Lao PDR: Sustainable Natural Resources Management and Productivity Enhancement Project

Best Practices

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Community Empowerment and NRM for Sustainable Development
Best practices of NRMPEP

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Sustainable Natural Resource Management and Productivity Enhancement Project
Department of Planning and Cooperation, Ministry of Agriculture and Forestry
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Abbreviation and acronyms

ACIAR  Australian Centre for International Agricultural Research
ACT   Asian Committee on Trade
ADB   Asian Development Bank
AEC   Asian Economic Committee
AGPC  Association des Groupements de Producteurs de Café
APMAS Asian Project Management Support Programme
DAFO  District Agriculture and Forestry Office
EDC   Enterprise & Development Consultant Co. Ltd.
IFAD  International Fund for Agricultural Development
Lao PDR Lao People's Democratic Republic
NBCA  National Biodiversity Conservation Area
NGO   Non Governmental Organization
PAFO  Provincial Agriculture and Forestry Office
PPCP  Public Private Community Partnership
RF    Revolving Fund
SNRMPEP Sustainable Natural Resource Management and Productivity Enhancement
Project
US$   United State Dollar
VDC   Village Development Committee
VVWs  Village Veterinary Workers

Cover pictures
1. Cattle raising in Taatseng village of Attapeu province
2. Rice PPCP in Sanamsai district Attapeu province
3. Chick Production center at Lamam district of Sekong province
4. Commercial corn production in Sekong province

Background photo
1. Piglet production center in Attapeu province
2. Visit of Mission members to corn production farmers in Lamam district of Sekong province
Preface

I am pleased to release the best practices of SNRMPEP for the community empowerment and Natural Resource Management for sustainable development produced based on the experiences during the implementation of the subprojects. This publication is to disseminate the best agricultural practices to other development partners to apply in other projects for the development of the farmers in help the Lao PDR to produce marketable surplus production to compete with the emerging AEC open market. Sustainable Natural Resource Management and Productivity Enhancement Project funded by the ADB and IFAD under special grant fund to support the poor and very poor farmers of 5 southern province to come out of poverty and convert them from marginalized farmers to commercial farmers with the sustainable use of existing natural resource as well as to protect the environment. Main objective of this project is Efficient and sustainable NRM and Higher Sector Productivity and Enhanced institutional capacity at national and provincial levels to manage natural resource utilization in a sustainable manner. SNRMPEP is first project to implement the Vientiane Declaration for decentralization and government policy of 3 builts. Project implementation has been decentralized to Kumb Ban and district level with strategic guidance by the province and national level departments. Thought, it was a bit difficult in the beginning to decentralize the implementation to Kumb ban and districts due to capacity issues but after initial difficulties project has achieved tremendous success. A total of 71 subprojects with financial support of US$ 22 million implemented with farmers production groups. These subprojects comprising of 9 groups viz.: Promotion of service providers for small livestock raising, Establishment of Sustainable Livestock Health Management System, Integrated Livestock based mixed farming system, Integrated Rice Based Farming System, Sustainable upland agriculture development, Organic Vegetable cultivation and value chain development, Cash Crop promotion, Promotion of Organic Coffee Value Chain and Natural Resource Management.

Best practices based on the actual learning from the field have documented in this publication. We hope reader will get benefit from it and also we need feedback for the further improvement of the development approach especially for the PPCP to support the poor community to not only get out of poverty but also converting them social-economically empowered community.

Dr. Phet Phomphiphak
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Ministry of Agriculture and Forestry
Chairman of National Project Steering Committee of SNRMPEP
I. Summary of progress under subprojects

SNRMPEP supported 7 subprojects of small livestock development. These are unique subproject in Lao PDR based on PPCP approach under which service provider were established mostly under private sector to produce chicks, ducklings, piglets, goats and fish fingerlings. These service providers are producing healthy and vaccinated breeding stock to supply farmers’ production groups. These groups are producing organically raised small livestock and are further linked with small livestock traders to insure the market and fair price to farmers. This initiative resulted in self-sufficiency of the meat production in the provinces, reduce malnutrition in rural community and reduce import of meat and meat products from other countries. Now as next step, these production groups are working to produce exportable quantity of small livestock and as a next step will be linked to high end organic markets in Lao PDR and in adjoining countries.

Sustainable Livestock Health Management Subprojects is another success. Project support 5 subprojects for the livestock health management. Start with the capacity building of the VVVWs in all villages, project strengthened the vaccination cold chain by supplying 208 Electric refrigerators, 30 sets of solar refrigerators and freezers, 2,918 high quality vaccination kits with automatic syringes and other equipment and long distance vaccination carriage boxes. Comprehensive trainings of VVVWs have been organized and they have been provided posters for livestock diseases and livestock vaccination book. Project also strengthened the livestock vaccination supply chain by supporting vaccination supply system through private sectors. In line with the government policy, mass scale vaccination carried out 2 times in month of November and March every year. In year 2013 there was huge loss in 5 southern provinces due to late season flood and was big danger of outbreak of livestock diseases. But due to mass scale vaccination supported by the SNRMPEP resulted no outbreak of disease and rather decrease in the incidence of livestock diseases.

Under the 12 subprojects of integrated livestock based farming system introduced the concept of mass scale cattle raising along with food crop plantation. 150 Chaff cutters were provided to the farmers for chopping the fodder. Farmers learnt the plant the fodder crops along with the food crops to raise the livestock with proper health care. Controlled grazing system was introduced and cattle assembled every evening in cattle shade. This resulted in collection of plenty of cattle dung and vaccination of cattle at right time. Apart from earning from the sale of cattle, farmers earned more money by sale of compost and also they applied the compost in rice field resulting productivity enhancement of rice. Economic models for the commercial raising of cattle with breed improvement established as best practice under these subprojects. Next step is to create organic cattle value chain of grass fed cow and link them with high-end organic meat market.

Rice being the staple crop of people of Lao PDR SNRMPEP supported 22 subprojects for the Integrated Rice Based Farming System. Concept of PPCP introduced under these subprojects by linking the farmers’ producer groups with the rice millers and exporter of rice. Project coordinated with IRRI and ACIAR for improved rice cultivation system. Farmers have been provided with revolving funds to buy the inputs for rice and other crop cultivation. Concept of farm mechanization introduced for the commercialization of rice production. 37 sets of tractors along with all necessary equipment have been provided to the farmers’ production
groups. These equipment are being used to increase the size of rice field, reduce the cost of land preparation from 1.5 million kip per ha to 0.5 million kip per ha and increase the additional areas under the rice cultivation. Farmers also started growing the legume crops in dry season to improve the soil fertility and harvesting of crop with less water. Khong district of Champasak province is very good example of increased size of rice field. Both rice productivity and price has been increased due to adoption of improved cultivation practices and high quality paddy rice production. Some innovations like wet direct seeded rice, dry direct seeded rice and use of power weeder for the weed management are best practices which can be replicated by other stakeholders.

Upland agriculture still source of livelihood in poor and very poor upland districts. 5 subprojects are being implemented for the upland agriculture. New innovation applied under the Sustainable upland agriculture development subprojects. SNRMPEP introduced the concept of intercropping of upland rice with Bong tree. Farmers can get income in the initial year from upland rice in first year, cash crops in second year from same field and confine their upland activities to 4 filed only. After 4th year farmers are able to harvest bong bark and earn more than 10 million kip per year. Ethic farmers of Samoye district started harvesting of bong and not this initiative spreading to other districts and provinces in upland areas. Farmers also provided 2,800 jab planters which they are using direct seeding of upland rice and other cash crops. Apart from Bong other perennial crops like Coffee in Xansai district and Dakching district also promoted in new areas of upland. Next step is value chain development of bong to insure higher price of bong bark to farmers and promotion of incent stick making in Lao PDR to provide more employment opportunities for the rural people.

With the coordination of private sector (SWIFT Company Ltd.) PPCP has been established under the 4 subprojects of Organic Vegetable cultivation and value chain development. Contract agreement has been signed and pilot households have started cultivation of organic vegetables using the organic vegetable cultivation technology in coordination with SWIFT Co. Ltd. 6 irrigation schemes in Attapeu, 4 in Champasak 4 in Savanakhet and 4 in Salavanh have been installed for organic vegetable cultivation and commercial production of organic vegetables will be started from the coming season. One subproject for organic vegetable processing to make chilly paste is being implemented with exclusively women groups in Salavanh and started commercial chilly paste processing.

3 subprojects for the cash crop promotion focused on the banana, sweet potato and peanut cultivation in Lao Ngyam district, Cashew in Khong district, sugarcane in Saiboury district. One subproject in Lao Ngyam district is being implemented in coordination with the Green Earth NGO which is focusing on the livelihood enhancement through link to business and value chain development. In Lao Ngyam district, SNRMPEP supported establishment of improved cultivation of Banana, sweet potato and peanut by technological improvement in coordination with ICRISAT and provided improved varieties of these crops as per the market requirement, constructed a 15 kms road section to easy access to market and established the linkage with the traders for fair price to farmers. A value chain study is ongoing to establish the processing centers for banana. 2 centers for peanut processing have been established to value add the peanut to fetch better market price. PPCP with sugarcane contract farming has been established by linking the sugarcane farmers of Saiboury district with Mitra Phool Lao Sugar mill in Savanakhet province.
Coffee is the biggest agricultural commodity Lao PDR to export in many countries. Lao PDR is very suitable to produce the quality coffee. 4 subprojects are being implemented for the organic coffee production and processing in Pakson, Laongyam, Thateng and Dakching districts. 3 subprojects linked with AGPC farmers association and 1 subproject with Green Earth company under the PPCP arrangement. Coffee production groups have been established and trained for the organic coffee production and primary processing of coffee. 36 coffee nurseries have been established by the group members. 34 wet coffee mills with processing of 5 ton red berry per hour each, have been installed for the processing of coffee at farm gate. Earlier farmers have to sell red coffee berries within 24 hours of harvest which resulted into get very low price without any bargaining. Now farmers can process the coffee at their farm which can be stored for long time and now they can sell it when market prices are good. AGPC also linking the organically produced coffee with high-end European market.

7 subprojects are focusing on sustainable Natural Resource Management. Apart from preservation and plantation of forest, emphasis is being given to generate income without destroying the forest plants. Key successes are establishment of green cardamom plantation in Pakson and Xansai district, Honey bee production and traditional medicine production in Bachiang district. Farmers also trained and practices shifting cultivation stabilization near the protected areas to reduce slash and burn. Apart from agricultural and forest conservation activities, small livestock raising also promoted to generate more income for the farmers and to reduce the hunting of wild animals in protected area.
II. Best practices for sustainable development

1. PPCP an effective approach for Poverty Reduction & Commercialization of Agriculture

SNRMPEP promoted Public Private Community Partnership (PPCP) model for promoting sustainable natural resource management and productivity enhancement with the overall development objective of poverty reduction and economic development. PPCP is mandated by Government of Lao PDR at the highest levels as reflected in 7th 5 year Plan and also in context of AEC.

PPCP model involves the Public or the Government at Village level involving the Village Development Committee headed by an elected leader; at District level DAFO, District Governor and other government agencies; at Province level PAFO, Provincial Vice Governor and other line departments. Private sector is involved from the local entrepreneurs preferably within community and Community comprises of Households from the Very Poor, Poor and some better off households.

Under PPCP model the community is involved from initial stages for commercialization leading to sustainability of the development initiatives. The focus on community is for Food security and Nutrition and Economic Security. Under PPCP project focused on the value chain approach based on the principles of economies of scale and aggregation. The strategy of the project is to develop local capacities by plugging the value chain gaps. The PPCP model aims to create win-win partnership framework for all three stakeholders with the overall development objective of poverty reduction and economic development.

**PPCP – win-win partnership framework**

<table>
<thead>
<tr>
<th>Private</th>
<th>Public/Government</th>
<th>Community</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lao entrepreneurs</td>
<td>DAFO/PAFO/DG</td>
<td>C1, C2, C3, HH</td>
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**Value chain approach**
- Pro – poor
- Inclusive
- Sustainable

**Economies of Scale**
- Clustering
- Market led

**Marketing**
- Local fresh market
- National or regional market
- Export market

Taxes, agree to support and include rural poor in the value chain

Facilitate linkage with community

Mandate, taxes

Technical and financial support

Procurement and aggregation

Business services

Buy back arrangements

Agricultural and livestock produce

Value chain

Raw materials

Agricultural and livestock produce

Processing and packaging
Stakeholders Roles in PPCP

- **Public – The government** facilitates the entire process and also ensures that the benefits to community is ensured. As regulator, sets up rules and regulations for sustainability and equitable distribution
- **Private** – As a profit making body, focuses on commercialization of the product by aggregating and building the supply chain at the level of raw materials as well as final products.
- **Community** – Comes together as a set of producers around a single product as a result of aggregation and attains efficiency to optimize returns.

Project’s support to Government by capacity building of PAFO, DAFO and VDCs for sustainability. Key motivation is to be strong player once the AEC is applicable 2015 onwards. 250 subproject coordinators at different levels and sectors. SNRMPEP is the first project to promoting ‘Sam Sang’ – 3 Build Policy and Vientiane declaration including decentralization at the Province, District and Village level, support to develop their own plan and vision and in project locations, SNRMPEP started this strategy

Project supported the community by forming the production groups on focused products, providing revolving Fund (RF) to Producer Groups, high quality inputs in coordination with private sector, technical support – trainings and exposure visits to farmers and infrastructure development

Private sector support and facilitated by sensitizing their interest of competitive advantage, facilitating through the government to certify or guarantee through the commercial banks to access the credit, supporting by formulation of Business Plan, politically and technical support and providing some matching funds to start the partnership.

Project is developing 11 Value Chains comprising of Small livestock, Cattle, Rice, Coffee, Bong, Banana, Sweet Potato, Peanut, Banana, Medicinal plants, Green cardamom, Organic Vegetables under the PPCP model.

Some key challenges in promotion of PPCP are legal framework for PPCP for long term sustainability, some policy gaps especially tax structure, SPS measure, lack of standardization and certification system, poor infrastructure, lack of interest from private sector to invest in value chain development, lack of technical knowledge of the staff and farmers, lack of farm machineries for the commercialization and bulk production of the commodities, lack of organized markets for grains and livestock, frequent disasters like floods and drought and understanding of agriculture value chain amongst various stakeholders.

Key learning from the implementation of PPCP models are PPCP needs to understand and adapt as per local context, blueprint without pre-testing doesn’t work, pre-testing or piloting phase needs time before rolling out sub-projects, design the sub-projects to include PPCP, local private sector should not be forgotten, community and local private sector needs support to interact and negotiate with large companies, government’s role is largely to provide technical and policy support, private financial institutions should be promoted to set up branches along with micro-finance at cluster of village level, focus on niche products and niche markets, for e.g. native chicken cannot be produced by large companies; dissemination of technical knowledge and focus on farm mechanization to reduce labour intensive nature of agriculture

Overall the PPCP model is an effective model to promote inclusive and sustainable development and project will continue to support this model and will further work with the government to overcome the key challenges and commercialize the agriculture in Lao PDR.
Till now 32 agreement for the PPCP has been signed. Maximum 11 PPCP agreements signed in Champasak province followed by 7 in Attapeu, 6 in Sekong, 5 in Salavanh and 3 in Savanakhet. Project is trying to contact all subproject with private sector linked by the PPCP for the value chain development and long term sustainability.
2. Commercial small livestock raising-Sekong model

The Sustainable Natural Resource Management and Productivity Enhancement Project (SNRMPEP) promotes commercialization of small livestock raising using the Public-Private-Community Partnership (PPCP) approach in five southern Lao provinces, with Sekong Province taking the lead to upscale this approach.

Before the project commenced, small livestock (chickens, ducks, pigs) was not generating substantial income for farmers. Farmers undertook small livestock raising exclusively for home consumption or to sell during times of need. A SNRMPEP study found that the key reasons for this lack of commercial production were (i) the absence of service providers who supply chicks, ducklings and piglets; (ii) high level of mortality of livestock due to diseases and poor management practices; (iii) lack of feeding systems; and (iv) the absence of an organized market and value chain development. Traditional feeding, breeding, and health management practices are quite basic and do not support commercial production at scale. This discouraged breeding and livestock farming which lead to the supply being much less than the high demand for the product in the market. In addition, it was virtually impossible for small farmers to compete with the big companies involved in broiler poultry production. The insufficient availability of meat in local markets increased the burden to import from nearby countries at high cost and it was becoming very difficult for the local people to buy this meat.

Project activities

There is a huge demand for native chicken in Lao PDR and adjoining countries because of its taste and organic nature. Accordingly, SNRMPEP promotes native chicken and duck raising and organic small livestock raising (no growth promoters, hormones or antibiotics are used). This has created a comparative advantage for small farmers over the big companies which raise broiler poultry and pigs.

SNRMPEP supports the establishment of private sector service providers in five southern provinces. Seven centres for piglet production, three for duckling production and two for chick production have been established and have started operations. Other service providers for organic meat production, feed production and marketing are also being established. The project has formed and trained 171 small livestock raising groups and the livestock health management system has been strengthened to reduce livestock mortality.
A model service provider

In 2012, as part of the PPCP approach, SNRMPEP signed an agreement with Ms. Aphonesavan Phomphonsy, a female entrepreneur from Sekong Province, to support (through the Provincial Agriculture and Forestry Office Livestock and Fishery Unit) the establishment of three production centres in Ban Non Nongva, Lamam District, one each for piglets, native ducklings and native chicks. SNRMPEP financing was used as working capital to purchase pigs (sows and boars), feed and equipment for artificial insemination and incubators in order to produce the required number of piglets, ducklings and chicks.

Ms. Aphonesavan is an excellent role model for aspiring entrepreneurs in Lao PDR and is keen to share her experience with other private farmers, especially women, who undertake the majority of poultry and pig raising in Lao PDR. Her centres have successfully achieved production capacity of 2,000 piglets, 40,000 chicks and 40,000 ducklings per year to supply to 1,200 farmers (300 households buy piglets, 450 buy ducklings and 450 buy chicks). Ms. Aphonesavanh signs agreements with the production groups to supply high quality vaccinated chicks, ducklings and piglets at a comparatively lower rate in order to motivate the farmers towards commercialization model and make sure they can get a good economic return from small livestock raising. She provides a warrantee wherein if any livestock dies due to disease within 2 months of supply, she replaces the livestock free of cost, which gives enormous encouragement to the farmers in the production groups. She also signs a buyback contract with the small livestock farmers at competitive prices.

Ms. Aphonesavan is very happy with her decision to become involved in the PPCP model. As a service provider, her farm’s capacity has significantly increased from the earlier capacity of just 300 piglets per year to 2,000 piglets, 50,000 chicks and 30,000 ducklings per year. She is pleased that her breeding farm is becoming more effective and productive with the project’s technical support. She is especially satisfied as her farm is helping to create a sustainable value chain for small livestock and meat in Sekong and is playing a critical role in providing improved livelihood opportunities to 350 households in 25 villages of Lamam and Thateng districts.
Positive outcomes for farmers

During the pilot year (2012-2013), the project focused on three villages. In Kasang Kang village, Lamam District, a pig raising group comprising eight households (four female-headed) was established. The group members were provided with comprehensive training by provincial and district agriculture staff. Revolving funds were also provided to purchase piglets from service providers. Four households started raising 35 piglets each and within four months all pigs were sold out, with average net profit of 12 million LAK per household.

A commercial chicken production group comprising 12 households (six female-headed) was also established in Kasang Kang village, out of which eight households started raising 200 native chickens per household (one household raised 800 chickens). This was the first time that poor farmers in this village raised chicken for additional income. Currently, all chickens are healthy and the households will start selling them soon. The project has expanded to Mor village, where three households recently started raising 500 chickens each.

In Kapeu village, Thateng District, two households who raised 60 piglets also sold out after four month of raising and earned a net profit of 15 million LAK per household. In Chunla village, Thateng District, two households started raising of 40 piglets each and are getting ready to sell them at the market.

Apart from these direct project beneficiaries, there are many other households availing of service provision for piglets, chicks and ducklings.

Following successful results from this pilot phase, SNRMPEP plans to continue providing inputs and technology for commercial pig raising and value chain approaches to poultry-raising by promoting producer groups and supporting business service providers. The PPCP model shows potential to support Lao farmers to produce quality pork, chicken and ducks, meeting the highest standards and the criteria of the WTO in order to compete in the future open market of the ASEAN Economic Community.

Sustainability

Service providers established under private sectors are now self-sustainable and apart from providing the chicks, ducklings and piglets to the target production groups, other farmers also taking advantages of these service providers. Many of the farmers come to these centers and purchase the chicks, ducklings and piglets by their own and after rearing for certain period of time sell to market. Revolving funds have been established to continue raising of small livestock. Very strong livestock health management system has been established in 5 southern provinces to
reduce the risk of livestock mortality. Farmers have been trained to raise the small livestock as entrepreneurs to generate measurable economic return from small livestock raising. SNRMPEP is working towards establishment of the meat processing centers for the production of organic meat from small livestock produced by the production groups and linking them with high-end organic market in Lao PDR and in adjoining countries.

Figure 8: Parent stock for breeding and healthy piglets produced by the center
3. Integrated Rice Based Farming System-Savanakhet model

SNRMPPEP financed 22 subprojects for improving and promoting integrated rice-based farming systems in the Decentralized Irrigation Development and Management (DIDM)-irrigated area of Kanthachan and the Thapho irrigation scheme area, both in Saiphouthong District, Savannakhet Province. The subproject area is located approximately 60 km southeast of Savannakhet city. Agricultural land in this area is flat and irrigated by electric pump in the dry season but soils are mainly sandy loam with low water holding capacity, low organic matter and low fertility.

**Before the project commenced,** rice productivity was 2.4 ton/ha in the wet season and 3.7 ton/ha in the dry season. According to the head of the Water Users’ Association in Saiphouthong District, most farmers could not plant anything in dry season because irrigated water was always in short supply due to less water delivery and high demand. In addition, farmers were unaware of improved farming system and crop rotation techniques. Rice crops were grown continuously in both wet and dry seasons resulting in reduced soil fertility and transfer of insects and other pests from one crop to another. Fertilizer in Lao PDR is imported from other countries and is very expensive which hinders its use (to replenish soil fertility for an optimum yield of rice) as the high cost of inputs results in less profitable business for farmers.

**Project activities**

Initial start-up activities and capacity building started in 2011, followed by full subproject implementation from February 2012 in Kanthachan and Thapo villages, Saiphouthong District. Farmers’ production groups were established and farmers were trained in improved rice cultivation, soil fertility management techniques including green manuring in the rice field and crop rotation with legumes (mung bean and peanut), compost making and group fund management. Groups were also provided with agricultural inputs such as seed fertilizer, to be used as a revolving fund.

Peanut cultivation requires one-fifth the quantity of water used to grow dry season rice. This means farmers can save on electricity bills for irrigation pump use. Being a leguminous crop,
peanuts improve soil fertility, resulting in an increase of up to 40% in productivity of the subsequent rice crop, even after a reduction of 20% in fertilizer use.

**Positive outcomes**

Due to project interventions, farmers have learned to improve rice cultivation. They now use proper crop management practices and apply appropriate quantities of fertilizer based on soil analysis using soil testing kits provided to production groups. This has resulted in an increase in wet season rice productivity from 2.4 ton/ha to 5 ton/ha, meaning an increase of approximately 5 million kip per household.

Following project intervention, 83 farmers (including 14 female farmers) planted peanut using improved seed and crop management practices in 98ha (compared to 5ha previously). Farmers have found that peanut plantations are particularly useful for improving soil fertility. Farmers report that when they grow peanuts in the dry season, they reduce the use of chemical fertilizer from 300 kg/ha to 200 kg/ha. All farmers who grew peanuts in the 2013 dry season harvested a bumper crop with an average peanut productivity of 1 ton/ha (compared to 0.7 ton/ha previously). Last year 83 families sold approximately 100 tons of peanuts, earning 1.3 billion kip, with an average net income of 13 million kip/ha for each family. This represents a net income increase of 11 million kip per family in just one season, as the average income for dry season rice is only 2 million kip/ha.

**Expanding the project activities**

Many farmers visited the peanut plantations of these model farmers and were impressed by the increased incomes achieved by improving the crop management system and using crop rotation. In 2013, SNRMPEP supported an additional 200 farmers in other provinces to grow peanuts in the wet season, replicating this model of improved farming system. The practice is gaining momentum, and many households outside the project target group are seeking to adopt it.
4. Developing rice value chains in food security in Attapeu Province

The Sustainable Natural Resource Management and Productivity Enhancement Project (SNRMPEP) implements 22 Integrated Rice Based Farming System projects in five provinces including one in Samakhixai District, Attapeu Province. Before the project commenced, implementation of improved farming practices was limited; soil fertility was low because of rice monoculture; crop rotation and soil fertility management practices were lacking; productivity was only 2 ton per ha in wet season and the cost of cultivation was high due to high input costs, especially fertilizer and land preparation. Farmers produced many varieties of mixed rice, most of which were of low quality in milling and fetched a low price at the market.

Attapeu is the southernmost province of Lao PDR with an area of 10,320 km². The total area under rice production is 22,500 ha in rainy season and 400 ha in dry season. Agriculture in Attapeu Province is still subsistence type and there is negligible marketable surplus. About 25% of households experience a rice deficit.

The Public-Private-Community-Partnership (PPCP) approach
SNRMPEP initiated a Public-Private-Community-Partnership in Samakhxai District, with the aim of moving farmers from subsistence to commercialized farming. The Public element of the partnership comes from the District Agriculture and Forestry Office (DAFO) who are the key project implementers. The Somphonexay Agriculture Development Company came forward as the private party in this partnership, signing a cooperation agreement with the provincial and district level government offices. Similar agreements were signed with farmers’ production groups, as the community partners, coordinated by village headmen to guarantee the contract on behalf of the company and the farmers.

Project activities
The Somphonexay Agriculture Development Company is facilitated by the DAFO to establish linkages with production groups, give logistics support and provide guarantee on behalf of the community to obtain credit from banks. DAFO also assisted the company to start a seed production and rice varieties centre. Three types of jasmine rice, two types of sticky rice and three types of plain rice have been tested. The government further facilitated tax incentives for the company to establish an improved rice mill in Sanamxai district, which is currently under
construction. The Somphonexay Company and technical DAFO staff organized on the job training for farmers and organized seven farmers’ production groups comprising 40 households (three female-headed) in Hin Lath village and 52 households (19 women) in Thasengchanh village. They provided revolving funds worth 92 million kip (US$ 11,645) in Hin Lath village and 217 million kip (US $ 27, 470) in Thasengchanh village. The revolving fund (worth a total of 332 million kip (US$ 42,025)) was used by the farmers’ groups to purchase seed and fertilizers from the Somphonexay Company. The company also signed a buy-back agreement with the farmers’ groups to purchase rice at a minimum support price of 2,500 kip per kg against the existing market price of 2,000 kip per kg. As per the contract, if the prevailing market price exceeds the minimum support price, the company agrees to buy the rice at higher rates. This buy-back arrangement is logical for the company because they get better quality rice in bulk. They also have the opportunity to buy other crops and livestock from farmers’ groups at competitive prices.

Positive outcomes
In the most recent wet cropping season, 105 ha of land were planted with improved varieties of rice using good agricultural practices. The cost of total inputs used was 2.01 million kip per ha. Farmers are expecting 5 ton per ha yield against the earlier production of 2 ton per ha. Farmers can earn approximately 10 million kip per ha in a single cropping season which is more than three times the income earned last year. During this dry season, 50 ha area has been planted and 1,000 ha area will be planted with rice in next wet season under this PPCP arrangement, with greater participation of women-headed households. A large number of farmers have already shown interest to join this PPCP model and SNRMPEP is now replicating this successful model to other districts in Attapeu Province and to other provinces.
5. Rice value chain development - an experience from Khong district

Rice is the staple crops of almost all households in Lao PDR. However, despite the availability of the land, good rainfall and laborious farmers, rice productivity was very low. In the subproject area, farmers usually practice subsistence farming in their villages which results in low production. The main crop for the area is rice and predominantly sticky rice varieties are grown which is largely consumed by the farmers. Farmers usually utilize hand tractors for their work in the fields. The well-off farmers employ these hand tractors for better yields. For those who cannot afford to do so, usually hire the hand tractors at higher rates for the entire season which may go up to almost 1 to 1.5 million kip per ha for each season. Even if the crop production is planned by the households, the existing traditional practices with respect to farming methods, fertilizers and manures, irrigation infrastructure along with the knowledge for intercropping or multi-cropping is absent or lacking among them. Despite the availability of 2-3 ha land per households they can’t cultivate the full area because size of rice field was very low which discourage the farmers to cultivate the land using tractors. This discourages commercial farming and up-gradation which invariably impacts the supply being much lesser then the high demand as well the income of the households from rising consistently. The high cost of seeds, fertilizers and higher transportation of grains to the market only makes it more difficult. Households do not have investment capacity to initiate commercial production. The deterring conditions at the ground level further gets aggravated with the households not willing to take risk by undertaking commercial production as it can bring considerable losses to them during disease break out in crops or pests infestation or any other untoward incident.

Figure 14: Expansion of size of paddy field in Muanesen village of Khong district

Keeping in view the existing problem, SNRMPEP funded Integrated Rice Based Farming for the commercialization of rice cultivation in Khong district, Champasak Province. This is one of the 22 integrated rice based farming system subprojects. More than 800 households in 4 villages namely Ban Soth, Ban Meuang sene, Ban Huakhong, and Ban Senehad in Soth Kumb Ban and the area under District Municipality of Khong district directly supported under this project.
Project in coordination with the PAFO and DAFO has signed PPCP agreement with the Loko company of joint venture between Lao PDR and Vietnam to start contract farming. Farmers have been organized into 4 producer groups and have been provided with revolving funds, a set of tractor with necessary equipment for farm mechanization, one irrigation scheme to irrigate rice in dry season. These groups also supported by establishment of the rice noodle processing units by women members at village level. With the help of private sector company, new rice varieties with high yielding capacity imported from Vietnam and pre-tested at farmers field and after testing OM 6976 selected for the large scale commercialization with buy back guarantee by the company.

110 ha rice area has been leveled using the tractors provided by the project with very low land development cost. Size of the rice plots was increased from 0.1 ha to 1 ha each plot. There 60% reduction in the cost of land preparation using the farm mechanization. Land use certificate have also been issued to the farmers to protect the farmers right for the land ownership. First year 600 ha area planted under improved cultivation of rice and farmers harvested an average production of 5 ton per ha and some farmers harvested as high as 6.5 ton paddy rice per ha. Farmers income increased from 2 million kip per ha to 8 million kip per ha with increased yield and increased price due to improved rice varieties. Now several farmers are
interested to join this initiative to increase the rice area under the PPCP system to 20,000 ha. from next rainy season onwards. This company has established modern rice mill to process the quality rice to export to several countries.

5 women’s groups comprising of 47 households in Khamao Phoumeo village of Khong district started processing of rice noodles using the rice they have produced. Project supported these women groups with sets of processing equipment, shade houses and revolving funds and provided noodle processing training. Before the project, about 10 households produce the rice noodles by purchasing rice from adjoining town of Cambodia with average processing of about 25 kg noodles per household. Now the number of households increased to 47 and each household is producing 100 kg noodles per day. Each household is earning net profit of 10 million kip per month by processing and marketing of noodles. These noodles are being marketed to 5 southern provinces as well as to Siengteng province of Cambodia. Now there is further plan to support these groups for the GMP, improvement of quality by developing various types of noodles and branding of their noodles to fetch the international market.

Figure 17: A women making rice spread, a process to make noodles in Khamao Phoumeo village
6. Yang Bong plantation – a boon for upland farmers in Samouay District, Saravan

The Sustainable Natural Resource Management and Productivity Enhancement Project (SNRMPEP), working with the Provincial and District Agriculture and Forestry Office (PAFO and DAFO), supports a subproject for commercial Bong tree plantations in Samouay and Taoye districts to provide an alternative livelihood source for farmers by reduce shifting cultivation and reduction of emission of carbon to protect the environment.

Background
Samouay District is the last frontier district of Saravan Province bordering Vietnam. It is mountainous (average elevation 1,000 meters above sea level) and home to the Ta Ouy ethnic group, once completely isolated and living in extreme poverty. The all-weather access road to the district opened just recently (2013). Farmers of Samouay District traditionally derive their livelihood from cultivation of upland rice and collection of non-timber forest products (NTFP), mainly the bark of the Bong tree. Upland rice, the main crop, is planted amidst the slash and burn of the forests - cultivation is shifted every 4 to 5 years. Population increase, recent expansion of industrial crops (e.g. Rubber and Eucalyptus) and large scale commercial agriculture business by private companies has reduced the area available for shifting rice cultivation. Rice productivity is very low (about 1 ton per ha.) which cause rice deficit for 2-3 months for more than 50% households in Samoye district. It is no longer possible to leave the land fallow for 10 years or more to ensure replenishment of soil fertility. Current constraints have reduced this time frame to 4-5 years which is leading to low rice productivity and an increase in weeds which requires more intensive labour for weeding.

Bong trees
Bong forests, once abundant in Samouay District, have been destroyed due to slash and burn shifting rice cultivation, so much so that mature bong trees can no longer be found in this area. In recent years, the demand for Bong in Vietnamese and Chinese markets has grownup, as it has many uses. Bong bark, which contains gum and aromatic oils, is used to make incense sticks, commonly used in temples throughout South and Southeast Asia. Bong is also used in mosquito coils and as glue in carton or particleboard production. Bong bark mixed with soil is used for modelling and moulding statues and household items. Bong can provide a good additional income for farmers, however, increased demand and overexploitation of natural Bong tree along with uncontrolled, nonsystematic collection of the bark and slash and burn practices for upland rice cultivation has put this plant on the list of endangered species. This in turn has severely impacted on the livelihoods of farmers in the upland areas.
Project activities

Before the project, farmers from Samouay and Taoye districts had some experience of growing Bong, having planted 100 ha in 2008. As part of an initial pilot project, starting in March 2011, 425 households across both districts were organized into production groups to plant bong trees. Each household planted 1 ha of Bong tree. The project also supported land use planning, issuing of a permanent land certificate, establishment of gravity irrigation schemes, establishment of Bong tree nurseries and provision of revolving funds for crop cultivation and Bong tree plantation.

All production group members were trained in upland crop cultivation and plantation and management of Bong trees. Farmers were also trained in sustainable harvesting of Bong bark which involves peeling the bark five times a year (by dividing the trunk into five stripes) rather than cutting it. The project further supported intercropping of the Bong tree upland rice and cassava in order to provide food security and income during the initial two years of Bong tree plantation (farmers can start harvesting the Bong bark from the fourth year onwards).

Positive outcomes

Two Bong tree nurseries have been established under the technical service centres in Taoye and Samouay districts, producing 500,000 plants per year. 15 more Bong plant nurseries have been set up by farmer production groups, producing an additional 500,000 seedlings per year, which are sold to other farmers to generate income for production group.

The project has generated huge interest from farmers. 741 households (including 296 female-headed households) have joined the production groups and within three years of project implementation, a 741 ha area of Bong tree has been planted against the target of 425 ha. This increase in interest and growth of Bong is a result of the increasing value of Bong, from 2,500 kip per kg in 2011 to 5,000 Kip per kg in 2013. This has been caused by increased industrial demand for Bong bark coupled with the organization of a marketing system by production groups with the technical support of the project.
Under normal management practices, from the fifth year onwards, farmers can harvest 3 tonnes of bark per year per ha. which can be increased to four tonnes per year per ha from the seventh year onwards. 1 ha of Bong bark can generate an income of about 15-20 million kip per ha and plants can provide economic yield up to 50 years. In 2013, four model households who planted 8.4 ha Bong tree in 2011 started Bong bark harvesting and earned 15 million kip each which will provide livelihood and economic security. Bong tree plantation will directly support the expansion of green forest in the district and in the country as a whole and will contribute to the reduction of carbon emissions affecting the global climate.

**Expanding the project activities**

The project is currently conducting a value chain study on Bong tree to understand the movement of Bong bark from Laos to other countries. In order to generate more income for farmers, the project will set up a Bong bark processing plant in Saravan and Savanakhet Provinces and will provide direct linkages to the international export market. The project is also working to develop an incense stick-processing unit to generate more income for communities.

This is an excellent model wherein livelihood generation for poor farmers can be promoted along with natural resource conservation. Other provinces are starting to learn from the success of this project and are up scaling the initiative to other upland areas, providing better livelihood alternatives and support to the farmers, while protecting the environment by reducing the shifting cultivation.

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Mr. Ambeen is a 39 year old with 8 family members from Phin A village, Samouay District. He used to practice slash and burn to grow upland rice and substitute his income by collecting NTFP. He only used rice for his own consumption and faced rice deficit for 2-3 months every year. He generates about 400,000 kip per year by sale of NTFP. He became involved in the Bong tree plantation subproject as a model farmer. Mr. Ambeen started planting Bong wood five years ago, increasing his area of plantation from 2 ha to 4 ha under the project in 2011. In 2013, he harvested 4,000 kg Bong bark from 1 ha and earned a very good income for his family (20,000,000 kip). In 2014, he is expecting to harvest an additional 1 ha, hoping to earn 40,000,000 Kip per year. Mr. Ambeen is very happy with his Bong wood plantation as a new alternative livelihood and has plans to increase the Bong plantation area further to generate more income and release his family from poverty. He has started sending his daughter and son to school and can now support his family to receive better health care due to this increased income.
Green cardamom set to reap rewards in Bolaven, Champasak

Green cardamom (Elettaria cardamomum Maton.) which is of same plant family of Zingiberaceae with Lao Red Cardamom (Amomum villosum) has been introduced in Champasak province of Lao PDR by the Sustainable NRM and Productivity Enhancement Project of Ministry of Agriculture and Forestry of Government of Lao PDR. PPCP has been established with a private company Spice Enterprises to link the farmers with private sector and to multiply the green cardamom seedlings locally at Bolaven plateau in Champasak province. This is the first time in South East Asian Countries to start growing of green cardamom (Elettaria cardamom). Earlier Lao farmers collect Red Cardamom (Amomum villosum) from the forest and in some area grow it for the market to China and Korea. Red cardamom used for the medicinal purpose but the prices were just 1 US$ per kg and give very low income. However Green cardamom has higher market price than the red cardamom. Average 500 kg green cardamom can be produced in 1 ha. Farm gate price of green cardamom may be at least US$ 10 per kg and can generate revenue of US$ 5,000 per year per ha. with a net profit of more than US$ 4,000 per year per ha.

Government of India through the Indian Embassy to Lao PDR has facilitated the visit of officials of the Ministry of Agriculture and Forestry to visit Spice Board of India and cardamom plantation area in Idukky district and also facilitated import of 10,000 plants of cardamom in year 2011. A nursery has been established in coordination with private sector at Bolaven plateau with production capacity of 200,000 seedlings per year which can be planted in 150 ha. per year. Main benefit to promote green cardamom plantation is to protect the forest tree because it can grow successfully under the shade of big trees.

Cardamom plants mature in about 20-22 months after planting polybag seedlings or rhizomes. Economic yield starts from 3rd year onwards after planting, and it continues up to 10 years. The
total life span of cardamom plants is about 15-20 years one ha. area can produce about 500-1,000 kg dry capsules every year.
The returns are so high from green cardamom, it called as “Green Gold” and many farmers are attracted to grow the cardamom. It is environmental friendly crops and can be grown under the shade of big trees by clearing the grass and bushes thus can protect the forest cover and can generate very high income.
This is a wonder crop and once establishes, will change the livelihood of the farmers as well as will contribute for the environmental protection by generating high income without slash and burn.
8. Sweet success of apiculture in Huaye Mesang village of Pathumphone district

Dong Houasao NBCA 110,000 ha covers parts of Pathomphorn, Paksong and Bachiang districts of Champasak province and Xepian NBCA 217,331 ha covers Pathumphorn and Khong districts of Champasak province. Due to shrinking of natural resources and increasing population, there is increasing pressure on natural resources. Honey is important part of the Lao people mainly used a little bit as food and also for medicinal purpose. The source of honey is mainly collected from the jungle honey from species *Apis dorsata* bees. (Pheung Hang, Pheung Pha in Lao) and some from the traditional bee hives (traditional apiarian, Pheung Kone in Lao) of the *Apis cerena* indigenous bee species. Despite the rich ecological environment for apiculture, proper bee keeping does almost not exist in Lao except some initial trial activities of individuals. The past experience shows that the apiculture in the most part of Lao is promising and economically viable. The Bee keeping sub project will also coordinate with the traditional medicine production sub project for the possible use of the traditional medicinal plant flowers and the nectar for the honey production. The rich forest areas and the forest vegetation of Pathomphorn district is ideal for the domestication of the jungle bees for honey production. The mulva nut trees can be the main nectar for the bee keepings. Traditional method of honey collection destroy the bee colony, chase out the bees by using the harmful methods (Burning the colony, use some insecticides, etc.) hence harmful to the natural bees which are important for the pollination of the trees and vegetation.

Figure 24: A panoramic view of Dong Houasao NBCA protected forest, apiculture hives established on boundary of the forest
Global Association for People and the Environment (GAPE) had assisted the villagers marketing services for the jungle honey by establishing the contacts with the honey whole sellers in Vientiane until 2010. Due to the poor quality of the honey (mainly due to the poor extraction and processing), the farmers found difficult to meet the demand of the wholesaler in Vientiane and stop delivery of the honey to Vientiane since 2010.

SNRMPEP supported apiculture in boundary of Dong Houasao NBCA to provide alternate livelihood opportunities to the villages located adjoining to NBCA. Provincial Agriculture and Forestry office coordinated with honeybee cooperative of Vĩnh Phúc province of Vietnam for the technical support. 2 technical staff hired from Vietnam and posted at Huaye Mesang village to provide on the job training to technical staff and target farmers. Initially 120 beehives placed on the boundary of Dong Houasao NBCA by 10 households of Houay Maesang and Huaye Phay villages and learn the techniques to take care of the bees and hives, protect the bees from natural enemies, collection and processing of the honey etc. On the job training proved very useful and farmers and local technical staff learnt a lot. During the first cycle of 30 days, 270 liters of pure honey harvested from these hives with average productivity of 2.25 liters of honey per hive. In 2nd round is ready to harvest with estimated production of 300 liters Farm gate price of pure honey is about 50,000 kip per liter which can generate gross income of 13.5 million kip per month. Total expenditure per cycle is only 2 million kip and farmers can earn a net income of 11.5 million kip per month from 120 hives. After getting the experience more farmers are motivated and additional 300 hives will be incorporated in honey bee raising to extend apiculture in 4 more villages (Ban Thop Sork, Ban Sanoth, Ban Houay Kho, Ban Thahoo) located in the vicinity of Dong Huoasao NBCA.
Project now focusing to improve the quality processing, certification, packaging and branding and linking with national and international market to make this initiative sustainable. As next step, project will develop the PPCP by linking the honey producer with the private sector so farmers can produce honey and can get insured market. The future replication and expansion of the Natural bee domestication and conservation will be mainly to the Xepian NBCA areas where Laven, Lavei, Soy and other ethnic groups are mainly dwelling who represent the poorest communities of the Champasak Province.
9. Sustainable Livestock Health Management in the entire project area of 5 southern provinces

Livestock raising contributes major source of livelihood support to rural people as 42% farmers raise cattle and buffaloes, 56% farmers keep poultries, 31% pigs and 6% raise goats. However livestock health management is one of the most important issues in 5 southern province to commercialize the livestock raising and poverty reduction. As per the baseline survey 11% cattle, 12% buffaloes, 24% pigs, 8% goats and 38% poultries died because of diseases every year. Farmers release the cattle, buffaloes and goat for free grazing and rarely adopt the vaccination resulting outbreak of diseases. Availability of the livestock vaccines, vaccination kits, cold chain for transport and storage of vaccines, vaccine supply chain, availability of vaccination revolving funds and skills of technical staff were issues of major concern to promote mass scale livestock vaccination.

![Figure 29: His Excellency Mr. Vilayvanh Phounkhe handingover the vaccination kits to VVWs in Savanakhet province](image)

Keeping in view the above issues, SNRMPEP supported 5 subprojects of livestock health management in Savanakhet, Champasak, Sekong, Salavanh and Attapeu provinces with financial assistance of more than US$ 1 million. Project has supported to strengthening of vaccination supply chain, vaccination cold chain by supply of 22 solar refrigerators, 184 electric refrigerators, 50 WHO approved long distance vaccine carriage box which can keep vaccine safe for 173 hours; 2,919 short rage vaccine carry box with 21 hours storage capacity and supply of 2,919 vaccination kits to all veterinary workers in target areas.
SNRMPEP produced 20,000 posters for the disease management of castles, buffaloes, Goat & Sheep, Pigs and poultries for all villages in 5 southern provinces and booklets for the veterinary workers. Vaccination supply chain has been established in coordination with private sector by directly linking the PAFO, DAFO and VVW with the private sector supplier with financial assistance worth US$ 341,000 to supply the vaccines within 10 days of placement of order. Project also supported vaccination awareness campaign followed by mass scale vaccination 2 times in a year in the month of November and March every year. Last year there was severe flood in southern provinces resulted huge loss in the crops and there was high risk of outbreak of the livestock disease. However, SNRMPEP in coordination with the concern PAFO and DAFO officials immediately mobilized the VVWs and mass scale vaccination carried out in month of November which resulted in not only prevention of disease outbreak but livestock mortality also reduced to 30% less as compare to a year before.

Still there are a number of issues like lack of capacity of the village veterinary workers, lack of vaccination calendar, lack of interest of farmers especially in remote areas and uncontrolled grazing by long term release of livestock especially cattle in forest which create obstacles in timely vaccination of the livestock. Livestock technical staff has developed the action plan has been prepared to deal of these issues and achieve the target of 80% vaccination for cattle and...
buffaloes and 60% vaccination of poultries, pigs and goats to further 50% reduction of livestock mortality by end of year 2014. Livestock health management subproject are also supporting 7 subprojects of small livestock raising and 12 subprojects of integrated livestock based farming system. Project is focusing to encourage the farmers for quality livestock raising with good agriculture practices and good health management practices to meet the standard of livestock as per the requirement of Asia Economic Community and WTO standards of food safety.

Figure 32: H.E. Minister of Agriculture handing over the certificate to progressive farmers in agriculture fare in Savanakhet

Figure 33: Cattle catwalk to select best cattle in agriculture fare and a happy farmers with winning 1.5 million kip award
10. Coffee value chain development under PPCP

SNRMPEP financed 4 subprojects for the organic coffee value chain development and part of 2 upland subprojects has coffee as one of the key component. These subprojects have been implemented in 78 villages of Xansai, Thateng, Dakching, Lao Ngyam ans Paksong districts providing direct benefit to more than 3,500 households. 3 Coffee value chain development subprojects are being implemented with AGPC farmers association and 1 with private sector as PPCP. subproject area coffee productivity is low. Before the project intervention, the smallholder farmers follow a ‘traditional’, no input management approach to growing Arabica under shade and Robusta with cattle free grazing underneath. Arabica yields of about 700 kgs parchment/ha or 450kgs/ha of exportable red bean (hulled and ready for export) coffee is the norm for small holders. The best yields achieved by the most active small holders, following organic production techniques exceed 1.6 tonnes of exportable coffee per hectare. In income terms this equates to a return per/ha of $3200\textsuperscript{1} versus $900. This clearly demonstrates that it is well within the capacity of the production ecosystem for small holders to increase their return per ha.

\textsuperscript{1} Returns calculated on 2010 prices paid by AGPC
To increase coffee production and improve coffee quality project supported a range of production related management practices and provide each farmer with the opportunity engage in hands-on farm improvement activities, utilizing resources that are commonly available and supplement these with bio-fertilizers and biological controls to boost coffee yields. Coffee quality has been enhanced through the upgrading and building of new wet coffee processing mills. These mills have demonstrated the effectiveness of centralized processing and enabled the groups to build up their technical and management skills to consistently produce high quality coffee. Project major investment under coffee subprojects used to establish 34 sets of wet coffee mills with processing capacity of 5 ton coffee berries/hour per set. Before the establishment of the wet coffee mills, farmers have to rush to the coffee traders to immediately procure the red berry at low price because farmers have no time to bargain due to degradation of quality of red berry is not processed within the 24 hours of harvest. Now farmers can process the red coffee berries at their farm and after drying the processed coffee bean, they can store and can sell when price of coffee bean increased. Apart from it due the processing of the coffee bean by the farmers value of the coffee increased and farmers net benefit almost doubled resulting more income generation for the farmers. Project also supported establishment of 25 coffee nurseries for the quality coffee seedling production, established new coffee production groups and strengthened old coffee production groups. Farmers and technical staff have been trained for the preparation of coffee nursery, coffee plantation and after care and postharvest management including processing of coffee using wet coffee mills.
AGPC played a key role for the coffee subprojects. Each group is represented at the AGPC Board by a representative who they elect at the annual general assembly of the Association. As well as following the rules of governance each member has signed a contract committing to follow the organic standards and compliance rules of ACT Thailand (organic certification) and with FLO (Fair Trade Organization). This means that each farmer will attend meetings and make available their sales and farm management records to both an internal and external audit of their farm each year. Each AGPC group comprises of different ethnic minority groups who are drawn together through the AGPC structure to work together to further their collective economic and social needs and through this structure implement the subcomponents of this project:

building capacity within groups; implementing technical changes to their farm
management system to build soil fertility; build coffee processing and storage facilities to help improve the overall quality of the coffee and benefit from market information.

Coffee subprojects has made a remarkable achievement by improving the livelihood of more than 3,500 households in the target areas. New coffee plantation areas opened in Dakching and Xansai district further support more farmers because potential for increasing the area under coffee at Bolaven plateau is very little and increasing demands of the coffee can be met by new coffee areas.
11. Integrated Cattle based farming by smallholder farmers in Attapeu province

Attapeu province is located in the most Southeastern of Lao PDR. Taatseng village located in Xansai district which have been migrated from upland to low land about 12 years back. As of 2010 total population of the village was 873 persons comprising of 136 households (161 households) in which 100% are of ethnic group including Ta Lieng and Arak. Out of 161 households 71% or 115 households were poor. Main source of livelihood was shifting cultivation and there were rice deficit from 3-5 months in a year. Before the project support, there was no organized system for livestock raising, most of the families released the cattle in forest. Cattle released uncontrolled lost in forest and destroy the crops of other farmers and make difficulties in the cultivation of crops. Many poor families have no cattle and whatever the cattle available were suffering from disease and poor health conditions. Though the village has 14,255 ha land out of which only 150 ha. area was under agricultural use. This 150 ha area also not developed as paddy land properly, as paddy land was undulated resulting very poor rice productivity. Farmers have no land use certificate. Farmers have no equipment for the cultivation of crops and most of the agricultural operation they perform by the manual labor.

SNRMPEP supported this village under pilot subproject for integrated farming system. Farmers have been organized in 8 production groups. They have been trained about integrated cattle raising along with crop cultivation. 300 ha area was fenced and land was divided into each household with land certificate. 43.5 ha area planted under fodder crops. After the plantation of
the fodder crops, 226 cattle provided to 100 households. 30 ha area planted under the rice and rice productivity increased from 1.5 ton per ha to 2.5 ton per ha despite the poor fertility of the soils. Cattle growers started controlled grazing of the cattle and in evening all cattle assembled in cattle shades constructed with the help of project. In cattle shade, farmers provide supplementary food and collect cattle dung. Cattle dung become a very good income source as farmers earn more money by selling of cattle dung to plantation companies and also make compost to apply in rice and fodder plots. Farmers also planted 23 ha area under the corn. Corn was sold to traders while corn stalks were used as fodder for cattle. A chaff cutter for the chopping of the green fodder and a bailer for the collection and bundling of the rice straw also provided to the production groups. 7 buffaloes also provided to the group member to help them land preparation. Project also supported development of paddy land and land for the cultivation of the fodder crops by land leveling. One irrigation scheme have been constructed using gravity water from perennial water source to irrigate the fodder crops and paddy field.

Now numbers of cattle have increased from 226 to 305 as 79 new calf produced by the cows. 16 cattle have been sold by the farmers for 40 million kip. An income of 90 million kip generated from the sale of corn and 29.7 million kip by selling of the seeds of the fodder crops. Now the farmers families are happy and their economic condition is improving gradually. Hungry season has reduced from 3-5 month to 1-2 month per year by additional rice cultivation. Livestock productivity also increased for target and not target
household due to strengthening of the livestock health management system. Farmers has established the revolving funds out of the support provided by the project and once a household will have enough cattle, will pass the equal amount of cattle to other households to extend the project support. Now project has plan to start livestock market to attract traders to the village to sell the cattle at competitive price and also to start further value chain development of for the production of organic beef from grass fed cattle.
Khong district is situated in the southernmost part of Champasak province and even the South most of the Lao PDR. Khong district is located in the partially flat and slight slope that situated along Mekong River in the Eastern side of the district and in the Champasak Plain. Other parts are Islands that scattered in the Mekong River. The area ranges from lowest at 80 m to the highest at 282 m (Phoukeo Mountain).

Farmers of this area cultivate upland and low land rice. Upland rice cultivation was major threat to the National Conservation Forest of Dong Hua Sao. Productivity of rice was only 1 ton per ha which was not sufficient to meet the feeding requirement of the farmers. 55% HH faced food shortage ranging from 3-6 months. SNRMPEP introduced commercial cashew cultivation project as pilot project. The implementation started from 2010 as a pilot subproject in 500 ha of area and 250 households of poor farmers in Kumb ban Haatsaikhoun comprising of 8 villages at the initial stage and aims to extend to all households in future.

250 household of farmer were volunteer participated in subproject implementation. 500 ha. land area was developed with support of the SNRMPEP and government of Lao PDR. Each household provided 2 ha of cleared/developed land to plant their cashew plots. SNRMPEP supported the farmers by providing 177 tons of organic fertilizer and 1,500 roles of barbed wire for fencing the plot and one gravity irrigation scheme.
SNRMPEP also established one cashew nursery. Government of Vietnam provided 150,000 grafted cashew plant of variety PN-1 which is one of the highest yielding varieties with large size nuts.

500 ha area under cashew has been planted and flourishing and additional 250 ha area have been cleared to plant the cashew in next wet season. Project also supported establishment of the mother plants in 10 ha area and cashew nursery with production capacity of 100,000 grafted plants, there will be an increase of 250 ha area under cashew every year. In first 2 years farmers conducted intercropping of legume and aerobic rice within the cashew plantation and generated additional income of Kip 3 million per HH. This year cashew plants are in full bloom and farmers will harvest the nuts in March-April. This year expected production is about 1.5 tons of nuts per ha which can generate income of about 10 million kip per ha. Now there is huge demand from other areas for the cashew plantation and cashew will one of the major crop like coffee for to support the livelihood of the poor farmers.
III. MS Project an effective tool for subproject management

AIT Thailand under an IFAD funded APMAS project has supported SNRMPEP to build the capacity of staff for subproject management using MS Project. AIT organized 2 training programme at Bangkok followed by 1 training session for the project staff in Vientiane. A local service providers EDC have also been trained who has continue conducted 1 training course for the project staff in Vientiane followed by on the job coaching for the use of MS Project in all 5 provinces.

This training course aimed to (a) give introduction to project management fundamentals and project scheduling, (b) create/increase ability for participants to create and manage project scheduling using Microsoft Project, (c) create/increase ability for participants to assign and manage resources using Microsoft Project, (d) create/increase ability for participants to present and share their project schedule with other project team members and stakeholders.

Participants have learnt among many: basic concepts of project management, developing work breakdown structure (WBS), managing tasks, assigning resources, project tracking and reporting. The training course was delivered in a mix among individual, group works, and classroom learning. Project staffs have realized the importance of using project management tools such as MS Project and intend to apply this newly acquired skills into daily works in managing subprojects and tasks for more efficiency and better project results.

MS Project applied in some selected subproject as pilot basis and provinces found it very encouraging as they can synchronize the various activities under one subproject to be completed at proper time using PERT Chart approach for example in livestock development subproject before the purchase of the cattle, when farmers has to start preparation of cattle shade, cultivation of fodder, health management and capacity building and all of these activities can be started on certain time so at the time of arrival of farmers are fully prepared. In future this project management technology will be applied.
ADB Grant 0144-LAO; IFAD Grant 0145-LAO (DSF-8025-LA); Sustainable Natural Resource Management and Productivity Enhancement Project, Department of Planning and Cooperation, Ministry of Agriculture and Forestry, Vientiane, Lao PDR. Email snmapep5@gmail.com