

# TABI UPdate

Agro-biodiversity and agro-ecosystems for upland development



Schweizerische Eidgenossenschaft  
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Swiss Agency for Development  
and Cooperation SDC

The Agro Biodiversity Initiative



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## Mushroom species and collecting surveyed in Chomphet district, Luang Prabang province

Mushrooms from the natural forest are in high demand in Laos both for export and local consumption. While in the past there have been enough mushrooms to meet local demand, factors such as increasing population, decreasing forest habitat, and more efficient transportation to larger markets are leading to potentially unsustainable harvesting rates from the forest. As demand for mushrooms grow, some destructive harvesting practices have been introduced which may further reduce regeneration rates.

To help gain further understanding of mushroom collection techniques, and of pressures on naturally occurring mushroom species in the forest, TABI provided support for a survey in Chomphet district in Luang Prabang Province. The survey team consisted of members of the Lao Women Union of Luang Prabang Province and Chomphet District, staff from the Provincial Agriculture and Forestry Office and the Faculty of Agriculture from the National University of Laos (NUOL), and villagers from Ban Nakham, Ban Houay Tane, Ban Som, Ban Na and Ban Sam O. Mushroom collection techniques were investigated as part of the survey, and the forest was mapped for different mushroom species growing sites.

The survey team found many species of mushroom to be abundant in the open deciduous forest, with the most common species being Het Lagok, Het Dou, Het Seth, Het Khai, Het Khaochao, Het Mandin, Het Na It, Het Na On, Het Nouat, Het Khon, Het Makkheua, Het Deune, Het Kha, Het Kanchong and Het Thane (see Table 1 on page 2). The survey found that mushroom collecting in the surveyed village areas was an important economic activity, with some collectors working through the night to sell in the morning at the market or to mushroom traders from outside the village. However, the team also found some people were collecting the mushrooms in a destructive way, removing the roots and stumps of the mushrooms, as well as the above ground fruiting body. This type of collecting is likely to lead to declining mushroom production.

Future activities planned based on the results of the survey include:

- Awareness campaigns to provide information on more sustainable mushroom harvesting techniques
- Further study on how to increase and maintain mushroom populations in the natural forest collection areas
- Further study into the market and supply chains for specific mushrooms
- Development of an awareness campaign and dissemination of indigenous knowledge regarding poisonous species
- Promotion of mushroom growing in village home gardens, and
- Developing a mushroom incidence calendar to support collection plans.

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Table1: Mushroom species surveyed

ລ/ດ No.	ຊື່ທ້ອງຖິ່ນ Local name	ຊື່ສາມັນ Common name	ຊື່ວິທະຍາສາດ Scientific name
1	ເຂັດລະໂງກ	ເຂັດລະໂງກຂາວ	<i>Amanita citrine var citrine</i>
2	ເຂັດໄຂ່	ເຂັດລະໂງກເຫຼືອງ	<i>Amanita wubjunguilla, Amanita caesarea, Amanita hemibapha</i>
3	ເຂັດເຂົ້າເກັດ		<i>Amanita umbrinolutea, A. vaginata</i>
4	ເຂັດດູ່		<i>Russula sanguinea</i>
5	ເຂັດໝອດ (ເຂັດກັອບອັອບ)	ເຂັດປະກາລັງ	<i>Clavulina cristata, Clavulina coralloides, Clavulina rugosa</i>
6	ເຂັດສະມອດ/ເຂັດມີ	ເຂັດຕີນກັບແກ້	<i>Schizophyllum commune</i>
7	ເຂັດເວັງ	ເຂັດເວັງ	<i>Boletus spp., Boletus edulis, Boletus aestivalis, Tylopilus alboater, Boletus reticulatus</i>
8	ເຂັດໄຮ	ເຂັດຕີນແຮດ	<i>Tricholoma crassum Berk.</i>
9	ເຂັດແຮດ	ເຂັດແຮດ	<i>Cantharellus cibarius</i>
10	ເຂັດມັນດິນ		<i>Clitocybe nebularis</i>
11	ເຂັດມັນດິນສີອິດ		<i>Clitocybe odora</i>
12	ເຂັດຖ່ານ	ເຂັດຖ່ານ	<i>Russula densifolia (Secr) Gill.</i>
13	ເຂັດໜ້າກົວ	ເຂັດໜ້າກົວ	<i>Russula foetens Fr.</i>
14	ເຂັດໜ້າອອນ	ເຂັດນ້ຳໝາກ	<i>Russula amygdaloides</i>
15	ເຂັດໜ້າອອນ	ເຂັດນ້ຳໝາກ	<i>Russula silvicola</i>
16	ເຂັດໜ້າອອນ	ເຂັດນ້ຳໝາກ	<i>Russula vesca</i>
17	ເຂັດໜ້າອອນ	ເຂັດນ້ຳໝາກ	<i>Russula lepida</i>
18	ເຂັດໜ້າອອນ/ເຂັດເກົ້າ	ເຂັດນ້ຳໝາກ	<i>Russula emetica</i>
19	ເຂັດຕີນາມແນະ/ເຂັດໜ້າອິດ		<i>Russula Phenomenon</i>
20	ເຂັດໜ້າເຫືາ/ໜ້າໄຄ		<i>Russula cyanoxantha</i>
21	ເຂັດເຕີນ	ເຂັດໄຄ	<i>Rusula virescens Fr. Russula sp.</i>
22	ເຂັດກ້ານຈອງ	ເຂັດຫຼັງຈີ່	<i>Ganoderma lucidum</i>
23	ເຂັດເຂົ້າຈ້າວ	ເຂັດເຂົ້າແບັງ	<i>Russula alboareolata</i>
24	ເຂັດໝາກເຂືອ		<i>Pisolithus tinctorius</i>
25	ເຂັດໜ້າທັງຄ້ອນທັງ		<i>Lycoperdon pyriforme</i>
26	ເຂັດຕີນຊຳ	ເຂັດຂອນ	<i>Lentinus sp.</i>
27	ເຂັດປູໝູ		<i>Lentinus sp.</i>
28	ເຂັດບົດ	ເຂັດບົດ	<i>Lentinus polychrous Lev.</i>
29	ເຂັດຄຳ	ເຂັດຄຳ	<i>Luctarius piperatus</i>
30	ເຂັດຄົນຟານ	ເຂັດປວກ	<i>Termitomyces cartilagineus</i>
31	ເຂັດຄົນ	ເຂັດປວກ	<i>Termitomyces fuliginosus</i>
32	ເຂັດຄົນນ້ອຍ/ເຂັດຕາບ	ເຂັດປວກ	<i>Termitomyces microcarpus</i>
33	ເຂັດຫາດ		<i>Lactarius rubidus</i>
34	ເຂັດໂຕ່ງຝີນ		<i>Melanoleuca alboflavida</i>
35	ເຂັດເຍື່ອ		<i>Chlorophyllum molybdites</i>
36	ເຂັດລະໂງກເບື້ອ	ເຂັດລະໂງກຫິນ	<i>Amanita virosa Secr.</i>
37	ເຂັດລະໂງກກ້ານຜັ່ນ		<i>Amanita phalloides</i>
38	ເຂັດເຍື່ອ (no name ?)		<i>Amanita pantherina</i>
39	ເຂັດເຍື່ອ (no name ?)		<i>Marasmius androsaceus</i>
40	ເຂັດເຍື່ອ (no name ?)		<i>Polyporus picipes</i>
41	ເຂັດເຍື່ອ (no name ?)	ລາທັງສີສົ້ມ	<i>Pycnoporus cinnabarinus</i>
42	ເຂັດເຍື່ອ (no name ?)		<i>Coltricia perennis</i>
43	ເຂັດເຍື່ອ (no name ?)		<i>Ganoderma colossum</i>

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**"Plain of Jars" honey hits the shelves**

TABI has been promoting improved productivity from native honey bees for 65 families in 5 villages (Ponsai and Kheung in Paek Distruct and LaeThong, Bong and Huat Dtun in Phoukods District), starting in December 2012. Traditionally, villagers raised bees in logs for honey production. Based on villager's request, TABI provided support and training on raising bees in wooden crates, and how to manage and increase the number of bee colonies in order to raise the production of high quality honey. Villagers were then assisted to survey the markets, shops and

'honey bottlers' in Vientiane, and were able to establish a partnership with the Niyom Lao company who agreed to train villagers in primary processing and bottling of the honey in the village. In this first pilot production season, January to June 2013, of the 65 villagers, 38 villagers produced honey in excess of family use requirement – that is, they had honey to sell at the market. Of these 38 families, 16 families joined the TABI/NiYom Lao marketing group, providing 142kg or litres of honey which was packaged into 440 bottles, resulting in a gross income of 7,589,000 kip from sales.



A range of different honey in Laos

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## Three new Subprojects in Xiengkhouang and Houaphanh provinces

As of September 2013, TABI is supporting 53 subprojects including the three new subprojects outlined below.

### 1. Integrating cropping of red beans and corn to control imperata grass and restore soil and fertility in degraded upland agricultural fields in Xiengkhouang province

TABI is providing support to 24 families in Ban Longkhane and Ban Longkhao-Longhang in Xieng Khouang to develop a sustainable cropping system using rotations of corn and red beans. Increases in local populations have led to increased rotations of corn cropping, and decreasing fallow periods. This intensification of land use has led to imperata grass invasion and persistence, as well as decreasing soil fertility which impacts on crop yields. The new system being promoted controls the imperata grass while at the same time increasing soil fertility, leading to increased yields for farmers, and generally more diverse soil biota.



### 2. The conservation of native fish species in 4 villages of Nonghet District, Xieng Khouang Province

River and stream fishing is an important source of income and food for many villages across Laos. However, increasing populations and new destructive fishing methods are threatening what has long been a sustainable resource, with some species being fished almost to extinction. To address these issues TABI is out scaling good experience in other areas to provide an awareness campaign in Nonghet District of Xieng Khouang province (Ban Sop Ten and Ban Phiang Mone in Houay Lom Village Cluster, and Ban Houay Khong and Ban Nam Houai in Phou Houa Xang Village Cluster) and facilitating the establishment of management zones including 18 native species conservation zones.

### 3. Improved native pig raising in two villages of Sop Bao District, Houa Phan Province with a focus on exports

The raising of local varieties of pigs is an activity that has been carried out in Lao villages for many generations for both income and food production. However traditional techniques of allowing animals to roam freely can lead to increased animal death, high rates of disease, and slow reproduction rates. TABI is providing support for villagers in 2 villages (Ban Pahang and Ban Pong) in Sop Bao District of Houa Phan Province to promote improved techniques for pig raising including vaccination, the use of traditional plant based remedies to prevent and treat disease, and intensification through growing and processing fodder species to feed pigs kept in pens. Improved techniques such as those supported in this new sub project will provide a more certain supply of meat for the villagers, and allow for more livestock to be sold, mainly to Vietnam, improving household incomes.



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## Fish passage in Houaphanh and Luangprabang



Aquatic resources are a vital source of food and income for many villagers in Laos. A major threat for many species of fish vital for rural livelihoods is the blocking of migratory pathways through the building of dams and irrigation weirs. Obstructions along rivers and streams can severely limit the ability for migratory species to travel to natural spawning grounds, leading to decreases in fish catches throughout the river systems. TABI is currently investigating the feasibility of constructing fish passages around selected irrigation weirs in Luang Prabang Province. It is hoped that well designed and built fish passages, used in conjunction with effective village aquatic resource management and fish conservation zones will protect and support the rich aquatic resources for both village consumption and income, and for biodiversity conservation.

## TABI supports sustainable Rattan harvesting by providing funding to the WWF led 'Sustainable Rattan Production and Harvesting Project'

In Bolikhamxai and Sekong Province, SDC (Swiss Development Corporation) is helping villagers sustainably harvest rattan from natural forest by supporting the Laos component of the WWF led 'Sustainable Rattan Production and Harvesting Project'. The project, which is regionally focused, brings together international rattan suppliers and consumers, Lao villagers and businesses, and governments to achieve both improved incomes for villagers, and better conservation outcomes for natural forest areas in the targeted districts. The 440 thousand USD support comes at the crucial 'strengthening' phase of the project to ensure that the good work done to date is sustainable into the future. The approach taken by the project is to strengthen people's livelihoods by building capacity in local villages, SMEs, and government. In addition, the project has assisted in gaining FSC certification for the harvested rattan, allowing local businesses and villagers demand a higher price for their products in international markets. To date the project has helped improve the livelihoods of 633 households of a total of 2,665 households in 21 villages in 4 districts of the two provinces (see Table 2 below). During the phase of the project supported by SDC it is intended that the project's reach will be even greater, with plans to expand the FSC certified forest area from which rattan is collected. The specific objectives of the project during this phase are to:

- Strengthen village-level rattan management groups
- Expansion of the certified (FSC) sustainable forest resource management area
- Provide linkages between suppliers
- Improve research on rattan ecology and biodiversity.

A key element of the sustainable rattan supply chain is the chain of custody (COC) certificate for the three Lao rattan companies involved in the production of rattan products. These companies are the Leunilan Agriculture Promotion Company, the Danlao

Company, and the Souphi Wood Processing Factory. These companies are already benefitting from the COC certification. For example, in 2011 the Leunilan Company exported a container of 2,460 sets of FRC rattan baskets to the European market for a total of 40,490 USD. In 2012 the Souphi Wood Processing Factory exported 3,470 sets of rattan bread trays to Switzerland for 46,609 USD. These companies employ over 200 hundred staff, of which 55% are women. In addition to the increased income to these companies and their employees, these large orders also provide a significant benefit to the villagers. For example, 50 percent of the income generated through the export of baskets by the Souphi Wood Processing Factory in 2012/13 went to 630 households in participating villages. This provides an average income of 100 to 150 USD for each household during the three months of production. See the figure below for more information on how the income benefits were distributed. The SDC funding will allow the WWF project to continue to demonstrate the practicality of a business model built upon community participation, sustainable natural resource management, and improved livelihoods with implications for the provincial and national economy. Further, support at this stage will allow local Lao FSC rattan producers secure long term supply for their products to the international market. Supporting such projects allows SDC to achieve the conservation of agrobiodiversity in rural landscapes while improving livelihoods through sustainable use of natural resources.

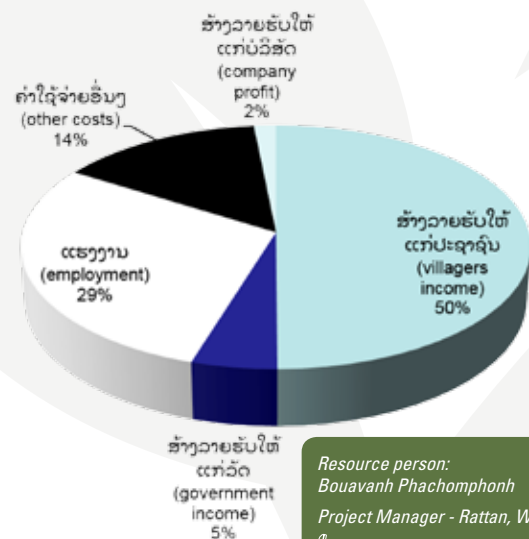


Table 2: Village income from Rattan

Village	No. HH	Income in Kip (2011 )	Income in Kip 2012 –Feb. 13
Sobphouan	139	22,675,000	18,016,000
Phonthong	369	82,025,000	227,992,000
Poungpatao	72	23,838,000	13,796,000
Donxart	69	31,109,000	5,474,000
Xhamtuei	110	-	4,518,000
Tha veng	189	51,132,000	57,099,000
Kuanchanh	157	31,500,000	34,200,000
Thongviengkham	203	5,080,000	6,888,000



### FSC Rattan tray production in 2013



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Table 3: Rattan species and uses

Scientific name	Products/uses
<i>C. Poilanei</i>	Handicrafts (high quality), young shoots edible
<i>C. rhabdocladus</i>	Handicrafts (high quality), young shoots edible
<i>D. jenkinsiana</i>	Handicrafts (high quality), young shoots and ripe fruit edible, seed used for souvenirs
<i>P. pierreana</i>	Handicrafts, young shoots edible
<i>C. laoensis</i>	Handicrafts (high quality), young shoots and ripe fruit edible
<i>C. gracilis</i>	Handicrafts, young shoots edible
<i>C. henryanus</i>	Handicrafts, young shoots edible
<i>C. solitarius</i>	Handicrafts (high quality) young shoots and ripe fruit edible
<i>K. lacinososa</i>	Stem used for frame of handicrafts
<i>C. palustris</i>	Handicrafts (high quality), young shoots and ripe fruit edible
<i>C. viminalis</i>	Handicrafts (high quality), young shoots and ripe fruit edible
<i>C. tetradactylus</i>	Handicrafts (high quality)
<i>C. Wailong</i>	Handicrafts (high quality), young shoots and ripe fruit edible
<i>C. plathycanthus</i>	Handicrafts (high quality), young shoots and ripe fruit edible



### Domestication of "Douk Deua" to relieve pressure on natural resources

Douk Deua or Kapouk are Lao names for a group of species of the genus *Amorphophallus* that are found in natural and secondary forests throughout all the provinces of Laos. It is a seasonal plant species although it can live for many years via an underground tuber. Each year a 150 to 200 cm stem and large single leaf grow up out of the ground during the wet season from the tuber and it is this tuber that is collected from the forest for sale to traders. These traders currently pay 4000 kip per kilogram for raw tuber heads or 20,000 kip per kilogram for dried tuber heads. The increasing export demand for Douk Deua means the demand for the plants from the natural forest is high, and many of the species are likely to come under threat due to overharvesting. The natural population may take many years to recover from this over exploitation. To reduce the pressure on the natural Douk Deua plants in the forest, TABI has been encouraging and promoting the growing of plants in village gardens (as already practiced in some villages), which will also generate more income for villagers.

Botanists have recently described 19 species related to Doukdeua that are found in Laos:

1. *Amorphophallus brevispathus*
2. *Amorphophallus coudercii*
3. *Amorphophallus croatii*
4. *Amorphophallus cruddasianus*
5. *Amorphophallus gallowayi*
6. *Amorphophallus kachinensis*
7. *Amorphophallus koratensis*
8. *Amorphophallus krausei*
9. *Amorphophallus laoticus*
10. *Amorphophallus mekongensis*
11. *Amorphophallus myosuroides*
12. *Amorphophallus ongakulii*
13. *Amorphophallus paeoniifolius*
14. *Amorphophallus parvulus*
15. *Amorphophallus prainii*
16. *Amorphophallus rhizomatosus*
17. *Amorphophallus scaber*
18. *Amorphophallus schmidtiae*
19. *Amorphophallus yunnanensis*



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## *Crispy River Weed 'khai paen' contributes both to village income and aquatic biodiversity*

The TABI supported khai paen project has been working in four villages in four separate districts of Luang Prabang Province. The total value of the production of khai paen in these four villages alone was 1,315 million kip or US\$ 168 thousand in 2011, and 1,539 million kip or US 197 thousand in 2012 (see Table 4 below). That is equivalent to average gross revenue of approximately 8 million kip or \$1,025 per household per year in 2011 and 13 million kip or \$1770 per household in 2012.

**Table 4: Estimated volume and value of khai paen production in four target villages**

Village	2011				2011 Total	2012			2012 Total
	Done Kao	Mouang Kham	Done Mor	Ban Bom		Don Kao	Mouang Kham	Ban Bom	
# Households producing	24	46	31	55		11	36	55	
fresh khai paen collected (kg)	5,840	40,641	32,200	62,100	140,781	1,500	27,600	27,270	56,370
sheets produced	55,760	432,160	201,250	639,600	1,328,770	15,500	276,000	217,000	508,500
sheets sold	55,414	442,480	200,652	636,930	1,335,476	15,500	270,100	214,860	500,460
sheets consumed	305	2,670	598	2,670	6,243	0	5,900	3,020	8,920
village income (million kip)	104.5	493.2	268.6	449	1,315.30	62	945.4	531.9	1,539.30
income per household (million kip)	4.4	10.7	8.7	8.2	8 per HH	5.6	26.3	9.7	13.6 per HH

In addition to providing an important revenue source for a number of villages, these fresh-river algae are also a natural and essential part of the ecosystem, growing underwater on rocks. They thrive in clear spots of running water in the Mekong River and other smaller rivers and streams. In these habitats, the algae are a vital part of the aquatic food chain. Small fresh-water crustaceans, fishes and other small animals consume these algae and in turn are consumed by larger animals. The giant catfish, pa beuk, the largest species of fish found in the Mekong river feeds almost exclusively on these algae. The sustainable management of this natural aquatic resource promoted by TABI and its project partners will provide an ongoing source of revenue for a large number of villagers, as well as contribute to the conservation of aquatic biodiversity.



## *Subsector Working group on Agro-biodiversity*

The Sub Sector Working Group on Agro-biodiversity (sSWG-ABD) held its inception meeting on the 20th September 2013 at the Lao Plaza Hotel. The meeting was chaired by Vice Director Dr Phouangparisak Pravongviengkham and Mr Savanh Hanephome of MAF, and co-chaired by Dr Lilliane Ortega of SDC.

Working group participants included:

Organisation	Attendees
GOL	10 persons
DP/UN	7 persons
IO/Projects	13 persons
NGOs/NPAs	7 persons
Research and Education	3 persons

This first meeting reviewed the terms of reference of the sSWG-ABD. Two changes proposed were to increase the scope of agro-biodiversity to include 'ecosystems', and to allow consideration of technical aspects of agro-biodiversity in addition to policy aspects. The meeting then agreed on the following topics for the annual work plan:

1. Lao rice genetic resources maintenance and assessment (responsible agencies TABI, TA, DoA and Nabong)
2. Potential, constraints and solutions to development of forest rattan (responsible agencies: WWF, FRC (MAF))
3. Enhanced management of selected/key medicinal plants (responsible agencies: DoH/TMC, DoF, FRC)
4. Aquatic resources – livelihoods: potential for fish passages, and conservation/propagation of native species (responsible agencies: TABI, TA, LARREC (NAFRI), Faculty of Agriculture/ NUOL)

An additional task agreed was to create an inventory and profile of agencies, programs and projects who focus on, or support the role of ABD in development. Meetings of the sSWG-ABD will be held twice a year, with each meeting focused on at least two topics.

### The scope of 'Agro-biodiversity'

"the variety and variability of indigenous animals, plants and micro-organisms....used for...food, agriculture and livelihoods.....including crops, livestock, forestry and fisheries..... diversity of genetic resources used for food, fodder, fiber, fuel and medicine"

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