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Original Paper

Preliminary Field Survey of Cultivated Crops in North Eastern Myanmar, Northern Laos and Northern Thailand, 2013

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Summary

To investigate the influence by local developments and international economy in remote minority dwelling areas on utilizations of crop and plant material, we surveyed the status of cultivation and distribution of crops at markets and farmers' fields in northeastern Myanmar, northern Laos and northern Thailand. The survey was conducted from 10th to 26th November in 2013 and funded by a Grant-in-Aid for Overseas Scientific Research of JSPS.

The production of large-scale vegetables by the external demand was performed in Shan State of Myanmar and there was a situation where the native cultivars have been lost and changed into modern ones improved in other countries. On the other hand, conventional landraces were recognized such as eggplants, and the traditional food use was still observed, although cultivation and distribution of foreign vegetables were expanding in the northern part of Laos. Since rapid modernization in these areas is progressing, it is considered that there is a need to perform the investigation, archiving and collection of plant genetic resources in the future and to promote the conservation and sustainable uses of native landraces as soon as possible.

Introduction

Wild biodiversity is really high in a Southeast Asian hillside and mountainous area, and the diversity of ethnic minorities' culture is also observed strongly. In addition, it is also considered as one of the centers of crop diversity (Vavilov, 1926) and actually it is confirmed by former survey and research in the area.

The economic activities beyond the border in the areas concerned with Thailand, Myanmar and Laos become active. Furthermore, knowledge and the materials of the plant genetic resources which have been used in traditional cultures and customs are being downplayed and lost because of a rapid change by the modernization. Therefore, it is necessary to understand the state of conservation and utilization dynamics of plant genetic resource including crop and to investigate changes in home-use farm products cropping system in minority living areas.

In the area concerned, several field investigations and collections of plant genetic resources were carried out so far in Myanmar (Saito *et al*., 2006; Watanabe *et al.*, 2007; Watanabe *et al*., 2011; Kawase *et al*., 2011; Yamamoto *et al*., 2011) and in Laos (Ochiai, 2002; Sakata *et al*., 2008; Saito *et al*., 2009; Matsunaga *et al*., 2010; Okuizumi *et al*., 2012; Kawase *et al*., 2012), but it was limited that the panoramic view information with respect to the cultivation and distribution of vegetable crops which was easily changed by external factors.

Thus, we field-surveyed the status of cultivation and the distribution of crops, mainly vegetables, at markets and farmers' fields in those areas in northeastern Myanmar, northern Laos and northern Thailand in order to investigate influence on utilizations of crop and plant material from local developments and international economy in the remote minority dwelling area.

Methods

The survey team members were basically Prof. Dr. Kazuo Watanabe, Gene Research Center, University of Tsukuba, Japan and Dr. Shin-ichi Yamamoto, Genetic Resources Center, National Institute of Agrobiological Sciences, Japan. Then Ms. Nan Hmwe Hmwe, Plant Biotechnology Center, Department of Agriculture, Ministry of Agriculture and Irrigation in Myanmar, Mr. Chanthanom Deuanhaksa, Agriculture Research Center, National Agriculture and Forestry Research Institute in Laos, and Mr. Myo Thiha Kyaw and Dr. Phunsiri Suthiluk, the School of Agro-Industry, Mae Fah Luang University in Thailand, respectively, joined in each country.

The itinerary of this survey and visited site are shown in Table 1 and Fig. 1, respectively. Air flights were used for international and intercity transfer, a rental car was used for the field survey and a motorboat was used at Inle Lake.

We focused mainly on the vegetables that it was thought that the influence of the external economy was much stronger than rice and cereals. We interviewed vegetable vendors at the markets and farmers at the farmer's field to collect information about the vegetables and herbs treated there and took photographs of those crops for the record.

Results and Discussion

North Eastern Myanmar

In Myanmar, we investigated the status of production and the distribution of vegetables at market, vegetable accumulative sites or farmers' fields in Aungban, Kalaw, Tegyit and Nyaung Shwe (Inle Lake) in Shan State. At the vegetable accumulative site in Aungban, several crops such as tomato, chayote, podded peas, green beans, cabbage, cauliflower, carrot, potato, ginger, garlic and onion etc. were gathered in huge amounts (Photo 1). A broker, Mr. Ko Win Naing said that those vegetables would be dispatched to all over the country in Myanmar and also exported to neighboring country, such as India.

When we visited Hin Kha Village, a suburb of Aungban, rice, corn, niger seed and radish were

Table 1. Itinerary of the field study in 2013

Date			Itinerary	Stay
10	Nov	Sun	Narita - (TG641) - Bangkok Bangkok- (TG305) - Yangon	Yangon
11	Nov	Mon	around Yangon (car)	Yangon
12	Nov	Tue	Yangon - (W9-141) - Heho Heho - Aungban - Kalaw(car)	Kalaw
13	Nov	Wed	Kalaw - Aungban - Tegyit - Kalaw (car)	Kalaw
14	Nov	Thu	Kalaw - Nyaung Shwe - Taunggyi (car)	Taunggyi
15	Nov	Fri	Taunggyi - Heho - (W9-141) - Yangon	Yangon
16	Nov	Sat	Yangon - (TG304) - Bangkok Bangkok - (TG574) - Vientiane	Vientiane
17	Nov	Sun	Vientiane - (QV101) - Luang Prabang Luang Prabang - Oudom Xay (car)	Oudom Xay
18	Nov	Mon	Oudom Xay - Muang Kua - Oudom Xay (car)	Oudom Xay
19	Nov	Tue	Oudom Xay - Luang Prabang (car)	Luang Prabang
20	Nov	Wed	Luang Prabang - (QV102) - Vientiane	Vientiane
21	Nov	Thu	around Vientiane (car)	Vientiane
22	Nov	Fri	Vientiane - (TG571) -Bangkok	Bangkok
23	Nov	Sat	Bangkok - (TG134) - Chiang Rai Chiang Rai - Mae Sai (car)	Mae Sai
24	Nov	Sun	Mae Sai - Tachileik - Mae Sai -	Chiang Rai
25	Nov	Mon	Chiang Rai - (TG135) - Bangkok	Bangkok
26	Nov	Tue	Bangkok - (TG676) - Narita	

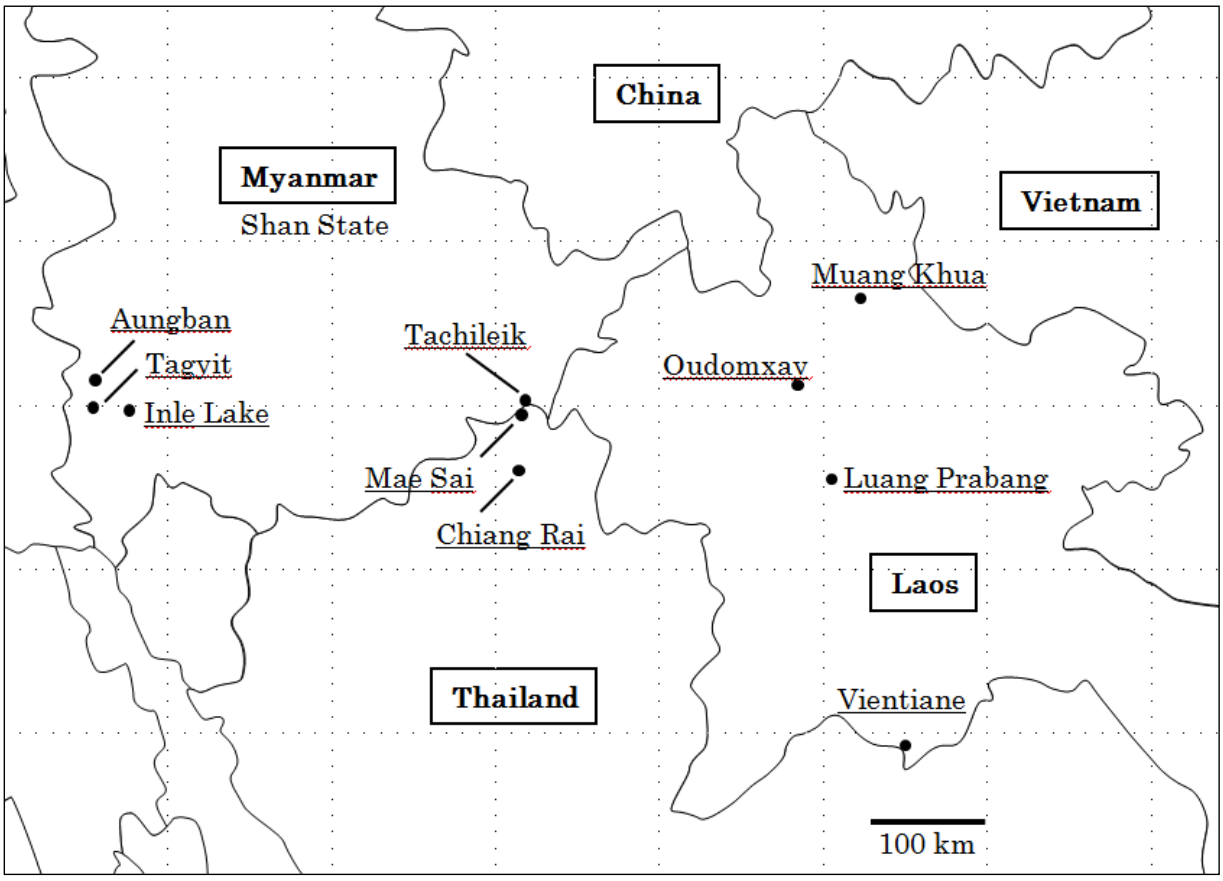

Fig. 1. Outline map of surveyed area in 2013

cultivated for mass production. Radish was grown for edible oil source in the area. Then, we observed a backyard garden at a farmhouse and found lima bean and Job's tear which were thought to be landraces (Table 3). We also visited a farmer who cultivated ginger for the market near Tegyit town and he told us that the productivity was 10 times with rich compost but root mealy bug came problem recently (Photo 2).

At the Inle Lake near to Nyaung Shwe town, we visited floating fields made by water plants in a traditional style which is similar to hydroponic culture. However, mainly cultivated crop in the field was an improved variety of tomato from Thailand (Table 3, Photo 3). In the surveyed area, crop varieties have been changed since the demands of production come from outside, both domestically and internationally and it is easy to cultivate western vegetables. Thus, about the olericulture, conventional landraces are being lost in Shan State mainly because of market mechanisms. On the other hand, about rice, which is a staple food in Myanmar, the government purchases and sells it cheaply by reducing input such as agrochemicals.

Northern Laos

We visited a market or the farmers' fields in the minority race residence areas of Luang Prabang and Oudomxay province, and investigated cultivation, the circulation situation of the convention crops and the improved varieties in Laos likewise in Myanmar.

There were abundant foreign vegetables such as cabbage, cauliflower and carrot and so on in the market, too (Table 2). And a lot of fruits were imported from China (Photo 4). But a traditional landrace was recognized with some crops such as eggplant (Photo 5). In addition, a lot of sales of the wild plants including a rattan petiole and Dokkae (flower of *Markhamia stipulata*) were observed. Wild flowers were frequently observed to be used as vegetables in this area. Furthermore, the same as the report by Kawase *et al*. (2012), the hunted wild creatures including bamboo worm, small birds and animals were frequently sold at the markets and the roadside stores (Photo 6). In the market and farmer's field, the seed packages of improved vegetable variety were often found and those vegetables were actually observed in the field (Photos 7 and 8).

A large-scale slash-and-burn agriculture was frequent in the investigated area (Photo 9) and corn was cultivated in the upper part and upland rice was grown in the lower part. The rice grown in a field was a tall upland variety (Photo 10) and thought to be a landrace which was suitable to the conventional harvesting style that farmers carry a basket on their back and stroke rice grain to drop to the basket. Thus we confirmed that the conventional food use was continued in the northern part of Laos.

Northern Thailand and Tachileik

In the investigation of the Chiang Rai province, the northernmost part of Thailand, we inspected markets in Tachileik town of the Myanmar side beyond the border, around Mae Sai town near the border and Chiang Rai city.

Vegetables sold in the market of this area were not significantly different from those sold in other regions of this survey but more similar to the ones in Laos. Much more kinds of culinary herb were sold in the market. In addition, bamboo worm and other insects were also sold in Chiang Rai. Tachileik had been strongly influenced by the Thai economy as a thriving area with border trade, in comparison with the town in the Shan State which we visited earlier. It was recognized that a lot of fruit was imported from Thailand in particular. In the field of the farmer which we visited for an investigation in Tachileik, two kinds of eggplant, mustard, tomato, Chinese kale, pumpkin, okra, roselle, cowpea, podded pea, chrysanthemum for

cut flower and so on were observed.

As this was the first year of the project, in order to outline the impact of the international economy of crop production in Myanmar and Laos, we investigated along the main highway without determining the target area as a spot.

Both regions received impact from neighboring China and Thailand strongly, modern varieties bred in both countries were cultivated for export so much in the regions. In particular, the store that set the Chinese characters sign were seen a lot in somewhat big towns, showing a strong influence from China. The demands for vegetables from economic development of neighboring countries and the construction of new highway may have large impact on the changes in the crops. Since it is considered the socioeconomic modernization progresses in this area from now on, due to the influence of the international and domestic economy, there is a need for the immediate investigation and conservation of crop landraces. In addition, it should be necessary an investigation of plant usage and collection of plant genetic resources in small villages that are remote from the highway which we could not investigate this time.

From the result of this survey, we would like to continue investigations in the northern Laos where a more traditional food use and traditional farming such as slash-and-burn remain, as a center of research region. About Myanmar, other than Shan State, in Kachin State, and Chin State etc., cultivation for commercial purpose was not widespread so much yet (Kawahara *et al*., 2006). Then we would consider those states as the next target area.

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ミャンマー北東部，タイ北部およびラオス北部における栽培植物・有用植物の予備的調査（2013 年）

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和文摘要

少数民族居住地域における地域開発活動や国際経済が植物利用および伝統知識に与える影響を調査するため，ミャンマー，ラオスおよびタイ北部の少数民族居住地域にて市場や農村地域で野菜を中心とした作物の栽培及び流通状況の調査を行った．調査は科学研究費基盤 (A) 海外学術調査「辺境少数民族地帯での植物利用及び伝統知の遺存と地域発展活動や国際経済の影響評価」（研究課題番号 25257416　研究代表者筑波大学渡邉和男）により，平成 25 年 11 月 10 日より 11 月 26 日の日程で遂行した．ミャンマーのシャン州では外部的な需要による大規模な野菜の生産が行われており，他国産の近代品種への変化が進み，在来品種が失われている状況であった．一方ラオス北部地域では外国産野菜の栽培と流通が広がっているが，ナスなどで在来品種が認められ，伝統的な食品利用が残っていた．しかしながら，これらの地域においても急速に近代化が進みつつあるので，今後早急に植物遺伝資源の調査と収集を行い，在来品種の保全を進める必要があると考えられる．

Table 2. List of crops and herbs observed in the market

	Date	11/12/2013	11/13/2013	11/18/2013	11/18/2013	11/19/2013	11/19/2013	11/20/2013	11/20/2013	11/20/2013	11/21/2013	11/21/2013	11/24/2013	11/24/2013	11/25/2013
	Village/Town/City	Aungban	Aungban	Oudomxay	Muang Khua	Lak 32	Luang Prabang	Luang Prabang	Luang Prabang	Luang Prabang	Vientiane	Vientiane	Tachileik	Mae Sai	Chiang Rai
	Market name or type	accumulation market (mkt)	5 days market	large food market	large food market	small food market	Navieng Kham/ large food mkt	Tha Hua Moi/ large food mkt	Phosy/ large food mkt	Phong Savang/ midium food mkt	Thong Kan Kham/ large food mkt	Khua Din/ large food mkt	large food market	Pa Muat/ midium food mkt	large food mkt
	Latitude (N)	20.39.08.589	20.39.36.684	20.41.15.331	21.04.54.267	20.34.36.994	19.52.34.158	19.53.28.773	19.52.36.775	19.53.22.462	17.58.28.390	17.57.53.928	20.27.07.506	20.24.39.981	19.54.35.848
	Longitude (E)	96.38.01.953	96.38.04.419	101.59.36.131	102.30.18.417	102.07.27.724	102.08.26.221	102.08.03.321	102.07.23.703	102.08.44.390	102.36.24.796	102.36.56.538	99.53.11.778	99.53.12.807	99.49.42.729
	Altitude (m)	1287	1284	625	388	859	292	289	209	301	169	170	403	420	398
Crop Name	Latin Name														
chili pepper	*Capsicum annuum* L.		○	○	○	○	○	○	○		○	○	○	○	○
tomato	*Solanum lycopersicum* L.	○	○	○	○		○	○	○	○	○	○	○	○	○
potato	*Solanum tuberosum* L.	○	○	○	○	○	○	○	○	○	○	○	○	○	○
eggplant	*Solanum melongena* L.		○	○	○		○	○	○	○	○	○	○	○	○
turkey berry	*Solanum torvum* Sw.		○	○			○	○	○			○		○	
scarlet eggplant	*Solanum intergrifolium* Poir.			○			○						○		○
chayote	*Sechium edule* (Jacq.) Sw.	○	○	○	○		○	○	○	○	○	○	○		○
young shoot of Cucurbitaceae	Cucurbitaceae		chayote	squash			squash	chayote	squash	chayote	chayote		bottle gourd	chayote	chayote
cucumber	*Cucumis sativus* L.		○	○	○		○	○	○	○	○	○	○	○	○
squash	*Cucurbita* spp.	○	○	○			○	○	○	○	○		○		○
zucchini	*Cucurbita pepo* L. var. *cylindrica*		○	○			○				○			○	
sponge gourd	*Luffa aegyptiaca* Mill.			○			○	○	○		○	○	○		
angled luffa	*Luffa acutangula* (L.) Roxb.		○	○			○	○	○		○		○		
bitter gourd	*Momordica charantia* L.			○	○		○	○	○		○	○	○	○	○
snake gourd	*Trichosanthes anguina* L.		○								○		○		
wax gourd	*Benincasa hispida* (Thunb.) Cogn.		○	○	○		○	○	○	○	○		○		○
bottle gourd	*Lagenaria siceraria* (Molina) Standl.		○	○			○	○	○	○	○		○	○	
passionfruit shoot	*Passiflora* spp.			○	○	○	○	○	○		○				
cabbage	*Brassica oleracea* L. var. *capitata* L.	○	○	○	○		○	○	○	○	○	○	○	○	○
cauliflower	*Brassica oleracea* L. var. *botrytis* L.			○			○	○		○	○		○		○
broccoli	*Brassica oleracea* L. var. *italica* Plenck						○	○		○	○		○		○
chinese kale	*Brassica oleracea* L. var. *alboglabra*		○	○					○		○	○	○	○	○
bok choy	*Brassica rapa* L. (Chinensis Group)						○	○	○		○	○	○		
Chinese cabbage	*Brassica rapa* L. (Pekinensis Group)		○	○	○		○	○	○	○	○	○	○	○	○
Chinese cab. Non-head	*Brassica rapa* L. (Pekinensis Group)		○	○		○	○	○	○	○	○		○		○
choy sum	*Brassica rapa* L. (Parachinensis Group)			○	○	○	○	○	○	○	○	○	○	○	○
mustard green	*Brassica juncea* (L.) Czern.			○		○		○	○	○	○	○	○	○	○
lettuce	*Lactuca sativa* L. var. *capitata*		○	○	○		○	○	○	○	○	○			○
stem lettuce	*Lactuca sativa* L. var. *angustana*			○							○				
leaf amaranth	*Amaranthus* spp.			○			○	○	○	○	○	○			○
water spinach	*Ipomea aquatica* Forsskal.		○		○		○	○	○		○		○	○	○
sweetpotato	*Ipomoea batatas* (L.) Lamk.		○	○			○	○		○	○		○	leaf	○
taro	*Colocasia esculenta* (L.) Schott		○	○/leaf ○			○	○	○	○	○/ stem ○	○/ stem ○	○	○	○
watercress	*Nasturtium officinale* W.T. Aiton		○					○	○	○					
garland chrysanthemum	*Glebionis coronaria* (L.) Cass. ex Spach						○	○			○	○		○	
pea shoot	*Pisum sativum* L.		○	○										○	○
podded pea	*Pisum sativum* L.	○					○	○					○	○	○
green bean	*Phaseolus vulgaris* L.	○	○		○	○	○	○	○	○		○	○	○	
lima bean	*Phaseolus lunatus* L.		○				○						○		○
winged bean	*Psophocarpus tetragonolobus* (L.) DC.		○	○	○		○	○	○				○	○	○
yard-long bean	*Vigna unguiculata* (L.) Walpers		○	○			○	○	○	○	○	○	○	○	○
lablab bean	*Lablab purpureus* (L.) Sweet		○				○						○	○	○
yam bean	*Pachyrhizus erosus* (L.) Urb.				○	○					○				○
carrot	*Daucus carota* L. subsp. sativus (Hoffm.) Arcang.	○	○	○	○		○	○	○	○	○	○	○		○
Daikon radish	*Raphanus sativus* L. var. *longipinnatus* L.H.Bailey		○	○			○/green pod ○	○	○/green pod ○		○	○	○	green pod	○/leaf○
ginger	*Zingiber officinale* Roscoe	○	○	○	○		○	○	○	○	○	○	○	○	○
garlic	*Allium sativum* L.	○	○	○	○		○	○	○	○	○	○	○		○
onion	*Allium cepa* L.	○	○	○	○		○	○	○	○	○	○	○	○	○
shallot	*Allium oschaninii* B.Fedtsch.		○		○		○	○	○		○	○	○	○	○

Table 2 (Continued).

	Date	11/12/2013	11/13/2013	11/18/2013	11/18/2013	11/19/2013	11/19/2013	11/20/2013	11/20/2013	11/20/2013	11/21/2013	11/21/2013	11/24/2013	11/24/2013	11/25/2013
	Village/Town/City	Aungban	Aungban	Oudomxay	Muang Khua	Lak 32	Luang Prabang	Luang Prabang	Luang Prabang	Luang Prabang	Vientiane	Vientiane	Tachileik	Mae Sai	Chiang Rai
	Market name or type	accumulation market (mkt)	5 days market	large food market	large food market	small food market	Navieng Kham/ large food mkt	Tha Hua Moi/ large food mkt	Phosy/ large food mkt	Phong Savang/ midium food mkt	Thong Kan Kham/ large food mkt	Khua Din/ large food mkt	large food market	Pa Muat/ midium food mkt	large food mkt
	Latitude (N)	20.39.08.589	20.39.36.684	20.41.15.331	21.04.54.267	20.34.36.994	19.52.34.158	19.53.28.773	19.52.36.775	19.53.22.462	17.58.28.390	17.57.53.928	20.27.07.506	20.24.39.981	19.54.35.848
	Longitude (E)	96.38.01.953	96.38.04.419	101.59.36.131	102.30.18.417	102.07.27.724	102.08.26.221	102.08.03.321	102.07.23.703	102.08.44.390	102.36.24.796	102.36.56.538	99.53.11.778	99.53.12.807	99.49.42.729
	Altitude (m)	1287	1284	625	388	859	292	289	209	301	169	170	403	420	398
Crop Name	Latin Name														
shallot leaf	*Allium oschaninii* B.Fedtsch.		○	○	○		○	○	○	○	○	○	○	○	○
chinese chives	*Allium tuberosum* Rottler ex Spreng.						○		○					○	○
hooker chives	*Allium hookeri* Thwaites		○										○		
okra	*Abelmoschus esculentus* (L.) Moench		○										○		
rosselle	*Hibiscus sabdariffa* L.		○	○/leaf ○			○		○				○/leaf ○		○
banana flower	*Musa* spp.			○	○		○	○	○	○	○	○	○		○
hummingbird flower	*Sesbania grandiflora* (L.) Poir.			○							○			○	○
dok kae	*Markhamia stipulata* (L.) Pers.			○			○	○	○		○		○	○	
dok nam panya	*Caesalpinia mimosoides* Lam			○			○	○	○						
Indian pennywort	*Centella asiatica* (L.) Urban		○								○	○	○		
Thai sweet basil	*Ocimum basilicum* L. var. *thyrsiflora*			○			○	○	○	○	○	○	○	○	○
holy basil	*Ocimum tenuiflorum* L.						○	○	○		○	○	○		○
coriandar	*Coriandrum sativum* L.		○	○	○	○	○	○	○	○	○	○	○	○	○
long coriandar	*Eryngium foetidum* L.			○	○		○	○	○		○	○	○		○
dill	*Anethum graveolens* L.			○	○		○	○	○	○	○	○		○	○
mint	*Mentha spicata* L.				○		○	○	○	○	○			○	
celery	*Apium graveolens* L. var. *dulce* (Mill.) DC.						○		○	○	○	○		○	○
mountain pepper	*Zanthoxylum* spp.			○	○	○		○							○
pak kaat	*Acmella paniculata* (Wall. ex DC.) R.K.Jansen			○			○	○	○						
heartleaf	*Houttuynia cordata* Thunb.						○				○	○		○	
vetnamese coriander	*Persicaria odorata* (Lour.) Sojak						○	○	○		○			○	○
wild betel leaves	*Piper sarmentosum* Roxb.			○			○	○	○					○	
lemon grass	*Cymbopogon schoenanthus* (L.) Spreng			○	○		○	○	○		○	○	○	○	○
galangal	*Alpinia galanga* (L.) Willd.			○			○	○	○		○	○	○	○	○
fingerroot	*Boesenbergia rotunda* (L.) Mansf.												○	○	○
turmeric	*Curcuma longa* L.										○			○	○
kaffir lime leaf	*Citrus hystrix* DC.						○		○					○	
climbing wattle	*Senegalia pennata* (L.) Maslin							○	○				○	○	
sa khan	*Piper ribesioides* Wall.			○		○	○	○	○					○	
rattan shoot	*Calamus* spp.			○		○	○	○	○					○	
midnight horror	*Oroxylum indicum* (L.) Benth. ex Kurz						○				○		○		
yanang	*Tiliacora triandra* (Colebr.) Diels						○	○	○			○			
yellow velvetleaf	*Limnocharis flava*			○			○	○							
Mekong weed	*Cladophora* spp.			○			○	○							
others			avocado, arrow root, 3 types of tree shoot	melon, green papaya, cassava, tamarind (pod and leaf), *Portulaca* spp. Palm seed (blue)			*Elsholtzia blanda*, young corn, tamarind leaves, mak kork, chayote flower, *Monochoria korsakowii* flower, *Commelina* spp., job's tear, watermelon, melon	cassava leaves	mak kork, tamarind		yam, lotus stem and root, spinatch, sugarcane, pandan leaves, green papaya, watermelon, melon, Indian spinach, etc.	squash or luffa flower,	neem shoot & flower, fern shoot, tamarind leaves, tree tomato, sugarcane, pandan leaves, curry tree leaves, job's tear, corn	neem shoot and flower, fern shoot, some herbs (Pak kachin hone, pak pan, bai iila, dok mabu)	sweet pepper, arrow root, rakkyo, mak kork, water mimosa, pandan leaves, *Tupistra muricata* flower spike

Table 3. List of crops and herbs observed in the farmers' field

Date	11/12/2013	11/13/2013	11/14/2013	11/18/2013	11/18/2013	11/18/2013	11/18/2013	11/18/2013	11/24/2013
Village/Town	Hin Kha	Aungban	Inle Lake	Lak Hok	HuayHom	Mon Savang	Phe	Moi Phe	Tachileik
farm type	back yard garden	ginger production	floating field	farmland	farmland	slash and burn yard	slash and burn yard	slash and burn yard	farmland
Latitude (N)	20.42.10.015	20.27.31.572	20.30.22.402	20.42.35.323	20.42.11.372	21.05.38.713	21.06.13.845	20.55.30.147	20.26.49.380
Longitude (E)	96.37.01.095	96.39.49.391	96.54.27.950	101.57.56.919	101.58.32.887	102.20.32.899	102.17.09.059	102.12.08.535	99.55.04.670
Altitude (m)	1309	1264	881	638	638	405	412	475	419
Crop cultivated	lablab bean	ginger	tomato	pea shoots	pea shoots	corn	upland rice	upland rice	tomato
	job's tear		cucumber	lettuce	lettuce	sorgham	sesame	corn	eggplant
	eggplant		yard-long bean	mustard green	mustard green	chili	bottle gourd		mustard green
			(taro)	chili	green beans	cardamom	wild bitter gourd		Chinese kale
			(water spinatch)	eggplant	Chinese kale		cardamom		squash
				mint	pumpkin				okra
				coriander	coriander		rubber tree		roselle
				garlic	garlic				yardlong bean
				onion	onion				chrythanthemum
				dill	dill				
				amaranth					
				radish					

Photo1. A large amount of cabbage at the accumulative market (Aungban, Myanmar)

Photo 2. A farmer's field for mass production of ginger (Pet Ta Le Village, Myanmar)

Photo 3. Tomato cultivation in a floating field (Inle Lake, Myanmar)

Photo 4. Pears and apples imported from China in a market (Oudomxay, Laos)

Photo 5. Eggplants considered as landraces in a market (Oudomxay, Laos)

Photo 6. Wild birds and animals sold in a market (Oudomxay, Laos)

Photo 7. Seeds improved in China sold at a market (Oudomxay, Laos)

Photo 8. Cultivation of lettuce, cabbage and so on for the market in riverside farmland (Huay Hom Village, Laos)

Photo 9. Huge slash-and-burn field in northern part of Laos (Phe Village, Laos)

Photo 10. Tall upland rice observed in a slash-and-burn field (Moi Phe Village, Laos)