Summary of Baseline Household Survey Results:

**Phonghong district
Vientiane province
Lao PDR**

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Abstract

This report summarizes the results of the household baseline survey conducted in Ekxang Climate-Smart Village and six surrounding villages in Phonghong district, Vientiane province, Lao PDR. The survey was implemented with participation of 140 randomly selected households using pre-prepared tablet-based questionnaires. The majority of the households were male-headed. On average, each household had six members and most of the members were between 5 and 60 years old. The household size and labor force in the target region are similar to national average. The main source of food and income of the households were from on-farm agriculture production, which was mostly contributed by cultivation and livestock. Agriculture production was mainly for self-sufficient purpose as most of products were consumed within the household. Farm size mostly ranged between 1 and 5 hectares and households still can expand land for crops from existing pasture or fallow land. Besides their own land, households were also allowed access to communal land for food crops, vegetables, and other products. With the availability of arable land, food production was enough for the household demand throughout the year. Considering a "typical food year", food shortage was only experienced by 3% of the households in June, July and October. Few households experienced food crisis in last five years. Although climate change is widely mentioned by the community, it was not perceived as a main factor that led to changes in farming practices. About 80% of the households changed their crops following market price and preference of consumer and availability of labor over the last 10 years. Rain water was often available for farming during rainy season. During the dry season, due to limited capacity of irrigation system, farmers often use water from ponds and boreholes for surrounding crop fields. Regarding information sources, households received climate and weather information from television and individuals, such as friends, relatives or neighbors. Most of the households owned television (97.9%) and mobile phone (95.7%). Information about extreme events and short term (2-3 days) weather forecast were available, but not the long term weather forecast or early warning of pest and disease outbreak. It seems that government organizations did not pay much attention to providing climate information to farmers as only one out of 129 households reported that they receive the information from government staffs.

Keywords

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1. INTRODUCTION

This is the report of the household baseline survey (HBS) conducted in the research site in Phonghong district, Vientiane province, Laos, under CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). The HBS is part of the baseline data collection activities of CCAFS as initial activities toward local engagement in participatory action research. The objective of HBS is to gather household level data that include basic indicators of welfare, information sources, livelihood/agriculture/natural resource management strategies, needs and uses of climate and agriculture-related information and current risk management, mitigation and adaptation practices. The main aim is to capture some of the diversity in the landscape, across communities and households, with sufficient precision in some of the indicators to capture changes that may occur over time. The same households covered by the household baseline survey will be revisited in 5-10 years.

Since the 1990s Vientiane has been under rapid infrastructure, economic and social development. Access to services including electricity, water, major roads, and education facilitated economic growth is being improved in the region. The 77% of the provincial population is still dependent on agriculture as their main livelihood activity and relies heavily on natural resources for food security. The main crop produced in Vientiane province is rice (lowland 39.2%, upland 41.5% and plateau 19.3%) with other important crops including tamarind, mango, maize, and rubber. Agricultural yields in the region are low, but have the potential to increase through the use of supplemental irrigation, new varieties, improved production techniques, and the adoption of climate smart technologies. A major threat to agriculture, food security and livelihoods in the region is climate change. The government of Lao PDR recognizes climate change as a barrier to the country's overall development and has adopted several strategies for promoting adaptation and mitigation across various sectors. However, the ability of the country to adapt depends greatly on the capacity of its institutions to plan and implement these strategies.

The HBS in Laos, including pilots and actual data collection, were done by CCAFS partners, including the International Water Management Institute (IMWI), the National Agriculture and Forestry Institute (NAFRI) of Laos, District Agriculture and Forestry Office (DAFO) of Phonghong, Mekong Development Center (MDC) and CUSO international. The two pilots were done in March 2015 in a village outside the study site. The actual HBS was conducted from April to May 2015 in seven (out of 20) villages of Phonghong district and covered 140 households. Figure 1 shows the location of villages within the study site of CCAFS in Phonghong district, Vientiane province, Laos. The red triangles present location of selected villages for HBS and red circles show the location of the surveyed households.

The questionnaire of the HBS was divided into 10 parts, as follows: household respondent and type; demography; sources of livelihood, crop, farm animals/fish, tree, soil, land and water management changes; food security; land and water; input and credits; climate and weather information; community groups; and assets. This report provides main findings from analysis of the household data. It is organized in four main sections: the Introduction, Results, Conclusion, and the Appendix. The Results section is divided into 10 sub-sections, corresponding to 10 parts of the questionnaire.

For the full details of the survey team members and villages surveyed, see Appendices A and B. The questionnaire and training materials use, including data entry and management guidelines, can be found at www.ccafs.cgiar.org/resources/baseline-surveys.
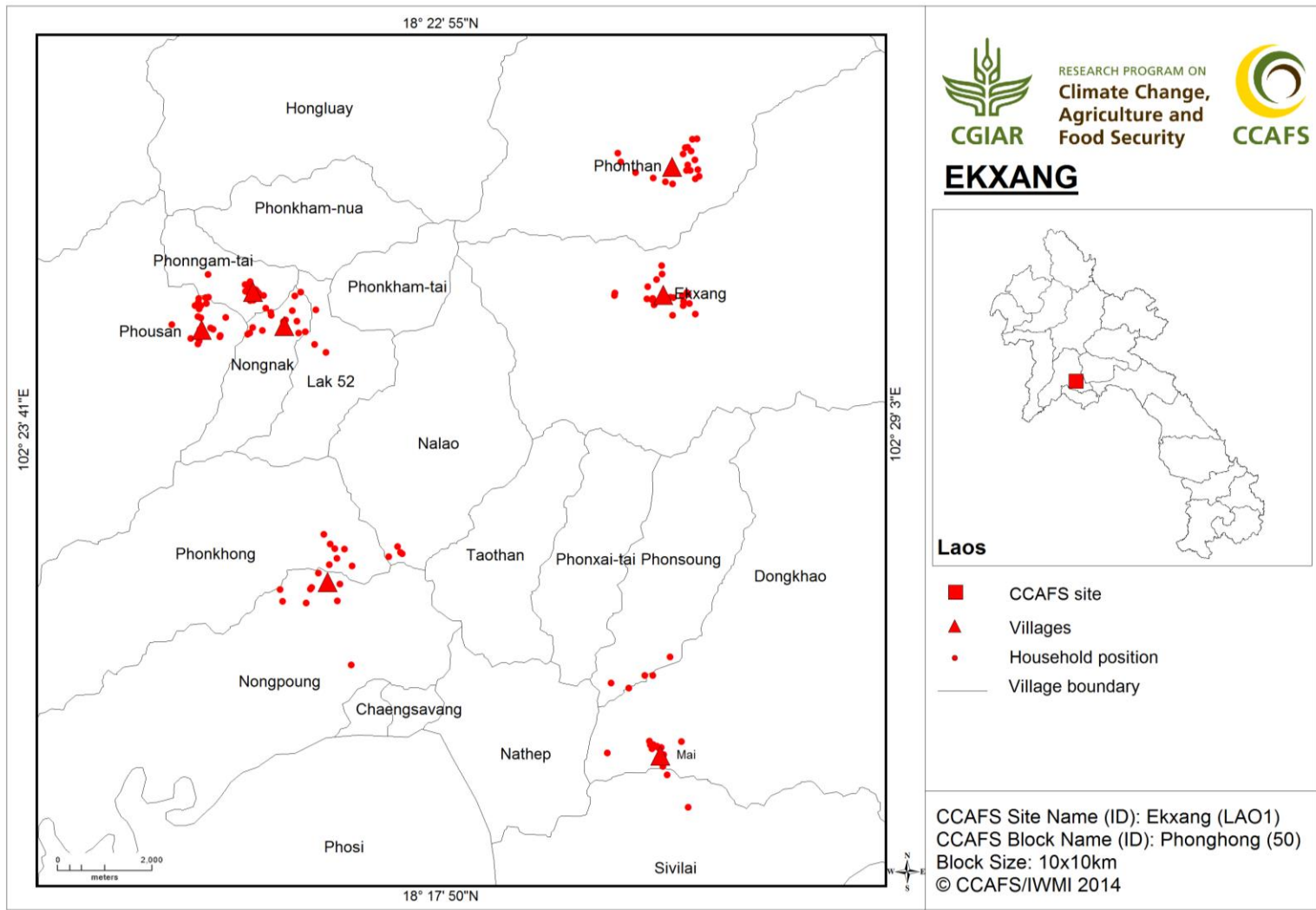
Figure 1. Research site map and location of sampled villages

2. RESULTS

2.1. Household types and respondents

Among the 140 surveyed households, more than 90% were male-headed and below 10% were female-headed. There were three main ethnic groups in the surveyed region: Loum (56.4%), Mong (27.1%) and Khumu (16.5%). Among the household respondents, there were 60.7% males and 39.3% females.

2.2. Demography

2.2.1. Household size and composition
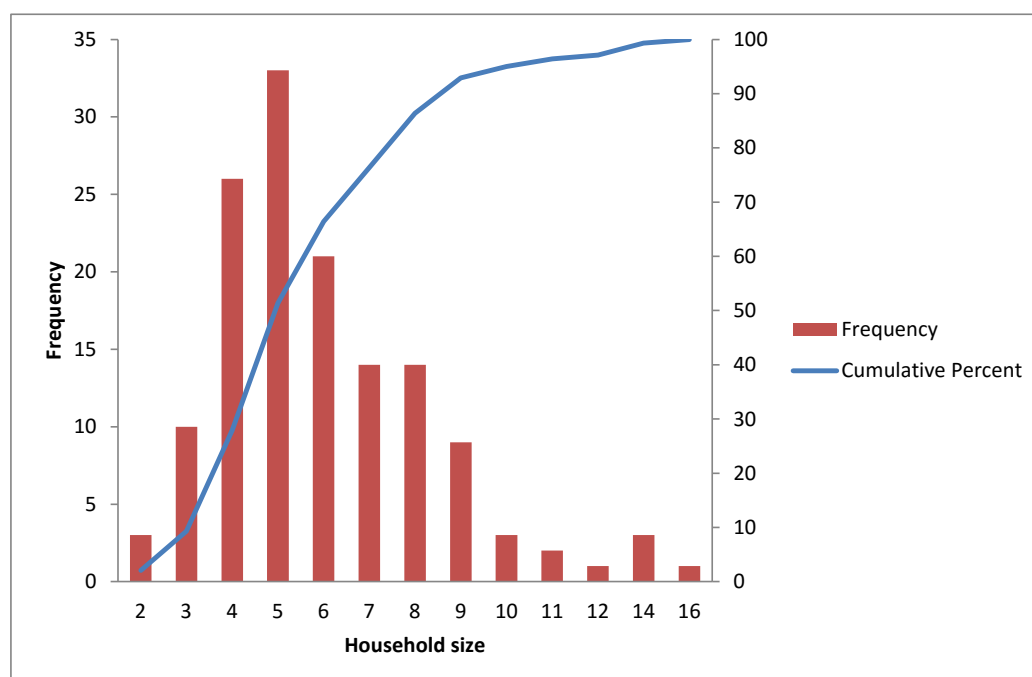
Figure 2. Size of households in surveyed villages.

Table 1. Demographic characteristics of the households

Characteristics	Value
Household size (mean)	6
Household with (%)	
1– 3 members	9.2
4 - 6 members	57.2
7-10 members	28.5
>10 members	4.9
With household members <5 years old (%)	51.4
With household members >60 years old (%)	35.0

Figure 2 and Table 1 show that more than half of the households (57.2 %) had 4-6 people in the family. On average, each household has six members. This household size is similar to the national average reported by the World Health Organization in 2010

(http://www.wpro.who.int/countries/lao/en/). More than 50% of households had children younger than 5 years and 35% had at least a member older than 60 years.

Most of the family members were in farming working age (between 5 and 60 years old). As been presented in Figure 3, about 85% of the interviewed households had more than 60% of family members in working age. Of which, households that had strong labor force (80-100% family member) accounted for 50% of the total households.
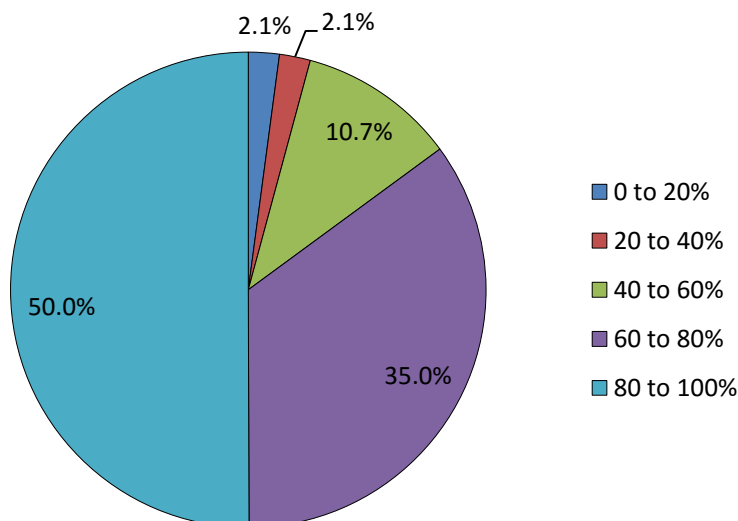
Figure 3. Households' working age between 5 and 60 year old (Values in the pie graph indicate proportions of age component of sampled households, and values in the legend indicate age component within a household)

2.2.2. Education levels

Four education levels, including no formal education, primary, secondary and post-secondary educations were considered. Nearly 100% of households (99.3%) had at least one member that received formal education (Table 2). Among 140 households, 52.9% reached secondary level, and 39.3% reached higher levels (high school, university). There was only one respondent (0.7%) who reported that no one in the family had formal education.

Table 2. Highest education level obtained by at least one household member

Level of education	% (N=140)
No formal education	0.7
Primary	7.1
Secondary	52.9
Post-secondary	39.3

2.3. Sources of livelihoods

2.3.1. On-farm livelihood sources

Agriculture is an important source of livelihood. Results show that one-fourth of households were in subsistence farming. Other households were in farming for consumption and for sale.

Agricultural production is rather diverse (Table 3). More than half of total households (72 out of 140 households) produced 4-6 products and 39% of them produced up to 7-10 products annually. There was no household that just produced one product. Because farmers likely sell their surplus agriculture products, among non-subsistence group, percentage of households that sell their products is higher when they produce higher number of products.

Table 3. Number of on-farm products

Number of products	% of households	Households selling products (%)	Household consuming products (%)
2 or 3 products	9.3	61.5	100
4 to 6 products	51.4	76.4	100
7 to 10 products	39.3	96.4	100

Table 4 shows that food crop and livestock are the main agricultural products in the region. Nearly all households produced these products (97% for cultivation only and 91 % for both cultivation and livestock). Data in the table shows that only 39% of households sold food crop products while more households (67%) sold livestock products. There were four households (2.9%) that raised livestock only, of which three households sold livestock products and one household engaged in livestock raising for home consumption.

Table 4. Producing, consuming and selling on-farm products

Products	Producing (N=140)	Consuming (N=140)	Selling (N=140)
Food crop (raw or processed)	97.1	97.1	39.3
Livestock and cultivation	91.4	89.3	65.0
Livestock only	2.9	2.9	2.1
Fish	26.4	26.4	7.9
Others (forest products, manure, etc.)	62.1	62.1	6.4
Not applicable[1]	0.0	0.0	24.3

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[1] The households did not consume and/or sell agricultural products

Collecting forest products is also popular in the region. About 62.1% of total households benefited from forest timber, fuel wood, charcoal, honey, manure, etc. These products were mainly for consumption of the households; a small percentage of the households (6.4%) sold these products for cash.

Among the households interviewed, about 26% reported fish farming as another livelihood activity. Fish farmed were mainly for consumption to more than the majority of households in fish farming. Only 11 out of 37 fishery households sold their product to market.

Figure 4 shows more details of on-farm products produced, consumed and sold by surveyed households. Grain rice is a raw food that was produced by most of the households. Producing processed foods (e.g. cake, snack, etc.) was not popular in the region. It can be seen clearly that large part of cash crops and large livestock (i.e. cow and buffalo) were for selling.
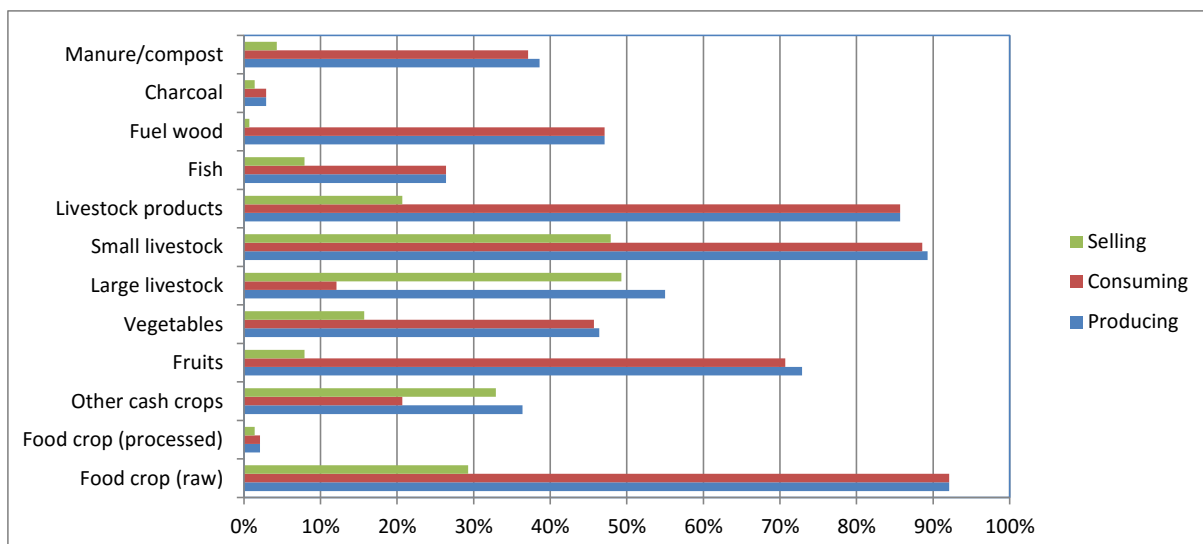
Figure 4. On-farm diversity in product produced, consumed and sold

2.3.2. Off-farm livelihood sources

In this report, off-farm products are defined as the agro-forestry products that households produce from lands that belong to others or from communal lands. About 42% of the households reported that they produced one to three off-farm products, including food crops, fruit, fish and non-timber forest products (Table 5). However, it was not a main source of their livelihood. The off-farm products were mainly for consumption of the households and it was very rare that farmers sell them to market.

Table 5. Producing, consuming and selling off-farm products

Products	Producing (N=35)	Consuming (N=140)	Selling (N=140)
Food crops for fruit	20.3	8.6	0.7
Fish	22.0	9.3	0.7
Others	74.6	30.0	1.4

2.3.3. Diversification index

The diversification index is an indicator calculated from a number of on-farm products. The index has three values corresponding to the number of on-farm products: 1 = 1 to 4 products (low production diversification); 2 = 5 to 8 products (intermediate production diversification); 3 = 9 or more products (high production diversification). The data shown in Table 6 indicate that most of the households in the target region had intermediate (62.9%) or high product diversification (10.7%).

Table 6. Diversification index

Diversification Index	% (N=140)
Low	26.4
Intermediate	62.9
High	10.7

2.3.4. Commercialization index

This index denotes the number of products that were sold. The index is assigned 4 values for 4 levels of commercialization: 0= no products sold (no commercialization), 1=1 or 2 products sold (low commercialization), 2= 3 to 5 products sold (intermediate commercialization) and 3= 6 or more products sold (high commercialization) (Table 7).

Most of agro-forestry products were consumed in the household. The low and intermediate commercialization indexes have a larger share, which accounted for 44.3 % and 34.3% of total households, respectively. There were only 4.3% that belonged to high commercialization rank.

Table 7. Commercialization index

Commercialization index	% (N=140)
No commercialization	17.1
Low	44.3
Intermediate	34.3
High	4.3

2.3.5. Division of labor in on- and off-farm products

Regarding on-farm works, 4.3 % of the households reported that men and women in the family shared the work equally. The same percentages were found in works that were done

by men or by women separately (Figure 5a). However, it is commonly seen that many members of the family (several) share on-farm works. 87% of respondents reported that husband, wife, children and other family members do the works jointly.

(a)   (b)
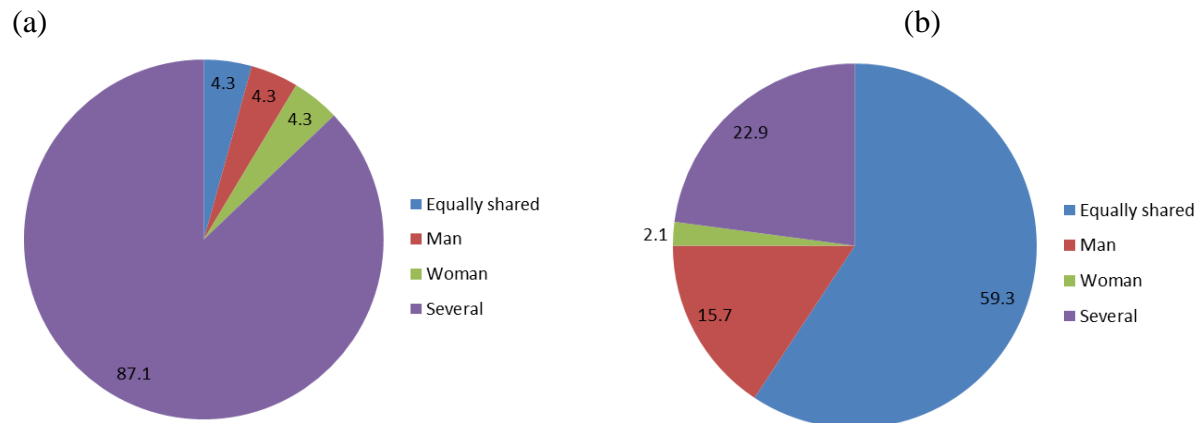
Figure 5. Agricultural workload (a) on-farm and (b) off-farm by family members

The sharing of off-farm works (Figure 5.b) shows a different situation. More than 59% of the households said that men and women equally shared the work. Works mainly done by men or women occurred in 15.7% and 2.1% of the households, respectively. The remaining nearly 23% of the households mentioned that their off-farm works were shared by several members in the family, including their children.

2.3.6. Sources of cash income

In last 12 months, nearly 43% and 37% of interviewed households received cash income from farming employment or other paid employments, respectively. Farmers also borrowed cash from formal banks or credits (35%). About one-third of the households were involved in business (Table 8). Data in the table shows that remittances or gifts were an important source of cash (22.9% of cases) as many households have members working abroad or at cities. Other sources, such as informal credits, renting land, etc. were mentioned by some households but were not popular in the region.

Table 8. Sources of cash income

Sources of cash income	% (N=140)
Employment on someone else's farm	42.9
Other paid employment	37.1
Business	30.0
Remittances/gifts	22.9
Formal loan or credit	35.0
Informal loan or credit	9.3
Renting out own land	4.3
No off-farm cash source	8.6

2.4. Changes in farming practices and resources

This section describes changes in farming practices (e.g. crop and animal variety, fertilizers, techniques, etc.) and resources (e.g. land, water, labor) in last ten years.

2.4.1. Crop-related changes

Regarding the number of crops to which changes were made over the last 10 years, the majority of households (50%) reported changes related to only one crop. Only 16-17% of the households made changes related to two or more crops. Less than one-fourth of the respondents (23) mentioned no changes. For those who made changes in last 10 years, about 54 adopted new crop varieties, 52 changed soil management practices and 42 changed agro-forestry managements.

With 102 crops-related changes reported, more than half were driven by the market, 24.5% of labor, 11.8% of land area and remaining 8.8% of climate, pest and diseases and projects (Figure 6). Considering all crops-related changes, out of the 160 reasons reported, 2.5% were related to the climate, 10% were related to a combination of climate and land, 41.9% were related to climate and land or market, and more than 45% were related to non-climate related reasons.
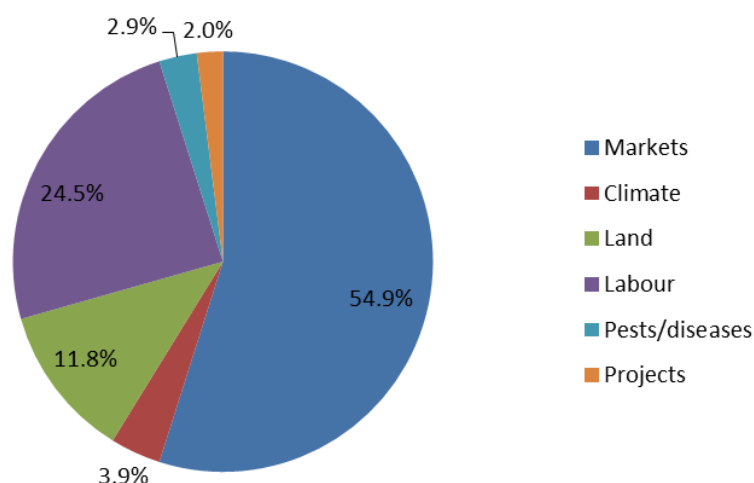
Figure 6. Reason of crop related changes

Table 9. Frequency and percentage of reasons of crop-related changes

Categories	Frequency	Percent
Climate-related reasons (N=4)		
More overall rainfall	1	25.0
More frequent droughts	2	50.0
Higher temperature	1	25.0
Market-related reasons (N=56)		
Better yield	14	22.6
Better price	26	41.9
New opportunities to sell	22	35.5
Land-related reasons (N=12)		
Land is less productive	9	75.0
Land is more productive	1	8.3
Less land	2	16.7

Table 9 shows that the market was an important driver of change. In most of the cases, changes were made when farmers see better opportunities to sell their products or higher market prices. In this region, land degradation was also a reason that forced farmers to change cropping practices. Regarding climate related reasons, only respondent mentioned about more rainfall, one respondent about higher temperature, and two respondents about more frequent droughts.

2.4.2. Farming practice-related changes

In terms of farming practices, for every 10 households, six did not introduce any new crop or variety for the last 10 years, while four households introduced at least one crop or variety (Table 10). Thirty percent of the households made cropping-related changes, which include one or more of the following: introduced intercropping, change in timing, change in planted area, started using pesticides/herbicides, integrated pest management, integrated crop management, introduced new crop varieties for better resistance, higher yield or better quality and using planting pre-treated/improved seed.

Table 10. Number of changes in farm practices over the last 10 years

Change in practice	Frequency	% (N=140)
Number of new crops or new varieties introduced		
None	*86*	*61.4*
1 or 2	*53*	*37.9*
3 or more	*1*	*0.7*
Number of cropping-related changes		
None	98	70.0
1 or 2	42	30.0
Number of water management related changes		
None	140	100
1		
Soil management related changes		
None	88	62.9
1 change	41	29.3
2 or more	11	7.9
Tree/Agro-forestry management-related changes		
None	98	70.0
Some changes	42	30.0

Thirty seven percent of the households had changes related to soil management, which include one or more of the following: stopped burning, introduce intercropping, cover crop, micro-catchments, ridges or bunds, terraces, stone lines, hedges, contour ploughing, rotation and started using more fertilizers.

For agro-forestry management, only one-third of the households reported some changes, such as they planted or protected trees over the last 12 months. All households reported no changes related to water management. This means no changes was introduced in the form of the following: started irrigating and introduced micro-catchments, improved irrigation, mulching, and improved drainage.

2.4.3. Livestock-related changes

Ninety five percent of the households reported that they had livestock over last 10

years. Nearly half of them have kept three or more animal types (Table 11). Survey results shows that among 133 households that had livestock. However, 114 households (81.4%) made changes in at least one animal type over last 10 years.

The livestock-related changes included the adoption of new animal types, herd size and component and source of feed. 26 households (18.6%) adopted new one or more animal types, 45 (32.1%) changed herd size and component and only one (0.7%) changed source of feed due to changes in cropping, such as growing fodder crops or improving pasture.

Table 11. Changes related to livestock over the last 10 years

Observing parameters	Frequency	% (N=140)
Number of animal types kept		
None	7	5.0
One	15	10.7
Two	49	35.0
Three and more	69	49.3
Number of animal types changed		
None	26	18.6
One	47	33.6
Two	34	24.3
Three or more	33	23.6
Adopted a new animal types/breeds		
None	114	81.4
1 or 2	20	14.3
3 or more	6	4.3
Number of herd related changes		
None	95	67.9
1 or 2	45	32.1
Animal feed related changes to cropping		
None	139	99.3
One	1	0.7

Less than half of the households (42%) gave reasons of changes in livestock. These reasons relate to market (37%), labor (35%) and diseases (28%). No one mentioned that they change livestock practices due to climate condition. Changes in livestock were mainly driven by one reason. Few households (11) mentioned to 2 or 3 reasons.

The market is the biggest driver of changes. There were 27 cases of change that cited to market, in which the majority (88.9%) referred to better market price or new opportunities to sell. Only 3 cases referred to more productive livestock.

2.4.4. Adaptability/Innovation index

An adaptability/innovation index is defined as the number of changes made in farming practices over last 10 years, as following: Low level = 0 or 1 change, intermediate level = 2 to 10 changes, and high level = more than 10 changes. Results show that households in the region belonged to two innovation levels. Most households (70%) belonged to the intermediate level and remaining belonged to the low level.

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2.4.5. Mitigation index

Mitigation index refers to several practices, including tree management, soil amendments, input intensification and a productivity index (Table 12). Tree management was adopted by 92.1% of the households. As being defined in this study, soil amendments mean fertilizers were used or have been used in the last 12 months for at least one crop. Statistic data shows that more than half (55%) of the households have applied soil amendments.

Input intensification has three levels: none, low, and high. Results shown in Table 11 denotes that there were still a number of households (34.3%) with no input intensification. Very few (5.7%) were at high level and remaining was at low level.

In this study, if a household says that they have better yield of any crop or the land is more productive for any crop, then they are considered to have increased productivity. Result show that only 10.7% of the households had increased productivity, while the majority (89.3%) did not report any improvement.

Table 12. Mitigation index

Measures	Frequency	% (N=140)
Tree management		
Without tree management	11	7.9
With tree management	129	92.1
Soil amendments		
Without soil amendments	63	45.0
With some soil amendments	77	55.0
Input intensification		
Without input intensification	48	34.3
Low input intensification	84	60.0
High input intensification	8	5.7
Productivity Index		
Without an increase in productivity	125	89.3
Increase in productivity	15	10.7

2.5. Food security

2.5.1. Food security index

Food Security Index (FSI) denotes the number of hunger months in a year experienced by households. The index is categorized into four classes: more than six hunger months, three to four hunger months, one to two hunger months, and no hunger month. Results show that up to 97.1% of the households did not experience hunger throughout the year. Only few of them said that they have food shortages in June, July and October. This confirmed that households were food secure.

2.5.2. Food sources

In Ekxang and surrounding villages, food sources of households can be from own farms and from rented or communal lands. Analysis of monthly food sources is presented in Figure 7. Most of the households (85.7%) produced food from their own farm through the year. About 12% reported that on-farm food was produced between 7 and 11 months and the minority (2.1%) produced it in less than 7 months.

Percentage of households that depended on off-farm food increases gradually from January and get the highest proportion (nearly 10%) in October. This means that self-sufficient agriculture is dominant here.
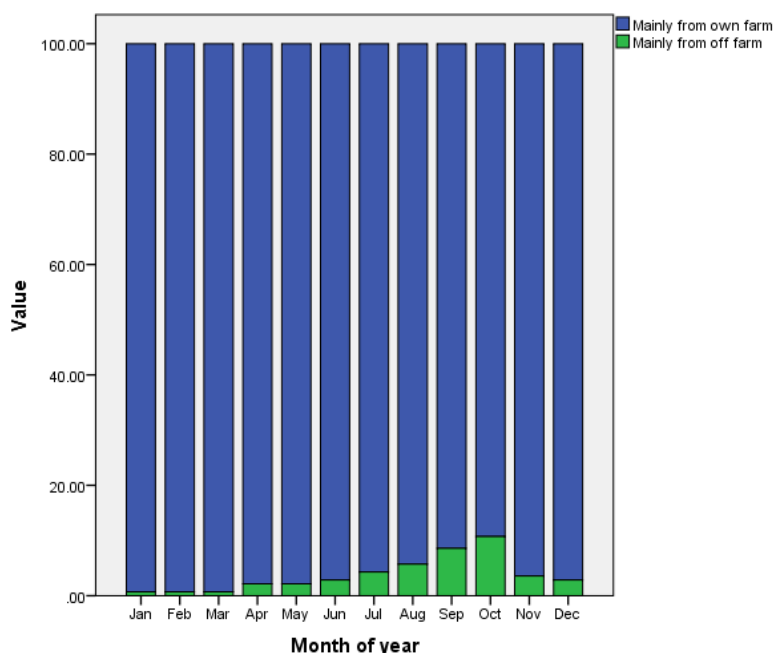
Figure 7. Main source of food for the households

2.5.3. Climate-related crises

In the last five years, about one-fourth of the households experienced climate-related crisis. Most of them (78%) reported that no assistance was provided when a crisis occurred. Only eight households (21.6%) received assistance from government agencies or NGOs.

2.6. Land and Water

2.6.1. Water for agriculture

Although coverage of irrigation systems is limited in the study region and rainwater is the main source for farming, 85.7% of respondents reported that irrigation was available for agriculture production. This seems that the respondents considered any irrigation methods rather than formal irrigation system. Accordingly, 72.9% of the households exploited groundwater from boreholes, 77.9% of them used water pumps for irrigation and very few households got water from inlet, water gate or other sources (8.6%).

Table 13. Water sources for agriculture

Availability of on-farm water sources	% (N=140)
Irrigation	85.7
Dams or water ponds	4.3
Boreholes	72.9
Water pumps	77.9
Inlet/water gate	0.7
None of the above	7.9

2.6.2. Land use

Farm size in the region is rather large. Nearly half of the households could access 1 to 5 hectares of agricultural land. More than one-fourth had access to more than 5 hectares of land and the remaining households (24.3%) had less than 1 hectare (Table 14). More than 50% of the households had 1 to 5 hectares of arable land. Percentage of households that had more than 5 hectares available for crops was about 15% only.

The majority (65%) of the households dedicated permanently less than 1 hectare for crops. Only two households (1.4%) reported that they have more than 5 hectares specialized for crops. Others used their agriculture land with different purposes, such as cultivation, pasture and fallow.

Land resource for agriculture development is still available. About 57% of the households were able to expand up to one hectare of agricultural land and 37% said they could expand even more than one hectare.

Table 14. Total land size and land use

Area	% of households (N=140)		
	Has access to land	Has land available for crops	Has land currently dedicated to crops
Less than one hectare	24.3	31.4	65.0
Between 1 and 5 hectares	48.6	53.6	33.6
More than 5 hectares	27.1	15.0	1.4

2.6.3. Communal land

Most of the households (71.4%) did not use the communal lands (Table 15). Among 140 surveyed households, 40 accessed communal land for different purposes, such as collecting food crops, vegetable, fish, herbs and non-timber forest products and grazing livestock. Among households who accessed the communal land, 80% of them said that the land is degraded or unproductive, while 57% described the land is under tree cover.

2.6.4. Hiring of machinery or labor

Data in Table 15 shows that animal power was rarely used in the region and a few households (1.6%) use animal for ploughing. More households (30.3%) rent farm machinery for farming. Hiring farm labor was also common in the region, with half of the households reported hiring farm labor in last 12 months.

Table 15. Hiring machinery or labor

Items	% (N=140)
Rental animal for farming	1.6
Rental tractor or other farm machinery	30.3
Hire farm labor	51.4
Do not rent/hire machinery or labour	16.8

2.7. Input and credit

With regard to purchases of farm inputs over the last 12 months by the households, one-fourth of the households reported having purchased certified seed; half of the households purchased fertilizer or veterinary medicine for livestock. It was popular in the region that farmers use pesticides to protect crops. More than one-fourth of the households reported to have received credit for their agricultural activities (Table 16).

Table 16. Farm inputs

Inputs	% N=140)
Purchased seed	25.0
Purchased fertilizer	50.7
Purchase pesticides	58.6
Purchase veterinary medicine	50.0
Received credit for agricultural activities	26.4
None of the above	17.9

2.8. Climate and weather information

This section summarizes information sources and how farmers receive and use weather/climate information in last 12 months. The information was categorized in three topics: extreme weather events, start of the rains, short term (2-3 days) weather forecasts. According to respondents, the forecasts of long term (2-3 months) weather and pest or disease outbreak were not included in the information that they received. Results show that most of the households (92%) received weather/climate-related information.

2.8.1. Forecast for extreme events

The majority of the households (94%) reported that they were not informed about extreme events. For those who received this forecast, they reported that there were several sources of information. Television was the main source (100%), followed by radio (50%) and friends/relatives/neighbors (37.5%). No one received this information from technical experts, other forms of mass media (newspaper, internet) or other sources. However, no source was reported to include advices in the forecast for extreme events and the households also did not have any responsive activity. Regarding the gender aspect, more men received the information than women did. There was only one household in which both men and women received the information.

2.8.2. Weather forecast for the next 2 to 3 days

The weather forecast for the next two to three days was received by most of the households (92.1%). Television was the most popular source of the information (92%), followed by friends/relatives/neighbors (62.8%) and radio (21.7%). Very few households received the information from other sources such as government organizations, newspaper or indigenous knowledge. With family members having equal access to information on television, 75% of the households reported that both men and women received short term weather forecast. According to most of the respondents (87.6%), this weather forecast did not include advice for farming. However, more than one-third of the households could use information that they received to adjust timing of farming activities.

Table 17. Weather forecast for the next 2 to 3 days

Topic	% of households
Received information (N=129)	92.1
Sources of information (N=129)	
Television	92.2
Friends/relatives/neighbors	62.8
Radio	21.7
Own observations	5.4
Govt. agricultural extension or veterinary officers	0.8
Newspaper	0.8
Traditional forecaster/indigenous knowledge	1.6
Received information of weather for next 2-3 days (N=129)	
Men	16.3
Women	8.5
Both	75.2
Advice was included in the forecast for weather for next 2-3 days (N=129)	12.4
Response to forecast for weather for next 2-3 days (N=16)	37.5

2.9. Community groups

      This section explores membership of households in community groups. In general, farmers often belong to one community group only. Data shows that half of the households joined saving/credit group (Table 18). There were other groups related to farming (i.e. fishing, agricultural productivity enhancement, vegetable production and resource management). However, very few households were members of these groups.

Table 18. Households' membership in community groups

Community group	% of households (N=140)
Fishing group	1.4
Savings and/or credit	51.4
Productivity enhancement	2.9
Vegetable production	1.4
Soil, land or water management	2.9
Not a member of any group	45.0

2.10. Assets

      Households' assets are categorized into five groups: energy (e.g. generator, solar panel, biogas digester, battery), information (radio, television, cell phone, internet access, computer), agricultural production (tractor, mechanical plough, thresher, and mill), transport (bicycle, motorbike, car or truck) and luxury (refrigerator, air conditioning, fan, bank account, improved stove).

      The list of assets per category owned by the households is shown in Table 19. The motorcycle was the most common household asset. More than half of the households owned bicycle and one-fifth owned a car.

      As irrigation water is limited, eight out of ten households owned a water pump to either exploit groundwater or transfer water from ponds to fields. Agricultural mechanization was clearly seen from the collected data. More than 60% of surveyed households owned mechanical plough and nearly 40% owned motors powered spraying tank. Besides, they also

had petrol trimmer, thresher, etc. but not common.

Table 19. Households' assets

Assets	% of the households (N=140)
Transport assets	
Motorcycle	96.4
Bicycle	53.6
Car or truck	18.6
Production assets	
Mechanical plough	66.4
Mill	0.7
Water pump/treadle pump	83.6
Petrol trimmer	10.0
Motor powered spraying tank	39.3
Thresher	1.4
Boat	5.0
Fishing nets	43.6
Energy assets	
Liquid pressurized gas	5.0
Battery (large - e.g. car battery)	0.7
Biogas digester	1.4
Information assets	
Television	97.9
Cell phone	95.7
Radio	57.1
Computer	15.0
Internet access	12.9
Luxury assets	
Refrigerator	81.4
Air conditioning	10.0
Electrical fan	97.1
Bank account	35.7

The use of fuel wood for cooking was still commonly seen in households. This explains the lack of assets in the energy group among more than 90% of the households in the area. Few households owned battery, liquid pressurized gas or biogas digester. With the availability of an electrical grid, most of the households in the region had television (97.9%), refrigerator (81.4%), electrical fan (97.1%). Some of them owned computer (15%) and air conditioning (10%).

To evaluate households' wealth, asset index is calculated as the number of assets of a household. The index is assigned three values: 0 = no asset (basic level), 1 = 1-3 assets (intermediate level) and 2 = 4 or more assets (high level). Results show that 98.6% of the households were in the high level of asset index. Overall, the majority of households owned two or more assets in each of following categories: transportation, production, information and luxury.

3. CONCLUSIONS

The household baseline survey included 140 households in Ekxang and surrounding villages in Phonghong district, Vientiane province, Lao PDR. The majority of households in this region were male-headed. The household size and labor force in the target region were similar to the national average.

In terms of livelihood, agricultural production with dominant cultivation and livestock was the main source of food and income. Diversity of agricultural products was not high as most of the households were in low or intermediate diversification index. Self-sufficient production was commonly seen in the region as most of agricultural products were consumed within the households. Therefore, commercialization level was also low. In farming, different members in the family worked on their own fields. It was common to see men and women share off-farm work equally.

Although farmers experienced negative impacts of climate change, climate factors only influenced decision of a small percentage of the households. The main drivers of changes in agricultural production over the last 10 years were market price, preference of consumers, and availability of labor. However, farming of the households did not change much and the adaptability index of the majority was in intermediate level.

Food security was not a significant problem of the community. Food produced from own farm was enough for households' food demand throughout the year. In the last five years, few households experienced food crisis and received assistance from government agencies and NGOs.

Land and water were the most important agricultural resources. Farm size in this region was rather large. Arable lands were still available for expanding agriculture production. Besides their own land, people were also allowed access to communal land for food crops, vegetables and other products. Rainwater was the main source for farming during rainy season. During the dry season, due to limited capacity of irrigation system, farmers were using water from ponds and boreholes for surrounding crop fields.

It seems that information on climate were insufficient. Households often gather climate and weather information from television and individuals, such as friends, relatives or neighbors. From these sources, households received information about extreme events and short term weather forecast. However, there was no source for long term weather forecast or early warning of pest and disease outbreak. Television was the most common media source that family members can access equally. Accordingly, both men and women in the household can receive climate and weather information. Sharing information among individuals was a common method. Therefore, establishing community groups will create a platform for farmers to share information and experiences in farming.

Appendix A: Survey process and implementation

The survey team was composed of six enumerators organized in three groups. The enumerators were selected from CSV partners, including Ms. Khamphamy Khodyhotha, Mr. Phetsamone Toummavong and Mr. Saythong Chidvilaphone from the National Agriculture and Forestry Institute (NAFRI), Mr. Yong Lee from Mekong Development Center (MDC), Mr. Sysavanh Vorlasan from the Province Agriculture and Forestry Office (FAFO) of Savannakhet province; Mr. Anousith Keophoxay from International Water Management Institute, Laos office. Mr. Anousith Keophoxay also played the role of survey supervisor. Besides, the survey team also assisted by the local staffs of District Agriculture and Forestry Office (DAFO) of Phonghong district and CUSO international.

Key survey team members were provided trainings in November 2014. Questionnaires of the survey were designed to be used on tablet device. All questions were translated into Laotian. Some questions and answer lists were modified based on consultations with senior researchers and experts from survey teams and local partners. Two pre-test of questionnaires were conducted by all survey team members in the field in March 2015. The purpose of the pre-tests was to ensure the questionnaires reflect reality in the field and survey team getting familiar with the tablet-based approach.

All villages within the block of 10km x 10km were identified. There were a total of 20 villages including Ekxang CSV. Except the CSV, other six villages from the list were selected randomly for the survey. The sample size was 140 households, or 20 randomly selected households from each village.

Before the questionnaire was administered, several meetings were convened with the commune and village authorities to inform about the purposes, scope, and procedure of the survey. The authorities then informed the villagers of the forthcoming household survey by the team to avoid suspicions or conflicts.

The actual survey was conducted from April to May 2015. Before every interview the enumerator had to explain the purpose and contents of the survey to household member(s) and also asked for consent for picture and GPS location recording. In case that survey team could not interview a selected household, another was selected as substitution using the reserve list of households that were randomized selected in the same village.

The role of supervisor was to check all survey questionnaires for completeness at the end of each survey day. In cases errors were found, the supervisor talked directly to individual enumerator concerned for correction. If the mistakes could not be easily corrected, the enumerator had to go back to their interviewed household and ask for the lacking information.

Appendix B: Sampling Frame – List of Villages

No.	Village name	District	Surveyed
1.	Nabon	Phonghong	
2.	Phonthan	Phonghong	X
3.	Hongluay	Phonghong	
4.	Phon-Soung	Phonghong	
5.	Phonxai-Tai	Phonghong	
6.	Dongkhao	Phonghong	
7.	Mai	Phonghong	X
8.	Nathep	Phonghong	
9.	Chengsavang	Phonghong	
10.	Nongpoung	Phonghong	X
11.	Phonkhong	Phonghong	
12.	Lak 52	Phonghong	
13.	Ekxang	Phonghong	X
14.	Nalao	Phonghong	
15.	Nongnak	Phonghong	X
16.	Phonngam-Tai	Phonghong	X
17.	Phonkham-Nua	Phonghong	
18.	Phonkham-Tai	Phonghong	
19.	Phousan	Phonghong	X
20.	Taothan	Phonghong	

X: Villages have been visited for household baseline survey