th colspan="2">Expected Budget</th></tr>
<tr><td colspan="2">Will be determined</td></tr>
</table>

Methodology

› Importance of external team evaluation

- To make sure VBC implemented the kouane bamboo forest monitoring method in the village.
- To make sure the kouane bamboo forest monitoring was well done by the villagers.
- To know how is the kouane bamboo forest plots in each village after harvesting season.

› Method for evaluations

- Prepare the templates of the external team evaluation.
- Collect all reports of kouane bamboo forest monitoring from VBC.
- Evaluate the report village by village.

For evaluation the reports of kouane bamboo forest monitoring, external team need to evaluate five main parts as follows:

1. *Main finding on forest monitoring method*
   - Have the VBCs conducted the two steps of the bamboo forest monitoring?
   - Who attended the activities?
   - How many plots have been surveyed?
   - Are there any fund in the village for conducting the bamboo forest monitoring activity?
   - Do the villagers approve the bamboo forest monitoring reports.
2. *Main finding on forest assessment*
   - How many clumps have been surveyed in each plot?
   - How many shoots/poles have regenerated in each plot since the previous year (Total number of poles 1 year, 2 years and 3 years old)?
   - How many hectares of kouane bamboo forest has been damaged by livestock, forest fire, broken poles, soil erosion?
   - How many tons sold in this year?
   - Estimated kilograms of kouane slats each person can harvest/produce per day?
   - Assessment of the diameter size of poles for each age categories. How many kilograms of slates can each pole produce?
   - Comparison of yield between this year and previous year?
   - Quantities and tons of kouane that can be harvested for next season?
   - Distance villagers to go to harvest in the forest plot (go in the same place, or need to go farther each year due to low forest regeneration).
   - What are the difficulties villagers faced and what solutions villagers can propose to resolve these challenges especially on the forest management?
   - Through the assessment, how is the forest governance in the village?
3. *Main finding on the rules and regulations for sustainable bamboo forest management*
   - The rules and regulations were respected by the villagers.
   - The techniques for harvesting are sustainable to appropriate to forest management rules and regulations.
   - Do the rules and regulations need to be improved to fit with current situations?
   - Do any rules and regulations need to be added to fit with current situations?

4. Recommendation to the VBCs

External team evaluate the summary report and if some issues need to be improved, suggestions are made to the VBCs such as: techniques for harvesting, report writing, data filling, etc.

5. Recommendation to the Government/project

External team assesses villagers' recommendations and based on appropriateness, relay the comments or recommendations to relevant governmental departments (district or provincial) for feedback and/or support.

› External team and DAFO approve the report

Finally, once the evaluation report have been generated and verified by the external team, both the external team and DAFO have to certify the reports of all villages to make the reports official. Once these reports have been certified, they are sent back to the village to act as reference at the village level.

Results

Once completed, the results of this step should be:

- Know how villagers managed the kouane bamboo forest plots.
- Know that the rules and regulations were respected by the villagers or not.
- Know what needs to support/improve for the next forest monitoring in the future.
- Kouane evaluation reports certified/approved by DAFO and send back the reports to the village.

Recommendations

- External team should take time to evaluate the kouane reports clearly.
- The evaluation of all reports should be based on the reality of the VBCs' reports from all villages.
- The external team report should be signed by external team members and DAFO offices.

Conclusion

This technical manual for kouane post-harvest forest monitoring is in-process and its current methods include lessons learned and experiences gathered from the previous 3 years. Its methods and associated agreements have been vetted, agreed upon, approved and implemented by the villagers since 2013. However, each year, the methods are re-evaluated and improved by all those involved to ensure the methods are appropriate for the existing situation in the villages' bamboo forests.

Through the participatory approach on conducting bamboo forest monitoring, the outcomes of this technical manual should be 3 parts.

› Field inventory

- Number of poles by ages represented in each subzone are recorded.
- Diameter of poles represented by each age group recorded.
- Lengths between kouane internodes represented by age group recorded.
- The damaged area in the kouane bamboo forest plot and the characteristic and potential reasons for the damage are recorded.

› Meeting with villagers

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and generated report which can be sent to the external team.

› External team evaluation

- Know how villagers managed their kouane bamboo forest plots.
- Know whether the rules and regulations were respected by the villagers.
- Know what needs to be supported/improved for future forest monitoring.
- Send back the reports to the village.

These outcomes are to facilitate the villagers and their VBCs to manage and monitor their Mai kouane bamboo forests for sustainable use. Of course, it is expected that difficulties and challenges will arise. But with increase capacity and experience gathered by the yearly implementation of the monitoring method described in this manual, the VBCs and villagers will gain increased ability to resolve and overcome these challenges and difficulties. Importantly, in time, the expertise of dynamic VBCs will lead to the development of some service providers belonging to organized groups such as the Bamboo Service Organization or Association which could use this manual to provide forest monitoring services and/or training of villagers to self-implement their own villages' annual bamboo forest monitoring. Finally, in line with the characteristics of all technical manuals, this forest monitoring manual should be updated, revised and improved each year to incorporate the experiences and lessons learned by implementers while ensuring that the methods continue to best fit the realistic situation of the bamboo forests in implementing villages.

Hok bamboo forest pre-harvest monitoring technical manual

In total, the pre-harvest monitoring of the hok bamboo forest implemented by VBCs involves 3 steps similar to those of the khome and kouane post-harvest monitoring: two steps conducted in the village with the participation of villagers and the third step is the external team evaluation. Specifically, the first step involves the field inventory of the hok bamboo forest by the VBC and foresters while the second step involves the VBCs meeting with villagers after the field inventory to present field results and discuss the rules and regulations. Finally, the third step involves the external team's evaluation of the results from step 1 and 2.

STEP 1

The field inventory

Step 1's field inventory of the hok bamboo forest plots in the village

Field observation in every hok bamboo plot

Discussion on hok bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

- To know numbers of poles for each bamboo age, and estimate quantity that can be harvested from hok forest each year.
- Representative size of poles for each bamboo age category.
- To know the damaged area of hok bamboo forest plot and reasons for the damage.
- To know soil fertility in hok plot, and existing challenges and constraints of bamboo forest management and monitoring.

Participants	Equipment and Document
• VBCs • Foresters	• Form 1: for field inventory (see Annex 8) • Pen • Diameter measure tool
Duration	
According to the number of plots (e.g: Ban loun 18 ha, and it takes 2 days).	
Place	
Village hok bamboo forest plots.	
Expected Budget	
According to the decision of VBCs	

Methodology on field inventory

› Importance of field inventory

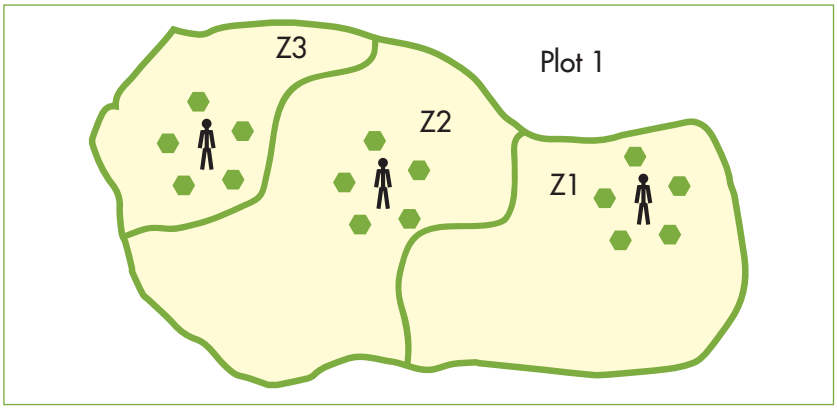
- Know the conditions of the hok forest plot before harvesting season.
- Area damaged and causes of damage such as harvesting (unsustainable techniques and tools), livestock, etc.
- Quantities of hok shoots that can be sustainably harvested in this season.

Villagers conduct field inventory

› Field inventory method

- Participations of the VBCs in the village.
- Select the hok plots where villagers will harvest, and according to the density zone (see CM manual), divide hok plot into 3 subzones based on the denseness of the hok forest in each subzones: high, medium and low density.

Subzones of high, medium and low density (Z1, Z2, Z3) for field inventory



- For each subzone, VBC counts the numbers of representative clumps.
- Once the representative clumps in each subzone have been identified (at least 5 clumps per subzone), VBCs record the number of clumps for each subzone (High, medium and low density subzones) using the table below.

Recording number of clumps identified in each subzone

Plot type	Number of clumps
High density	
Medium density	
Low density	
Total	

- Recording number of existing poles by age per subzone
  - VBCs walk to the middle of the representative clumps in each subzone and record the number of poles corresponding to their age.
  - VBCs record the number of 1 year old poles in each clump (5 clumps) per subzone.
  - Record the number of 2 years old poles in each clump (5 clumps) per subzone.

VBC count the poles in each age group

Table for recording the number of pole by each age categories

Number of clumps	Subzone	Poles age	
		1 year	2 year
line 1	High density		
line 2			
line 1	Medium density		
line 2			
line 1	Medium density		
line 2			
Total			

This information will be used to quantify poles in the plot that can give shoots this season.

- Measuring poles diameter in the hok plot
  - VBC will measure poles' diameters for only 1 clump for each subzone. This selected clump should best represent the subzone.
  - For each pole, measure at the 4th internode from the bottom.

– VBC measure length between internodes for one representative clump per subzone.

– Measure size of 1 year old poles of representing clump for each subzone.

– Measure size of 2 years old poles of representing clump from each subzone.

VBC count the poles in each age group

Recording of these measurements should be done on the table below.

Table for recording the size of poles each class of age

	Diameter of hok poles								
	High density			Medium density			Low density		
	1 y	2 y	> 3 y	1 y	2 y	> 3 y	1 y	2 y	> 3 y
Clump 1									
Total									
Average									

- Measuring the area blossoming and area alive in the hok forest plot
  – If there is no blossomed in the hok bamboo forest plot, VBCs can skip this step.
  – If there are some hok blossomed, VBCs need to calculate the percentages blossomed and percentages alive and record to the table below.

Table for recording the percentages blossomed and percentages alive of hok forest plot

Plot	Yes/No	Area of plot (ha)	Percentage blossom	Area alive (ha)
Plot				

Area whole plot..... ha ➔ 100%
Number % area blossomed.....% ➔ x ?

$$X = \frac{\text{Number \% area blossomed.....\% } \mathbf{X} \text{ Area whole plot..... ha}}{100\%}$$

$$= \text{Number area blossomed.....ha}$$

So it means:

Area whole plot.....ha **–** Number area blossomed.....ha **=** Number area alive .....ha

- Measuring bamboo forest's damaged area for the plot

VBCs walk throughout the entire plot and make observations on the condition of the bamboo forest. Specifically:

– Check the damaged area caused by livestock.

– Document damaged areas by slash and burn or forest fire.

– Damaged area caused by felling of old bamboo poles dying or broken.

– Damaged area caused by soil erosion, etc.

VBC documenting bamboo forest damage in plot.

The documentation of all bamboo forest damages should be recorded in the table next page.

Table for recording the damaged area of hok bamboo forest plot

Observation of the damaged in the area				
Damage criteria	Yes /no	Area (ha)	Causes	Solution
Damaged by animal				
Fire forests				
Pole broken and fall				
Not approved cutting of trees				
Soil erosion				
Poor harvesting techniques				

The damaged area of the hok bamboo forest plot is directly link to the reduction in forest production capacity. This will be taken into account for forest capacity calculation.

- Measuring and calculating soil fertility of hok bamboo forest plot
  - At the same time during which the VBCs walk and check for the hok bamboo forest plot conditions, they also need to check soil fertility of the plot.
  - Measure moisture inside the hok plot.
  - Based on measurement, VBC need to determine if the soil fertility and moisture level are the same, increased, or decreased in comparison to previous year.
  - In the case that it was determined soil fertility or soil moisture had decreased, VBCs need to indicate the causes and propose solutions.

These observations and determinations need to be recorded in the table below.

Table for recording the fertility and moisture in the hok bamboo forest plot

Observation of organic meter in the area			
	Observation	Causes	Solution
Organic/leaves			
Moisture			

- Quantities can be harvested in this season

Once VBCs have completed the field inventory, they need to calculate and estimate the quantities or Hok shoots that can be harvested for each hok plot for this season based on the results from field inventory:

– We know the total area of whole plot is……ha.

– We know the total poles from 1 year, 2 years and more than 3 years old poles from step 1 (field inventory) is……poles in the representative clumps that were surveyed (5 clumps / subzone. Total 15 clumps).

– We know number of poles from 1 and 2 years old are 378 poles/ha (based on E&D).

– We know in average number of shoot per mother culm 1 and 2 years is 6 shoots (based on E&D).

– We know on average 1 shoot is 0.93 kg (based on E&D).

Through the monitoring we know the area was damaged……ha, of which area damage by …… and ……
Therefore, the calculation of the quantities can be harvest in the next season is:

Area of the plot……ha **–** Area damaged……ha **=** ……ha

378 poles ➔ 1 ha

Number poles 1 and 2 years from surveyed (step 1) ……poles ➔ x ? ha

$$X = \frac{\text{Number poles 1 and 2 years from surveyed (step 1) ……poles } \mathbf{X} \text{ 1 ha}}{378}$$

= Area surveyed……ha

Area surveyed……ha ➔ Nbr poles 1 and 2 years from surveyed (step 1) …….poles

Total area…… ha ➔ x ? ha

$$X = \frac{\text{Total area…….ha } \mathbf{X} \text{ Nbr poles 1 and 2 years from surveyed (step 1) ……..poles}}{\text{Area surveyed……ha}}$$

= Number of poles……poles

- We know the average number of shoot per mother culm is 6 shoots (E&D), therefore:

1 pole ➔ 6 shoots

Number of poles.....poles ➔ x ? shoots

$$X = \frac{\text{Number of poles .....poles } \mathbf{X} \text{ 6 shoots}}{\text{1 pole}}$$

= Number of shoots.....shoots

- We know in average 1 shoot is 0.93 kg (E&D)

1 shoot ➔ 0.93 kg

Number of shoots.....shoots ➔ x ? kg

$$X = \frac{\text{Number of shoot .....shoots } \mathbf{X} \text{ 0.93}}{\text{1 shoot}}$$

= Number of shoots.....kg

1,000 kg ➔ 1 ton

Number of all shoots.....kg ➔ x ? tons

$$X = \frac{\text{Number of all shoot .....kg } \mathbf{X} \text{ 1 ton}}{\text{1,000 kg}}$$

= Number of shoots.....tons

For sustainable use of the forest villagers will harvest only 80% of the shoots, therefore:

100% ➔ Number of shoots..... tons

80% ➔ x ? tons

$$X = \frac{\text{80\% } \mathbf{X} \text{ Number of shoots.....tons}}{\text{100\%}}$$

= Tons can be harvested in this season.....tons

› Challenges and recommendations

During the field inventory, VBCs may need to indicate:

- The difficulties encountered during the field inventory.
- Improvements for future hok bamboo forest monitoring.
- VBCs' recommendations to improve and/or modify the method, etc.

Form inventory can be seen in Annex 8.

Results

Once completed, the results of this step should be:

- Number of hok van and hok kay clumps represented in each subzone recorded.
- Number of poles by ages represented in each subzone are recorded.
- Diameter poles represented by each age group recorded.
- The damaged area in the hok bamboo forest plot, if any.
- The level of moisture and fertility exist in the hok forest plot.
- Quantities can be harvested in each hok bamboo forest plot.

Once completed, the VBCs and Producers group (PG) are able to use this data to calculate and estimate the bamboo forest production capacity for the next season. Therefore, auxiliary results from this step and the calculations derived from this step include:

- Forest production capacity are used for contract negotiation with the traders.
- Linkage between Government's quotas given to traders and planned trading.
- Monitoring and ensuring villagers' hok bamboo forest management and use in a sustainable and long term manner.

Recommendations

- Outcomes should be based on the reality of the villagers and their forests.
- All information should be clear and transparent as the information derived from this step will be used for analysis and evaluation by the external team.

STEP 2

Village meeting

Village meeting for discussing on the hok bamboo forest plot and rules and regulations

1 Field observation in every hok bamboo plot

2 Discussion on hok bamboo forest, rules and regulations and village validation of the report and send to external team

3 External team evaluation the reports of bamboo forest monitoring

Objectives

- Present the pre-harvest monitoring field observation and inventory results.
- Conduct open and participatory discussion with villagers on hok bamboo forest plots, trade planning and forest management rules and regulations.
- Obtain participating villagers' approval on the results of pre-harvest monitoring before generated report is sent to external team for evaluation.

Participants	Equipment and Document
• Village chief • VBCs • Foresters • Villagers in the village	• Results of field inventory • Form 2: Discussion on hok bamboo forest, and discuss on the rules and regulations • Pen
Duration	
2-4 hours	
Place	
Village meeting room	
Expected Budget	
According to the decision of VBCs	

Methodology

› Importance on meeting with villagers

- Present the results from field inventory to the villagers.
- Open discussion with villagers on the hok bamboo forest status, management and trade conditions.
- Discussion and calculation the potential nor hok production with the villagers.
- Discussion on the forest management rules and regulations.
- Obtain villagers' approval for the summary report before sent to external team evaluation.

› Method for the meeting with villagers

- VBC prepare results from field inventory then presented to all villagers.
- This step should encourage and ensure the active involvement and participation of everyone from the village through VBCs' and village's chief strong coordination with all villagers.
- During the village meeting, VBCs should clearly present the objectives of the meeting followed by methodological and easy to understand review of the results from the field inventory to all participants.

• Once the review of results is completed, participants are encouraged to openly discuss on the hok bamboo forest plots, management and trade. To facilitate the participatory discussions, some questions that could be used:

- Are there any village bamboo fund in the village use for bamboo forest monitoring activity? If yes, how much per person per day for implementing the bamboo forest monitoring activity? If no, how do they consider for conducting bamboo forest monitoring activity?
- How many tons of fresh hok shoots were harvested last season?
- How many tons of fresh hok shoots are expected to be harvested this season?
- How many kilograms can each villager harvest per day during the season?
- How many shoots are in one kilograms?
- Assessment on whether this year's yield will be better than last season, what factors can be accounted for the changes, if any?
- How was the hok size compare to previous year?
- Distance villagers to go to harvest in the forest plot (go in the same place or need to go farther each year due to low forest regeneration).
- What are the difficulties villagers faced and what solutions villagers can propose to resolve these challenges especially on the forest management?
- How will hok blossoming (and pole death) affect the quantity and the bamboo activity (collection and processing) in the village?
- If while in the field VBCs, witnessed animals destroying Nor hok plot or and fire forest, what solution the villagers can propose to these problems?
- Do they think the bamboo forest is well managed by themselves or villagers? If not what are the solutions if it is not well managed.

• Participatory discussion with all villagers should be held on their understanding, implementing and managing of the forest management rules and regulations.

• Finally, from the field observations, VBCs may have witnessed unsustainable practices being used in the bamboo forest. The VBCs may openly discuss about the issues on respecting the rules and regulations, specifically:

- If the rules and regulations were not applied, the VBC and villagers should discuss and understand why they were not applied.
- Which rules did not fit with the village's reality and need to be improved.
- Which new rules the villagers seem necessary to be added and why?

Form 2: discussion on hok bamboo forest, rules and regulations can be seen in Annex 9.

Results

Once completed, the results of this step should be:

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and report which can be sent to the external team.

Recommendations

- Take time to discuss with the villagers to obtain required information.
- Read clearly the rules and regulations to the villagers and if needed, work with the villagers to improve the rules and regulations to fit with the villagers' reality.
- The report generated should be understood and approved from the villagers. Approved report should be signed and stamped by the village chief before it is sent to the external team for evaluation.

STEP 3

External team evaluation

Step 3 external team evaluation the reports of hok bamboo forest

Field observation in every hok bamboo plot

Discussion on hok bamboo forest, rules and regulations and village validation of the report and send to external team

External team evaluation the reports of bamboo forest monitoring

Objectives

To evaluate the reports of hok bamboo forest pre-harvest monitoring of all villages, with the purpose of ensuring that the hok bamboo forests were well managed by the villagers.

The external team evaluation is conducted by an outside team, which is not directly responsible for the management or implementation of the bamboo forest monitoring. VFMTs and DAFO technicians comprise this external team and are responsible for the external monitoring and evaluation. The external team monitors are trained by the bamboo project every year. External team evaluations can only take place once the bamboo forest monitoring has been implemented and the village forest monitoring report has been generated. This external team is responsible for collecting and assessing monitoring reports from VBCs with the purpose of determining VBCs' effectiveness. From the assessment, the external team also produces a full report which indicates if the village monitoring is well done. Once the analysis and final assessment is made, the external team then approves all VBCs' reports and gives back to the villages with their conclusions and recommendations.

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>The external team composed of:
• VFMTs (charge of external team)
• DAFO technician</td><td rowspan="4">• Form 1 and form 2 (see Annex 5 and 6)
• Form for evaluation (see Annex 7)
• Pen</td></tr>
<tr><th>Duration</th></tr>
<tr><td>According to the number of villages (e.g: normally 1 village takes 2-4 hours).</td></tr>
<tr><th>Place</th></tr>
<tr><td>External team's house, village meeting room.</td><td></td></tr>
<tr><th colspan="2">Expected Budget</th></tr>
<tr><td colspan="2">Will be determined</td></tr>
</table>

Methodology

› Importance of external team evaluation

- To make sure VBC implemented the hok bamboo forest monitoring method in the village.
- To make sure the hok bamboo forest monitoring was well done by the villagers.
- To know the status and condition of the hok bamboo forest plots in each village before harvesting season.

› Method for evaluations

- Prepare the templates of the external team evaluation.
- Collect all hok bamboo forest monitoring reports from VBC.
- Evaluate the report village by village.

For evaluation the reports of hok bamboo forest monitoring, external team need to evaluate five main parts as follows:

1. *Main finding on forest monitoring method*
   - Have the VBCs conducted the two steps of the bamboo forest monitoring?
   - Who attended the activities?
   - How many plots have been surveyed?
   - Are there any fund in the village for conducting the bamboo forest monitoring activity?
   - Do the villagers approve the bamboo forest monitoring report?
2. *Main finding on forest assessment*
   - How many clumps have been surveyed in each plot?
   - How many shoots/poles have regenerated in each plot since the previous year (Total number of 1 year and 2 years old poles)?
   - How many hectares of hok bamboo forest have been damaged by livestock, forest fire, broken poles, soil erosion?
   - How many tons sold in this year?
   - Estimated Nor hok shoots each person can harvest/produce per day?
   - Assessment of the diameter size of poles for each age categories. How many kilograms per hok shoot?
   - Comparison of yield between this year and previous year.
   - Quantities and tons of Nor hok shoots that can be harvested for next season.
   - Distance villagers to go to harvest in the forest plot (go in the same place or need to go farther each year due to low forest regeneration).
   - What are the difficulties villagers faced and what solutions villagers can propose to resolve these challenges especially on the forest management?
3. *Main finding on the rules and regulations for sustainable bamboo forest management*
   - The rules and regulations were respected by the villagers.
   - The techniques for harvesting are sustainable and appropriate to forest management rules and regulations.
   - Do the rules and regulations need to be improved to fit with current situations?
   - Do any rules and regulations need to be added to fit with current situations?

4. Recommendation to the VBCs

External team evaluate the summary report and if some issues need to be improved, suggestions are made to the VBCs such as: techniques for harvesting, report writing, data filling, etc.

5. Recommendation to the Government/project

External team assesses villagers' recommendations and based on appropriateness, relay the comments or recommendations to relevant governmental departments (district or provincial) for feedback and/or support.

› External team and DAFO approve the report

Finally, once the evaluation report have been generated and verified by the external team, both the external team and DAFO have to certify the reports of all villages to make the reports official. Once these reports have been certified, they are sent back to the village to act as reference at the village level.

Results

Once completed, the results of this step should be:

- Know how villagers managed the hok bamboo forest plots.
- Know whether the rules and regulations were respected by the villagers.
- Know what support/improvements are needed for future forest monitoring.
- Hok evaluation reports certified/approved by DAFO and send back to the village.

Recommendations

- External team should take time to evaluate the hok reports clearly.
- The evaluation of all reports should be based on the reality of the VBCs' reports from all villages.
- The external team report should be signed by external team members and DAFO offices.

Conclusion

This technical manual is in-process and its current methods include lessons learned and experiences gathered from the previous 3 years. Its methods and associated agreements have been vetted, agreed upon, approved and implemented by the villagers since 2013. However, each year, the methods are re-evaluated and improved by all those involved to ensure the methods are appropriate for the existing situation in the villages' bamboo forests.

Through the participatory approach on conducting bamboo forest monitoring, the outcomes of this technical manual should be 3 parts.

› Field inventory

- Number of clumps hok van and hok kay represented of each plot are recorded.
- Number of poles by ages represented in each subzone are recorded.
- Diameter of poles represented by each age group recorded.
- Average kilogram per shoot is recorded.
- The damaged area in the hok bamboo forest plot.

› Meeting with villagers

- A clear discussion with all villagers on possible issues related to forest use.
- An improvement of the rules and regulations on forest management.
- Approval of the villagers on the statements made, discussions held and report which can be sent to the external team.

› External team evaluation

- Know how villagers managed their hok bamboo forest plots.
- Know whether the rules and regulations were respected by the villagers.
- Know support needs and improvements for future forest monitoring.
- Hok evaluation reports certified/approved by DAFO and send back the reports to the village.

These outcomes are to facilitate the villagers and their VBCs managing and monitoring their Mai hok bamboo forests for sustainable use. Of course, it is expected that difficulties and challenges will arise. But with increase capacity and experience gathered by the yearly implementation of the monitoring method described in this manual, the VBCs and villagers will gain increased ability to resolve and overcome these challenges and difficulties. Importantly, in time, the expertise of dynamic VBCs will lead to the development of some service providers belonging to organized groups such as the Bamboo Service Organization or Association which could use this manual to provide forest monitoring services and/or training of villagers to self-implement their own villages' annual bamboo forest monitoring. Finally, in line with the characteristics of all technical manuals, this forest monitoring manual should be improved, updated, and revised each year to incorporate the experiences and lessons learned of implementers as well as ensuring that the methods continue to best fit the realistic situation of the bamboo forests in implementing villages.

ANNEX 1

List of 7 village forest management Technicians (2015)

Village Forest Management Technicians (VFMT)				
No	Name of VFMT	Village	District	Contact number
		Khome value chain		
1	Mr. Thepphone	Boy-nongdeng	Samneua	030 9273072
2	Mr. Sonekeo	Fath	Viengxay	030 4793284
		Hok value chain		
1	Mr. Sonekeo	Fath	Viengxay	030 4793284
2	Mr. Bouaphone	Meuath	Viengxay	020 98720154
		Kouane value chain in soy cluster		
1	Mr. Sayphone	Phounmai	Viengxay	020 96476031
2	Mr. Sengthong	Nahor	Viengxay	020 55320635
		Kouane value chain in Vangxeng zone		
1	Mr. Vanhphone	Phonxay	Sobbao	020 97789991
2	Mr. Khamphien	Earn	Viengxay	020 96541503

ANNEX 2

Form 1 – Field inventory in khome bamboo forest plot (2015)

Date.....

Village:.....District:.....Province:.....

Evaluator's name:

1.....; 2.....;

3.....; 4.....;

5.....; 6.....

Plot No:.....Plot's Name:.....Area of the plot.....ha

How many lines in each subzone?

Plot 1	Big shoots	Medium shoots	Small shoots	Total
Number of lines (50 m^2)				
Total area survey m^2				

Note: the lines in each subzone should not less than 2 lines/subzone (big shoot, medium shoot and small shoot) and the area of the line should be 1 m/side.

Number of poles by age

Count number of poles for each class of age 1 year, 2 years, > 3 years in line 2 m x 25 m = 50 m^2 for each subzone in the plot (subzone: big shoot, medium shoot and small shoot).

Number of Lines	Subzone	Poles age		
		1 year	2 years	> 3 years
line 1	Big shoot			
line 2				
line 1	Medium shoot			
line 2				
line 1	Small shoot			
line 2				
Total				

Note: the regeneration shoots in each line is the number of pole 1 year and 2 years in each lines will be used for calculation quantity can be harvest in next season.

Diameter measurement

Comparison of khome size in each class of age (1 year, 2 years and >3 years)

	Size of shoot								
	Big shoot			Medium shoot			Small shoot		
	1 y	2 y	> 3 y	1 y	2 y	> 3 y	1 y	2 y	> 3 y
Line 1									
Total									
Average									

Note: for the measurement VBCs will measure representative poles 3 poles by age (e.g.: pole 1 year, VBC need to measure 1 biggestpole, 1 medium pole and 1 smallest pole measure (cm)).

Damaged area

Observation of the damaged in the area				
Damage criteria	Yes /no	Area (ha)	Causes	Solution
Damaged by animal				
Fire forests				
Pole broken and fall				
Soil erosion				
Big hole and deep				

Soil fertility

Observation of organic meter in the area			
	Observation	Causes	Solution
Organic/leaves			
Moisture			

Take note: A (increase) B (Reduce), C (Same).

Quantities can be harvested in next season

Example:

– We know the total area of whole plot is 124 ha.

– We know the total poles 1 year and 2 years from step 1 (field inventory) is 123 poles in the area of 300 square meter (300 M2) where was surveyed.

– We know 1 poles 1 year or 2 years can give 5 shoot/year (E&D).

– We know 1 shoot is 0.19 kg (E&D).

– Through the monitoring know 0.3 ha was damage by livestock. Therefore the calculation of the quantities can be harvest (QCH) in the next season is:

124 ha – 0.3 ha damaged = 123.7 ha

300 m^2 ➔ 123 poles

123.7 ha or 1,237,000 m^2

1,237,000 m^2 ➔ x ? poles

$$X = \frac{1{,}237{,}000 \times 123}{300} = 507{,}170 \text{ poles}$$

We know 1 poles 1 year or 2 years can give 5 shoots/year (E&D), therefore:

1 pole ➔ 5 shoots

507,170 poles ➔ x ? shoots

$$X = \frac{507{,}170 \times 5}{1} = 2{,}535{,}850 \text{ shoots}$$

We know 1 shoot is 0.19 kg (E&D), therefore:

1 shoot ➔ 0.19 kg

2,535,850 shoots ➔ x ? kg

$$X = \frac{2{,}535{,}850 \times 0.19}{1} = 481{,}811.5 \text{ kg}$$

1,000 kg ➔ 1 ton

481,811.5 kg ➔ x ? ton

$$X = \frac{2{,}535{,}850 \times 1}{1{,}000} = 481.81 \text{ tons}$$

For sustainable use of the forest villagers will harvest only 80% of the shoots, therefore:

100% ➜ 481.81 tons

80% ➜ x ? tons

$$X = \frac{80\% \times 481.81}{100\%} = 385.44 \text{ tons can be harvested in next season}$$

What is the quantity can be harvested in your village in next season?

- We know the total area of whole plot is……ha.
- We know the total poles 1 year and 2 years from step 1 (field inventory) is……. poles in the area of 300 square meter (300 m^2) where was surveyed.
- We know 1 poles 1 year or 2 years can give 5 shoots/year (E&D).
- We know 1 shoot is 0.19 kg (E&D).
- Through the monitoring know area was damaged by…… is……ha. Therefore the calculation of the quantities can be harvest in the next season is:

Area all plots……ha – Area damaged……ha = Remain area ……ha

300 m^2 ➜ number of poles from monitoring……poles

Remain area……m^2 ➜ x ? poles

$$X = \frac{\text{Remain area……}m^2 \times \text{number of poles from monitoring……poles}}{300}$$

X = number of poles remain area……poles

We know 1 pole 1 year or 2 years can give 5 shoots/year (E&D), therefore:

1 pole ➜ 5 shoots

Number of poles remain area……poles ➜ x ? shoots

$$X = \frac{\text{Number of poles remain area……poles} \times 5 \text{ shoots}}{1}$$

X = Number of shoots……shoots

We know 1 shoot is 0.19 kg (E&D), therefore:

1 shoot ➜ 0.19 kg

Number of shoots.....shoots ➜ x ?

$$X = \frac{\text{Number of shoots.....shoots} \times 0.19 \text{ kg}}{1}$$

X = weight of shoot.....kg

1,000 kg ➜ 1 ton

Weight of shoot.....kg ➜ x ? tons

$$X = \frac{\text{Weight of shoots.....kg} \times 1}{1{,}000 \text{ kg}}$$

X = Weight of shoot.....tons

For sustainable use of the forest villagers will harvest only 80% of the shoots, therefore:

100% ➜ Weight of shoot.....tons

80% ➜ x ? tons

$$X = \frac{80\% \times \text{Weight of shoots.....tons}}{100}$$

X = Number of tons can be harvested in next season is..... tons

Difficulties and recommendations

Difficulties

.....

.....

Recommendations

.....

.....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village	Head of VBC
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member

ANNEX 3

Form 2 – Discussion on khome bamboo forest, rules and regulations

Date.....

Village:.....District:.....Province:.....

Evaluator's name who participated to the discussion:

1.....; 2.....;

3.....; 4.....;

5.....; 6.....

Discussion on the khome bamboo forest plots

No	Topics		Details
1	Are there any bamboo fund in your village use for forest monitoring?	☐ Yes	If yes, how much per person per day? .....
		☐ No	If no, how do you consider to conduct the bamboo forest monitoring? .....
2	How many tons khome shoots sell in this year?		=> .....ton of shoot (logbook)
3	How many kg/person/day villager could harvested during highest shooting period?		=> .....kg shoot/person/day this year => .....kg shoot/person/day last year
4	How different size of shoot this year compare to last year, how many shoots/1 kg?		=> .....kg shoot/person/day this year => .....kg shoot/person/day last year
5	Do you think the yield in this year is better than last year? Yes or No and What changed and why?	☐ Yes	What change or Why? ....
		☐ No	What change or Why? ....
6	Do you need to go farther and farther year after year to collect khome shoots in the forest?	☐ Yes	Because: ....
		☐ No	Because: ....
7	If in the field VBC saw some live-stock destroyed and fire forest, what can be the solution from villagers?	Solution	Solution: ....
8	Do they think the bamboo forest in well managed by themselves or villagers? If not what are the solutions?	☐ Yes	Because: ....
		☐ No	Solution: ....

Discussion on existing rules and regulations (FMP, CM AGREEMENT AND PLUP)

Allocation of khome bamboo forest plots to the village	Is rule implemented?	How to improve?
xx "khome bamboo forest plots" representing xx hectares have been allocated to the village.	☐ Yes If not why:	....
The "khome bamboo forest plots" allocated to the village belong to all villagers, who can ask for a Communal Land Title at the name of the village.	☐ Yes If not why:	....
Rights to collect khome shoots for home consumption	**Is rule implemented?**	**How to improve?**
All villagers have the right to collect khome shoots for home consumption.	☐ Yes If not why:	....
All villagers have the right to collect other NTFP for home consumption.	☐ Yes If not why:	....
All villagers have the right to cut small trees less than 20 cm circumference for home consumption.	☐ Yes If not why:	....
Rights to collect and trade khome bamboo shoots	**Is rule implemented?**	**How to improve?**
All villagers have the right to collect, process and sell Khome shoots, provided that they respect the village rules and regulations.	☐ Yes If not why:	....
Villagers from neighbor village are not allowed to collect and sell the resource of the "bamboo forest plots" allocated to the village. They need to ask an authorization to the VBC. If they receive the authorization, they must also respect the village rules and regulations.	☐ Yes If not why:	....

Forest management rules and regulations for ensuring regeneration of the khome bamboo forest	Is rule implemented?	How to improve?
Villagers are allowed to collect khome shoots for trade only during the season decided by the village authority. Normally, the authorized trading season starts on 01 of December and ends on 30th of March, but the dates can change depending on the shooting season (irregular every year). The opening and closing dates should be decided by the VBC every year.	☐ Yes If not why:	.....
Villagers are not allowed to collect for trade before or after the authorized season.	☐ Yes If not why:	.....
Villagers have the obligation to use appropriate tools (small hoes) for collecting the shoots. Big hoes are forbidden because they dig big hole and damage the forest.	☐ Yes If not why:	.....
Forest management rules and regulations for stimulating the production of khome bamboo shoots	**Is rule implemented?**	**How to improve?**
Villagers should cut pole aged more than 3 years old to allow a better shoot growing.	☐ Yes If not why:	.....
Villagers are not allowed to cut pole aged less than 3 years old because pole 3 years old and less are the mother of the new shoots.	☐ Yes If not why:	.....

Forest management rules and regulations for protecting the khome bamboo forest plots	Is rule implemented?	How to improve?
Slash and burn is forbidden in the bamboo forest plots.	☐ Yes If not why:	....
Domestic Animals must not access to the bamboo forest plots (Buffaloes, cows…).	☐ Yes If not why:	....
It is forbidden to destroy the signboards of the bamboo forest plots.	☐ Yes If not why:	....
Penalties	**Is rule implemented?**	**How to improve?**
Penalties and fines can be applied for those who do not respect the rules and regulations.	☐ Yes If not why:	....

New rules and regulations proposed during the meeting (explain the objective):
....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village

Head of VBC

VBC member

VBC member

VBC member

VBC member

VBC member

VBC member

VBC member

ANNEX 4

Form for khome external team evaluation

Forest Management Monitoring / External team evaluation

Village:..... District:.....

Bamboo forest specie:.....

Date of external team evaluation:.....

Place:.....

External team:

1.....; 2.....;

3.....; 4.....

Forest area monitored

	Name	Area (ha)
Plot 1		
Plot 2		
Plot 3		
Plot 4		
Plot 5		
Plot 6		
Total:		

Main finding on monitoring method

The 2 forms of bamboo forest monitoring in the village have been completed?

Yes ☐

Date of field survey:.....

Date of discussion on the bamboo forest and R&R: .....

No ☐

Because:.....

Who participated to the 2 forms?

Name of VBC:

1) .....; 2) .....;

3) .....; 4) .....;

5) .....; 6) .....

Did they survey all plots? How many plots have been surveyed?

Yes ☐ If yes, how many plots have been surveyed?.....

How many ha have been survey? .....

No ☐ If no, why?

.....

Do you have any fund in your village allocated for bamboo forest monitoring activity? If yes, what is the payment? If no, how do you consider to conduct bamboo forest monitoring in your village?

.....

Do the villagers agreed and approved the report?

Yes ☐

No ☐

Because:

.....

Main findings on forest assessment

How many lines have been surveyed in each plot?

Plot 1: .....lines.

Plot 2: .....lines.

Plot 3:.....lines.

Plot 4: .....lines.

Plot 5:.....lines.

Plot 6: .....lines.

How many regeneration shoots in each plots? (Total number of poles 1 year, 2 years.

Plot 1: 1 y .....2 y.....

Plot 2: 1 y ..... 2 y.....

Plot 3: 1 y ..... 2 y.....

Plot 4: 1 y ..... 2 y.....

Plot 5: 1 y ..... 2 y.....

Plot 6: 1 y ..... 2 y.....

How many ha have been damaged by livestock, fire forest, poles broken, soil erosion and techniques for harvesting in all plots?

Livestock? => .....ha.

Slash and burn or fire forest? => .....ha.

Poles broken and fall? => .....ha.

Soil erosion? =>.....ha.

Techniques for harvesting=>.....ha.

Could harvested how many kg/person/day?

.....

How is the size of shoot? How many shoots/kg?

Numbers of shoots/kg =>.....shoots.

How is the yield compare to previous year? (logbook)

Yield in this year=>.....Tons.

Yield in last year=>.....Tons.

Quantities can be harvest in next year. How many tons in all plots?

.....

How far villagers go to harvest in the forest plot? Go in the same place? Or need to go farther and farther?

.....

What are the difficulties villagers faced during the field surveyed and what are the best solutions of the villagers on the forest management?

.....

Summary, what is the bamboo forest governance in the village?

.....

Main findings on rules and regulations

Are all rules and regulations were implemented? Put (✔)

=> Yes ☐ or No ☐

– If no, which rules has not been implemented? And why or need improve?

a) .....
b) .....

– New rules? Why?

a) .....
b) .....

Recommendations to the VBC

.....

Recommendations to the Project

.....
.....
.....

The external team approve this
bamboo forest monitoring report and
send it back to the village

At village..... Date evaluation.....

External team member External team member

External team member External team member

District of Agriculture and Forestry Office

ANNEX 5

Form 1 – Field inventory in kouane bamboo forest plot

Date.....

Village:.....District:.....Province:.....

Evaluator's name who participated to the discussion:

1.....; 2.....;

3.....; 4.....;

5.....; 6.....

Plot No.:.....Plot's name:.....Area of the plot:.....ha.

Number of kouane clumps representative for each subzone

Plot 1	Number of clumps
High density	
Medium density	
Low density	
Total	

Note: The clumps representative should not less than 3 clumps in each subzone (high density, medium density and low density).

Number of poles by age

How many poles 1 year, 2 years and >3 years (comparison) in the clumps representative?

Number of clumps	Subzone	Poles age		
		1 year	2 year	> 3 year
Clumps 1	High density			
Clumps 2				
Clumps 1	Medium density			
Clumps 2				
Clumps 1	Low density			
Clumps 2				
Total				

Size measurement

Comparison of kouane size in each class of age (1 year, 2 years and > 3 years)

	Diameter of Kouane poles								
	High density			Medium density			Low density		
	1 y	2 y	> 3 y	1 y	2 y	> 3 y	1 y	2 y	> 3 y
Clump 1									
Total									
Average									

Note: measure by (cm).

Internode of poles

Observation the inter node of pole 1 year, 2 years and >3 years in this plot

Clump	Observation
Pole 1 year	
Pole 2 years	
Pole > 3 years	

Damage area

Observation of the damaged in the area				
Damage criteria	Yes /no	Area (ha)	Causes	Solution
Damaged by livestock				
Fire forests				
Pole broken and fall				
Cut the tree not approve				
Soil erosion				
Harvesting techniques				
Total damaged area				

Note: Indicate the number

Quantities can be harvest next season

Example:

- We know the total area of the plot is 124 ha.
- We know the poles of 3 years from field survey are 122 poles from the number of clumps representative (3 clumps/subzone, total 9 clumps).
- We know in average poles 3 years is 3553 poles/ha (E&D).
- We know 1 pole is 12 kg (E&D).

Through the monitoring know 0.3 ha was damage by livestock. Therefore the calculation of the quantities can be harvest in the next season is:

124 ha – 0.3 ha damaged = 123.7 ha

3,553 poles → 1 ha

122 poles → x ?

$$X = \frac{122 \times 1 \text{ ha}}{3{,}353} = 0.03 \text{ ha}$$

0.03 ha → 122 poles

123.7 ha → x ? poles

$$X = \frac{123.7 \text{ ha} \times 122 \text{ poles}}{0.03 \text{ ha}} = 503{,}046 \text{ poles}$$

We know 1 pole is 12 kg (E&D), therefore:

1 pole → 12 kg

503,046 poles → x ?

$$X = \frac{503{,}046 \times 12 \text{ kg}}{1 \text{ pole}} = 6{,}036{,}552 \text{ kg}$$

1,000 kg → 1 ton

6,036,552 kg → x ? ton

$$X = \frac{6{,}036{,}552 \text{ kg} \times 1 \text{ ton}}{1{,}000 \text{ kg}} = 6{,}036 \text{ tons}$$

For sustainable use of the forest villagers will harvest only 50% of the shoots, therefore:

100% ➜ 6,036 tons

50% ➜ x? tons

$$X = \frac{50\% \times 6{,}036 \text{ tons}}{100\%} = 3{,}018 \text{ tons can be harvest in next season}$$

What is the quantity can be harvested of your village in next season?

- We know the total area of the plot is…….ha.
- We know the poles of 3 years from field survey are…….poles from the number of clumps representative (3 clumps/subzone, total 9 clumps).
- We know in average poles 3 years is 3,553 poles/ha (E&D).
- We know 1 pole is 12 kg (E&D).

Through the monitoring we know the area was damaged…….ha was damage by ……Therefore, the calculation of the quantities can be harvest in the next season is:

Total area of all plots……ha – Area damaged….. ha = area remain…… ha

3,553 poles ➜ 1 ha

Number of poles 3 years from field survey are…….poles ➜ x ? ha

$$X = \frac{\text{Number of poles 3 years from field survey are…….poles} \times 1 \text{ ha}}{3{,}553 \text{ poles}}$$

X = Area survey…….ha

Area survey……ha ➜ Number of poles 3 years from field survey are……poles

Area remain……ha ➜ x ? poles

$$X = \frac{\text{Area remain……ha} \times \text{Nbr of poles 3 years from field survey…….poles}}{\text{Area survey……ha}}$$

X = Number poles whole plot……poles

We know 1 poles is 12 kg (E&D), therefore:

1 pole ➜ 12 kg

Number poles whole plot.....poles ➜ x ? kg

$$X = \frac{\text{Number poles whole plot.....poles} \times 12 \text{ kg}}{1 \text{ pole}}$$

X = Number poles.....kg

1,000 kg ➜ 1 ton

Number poles.....kg ➜ x ? tons

$$X = \frac{\text{Number poles.....kg} \times 1 \text{ ton}}{1{,}000 \text{ kg}}$$

X = Number poles.....tons

For sustainable use of the forest, villagers will harvest only 50% of the shoots, therefore:

100% ➜ Number poles.....tons

50% ➜ x ? tons

$$X = \frac{50\% \times \text{Number poles.....tons}}{100\%}$$

X = Tons can be harvested in next season.....tons

Difficulties and recommendations

Difficulties

.....

.....

Recommendations

.....

.....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village	Head of VBC
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member

ANNEX 6

Form 2 – Discussion on kouane bamboo forest, rules and regulations

Date……

Village:……District:……Province:……

Evaluator's name who participated to the discussion:

1……; 2……;

3……; 4……;

5……; 6……

No	Topics		Details
1	Are there any bamboo fund in your village use for forest monitoring?	☐ Yes	If yes, how much per person per day? .....
		☐ No	If no, how do you consider to conduct the bamboo forest monitoring? .....
2	How many ton slat harvested and sell in this year?		=> .....ton of slat (logbook)
3	How many kg of slats/person/day during harvesting period in this year compare to previous year?		=> .....kg slat/person/day this year => .....kg slat/person/day last year
4	Do you think the yield in this year is better than last year? Yes or No and What changed and why?	☐ Yes	What change or Why? ....
		☐ No	What change or Why? ....
5	How is the kouane size compare to previous year? 1 pole how many kg of slat?		This year:..... Last year:.....
6	If in the field VBC saw some livestock destroyed and fire forest, what can be the solution from villagers?	☐ Yes	Because: ....
		☐ No	Solution: ....
7	If in the field VBC saw some livestock destroyed and fire forest, etc. what can be the solution from villagers?	Solution	Solution: ....
8	Do they think the bamboo forest in well managed by villagers? If not what are the solutions?	☐ Yes	Because: ....
		☐ No	Solution: ....

Discussion on existing rules and regulations (FMP, CM AGREEMENT and PLUP)

Allocation of kouane bamboo forest plots to the village	Is rule implemented?	How to improve?
xx "kouane bamboo forest plots" representing xx hectares have been allocated to the village.	☐ Yes If not why:	.....
The "kouane bamboo forest plots" allocated to the village belong to all villagers, who can ask for a Communal Land Title at the name of the village.	☐ Yes If not why:	.....
Rights to collect kouane shoots for home consumption	**Is rule implemented?**	**How to improve?**
All villagers have the right to collect kouane shoots for home consumption.	☐ Yes If not why:	.....
All villagers have the right to collect other NTFP for home consumption.	☐ Yes If not why:	.....
All villagers have the right to cut small trees less than 20 cm circumference for home consumption.	☐ Yes If not why:	.....
Rights to collect and trade kouane bamboo shoots	**Is rule implemented?**	**How to improve?**
All villagers have the right to collect, process and sell kouane shoots, provided that they respect the village rules and regulations.	☐ Yes If not why:	.....
Villagers from neighbor village are not allowed to collect and sell the resource of the "bamboo forest plots" allocated to the village.	☐ Yes If not why:	.....
They need to ask an authorization to the VBC. If they receive the authorization, they must also respect the village rules and regulations.	☐ Yes If not why:	.....

Forest management rules and regulations for ensuring regeneration of the kouane bamboo forest	Is rule implemented?	How to improve?
Villagers are allowed to collect kouane pole for trade only during the season decided by the village authority. The authorized trading season starts on October to July. But the dates can change depending on the shooting season (irregular every year).	☐ Yes If not why:	.....
It is forbidden to access the forest during the shooting period because there is a high risk of shoots damage that will impact the yield in the future.	☐ Yes If not why:	.....
The opening and closing dates should be decided by the VBC every year. Villagers are not allowed to collect for trade before or after the authorized season.	☐ Yes If not why:	.....
Forest management rules and regulations for stimulating the production of kouane bamboo	**Is rule implemented?**	**How to improve?**
Villagers are not allowed to cut pole aged less than 3 years old, because pole 3 years old and less are the mother of the new shoots. (Exception: can eventually cut bamboo pole less than 3 years old to access into the middle of the clumps to cut pole aged more than 3 year old.)	☐ Yes If not why:	.....

Forest management rules and regulations for protecting the kouane bamboo forest plots	Is rule implemented?	How to improve?
Slash and burn is forbidden in the bamboo forest plots.	☐ Yes If not why:	....
Domestic animals must not access to the bamboo forest plots (Buffaloes, cows, etc.).	☐ Yes If not why:	....
It is forbidden to destroy the signboards of the bamboo forest plots.	☐ Yes If not why:	....
Company workers cannot access to the forest to cut poles.	☐ Yes If not why:	....
Penalties	**Is rule implemented?**	**How to improve?**
Penalties and fines can be applied for those who do not respect the rules and regulations.	☐ Yes If not why:	....

New rules and regulations proposed during the meeting (explain the objective):
.....
.....
.....
.....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village

Head of VBC

VBC member

VBC member

VBC member

VBC member

VBC member

VBC member

ANNEX 7

Form for kouane external team evaluation

Village:..... District:.....

Bamboo forest species:.....

Date of external team evaluation:.....

Place:.....

External team:

1.....; 2.....;

3.....; 4.....

Forest area monitored

	Name	Area (ha)
Plot 1		
Plot 2		
Plot 3		
Plot 4		
Plot 5		
Plot 6		
Total:		

Main finding on monitoring method

The 2 forms of bamboo forest monitoring in the village have been completed?

Yes ☐

Date of field survey:.....

Date of discussion on the bamboo forest and R&R: .....

No ☐

Because:.....

Who participated to the 2 forms?

Name of VBC:

1) .....; 2) .....;

3) .....; 4) .....;

5) .....; 6) .....

Did they survey all plots? How many plots have been surveyed?

Yes ☐ If yes, how many plots have been surveyed?.....

How many ha have been survey? .....

No ☐ If no, why?

.....

Do you have any fund in your village allocated for bamboo forest monitoring activity? If yes, what is the payment? If no, how do you consider to conduct bamboo forest monitoring in your village?

.....

Do the villagers agreed and approved the report?

Yes ☐

No ☐

Because:

.....

Main findings on forest assessment

How many lines have been surveyed in each plot?

Plot 1: .....lines.

Plot 2: .....lines.

Plot 3:.....lines.

Plot 4: .....lines.

Plot 5:.....lines.

Plot 6: .....lines.

How many regeneration shoots in each plots? (Total number of poles 1 year, 2 years.

Plot 1: 1 y .....2 y.....

Plot 2: 1 y ..... 2 y.....

Plot 3: 1 y ..... 2 y.....

Plot 4: 1 y ..... 2 y.....

Plot 5: 1 y ..... 2 y.....

Plot 6: 1 y ..... 2 y.....

How many ha have been damaged by livestock, fire forest, poles broken, soil erosion and techniques for harvesting in all plots?

Livestock? => .....ha.

Slash and burn or fire forest? => .....ha.

Poles broken and fall? => .....ha.

Soil erosion? =>.....ha.

Techniques for harvesting=>.....ha.

Could harvested how many kg/person/day?

.....

How is the size of shoot? How many shoots/kg?

Numbers of shoots/kg =>.....shoots.

How is the yield compare to previous year (logbook)?

Yield in this year=>.....tons.

Yield in last year=>.....tons.

Quantities can be harvest in next year. How many tons in all plots?

.....

How far villagers go to harvest in the forest plot? Go in the same place? Or need to go farther and farther?

.....

What are the difficulties villagers faced during the field surveyed and what are the best solutions of the villagers on the forest management?

.....

Summary, what is the bamboo forest governance in the village?

.....

Main findings on rules and regulations

Are all rules and regulations implemented? Put (✔)

=> Yes ☐ or No ☐

– If no, which rules has not been implemented? And why or need improve?

a) .....
b) .....

– New rules? Why?

a) .....
b) .....

Recommendations to the VBC

.....

Recommendations to the Project

.....
.....
.....

The external team approve this
bamboo forest monitoring report and
send it back to the village

At village.....

Date evaluation.....

External team member

External team member

External team member

External team member

District of Agriculture and Forestry Office

ANNEX 8

Form 1 – Field inventory in hok bamboo forest plot

Date.....

Village:.....District:.....Province:.....

Evaluator's name who participated to the discussion:

1.....; 2.....;

3.....; 4.....;

5.....; 6.....

Plot No.:.....Plot's name:.....Area of the plot:.....ha.

Number of hok clumps representative for each subzone

Plot 1	Number of clumps
High density	
Medium density	
Low density	
Total	

Note: the clumps representative should not less than 3 clumps in each subzone (high density, medium density and low density).

Number of poles by age

How many poles 1 year, 2 years and >3 years (comparison) in the clumps representative?

Number of clumps	Subzone	Poles age		
		1 year	2 years	> 3 years
Clumps 1	High density			
Clumps 2				
Clumps 1	Medium density			
Clumps 2				
Clumps 1	Low density			
Clumps 2				
Total				

Note: the total number of regeneration poles (1 year and 2 years) will be used for calculation the quantities can be harvested in the coming season.

Size measurement

Comparison of hok size in each class of age (1 year, 2 years and >3 years)

	Diameter of hok poles								
	High density			Medium density			Low density		
	1 y	2 y	> 3 y	1 y	2 y	> 3 y	1 y	2 y	> 3 y
Clump 1									
Total									
Average									

Note: measure by (cm).

Percentage blossoming in the plot

Plot	Yes/No	Area of plot (ha)	Percentage blossom	Area alive (ha)
Plot				

If yes, VBCs need to calculate the area alive as below:

If no, VBCs don't need to calculate.

The way to calculate. For example, we have 10 ha and blossomed 5%, which means:

100% ➔ 10 ha

5% ➔ x ?

$$X = \frac{5\% \times 10 \text{ ha}}{100\%} = 0.5 \text{ ha is blossoming, it means 9.5 ha alive}$$

Therefore, what is the level blossoming in your village?:

100% ➡ Area whole plot..... ha

Percentage area blossomed.....% ➡ x ?

$$X = \frac{\text{Percentage area blossomed.....\% x Area whole plot..... ha}}{100\%}$$

X = Number area blossomed.....ha

So it means:

Area whole plot.....ha – Number area blossomed.....ha = Number area alive.....ha

Damage area

Observation of the damaged in the area				
Damage criteria	Yes /no	Area (ha)	Causes	Solution
Damaged by livestock				
Fire forests				
Pole broken and fall				
Soil erosion				
Total damaged area				

Note: if there is damaged area in the plot, need to indicated the area damaged.

Soil fertility

Observation of organic meter in the area			
	Observation	Causes	Solution
Organic/leaves			
Moisture			

Note: A (increase) B (decrease), C (Same).

Quantities can be harvested in hok forest plot

Example:

- We know the total area of whole plot is 124 ha.
- We know the total poles 1 year, 2 years from step 1 (field inventory) is 123 poles in the representative clumps where have been surveyed (5 clumps / subzone. Total 15 clumps).
- We know number of poles 1 year and 2 years are 342 poles/ha (E&D).
- We know in average number of shoot per mother culm is 6 shoots (E&D).
- We know in average 1 shoot is 0.93 kg (E&D).

Through the monitoring know 0.3 ha was damage by livestock and 7 ha was damaged by blossoming. Therefore the calculation of the quantities can be harvest in the next season is:

124 ha – 7.3 ha damaged = 116.7 ha

342 poles ➜ 1 ha

123 poles ➜ x ? ha

$$X = \frac{123 \times 1}{342} = 0.35 \text{ ha}$$

0.35 ha ➜ 123 poles

116.7 ha ➜ x ? poles

$$X = \frac{116.7 \text{ ha} \times 123}{0.35 \text{ ha}} = 41{,}011 \text{ poles}$$

We know in average number of shoot per mother culm is 6 shoots (E&D), therefore

1 pole ➜ 6 shoots

41,011 poles ➜ x ? shoots

$$X = \frac{41{,}011 \text{ poles} \times 6 \text{ shoots}}{1 \text{ pole}} = 246{,}066 \text{ shoots}$$

We know in average 1 shoot is 0.93 kg (E&D)

1 shoots ➔ 0.93 kg

246,066 shoots ➔ x ? kg

$$X = \frac{246{,}066 \text{ shoots} \times 0.93 \text{ kg}}{1 \text{ shoot}} = 228{,}841 \text{ kg}$$

1,000 kg ➔ 1 ton

228,841 kg ➔ x ? tons

$$X = \frac{228{,}841 \text{ kg} \times 1 \text{ ton}}{1{,}000 \text{ kg}} = 228.841 \text{ tons}$$

For sustainable use of the forest, villagers will harvest only 80% of the shoots, therefore:

100% ➔ 228.841 tons

80% ➔ x ? tons

$$X = \frac{80\% \times 228.841 \text{ tons}}{100\%} = 183 \text{ tons can be harvested in this season}$$

What is the quantity can be harvested of your village in this season?

– We know the total area of whole plot is……ha.

– We know the total poles 1 year, 2 years and 3 years from step 1 (field inventory) is……poles in the representative clumps where have been surveyed (5 clumps / subzone. Total 15 clumps).

– We know number of poles 1 year and 2 years are 342 poles/ha (E&D).

– We know in average number of shoot per mother culm is 6 shoots (E&D).

– We know in average 1 shoot is 0.93 kg (E&D).

Through the monitoring we know the area was damaged……ha was damage by ……Therefore, the calculation of the quantities can be harvest in the next season is:

Total area of all plots……ha – Area damaged…… ha = …… ha

342 poles ➜ 1 ha

Number poles 1, 2 and 3 years from surveyed.....poles ➜ x ? ha

$$X = \frac{\text{Number Number poles 1, 2 and 3 years from surveyed.....poles x 1 ha}}{342}$$

X = Area surveyed.....ha

Area surveyed.....ha ➜ Nbr poles 1 and 2 years from surveyed....poles

Total area.....ha ➜ x ? poles

$$X = \frac{\text{Total area.....ha x Nbr poles 1, 2 and 3 years from surveyed.....poles}}{\text{Area surveyed.....ha}}$$

X = Number of poles all area.....poles

We know in average number of shoot per mother culm is 6 shoots (E&D), therefore:

1 pole ➜ 6 shoots

Number of poles all area.....poles ➜ x ? shoot

$$X = \frac{\text{Number of poles all area.....poles x 6 shoots}}{\text{1 pole}}$$

X = number of shoots all area.....shoots

We know in average 1 shoot is 0.93 kg (E&D)

1 shoot ➜ 0.93 kg

Number of shoots all area.....shoots ➜ x ? kg

$$X = \frac{\text{Number of shoots all area.....shoots x 0.93 kg}}{\text{1 shoot}}$$

X = number of all shoots.....kg

1,000 kg ➜ 1 ton

Number of all shoots.....kg ➜ x ? tons

$$X = \frac{\text{Number of all shoots.....kg x 1 ton}}{\text{1,000 kg}}$$

X = Number of shoots..... tons

For sustainable use of the forest, villagers will harvest only 80% of the shoots, therefore:

100% ➔ Number of shoots..... tons

80% ➔ x ?

$$X = \frac{80\% \times \text{Number of all shoots..... tons}}{100\%}$$

X = Tons can be harvested in this season..... tons

Difficulties and recommendation?

Difficulties during the field surveyed?

.....
.....
.....

Recommendation of VBCs on the forest management?

.....
.....
.....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village

Head of VBC
VBC member
VBC member
VBC member
VBC member
VBC member
VBC member

ANNEX 9

Form 2 – Discussion on hok bamboo forest, rules and regulations

Date.....

Village:.....District:.....Province:.....

Evaluator's name who participated to the discussion:

1.....; 2.....;

3.....; 4.....;

5.....; 6.....

Plot No.:.....Plot's name:.....Area of the plot:.....ha.

Discussion on the hok bamboo forest plots

No	Topics		Details
1	Are there any bamboo fund in your village use for forest monitoring?	☐ Yes	If yes, how much per person per day? .....
		☐ No	If no, how do you consider to conduct the bamboo forest monitoring? .....
2	How many fresh hok shoots last year? How many fresh hok shoots this year? How many kg/person/day villager can harvest during the season? How many shoots/kg?		=> .....ton fresh hok shoot (logbook) => .....ton fresh hok shoot (monitoring and estimate by VBCs) => .....kg/person/day => .....shoots/kg
3	Do you think the yield in this year is better than last year? Yes or No and What changed and why?	☐ Yes	What change or Why? ....
		☐ No	What change or Why? ....
4	How was the hok size compare to previous year?	Put (✔)	In 2015 big c, meduim c, small c, same c. In 2016 big c, meduim c, small c, same c.
5	Do you need to go farther and farther year after year to collect hok shoots in the forest?	☐ Yes	Because: ....
		☐ No	Solution: ....
6	With the hok blossoming, do you think it will affect the quantity and the bamboo activity (collection and processing) in the village?	☐ Yes	Because: ....
		☐ No	Solution: ....

No	Topics		Details
7	If in the field VBC saw some livestock destroyed and forest fire, etc. what can be the solution from villagers?	Solution	Solution: ....
8	Do they think the bamboo forest in well managed by villagers? If not what are the solutions?	☐ Yes	Because: ....
		☐ No	Solution: ....

Discussion on existing rules and regulations (FMP, CM AGREEMENT AND PLUP)

Allocation of hok bamboo forest plots to the village	Is rule implemented?	How to improve?
xx "hok bamboo forest plots" representing xx hectares have been allocated to the village.	☐ Yes If not why: …… …… ……	……
The "hok bamboo forest plots" allocated to the village belong to all villagers, who can ask for a Communal Land Title at the name of the village.	☐ Yes If not why: …… …… ……	……
In case the villagers decided to make internal allocation of clumps to households inside the "bamboo forest plot," the households can sell their rights on clumps to other households.	☐ Yes If not why: …… …… ……	……
Rights to collect hok shoots for home consumption	**Is rule implemented?**	**How to improve?**
All villagers have the right to collect Hok shoots for home consumption.	☐ Yes If not why: …… …… ……	……
All villagers have the right to collect other NTFP for home consumption.	☐ Yes If not why: …… …… ……	……
All villagers have the right to cut small trees less than 20 cm circumference for home consumption.	☐ Yes If not why: …… …… ……	……

Rights to collect and trade hok bamboo shoots	Is rule implemented?	How to improve?
All villagers have the right to collect, process and sell hok shoots, provided that they respect the village rules and regulations.	☐ Yes If not why: …… …… ……	……
Villagers from neighbor village are not allowed to collect and sell the resource of the"bamboo forest plots" allocated to the village. They need to ask an authorization to the VBC. If they receive the authorization, they must also respect the village rules and regulations	☐ Yes If not why: …… …… ……	……
Forest management rules and regulations for ensuring regeneration of the hok bamboo forest	**Is rule implemented?**	**How to improve?**
Villagers are allowed to collect hok shoots for trade: - During the season decided by the village authority. - Normally, the authorized trading season starts on 01 of August and ends on 30th of September. - But the dates can change depending on the shooting season (irregular every year). The opening and closing dates should be decided by the VBC every year. Villagers are not allowed to collect for trade before or after the authorized season.	☐ Yes If not why: …… …… ……	……
Villagers have the obligation to use appropriate tools (small hoes and appropriate knifes) for collecting the shoots. Big hoes are forbidden because they dig big hole and damage the forest.	☐ Yes If not why: …… …… ……	……
Forest management rules and regulations for stimulating the production of hok bamboo	**Is rule implemented?**	**How to improve?**
Villagers are not allowed to collect shoots higher than 150 cm.	☐ Yes If not why: …… …… ……	……
Villagers are not allowed to cut pole aged less than 3 years old because pole 3 years old and less are the mother of the new shoots.	☐ Yes If not why: …… …… ……	……

Forest management rules and regulations for protecting the hok bamboo forest plots	Is rule implemented?	How to improve?
Slash and burn is forbidden in the bamboo forest plots.	☐ Yes If not why:	....
Domestic animals must not access to the bamboo forest plots (Buffaloes, cows, etc.).	☐ Yes If not why:	....
It is forbidden to destroy the signboards of the bamboo forest plots.	☐ Yes If not why:	....
Penalties	**Is rule implemented?**	**How to improve?**
Penalties and fines can be applied for those who do not respect the rules and regulations.	☐ Yes If not why:	....

New rules and regulations roposed during the meeting (explain the objective):
.....
.....
.....
.....

Approval the form before sending to external monitoring team

At village:.....Date: .....

Chief of Village	Head of VBC
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member
	VBC member

ANNEX 10

Form for hok external team evaluation

Forest Management Monitoring / External team evaluation

Village:..... District:.....

Bamboo forest species:.....

Date of external team evaluation:.....

Place:.....

External team:

1.....; 2.....;

3.....; 4.....

Forest area monitored

	Name	Area (ha)
Plot 1		
Plot 2		
Plot 3		
Plot 4		
Plot 5		
Plot 6		
Total:		

Main finding on monitoring method

The 2 forms of bamboo forest monitoring in the village have been completed?

Yes ☐

Date of field survey:.....

Date of discussion on the bamboo forest and R&R: .....

No ☐

Because:.....

Who participated to the 2 forms?

Name of VBC:

1) .....; 2) .....;

3) .....; 4) .....;

5) .....; 6) .....

Did they survey all plots? How many plots have been surveyed?

Yes ☐ If yes, how many plots have been surveyed?.....

How many ha have been survey? .....

No ☐ If no, why?

.....

Do you have any fund in your village allocated for bamboo forest monitoring activity? If yes, what is the payment? If no, how do you consider to conduct bamboo forest monitoring in your village?

.....

Do the villagers agreed and approved the report?

Yes ☐

No ☐

Because:

.....

Main findings on forest assessment

How many lines have been surveyed in each plot?

Plot 1: .....lines.

Plot 2: .....lines.

Plot 3:.....lines.

Plot 4: .....lines.

Plot 5:.....lines.

Plot 6: .....lines.

How many regeneration shoots in each plots? (Total number of poles 1 year, 2 years)

Plot 1: 1 y .....2 y.....

Plot 2: 1 y ..... 2 y.....

Plot 3: 1 y ..... 2 y.....

Plot 4: 1 y ..... 2 y.....

Plot 5: 1 y ..... 2 y.....

Plot 6: 1 y ..... 2 y.....

How many ha have been damaged by livestock, fire forest, poles broken, soil erosion and techniques for harvesting in all plots?

Livestock? => .....ha.

Slash and burn or fire forest? => .....ha.

Poles broken and fall? => .....ha.

Soil erosion? =>.....ha.

Techniques for harvesting=>.....ha.

Could harvested how many kg/person/day?

.....

How is the size of shoot? How many shoots/kg?

Numbers of shoots/kg =>.....shoots

How is the yield compare to previous year (logbook)?

Yield in this year=>.....tons.

Yield in last year=>.....tons.

Quantities can be harvest in next year. How many tons in all plots?

.....

How far villagers go to harvest in the forest plot? Go in the same place? Or need to go farther and farther?

.....

What are the difficulties villagers faced during the field surveyed and what are the best solutions of the villagers on the forest management?

.....

Summary, what is the bamboo forest governance in the village?

.....

Main findings on rules and regulations

Are all rules and regulations were implemented? put (✔)

=> Yes ☐ or No ☐

– If no, which rules has not been implemented? And why or need improve?

a) .....
b) .....

– New rules? Why?

a) .....
b) .....

Recommendations to the VBC

.....

Recommendations to the Project

.....
.....
.....

The external team approve this
bamboo forest monitoring report and
send it back to the village

At village.....

Date evaluation.....

External team member

External team member

External team member

External team member

District of Agriculture and Forestry Office

Producers group manual

Team Concept for formation, sustainability and effective functioning

Method at the village level

Producers group introduction

The development of this training is to support aspiring, nascent or existing village producer groups in their self actualization of the team concept with the purpose of developing strong producer group organizations, leadership, functioning, administration and financial skills. The major goals are to facilitate the producer groups and its members in:

- Capitalization of producers group's strengths to contribute to the value chains' growth.
- Self sufficient and self-sustenance for the ability to trade fairly in a sustainable way.
- Realization and actualization of group and its members' potential and maximization of their socio-economic benefits through the group.

The manual is meant to be used as a guide and source book to implement training programs providing participatory practical knowledge on how to develop and the building of group members' capacity to:

- Identify importance of group and develop group structure and organization that is best for members.
- Members understand methods for electing group leaders and assigning roles and responsibilities based on members' abilities.
- Members trained in group functioning methods including reporting to ensure transparency, trust building, and improved group functioning:
  - logbook keeping and financial calculations;
  - production and trade analysis;
  - holding group meetings and status reports;
  - identify challenges /constraints and develop production plans.
- Members understand market analysis and linkages with trader to negotiate contracts.

Through the participatory approaches proposed in this training and with ample time and experience gain through practitioners' self-assessments of lessons-learnt, the training modules are developed to achieve the following:

- Group members generated a list of objectives and expectations and based on this, determine group formation is needed.
- Group members review their current structure and organization and develop new structure and organization that best fit with their realities, objectives and expectations (from Outcome 1).
- Members used different election methods to elect group members. Roles and responsibilities are clearly understood by all members.
- Members assessed their abilities and assigned roles and responsibilities based on election results and abilities.
- Members are able to keep logbooks and production and trade information using financial calculations.
- Members are able to use the logbooks and production and trade records to analyse for themselves yearly production and trade.
- Yearly participatory and transparent group meetings are held to:
  - share production and trade status reports with analysis;
  - identify improvement points and production plans developed;
  - assess the use of fees to pay for services.
- Members developed more linkages to traders and can negotiate better and more sustainable contracts.

How to use the manual

- Training should take time and participatory as the training follows the adage: "learning by doing."

  All participants understand each section, participate and can explain to others before moving on to the next section.

- Manual should be given out to participants with papers and pens/pencils for active participation, game playing and taking notes.
- At the conclusion of each section, training document and notes recorded by group members should be saved for future use.
- If previously trained and experienced group members leave the group, they should use the training documents and notes to train new members.
- Leaving previously trained and experienced group members should hand over all training documents and notes to new members to ensure cumulative producer group knowledge and experience are passed on and improved. This ensures producer group's overall capacity **sustainability and growth**.

The manual was initially created in presentation form and utilized to train over 30 villages of the handicraft, Nor khom fresh shoots and Mai kouane slats and sticks producing villages supported by the Huaphanh Bamboo Sector Development Project. Based on participants' feedbacks and contributions, the manual was improved to better fit with the working context of the rural Northern Upland Lao villagers.

Training schedule and sections

The training schedule and training sections give an overview on the number of sections of the training, their sequence, main topics to be dealt with, and the duration of the sessions and the proposed time. This is meant to serve as a soft guide for the trainer and the participants (Producer group members) to organize their time. The level of training depth, duration, time of training should be planned to fit accordingly to participant's capacity and availability.

Section	Topic	Duration
Section 1 What is a group?	Defining Producer group and examples of different types of groups.	20 minutes
Section 2 Assessing the needs for group.	1. Members identify advantages and disadvantages of forming a group. 2. Participatory system for deciding on group formation and/or its maintenance.	20-30 minutes
Section 3 Defining Group's Objectives and Goals.	Participatory discussions and reflection to identify and agree on common goals and objectives of group.	30 minutes-1 hour
Section 4 Group formation, structure, voting and assigning roles and responsibilities.	1. Members discussion and deciding on form of group structure. 2. Practical use of participatory voting system to select leadership and assign roles and responsibilities.	30 minutes-1 hour
Section 5 Ensuring group functioning, transparency and trust.	1. Members understand concept of developing group transparency and trust to achieve common goals. 2. Members are able to hold participatory group discussions for raising and resolving issues. 3. Practical use of the "trust fall game".	30 minutes-1 hour
Section 6 Logbook and simple financial calculations.	1. Understand simple financial and accounting concepts of income, expenses and profits. 2. Recognizing importance of logbook keeping and how to keep a logbook. 3. Practical use of simple and more complex financial logbook for producer group.	30 minutes-1 hour
Section 7 Analysis production and market demands.	1. Utilizing group's financial logbook to analyse market demands. 2. Utilizing group's financial logbook to analyse traders profile and identify production profiles achieving best economic benefits for group.	30 minutes-1 hour
Section 8 Developing village funds through fees.	1. Importance of village bamboo fund. 2. Understanding structure and collection of fees to source fund. 3. Practical example of adaptable fund use.	30 minutes

Section	Topic	Duration
Section 9 Finding and Linking with market players.	1. Simple understanding of strong value chain and its linkages. 2. Importance of each linkage and how each value chain link can coordinate with each other. 3. Practical use of information sharing system for producer group to link with other value chain stakeholders.	30 minutes-1 hour
Section 10 Developing trading terms and negotiating contracts.	1. Simple understanding of types of farmers contract in Lao. 2. Members analysis of positives and negatives of contracts. 3. Practical use of SWOT for group members to analyze need for contracts with traders. 4. Practical steps for contract negotiation and formation.	30 minutes-1 hour
Section 11 Defining challenges / constraints and finding solutions.	1. Understanding group discussions and paths for identify challenges and constraints. 2. Participatory group discussions utilizing all members inputs for finding solutions. 3. Identification of potential support for implementing solutions.	15-30 minutes
Section 12 Organizing meetings, status report and yearly planning.	1. Importance of regular group meetings to develop and reinforce group transparency and trust. 2. General topics usable for group meetings and reporting.	15 minutes

<table>
<tr><th>Participants</th><th>Equipment and Document</th></tr>
<tr><td>• Village chief
• Village Bamboo Committee members
• Potential bamboo producer group members
• Existing bamboo producer group members
• District technicians (DOIC and/or DAFO)</td><td>• Handout of abridged presentation of Training manual for participants
• A0 papers for presentation
• Pens and notebook for note taking
• LCD projector (optional if there is easily accessible electricity)</td></tr>
<tr><th>Duration</th><td rowspan="3"></td></tr>
<tr><td>Vary by section (see above).</td></tr>
<tr><th>Place</th></tr>
<tr><td>Village meeting room or naiban's house.</td><td></td></tr>
<tr><th colspan="2">Expected Budget</th></tr>
<tr><td colspan="2">50,000 kips per participant</td></tr>
</table>

Section 1: what is a group?

In this section, the training topics include:

- Defining Producer group and examples of different types of groups.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' feedback. Effectively done, the following could be achieved:

- Participants understand that producer groups are teams working together.
- There are different types of producer groups that fit differently with different types of producers and/or villages.

Methodology

Training participants are provided handouts of presentation of the training manual translated to Lao language.

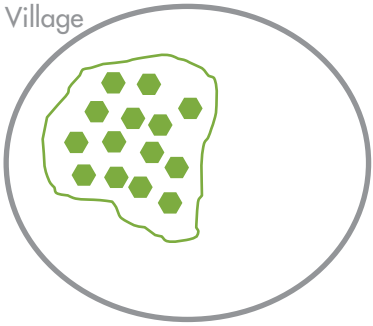
As a group, participants face the trainer who presents the section's training utilizing local language and dialect while the participants follow using the handouts. Utilization of LCD projection could support the process if there is electricity or space for image projection.

Trainer draws a picture of people climbing mountains and helping each other to reach the top and asks participants the intended meaning of the figure.

Trainer presents the following:

- Producer Groups are **TEAMS** with each person doing his/her own roles and responsibilities so the team as a whole can achieve its objectives.
- When team **achieves common goals and objectives**:
  - members **ACHIEVE** objectives;
  - members are **RECOGNIZED**;
  - members **RECEIVE BENEFITS**;
  - members act and **LIVE AS ACHIEVERS**;
  - members **TRUST** each other and team.
- Today, **Producer and Trade Groups** supported by the Bamboo Project are created by some villagers for "best use of bamboo forest in a sustainable way to generate economic benefits and income".

Examples of different types of bamboo-based producer groups supported by the Bamboo Project.

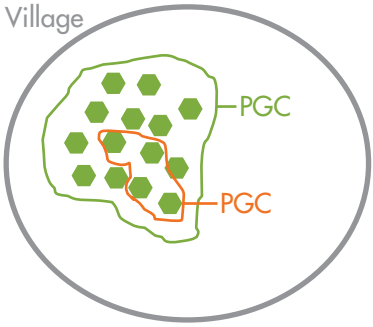


Bamboo Shoots Harvesting and Marketing Producer Group (Nor Hok and Khom):

- Formed by villagers (generally all villagers) for harvesting, processing (Nor hok) and trading.
- Often has committee that plan production, check quality and organize trade for group.

Handicraft Producer group:

- Formed by some villagers (not always all villagers) for producing and trading handicraft.
- Often has committee that plan production, check quality and organize trade for group.



Producers group Committees (PGC):

- Are created by the producer group **BUT** authorized by the village authority (naiban).
- They plan production, check quality and organize trade.
- They work for the producer group **AND NOT** under the control of the village authority.

To initiate participants' thinking on the concept of producer groups, they are asked for their experience and feedbacks on:

- Encountering similar producer groups within or nearby their villages.
- Which example would fit best in their village?

Section 2: assessing the needs for group

In this section, the training topics include:

- Members identify advantages and disadvantages of forming a group.
- Participatory system for deciding on group formation and/or its maintenance.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' feedback. Effectively done, the following could be achieved:

- Participants understand the need for discussions amongs themselves and to carry out these discussions without facilitation to identify common goals and objectives.
- Participants understand and have capacity to conduct SWOT analysis for annual assessment of producer group formation or continuation.

Methodology

As a group, participants face the trainer who presents the section's training utilizing local language and dialect while the participants follow using the handouts. Utilization of LCD projection could support the process if there is electricity or space for image projection.

The trainer proposes to participants that when villagers first consider forming a producer group, they should discuss amongst themselves:

- What are their common interests?
- Will each current member's and interested potential member's interest (personal objectives and goals) be better achieved as a group?
- Does everyone feel equally strong about needing to make a group?

> It is important that all members are heard and their Interests, Goals, and Objectives are the same as the group.

As practice, the trainer then asks the participants to answer the questions and record the answers on A0 papers for all participants to see.

Each year, subsequent to group formation, the current members along with interested potential members should use the training manual to again discuss:

- Is there common interest by everyone?
- Will each person's interest be better achieved as a group?
- Does everyone feel equally strong about needing to continue the group?
- Current group members remind all members of group's Interests, Goals, and Objectives.

Once participants know how to conduct discussion and analysis of members' interests, objectives and goals, the next step should be analysis for group formation or continuation.

It is important that participants analyse deeply the positives and negatives of group formation. **A tool that the trainer now introduces is SWOT (Strength, Weakness, Opportunities and Threats).** This tool should be used by members for annual assessment.

On A0 Paper, the trainer should generate and clearly explain the SWOT chart like below.

STRENGTHS	WEAKNESSES
What positives can be achieved and benefits given to members by making the producer group?	What negatives can be incurred and costs to members by making the producer group?
OPPORTUNITIES	**THREATS**
What can the producer group give to members that the members cannot get alone as individuals?	What bad impact can a producer group bring to members that would not happen if members were alone?

As practice, the trainer then asks the participants to fill in the SWOT analysis and record the answers on A0 papers for all participants to see.

STRENGTHS	WEAKNESSES
What positives can be achieved and benefits given to members by making the producer group? 1. 2. 3.	What negatives can be incurred and costs to members by making the producer group? 1. 2. 3.
OPPORTUNITIES	**THREATS**
What can the producer group give to members that the members cannot get alone as individuals? 1. 2. 3.	What bad impact can a producer group bring to members that would not happen if members were alone? 1. 2. 3.

Section 3: defining group's objectives and goals

In this section, the training topics include:

- Reflection and participatory discussions to identify and agree on common goals and objectives.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' feedback. Effectively done, the following could be achieved:

- Participants understand the need for participation by all group members in brainstorming and identify common objectives and goals.
- Participants achieve practical understanding of how to combine members feedbacks to establish producer group's goals and objectives that fit with all members.

Methodology

Using the results from participants' SWOT analysis from section 2, in this section, participants can identify the common opportunities and strengths to start listing group objectives and goals based on their interests.

Using the figure below, participants are reminded that once the members decide to establish a group, consideration by members for their producer group objectives and goals should combine their SWOT results and their sense of team work and community:

STRENGTHS	WEAKNESSES
What positives can be achieved and benefits given to members by making the producer group?	What negatives can be incurred and costs to members by making the producer group?
OPPORTUNITIES	**THREATS**
What can the producer group give to members that the members cannot get alone as individuals?	What bad impact can a producer group bring to members that would not happen if members were alone?

However, producer groups members should remember that a group with too many objectives and goals will have problems meeting those objectives and goals.

The idea of over stating many objectives and goals, creating the situation the producer group is over stretched to different sides, resulting in its inability to function, much like the inability of a producer group to function when there are too many objectives and goals.

From this, participants are reminded:

- Group objectives and goals should be simple and in a way so everyone in the group agrees and have capacity to do.
- Group Objectives and Goals should be focussed and fit with members Interests.

Once these concepts are clearly understood, then group's objectives and goals can be established using the following steps.

As practice, using A0 papers, the trainer should work with the participants using these tables as examples for their clear understanding and implementation on establishing or reinforcing producer group objectives and goals.

- Write down Objectives and Goals from discussions with all members.
- Once the list of Objectives and Goals is completed, let members vote on if they agree or not agree to the list of Objectives and Goals.

Objectives and Goals of Group			Comments from Members
1. Example: Greater prices for better income			
2. Example: Better product quality from training			
3. Example: Better bargaining power for better contracts			
4. Example: Group members can meet girls or boys better			

- From the votes, choose the objectives and goals members clearly wants and discuss:

Objectives and goals of group			Comments from Members
1. Example: Greater prices for better income			
2. Example: Better product quality from training			Needs some discussion
3. Example: Better bargaining power for better contracts			Needs a lot of discussion
4. Example: Group members can meet girls or boys better			

- After discussion and agreement by all members, finalize group's objectives and goals:

Objectives and goals of group	Comments
1. Example: Greater prices for better income	This was clearly chosen by all
2. Example: Better product quality from training	This required some discussions and improvements to achieve unity
3. Example: Better bargaining power for better contracts	This was chosen ONLY AFTER discussions to achieve unity

- These objectives and goals will be the basis of the group.
- Each year subsequent to the formation of the producer group, members should conduct similar exercise using the established objectives and goals as the foundation for improving and/or reinforcing the producer group's objectives and goals for that year.

Section 4: group formation, structure, voting and assigning roles and responsibilities

In this section, the training topics include:

- Members discussion and deciding on form of group structure.
- Practical use of participatory voting system to select leadership and assign roles and responsibilities.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants understand the concept of learning process, and how this process is important for group functioning.
- Participants understand and are able to conduct participatory meetings to decide on forming a producer group. For members of existing producer groups, they should be able to conduct annual review and deciding on keeping a group.
- Participants gain practical knowledge to hold participatory meetings to develop a producer group structure, roles and responsibilities of group committee using a fair voting system. For members of existing producer groups, they should be able to conduct annual review and make improvements.
- Participants can apply the learning process to improve their group.

Methodology

- It is very **important ALL** participants and group members participate in the activities.
- To ensure group continues to work well, **each year**, these activities should be **reviewed to everyone**.
- When **old committee members leave**, the activities in this section are r**eviewed to new members** and new elections made with new members **BEFORE old members leave.**

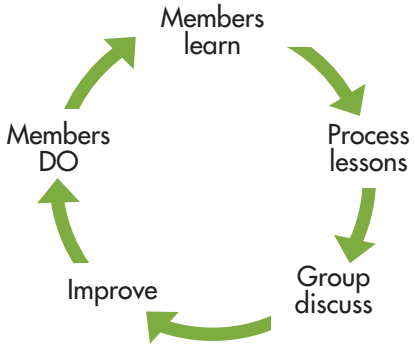
Important aspect of progression of producer group is the idea of **learning** process.

Learning process is a cyclical process where a group with its members **learns, process the lessons** individually and collectively, **discuss as a group to improve the group (objectives, goals, and actions) then implement (do) their action plan.**

Learning process: activities in this section is a learning process for all members.

Group development and progress is directly tied to members' inclusiveness and application of the learning process to ensure all members have equal participation and voice within the group.

Part of the learning process is the formation of the group. Year by year, as the group learns and grow together, how they form the group and the leadership they choose should reflect this growth.



Group formation or Group keeping

Training participants are explained that once members of a group have developed clear group goals and objectives, they can **vote to form a producer group**. Also, annually, once members of existing group have conducted their discussion on group's objectives and goals, they can conduct **annual vote on whether they should maintain their producer group.**

The voting process can be participatory:

1. Members write on a small paper to say Yes or No. Then put this paper in a hat collecting all votes - **They should not write their names.**
2. One person who everyone trust and respect then can read each vote and count **Yes** or **No** votes using similar table as below.
3. If there are more **YES** votes than **NO** votes, the group is formed.
4. If there are more **NO** votes than **YES** votes, then group is not formed or disband (for existing producer group).

Votes for forming/keeping group

YES	NO	Total YES	Total NO

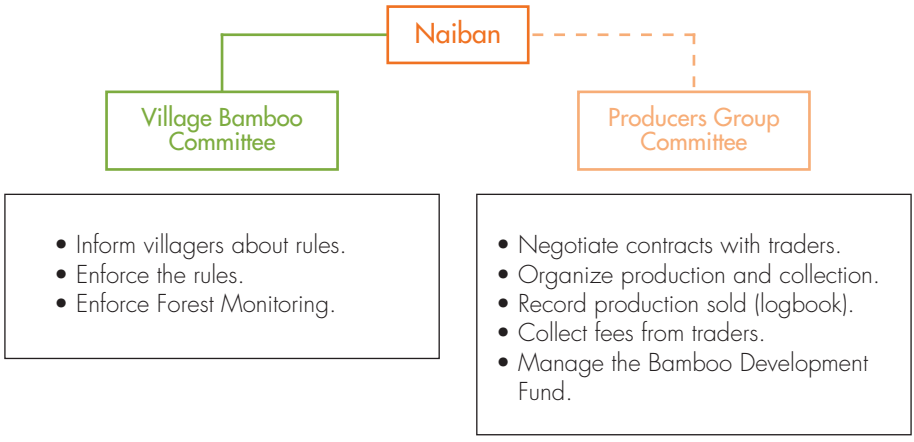
Final Decision is:
Group Discussion on **Final Decision and is there need for voting again after discussion?**

As practice, trainers can generate the above table on A0 paper and practice voting with participants. Once participants have clear understanding and practical knowledge of the group formation/maintenance system, the trainer can proceed.

Group structure

Participants are made aware that when a producer group is first formed, a group structure needs to be developed using the contents below in a participatory way with its member. Each year subsequent to formation, the group and its members should use similar method to re-assess and improve group structure to best fit with their learning process.

Today, some producers groups supported by the Bamboo Project have the following structure with three main components: Naiban (Village head), Village Bamboo Committee (VBC), and Producers Group Committee (PGC). The VBC and PGC each have their roles to play:



The new group can use this example for forming their own. It is important to **remember that ALL members should vote on the new structure.**

Every year after group formation members should discuss if they continue to agree to their group structure and make improvements.

PGC Roles and Responsibilities

Once the group has developed its structure, then the group can decide on the roles, responsibilities and number of members inside committee. Also, each year, existing group should review and discuss on improving its existing structure. Members can use this as example. In general, these roles and responsibilities have been used and improved by many existing producer groups supported by the Bamboo Project:

Group Leader	• Represents Group. • Manages and supervises group committee members. • Informs and enforces rules to group members (with naiban support).
Deputy Group Leader	• Helps the Group Leader. • Ensures accounting of <admin costs> of PG Committee.
Finance Manager	• Helps the Group Leader. • Ensures accounting of <admin costs> of PG Committee.
Forest Team (1 to 4 persons)	• Monitor respect of rules by Bamboo group members during harvest. • Participate in post harvest forest monitoring.
Marketing Team (1 to 4 persons)	• Deals with traders. • Bargain prices, quantities and dates. • Schedule the collection days of traders. • Inform members of the collection days of traders.

With the decision on group structure, roles and responsibilities of group leadership, group members then know how many committee members they will need. Then they can vote on committee. A participatory voting system can be:

1. Each member write on a small paper the two names of people who they elect to be in the committee.
2. This paper is placed in a hat collecting all votes. Member should not write his or her own name.
3. One person who everyone respects then read each vote and write down the names with the number of votes.
4. Based on the number of votes the person received, the roles and responsibilities can be decided.

Name of Member	Vote received	Total number of vote
Mr. A		11
Mr. B		3
Mrs. C		7
Ms. D		5

5. Votes received by each member can be used to assign roles:
   a. Highest votes: producer group leader.
   b. Second highest votes: Deputy producer group leader.
   c. Third highest votes: Second deputy producer group leader.

Name of Member	Vote received	Total number of vote	Role and Resposabilities
Mr. A		11	Producer Group Leader
Mr. B		3	Option for 2nd Deputy Producer Group Leader
Mrs. C		7	Deputy Producer Leader
Ms. D		5	2nd Deputy Producer Group Leader

6. It is important to ask if members elected accept the role and responsibilities.
   This is to ensure voted Committee members believe in their abilities and are motivated to perform their proposed roles.
7. Based on this the group can finalize committee leaders.

Name of Member	Vote received	Total number of vote	Role and Resposabilities	Does member accept?
Mr. A		11	Producer Group Leader	Y
Mr. B		3	Option for 2nd Deputy Producer Group Leader	Y
Mrs. C		7	Deputy Producer Leader	Y
Ms. D		5	2nd Deputy Producer Group Leader	NO

It is important that during this step, **ALL MEMBERS AGREE** and **APPROVE on the Committee leadership and their roles.**

8. The Producer group committee leaders can then decide on members to fulfill other roles (based on the group structure previously developed by the group members) based on:

a. Their ability to successfully do the roles and responsibilities

1. They **really want** to do the job.
2. They **have experience** in doing activities similar to the roles.
3. They **are respected by others**.
4. Every producer group member's agreement and approval.

As practice, trainers can generate the above tables on A0 papers and practice the above process with participants. Once participants have clear understanding and practical knowledge of voting and assigning roles and responsibilities system, the trainer can proceed.

Section 5: ensuring group functioning, transparency and trust

In this section, the training topics include:

- Members understand concept of developing group transparency and trust to achieve common goals.
- Members are able to hold participatory group discussions for raising and resolving issues.
- Practical use of the "trust fall game".

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

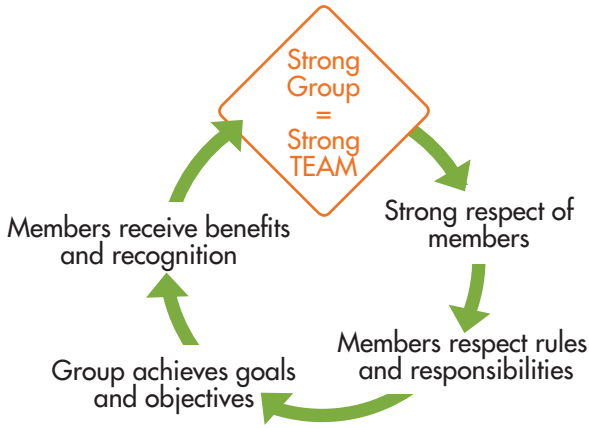
- Participants understand the concepts of transparency and trust for members within a producer group to successfully work as a group to meet objectives and goals.
- Participants are able to apply two different methods toward developing group transparency and trust in producer group meetings.

Methodology

Participants are first reminded good group functioning occurs when the group works as a good team:

- This involves **members respect** each other, each other's capacities and roles, and thus the **members respect the rules and responsibilities** of the group.
- This respect creates a **trust** in that each member will fulfill and successful complete his/her responsibilities based on group rules. At the same time, each member feels the accountability to complete his/her roles for the group. Together, **this helps the group achieve its goals and objectives.**
- The **benefits that come with the group** achieving its goals and objectives then **leads to members receiving benefits and recognition**. Members of recognized successful groups are also recognized as successful group members.

- Participants are also reminded that to ensure the development of strong group (thus strong team), several factors need to exist inside the producer group: **Transparency and Trust.**
- Transparency is being clear and honest with each other on:
  - information and knowledge each member knows and do not know;
  - actions each member have done and plan to do;
  - each member's expectations and wants for himself/herself and group.
- Trust is the most valuable part of group and relationship building between members:
  - by believing in others;
  - by believing that all members are working together;
  - by working together and seeing the good results together.

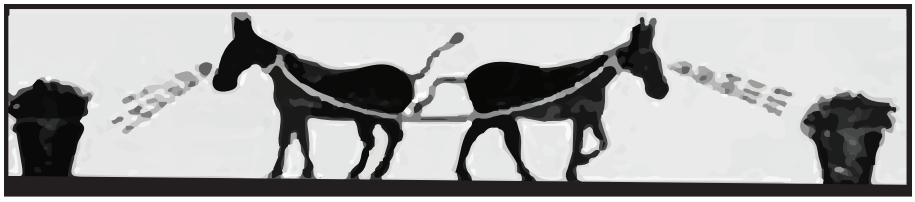


When a group works together as a team with **transparency** and **trust between each member**; members are cohesive when the group encounters problems or challenges.

By working together to identify and find solutions to their problems or challenges, the group can reach its objectives and goals.

As practice, the participants are shown a picture (see page 331) and asked for what participants think the picture is trying to convey.

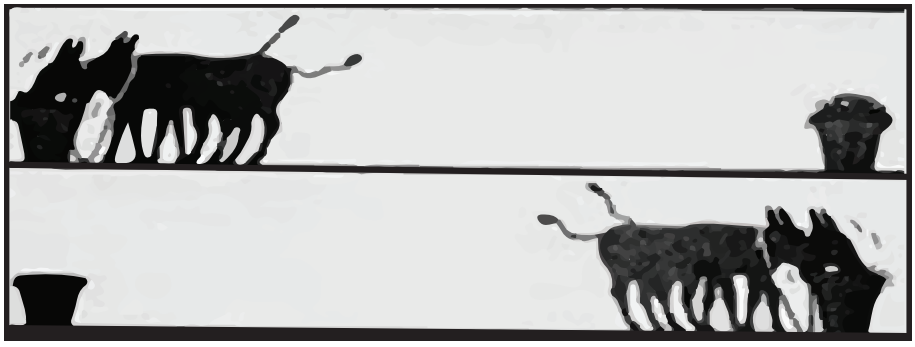
Once participants have provided their interpretation of the picture, the trainer can explain:



Group members are linked but sometimes want different things.

When members want only their own benefits, they fight and lose trust.

BUT they forget they are linked and fighting means no one benefits.



When members discuss openly and trust each other then they can find solutions.

Figure reference: Adapted for specific use from Mobilizing Ideas workshop for Improvement Association Rice Mill by CORD Laos (June 2013).

> By working together, all group members can achieve their benefits.

It is important that participants fully understand this interpretation before moving on.

With the understanding that transparency and trust between producer group members is important for group functioning and success, participants are asked:

- How can group members develop **transparency and trust?**

Following participants' feedbacks, the trainer can propose the following methods for improving group member's **transparency** and **trust**:

- Developing transparency: **Group discussions** where each member shares feelings and thoughts while receiving feedback from group.

A table such as below could be used by group members during their meetings. These meetings should be conducted at least once per year.

Member feelings			Feedback from group
1. Own objectives and goals to be in the group			
2. Good feelings about being in the group			
3. Not good feelings about being in the group			
4. What can the group do to make him/her feel like an important part of the group?			
5. Other comments			

As practice, trainers can generate the above tables on A0 papers and practice the above process with participants. Once participants have clear understanding and practical knowledge of voting and assigning roles and responsibilities system, the trainer can proceed.

- Developing trust building through playing a game during group meetings: **Trust fall.**

  1. Everyone stands behind a volunteer with their hands out ready to catch the person.

  2. One volunteer go on top of a chair with his back to the group. Cross arms and closes eyes.

  3. This volunteer, with his/her arms crossed and eyes closed then fall back to the group and trusts the members standing behind him/her to catch him/her.

4. As the volunteer falls, the group members behind him/her catch and not let him/her fall.

5. Every member of the group should play the role of the volunteer once.

6. Group then can discuss:

   – how each person feel to be the volunteer and falling;

   – how each person feel to be part of the group catching the volunteer and be responsible for that person's trust?

As practice, participants should conduct this game until at least the majority of participants have performed his/her role as the falling member.

Section 6: logbook and simple financial calculations

In this section, the training topics include:

- Understand simple financial and accounting concepts of income, expenses and profits.
- Recognizing importance of logbook keeping and how to keep a logbook.
- Practical use of simple and more complex financial logbook for producer group.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants understand the importance and concept of financial logbook keeping for the group.
- Participants achieve practical understanding of incomes, expenses, profit and loss.
- Participants are able to keep simple or complex logbooks to calculate their producer group's profitability or loss derived from their products or services.

Methodology

Starting on this section, it is important for participants to understand that keeping financial logbooks for the producer groups is crucial for the group to fully understand the money that is spent by the group to produce products or provide services (Expenses) and the money that comes into the group from selling their products or services (Income). This allows the group to monitor and assess how their group is functioning and how to improve their profitability.

Logbook and simple financial calculations

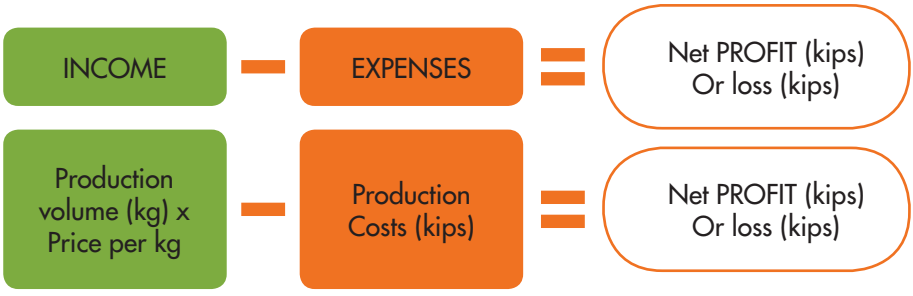
Income is money going IN:
can be money from selling something produced, something gathered or services/labour.

Expenses are money going OUT:
can be spend to buy materials to produce an item, labour or services of someone else.

In any producer group, there should be a person responsible for the financial logbook keeping. This person should be:

- Strong in financial matters.
- Possesses capable mathematical skills.
- Meticulous and motivated in keeping financial records for the group.

Participants should know that:



Profit: there was more income than expenses.
Loss: there was more expenses than income.

A simple logbook of income and expenses such as below, could still be kept and used by the producer group to perform simple calculation of Profit:

Item	Income from Sales (kips) (I)	Sale Date	Expenses to produce item (kips)	Total expenses (E)	Profit or Loss (I – E)
1. A	15,000 kips	7/8/2015	3,000 (material 1) 5,000 (material 2)	8,000	7,000 Profit
2. B	50,000 kips	6/6/2015	20,000 (material 1) 20,000 (material 2) 13,000 (other)	53,000	-3,000 Loss

For producer groups with more capable financial officer or stronger financial capabilities, **more complex logbooks can be developed** (such as below). More complex logbook will allow producer groups to keep more indepth records of their income and expenses. This allows the group to have deeper analysis of factors affecting their profits or loss.

More complicated expenses logbook:

Produced item to sell	Material purchased	Purchase date	Purchase from who?	Cost of material (C) kips	Number of materials bought (N)	Total cost C x N (kips)
1. Item A	Material 1	7/2/2015	Mr. XX (B. Fath)	1,000	2,000 kg	2,000,000
2. Item A	Material 2	7/4/2015	Mr. YY (B. Fath)	50,000	20	1,000,000
Total	2 Materials					3,000,000

More complicated income logbook:

Item sold	Date sold	Sold to who?	Selling price (P) kips	Number of items or kg sold (N)	Total income P x N + F
1. Item A	7/17/2015	Trader 1	33,500	100 kg	3,350,000
2.					
Total					3,350,000

From these logbooks, a producer group can discover if there group is operating under profit or loss based on their group expenses and income:

Income – Expenses = **Profits or Losses**

In general, a Profit exists for the producer group when there was more income obtained than expenses incurred by the producer group.

Conversely, a Loss exists for the producer group when there were more expenses incurred by the group than income obtained by the group.

As practice, the trainer with participants should conduct mock calculations using the expenses and incomes of products directly relevant with the participant's producer group.

Section 7: analyzing production and market demands

In this section, the training topics include:

- Utilizing group's financial logbook to analyse market demands.
- Utilizing group's financial logbook to analyse traders profile and identify production profiles achieving best economic benefits for.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants gain practical knowledge on using the logbooks to analyze product sold profile and identify best economic return products.
- Participants gain practical knowledge on using the logbooks to analyze traders and identify traders providing best economic return for specific products.
- Participants are able to identify for themselves the best production (product types) and trade (traders and their product demand) system that provide best return.

Methodology

Product Income Analysis

Trainers reviewed that beyond the ability for the producer group to assess group's profit and loss based on their incomes and expenditures recorded, logbooks can also help producer groups to analyze their production.

- Calculate how many products were sold and prices.
- When is the best time to sell the products and what types of products.
- Best production time to get best price.
- How much labour is needed for specific product.
- Products providing most economic benefit at lowest costs (labour and materials).

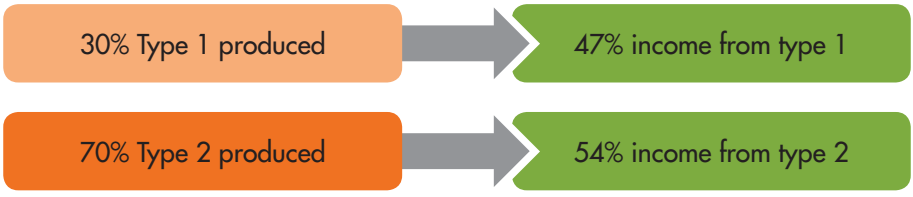
For example, in the table, using their logbook, the producer group can see that trader 1 pays higher price for Product A type 1 than for Product A type 2.

Item sold	Date sold	Sold to who?	Selling price (P) Kips	Number of items or kg sold (N)	Total income P x N + F
Product A Type 1	7/17/2015	Trader 1	50,000	30	1,500,000
Product A Type 2	7/17/2015	Trader 1	25,000	30	1,750,000
Total					3,250,000

From the logbook, a deeper analysis can be made. In the table below, the participants are shown that from simple logbook, a producer group can analyze and identify the economic benefits from their specific products. For example:

Product	Amount	Percent
Total Product A sold this year (kg)	100	100% total sold
Total income from products (Kips)	3,250,000	100% total income
Total type 1 of product A	30	30% of total sold
Income from type 1 of Product A (Kips)	1,500,000	47% of total income
Total type 2 of Product A sold (Kg)	70	70% of total sold
Income from type 2 of Product A (Kips)	1,750,000	53% of total income
Average price (Kips)	32,500	

From the table above (used as example) a simple analysis of the production income can show:



What this means to producer group members are thus:

- Type 1 brings more income than type 2 of product A.
- Producer group spend more labour and resources to make type 2 than type 1.
- Perhaps the producer group should focus on producing type 1 more than type 2….

As practice, the trainer with participants should conduct mock calculations using the incomes of a product directly relevant with the participant's producer group.

Traders Analysis

It is also good to make participants aware that Logbooks AND talking to other producer groups can help producer groups analyze the market demands (from traders and from consumers).

- Calculate how many products were purchased by traders.
- What products the traders want to buy the most?
- Best production time to get best price from the traders for specific products.
- Which traders seems to give the best price and pay fees?
- And more…

For example, in the table below, using their logbook, the producer group can see that trader 1 pays higher price for Product A while trader 2 pays higher price for Product B.

Item sold	Date sold	Sold to who?	Selling price (P) Kips	Number of items or kg sold (N)	Total income P x N + F
Product A	7/17/2015	Trader 1	33,500	100 Kg	3,350,000
Product B	7/17/2015	Trader 1	25,000	100 Kg	2,500,000
Product A	7/25/2015	Trader 2	28,000	100 Kg	2,800,000
Product B	7/25/2015	Trader 2	35,000	1,000	3,500,000
Total					12,150,000

From the logbook, a deeper analysis can be made such as the table below. In the table below, the participants are shown that even with the simple logbook, a producer group can calculate for the total income for different product from different traders.

Each year, it is important for producer group members to closely analyse their products' income using the logbook such as above to generate a table such as below:

Product A	Amount
Total income from Product A and Product B (Kips)	12,150,000
Total Product A sold (Kg)	200
Total income from Product A (Kips)	6,150,000
Total Product A sold to trader 1 (Kg)	100
Total income from trader 1 for Product A (Kips)	3,350,000
Total Product A sold to trader 2 (Kg)	100
Total income from trader 2 for Product A (Kips)	2,800,000

Product B	Amount
Total income from Product A and Product B (Kips)	12,150,000
Total Product B sold (Kg)	200
Total income from Product B (Kips)	6,000,000
Total Product B sold to trader 1 (Kg)	100
Total income from trader 1 for Product B (Kips)	2,500,000
Total Product B sold to trader 2 (Kg)	100
Total income from trader 2 for Product B (Kips)	3,500,000

What this means to producer group members are thus:

- Income from Product A is about the same as from Product B, **but:**
  - **for Product A,** trader 1 pays better price than trader 2; **and**
  - **for Product B**, trader 2 pays better price than trader 1.
- Both traders come to buy at different time - Trader 1 comes earlier than Trader 2.
- **This means it is best to make product A in one week and sell to trader 1. In another week, produce product B and sell to trader 2. Producer group can spend more time each week to make best product that gives best price.**

As practice, the trainer with participants should conduct mock calculations using the incomes of a product directly relevant with the participant's producer group.

Section 8: developing village funds through fees collection

In this section, the training topics include:

- Importance of village bamboo fund.
- Understanding structure and collection of fees to source fund.
- Practical example of adaptable fund use.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants understand the importance of collecting fees for village bamboo fund and different crucial uses of the fund.
- Participants gain practical knowledge on identifying fee structure and capable of conducting mutually respectful negotiations with traders to agree on a fee structure.
- Participants gain practical knowledge on conducting participatory discussions to identify and allocate different uses of the fund.

Methodology

Developing Fees and Collection

As part of a comprehensive training to develop a sustainable producer group, it is important for the participants to be introduced to the idea of developing a Bamboo Village fund. Based on the previous experiences the Bamboo Project and other Projects in supporting development of producer groups, bamboo village funds for the producer groups are crucial for:

- Support group with paying for forest monitoring, bamboo plantation installation and maintenance, trainings by professionals or service providers, and meeting costs.
- Support for group to pay for committee group members for their services to the group.
- Support villagers during difficult times as loans.

- Used by members to purchase materials or tools to produce bamboo products.
- **Other uses deemed necessary based on the needs proposed by group members and agreed by entire group based on participatory discussions.**

However, participants should be aware that developing a Village Bamboo fund first requiring a participatory meeting between members and traders to discuss:

- Producer group members **WANTING** to collect fees from traders.
- Producer group **with** traders decide on fee that agreed by both sides.
- Producer group is strong to bargain with traders to pay fees.
- Producer group select a member responsible for collecting fees and record:
  - this could be a dedicated **financial officer** elected by the group who has the skills and motivation to perform him/her role.
- The member who collects the **fee regularly report** the amount of fees collected and how it has been used.

A facilitative tool that could be used during this process can be a table similar to below:

Product	Item price (kips)	Annual Product Income	Option 1: Fee on each item	Option 2: Fee on total value trader buy each time	Option 3: Flat rate proposed by trader
A	10,000	2,000,000 (200 sold) from 4 times/year, each time **500,000 kips**	1000 kips/item; 200 x 1000 kips = **200,000 kips**	10% of total value each time x 4 times/year. = 10% of 500,000 kips/time x 4 times = **200,000 kips**	Yearly fee of 100,000 kips for product
B	.....	.....	.....	.....	.....

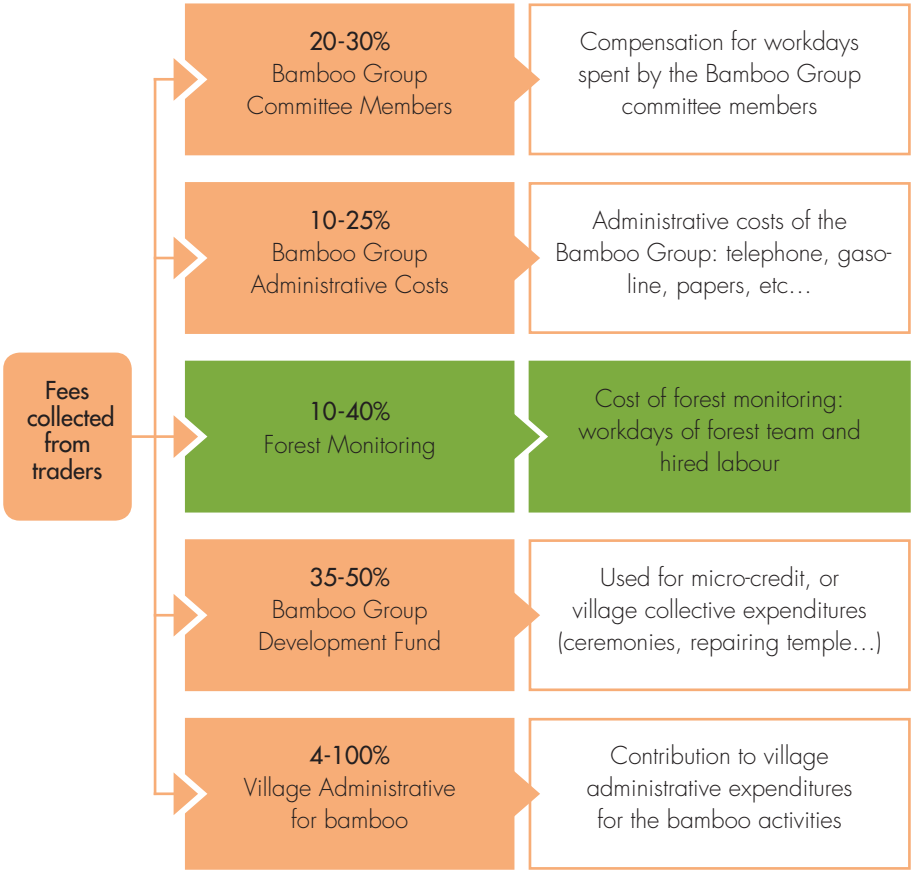
Based on the options proposed by both sides, the producer group members and traders should discuss and negotiate to agree on a fee system fitting with both sides' objectives and goals.

As Practice, the trainer with participants use similar table (above) with products or services sold by the participants to practice developing a fee collection structure in which some participants will role play and present fee collection options from producer group members while some participants will role play and present fee collection options from traders.

Determining Fund Use

When participants have a clear understanding for developing how fees can be collected, they should be aware that this is only useful if the producer groups and the traders apply.

In addition to fee collecting to establish fund, producer group needs to decide on the how the fund should be used. As, an example the trainer can use the structure of fund use developed by some producer groups supported by the Bamboo Project:



As practice, to ensure participants clear understanding of how such a fund use structure can be developed and implemented, the trainer needs to carefully explain the table above. To enforce participants' practical understanding of fund use in the table above, they should practice developing a mock structure that best fit with their villages.

Section 9: finding and linking with market players

In this section, the training topics include:

- Simple understanding of strong value chain and its linkages.
- Importance of each linkage and how each value chain link can coordinate with each other.
- Practical use of information sharing system for producer group to link with other value chain stakeholders.

Expected outcomes

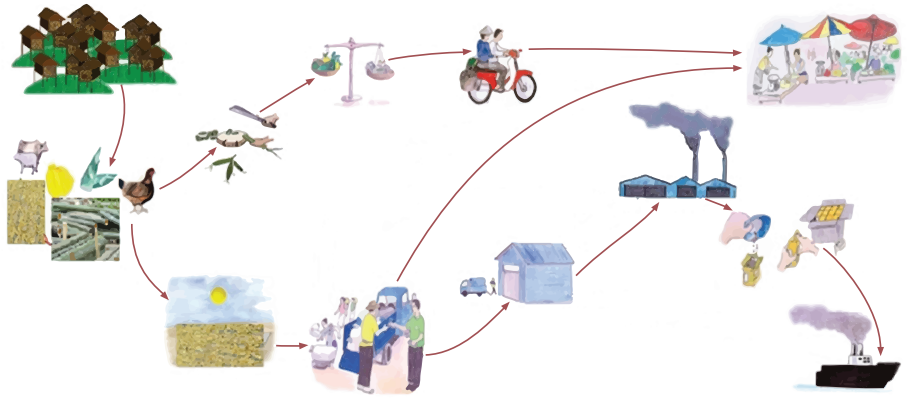
The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants have an understanding of value chains and levels of coordinations of value chain linkages.
- Particiants achieve practical knowledge on gathering information about other stakeholders to identify market availability.
- Participants are able to utilize collected information to analyze their competitive advantage toward greater market access and contact negotiations.

Methodology

In order for participants and producer group members appreciate their roles in developing a strong value chain, it is important that they are introduced to a simplified view of a value chain. To do this, the trainer presents the following graph (see next page):

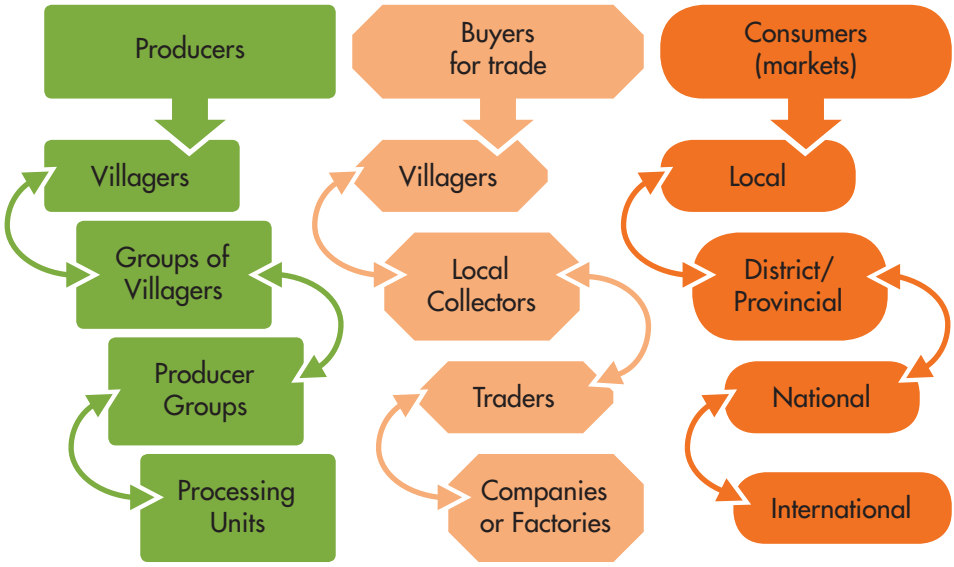
Simple view of a strong and active value chain



Explanation of the graph:

- Each value chain has many linkages that coexist and help each other coexist in a mutually beneficial manner through well coordination and dialogue.
- The Villagers or producer groups produce the products that through value-added processing steps to improve quality, are then sold to local collectors.
- Local collectors collects and make payments to the producers; then sell the products to traders who then can introduce further value-added processing before selling to companies or factories.
- The companies or factories can then introduce final value-added processing and/or packaging processes before selling to their consumers.
- Although not all value chains involve local collectors, a strong value chain involve the well coordination in production and trading between **producers, traders/ companies (or also known as Buyers), and consumers**.

Within each value chain linkage, there is need for deeper coordination between components making each linkage: Producers, Buyers, and Consumers. Participants are introduced the level of coordination between these groups:



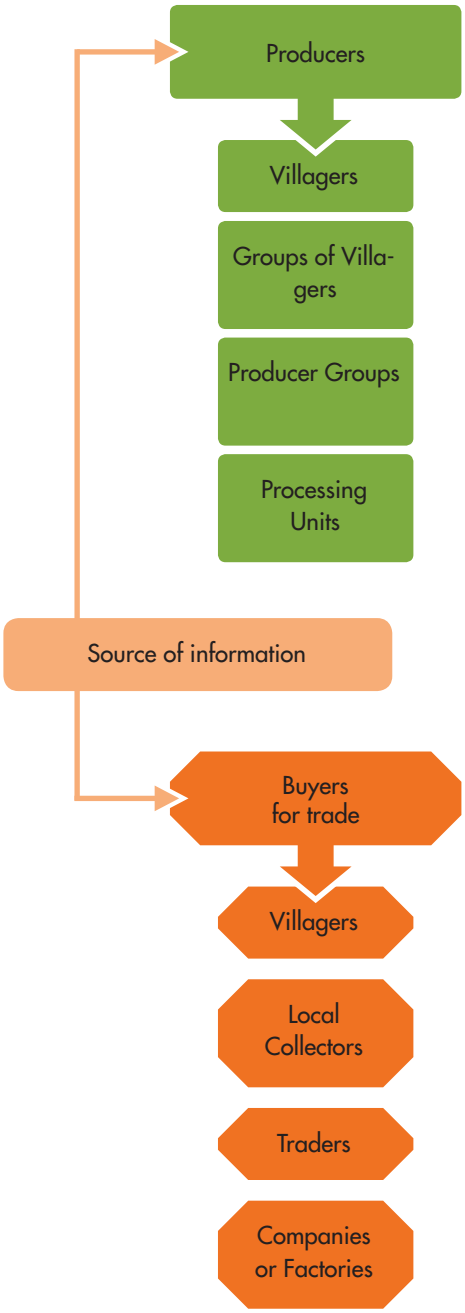
Trainer clearly explain that within the producer groups, villagers can coordinate into groups of villagers who can coordinate into producer groups and finally into processing units. For Buyers, the levels involve the villagers who sell to local collectors who can sell to traders, traders then sell to companies to factories. At the consumer levels, consumers can be local and district/provincial consumers where villagers and local collectors can sell directly while traders and companies/factories can sell to national and international consumers.

Thus, by knowing the levels of producers, buyers for trade and consumers, producer groups can start exploring the information about these players so they can coordinate themselves and introduce themselves to access greater markets (traders and consumers).

To gather the information on the other value chain stakeholders, producers and producer groups can:

- Exchange and share information with other producer groups.
- Ask for information from relevant district Government (Industry and Commerce, Agricultural and Forestry, etc).
- Ask local collectors, traders or companies representatives who come to the village.

In asking for information, the producer groups could use the following sample questions with other stakeholders:



1. Who do you sell to?
2. What price are you selling?
3. Where are these traders from?
4. Where is final market for these traders?
5. More... Depends on group.

1. Who do you buy from?
2. What prices do you pay?
3. Who do you sell to?
4. Where is the final market?
5. More... Depend on group.

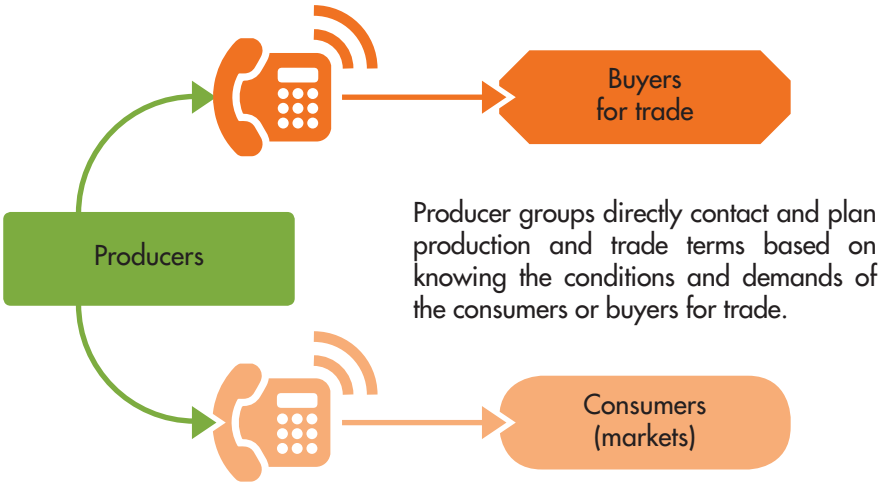
Using the questions above, the producer groups can expect to know:

Information from producers	Contacts	Information from traders	Contacts
1. Who are local collectors, traders, or companies	Name, phone numbers of buyers for trade	Who are the villages or producer groups the local collectors, traders, or companies are buying from	Village name or producer group locations
2. Prices being sold for products	Different price for different product types	What prices are they paying?	Different price for different product types
3. Where the products are being sold to..	Name of traders or companies outside of district or province	Where the products are being sold to.	Name and Location of final consumers or factories

As practice, trainer and participants should conduct role playing in which some participants play the role of the producer group, others play the role of nearby producer groups, and finally some participants play the role of traders. Participants, through their role then ask and answer questions using the questions above. They are also encouraged to develop additional questions that fit best with their situation. The participants are then facilitated in analyzing the results to fill in the table below.

Information from producers	Contacts	Information from traders	Contacts
1. Who:	Names and phones:	1. Who:	Village name:
2. Prices:	Type and price:	2. Prices paid:	Type and price:
3. Where products sold:	Name of outside traders:	3. Where traders sell:	Final location:
4. Other:			

Finally, it is important participants understand the usefulness of knowing information from other value chain stakeholders for creating market linkages. To support this, the trainer presents the following picture and asks participants what their interpretation of the intended message:



Trainer explanation: Through phone calls or direct contact, the producers can call the consumers (markets) and buyers to assess for the current market demands. By knowing what the consumers (markets) demand, the producers can negotiate, coordinate production and plan trading terms better with buyers.

Section 10: developing trading terms and negotiating contracts

In this section, the training topics include:

- Simple understanding of types of farmers contract in Lao.
- Members analysis of positives and negatives of contracts.
- Practical use of SWOT for group members to analyze need for contracts with traders.
- Practical steps for contract negotiation and formation.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants understand simple contract type that fits with them.
- Participants are able to identify the positive and negatives for developing and reaching a contract with their counterparts.
- Participants are able to utilize a SWOT analysis to clearly determine the need for their producer group to develop and reach a contract with their counterparts.
- Participants understand simple flow chart to navigate the paths needed for contract development, negotiations and agreement.

Methodology

From the last section, the participants came to understand their importance within the value chain. For the participants to full capture the inherent benefits existing by working as a producer group, it is also important for them to understand some farmer groups concepts as well as utilizing their understanding toward beneficial contract negotiations.

The trainer thus starts by going over the simple concept of contract and farmers groups:

- Contract in Lao it is referred to as "sanya phoukphan songsoun": production agreement between two parties – traders (collector, trader or company) AND producer or producers:
  - agree to produce and sell products;
  - agree to product quantity, quality, and time of delivery;
  - agree to price based on quality;
  - agree to purchase and method of payment.
- In Laos, a widely practiced model contract is "2 + 3" for farmer groups are:
  - Farmers/producers put in 2: land and labour. If there is no need for land (companies or traders with whom producer groups engage in contract already provide the land), farmers do not have land, or are not willing to include their land into the contract, then only labour is the main input of producer groups within the contract (which then makes this a 1 + 4 contract)
  - Investors/traders/companies responsible for: market, capital/finance/credit, and technology.

It is then important for the trainees to be reviewed some positives and negatives that can arise in these sorts of 2 + 3 (or 1 + 4) contracts:

POSITIVES
1. **Increased income opportunities** from access to reliable markets
2. **Reduced risks**
3. Provide **guaranteed** and stable prices
4. **Access to credit/loans**, inputs, production, marketing services
5. **Introduced to technology** and production methods that increase production, product quality, and producers' skills
6. **Recognition** by other stakeholders
7. Potential **support** from Government and projects

NEGATIVES
1. **Become dependent** or even indebted to the investor/traders through loans
2. **Become food insecure** because changed from farming or gathering food to production
3. **Not stable market conditions** causing demand or price fluctuations resulting in lost income
4. Can be **manipulated by tricky investors** or traders during and after contract negotiations resulting in lowered price and delayed payment
5. **Production risk** if the technology does not fit with producers' capacity

Thus, in every producer group, similar exercises in identifying positives and negatives should be conducted by all members at producer group meetings.

As Practice, the trainer and participants should conduct a mock producer group meeting to identify the **positives** and **BIG negatives** in developing and agreeing to contracts with companies or traders. A template such as below can be used by participants to vote on identified positives and negatives.

POSITIVES		
1. Increased income		
2. Reduced risks		
3. Guarantee		
4. Access to credit/loans, inputs and services		
5. Improved technology		
6. Recognition		
7. Support from NGOs or Government		
Other		

NEGATIVES		
1. Become dependent or even indebted to the investor/ traders through loans		
2. Become food insecure		
3. Not stable market/prices		
4. Manipulated by traders		
5. Production risk from technology not fitting producers' capacity		
Other		

Once participants have gotten the practice of identifying positives and negatives of developing and reach contract agreement, it is imperative that they understand the need to assess the identified positives and negatives by working together as a group.

- To help this analysis, a producer group can conduct another SWOT analysis (Strength, Weakness, Opportunities and Threats) to see if contract is good for the group.

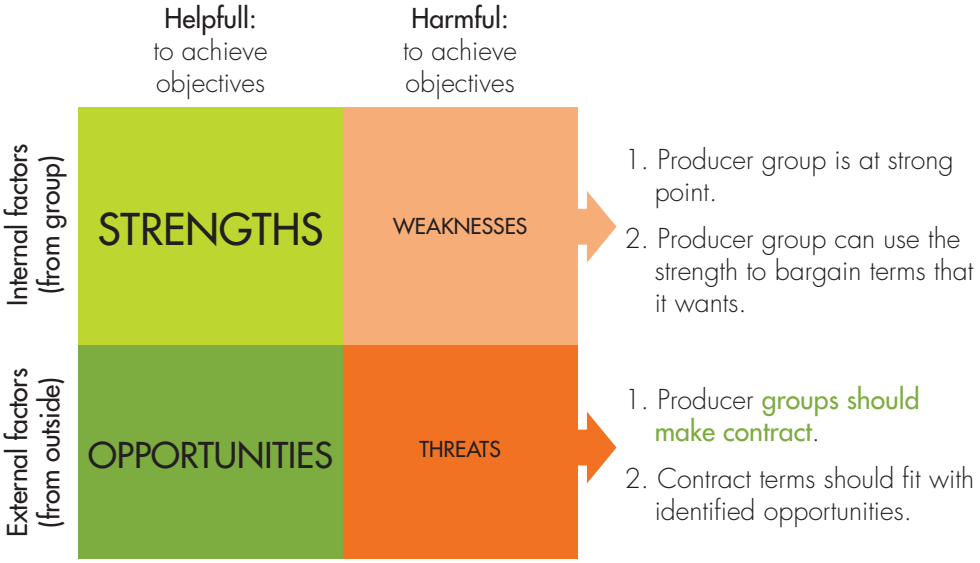
As Practice, trainer and participants should conduct a mock SWOT analysis using a similar template as below. This template could be copied and applied directly by the producer group or it could be changed to best fit a producer group's specific situation.

	Helpfull: to achieve objectives	**Harmful:** to achieve objectives
Internal factors (from group)	**STRENGTHS** What positives the producer group possess and can use to get good contract?	**WEAKNESSES** What negatives the producer group possess that decrease its ability to get good contract?
External factors (from outside)	**OPPORTUNITIES** What can the producer groups gained through contract that it does not have if there is no contracts?	**THREATS** What harm or bad impact can happen to producer group or its members by having contract?

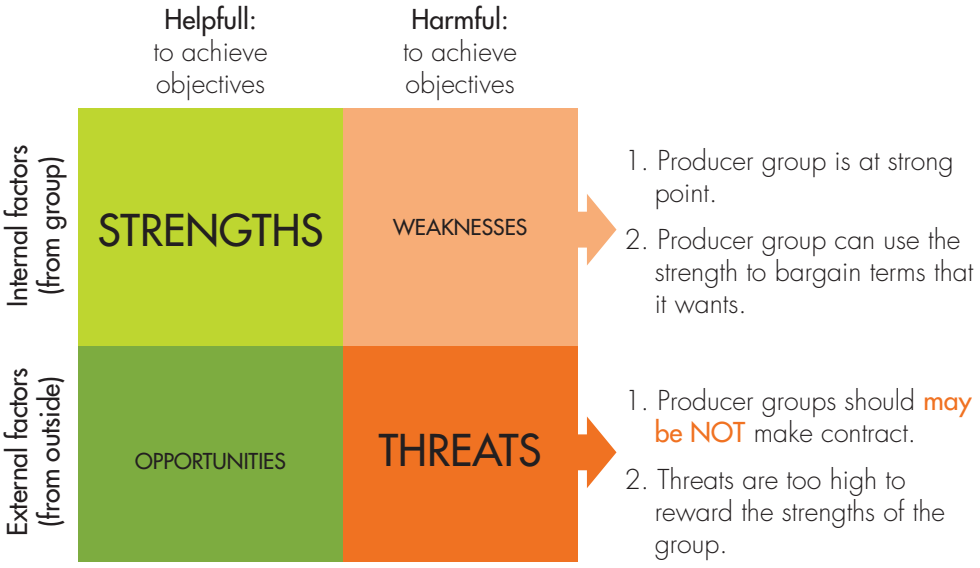
SWOT analysis, when done correctly and in a participative manner, can help a producer group clearly recognize the need or no need to form a contract with traders or compaies.

In general, the following can be recommended to any producer group based on their SWOT analysis:

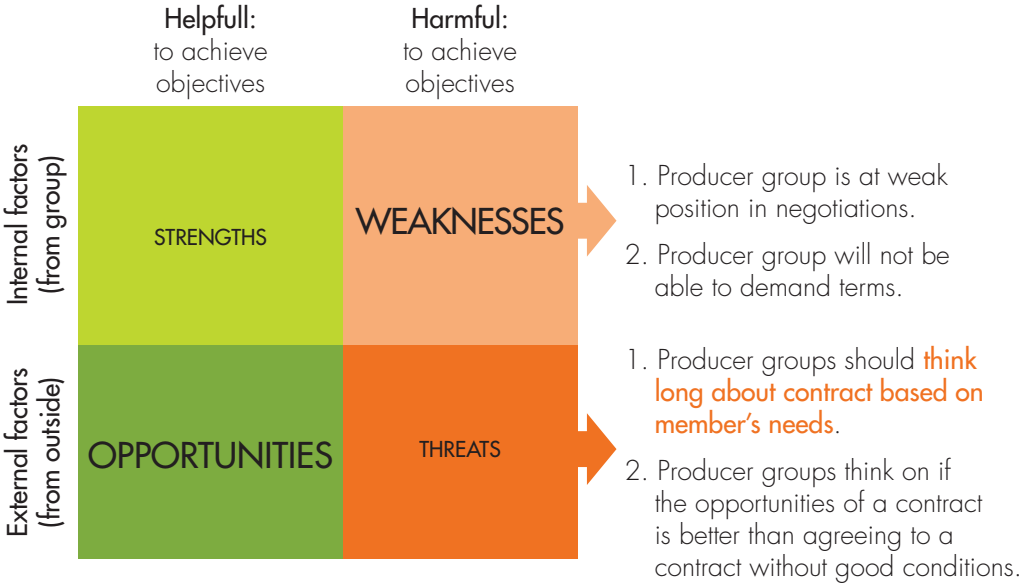
› Big identified Strengths and Opportunities with small weaknesses and threats



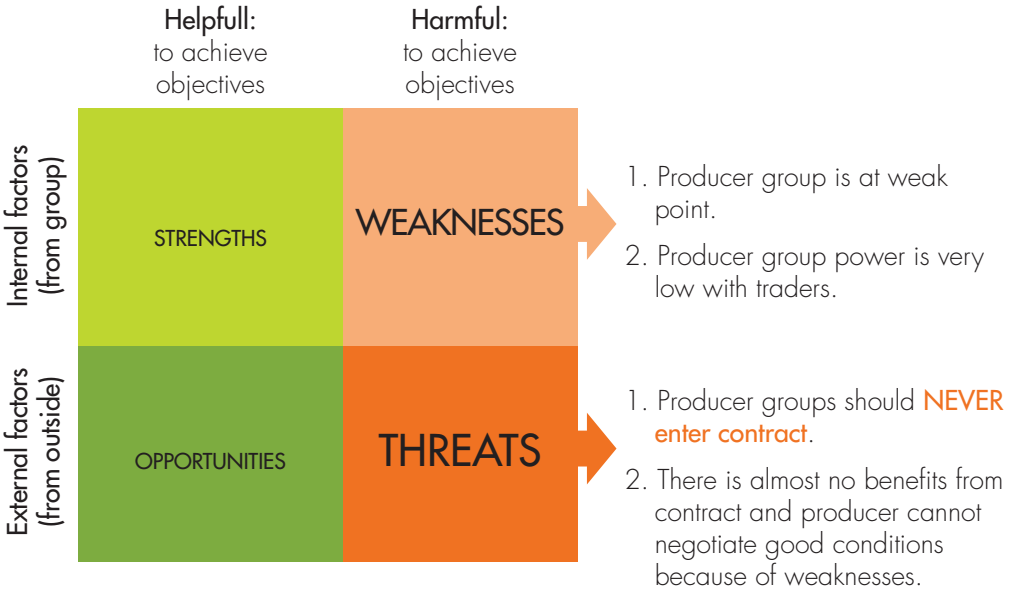
› Big identified strengths that are mitigated by large Threats



› Big identified Weaknesses but is also offset by Big Opportunities for the future



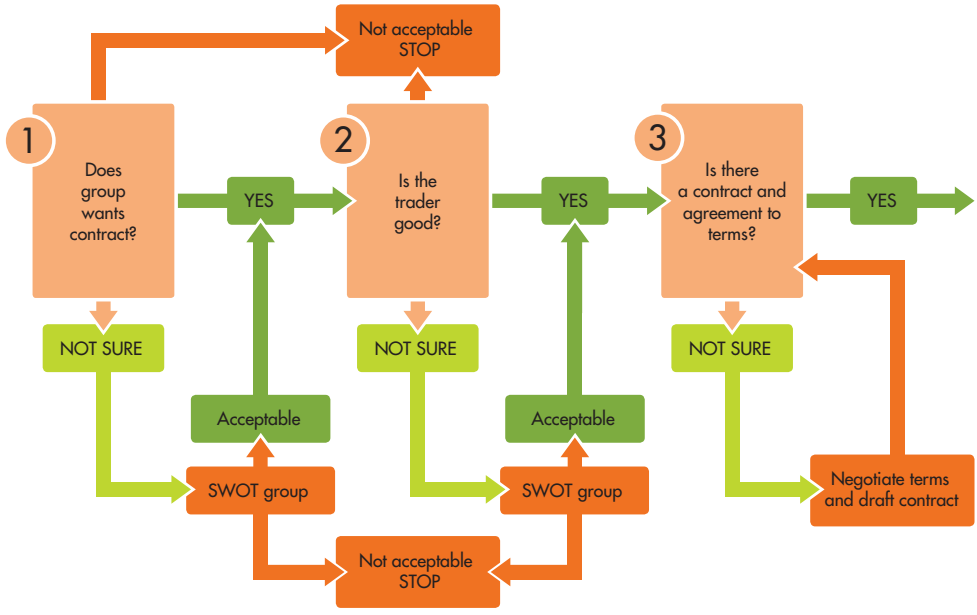
› Big identified Weaknesses augmented by the big Threats



As Practice, the trainer and participants should go over the SWOT analysis results from the previous exercise to identify, as a group, which of the 4 situations (above) fit with their analysis.

Once any producer group has conducted their SWOT analysis, a flow chart such as the one below can be used to help it develop a contract and reach contract agreement with their counterparts.

As Practice, to facilitate participant's full understanding of the flow chart, the trainer should take time to go over each step (3 main steps). Each question presents potential paths based on the answers. By slowly and methodologically following the steps, the participants and their producer group can have an idea of how to develop, negotiate and reach a contract agreement with their counterparts.



Section 11: defining challenges/constraints and finding solutions

In this section, the training topics include:

- Understanding group discussions and paths for identify challenges and constraints.
- Participatory group discussions utilizing all members inputs for finding solutions.
- Identification of potential support for implementing solutions.

Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

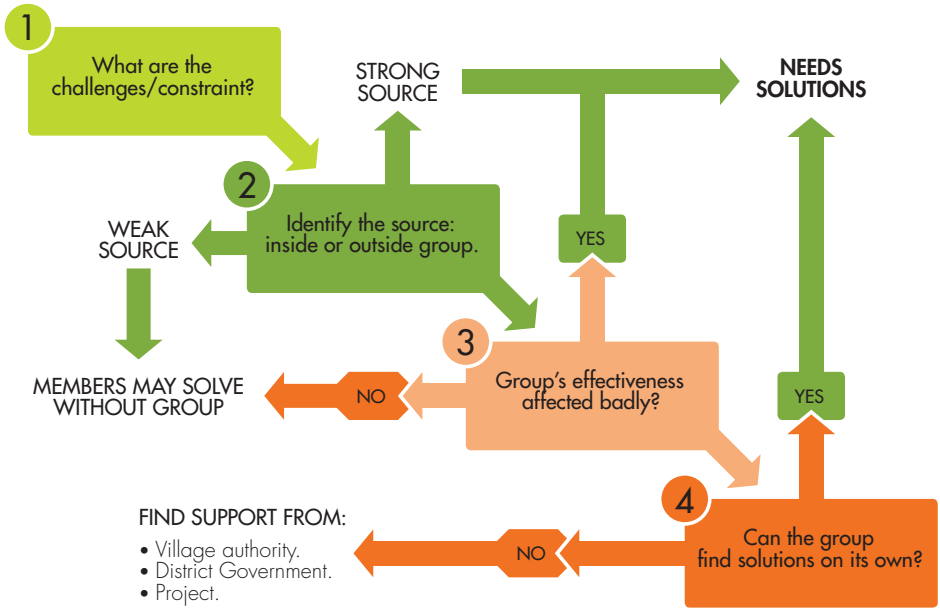
- Participants understand simple concept of conducting producer group meeting to identify existing or potential group problems.
- Participants obtain practical knowledge and understanding on how to use participatory means to explore solutions to problems as well as identify external sources of support to resolve irreconcilable problems.

Methodology

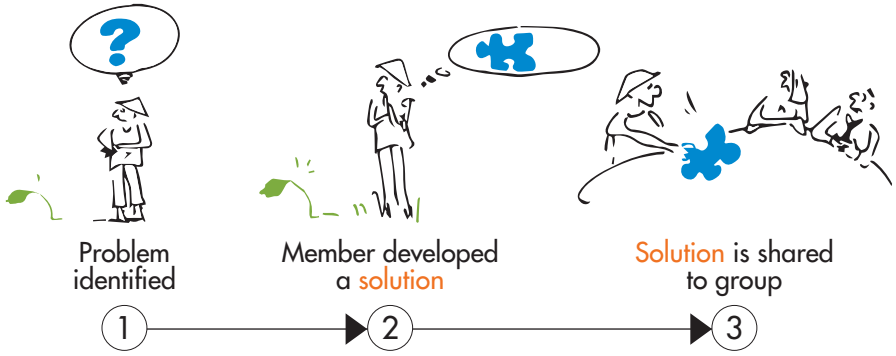
Participants are reminded that producer groups function best when they work as teams working together to reach group's goals and objectives. However, any team or producer group are made up of people and will eventually encounter interpersonal or group problems.

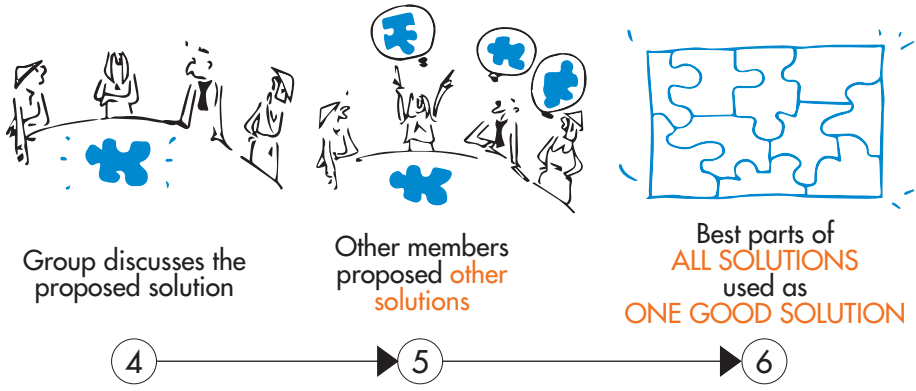
Therefore, an important aspect of producer group functioning is problem identification, group discussion and problem solving.

When a group encounter problems, it should first identify and define:

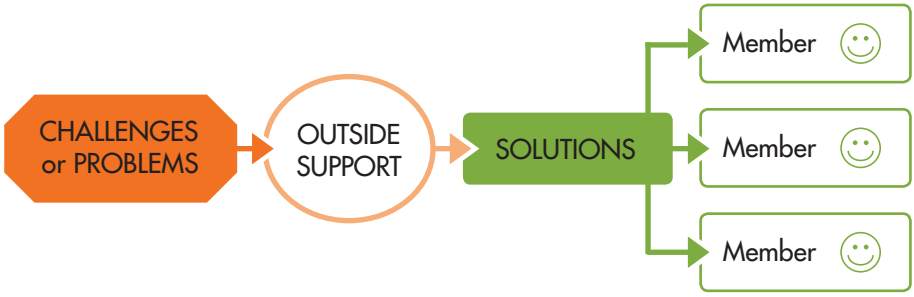


Once the challenges / constraints have been identified, through producer group meeting and utilizing participatory and respectful discussions, solutions can be found.





When a problem is too difficult for a group to solve, it is important to remember that they can ask help from others outside the group.



For any producer group, especially those working in bamboo-based value chains and supported by the Huaphanh Bamboo Sector Development Project, some sources of support which a producer group should identify and utilize are:

Outside Support

It is important to know names and telephone number.

- Village authority
  - – Village chief (Naiban):
  - – Village elders:
- Government
  - DAFO:
  - DOIC:
  - Others:
- Others like Projects (Bamboo Project, TABI, WWF etc.).

As Practice, the trainer should use the flow charts above and conduct a mock game with participants to identify some potential problems as well as identify some solutions or external sources for group support.

Section 12: organizing meetings, status report and yearly planning

In this section, the training topics include:

- Importance of regular group meetings to develop and reinforce group transparency and trust.
- General topics usable for group meetings and reporting.

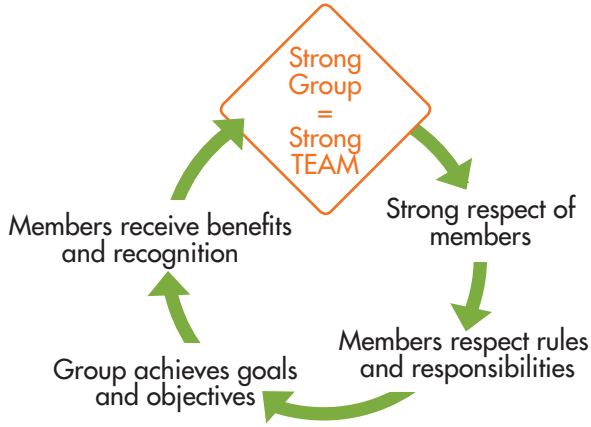
Expected outcomes

The trainer should take time to present the content and allow time for ample participants' participation and feedback. Effectively done, the following could be achieved:

- Participants are able to plan and conduct a producer group meeting to report group progress to all members to ensure transparency and trust within the group.

Methodology

In this final section, the trainer starts by presenting the diagram below and asking the participants the intended meaning:



Transparency & Trust in group

By now, the participants should be able to explain the meanings of the diagram as it reiterates the main tenets of the entire training to develop a strong producer group.

They should be reminded that any strong producer group requires transparency and trust within the group. To ensure Transparency and Trust in group and good group functioning, producers group committees should have regular group meetings.

In these meetings, tt is important to invite village authority and respected elders to the meetings to provide advices.

- If possible, invite district Government (DOIC and DAFO) to facilitate discussions

To prepare for meetings, committee should plan:

- A meeting date.
- Location of the the meeting.
- Invited participants.
- Objectives of the meeting:
  - review of producer group organization and make improvements. Use Section 4 and 5;
  - review of production and trade: use production and trade analysis (Section 7 and 8);
  - reporting of financial and recent meetings or workshops. Use section 6;
  - raise hot burning issues and group discussion to find solutions. Use Section 11;
  - others….

Of course the main agenda, objectives and meeting dates should fits with the producer group member's availability and situation.

As practice, the trainer with the participants should conduct a mock planning of such a producer group meeting with identified meeting objectives, participants, agenda, etc.

Community-based management of natural bamboo forests

This practical guide is written based on the experience of a six-years project, conducted with the support of GRET in the northern mountains of Houaphan province, Lao PDR, in close partnership with the Provincial Department of Agriculture and Forestry. The guide focuses on the development of sustainable bamboo-based value chains, involving farmers, the private sector and government.

A first introductory section describes the collective learning approach adopted by the Project for accompanying the bamboo sector stakeholders in co-developing sustainable value chains.

The four next practical sections describe methods and tools developed by the Project on: i. experimentation of bamboo forest management techniques, co-designed and implemented by villagers and the National Forest Research Center; ii. support to villagers for the preparation of bamboo forest management plans; iii. annual bamboo forest monitoring implemented by villagers; and iv. creation and training of bamboo producer groups.

This guide invites readers to understand the benefits and challenges of a collective learning process for developing sustainable and socio-economically balanced natural resource based value chains.

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