

Ministry of Agriculture and Forestry
National Agriculture and Forestry Research Institute
National Rice Research Program

Northern Uplands Rice Based Farming Systems Research Project (NURiFaR)

**Understanding Food Security in Northern Laos
An analysis of household food security strategies in
upland production systems**



Supported by the **S**wiss Agency for **D**evelopment and **C**ooperation

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and Cooperation SDC

June 2011

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List of acronyms

DAFO	District Agriculture and Forestry Office
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GoL	Government of Lao PDR
HH	Household
ICESCR	International Covenant on Economic, Social and Cultural Rights
IRRI	International Rice Research Institute
IUCN	The World Conservation Union
Lao PDR	Lao People's Democratic Republic
MAF	Ministry of Agriculture and Forestry
MDG	Millennium Development Goal
MSG	Mono Sodium Glutamate
NAFES	National Agriculture and Forestry Extension System
NAFRI	National Agriculture and Forestry Research Institute
NAFReC	Northern Agriculture and Forestry Research Centre (Uplands Research)
NGO	Non-Government Organization
NURiFaR	Northern Uplands Rice Based Farming Systems Research Project
NTFP	Non-Timber Forest Product
PAFO	Provincial Agriculture and Forestry Offices
SDC	Swiss Agency for Development and Cooperation
UNDP	United Nations Development Program
WFP	World Food Program
WHO	World Health Organization

Acknowledgements

The authors wish to thank Mr. Houmchitsavath Sodarak, Director of the Northern Agriculture and Forestry Research and Extension Center (NAFReC), Mr. Kouang Douangsila, National Project Director of Nurifar, Mr. Martin Dunn, project advisor, Nurifar and Mr. Carl Mossberg, Ramboll Natura, for their support in organizing this study. Joost Foppes wishes to thank Dr. Jutta Krahn for her advice on nutritional aspects and Shalmali Guttal and Randy Arnst for sharing their latest report. Special thanks go to all the Province and District staff in Xay district, Oudomxay Province and Sing district, Luang Namtha district, who helped in the implementation of the field survey. The team is most grateful for the patience and time spent by all the women who participated in the survey in the four villages visited: Ban Mok Kha, Ban Chom Ong, Ban Cha Oup and Ban Houay Na Tai.

1 Introduction

1.1 Nurifar project goals and objectives

The Northern Uplands Rice-based Farming Systems Project (NURiFaR) is a project implemented by the National Agriculture and Forestry Research Institute (NAFRI) with financial support from Swiss Agency for Development and Cooperation (SDC). The project is a continuation of earlier rice research support provided by International Rice Research Institute (IRRI) and SDC in collaboration with the Ministry of Agriculture and Forestry (MAF) that was carried out throughout the country. The project began in December 2008 and will end September 2012 (NURIFAR 2008).

The main purpose of the project is: *to improve the livelihoods of the poor in northern uplands by developing and disseminating appropriate technologies for rice-based farming systems*. Enhancing food security is the central concern of these efforts. The project works in 6 districts in 3 Northern Provinces (Luang Prabang, Oudomxay and Luang Namtha). It is also focused on capacity building and coordination within NAFRI as a preliminary step to further SDC support on institutional and organisational strengthening NAFRI as a research-for-development agency.

1.2 Why a food security study

A major aspect of the project is to better understand the impacts of the rapid economic transition occurring in the uplands on food security, nutrition and livelihoods. The socio-economic research team of the NAFRI Northern Agriculture and Forestry Research Center (NAFREc) has carried out a number of socio-economic studies but is still young and lacks the experience to carry out a complex and integrated study. A consultant was hired to support the socio-economic team in designing and carrying out a food security study that would create more understanding on how upland communities understand food security and deal with it. The study was undertaken in March 2011. This report describes the outcomes of that study.

1.3 Objective and goals of the study

The immediate objective of this study is: *to understand how households manage their resources to achieve food security, with special reference to the differences in socio-economic and agronomic conditions*.

The underlying goal is: *to better understand the impacts of the rapid economic transition occurring in the uplands on food security, nutrition and livelihoods*.

2 Study design and methodology

2.1 Research framework

The food security study is to be guided by four key questions:

1. How do farmers understand food security?
2. What are their strategies for achieving food security?
3. How do they deal with uncertainty and shocks?
4. How do they think food security can be strengthened?

More specifically, these research questions are aimed at describing:

- The complexity of upland food production systems
- The strategies of farmers to produce, collect, buy and borrow food

- The factors that determine risk and vulnerability of food production

Based on these three components, farmers and researchers can identify response mechanisms to reduce the risks. Building on already existing mechanisms developed by farmers, researchers can help to develop alternative options and solutions that could build into recommendations to be used by extension agents to assist farmers in improving their practices.

This logical flow of research is the main analytical framework proposed for researching food security (see diagram below).

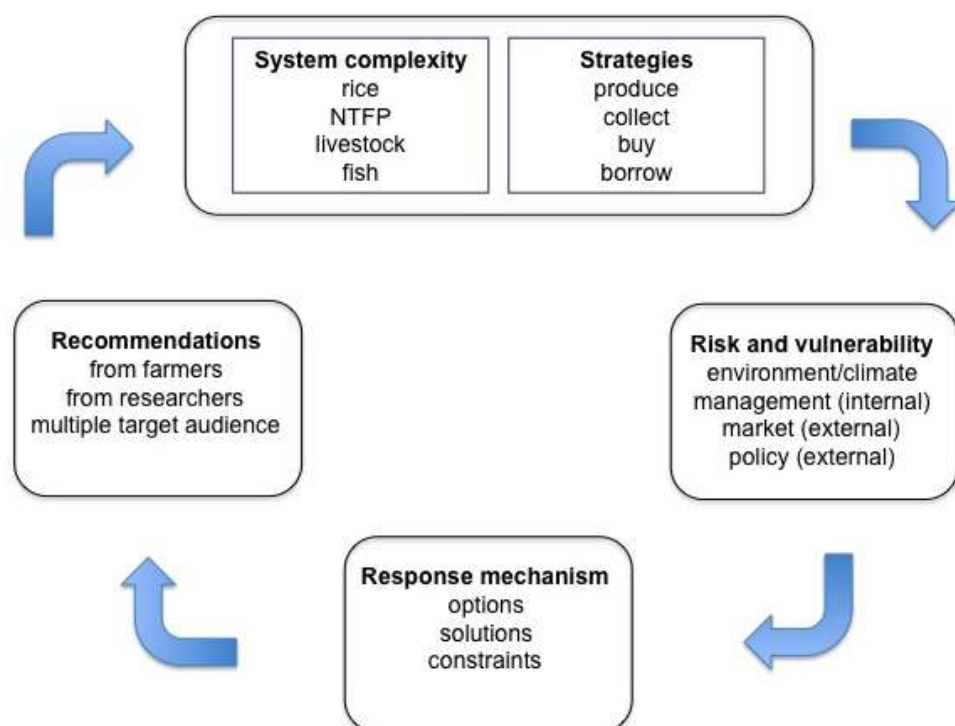


Figure 1: Analytical framework and logical flow of food security research

The research team analyzed and connected findings by using the analytical framework shown in the diagram above. The diagram introduces a set of interlinked dynamics that would seem to be the key to understanding the food security strategies of local communities in upland northern Laos. There are four main steps in this process:

1. Understand the **complexity of food production systems and food security** in local communities. This is both a descriptive and analytical step, which produces information on not only the farming practices, but how they are situated within farmers' conception of their opportunities, such as trade, barter, exchange and sale.
2. Understand **risk and vulnerability** of these systems and strategies. A number of internal and external forces threaten the local production systems and strategies. Uncertainty of natural and climatic conditions, market conditions and trends, and the policy environment all are sources of uncertainty for local people.
3. Understand the **response mechanisms** that local people use in the face of uncertainty, with particular attention to the constraints. These responses highlight the priorities, capacities and hopes of people as they respond to problems.
4. Synthesize the **conclusions and recommendations**, as derived from our data collection, farmer recommendations and consultations at various levels in the field. These recommendations address the systems and strategies examined at the beginning, in hopes that they can be strengthened. It

should be clear that a key component in this framework is the linkages between risk/vulnerability and response. In general, our understanding of how farmers perceive risks and respond to unpredictable circumstances is very low.

5. **Develop a set of indicators** for food security appropriate for the community. This is a longer-term objective of the project, which will draw on the information and analysis of this study. At the end of the project, the project should be able to provide input to the formulation and/or reformulation of the government's indicators of food security. The value-added from NURiFaR will be to provide more detail based on a deeper understanding of poverty and rice-based production systems in the north, with a particular emphasis on the local social and agronomic situation.

2.2 Research process

The food security study started with of a short literature review to familiarize NURiFaR staff with the main concepts used in food security research as well as existing literature on food security in Lao PDR. The field work consisted of interviews in 4 villages in the NURiFaR target provinces of Oudomxay and Luang Namtha. The field work mainly consisted of group discussions about food security and individual household interviews. The study took place in a period of five weeks: one week for literature review and preparation, two weeks for field work and two weeks for data analysis and report writing.

2.3 Group discussion on food security

Villagers were invited their views on food security in discussion groups. Initially, women and men were separated in small groups to ensure women's voices can be heard. After the first village the team decided to interview only women as it became clear that women know much more and are more interested to talk about food security than men. These meetings covered eight key questions exploring villagers understanding of food security (see box 1).

Box 1: 8 Questions for group discussions

A: Identifying people at risk

1 Who are the people most at risk of food shortages? Identifying vulnerable groups (6 questions)

2 What are the main food strategies? Collecting, Producing (growing/raising), Buying, Borrowing

B: Identifying vulnerability factors and causes:

3 What is the history of food shortages? What are the Trends? Timeline, trend analysis

4 What are the main causes of food shortages (Environmental, Economic, Policy, Social and Conflict)

C: Identifying the variety and sources of food

5 What is the variety of food? List and rank food categories

6 What are the main sources of food? Forest, Streams, Fallow, Cultivated fields, Paddy, Buying

D: Planning for action:

7: What are the community's main coping strategies, proposed solution?

8: What do villagers propose as future actions? What stakeholders should be involved at family, village/kumban, district/province level?

The meetings were held at times that are convenient to the villagers. Mostly the team spent more than one day in each village, allowing time for several meetings with villagers. The group discussions were facilitated by around eight topics, divided into three groups (see box 2).

Box 2: How the group discussions were structured

Key Questions	Tools	Group arrangement	Time	No sheets
A: Identifying people at risk			Total 2 hours	
1 Who are the people most at risk of food shortages?	Step 1: Wealth ranking Step 2: Vulnerability analysis	2 groups: men and women 2 groups: men and women	20 minutes 40 minutes	2 2
2 What are the main food strategies?	Step 1: Strategy analysis	8: Men: 4 wealth groups Women: 4 wealth groups	30 minutes + 30 minutes reporting	8
B: Identifying vulnerability factors and causes			Total 1.5 hours	
3 What is the history of food shortages? What are the Trends?	Step 1: Timeline Step 2: Trend analysis	2 groups: men and women 2 groups: men and women	30 minutes 30 minutes	2 2
4 What are the main causes of food shortages?	Step 1: Factor analysis	10: Men: 5 food categories Women: 5 food categories	30 minutes	10
C: Identifying the variety and sources of food			Total 2 hours	
5 What is the variety of food?	Step 1: Listing products	8 groups: men and women	20 minutes	8
	Step 2: Ranking products	8 groups: men and women	20 minutes	
	Step 3 : Ranking food categories	2 groups: men and women	20 minutes	2
6 What are the main sources of food?	Step 4: Ranking Sources	7 groups: men 3, women 4	30 minutes	7
	Step 5:	Presenting group results	40 minutes	
D: Planning for action			Total 1.5 hours	
7 What are the main coping strategies?	Step 1: Coping strategy analysis	8 groups: 4 wealth groups, both for men and women	30 minutes	8
8 What future actions does the community propose?	Step 1: Stakeholder analysis	2 groups: men and women	30 minutes	2
	Step 2: Action planning	2 groups: men and women	30 minutes	2
				Total: 61

2.4 Individual household interviews

At least 8 families per village, at least 2 per wealth group (wealthy, medium, poor, very poor). If two villages were surveyed, 16 families in total were interviewed in each village. Household interviews were held in the day time. The aim was to get more precise estimates of actual food intakes, nutrition levels, sourcing of food and strategies applied per household and per wealth category.

2.5 Selection of sites

The survey was carried out in Xay district, Oudomxay Province, and Sing district, Luang Namtha Province, as these are priority districts where the project works. The actual selection of villages was

determined by district agricultural officers in each district in planning meetings with the survey team. The selection was based on various criteria (see Table 1). The team decided to select two villages in each district villages, rather than one, so as to capture more variety in food security.

Table 1: Selection of villages for the food security study

Criteria	Sing district		Xay district	
	Cha Oup	Houay Na Tai	Mok Kha	Chong Om
village				
1: upland/lowland rice	upland	lowland	upland	both
2: rice surplus/shortage	shortage	surplus	shortage	surplus
3: selling rice early	no	no	some	yes
4: rubber plantation	yes	no	no	no
5: labor important source of income	yes	yes	no	no
5: maize growing	no	no	yes	yes
6: forest dependent	no	no	yes	yes
7: ethnic group	Akha	Akha	Khamu	Khamu

3 A short literature review

3.1 Key concepts of food security

3.1.1 Key elements of food security

The main elements of food security are: food availability, food accessibility, food use and utilization and food stability (Bultrini, Vidar et al. 2009):

1: Food Availability (Physical Availability of Food)

Availability refers to either of feeding oneself directly from productive land or other natural resources (e.g. Non-Timber Forest Products), or for well-functioning distribution, processing and market systems that can move food from the site of production to where it is needed in accordance with demand.

The availability of sufficient quantities of food of appropriate quality, supplied through domestic food production, commercial food imports, food aid and domestic food stocks.

2: Food Accessibility (Economic and Physical Access to Food)

Adequate accessibility to food means: access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet. Entitlements are defined as the set of all commodity bundles over which a person can establish command given the legal, political, economic and social arrangements of the community in which they live (including traditional rights such as access to common resources).

Food accessibility is dependent on production, income and market access. More importantly, it refers to the ability to generate sufficient income (in addition to own production) to meet basic food needs.

3: Food Use and Utilization

Adequate use of food means: utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being where all physiological needs are met. This brings out the importance of non-food inputs in food security.

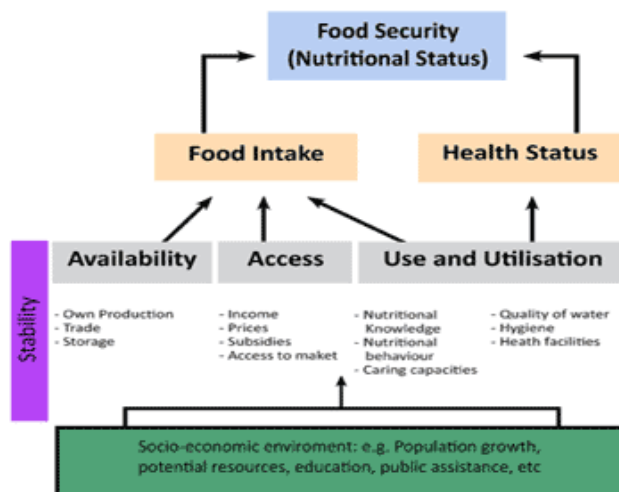
Food utilization is influenced by several factors such as: eating styles and habits (food taboos and traditional beliefs), caring capacities (level of education, nutritional knowledge), quantity and quality of food consumed (number of meals/day, diversification of food consumed and food safety) and clean water access.

4: Stability

Food stability implies that people are able to gain access to adequate food both economically and physically. Stability of food supply and adequacy of food presuppose environmental sustainability, implying that there is judicious public and community management of resources ensuring availability of sufficient food for both present and future generations.

Food stability is dependent on the system of how to have adequate nutritious supply of food for the entire nation at all times even during difficult times such as: food safety nets, early warning system, and food aid.

To be food secure, a population, household or individual must have access to adequate food at all times. They should not risk losing access to food as a consequence of sudden shocks (e.g. an economic or climatic crisis) or cyclical events (e.g. seasonal food insecurity). The concept of stability can therefore refer to both the availability and access dimensions of food security.



Picture 1: A diagram representing key elements of food security.

(Source: http://foodsecuritylink.net/myanmar/index.php?option=com_content&view=article&id=33&Itemid=18)

3.1.2 Vulnerability and risk analysis

Various useful methodologies for rapid assessment of vulnerability and risk have been developed in the context of disaster management. Key terms used in this field include (Abarquez and Murshed 2004):

Hazard: *“Any phenomenon, substance or situation, which has the potential to cause disruption or damage to infrastructure and services, people, their property and their environment”.*

Disaster: *“The serious disruption of the functioning of society causing widespread human, material or environmental losses, which exceed the ability of the affected communities to cope using their own resources. Disasters occur when the negative effects of the hazards are not well managed”.*

Vulnerability: *“A concept which describes factors or constraints of an economic, social, physical or geographic nature, which reduce the ability of a community to prepare for and cope with the impact of hazards”.*

Risk: *“The probability that negative consequences may arise when hazards interact with vulnerable areas, people, property and environment”*

Several RRA tools that are commonly used to analyse vulnerability and risk include:

(a) Wealth ranking

Wealth ranking is a tool that can be used to let a community map out the differences between households in terms of relative wealth and poverty. Poor households are often more vulnerable. An example is presented in Table 2.

Table 2: Example of a wealth ranking exercise (Frankenberger, Luther et al. 2002).

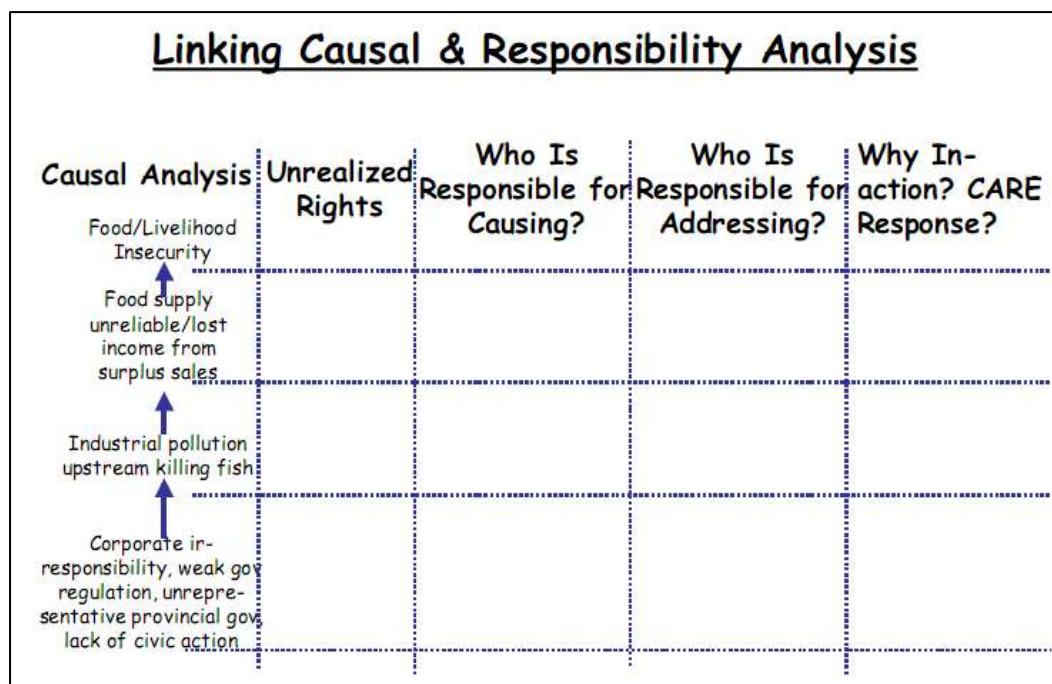
Source: CARE Madagascar, "Antananarivo Urban Household Food and Livelihood Security Program", 1997, Madagascar,

	Very Poor	Poor	Better Off	Rich
Housing	Shelter made of cardboard boxes, or lives outside	Walls made of dried mud or unbaked bricks; Roofs of dried reeds	Small house with 2-3 rooms; Outside shower and latrine; No electricity	Larger house with 2 or more floors; Water and electricity
Food Security	Only eats when food available and has cash to purchase it; Sometimes does not eat all day.	2 meals a day, one with rice and one with manioc or rice soup.	3 meals a day, 2 with rice and breakfast with bread and tea.	Eats all types of food; Indefinite number of meals.
Health	Consistently poor health; No access to health care.	Uses public health centers or religious dispensary.	Uses affordable private health centers or work-sponsored health centers.	Usually fetches a doctor to the home; Able to buy medicines.
Financial Status	Begs or steals for money.	Daily earnings spent same day.	Earns a salary at end of month, but insufficient to meet monthly expenses; Often in debt; No savings	No financial problems; Has bank account.

(b) Stakeholder and responsibility analysis

Several tools can be used to assess the role of various stakeholders in food security. Venn diagrams are a common tool. It is also possible to link stakeholder analysis to rights and responsibilities (see Table 3).

Table 3: Example of a causal and responsibility analysis. Source: (Frankenberger, Luther et al. 2002)



(c) Analysis of the Sources of Risk

This tool consists of asking participants to analyse different factors that cause risks to their livelihoods and group them into categories such as environmental, social, economic, and conflict factors (see Table 4). This can be applied to various sources of livelihoods, such as human capital, social capital, etc. It could also be applied to various sources of food security, e.g. food produced, food collected from the wild, food bought etc.

Table 4: Analysis of the sources of risks to livelihoods (Frankenberger, Luther et al. 2002)

Sources of Livelihood	Types of Risk				
	Environmental	Social		Economic	Conflict
		State	Community		
Human Capital Labor power, education, health	Disease epidemics (malaria, cholera, dysentery) due to poor sanitary conditions, AIDS	Declining public health expenditures, user charges, declining education expenditures	Breakdown in community support of social services	Privatization of social services, reduction in labor opportunities	Conflict destroys social infrastructure, mobility restrictions
Financial and Natural Capital Productive resources (land, machinery, tools, animals, housing, trees, wells, etc.), liquid capital resources (jewelry, granaries, small animals, savings)	Drought, flooding, land degradation, pests, animal disease	Land confiscation, no secure tenure rights, taxes, employment policies	Appropriation and loss of common property resources, increased theft	Price shocks, rapid inflation, food shortages	Conflict leads to loss of land, assets, and theft
Social Capital Claims, kinship networks, safety-nets, common property	Recurring environmental shocks breakdown ability to reciprocate. Morbidity and mortality affect social capital	Reduction in safety net support (school feeding, supplementary feeding, FFW, etc.)	Breakdown of labor reciprocity, Breakdown of sharing mechanisms, stricter loan requirements, lack of social cohesion	Shift to institutional forms of trust, stricter loan collateral requirements, migration for employment	Communities displaced by war, theft leads to breakdown in trust
Sources of Income Productive activities, process and exchange activities, other sources of employment, seasonal migration	Seasonal climatic fluctuations affecting employment opportunities, drought, flooding, pests, animal disease, morbidity and mortality of income earners	Employment policies, declining subsidies or inputs, poor investment in infrastructure, taxes		Unemployment, falling real wages, price shocks	Marketing channels disrupted by war

(d) The six questions on vulnerability

Another tool developed to define vulnerable groups is called “the six questions”, see Table 5 below (Holloway, Roomaney et al. 2008): (1) Who is most at risk, (2) why are they at risk, (3) when are they most at risk, (4) what is increasing (or decreasing) the risk, (5) what is the outcome (effect) of the risk, and (6) how to groups who are at risk reduce and cope with the risk?

Table 5: The six questions to identify vulnerable groups (Holloway, Roomaney et al. 2008)

Question	Activities/ tools that provide information
Who is most at risk?	Community map, transect walk, risk history table
Why are they at risk?	Community map, transect walk, problem tree
When are they most at risk?	Seasonal calendar
What is increasing (or reducing) the risk?	Risk history table, problem tree, seasonal calendar, community map, transect walk
What is the outcome (effect) of the risk?	Problem tree, community map, transect walk
How do at-risk groups reduce and cope with the risk?	Venn Diagram, community map, transect walk, risk management capacities matrix

(e) Timelines

To understand how often food shortage occur, community members can be asked to make a timeline of critical events (Societies 2006). Participants are asked to recall years when food shortages or other large disasters occurred, these events are recorded in a table along the past 10 or more years.

3.1.3 Developing indicators for food security

Most of the literature on indicators for food security seems to deal with analysis of large statistical data-sets at the national level (Sibrian 2008). One basic principle is to ask target groups if they experience hunger by formulating questions about: 1) anxiety about household food supply ; 2) insufficient quality, which includes variety, preferences and social acceptability; and 3) insufficient food supply and intake and the physical consequences (Deitschler, Ballar et al. 2010).

Often these indicators are related to poverty analysis. A useful source of information can be found at: <http://www.povertytools.org/>. On this site, guidelines can be found of USAID Poverty Assessment Tools (PAT) prepared for Cambodia and Vietnam. There is no clear set of PAT guidelines for using indicators of food security in Lao PDR yet. For Cambodia (USAID 2010), the last two of the 17 questions in the household poverty assessment questionnaire¹ relate to food security:

- *Question 16: "How many times in the past 7 days did your household consume fish, fish paste, squid, shrimp and prawns, etc. at home?"*
- *Question 7: "How many times in the past 7 days did your household consume other meat, such as beef, pork, chicken, duck, etc. at home?"*

For Vietnam (USAID 2010), the household questionnaire does not have any questions on food intake. There are four questions out of the total of 18 questions relating to agriculture and labor:

- *Question 15: "How many chickens does your household own?"*
- *Question 16: "During the last 12 months has any member of your household managed agricultural or forestry land or participated in agricultural or forestry cultivation, or raised livestock or seafood on land managed or used by your household?"*
- *Question 17: "During the last 12 months, has any member of your household worked on any annual crop land belonging to the household, such as long-term use land, contract land from state enterprise (state farm, forestry enterprise, company, enterprise, camp) or auction land?"*
- *Question 18. "What is the total land area of all of the plots of land you own? (do not include land rented/borrowed from other households or rented/let out to other households during all of the past 12 months)"*

N.B. For Lao PDR, the website www.decide.la has a lot of information, but not yet much information on food security. NAFRI could explore how to add food security data to this site.

3.2 Literature on food security in Lao PDR

3.2.1 Government Strategies

Food security is one of the key goals in the National Social and Economic Development Plan 2011-2015.

The lead Government document defining food security in Lao PDR is the National Nutrition Strategy, Prime Minister's Decree 248, issued 01/12/2008 (Health 2008). This strategy is aimed at eradicating malnutrition, in order to reach the Millenium Development Goal (MDG) No 1, Target 3: To halve, between 1990 and 2015, the proportion of people who suffer from hunger.

¹ Other questions on poverty indicators included: house building materials, method of boiling drinking water, how many suitcases, motorcycles, televisions, dining sets, wardrobes does the household possess, etc.

The strategy is also based on the “rights to adequate food” under the International Covenant on Economic, Social and Cultural Rights (ICESCR) which the Government of Lao PDR (GoL) signed in 2000 and ratified it on February 2007.

The present status of nutrition in Lao PDR is far from adequate, there are high levels of protein-energy malnutrition, stunting, especially among ethnic minorities in remote upland areas, high levels of micronutrient deficiencies such as Vitamin A, iodine and iron, anaemia is common among young children and mothers in reproductive age.

The National Nutrition Policy formulates ten specific objectives as follows:

- 1) Improve nutrient intake;
- 2) Prevent and reduce food and vector borne diseases;
- 3) Improve food access and food availability;
- 4) Improve mother and child care and education in nutrition and health;
- 5) Improve environmental health;
- 6) Improve nutrition programming with participatory management and M+E;
- 7) Make nutrition central in socio-economic development;
- 8) Priority investment in nutrition;
- 9) Strengthen the nutritional capacity within all levels and sectors of the GoL;
- 10) Facilitate action-oriented research and information systems.

While the key responsibility for implementing this strategy is assigned to the Ministry of Health, a strong input from the Ministry of Agriculture is also foreseen, particularly to:

- Expand the concept of and strategies for food security to encompass also nutrition security (with focus on dietary diversity);
- Plan and ensure food production at national level according to nutritional needs,
- Increase support for stable food security at household level;
- Encourage sustainable planning, usage and management of biodiversity resources for increased household food security;
- Facilitate the implementation of operational research in agriculture and forestry related to nutrition;
- Manage and promote safe food production (e.g. usage of pesticides and other chemicals);
- Build capacity in nutrition for technical staff at all administrative levels;
- Monitoring and evaluation of activities related to food security in cooperation with other key GoL stakeholders.

3.2.2 Studies on food security and malnutrition

Child malnutrition is a key problem in Lao PDR. The prevalence of stunting among children (children of short stature compared to their height is almost 50%, which is classified by WHO as “very high”, greater than the average of developing countries in the world and in South–East Asia (Kotsaythoune Phimmasone, Inpanh Douangpoutha et al. 1996).

3.2.3 Case studies on upland rice farming

There is quite a wealth of literature on upland rice farming in Lao PDR, produced by NAFRI. The main mode of production is rotational upland rice farming. Traditionally a system of slash-and-burn agriculture was applied. Government policies intended to reduce the perceived negative effects of this system have sometimes had negative impacts on food security by limiting the fallow period and the amount of land available for upland agriculture for rural communities (UNDP 2001; Chamberlain 2007).

The diversity of indigenous rice varieties in Lao PDR is one of the highest in the world, only equaled by India (Appa Rao, Bounphanousay et al. 2002). A joint IRRI-NAFRI project identified 13,193 local varieties, of which 7,368 were grown in uplands. Of these upland varieties, 85% were glutinous, 28%

belonged to the early maturing type (“khao dor”), 47 % to the medium maturing type (“khao kang”) and 25% were late maturing types (“khao pi”). This diversity provides a strong risk aversions strategy for farmers as they can spread the risk of droughts and flooding by selecting the right variety for each type of soil.

Not surprisingly, when farmers are asked what are the main bottlenecks in upland rice farming, varieties appear on the bottom of the list, see Table 6 below (Roder, Phengchanh et al. 1997). Weeds, rodents and drought are the main constraints, yet effective techniques to deal with these issues remain elusive (Sodarak, Ditsaphone et al. 2005).

Table 6: Major constraints to upland rice production Source: (Roder, Phengchanh et al. 1997). Based on interviews with 129 slash-and -burn farmers in four districts of Luang Prabang and Oudomxay Province in 2001.

No	Constraint	Frequency
		(% of respondents)
1	Weeds	85
2	Rodents	54
3	Insufficient rainfall	47
4	Land availability	41
5	Insects	34
6	Labour	24
7	Soil fertility	21
8	Erosion	15
9	Domestic animals	15
10	Wild animals	11
11	Disease	8
12	Suitable varieties	0
	Total	129

3.2.4 Case studies on forest foods

Two key studies on forest foods have illustrated the importance of wild food products in the diet of rural Lao people ((Clendon 2001; Krahn 2005). Several aspects are of particular importance. The first is that wild foods or Non-Timber Forest Products are not only important as direct source of food, but are also often sold in order to buy other food such as rice. The second aspect is that wild foods provide a large and very diverse part of the diet of rural people. Especially bamboo shoots are consumed in large quantities (see

Table 7 below).

The third aspect is the large economic value of wild foods for the national economy. The annual consumption of wild foods, including fish and aquatic animals is estimated to be worth \$1.1 billion, equivalent to 32% of the GDP of Lao PDR in 2008 (Foppes 2008).

A fourth aspect is the trend of rapid decline in access to wild food resources for rural people in Lao PDR. A recent study on livelihood trends among rural communities shows how villagers perceive the share of food collected from the wild, by gathering for their own consumption and by foraging for their livestock, is declining compared to the situation five years ago (see Table 8). Food from the farm was also declining, so rural households in this study find themselves having to obtain much more food through buying in cash (Arnst and Guttal 2011).

Table 7: Estimate of consumption of forest foods per household (Clendon 2001).
Quantities of forest foods gathered per family per week in the rainy season, Khamteuy village, Vapi district, Salavan.

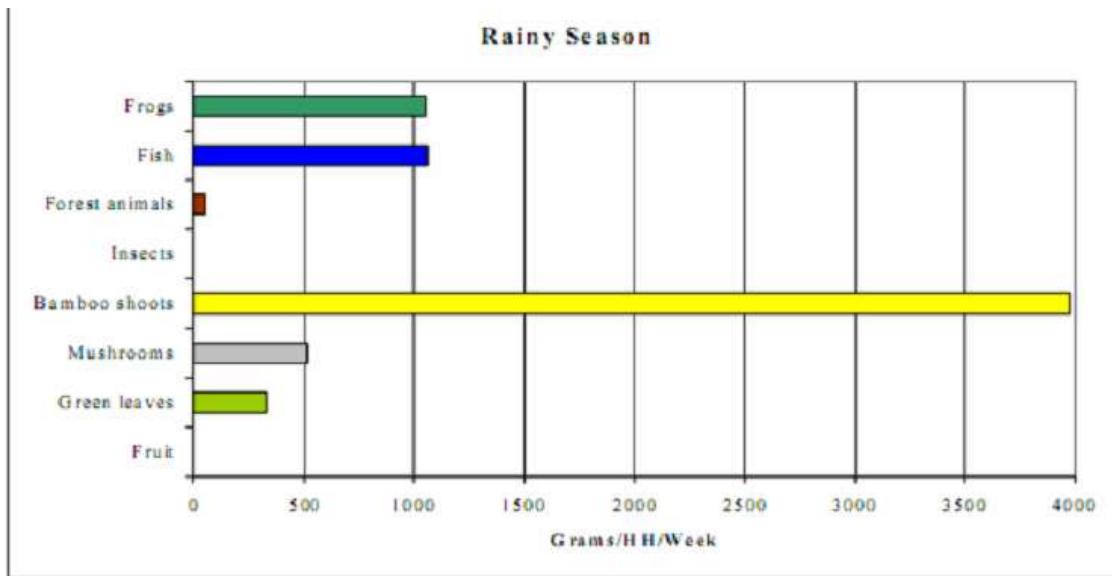


Table 8: Trends in sources of food according to villagers in northern Laos (Arnst and Guttal 2011).

	Past %	Present %	Change %
Forage/Gather	36.6	25.9	-10.7
Grow/Raise	33.2	29.6	-3.6
Trade/Barter	14.8	13.4	-1.4
Buy in Cash	15.4	31.1	+15.7

3.2.5 Studies on social impacts of lack of food security

Several studies have illustrated how increasing lack food security in the uplands of Lao PDR may cause negative social impacts such as indebtedness, drug addiction, prostitution, emigration and human trafficking (Lyttleton, Cohen et al. 2004). Lack of food security was the most common reason given for migrating to Thailand by illegal immigrants from Lao PDR in a comparative study (SERC 2008).

Resettlement or relocation of rural communities by the Government often directly reduces their food security (Raintree 2003).

3.2.6 Main food categories in rural Lao PDR

In international food security literature, twelve categories of food products are commonly used:

- | | |
|-------------------------|---------------------------|
| A. Cereals | G. Fish and seafood |
| B. Root and tubers | H. Pulses/legumes/nuts |
| C. Vegetables | I. Milk and milk products |
| D. Fruits | J. Oil/fats |
| E. Meat, poultry, offal | K. Sugar/honey |
| F. Eggs | L. Miscellaneous |

Source: (Swindale and Bilinsky 2006)

The research team reviewed these categories and rearranged them in a way that would be more compatible with Lao culture and food habits (seeup 11).

Table 9). Cereals and roots and tubers were combined in one group (group 1). Meat was separated into meat derived from livestock (group 2) and meat derived from wild animals (group 4). Fish and aquatic animals being the most predominant source of protein in Lao diets were kept as group 3. Eggs were included under group 2. Vegetables were put as group 5, but bamboo and rattan shoots were separated into a special group (group 6) because of their relative importance in Lao culture. Pulses and Milk products were not included as they are hardly consumed in Laos, nuts were retained under the category of fruits in group 8. Oils and fats were retained as group 10. Two new groups were added: medicinal plants which are often seen as part of food (group 7) and herbs and spices which are often seen as a separate group in Lao culture (group 9). One group was added to get a clearer picture of food bought from outside the community (group 11).

Table 9: Main categories of food in rural Lao PDR (team's own selection).

No	Food Category	Main criteria	Typical products
1	Grains and tuber crops	Staple foods, source of carbo-hydrates, produced on farm	Rice, maize, cassava, sorghum, forest tubers
2	Livestock	Source of protein, fats, produced on farm	Chicken, pigs, cattle, etc.
3	Wild water animals	Source of protein, fats, collected from wild	Fish, frogs, crabs, snails, etc
4	Wild land animals	Source of protein, fats, collected from wild	Birds, insects, mammals
5	Vegetables	Source of minerals, vitamins, fibre, collected and cultivated	Leaf vegetables, fruit vegetables, flowers, etc
6	Edible shoots	Source of protein, minerals, from wild	Bamboo and rattan shoots
7	Medicinal herbs	Medicinal plants are seen as part of food	Large variety
8	Fruits	Source of vitamins	Mainly wild fruits
9	Herbs	Adding taste, seen as separate category	Large variety
10	Oil plants	Source of fats	Sesame, peanuts, etc.
11	All foods bought from outside	Difficult to produce in the village (e.g. salt) also indicator of market access	Salt, Mono-Sodium Glutamate, oil, others

4 Findings from this study on food availability

4.1 Household wealth categories and rice availability

In all four villages surveyed, district authorities had already performed a wealth ranking exercise within the last 24 months. In Xay district, households were divided into five wealth classes. In Sing district, households of each village were simply divided into two or three classes (see Table 10: Household wealth categories and wealth indicators in four villages in Northern Laos, March 2011.).

Table 10: Household wealth categories and wealth indicators in four villages in Northern Laos, March 2011.

Village 1: Mok Kha	Xay district		Oudomxay Province		
Criteria	Category 1	Category 2	Category 3	Category 4	Category 5
description	thouk soud	thouk	phan kang	hang	hang mi
rice availability	6 to 9 months	7 to 9 months	8 to 9 months	8 to 9 months	12 months
shortage	3 to 6 months	3 to 5 months	3 to 4 months	3 to 4 months	0 months
income (million kip/year)	0.3	1.5 to 2	3.5 to 5	4 to 5	6 to 15
Food Accessibility	-no paddy fields, - mostly depend on forest for food,- have no land for cultivation	some years enough to eat, some years lacking rice	enough to eat	enough to eat	enough to eat
Housing	bamboo house with bamboo floors and walls and grass roof	wooden planks, bamboo floors, grass roof	wooden planks on floor and wall, zink roof	wooden planks on floor and wall, zink roof, ground floor cemented	wooden planks on floor and wall, zink roof, ground floor cemented
Health	Often sick, some people are single	no comments	mainly respiratory diseases	normal	normal
Village 2: Chom Ong	Xay district		Oudomxay Province		
Criteria	Category 1	Category 2	Category 3	Category 4	Category 5
description	thouk soud	thouk	phan kang	hang	hang mi
rice availability	3 to 4 months	6 months	7 to 10 months	10 to 12 months	12 months
(months/year)	8 to 9 months	6 months	2 to 5 months	0 to 2 months	0 months
income	0.6 to 0.9	0.5 to 2	0.5 to 3	1 to 5	2 to 17
Village 3: Cha Oup	Sing district		Luang Nam Tha Province		
Criteria	Category 1		Category 2		
description	thouk		hang mi		
rice availability	6 months		9-10 months		
(months/year)					
income	less than 2		more than 2 million kip		
(million kip/year)					
Village 4: Houay Na Tai	Xay district		Oudomxay Province		
Criteria	Category 1		Category 2		Category 3
description	thouk		kang		hang mi
rice availability	6 months		9-10 months		all year
(months/year)					
income	n.a.		n.a.		6

The food security survey team asked a group of women in each village to review the key indicators that determine the wealth status of each household. They were asked specifically to describe rice availability, annual cash income, food accessibility, housing and health status for each wealth group. Questions on food accessibility, housing and health were only asked in the first village, Mok kha. The team found that the answers were not very specific, and focused in the remaining villages on the two other indicators: *rice availability* and *annual cash income*.

Rice availability remains a key indicator of wealth. The degree of poverty assigned to a household ranged from only 3-4 months per year in the poorest households (Chom Ong) to 6 months in most other villages. Households with enough rice to eat for 9-10 months were considered average wealthy in Oudomxay Province, and wealthy in Luang Nam Tha Province. In short, the great majority of households in the four villages surveyed do not have enough rice to eat the whole year round. They need to buy, borrow or receive rice from outside.

This may not be easy for the poorest households, if we look at their perceived annual cash income. Poor households were defined in all four villages as earning less than 2 million kip (about \$250) per year. That would roughly suffice to buy about 500 kg of rice, which could feed an average household of six persons for not even three months². With an average lack of rice for six months per year or more, they would need to find at least another 550 kg or more through exchange for labor, bartering forest and farm products, borrowing or other means.

4.2 Household rice consumption, buying and selling

In interviews with 15 households in 3 of the 4 villages, detailed data were gathered on rice production, consumption, buying, borrowing and other uses of rice. Annual consumption needs per household were calculated on the basis of an annual consumption per adult of 350 kg un-milled or paddy rice. Children from 01-10 years old were counted as consuming half that amount. New born children less than 1 year were counted as not consuming rice.

On average, the households produced 2.5 tons of rice, which was 216 kg more rice than needed for their annual household consumption of 2.3 tons (see Table 11). However they sold on average 419 kg of rice early after harvest. They plan to buy back on average 357 kg (122 kg rice already bought, 197 expected to buy and 38 kg borrowed rice). With another 59 kg on average estimated per household to be used for livestock, the average household is left with a balance of 102 kg of rice per year.

Table 11: Rice consumption, production and buying data from 15 households in 3 villages in Northern Laos, March 2011

Rice Use	Quantities (kg)				Values (kip)			
	Mok kha	Chom ong	Houay na tai	Average	Mok kha	Chom ong	Houay na tai	Average
No families	7	5	3	15	7	5	3	15
Total production	2,522	3,108	1,567	2,526	not cash	not cash	not cash	not cash
Rice bought	89	218	42	122	-398,571	-735,750	-177,083	-466,667
Expect to buy	147	290	157	197	-662,143	-978,750	-668,667	-768,983
Borrowed	53	40	-	38	-237,857	-135,000	0	-156,000
All bought/borrowed	289	548	199	357	-1,298,571	-1,849,500	-845,750	-1,391,650
					\$ -162.32	-231.19	-105.72	-173.96
Rice sold	71	1,140	27	419	214,286	2,850,000	66,667	1,063,333
Used for livestock	15	98	65	53	not cash	not cash	not cash	not cash
Rice needed	2,225	2,800	1,692	2,310	not cash	not cash	not cash	not cash
Balance	499	(382)	(18)	102	-1,084,286	1,000,500	-779,083	-328,317
Price rice sold	3,000	2,500	2,500	2,200	-135.54	125.06	-97.39	-41.04
Price rice bought	4,500	3,375	4,250	4,000				

The average amount of money spent this year on buying and borrowing rice is estimated to be 1.4 million kip (\$174). This is partly compensated by income from buying rice (1.06 million kip), but on average still some 300,000 kip (\$41) will need to be found to buy the additional rice needed to meet the annual household rice requirement. The situation varies from an average shortfall of 1 million kip (\$135) in Mok Kha village to an average surplus of 1 million kip (\$125) in Cho mong village.

² Based on an annual requirement of 350 kg of un-milled rice per person per year, an average family of six persons would need 2,100 kg of rice per year, or 175 kg per month. Based on an average buying price of 4,000 kip/kg, this would cost 700,000 kip per month.

The rice price varies sharply with the seasons. In the dry season, just after the harvest, the price was around 2,200 kip. Quite a few households sold rice at that price, to pay back debts. In the wet season, when rice is running out and people need to buy rice, the price rises to around 4,000 kip per kg. Table 12 gives a rough estimate of the monetary value of the average household rice harvest at both prices. It should be noted that most of this rice will never be sold as it is consumed within the household.

Table 12: Comparing the value of rice at dry season selling price and wet season buying price. Estimates of the equivalent monetary value of the average rice harvest per household in three villages in Northern Laos, March 2011.

Monetary value of average rice harvest per household	Mok kha	Chom ong	Houay na tai	Average
Total production (kg)	2,522	3,108	1,567	2,526
value at dry season selling price of 2,200 kip/kg	7,566,429	7,770,000	3,916,667	5,557,933
in \$ (8.000 kip/\$)	\$ 946	\$ 971	\$ 490	\$ 695
value at wet season buying prices of 4,000 kip/kg	11,349,643	10,489,500	6,658,333	10,105,333
in \$ (8.000 kip/\$)	\$ 1,419	\$ 1,311	\$ 832	\$ 1,263

What these figures illustrate is the importance of rice buying and selling. In a bad year, many households will run out of rice earlier than usual, forcing them to buy rice at a high price. When they pay back, the rice price is low so they need to sell a lot more rice than they originally borrowed to pay back the debt. Households need to spend more time obtaining cash income to buy rice.

4.3 Vulnerability assessment

Secondly women were asked in each village to talk about vulnerability in small discussion groups. They were asked to discuss the six questions commonly asked in vulnerability assessment studies:

- (1) who is most at risk?
- (2) why are they at risk?
- (3) when are they most at risk?
- (4) what is making the risk bigger or smaller?
- (5) what is the outcome of the risk?
- (6) how do they cope with the risk?

Question 1: Who is most at risk?

In all four villages, the poorest group as defined in wealth ranking was seen as most at risk (Table 13).

Table 13: Who is most at risk? Women's answers in four villages in Northern Laos, March 2011.

Question 1: Who is most at risk of food shortage?			
Mok Kha	Chom Ong	Cha Oup	Houay Na Tai
Poorest families, lacking 3-6 months rice	Poorest families, lacking	Poorest, lacking 10 months of rice	Poorest, lacking 6 months of rice

Question 2: Why are they at risk?

Quite a variety of reasons were proposed as to why poor households are most at risk to lack food (see Table 14). The most commonly mentioned reasons were:

- (1) Not enough land (8 answers):

- a. Not enough land to grow rice (4 answers)
 - b. Our population is growing (1 answer)
 - c. So many rubber plantations do not leave any land for us to grow food (1 answer)
 - d. Poor people do not own any paddy (1 answer)
 - e. We have just settled here, we do not have any land (1 answer)
- (2) Poor soils, grass fallows, because we are not allowed to use older forest fallows for upland rice growing (4 answers)
- (3) Poorest household are mostly young couples, they are still establishing their households and do not yet have good land, have more health problems (3 answers)
- (4) No water in our paddy, no irrigation (2 answers)
- (5) Some people are just lazy, some lack labor (2 answers)
- (6) Rats damaged our crops(1 answers)
- (7) Poor households have no money, no income(1 answer)

Table 14: Why are they at risk? Womens' answers in four villages in Northern Laos, March 2011.

Question 1: Why are they at risk of food shortage?			
Mok Kha	Chom Ong	Cha Oup	Houay Na Tai
1-They have more health problems, 2-they are often young people establishing new households, who do not yet have good agricultural fields 3-They have no money, no income, 4-They are often sick, 5-They have no land for growing crops	1-Our paddy fields lack water 2-Rats damage our rice crops 3-not enough land for everybody 4-some people are just lazy 5-not enough labor available	1-soil very poor 2-grass fallows 3-government does not allow us to use older forest 4-not enough land, 5- our population is growing 6- so many rubber plantations leave almost no land to grow food	1-not enough land to grow food 2-we only have short, grassy fallows, giving low yields 3-poor people do not own any paddy 4-there is no irrigation for those who have paddy 5- we just arrived here, do not have money to buy more land

In conclusion, rural women in all four villages see lack of land the most important cause of food shortages, followed by the poor conditions of the soil as a result short fallow rotations. Both factors are seen as indirect effects of Government policies on resettling households to new locations, on limiting land areas per village through land use planning, through restricting the use of older fallow land and to the allocation of village land for rubber concessions. Lack of cash to buy food is considered the least important factor.

Question 3: When are they most at risk?

The answer was the same for all four villages: food shortages occur when last year's harvest of rice is depleted and the new rice has not yet been harvested. Early maturing rice varieties can be harvested from the end of September, the bulk of rice is harvested in October-November. The period of rice shortages is greatest in August, but for many families who are lacking rice more than two months per year, rice shortages may already occur as early as April.

Question 4: What factors make the risk bigger or smaller?

It was difficult for most women groups to see how this question would be different from the earlier question no 2: why are poor people at risk of food shortages? The main factors: lack of land and poor soils, lack of water in paddy fields, were mentioned again. A new factor mentioned here was the problem of weeds in upland fields, and land used for sugar cane plantations competing with land needed for rice (see Table 15).

In Chom Ong village, there was quite a bit of discussion on “khao kheo” as being an important factor leading to food insecurity for poor families. This is the selling of rice already before the harvest at a low price to pay off debts. If these households could hold off selling their rice until harvest, they would have enough money and rice to last the year. Village rice banks might be able to address this issue.

Table 15: What makes risk bigger or smaller? Women’s answers in four villages in Northern Laos

Question 4: what is making the risk of food shortage bigger or smaller?			
Mok Kha	Chom Ong	Cha Oup	Houay Na Tai
The main factor is having (access to) agricultural land, Poor people’s land is more dry, they have problems with rats and insect larvae eating their rice	-Not enough water for rice production -Not working hard enough	-because we plant sugar cane on crop land	-Lack of rains, poor soils, -no irrigation -lots of weeds in our upland fields

Question 5: What is the outcome of the risk?

This question could not be answered by anybody in the first village. Perhaps it was a question of translation of the rather abstract terms of “outcome” and “risk” which confused people, or perhaps the key outcome: chronic lack of food, was so obvious that the village women did know what else to say on the topic, we do not know why this question was so difficult to answer. At any rate as it was clear no answers could be expected, the team decided to skip this question in the remaining villages.

Question 6: How do they cope with the risk?

There was no problem answering this question see (Table 16).

Table 16: How do vulnerable households cope? Women’s answers in four villages in Northern Laos

Question 6: how do they cope with the risk of food shortage?			
Mok Kha	Chom Ong	Cha Oup	Houay Na Tai
1 Borrow within family, 2 labor 3 selling livestock 4 sell NTFPs	1exchange labor for rice 2sell handicrafts to buy rice 3sell NTFPs to buy rice 4raise more livestock to sell and buy rice 5work as laborer to buy rice, either digging paddy fields weeding upland fields or sawing timber to sell planks	1Borrow money from our village bank 2work as laborer to weed grass and to dig holes for planting rubber, 3sell NTFPs 4plant cash crops such as beans, sesame, ginger, mak eu, mak tone,	1work as laborers to buy food 2sell NTFPs to buy food

The main coping strategies mentioned were:

- (1) Work as laborer to buy rice: digging paddy fields, digging holes for rubber planting, weeding, sawing wood to sell planks, exchanging labor for rice instead of money (5 answers)
- (2) Selling NTFPs and handicrafts to buy food (5 answers)
- (3) Borrowing from family or village bank (2 answers)
- (4) Selling livestock (2 answers)
- (5) Planting cash crops to sell, beans, sesame, ginger, make u, mak tone (1 answer)

In conclusion, selling labor and forest products are the main coping strategies. Farming (livestock and crops) is a relatively small part of coping strategies for poor households to deal with food shortages.

4.4 Diversity of foods

4.4.1 Food categories

Eleven key categories of food were identified based on literature research on participatory analysis of nutrition studies in Lao PDR (see Table 17). In each village, groups of women were asked to list as many products as they could for each category and also rank them in order of importance. A total of 212 food products were mentioned over all eight categories. In the end, women were also asked to indicate the relative importance of each category by ranking the categories in order of importance (see Table 17).

Rice and other starchy products or sources of carbohydrates (maize, tubers, etc.) were considered the most important category. Second most important were all types of food bought from outside the village such as salt, MSG, meat and sweets. Vegetables ranked third, meat from wild animals and livestock ranked fourth, together with bamboo and rattan shoots. Medicinal herbs, fruits, nuts and herbs were considered least important (see Table 17). In the next section, the specific products in each of these groups will be examined in more detail.

Table 17: Eight categories of food:
Their relative importance and number of products, according to women in four villages, northern Laos, March 2011

No	Food Category	Villages				Overall rank	Diversity Products
		Mok Kha	Chom Ong	Cha Oup	Houay Na Tai	Importance	Total 212
1	Rice, other grain crops, tubers, other sources of carbohydrates	8	8	8	8	32	37
2	All foods bought from outside the village	4	4	7	7	22	23
3	Vegetables, flowers	5	7	4	4	20	33
4	Wild animals (fish, wildlife,)	7	3	5	3	18	41
4	Livestock	2	5	6	5	18	8
4	Edible shoots	3	6	3	6	18	11
5	Medicinal herbs	6	1	1	6	14	14
6	Fruits, herbs and oil plant	1	2	2	2	7	23, 14, 8

NB a rank of 8 is highest importance, a rank of 1 lowest importance

4.4.2 Diversity and key products within each food category

4.4.2.1 Grains and tubers

Not surprisingly, rice³ is considered the most important product among all the products that are a source of carbohydrates (grains, tubers, etc.) Wild forest yam tubers were considered the second most important product in this category, more important than cultivated tubers such as cassava, taro or sweet potato and also more important than other grains such as maize, job's tears and sorghum (Table 18). This underscores the importance of wild foods among the staple foods.

³ N.B. the 29 individual rice varieties are presented in section 5.3.3 below.

Table 18: Grains and Tubers ranked to importance by women groups in four villages in northern Laos, March 2011

No	Product	Ranking	Villages				Price (kip/kg)
		overall score	mok kha	chom ong	cha oup	houay na tai	
1	Rice (milled)	28	7	7	7	7	18,000
	(unmilled)						4,500
2	Forest yams	21	6	6	6	3	
3	Cassava	18	5	4	4	5	500
4	Maize	17	3	2	6	6	875
5	Taro (pheuak)	15	4	3	5	3	2,000
6	Sweet potato	12		5	3	4	1,000
7	Yam bean	9	1			8	
8	Job's tears	7	4	1	1	1	3,000
9	Sorghum	4			2	2	

4.4.2.2 Food products bought from outside the village

In the four villages surveyed, women identified 23 food products they buy regularly. The top five food products bought are salt, mono-sodium glutamate (MSG) locally known as “paeng noua”, pork meat, eggs and cooking oil (see Table 19).

Table 19: Food products that are bought from outside ranked to importance by women groups in four villages in northern Laos, March 2011

No	Product	Ranking	Villages				Price (kip/kg)
		Overall score	mok kha	chom ong	cha oup	houay na tai	
1	Salt	40	4	13	10	13	2,125
2	MSG	40	5	14	9	12	12,000
3	Pork meat	26	2	12	3	9	24,250
4	Eggs	24		11	7	6	800
5	Cooking oil	21		2	8	11	2,000
6	Chicken meat	21		10	6	5	25,000
7	Fish	16	3	3		10	17,333
8	Cabbages	13			5	8	3,000
9	Duck meat	10		10			30,000
10	Buffalo meat	9	1	6	1	1	7,500
11	Beef meat	9	1	6	1	1	28,500
12	Dried chilies	9		9			30,000
13	Oranges	9		5	2	2	4,333
14	Rice milled	8		8			4,000
15	Noodles "khao soi"	8			4	4	2,500
16	Birds	7		7			30,000
17	Chinese cabbage	7				7	2,000
18	Tamarind	5		5			8,000
19	Apples	5		5			10,000
20	Dog meat	4		4			12,000
21	Long beans	3				3	5,000
22	Sugar	1		1			8,000
23	Rats, squirrels	0					25,000

These products can also be roughly divided into four categories: meat, fish and eggs, dried foods, vegetables and fruits (see Table 20). Protein rich food such as meat, fish and eggs are the most important type of products bought, closely followed by dried foods such as salt, MSG and dried chillies. Vegetables and fruits are bought less frequently.

Table 20: Summary of types of food most commonly bought from outside the village (based on table 19 above).

Product type	total score	percentage
Meat, fish and eggs	116	39%
Dry Foods	103	34%
Vegetables	28	9%
Fruits	52	17%
Total	299	100%

4.4.2.3 Vegetables

Women groups in the four villages mentioned 33 types of vegetables as most commonly consumed in their households (see Table 21). Some groups differentiated between edible flowers (“dok”, e.g. dok khæ, Sesbania flowers), fruit vegetables (“mak”. e.g. “mak taeng”, cucumbers), leaf vegetables (“pak”, e.g. “pak khoud”, fern leaves), and mushrooms (“hed”). For almost all vegetables women could also mention a price, which indicates they are also frequently traded.

Table 21: Vegetables diversity and ranking to importance by women groups in four villages in northern Laos, March 2011

No	Product	Ranking	Villages				Price (kip/kg)
		Overall score	Mok kha	Chom Ong	Cha Oup	Houay Na Tai	
1	pak khoud	30	8	10	5	7	1,000
2	pak khad cabbage	29	9	8		12	2,500
3	egg plant	27	9		9	9	1,750
4	pak nok	26	7	10	6	3	6,000
5	mak euk	26	7		8	11	750
6	pak nao	24		4	10	10	1,000
7	banana flowers	23		12	3	8	1,000
8	pak kalampi	15	9	6			2,000
9	pak mak wa	14		4	4	6	
10	pak khaep	10	7	3			
11	pak hom	9	7		2		5,000
12	long beans	9	5			4	2,750
13	dok khæ	9	9				
14	peppers	9	9				10,000
15	bone	9		9			
16	dok phit	8	8				
17	mak teng	8	8				500
18	dok wan	7	7				
19	pak koi	7	7				
20	pak salad	7		7			
21	nyod mak toua	7			7		
22	mak nam	6	6				500
23	mak toua phaep	6	6				
24	pak feuk	5		5			3,000

25	mushrooms	5				5	15,000
26	pak hak	4		4			
27	mak ton	4	4				500
28	mak kadon	4	4				
29	pak top	3			1	2	2,000
30	pak hai som	2		2			
31	mak bouap	2	2				
32	pak nya heua bin	1		1			
33	pak khao thong	1				1	6,000

4.4.2.4 Livestock and wildlife

The most frequently consumed type of livestock in the households in the four villages surveyed were chicken, ducks, pigs, cattle and dogs (see Table 22). Fish caught in fishponds is a rare item on the menu of these upland villages, most of their fish comes from the wild.

Table 22: The importance of livestock consumed as food ranked by women in four villages in Northern Laos, March 2011.

No	Product	Ranking	Villages				Price
		overall score	mok kha	chom ong	cha oup	houay na tai	(kip/kg)
1	chicken	28	7	7	7	7	25,000
2	ducks	17	6	6	5		30,000
3	pigs	16	5	5	6		21,000
4	cattle	14	4	4		6	27,000
5	dogs	10	2	3		5	18,000
6	buffalo	8	4	4			27,000
7	goats	5	3	2			18,000
8	fish	2	1	1			16,000

Overall, wildlife and aquatic animals were ranked as an equally important source of food compared to livestock (see Table 17 above). Yet the diversity of wild animals consumed is much higher than livestock: the women listed 41 types of wild animals as food sources, compared to 8 types of livestock (Table 23).

Table 23: Wildlife as food diversity and ranking according to groups of women in four villages in Northern Laos, March 2011

No	Product	Ranking	Villages				Price
		Overall score	Mok Kha	Chom Ong	Cha Oup	Houay Na Tai	(kip/kg)
1	crabs	27		7	6	14	20,000
2	fish	23	8	8	7		
3	snails	19					
4	birds in general	14			4	10	17,000
5	fish 'pa pan'	13				13	15,000
6	shrimps	12		7	5		
7	snails	19				12	4,000
8	birds 'nok nit'	11	6	5			
9	frogs	11				11	15,000
10	'nio' insect larvae	9				9	
11	squirrel 'kahok'	8	1	4	3		5,000
12	mole crickets	8				8	

	'chinai'					
13	birds 'nok pid'	7	7			
14	bamboorat 'oun'	7			7	180,000
15	birds 'nok it'	6	6			
16	birds, junglefowl	6	x		6	
17	rats	6	x	6		5,000
18	birds 'nok kao'	5	5			
19	wild boar	5	3	1	1	25,000
20	beetle 'meng kha'	5				5
21	birds 'nok jack'	4	4			
22	muntjak deer	4	x	3	1	30,000
23	civet cat 'nyen'	4	2	2		
24	insect 'meng da'	4				4
25	crickets 'takataeng'	3				3
26	rhino beetles 'nhuang sang'	2				2
27	bamboo grub 'toua mae'	2			2	55,000
28	monitor lizard	1				1
29	squirrel "jone"	0	x			
30	serow 'nyeuang'	0	x			
31	Wild dogs ma nai	0	x			
32	Wild cat sua noi	0	x			
33	hone	0	x			
34	porcupine 'men'	0	x			
35	bears 'mi'	0	x			
36	bird nok tanglor	0	x			
37	bird nok sae	0	x			
38	bird nok ka	0	x			
39	bird nok koua	0	x			
40	bird nok nyang	0	x			
41	bird nok pao	0	x			

In summary, among all wild animals consumed, fish and aquatic animals are seen as the most important source of food (45%), followed by birds (29%), see Table 24 below. Land animals and insects account for 14% and 13% of all wild meat consumed.

Table 24: Summary ranking of types of wildlife consumed in four villages in northern Laos, based on table 23 above

Type of Wildlife	score	%
fish and aquatic animals	105	45%
birds	67	29%
land animals	32	14%
insects	31	13%
ALL	235	100%

4.4.2.5 Edible shoots

Edible shoots such as bamboo and rattan shoots can be regarded as a type of vegetables. They are treated as separate group because of their relative importance and frequency found in literature on non-timber forest products in Lao PDR. Eleven types of bamboo shoots and one type of rattan shoot (“nyod vai”) were mentioned as frequently consumed by women groups in the four villages surveyed (Table 25).

Table 25: Edible shoots diversity and ranking to importance by women groups in four villages in northern Laos, March 2011

No	Product	Ranking	Villages				Price
		overall score	mok kha	chom ong	cha oup	houay na tai	Kip/kg
1	nor bong	20	9	6	4	1	1,625
2	nor mai hok	17	8	5	2	2	1,500
3	nor mai sang	14	3	3	3	5	750
4	nor khom	13	7	1	1	4	3,000
5	nor lan	6	6				2,000
6	nor mai hia	6	2	4			750
7	nor lai	5	5				750
8	nor mai bok	4	4				1,000
9	nyod vai	3	1	2			
10	nor van	3				3	1,500
11	nor man	0					1,000

4.4.2.6 Medicinal products

Women were also asked to list medicinal products consumed as foods (Table 26). There was quite a large difference between the two ethnic groups. In the two Khamu villages in Oudomxay, only four products were mentioned in only one village, no ranking was given. In the two Akha villages in Luang Nam Tha, a large variety of medicinal products were mentioned, among them many animal products (e.g deer embryos, monkey gall).

Table 26: Medicinal plants listed as foods by women in four villages, Northern Lao PDR, March 2011

No	Product	Ranking	Villages			
		Overall score	Mok kha	Chom Ong	Cha Oup	Houay Na Tai
Khamu medicine						
1	pak khoud nam		n.a.	x		
2	hom keo		n.a.	x		
3	khapou		n.a.	x		
4	nay kiou		n.a.	x		
Akha medicine						
1	nyod mak sida	12			6	6
2	mai thalo	10			6	4
3	raw bananas	8				8
4	peuak mak lin mai	8			8	
5	bai nya nang	8			8	
6	nyod mak thoum	8			8	
7	lae ya	7			7	
8	hak mak houng	6			6	
9	ton ah chou lou	5			5	

	chou				
10	bear gall	4		2	2
11	deer embryo	4		4	
12	monkey gall	3		3	
13	bai mak phot	2		2	
14	ae lai, ae tae	1		1	

4.4.2.7 Fruits, nuts, spices and oil products

The most commonly consumed fruits are bananas, pineapple, pomelo, mango and longan (lamyai). Some 28 types of fruits were listed (see Table 27). For most local fruits village women could not mention a price, which may indicate these fruits are not much bought or sold.

Table 27: Fruits consumed diversity and ranking to importance by women groups in four villages in Northern Laos, March 2010.

No	Product	Ranking	Villages				Price (kip/kg)
		Overall score	mok kha	chom ong	cha oup	houay na tai	
1	banana	15	9			6	1,000
2	pineapple	12	9		3		1,000
3	pomelo	11	8			3	4,000
4	mango	10	8		2		
5	longan	9	8			1	
6	papaya	9			4	5	1,000
7	rambutan	7	7				
8	mak bai	7	7				2,000
9	mak man	6	6				3,000
10	guava	6	4			2	
11	mak sim	5	5				
12	mak fod	5	5				
13	mak dah	5	5				
14	mak lod	4	4				
15	tamarind	4				4	3,500
16	lime	3	3				
17	mak phaen	2	2				
18	mak kho som	1	1				
19	water melon	1			1		1,500
20	mak fai	0		x			
21	mak khamphom	0		x			
22	mak fot	0		x			
23	mak sim	0		x			

The most commonly consumed herbs and spices are dried chillies, lemon grass, garlic, ginger and shallots (see

Table 28).

Table 28: Spices and herbs ranked to importance by women groups in four villages in Northern Laos, March 2011

No	Product	Ranking	Villages				Price
		overall score	mok kha	chom ong	cha oup	houay na tai	(kg/ha)
1	dried chilies	29		10	11	8	30,000
2	lemon grass	23		8	10	5	
3	garlic	23		5	12	6	15,000
4	ginger	20		7	8	5	5,000
5	shallots	20		5	9	6	7,500
6	galangal	13		6	7		4,000
7	mint pak hom	10			3	7	1,000
8	egg plants	9		9			
9	coriander	8		2	6		
10	mak khene spice	8			5	3	
11	'pak khi on'	4		4			
12	basil	4		3		1	
13	tomato	4				4	
14	dill	4			4		
15	'pak peo'	2			2		
16	'sakhane' wood	1		1			
17	'bai yeum'	1				1	
18	mint 'hom lap'	1			1		

Last but not least women also ranked the main sources of oil seeds used in their households. Sesame is the most important source of oil, followed by peanuts and soybeans (see Table 29).

Table 29: Oil seeds used as food ranked to importance by women groups in four villages in Northern Laos, March 2011.

No	Product	Ranking	Villages				Price
		overall score	Mok kha	Chom ong	Cha Oup	Houay Na Tai	(kip/kg)
1	sesame	16		3	5	8	7,500
2	peanuts	14		1	6	7	6,500
3	soy beans	10			4	6	500
4	sunflower	9		2	3	4	5,500
5	green beans	5				5	
6	'mak kou' nuts	4			1	3	1,000
7	'mak king' nuts	3			2	1	
8	chestnuts	2				2	1,500

4.4.3 Diversity of rice varieties

In the four villages surveyed, 29 varieties of rice were being planted (see Table 30). Out of these, 22 are upland varieties, only seven are planted in the paddy field. 24 varieties were glutinous (sticky) rice, only five were not. Most of these varieties (15) varieties late maturing “pi”, 11 medium “kang” and 3 early maturing “doh”. Almost all were local varieties, only two were introduced (HDK 5 and Nam Tha).

Table 30: Diversity of rice varieties in four villages in northern Laos, March 2011

No	Variety	Maturity type	Upland/paddy	Glutinous or not	Villages				Remarks
					mok kha	chom ong	cha oup	houay na tai	
beu	sanit pan	doh/kang/pi	na/hai	niao/chao					
1	khao thoua	doh	hai	niao		x			fast growing, early maturing
2	khao phae savanh	doh	hai	niao		x			early maturing
3	khao chat cheo	doh	hai	niao			7	8	early maturing, we can eat before the others are ripe
4	khao phae daeng	kang	hai	niao	x				
5	khao none	kang	hai	niao	x				
6	khao lam	kang	hai	niao	x				
7	khao kok	kang	hai	niao		x			heavy, large grains
8	khao na leuang	kang	hai	niao		x			good yield, tasty, soft,
9	khao paen thaen	kang	hai	niao		x			we use for ceremonies, part of our culture, need to keep
10	khao rouk	pi	hai	niao	x				
11	khao khao	pi	hai	niao	x	x			good yield
12	khao ban draem	pi	hai	niao	x				
13	khao chak	pi	hai	niao	x				
14	khao prien	pi	hai	niao	x				
15	khao kha ip	pi	hai	niao		x			heavy, large grains, smells good
16	khao dam	pi	hai	niao		x			heavy, large grains, smells good
17	khao mak wa	pi	hai	niao		x			big grains, good yield
18	khao sae seuk	pi	hai	niao			4	2	hard, but becomes large when soaked in water
19	khao laai	pi	hai	niao			5	5	used for ceremonies, used for baking rice cookies
20	khao kham	pi	hai	niao			6	4	used for ceremonies, used for baking rice cookies
21	khao lao soung	pi	hai	chao			1	3	delicious, soft
22	khao pae lae	pi	hai	chao			3	1	high yield, delicious, big grains
23	HDK 5	kang	na	niao	x				
24	khao nga sang	kang	na	niao	x	x			fit to our soil good yield
25	khao sa daed	kang	na	niao		x			I use because it is the only one I have
26	khao meuang nga	pi	na	niao		x			long duration variety, good yield
27	khao chao mat	kang	na	chao		x			as a safety crop, in case we have nothing else to eat
28	khao a noi	kang	na	chao			2	7	drought resistant, hard, good emergency food, fills the body
29	khao nam tha	pi	na	chao				6	high yield

The team collected some data on the relative yields of various rice varieties from individual family interviews as well. Table 31 shows all rice varieties planted by seven interviewed families from different wealth classes. There is a large spread in yield factor (kg harvested/kg planted). In this group, the most common varieties are “khao nga sang”. “khao khao”, “khao cha ngan”, “khao phae daeng” and “khao nga kroung”.

Table 31: Yield factors of upland varieties planted by 7 families in Mok Kha village, March 2011

Variety	Ma-turing type	Upland/paddy	Sticky or not	Kg planted	Kg harvested	yield factor	no families	kg/fam
khao nga sang	kang	na	niao	190	7,225	38	6	1,204
khao khao	pi	hai	niao	50	1,950	39	4	488
khao chah ngan	do	hai	niao	10	1,800	180	1	1,800
khao phe daeng	kang	hai	niao	30	1,800	60	2	900
khao nga kroung	pi	hai	niao	20	1,500	75	1	1,500

khao rouk	pi	hai	niao	40	1,110	28	3	370
khao lam	kang	hai	niao	30	900	30	1	900
khao ban raem	pi	hai	niao	30	630	21	3	210
khao HDK 5	kang	na	niao	20	500	25	1	500
khao ta kiet	pi	na	niao	15	390	26	1	390
khao chak	pi	hai	niao	20	600	30	2	300
khao none	kang	hai	niao	10	300	30	1	300
khao done	pi	hai	niao	10	240	24	1	240
khao kham	pi	hai	niao	30	180	6	1	180
			Total	505	19,125	38	7	2,732

Looking at the same data per family, there is a much more even spread in the so called “seed factor”: the amount of rice planted (on average 72 kg per family and the amount of rice harvested (on average 2.7 tons per family), see Table 32. This shows how households reduce risks of rice harvest failures by planting a mix of rice varieties in their rain-fed upland fields. There was no clear correlation between wealth class and rice yield. Wealthy families just plant larger areas of upland rice (kg planted is higher).

Table 32: Yield factors per family (n=7) in Mok Kha village, Oudomxay, March 2011

Family	wealth class	No varieties planted	kg planted	kg harvested	yield factor
A	1	4	95	3,150	33
B	2	4	60	4,170	70
C	2	3	50	1,950	39
D	3	4	120	4,680	39
E	3	3	60	1,700	28
F	4	5	70	2,125	30
G	5	5	50	1,350	27
		Total	505	19,125	38
		Average	72	2,732	38

5 Findings on food accessibility

5.1 Sources of food

Groups of villagers were asked to explain the relative strengths and weaknesses of key sources of food security such as production on farm and in household, collecting from the wild, buying from the market, borrowing, exchange (barter), as well as gifts from relatives or from projects and government. In Mok kha village, both men and women were asked (see Table 33). In the remaining three villages only women participated in the interviews.

Table 33: Strengths and weaknesses of different sources of food security identified by women and men groups in Mok Kha village, Xay district, Oudomxay, March 2011

No	Source	Strengths		Weaknesses		Typical products	Rank	
		women	men	women	men		Men	Women
1	Producing	no need to buy, can sell, can eat,	no need to buy, no need to waste time looking for food in forest	food not always good quality, sometimes low yields, not enough,	it requires a lot of labor, we have no good techniques, soil is poor	rice, maize, cassava, sweet potato, mak euk, peanuts, peppers, egg plants, cucumbers	22%	30%
2	Collecting	no need to buy, can sell, can eat,	no need to buy, it is organic (no chemicals)	difficult to find, far away, often seasonal so not always available	less forest now, wild foods less available now compared to the past	bamboo shoots, mushrooms, rats, birds, frogs, vegetables,	15%	15%
3	Buying	makes food taste better	easy to get, no wasting of time	no money to buy	it costs money, for some products we have to go to the city	rice, MSG, salt, meat, chicken, medicines	20%	17%
4	Borrowing	low interest	easy to get, no wasting of time, not difficult to pay back	we get into debt	high interest, sometimes we need to work a long time to pay back	rice, money, alcohol	12%	12%
5	Exchanging	no debt	if we don't have money, we can exchange either with our products or with labor, it is direct, we get paid the same day	not always fair deal, sometimes they cheat us by not paying for our labor	not everybody has labor time left over to pay back, some people have to work a long time to pay back, it is a strain on some people's health	rice, labor for weeding, paddy construction, cutting wood	10%	10%
6	Gifts from relatives	it is free, friendship	no problems	we are shy to ask, cannot ask a lot	no problems	rice, money	6%	7%
7	From Projects, Government	no comments	free, we don't have to work for it going out of the village	no comments	no problems	milled rice, unmilled rice, seeds for fodder crops, fish fingerlings, agricultural tools	15%	9%
	All						100%	100%

The main comments made by women over all four villages on each of these food sources were:

1: Producing food on farm and in household

Strengths: no need to buy if you can grow food on your farm, it is always there, we can sell, we can eat, no need to waste time looking for food in forest

Weaknesses: our farm food is not always of good quality; often we get low yields, not enough food. Farming requires a lot of labor, we have no good techniques, our soil is poor, susceptible to drought, depending on rains, we suffer from insect pests, there are no new varieties available

Typical products: rice, maize, cassava, sweet potato, mak euk, peanuts, peppers, egg plants, cucumbers, phak kad, fish, ginger, garlic, coriander, sesame, mak euk, mak ton

2: Collecting food from the wild

Strengths: no need to buy food if you can collect it, we can sell collected foods, we can eat any time we want, it is natural, organic, no chemicals

Weaknesses: there is less forest now, wild foods are less available now compared to the past, many people are competing for it now, it is getting more difficult to find, we have to go far away to find it, many wild products are seasonal so not always available

Typical products: bamboo shoots, mushrooms, rats, birds, frogs, fish, forest crabs, bamboo grubs, vegetables, ferns, sakhane, pak mak wa, pak nok

3: Buying food

Strengths: condiments make our food taste better, buying food saves time, there is no need to go to forest, it is convenient, easy to get

Weaknesses: some people have no money to buy any food, it costs money, for some products we have to go to the city, that takes time

Typical products: rice, MSG, salt, meat, chicken, medicines, fish, pork, buffalo and beef meat, phak khad, chilies, salt, cooking oil, oranges

4 Borrowing

Strengths: low interest, not difficult to pay back, it saves time, it is easy to find neighbors who will lend us money

Weaknesses: we get more into debt, sometimes we have to pay high interest 2% per month⁴, sometimes we need to work a long time to pay back, our village bank is small so not everybody can borrow at the same time, sometimes we have to sell livestock to pay back

Typical products: rice, alcohol, money

5 Exchanging

Strengths: compared to borrowing there is no debt, no interest, if we don't have money, we can get food by exchanging either with our farm products or forest products or with our labor, it is direct, we get paid the same day

Weaknesses: We don't always get a fair deal, sometimes they cheat us by not paying for our labor, sometimes the actual value of a duck or chicken we give them is much higher than the rice they give us, not everybody has labor time left over to exchange for food, some people have to work a long time to pay back what was given to them, it is a strain on some people's health, we cannot produce enough labor to exchange for all the things we need.

6 Gifts from relatives. Strengths: it is free, it builds friendship. *Weaknesses:* not many families get this, we are shy to ask, cannot ask a lot

7 Gifts from projects and Government. Strengths: it is for free, we don't have to work for it going out of the village, it reduces our lack of rice, we have something to eat, we can clothe our children.

Weaknesses: It is always temporary, now projects don't come anymore to our village

Typical products: milled rice, un-milled rice, seeds for fodder crops, fish fingerlings, agricultural tools, clothes from German project, tinned fish, sugar and oil from WFP.

⁴ Martin Dunn comments: This actually is a good rate in my opinion (MFI rates are 3-4%/mo.). The actual rate that farmers end up paying by selling "khao keow" is something like 20% per month".

In Mok Kha village, detailed data were collected on the relative importance of each of these sources of food (see Table 34). Groups of wealthy, middle and poor households were divided each into a small group of women and a small group of men, who ranked the sources of food. Overall, 42% of all food consumed is produced in the household (either produced on farm or collected from forest). In other words, 58% is obtained from outside the village. Of this, some 40% is bought, borrowed or exchanged for labor and 18% is obtained from gifts by relatives or by projects.

The differences between men and women were not large. Women seemed to attach more importance to food produced on the farm, less to food bought or received from Government. The difference between households belonging to different wealth categories was more pronounced. Poor households never mentioned food aid received by Government or from relatives. As a result, their rankings for food produced on farm, collected from forest and bought from the market were higher than those of medium and wealthy households.

Table 34: Relative importance of different sources of food
Mok Kha village, Oudomxay, March 2011. Villager divided in 6 small groups of wealthy, middle and poor households. Within each group, men and women were separated. Each group ranked sources of food to relative importance.

Source	Wealthy		Middle		Poor		All					total
	women	men	women	men	women	men	wealthy	middle	poor	women	men	
Produce on Farm	26%	24%	27%	20%	38%	n.a.	25%	24%	38%	30%	22%	27%
Collect from Forest	16%	20%	7%	10%	21%	n.a.	18%	9%	21%	15%	15%	15%
Buy from Market	11%	20%	17%	20%	23%	n.a.	16%	19%	23%	17%	20%	18%
Borrow	9%	16%	15%	7%	11%	n.a.	13%	11%	11%	12%	12%	12%
Exchange for labor or barter	10%	n.a.	13%	17%	7%	n.a.	10%	15%	7%	10%	10%	10%
Gifts from relatives	13%	n.a.	8%	16%	0%	n.a.	13%	12%	0%	7%	6%	7%
Gifts from Projects or Government	15%	20%	13%	10%	0%	n.a.	18%	12%	0%	9%	15%	11%
All	100%	100%	100%	100%	100%	0%	112%	100%	100%	100%	100%	100%

Unfortunately, these data are not available from the other three villages, due to misunderstandings in the recording of data. Yet this method of asking village groups to assign values to the various sources of food would seem a good tool for rapid analysis of food security at village level.

5.2 Factors determining food production from agriculture and gathering

The team asked villagers to identify the main factors or causes determining food security or insecurity. As much as possible, an attempt was made to group factors mentioned by villagers in categories such as environmental factors, economic factors, policy factors, social factors and conflict.

For rice, village women mentioned many environmental issues such as upland crops being dependent on erratic rainfall, rats and insect pests, rice diseases such as blast (see Table 35 below). The sharp annual changes in rice and maize prices and the competition between cash crops and rice were mentioned as economic factors reducing availability of rice. Government policies resettling

villages to new locations, limiting land available for shifting cultivation causing poor fallows and declining yields are also determinants of rice food security. Population increase causes social conflicts over land for growing rice.

Table 35: Factors determining rice food (in-) security according to village women.

Data from in four villages in northern Laos, March 2011. M= Mok kha village, oudomxay, C= Chom Ong village, Oudomxay, O= Cha Oup village, Luang Namtha, H= Houa Na Tai village, Luang Namtha

A: Rice				
Environmental	Economic	Policies	Social	Conflict
-difficult to predict rains and select the right planting time (M) - some years too much rains (M) -some years too much drought (M) -some times rats eat our rice (M) -some insects damage our rice, "meng kai pa", "douang" (M) -sometimes there are rice diseases like blast (M)	-we plant so much maize there is not enough land to plant rice (M) -some years the maize price is so low we lose money (M, O) -for those who sell rice, the price is sometimes low (M)	-we had to move our village, needed to establish new agricultural land (M) - the policy to eradicate shifting cultivation limits the amount of land we can cultivate (M)	- not enough labor to do all the work (M, O) - we still are establishing ourselves in this new location (M)	There are conflicts over land, rich families take the best land, only poor land is left for the poor (M)

For wild collected foods, the main issue is the rapid depletion of wild resources as a result of more people living in the same area (see Table 36).

Table 36: Factors determining (in-) security of wild collected foods according to village women.

Data from four villages in northern Laos, March 2011. M= Mok kha village, oudomxay, C= Chom Ong village, Oudomxay, O= Cha Oup village, Luang Namtha, H= Houa Na Tai village, Luang Namtha

B: Wild collected foods				
Environmental	Economic	Policies	Social	Conflict
The streams have less water and less fish than before (M) Not much forest left	There is so little wildlife we cannot sell it anymore (M)	There is a hunting ban which makes it more difficult to shoot larger wildlife like deer, wild boar, porcupines, etc.(M)	There is much less now as population increased (M, O)	Anybody can go anywhere to put snares or hunt small animals, so they are almost finished (M) We have conflict over bitter bamboo shoots harvesting with neighboring villages (O)

For livestock, the main factor seems to be the lack of communal grazing land, which causes conflicts when cattle damage crops. It is also likely to cause animal health problems.

Table 37: Factors determining livestock food (in-) security according to village women.

Data in four villages in northern Laos, March 2011. M= Mok kha village, oudomxay, C= Chom Ong village, Oudomxay, O= Cha Oup village, Luang Namtha, H= Houa Na Tai village, Luang Namtha

C: Livestock				
Environmental	Economic	Policies	Social	Conflict
Many animals die because of diseases (M, O)	Prices are low, we do not get much income		Many families live here now, they all raise animals, there is not enough natural grazing so animals die	We need to stop grazing animals freely, families should keep their animals on their own land

For food products bought on the market, there was only one main factor identified: people feel they can buy more food because they can sell maize and earn money with it.

Table 38: Factors determining (in-) security of food bought on the market according to village women.
 Data from four villages in northern Laos, March 2011: M= Mok kha village, oudomxay, C= Chom Ong village, Oudomxay, O= Cha Oup village, Luang Namtha, H= Houa Na Tai village, Luang Namtha

D: Bought foods				
Environmental	Economic	Policies	Social	Conflict
	We can buy more food because we can sell maize and earn money with it (M, O)			

The conclusion is that village women see problems in **access to land** to produce food from agriculture and access to forest land for gathering wild foods as the main factor limiting their food security. They also mentioned lack of labour opportunities as a factor limiting their access to cash income for buying food.

They did not mention **access to markets or food prices** as a factor even though we learned earlier that that 40% of food consumed in the villages is derived from outside the village (see Table 34 above).

Access to Government food support programs was not mentioned either, even though we learned earlier these could contribute up to 18% of all food consumed in the surveyed villages (see Table 34 above).

Access to health services and clean water was never mentioned as being related to food security, although lack of access to clean water is a big issue in almost all the villages surveyed and was brought up in all discussions somehow.

6 Findings on use and utilization of food

6.1 Estimates of quantities and values of food consumed at household level

In the individual household interviews, each household gave detailed estimates of the quantity and price of various food products consumed per year. Based on these household interviews, an estimate of the value of various food sources could be made (see Table 39). The predominance of rice as a key source of food is confirmed here, but there are large differences between villages.

In Oudomxay, rice produced on farm represents some 77% of the total value of foods consumed, in Luang Namtha only 50%. The other farm products only contribute 14% overall (17% in Oudomxay and 3% in Luang Namtha). In the village in Luang Namthat, Houay Na Tai, the total value of rice produced on the farm is only half as big as in the two villages in Oudomxay. The share of rice in the total value of food is also higher in the Oudomxay villages. The value of bought food is also larger in Luang Namtha.

If rice taken separately, the remaining farm products only account for 14% of the value of all foods.

Table 39: Values of food produced on farm, collected from forest and bought from outside, based on individual household interviews in four villages in Northern Laos, March 2011.

Village	Mokkha		Chom Ong		Cha Oup		Houay Na Tai		Average	
No Households	8		5				3			
Unit	kip per family	%	kip per family	%	kip per family	%	kip per family	%	kip per family	%
1: Farm products	9,094,786	79%	8,888,300	75%	n.a		4,266,667	52%	7,416,584	70%
<i>of which rice:</i>	6,557,571	57%	7,355,600	62%			4,026,667	49%	5,979,946	57%
<i>other farm products</i>	2,537,214	22%	1,532,700	13%			240,000	3%	1,436,638	14%
2: Wild collected products	1,534,076	13%	1,547,250	13%	n.a		1,591,667	19%	1,557,664	15%
3: Bought products	883,637	8%	1,454,567	12%	n.a		2,343,889	29%	1,560,698	15%
	11,512,499	100%	11,890,117	100%			8,202,222	100%	10,534,946	100%

On first sight, these data seem to differ from the group ranking exercise presented in table 34 above. Rice, which is mostly consumed and not counted as a source of income, confuses the picture in table 35. In table 36 below we take rice out of the equation for Mok Kha village. All other foods produced on farm then make up 22%, wild collected foods 13% and bought foods 8%. These numbers are remarkable similar to the data presented in table 34. In other words there was little difference between the individual household estimates and the group ranking estimates here.

Table 40: Comparing estimates from individual household interviews with group ranking data.

This table presents relative weights attributed by village women to three key sources of food (1: from farm, 2: wild collected and 3: bought) in Mok Kha village, Oudomxay. Data on the left from individual household valuation (see Table 39 above) are compared with those from group ranking on the right (see Table 34 above).

	kip	\$	%	from
Food from farm	9,094,786	\$ 1,137	79%	ranking
rice	6,557,572	\$ 820	57%	data
non-rice	2,537,214	\$ 317	22%	22%
wild collected foods	1,534,076	\$ 192	13%	15%
bought foods	883,637	\$ 110	8%	12%
total without rice	4,954,927	\$ 619		
total	11,512,499	\$ 1,439	100%	

6.2 Recall data on food consumed over a week and over a day

Individual households were asked to recall how often they consumed common food items over the past week. Table 41 shows the frequency of consuming key food items over a week period. In most households, the majority of food items (except rice) were consumed less than once per day.

Table 41: Weekly food recall data
 how many times key food items were consumed in the household over the last 7 days. Data collected over 15 households (hh) in 3 villages in Northern Laos, March 2011 (Mok kha village, 7 hh, Chom Ong village, 5 hh and Houay Na Tai, 3 hh).

times per day	not once	less than once a day							more than once per day		
		1	2	3	4	5	6	total	once	twice	thrice
times per week	0	1	2	3	4	5	6	total	7	14	21
fish	5	3	2	3	1		1	10			
aquatic animals	5	3	4	2	1			10			
wildlife, livestock	0	3	5	3	1		1	13	2		
birds	7	4	2	1	1			8			
other animals	8	3	2	1		1		7			
bamboo shoots	2		4	3	2			9	3		1
leaf vegetables	3		2	4	3		1	10		1	1
other vegetables	4	2	2	2	1	1		8			3
fruits	5	3	3	3	1			10			
condiments, spices	1			1				1	1		12
vegetable oil	9	1	1	3	1			6			
MSG	1		1					1	1		12
food bought (times)	4	4	1	3	1			9			2
any other food	12		2	1				3			

Table 42 summarizes the same data in different terms. It shows how many families consumed various food items in frequency classes of: not eaten once in the whole week, eaten less than seven times per week, eaten, once a day, twice a day or three times a day.

Most households consumed most food items less than once a day. Vegetable oil was not used once in the whole week by 60% of interviewed households. Fish is the most commonly consumed source of animal protein, however none of the households can afford to consume fish every day of the week. Most households consumed meat only once or twice per week.

Some 20% of households consumed at least once a day. Some 20% of households consumed vegetables three times per day. Except for rice, the only food items consumed three times per day by most households were condiments such as MSG and salt. It is also interesting to observe that for almost all food items there were several households who had not consumed them once over a whole week.

Table 42: Weekly food data expressed as frequency percentages

Frequency of eating key food items in 15 households in northern Laos, based on seven-day recalls in interviews with 15 households presented in Table 41 above, in 3 villages: Mok kha village, 7 hh, Chom Ong village, 5 hh and Houay Na Tai, 3 hh, March 2011).

times per day	not once	less than 1 time per day	1 time per day	2 times per day	3 times per day
fish	33%	67%			
aquatic animals	33%	67%			
wildlife, livestock	0%	87%	13%		
birds	47%	53%			
other animals	53%	47%			
bamboo shoots	13%	60%	20%		7%
leaf vegetables	20%	67%		7%	7%
other vegetables	27%	53%			20%
fruits	33%	67%			
condiments, spices	7%	7%	7%		80%
vegetable oil	60%	40%			
MSG	7%	7%	7%		80%
food bought (times)	27%	60%			13%
any other food	80%	20%			

The 15 interviewed households were also asked to recall what they ate the day before (see Table 43).

Table 43: Recall of key food items consumed the day before.

Data from 15 households in 3 villages in northern Laos: Mok kha village, 7 hh, Chom Ong village, 5 hh and Houay Na Tai, 3 hh, March 2011.

number of meals per day	No of households				Percentage of households			
	0	1	2	3	0	1	2	3
no meals consumed	0			15	0%	0%	0%	100%
rice	0			15	0%	0%	0%	100%
fish	11	2	1	1	73%	13%	7%	7%
meat	9	4	1	1	60%	27%	7%	7%
bamboo shoots	5	3	3	4	33%	20%	20%	27%
vegetables	2	5	5	3	13%	33%	33%	20%
fruits	10	3	2		67%	20%	13%	0%
others	8	4	1	2	53%	27%	7%	13%

All 15 households reported they had had three meals that day. Fish was consumed by 11 out of 15 households (73%) at least with one of the meals, meat by 60%, bamboo shoots by 33% and vegetables only by 13%. Only one household had eaten meat or fish three times per day, compared to four households reporting eating bamboo shoots three times per day.

7 Findings on food stability

7.1 History of food shortages

Mokkha: The road into this area was built in 1990 and this was also when the first families came down to settle here from the former village site in the mountains. In 1997, all remaining families came down. In 2001, the old village of Katang Chi also joined us. There was a big rice shortage in 2004-2005, and in 2008-2009, both mainly due drought and to rat damages. In 2002, there was also a problem with shortages of bamboo shoots, vegetables and fish. This is attributed to the rapid increase in slashing and burning of forests which resulted from many families coming to live in this area.

Chom Ong: The village was established since 1990. In 2008, there was a big shortage of rice because of drought. The villagers coped with this situation by working as laborers to buy rice, and by selling chicken and ducks to buy rice. The last two years, 2009-2010, there was a lower but persistent lack of rice as well. The main reasons are persistent droughts, the increase of the population and the lack of labor to do all the work cultivating upland rice. The villagers are using more money to buy rice now compared to the past. They are also exchanging labor for rice more than before.

Ban Cha Oup: in 2006 we moved here from the mountains. In the beginning there was no water to drink and it was difficult to get here by road and also many animals died. We believe this may have something to do with all the chemicals used in the sugarcane fields. In 2007 and 2009-2010 we experienced rice shortage and hunger, because of lack of rains and rats eating our rice. We coped with this problem by asking for help from relatives, by mixing maize with our rice for eating and by working as laborers to earn money for buying rice. Some people sold NTFPs or thatch grass for roofing. Many people had to sell their silver and other savings.

Ban Houay Na Tai: This village was moved to its present location around ten years ago in 2001 There was a shortage of rice in 2008, when rice plants grew but did not fill seeds (“khao bo ok houang, khao liep”). There were also other rice diseases. In general there is not much land to grow rice here. The villagers coped with the situation by working as laborers in road construction, working in rubber plantations. They also adopted their feeding habits by mixing rice with maize and by eating more wild tubers from the forest. In 2010 many livestock died, especially pigs and chickens, the villagers do not know what caused this to happen. This year, 2011, many villagers suffered from intestinal problems (“thok thong”) and from respiratory problems due to the cold weather. The villagers believe these health problems are caused by lack of food and lack of hygiene.

The conclusion is that all four villages experienced quite several severe food crises over the past ten years. 2004 and 2008 stand out as years with severe rice shortages. The villages in Luang Namtha continue to have rice shortages over 2009-2011. Last year, 2010 was a disastrous year for livestock in Sing district, Luang Namtha, as many pigs and chickens died. The village of Mok Kha in Oudomxay also remembered a sharp reduction in availability of food in 2002 as a result of many families moving in to settle in the same area.

7.2 Trends in food availability from various sources

Village groups were asked to compare the availability of food from various sources today compared to five years ago (see Table 44).

Food produced on the farm is perceived to have increased by 14% on average. However there are strong differences between the villages. In Chom Ong, a large increase was linked to the construction of irrigated paddies.

In Houay Na Tai there is a structural problem with lack of land. Most households here only moved in over the past ten years, they were given very little paddy field and not enough upland. They get much less rice from uplands as five years ago, so they estimate that food production from farms has gone down 32% compared to five years ago. They spend much more time working as laborers in sugarcane and watermelon fields of other people in order to buy rice.

Food collected from the wild remained more or less even in two villages but was estimated to have gone down more than 50% over the last five years in the other two villages.

Buying and borrowing of food was estimated to have gone up in three villages with about 80% or so. Only in Ban Cha Oup women explained they have always been borrowing and buying a major part of their food, they do not feel the situation changed much.

Exchanging food for labor and barter trade has gone up in most villages as well, only Ban Chom Ong reported a decline, as a result of increased paddy rice production.

Gifts from relatives were considered to have gone up a lot in the two villages in Luang Nam Tha (Cha Oup and Houay Na Tai), which seems to be linked to the on-going troubles they have had with rice production over the past four years.

Donations from Government and Project was generally estimated to have reduced in all four villages, but more so in Luang Namtha then in Oudomxay.

Table 44: Trends in sources of food in four villages in northern Laos, March 2011.

Village groups were asked to compare the situation now with the situation 5 years ago and now. The percentages in this table show the perceived increase or decrease of the use of each source. E.g. on average the amount of food collected from the wild at present is 29% less than 5 years ago.

No	Source	Mok Kha	Chom Ong	Cha Oup	Houay Na Tai	Average	Trend
1	Producing	19%	66%	3%	-32%	14%	up
2	Collecting	-67%	0%	4%	-51%	-29%	down
3	Buying	79%	85%	1%	94%	65%	up
4	Borrowing	50%	30%	-10%	146%	54%	up
5	Exchanging	21%	-42%	14%	250%	61%	up
6	Gifts from relatives	0%	0%	-1%	250%	62%	up
7	From Projects, Government	-2%	-14%	-4%	-78%	-25%	down

8 Findings on villager's food security strategies

8.1 Stakeholder Analysis

In the two villages in Luang Nam Tha, Cha Oup and Ban Houay Na Tai, the teams were able to ask villagers to do a stakeholder analysis around the problem of food security (see Table 45).

Table 45: Stakeholder analysis around the problem of food security.

Answers from women groups in two villages in Luang Namtha: , O= Cha Oup village, Luang Namtha, H= Houa Na Tai village.

Problem	Stakeholders contributing to problem	Stakeholders who can contribute to the solution	Rights	Responsibilities
1: not enough food, not enough land to produce food (H)	-District only gave us land for 7 families only, we have so many more now, not enough land(H) -District never allow us to use older forest to make gardens (O) -population is increasing(O) -soil getting poorer(O)	-District could teach us how to grow crops and raise animals(H) - Can we get more irrigation to grow more rice (O) -we want more livestock to raise (O) -We need more help in family planning(O)	-Families with a lot of land can give some land to poor families(H) -We have the right to ask help (O) -District should review LUPLA to give us more land	Every family should try to feed themselves(H) -Wealthy families should help the poorer ones -District and province should help poor villages(O)
2: Company asked us to plant cassava, then did not come to buy(H)	Company signed a contract with us, but then they only buy cut and dried cassava, we cannot do this it is too much work(H)	No idea(H)	No idea(H)	No idea(H)
3: Company does not follow the contract about buying sugar cane(H)	Company does not pay the full amount, e.g. we load 11 tons on a truck they only pay 10 tons(H)		We can only observe what is going on(H)	
4: Livestock: -many animals died (O) -Outsiders ask us to raise their livestock animals on our land, now many animals died (H)	It could have something to do with all the chemicals sprayed on the crops(H) -In our old village site, the animals never died. Now we live close to the road, our animals die. Because of chemicals used in sugar cane fields and hitting by cars. (O)	The district tells us we should look after the animals more carefully, not let them graze everywhere(H) -We hope that district will help us to find a way to raise animals orderly (O)	-We don't allow people to sell meat from outside in our village to avoid transfer of diseases(H)	-We should all follow the recommendations of the district staff(H)

They were asked to identify stakeholders who are part of the problem and stakeholders who can be part of the solution. They were also asked to identify the rights and responsibilities of stakeholders.

The main problems raised were (1) not enough food to eat, not enough land to grow food, (2) Problems with cassava and sugar cane companies not honouring contracts causing villagers to lose cash income to buy food and (3) problem of livestock dying.

The main stakeholders contributing to the problems were seen to be the District authorities, forbidding access to older fallow land for upland rice cultivation, causing shortages of food. Communities see themselves as another cause of land shortages through increase of population. For the problems with contracting, clearly the companies were seen as main cause of the problem.

While the district authorities are pointed out as one of the stakeholders contributing to food problems, they are also seen as the main stakeholder that could assist in resolving the problems of lack of land and raising livestock. For the problem with contracting, villagers said they have no idea who could help them with this.

It was not easy for village women to think of themselves in terms of “rights” or to express any rights. In one village, women mentioned they feel they have the right to ask the district for assistance. In another village, when asked about rights, villager’s expressed a sense of despair: “we can only observe what is going on”.

Village women also found it difficult to define “responsibilities” of stakeholders. The answers varied: “every family should try to feed itself”, “rich families should help the poor”, “district authorities should provide support to poor villages” and “we should follow district recommendations”.

The conclusion is that villagers clearly identify district authorities and companies as the main stakeholders contributing to the causes of shortages of land and food. At the same time they look at the District authorities as the main stakeholder who could help resolve their food security problems. The focus of that assistance should be on providing more land for food production to village communities, according to village women. The villagers also have conflicts with companies over payments for contracts, but they have no idea who could assist them in resolving these conflicts.

8.2 Problem Solving Matrix

In one village, Cha Oup of Sing district in Luang Namtha Province, the team was also able to test a problem solving matrix (see

Table 46). During this exercise, village women were asked to identify the main issues, main causes and solutions of food security. The solutions were further divided into the level of action: household, village, kumban village cluster and district.

The main finding is that village women find it difficult to define what outsiders could do to help them improve their own food security. The solutions they propose are partly existing coping strategies, such as exchanging labor for rice, eating rice mixed with maize, eating rice with taro and eating forest tubers.

In terms of new solutions, village women proposed:

- We should divide the forest into zones for harvesting
- We could plant some wild plants in gardens
- The district should allocate more land from rich to poor families
- We could collect money from all households to buy veterinary medicine as a group
- We should follow district rules on keeping animals away from the road
- We should not eat meat of sick animals

Table 46: Problem solving matrix on food security.
Ban Cha Oup, Sing district, Luang Namtha Province, March 2011.

No	Food Security issue	Main causes	What can be done			
			Family	Village	Kumban	District
1	Not enough rice	-rats -population growth - no paddy -rice gives no grain -young grassy fallows give poor soils -rice not beautiful -not enough land	-labor -eat rice mixed with maize -eat rice with taro -eat forest tubers -	-allocate more land from rich to poor families		
2	Livestock dying	-no vaccinations	-local spirit ceremonies -vaccinat -eat pills	-Collect money from all hh to buy vet medicine		-Follow the rule of district to look after animals and don't eat meat of sick animals
3	Wild foods much less available	-more people -less forest	-we should divide the forest into zones for harvesting -We could plant some wild plants in gardens			

The conclusion is that without prior consultation and facilitation, village women find it hard to identify their own support needs for improving food security. More help is needed to make village women aware of the issues and options in terms of improving food production, utilization and access to food.

9 Conclusions

9.1 Conclusions on how local people understand and deal with food security

When asked directly, local people in the four villages surveyed understand food security first and foremost to be expressed in terms of self-sufficiency in rice. Relative wealth of households is primarily expressed in terms of how many months a household can feed itself. On average, the 54 households interviewed produced just enough rice to feed their household. However many households sell rice after harvest to pay debts and need to buy rice later in the season at a higher price. Poor households are not so lucky, they are considered on average to be short of rice for six months per year or more. Rice also represents a large part of the total value of all food consumed in the family: 77% in Oudomxay and 50% in Luang Namtha.

9.2 Conclusions on factors determining food security

The main factor determining food security mentioned by villagers in all four villages was shortage of land and poor quality of soils, reducing food production. Also access to forests for gathering wild foods is rapidly declining. The main causes for shortage of land are seen to be the concentration of many households in one location as a result of village relocation policies, the reduction of fallow periods to less than four years as a result of policies to end shifting cultivation and the natural population growth.

9.3 Conclusions on strategies of local people to achieve food security

When asked to compare food produced on the farm with other sources of food, on average only 27% of all food is estimated to be derived from the farm. Other sources of food include food collected from the wild (15%), food bought with cash (18%), food borrowed (12%) food exchanged for labor or barter (10%) as well as food received as a gift from relatives (7%) or from the Government and/or aid projects (11%).

9.4 Conclusions on how local people deal with shocks/uncertainty

Major rice shortages occurred repeatedly in all four surveyed villages over the past ten years. A major rice shortage struck all four villages in 2008 as a result of poor rainfall. There was another rice shortage in 2005 in Oudomxay. The villages in Luang Namtha have been suffering from poor rice yields every year since 2008. Lack of forest foods and large scale dying of livestock due to pests were also recorded in several villages.

The main coping mechanisms of farmers consist of (a) working as a laborer in exchange for rice (b) selling maize to buy rice and (c) adding tubers and maize to rice when there is not enough rice. In section 6.1 above, villagers mentioned their key sources of cash income to be labor. Maize is not available as income source to all families, however. The dependency on labor as the main source of cash to buy food reduces the amount of labor that households can spend on producing their own food.

9.5 Conclusions on locally proposed solutions to improve food security

Local solutions to improve food security proposed by village women included:

- We should divide the forest into zones for harvesting
- We could plant some wild plants in gardens
- The district should allocate more land from rich to poor families
- We could collect money from all households to buy veterinary medicine as a group
- We should follow district rules on keeping animals away from the road
- We should not eat meat of sick animals

Interestingly, the women did not propose anything on rice production technology. On the other hand, this survey showed a large variety of upland rice varieties being planted by women in the area. It is not clear that there are any better upland rice varieties than the local ones.

The clear message is that they believe access to land with good soils is the main issue to be addressed. Research on rice upland production should focus on working with local varieties, addressing the causes of poor yields such as weeds, poor soils, insect and rat infestations and plant diseases. These issues have already been identified numerous times in the past (see also table 6 above), but so far little research seems to have been directed towards resolving them and little practical new technologies have been identified.

The other conclusion is that there is a clear need to work more on intensified systems of upland livestock raising, confining animals during the rainy season, improved systems for animal feeding and livestock health control.

9.6 Conclusions on trends, future directions of food security

The main trends in food security seem to be:

- **Food production from farms is already low and is likely to drop even further.** The share of food produced on the farm remains less than a third of all food consumed. There is little sign of improvement as long as no new successful upland food production techniques are identified or adopted. The increased intensity of cropping with very short fallow cycles, exhaustive cultivation of maize and other commercial crops is likely to lead to a deterioration of soils. If nothing is done, the share of food produced from the farms could drop from 30% to 10-20% over the next ten years.
- **Food collected from the wild is rapidly decreasing,** making rural households more dependent on their ability to buy food on the market. If nothing is done, the share of food collected from the wild could drop from its present level of 18% to less than 10% over the next ten years.
- **Cash cropping has brought cash income enabling households to buy food, but not for everybody.** Especially maize has brought a lot of cash income to rural communities, but not to all. The risk is that large groups of households belonging to ethnic minorities in remote communities will remain locked out of this development. The other risk is that intensive cash cropping without rotations will exhaust soils and accelerate erosion.
- **Rural households are becoming more and more dependent on their ability to work as laborers to obtain cash to buy food.** The benefits are that rural households have more access to food produced elsewhere. Meat and eggs are among the most often bought products. That means that people who can afford it are consuming more proteins in their diet. It also implies a big risk for two reasons. The first is that there are not enough employment opportunities for all, so poor households are at risk of not being able to earn enough cash income to buy the food they need. Secondly, the more time a poor household spends on working on somebody else's field, the less time they have to produce their own food.
- **Livestock raising is reaching crisis levels,** many animals are dying, there is not enough land to graze animals, there are no good systems for reducing exposure of animals to diseases, there are no good systems for improved feeding of livestock and there are negative impacts of commercial cropping on livestock (e.g. poisoning by chemicals). If nothing is done, livestock is likely to become less important as a source of food and as a source of income. At the same time, the economic potential for livestock raising in the uplands is very promising, if given appropriate support.

- **Rural households experience conflicts with companies over land use and shocks in their food security.** They lack awareness, ability and organizational power to deal with these threats effectively. If nothing is done to improve the organizational capacity of rural communities, the risk is that they will be left out of economic development opportunities, they will be left with no access to land, they risk becoming marginalized and dependent on Government support forever.
- **Food aid to schoolchildren is being scaled back.** Previously successful schemes providing rice, maize, sugar and tinned fish to school children were making a real impact. Many of these schemes are now being scaled back. With the negative trends in availability of various food sources, the risk is that the nutrition status of school children could get worse again.

10 Recommendations

10.1 Recommendations for follow-up research to understand food security

This rapid survey could only “scratch at the surface” of a large and complex food production and consumption system. It only covered four villages and its results can only be seen as indicative. To get a more accurate picture on what is the actual situation over the entire area of northern Laos, how many families are experiencing improvements or deterioration in their access to the various sources of food, a more comprehensive study would be needed. A short household interview tool should be developed, which can easily be implemented within 30-40 minutes per household. A sampling scheme should be developed to interview sample households in all districts of the provinces covered by the Nurifar project.

10.2 Recommendations for developing and testing indicators of food security

The development of indicators of food security is a complex affair. In other countries, this is usually done on the basis of an analysis of country wide poverty or household economic statistics. It is recommended for Nurifar to hire a specialist consultant to do this work and establish a collaborative partnership with the National Statistics Office and the Ministry of Health.

10.3 Recommendations for a research agenda aimed at enhancing impact on food security in rice based agricultural systems in the uplands of northern Laos

Another type of research would be needed to develop recommendations for improving food security. Six key areas of research seem to present themselves as priorities for further research:

A: Sustainable and Equitable Land Use. Lack of land is a key factor identified by (women) farmers as affecting their food security. This raises questions for further research:

- What is the best way to produce food in the uplands, what would be the optimal fallow period on various soil types and slopes, how should upland farming be regulated for sustainable yields?
- What is the effect of intensive commercial cropping of maize, bananas etc. on the soil condition of uplands?
- How much land should be reserved for food production per household in various locations?
- What are the best practices to deal with rats, insect pests and other problems faced by upland rice farmers?
- What would constitute the most effective process for developing sustainable upland farming systems, building on village level innovators and linking them to extension services and national and international research networks?
- What would be an effective way to monitor the status of soil conditions in the uplands?

B: Increasing cash income from upland farming. Selling of maize was mentioned as a key income source, but not all households can benefit from this income source. More research is needed to find out:

- What are the bottlenecks that stop many upland households from producing cash crops like maize and selling them on the market?
- What are other niche products that could be cultivated in association or rotation with upland rice that could provide either food for consumption or cash income for farmers to buy food?
- What would be effective mechanisms to link farmers to markets, to increase village level producer groups and agro-enterprises?

C: Reducing dependency on labor to buy and produce food. Working as laborers on other people's land is mentioned as the main source of income for poor households who need to buy rice. More research is needed to find out:

- What food production systems would allow families to grow more food with less labor inputs?
- In situations where labor opportunities become less available, what alternative coping mechanisms could be promoted as a safety net for poor households?

D: Mitigating the loss of wild food resources. Collecting wild foods used to be a key safety net for poor families. The availability of this source of food is rapidly declining. More research is needed to find out:

- How could local communities become more involved in sustainable management of forest land by focusing on sustainable management of wild foods?
- How could popular wild foods be domesticated and grown on farm?

E: Developing locally adapted intensive livestock production systems. More research is needed to:

- Develop livestock management systems that reduce diseases and provide enough food for animals and can be managed with the limited labor available?

F: Improving food utilization. Little is known about the utilization of food. More research is needed on:

- How could nutritious diets be composed from available food products in the uplands?
- What methodology would be most effective to promote good nutrition practices among rural housewives in the uplands?
- What would be sustainable and effective ways to translate the "right to food" into effective school nutrition support programs?

10.4 Recommendations for NURiFaR to do over the next 12 months:

- **Implement a rapid food security survey** to identify food security status and main issues of (women) farmers in all districts covered by NURiFaR. Applying some of the RRA tools used in this study, NURiFaR researchers could identify status of rice self-sufficiency, distribution of food sources, variety of food sources (especially local rice varieties), farmers' perceptions on factors causing food (in)-security and their main problems in producing food in rice-based systems.
- **Develop a methodology for rapid identification of nutrition status of households.** The Ministry of health has developed tools for collecting statistical data on stunting, wasting etc, but will depend on other agencies to do this work at village level. Because most of the solutions for better nutrition are likely to be agriculture-based, the agricultural research and extension services are best suited to work with the health offices and Lao Women's Union on this topic. Please contact Dr. Jutta Krahn for professional advice in this concept: jukrahn@gmx.de
- **Develop a methodology for extension of good nutrition practices** based on locally available food items produced in local farming systems. Similar to nutrition status surveys, this work needs to be undertaken in collaboration with province/district health offices, Lao Women's Union Offices and Agricultural Offices. This would be the ground work for the potentially most powerful innovation in the future research agenda and role of NAFRI in ensuring national food security.

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