Localized and sustainable management of bamboo resources: experiences in participatory forest inventory.

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Abstract
Bamboo is an important non timber forest product (NTFP) especially in the context of the livelihood of the poor in Lao PDR. Next to self-sustaining purpose (home consumption shoots, construction material) it has an additional economic/commercial value. The bamboo value chain has as such the potential to foster pro-poor economic growth. The bamboo sector is however characterized by traditional techniques, supplying traditional markets and lacks in general innovative dynamics.

Sangthong district, Vientiane municipality, is categorized as one of the poorest districts in Laos. In Sangthong a total of 1,791 families or 9,527 persons are involved in bamboo collection, processing and sale, which accounts for about 50 % of the population. The main handicraft products are low value traditional products like fencing and chicken baskets. 90% of these basic products are exported to Thailand crossing the border. In addition to export markets in Vientiane are increasingly targeted.

Bamboo sold from Sangthong district to domestic markets mainly consists of unprocessed raw poles, used in the bamboo handicraft shops of Vientiane capital city. According to a study by the National University of Laos, some 90,000 poles are rafted down the river to Vientiane capital city per year. However, with a farm-gate price of 600 kip per pole, their value amounts only to 54 million kip (US$5,400). The value of handicraft products sold from Sangthong district to the capital city is estimated to be worth some US$ 7,000. The total value of the production for the local market can thus be estimated to be around US$ 12,400 which is only a small percentage as compared to total export value. Jointly with the Gender Development Group (GDG), WWF and local partners like the district agricultural office ad local producer groups, SNV is investing in developing advanced bamboo value chains. Increasing and localizing value added leading to increased income for local producers is the main objective. Investments in the development of bamboo value chains are however only sustainable in case the supply of raw material is guaranteed over time. For this reason, SNV supports local communities and authorities in developing sustainable management plans for local bamboo resources assuring a sustainable supply of raw material. The presented case does highlight this essential part of developing sustainable and pro-poor bamboo value chains in Sangthong district and described used methodology in detail.

Traditional ways of cutting bamboo are not efficient and cause unnecessary resource depletion.

Introduction
SNV, the Netherlands Development Organizations, aims to support production, income and employment opportunities through capacity development in small holder agriculture, forestry products and tourism which are accessible to the poor. Within the forestry sector, SNV has selected the bamboo value chain as a priority sector with a good potential for improving income and employment opportunities for poor families.

According to the assignment with Gender Development Group and Bamboo Traders Association this year SNV will
be supporting the further development and effectiveness of the bamboo value chains in order to improve productions, income and employment in the 17 target villages in Sangthong district.

In order to develop the bamboo value chains in a pro-poor way, it is required to enhance the organizational level at communities. Firstly, it is necessary to strengthen the management skills of the established producer groups. Secondly, the groups require basic entrepreneurial and business skills in order to set up viable business. Thirdly, complying with market demands will be essential for successfully tapping into new and existing markets. Last but not least, assuring sustainable management of the bamboo resource base is essential to assure sustainable business thus income generation.

**Sustainable management of bamboo resources as key constraint**

The bamboo handicraft sector in Sangthong district is providing a stable yet low income to roughly half of the population. One of the key constraints in the sector is the fast depletion of bamboo resources due to lack of proper resource management, causing over harvesting and limited awareness of villagers about efficient harvesting methods and cutting techniques. Also, immigration of thousands of families into the area since the year 2001 has resulted in the destruction of bamboo stands due to practiced slash and burn cultivation. Bamboo stands have also been cut to make room for rubber plantations and other cash crops.

While in some areas bamboo has been cut down, in many areas bamboo resources are still abundant. These remote stands still have a good potential for sustainable exploitation. As no guidelines exist for sustainable managing of natural resources conflicts between communities and district authorities are not uncommon. New techniques to assess and map resources and simple plans for harvesting and supportive policies are needed.

In 2008 SNV and GDG, supported by WWF, took up this challenge and piloted a bamboo and rattan inventory leading into the development of a local forest management plan in one village of the Kum Ban Pattana 05. The purpose of this activity is to try to estimate available bamboo and rattan resources and develop sustainable management and harvesting plans accordingly. The activities were introduced to the members of local bamboo handicraft producer group/association.

**Method/Approach**

The rattan and bamboo resources assessment is carried out by sampling, since the measurement of the entire forest population is not practical. Several sampling methods can be used. An appropriate sampling method should be selected by trained forest staff. The village forest inventory teams do not need to know all the details of the sampling method, but should be able to apply selected sampling methodology. A common method used in Laos is the line-plot method because this is a simple and easy to implement, and adequate for planning purposes at local level. A baseline and parallel strip lines with sample plots are placed at regular spacing. Along the strips plots of 10 m width and 50 meter length are than surveyed. This methodology is efficient and if duly applied, results adequately reflect standing volumes and re-growth potentials.

The methodology used in Sangthong district is an adaption of the above and was developed by SUFORD and SNV in 2007. The transect lines inventory is carried out by measuring bamboo/rattan encountered over a transact walk of 10 m width and variable length. Lines don’t necessarily have to be laid out systematically, nor have they to be straight due to you will have obstacle in the forest. While walking through the forest, it’s more important to let the villagers decide where to go and make the transect line accordingly. The assessment will be conducted only in forest areas where the concerned NTFP occurs, as defined by the villagers during the participatory mapping exercise.
In order to establish 10 m wide transects, villagers are asked to stand in line one next to each other and form a line of 10 m length. The best way to do this is to give them a colored rope ten meter length, ask to stretch the rope and then stand next to each other along the rope. For practical purposes and for better accuracy, it is recommended not to place more 5-10 people a long the line. After having formed a 10 metres line, the first team of villagers will be asked to keep in mind the distance they have between each other and to keep that distance while walking throughout the forest and a second team of villagers (2-3 people) will be given a measuring the tape of at least 50 m length. These villagers will have to measure the distance that the 10 meter line will cover while moving into the forest. For the practical purposes, it is recommended to record this distance at intervals of 30 m. Once completing the forest walk, the sum of 30 m intervals will give the total distance covered the transact line.

While moving through the forest, the villagers forming the 10 m line, will have to stop whenever they encounter any of the target species and carry out an assessment (see the bamboo or rattan culms and count the poles or stems). The recording will be done per targeted species.

The number of transect lines and areas to be recovered (sampling intensity), will be depend on the condition of the forest and resource to be assessed. The more the forest and the distribution of NTFP product are homogenous, the less of sampling intensity needs to be. This homogeneity can be assessed while carrying out the inventory. Data collected should be at least 0.5-1% of the total area, but this will also depend on available financial and human resources as well as on the accuracy that is required.

Lessons learned.
Through providing simple and participatory methods for forest inventory and capacitating local communities in its use, local communities are well able to collect the necessary data for developing sustainable management plans. The participatory approach is cheaper (in comparison to surveys / inventory conducted by Forestry staff) and increases local commitment towards adhering to formulated management plans and assigned quota per household. Such inventories are not only the basis for sustainable management plans for natural resources but also assuring sustainability of value chains based on those resources and as such sustainability of created income opportunities.

Village inventory teams practicing transect walks

Based on the results of the participatory inventory maximum harvest volumes for the targeted forest area are set and divided per family. For the specific case described this means that in each family is allowed to cut maximum of 500 poles (of Mai Faang bamboo variety) in order to assure sustainability of the available bamboo resources.

A village forest inventory team at site