



Japan International Cooperation Agency (JICA)
Sustainable Natural Resource Management Project (SNRM)

CASE STUDY

Creating Sustainable Short-term Income from Beekeeping Promotion in Thanh Hoi Commune, Tan Lac District, Hoa Binh Province, Vietnam

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List of Abbreviations

JICA	Japan International Cooperation Agency
REDD+	Reducing emissions from deforestation and forest degradation and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries
SNRM	Sustainable Natural Resource Management Project
VMBFMLD	Village Management Boards for Forest Management and Livelihood Development
VND	Vietnamese Dong

I. Background and Objective

Thanh Hoi commune has a total area of 2,633 ha with 61% of forest lands comprising protective forest (424 ha, 16%) and production forest (1,184 ha, 45%), respectively. The production forest is mostly plantation of *acacia mangium* with 4-5 year rotation used as materials for chip production. Forest area is surrounded by fruit cultivation. Pomelo, and longan are the most popular fruits to be cultivated in agricultural lands and home gardens. Pomelo in Thanh Hoi is particularly popular for its sweet taste and is traded with good price; pomelo cultivation is expanding rapidly in the commune. Natural forests, acacia plantation as well as these fruits flowers are good sources of natural honey.

Sustainable Natural Resource Management Project (SNRM) funded by JICA aims to enhance forest management through enhancing livelihood activities. The project focuses on forest dependent households to diversify income and enable them to have greater financial capacity to protect natural forests (against encroachment) for water resources and/or maintain forest plantations for longer period to have larger income per hectare/year with greater average carbon stock in the plantation.

Beekeeping provides a sustainable income as Non-Timber Forest Products (NTFP). Beekeeping has been practiced for a long time by villagers but mainly from wild bees by making smoke or domesticated natural honey bees by traditional practices in small scale¹. Even though there is abundant resource in the commune, due to the lack of basic techniques, honey yield was very low (1-2 liters/household/year) that serves family needs only². Recognizing the potential, SNRM helped villagers develop commercial beekeeping operation for sustainable honey production.

The objective of beekeeping promotion as a REDD+ pilot activity is to increase sustainable livelihood income from beekeeping in the pilot commune, thereby creating financial capacity of villagers to contribute to forest protection and maintenance of forest plantation for longer period. The support was provided to all the households in the target villages who desire to participate in the activities. As a SNRM project design, the support to beekeepers was provided through Village Management Boards for Forest Management and Livelihood Development (VMBFMLD) which aims to manage forest in the village with livelihood support.

II. Support Process

Beekeeping requires high investment costs, space to keep hives, techniques and commitment to labor. Based on the assessment survey of the current situation of the households, SNRM conducted: (1) technical assistance: study tours and technical trainings, (2) material supply: bee breeds, hives and others, (3) producer organizing through forming interest groups, and (4) market development.

2.1 Beekeeping techniques

Beekeeping involves risky and technically difficult operation. SNRM introduced several basic techniques commercial beekeeping to the villagers.

- Use of modern proper size hive boxes to generate more honey from each colony
- Generation of Queen bees to control the number of bee colonies
- Harvesting techniques (timing, collection and storage)

¹ In the target village, 7 households in the commune were engaged in beekeeping with 2- 3 traditional round beehives/household.

² Some Honey product in Thanh Hoi has been sold in the market but the quality was low due to improper harvest techniques (timing of harvesting, honey filtering, etc.). Packing with glass bottle was problem in transportation and long-time preservation and self-made cover was below the standard on the market.

- Prevention of diseases (countermeasures against attacks by insects, worms, and parasites)
- Feeding bees in low production period (during hot and cold seasons) in order to avoid escaping
- Use of proper equipment: wax foundations, head cover hats, and smoke makers.
- Enhancement of honey quality by filtering and dehydration

Using proper size of beehives is important to control the production. Although some villagers have been using the improved beehive boxes, the size and design have to fit to meet standard requirement to open/close the beehive boxes. The villagers started using bee hives of 45cm x 40cm x 35cm which fit with 5-8 sheets of bees.

The control of number of bee colonies is important technique. The life of queen is about two years but after one year the production will be decreased; therefore, queen needs to be replaced after one year. Dividing bee colonies are done by two steps: 1) placing round beehives into natural rock holes and 2) move to improved beehive boxes to divide bees naturally.

Without providing additional feed for bees during hot and cold seasons (July - September and in December - February), bees will escape.

2.2 Technical trainings

In order to sensitize these beekeeping techniques, SNRM organized three study tours and four technical trainings in the commune. The study tours were to visit 1) a beekeeping group in My Duc district (Hanoi), 2) beekeeping households VietGAP in Hoa Binh City and 3) Tropical Bee Research and Beekeeping Center (Hanoi University of Agriculture). During the study tours, beekeepers learned important basic beekeeping technique applicable in their farm from professional organizations as well as directly farmers in the similar conditions.

The technical trainings in Thanh Hoi were organized by experienced trainers from Hanoi Agricultural University. Due to complex problems of beekeeping techniques, SNRM organized three days handholding training course to learn basic techniques of beekeeping: improved bee packing, queen bee creation, bee hive splitting, honey harvesting, feeding bees, quality checking of honey and disease control. After the training, SNRM monitored their progress and motivated them to apply the trained knowledge into practice. 87 villagers (7 experienced and 7 new beekeepers) participated in technical trainings and mastered basic beekeeping techniques.

2.3 Bee and material supply for beekeepers

After providing the first technical trainings, SNRM provided bee breeds and beekeeping equipment to beekeepers. After the transporting bees, the stability of bee colonies needs to be ensured. Technical assistance to place and stabilize the bees after moving, and checking their status immediately after handing over the bees is particularly important, especially for new beekeepers. A total of 249 bee colonies were provided to the beekeepers. Each beekeeper was provided with 3 bee colonies (3 bars /colony) with a value of 1,950,000 VND/3 bee colonies. Beekeepers contributed a minimum of 30% of the value of bees to Village Fund, equivalent to 540,000 VND/household. In addition, some beekeeping supplies were provided to each household (e.g. hats, foundation, knives, pollen, feeding trays, smoke creator (one per household), and bottles) and to beekeeper groups (e.g. honey extractor, and honey refractometer).



A training on beekeeping techniques for beekeepers in Thanh Hoi Commune.

2.4 Establishment of beekeeping interest groups

Beekeeping in Thanh Hoi commune have brought significant income to the people, but there is a limitation to which individual household can do. They often suffer from low sales price, lack of beekeeping technique that led to loss of bee, and high prices of input materials because of the physical distance to material providers and small-scale production per household. In order to overcome such shortcomings, SNRM has facilitated to organize interest groups of beekeepers. Interest groups have many potential roles to enhance beekeeping: 1) increase access to input materials, 2) enhance the capacity to access markets by creating negotiating powers with a large number of households, 3) create a common production unit, and 4) introduce advanced techniques by using modern equipment. The members of interest groups can support each other in terms of technique application and access to market for honey products.



Meeting of beekeeping interest group in Thanh Hoi commune

Based on geographical location, population characteristics, number of beekeepers and village history, three interest groups were established with a total of 87 participants. All groups have their own rules³ and organize regular activities according to the needs of each group. In addition, the interest groups established Group Fund in the group, which is contributed by group members to be used for group activities and small credit provision to its members to develop beekeeping.

2.5 Market access for honey product

In parallel with supporting the production process, SNRM also paid great attention in marketing. The project organized a study tour on marketing. Experiences learned from the study tour were very important for beekeepers to think how to make their products meet market requirements, price, quality, trends, and buyer's tastes. The project also supported bottles and labels as well as developing the connection between the beekeeper interest groups and potential honey consumers to help expand sales channels for their products.

2.6 Dehydrating honey

In order to sell in a normal market, the water content of honey must be less than 20 – 21% to prevent fermentation. If the water content is above this level, fermentation will take place as the yeast in honey will be activated; it makes the honey sour. The water content of honey in Thanh Hoi tends to be high; especially in summer (reaching 24%) when the humidity is very high (60-80%). Since honey is hygroscopic substance, it will absorb moisture from the air. In order to overcome the problem, the project supported a beekeeper group to equip a dehydrator to reduce the water content in their honey product (the project supported 50% of purchase price). Since the price of the dehydrator is expensive (about VND 21,500,000), beekeepers cannot afford to buy it by themselves. The dehydrator was purchased and being operated by a small group of beekeepers who have a larger hives and can afford to invest in the equipment. They rent the dehydrator to other beekeepers who have smaller production. After dehydrating the honey to meet the required standard (20-21%), beekeepers can sell their products easier in the market.

³ The rule includes operation principle, conditions of membership, member's rights and duties, membership fee, group fund, etc.

III. Achievement

Through the support of SNRM, beekeeping in Thanh Hoi commune have gained great deal attracting many villagers to participate in beekeeping. As of the beginning of 2020, there are 82 beekeepers in the SNRM target villages in Thanh Hoi Commune, forming three interest groups. The total beehives of the beekeepers are about 700-800 hives. Number of beekeepers, number of bee colonies, amount of honey harvested increased by 11.7, 28.6 times and 40 times, respectively (table below).

Number of beekeepers, beehives and honey production of SNRM participants

Year	Number of beekeepers**	Number of bee hive**	Harvested honey (litre)**	Honey per hive (litre)	Hives per household	Honey per household (litre)
2016*	7	25	80	3.2	3.6	11.4
2017	76	690	3,700	5.4	9.1	48.7
2018	87	787	4,765	6.1	9.0	54.8
2019	82	716	3,198	4.5	8.7	39.0
Comparison between before and end of project***	11.7	28.6	40.0	1.4	2.4	3.4

* 2016: before Project's intervention

** IN-DEPTH MONITORING REPORT: REDD+ Pilot Activities of Sustainable Nature Resource Management Project in Hoa Binh Province. SNRM. 2019

***: the figures are proportions of the 2019 figure against the 2016 figure (the figure of 2016 is one).

Beekeepers in Thanh Hoi keep domestic bees as it is suitable with natural condition. Bee hives are kept in their gardens. Each household keep approximately 7 to 50 bee hives depending upon size of gardens, distance from sources of nectar and the level of willingness to work for beekeeping.

The interest group system supports very well sharing beekeeping techniques between experienced and new beekeepers. It also made a mechanism to monitor number of hives, harvest amount and sales status.

Beekeepers reported that in Thanh Hoi honey can be harvested in two seasons: Spring from January to April and autumn from October and November. 70% of honey is produced in spring. When acacia blooms from the end of April, wild bees emerges and attack honey bees of villagers; therefore they cannot take honey from Acacia.

In 2018 on average one beekeeper produced 55 liters of honey with 9 hives in each household and 6.1 liters per hive⁴. According to a villager, one hive can produce a liter of honey every 2 weeks during the main production seasons producing approximately 6 liters of honey per hive in spring and 4 liters in autumn, around 10 liters per hive per year. Some advanced beekeeper produced approximately 400 liters of honey in a year with the sales price VND 180,000 per liter (7.8 USD/liter⁵), generating annual income from honey, 72 million VND (3,120 USD).

The beekeepers are very happy with the additional income generated from honey. Many of them are ready to expand further. However, beekeepers were also aware of the limitations in growth. A head of a beekeeping group estimated that his village and neighboring villages could sustain up to 300 and 200 hives, respectively depending upon topography and access to flowers.

⁴ 2019 was low honey production year compared with 2020.

⁵ 1USD=23,000 VND as of March 2020.

Many beekeepers reported that thanks for the initial project support, as well as the support received under the beekeeper interest group and their increased incomes from honey sales, they were able to invest in purchasing more hives. Many of them have also invested in other activities and technology to diversify their farming production.

VI. Lesson learnt

The project has succeeded in developing capacity of villagers to operate commercial beekeeping generating significant income to households. Typical villagers in Thanh Hoi cultivate rice and vegetable and keep chickens for home consumption, and grow pomelo and acacia for cash income. According to a beekeeper in Tam 2 village who newly learned beekeeping techniques from SNRM, in 2019 he earned 38 million VND from pomelo (20 million VND from fruit and 18 million VND from seedlings) and 18-20 million VND from honey. He has 1.7 ha of acacia plantation which produces 40 million VND every 4, 5 years for chips. He may consider waiting for small timber which produces 100 million VND in ten years. Honey generates significant income (about a half of pomelo) to acacia plantation owners, which enabled them to consider an option to produce acacia timber with longer rotation period.

In terms of technical aspects, the project support was implemented in a reasonable and scientific manner based on the capacity and needs of the villagers. Beekeepers are now able to create queen bees and change the number of hives as they want. Queen bee needs to be changed to maintain the production per hive and number of hives need to be adjusted according to the amount of available honey in the field.

Beekeeping interest groups are very helpful for the development of beekeeping industry in the commune as they help each other in procurement of supplies and technical knowhow. It creates foundation for larger-scale production development in the future. In fact, the beekeeper interest group established Group Fund based on member's contribution to provide micro finance to help its members for beekeeping and other livelihood development activities. The establishment of Group Funds was a good initiative so that the members can solve their financial problems independently.

Originally it was expected to take acacia honey for income generation, but in fact acacia honey is taken by wild bee; thus domesticated honey bee has limited access. It suggests that there is much higher potential of honey production in the commune including acacia plantations. In order to take acacia honey, wild bee needs to be treated and bee hives probably need to be placed in the plantation⁶.

The provision of bee and material supplies is not 100% borne by the project as beekeepers must have contributed 30-50% of the value to the Village Fund which is managed by VMBFMLD. This mechanism warrants the willingness of villagers for beekeeping and their contribution to forest management.

Market access for honey product is difficult; beekeepers do not know how to commercialize their honey and connect with market. This remains as a huge challenge for beekeepers; they know how to produce products, but they do not know how to sell them.

Commercialization of a local agro-product needs collective support from stakeholders. It is expected that District Department Agriculture and Rural Development to work closely with Thanh Hoi Commune People Committee to improve quality control and marketing skills of beekeepers and to popularize their honey through district or provincial agro-products promotion events.

⁶ In Borneo, large scale honey production is under operation in Acacia mangium plantation. http://www.borneoacacia.com/en/?page_id=21917

Linking beekeeping with socio-economic development program may be a way to support them in an effective way. The project worked with the local government to include Thanh Hoi's honey product in the list of potential products in the “One Commune One Product Program (OCOP)⁷” of Tan Lac District. This would create an important premise to maintain, strengthen and develop beekeeping in Thanh Hoi commune in the future.

V. Conclusion

Promotion of beekeeping by SNRM in Thanh Hoi commune shows that beekeeping is a high potential livelihood activity effectively using unused natural resources, generating great income for villagers who live in the vicinity of forests. It is a very good REDD+ activity to enable them to protect and maintain forest resources through enhanced livelihoods.

In order to disseminate beekeeping, villagers need financial support to buy hives and suitable equipment as well as technical support from experienced beekeepers since beekeeping is a highly technical activity with numerous difficult practices. Engagement of the local authorities to support poor households to participate in beekeeping is needed.

Forming beekeeping interest groups plays an important role to make financial and technical support more effective. The interest group facilitated to disseminate and maintain the support in the group by mutual help among villagers (through voluntary technical and financial support from farmer to farmer) and also helps to commercialize the honey product as a mass in the future.

It is considerable to develop a larger beekeeping association for the district to enable beekeeper groups to communicate with the government for the support based on the actual needs and challenges of beekeepers.

⁷ In order to be included in OCOP Programme, the product has to satisfy the following nine criteria: 1) Use local materials and resources, 2) High value addition, 3) Good potential market, 4) Have business plans, 5) High level