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Lao PDR:

Comprehensive Food Security and Vulnerability Analysis (CFSVA)

Draft

Data collected in Oct/Nov 2006

Strengthening Emergency Needs Assessment Capacity (SENAC)

Table of contents

Figures, tables and maps index

List of Acronymes

Lao PDR/ LPDR	Lao People's Revolution Party
GoL	Government of Laos
NBCA	National Biodiversity Conservation Areas
LECS	Lao Expenditure and Consumption Survey
NAFRI	National Agriculture and Forestry Research Institute
LCDC	Lao National Commission for Drug Control and Supervision
NGPES	National Growth and Poverty Eradication Strategy
NSEDP	National Socio Economic Development Plan
NSC	National Statistic Center
NHS	National Health Survey
SFE	State Food Enterprise
NTFP	Non-Timber Forest Product
OAA	Other Aquatic Animals
ARI	Acute Respiratory Infection
NTB	Non-Tariff Barriers
UXO	Unexploded Ordnance
MT	Metric Tons
MFA	Multi-Fiber Agreement
GDP	Gross Domestic Product
US$	United States Dollar
CFSVA	Comprehensive Food Security and Vulnerability Analysis
MICS	Multiple Indicators Cluster Survey
BMI	Body Mass Index
MUAC	Mid-Upper Arm Circumference
PCA	Principal Component Analysis
GLM	General Linear Model
CPI	Consumer Price Index
FCS	Food consumption Score
FCG	Food Consumption Group
UN	United Nations
UNDP	United Nations Development Programme
FAO	United Nations Food and Agriculture Organisation
WFP	United Nations World Food Programme
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
WHO	World Health Organisation
WB	World Bank
DFID	United Kingdom Department for International Development
ASEAN	Association of South East Asian Nations
AHTN	ASEAN Harmonised Tariff Nomenclature
AFTA	ASEAN Free Trade Area
ADB	Asian Development Bank
LDC	Least Developed Country
HQ	Headquarters
CRED	Center for Research on Epidemiology and Disasters
NGO	Non-Governmental Organisation
FIVIMS	Food Insecurity and Vulnerability Information and Mapping System
FFW	Food For Work

Acknowledgements

Executive Summary

Why a Comprehensive Food Security and Vulnerability study?

This is the first country-wide food security study undertaken in the Lao PDR. Its purpose is to provide WFP and its partners with a good understanding of the nature and extent of food insecurity and suggest interventions that could sustainably address some of these issues.

The primary objective of a CFSVA is to provide information to WFP decision makers and other food security actors to design and implement the most appropriate and timely interventions. This is done through an analysis of which and how many people are vulnerable to food insecurity, where these people are located, why they are food insecure, and how food or other forms of assistance can make a difference in reducing hunger and supporting their livelihoods.

This CFSVA has other more specific objectives which include:

- Explore the links between national policies and food security;
- Provide an overview of how well food markets are functioning;
- Explore the role of different livelihood strategies in providing food security;
- Assess risks to food security from different types of shocks, and subsequent mitigation responses (coping strategies) employed by households;
- Explore the food consumption patterns, in particular:
    - The significance of wild food sources;
    - The relative importance of rice consumption versus. other foods; and
    - The appropriateness of rice as a food security indicator;
- Profile food insecure households;
- Explore linkages between nutritional status of children and women, and food security;
- Conduct causal analysis of food security.

How was the study done?

The analysis is based both on primary and secondary data analysis.

- The primary data collection lasted six weeks from early October to Mid-November. Three hundred and ninety-eight village heads were interviewed through a key informant questionnaire in the sampled villages, and 3,926 households were interviewed through a household questionnaire. In addition, 2,541 children and 3,456 women were measured for anthropometric data. The household selection was based on a random sample of all rural households in Lao PDR, stratified by province. Subsequent weighting of the data was conducted to allow for other post-survey stratifications. Much of the data is being reported by two main classifications found to be very useful for the analysis; Agro-Ecological Zones (based on World Bank classification) and Main Ethnic Groups.
- The primary data analysis was complemented by numerous sources of secondary information.

The Bigger Picture – Key issues

The main conclusions from the study can be summarized as follows:

- The chronic malnutrition in Lao PDR is at an alarmingly high level. Every second child in the rural areas is chronically malnourished, affecting not only their physical development but also their cognitive capacity.
- The steady economic growth that Lao PDR has experienced over the last 15 years, has not yet translated into improved nutritional status of the Lao population. Chronic malnutrition is as high today as it was 10 years ago.
- Thirteen percent of the rural households have either poor or borderline food consumption. However, two thirds of the rural households also have a livelihood portfolio that puts them at additional risk of becoming food insecure should one or more shocks occur in a given year.
- Sino-Tibetan ethnic groups are the most disadvantaged and food insecure followed by the Hmong-Mien and the Austro-Asiatic. Most of these groups reside in the Southern and Central Highlands and the Northern Highlands agroecological zones of the country.
- Dietary intake of fat is generally too low. Use of vegetable oil in the diet is rare, and most of the fat comes from animal sources.
- Access to wild meat and aquatic resources (animal protein) is critical for ensuring food security for the most vulnerable groups. Wild meat and aquatic resources, especially wild fish, is the biggest source of animal protein in rural Lao PDR. Consumption of domesticated animals is currently not at a level where it can compensate for a potential loss of access to wildlife.

Who are the food insecure?

A total number of 84,000 households were food insecure at the time of the survey (poor and borderline food consumption). The largest proportion of food insecure households was found in Bokeo (41 percent), Saravane (30), Xiengkhuang (25), and Sekong (24).

There is no single indicator that can easily identify food insecure households. However, a combination of several characteristics can be used to differentiate food insecure from food secure households. For instance, food insecure households tend to be typically farmers with low engagement in fishing and hunting or unskilled labourers. They practice upland farming on a small plot of land in fragile areas with steep slopes. Often, they do not possess a kitchen garden. They are mostly asset poor, poorly educated, illiterate and from non-Lao Tai ethnic groups. They live in villages with little or no key infrastructure, and suffer from bad sanitary conditions.

Who could become food insecure? Risk of Food Security

Although few households show a food consumption pattern that would categorize them as food insecure (poor or borderline food consumption), risk analysis indicates that a high number is vulnerable to becoming food insecure due to different types of shocks.

The analysis show that only about one third of the rural population of Laos can be considered food secure (acceptable food consumption) in the strict sense. The rest of the population faces risks, endangering their food security. One quarter (26%) faces multiple risks (more than one shock affecting a household simultaneously). Another 40% is at risk of becoming food insecure because of either loss of access to natural resources, flood, drought or the sudden increases in food prices.

The political context

Some governmental policies such as the ban on opium production and shifting cultivation, the land allocation programme and the resettlement programme have had a strong impact on food security, perhaps more than the food security strategy

itself. The opium eradication policy, which was swiftly implemented due to a strong political will and donor support, led to a significant decline in opium cultivation but also resulted in the loss of an important source of income for many communities. The resettlement programme has increased vulnerability to food insecurity mainly due to the lack of funds to provide adequate social services for the resettled population.

Therefore, it is very important to closely monitor the implementation of the above-mentioned policies in the future as they may have potential unintended negative consequences on food security. It would also be important for the development community to continue dialogue with the GoL on these issues to identify ways of mitigating the negative effects of these policies.

Food, Markets and the Economy

A significant decline in economic poverty has occurred over the last decade--from 46 percent in 1993 to 33.5 percent in 2003–due to sustained economic growth (6-7 percent annually since 1990), in a stable macro-economic environment. However, geographical differences remain: poverty remains higher in villages than in cities; in areas without roads than those with; along the Vietnamese border (Central and Southern Highlands) than along the Thai border (Vientiane Plains and the Mekong Corridor); and in the uplands (sloped, fragile land) than in the lowlands.

The economic outlook is challenged by structural factors: large areas of UXO contamination; influence by rapidly industrializing neighbours; an increasingly young population with limited education and skills; mountainous and sparsely populated areas hardly reached by basic services and infrastructure; mounting pressure on fragile forest and water resources; limited national and local government capacity to enforce laws and regulations that can preserve trade competitiveness and mobilize revenue; a predominantly agrarian economy dependent on climatic changes.

As per the food balance sheet, the net production of food grains (rice) is just enough to meet per capita consumption requirements in Lao PDR, with major rice deficits in the Northern provinces.

With the surplus net production of rice being just sufficient, food imports (commercial and food aid) play an important role in providing complementary supply to food deficit areas or during years of production shortfalls. Cross-border trade plays a significant role in food supplies in Laos.

Over the past years, the upward trend of the consumer price index has been driven mainly by food price increases, especially the price of glutinous rice. Rice price increases are due to a combination of supply shocks (droughts and floods) and external shocks (oil price increases). Seasonal price variation of glutinous rice is seen as an important constraint to household access to food, especially during the lean season. These findings suggest that any substantial rice production shortfall would have a significant impact on general inflation and household purchasing power in Laos.

In general, market centres are not well integrated with rural areas in Laos because of: i) limited road access; ii) poor road conditions, especially during the wet season, which in many instances, leads to relatively long period of isolation; and iii) a quasi one-way trade direction from traders/agents to communities, which compensates the

limited access to markets but at potentially high transaction costs because of lack of market information for communities' decision making.

Markets constitute the second source of food for households after their own production. While many households have very limited surplus production to sell on the market, a substantial amount of their purchases on markets are made of food items (45 percent). Farmers may also, due to insufficient storage facilities, have to sell their products at post-harvest time, when prices are low, and replenish their stocks at pre-harvest time, when prices are high. Combining their limited income opportunities with some dependence on markets for food at certain times of the year, an increase of food commodity prices or a decrease of income levels would have a negative impact on households' purchasing power and consequently the pattern of their food consumption.

Household Asset Endowments

Livelihoods analysis usually distinguishes between natural, human, physical, financial and social assets. Although one cannot ascertain the livelihoods outcome (e.g. food security level) from the combination of assets a household possesses, it gives an indication as to the level and types of assets different groups can access, and which are the areas where intervention may be helpful.

Natural assets: farmers in the upland areas, Northern Highlands and Central and Southern Highlands, have less and more insecure natural assets at their disposal compared to farmers in the lowlands. There are differences between ethnic groups as well. The Lao Tai are mainly paddy producers (1.8 hectares on average) and only minimally involved in upland production (0.4 hectares). At the opposite end are the Sino-Tibetan groups with only 0.4 hectares of paddy production, and 1.4 hectares of upland production. The other groups have an equal amount of paddy production (0.9 hectares) and upland production (1.0 hectare). Similar patterns also apply when looking at entitlements to land. Whereas 63 percent of the Lao Tai groups report ownership of land, only 17 percent of the Sino-Tibetan groups report the same. The two other groups fall in between with approximately 35 percent. It is thus clear that the Sino-Tibetan ethnic groups are disadvantaged when it comes to access to natural capital. To some extent, this also applies to the Austro-Asiatic and the Hmong-Mien groups.

Human assets: Less than one in ten villages has a health center, although many have a health volunteer and/or medical kit. The level of education is fairly low, especially for women. Seventy-one percent of spouses of household heads have no or incomplete primary education. The education levels are particularly low among the Sino-Tibetan groups. This disadvantage among women in general and people from the Sino-Tibetan groups is also reflected in their low literacy levels. Their lack of formal education and the ability to acquire and communicate information through reading and writing hinder them in participating in the wider society and in being able to take full advantage of new opportunities.

Physical assets: Access to proper toilet facilities and safe water sources appears to be a serious problem throughout the country. Physical access to water is less of a problem that the quality of the water source itself.

Ownership of productive and non-productive assets varies widely across the country. A wealth index was therefore constructed to capture this variation and separate those households who own a wide variety of assets from those who only own a few. Looking at the distribution of the poorest quintile (poorest 20 % of the sample), there is a clear overrepresentation of poor households in Phongsaly, Sekong and

Luangprabang. Further, more than half of the Sino-Tibetan households fall among the poorest quintile. The Austro-Asiatic is also clearly overrepresented among the poorest households. There is a small overrepresentation among the Hmong-Mien households, whereas the Lao Tai is the only group where the representation among the poorest households is proportionally smaller.

Financial and social assets: All households in the survey report access to credit, but it is limited to two sources; the village head and middle men. Eighty-five percent say they have access to credit from their village head, whereas 16 percent report access from the middle men. Only eight percent of the households reported receiving remittances. In terms of ethnic groups, the Hmong-Mien (15%) and Lao Tai (14%) seem to have tighter links and more support from outside than the Austro-Asiatic (3%) and the Sino-Tibetan (6%) groups.

Household Livelihood Strategies

Almost 95% of households reported to be engaged in agriculture, while 29% were involved in livestock rearing/selling. Fishing/hunting was reported by slightly less than 8% of households. This is clearly underreported. Agriculture was the most important livelihood activity in all provinces, whereas livestock rearing and selling was the second most important in most provinces. Collection of Non-Timber Forest Products was also important in most provinces. While agricultural-based activities remain by far the most important, there is some involvement in unskilled non-agricultural labour.

Rice is the dominant crop in agricultural production. Seventy-one percent report glutinous rice as their main crop, and an additional 14 percent report white rice as their main crop. The Lao Tai and Austro-Asiatic groups are hardly involved in white rice production (less then 10 percent both as main and secondary crop). On the other hand, 67 percent of the Sino-Tibetan groups report white rice as main crop compared to 29 percent for glutinous rice. Among the Hmong-Mien groups it is more even, with 48 percent reporting white rice as main crop compared to 37 percent reporting glutinous rice. The average expected number of months that the current rice harvest would last is eight and a half.

Although rice dominates, cash crops are also of importance to many households. Although as much as 34 percent of households report not planting a second crop, 15 percent planted maize as their second crop and 6 percent planted cassava as their second crop. Only just over half of all households keep a kitchen garden. Whereas 86 and 71 percent of households in Borikhamxay and Huaphanh provinces respectively keep a kitchen garden, only 25 percent of households in Phongsaly province currently benefit from the healthy produce of a kitchen garden. Most households use their kitchen garden for vegetables.

Overall, the reported average cash and credit outlets per month were 758,000 kip. Of this, 397,000 kip went to food items. This means that when only considering cash and credit outlets, the households in the survey spent 44 percent of their monetary resources on food. When own-produced food was included in the calculation, the share of resources that was spent on food increased on average to 65 percent. Both the overall expenditure levels and the proportion spent on food differed widely across the country. The highest level of expenditures devoted to food was found in Khammuane and in Sekong province (74%).

Household Food Consumption

The proportion of the rural population which has poor food consumption is 13 percent (two percent food insecure and an additional 11 percent borderline). This

was the situation at harvest time (October/November) 2006. It is likely that the proportion of households with poor food consumption will increase during the peak of the lean season.

Overall, the food consumption pattern in Lao PDR varies greatly between seasons, regions and ethnic groups. Households generally rely upon a wide variety of food items, yet the amounts consumed are not always sufficient. This is particularly true for consumption of nutrients such as fats and protein.

Most households eat rice, or rice coupled with other staples such as maize or cassava, 7 days a week. Glutinous rice is the preferred staple by the Lao Thai and the Austro-Asiatic groups, whereas the Sino-Tibetan and the Hmong-Mien groups prefer non-glutinous rice. The data shows a fairly high consumption of non-rice staples. Thus it cannot be stated that rice insecurity necessarily implies insufficient access to staples.

Over the 7-day recall period, big wildlife was reported to be eaten by 6% of the households, small wildlife by 26%, river fish by 81%, other aquatic animals by 55%, pond fish by 20%, poultry and pork each by 41%, and buffalo/cow meat by 42% of the households, stressing a high importance of wild animal protein and fat sources. Wild meat and fish sources are clearly more important as protein and fat sources than domesticated meat and fish/aquatic resources. This means that access to these wild meat and aquatic resources is of clear concern from a food security point of view. As these sources are under increasing threat, proper management of wildlife and aquatic resources becomes a food security concern. It also points to the need for fostering more consumption of domesticated meat and fish sources, as wild food sources may not be able to cover all needs. Changes in cultural habits, where domesticated meat is more used for ceremonial occasions than as part of a regular diet, may need to be encouraged.

Consumption of vegetables is seasonal, but at the time of the survey the average consumption of vegetables was sufficient. Fruit consumption, however, was very low, but this could be due to seasonality issues and/or underreporting.

Intake of fat and oil is crucial in any diet, due to its importance for the absorption of many vital vitamins. The usage of fat/oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is low. Only 14% of the households reported adding vegetable oil or lard to their daily cuisine; 44% reported to not have added fat at all over the last 7 days.

The analysis shows that the main component differentiating households with acceptable food consumption from households with poor or borderline food consumption is animal protein intake, mostly wild fish and meats. Access to such food sources is therefore critical in order to ensure acceptable food consumption for all. Promotion of a higher intake of fruits, oil and fat would also be highly desirable.

Children's Nutritional Status

Chronic malnutrition, or stunting, is at an alarmingly high level in Lao PDR. Every second rural child under 5 years of age is stunted. The survey shows that 38 percent of rural children under 5 are underweight and wasting to be at 8 percent for the same group. There has been no improvement in the chronic malnutrition in Lao PDR over the last 10 years. A small reduction in underweight has been noted, and some reduction in wasting. These reductions are positive, but the persistently high chronic malnutrition rate is alarming.

The analysis, despite its limitations, shows that ethnic minorities (especially Sino-Tibetan and Austro-Asiatic) are highly vulnerable to nutritional problems, and that certain agro-ecological zones are disadvantaged. The highest prevalence of wasting was found in the Mekong Corridor, even higher than in the highlands. Furthermore, children from families with better road access are not necessarily better off when it comes to nutrition.

Like other surveys have shown (such as MICS III), the CFSVA confirms that stunting increases significantly after the first year. This is most likely linked to unhealthy weaning practices, especially with regards to timing and choice of weaning foods.

Growth stunting in infants is a risk factor for increased mortality, poor cognitive and motor development and other impairments in function. Lao children, who are malnourished and living in poverty, cannot fulfil their development potential. They may do badly at school and have low productivity in adulthood. As a result they pass on poverty and deprivation to future generations.

Women's Nutritional Status

Mothers' health and nutritional status is extremely important for the intra-uterine development of children. Bad nutritional status of mothers impair the development of the children even before they are born, making many of them start their life with a serious disadvantage.

Although there are no consistent measurements of the prevalence of underweight in women of reproductive age in Laos, comparison to previous measurements indicate that the prevalence may be the same or slightly decreased since 1995. The CFSVA data show that 12 percent of women in reproductive age are underweight. Some geographical differences exist, with a trend (only some are significant) of lower prevalence in the northern highlands and lowlands, and in the Vientiane Plain.

It can be concluded from the regression analysis that wealth is the strongest predictor of Body Mass Index (BMI) of all indicators included in the analysis. However, wealth can be considered a basic factor of nutrition, and is closely related with many of the other indicators considered, so caution is warranted when interpreting the results. Further, improving sanitation may have a positive impact on the nutritional status of women. Higher food consumption (as measured by the Food Consumption Score) may also have an impact on the nutritional status of women.

Determinants of Food Insecurity

The analysis shows that a household's food security is to a large extent determined by their asset wealth. In addition, the livelihood strategy that a household employs will affect the food security outcome. Households involved in non-farming activities such as petty trading and skilled and salaried work have better food security than purely farming households, although households engaged in unskilled labour are also not doing well. However, among the farmers, involvement in additional activities such as fishing and hunting clearly did better than pure farming households.

This shows the importance of understanding livelihood opportunities, to find the most appropriate intervention to address food insecurity. These livelihood opportunities may be enhanced if certain assets are strengthened. A livelihood strategy that is currently not providing food security or not available to many households may work better or become available if crucial assets for these activities are enhanced. It should also be noted that the policy context in which these livelihood strategies take place, may significantly affect the livelihood outcome.

Main Recommendations

This report has shown that food insecurity in Lao PDR has many causes and that it can only be adequately addressed through a multi-sector approach. Household food security is inextricably linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. However, stand-alone interventions within any of these sectors will have a limited effect unless the overall policy environment is favourable to food security. One of the key messages emanating from this report is that a favourable policy environment for food security has to be ensured before technical solutions can significantly reduce food and nutrition insecurity. It is not enough to just focus on poverty reduction since it is a necessary but not a sufficient condition for improved food security and nutrition, issues that need to be explicitly addressed.

Chapter 10 of this report lists the recommendations emanating from this study.

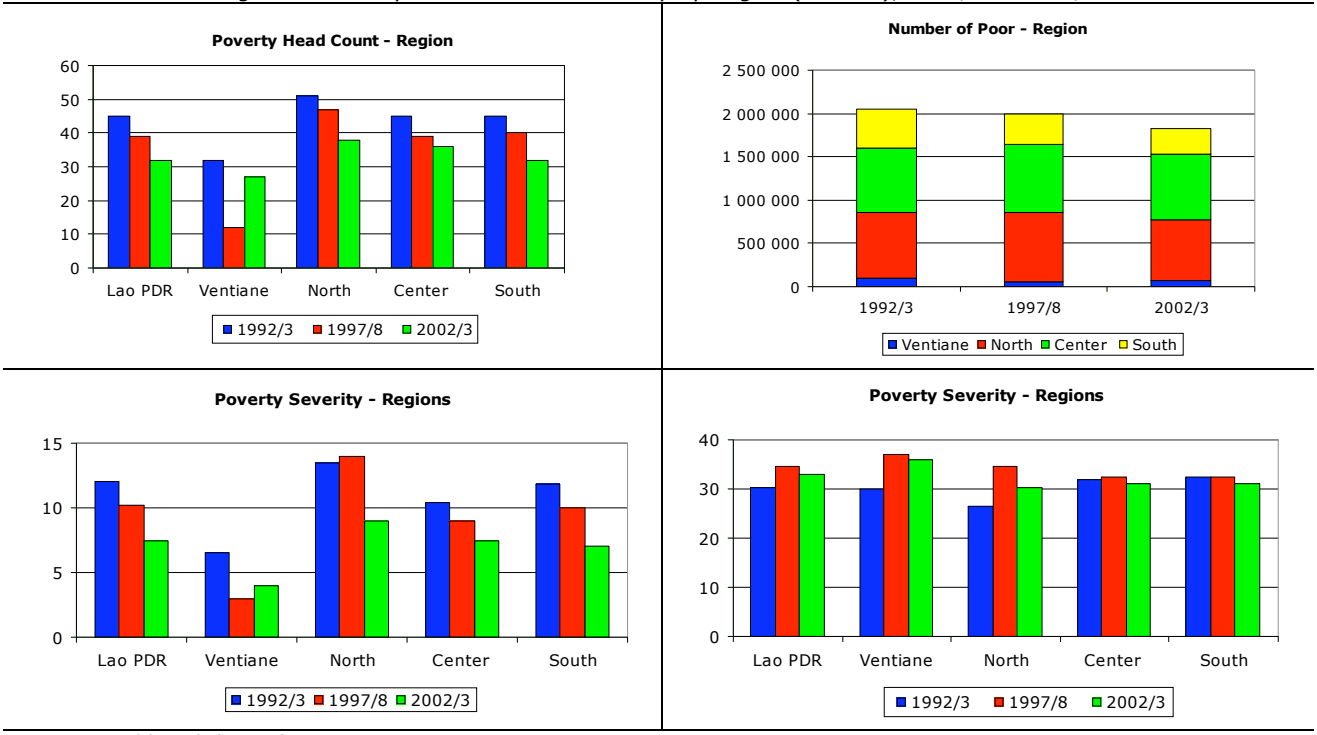
Chapter 1. Introduction

1.1. General information on Lao PDR

The Lao People's Democratic Republic (Lao PDR) was established in 1975 succeeding the Kingdom of Laos, following decades of civil war and heavy involvement in the larger Indochina war in the eastern and northeastern provinces[1]. The war itself left many scares. One of the main inheritances from the war is a large amount of Unexploded Ordnance (UXO) left in and on the ground from American bombing during the war. Lao PDR is one of the most heavily bombed countries in the world, and UXOs continue today to have a major impact on rural lives. 30 years after the war, lives are still being lost to contact with UXOs. Further, livelihoods are being held back as agricultural expansion in many areas is impossible until the land is cleared for UXOs. In the Eastern part of the country, along the Vietnamese border, this fact continues to impact livelihoods and therefore food security for a large number of households.

The Lao PDR is a landlocked country and shares borders with the following countries: Thailand, Myanmar, People's Republic of China, Vietnam and Cambodia. The total land area covers 236,800 km². With a population of 5.6 million inhabitants, Lao PDR has a population density of only 24 persons per square kilometer[2]. This is one of the lowest population densities in East Asia[3]. Lao PDR has a very low proportion of the population residing in urban areas. Only 27 percent of the population lives in urban areas (2005), up from 17 percent in 1995. During the same period, average household size decreased from 6.0 to 5.8. The annual population increase was 2.1 percent in 2005, down from 2.5 in 1995. The Total Fertility Rate decreased from 5.6 to 4.5. Life expectancy for women increased from 52 to 63 years between 1995 and 2005, whereas the increase for men was from 50 to 59 years. Child Mortality Rate decreased from 170 per 1000 to 98 and Infant Mortality Rate from 104 to 70.

Figure 1: Poverty Headcount and Severity by Region (Percent), 1992/3 to 2002/3



Source: World Bank (2006a): Poverty Assessment

[1] GoL and UN Country Team in Lao PDR, (2006).
[2] National Statistics Center, (2006a).
[3] UNDP, (2006)

The Lao PDR is classified by the United Nations as a 'least developed country' (LDC). The other three countries in the region that has the same status are Cambodia, Myanmar and Timor Leste. Per capita income in 2005 was US$ 491. In 2004, 71 percent of its population lived on less than US$2 a day, and 23 percent on less than US$1 a day. However, a significant decline in poverty has been achieved during the last decade, though spatial disparities remain (figure 1): using Lao PDR national poverty line (of approximately US$1.5 a day) the incidence of poverty has fallen from 46 percent in 1992/93 to around 33.5 percent in 2002/03. Poverty is lower in cities than in villages; in areas with roads than those without; along the Thai border than along the Vietnamese border; and in the lowlands than in the uplands[4]. The regions with the largest number of poor are the Centre (due to high population density) and the North. Income inequality is higher in Vientiane capital than the rest of the country.

1.2. Ethnic Diversity

Lao PDR is one of the world's most ethnically diverse countries. The Government of Laos (GOL) has acknowledged 49 different ethnic groups[5]. Linguists claim the country's population comprises more than 250 linguistic subgroups[6]. The highest level of distinct ethnic diversification can be found in the uplands[7]. Ethno-linguistic classification allows one to group these 49 groups into four main groupings: the Lao-Tai, the Austro-Asiatic, the Sino-Tibetan and the Hmong-Mien. The majority group, the Lao Tai, only make up 55 percent of the population. If one includes ethnic groups with similar language (the Lao-Tai), the majority group increases to approximately 65 percent. However, ethnic minority groups make up as much as approximately 35% of the total population. Whereas the majority group traditionally is linked to lowland paddy rice production and is more urbanized, the minority groups are traditionally more linked to shifting cultivation in the rural uplands. This diversity poses many challenges for the Government and development partners. All these groups have different language, different cultural belief systems and practices, and this can be seen as a very valuable asset for the country. On the other hand, for these groups to participate in the Lao society and the modern economy, some means of common communication must be developed. It would for instance be very costly, although desirable, for the Lao Government to deliver primary education to all children in their mother tongue. Similarly, the market integration is increasing in Lao PDR, and to preserve the mainly self-sufficient subsistence economies (often based on shifting cultivation) of the ethnic groups will be very challenging. To find a balance between preparing these groups for a role in the modern economy and preserving their unique cultural practices will be a main challenge for the Lao people in the decades to come.

Table 1: Overview of Ethnic groupings in Lao PDR

Ethnic group	**Percent**
Lao-Tai	65
Austro-Asiatic	24
Sino-Tibetan	3
Hmong-Mien	8

Source: Adapted from the Census 2005

4 World Bank, (2006)
5 Lao National Front for Construction, (2005)
6 Chamberlain, (2002a)
7 UNDP, (2002)

Chapter 2. Objectives and Methodologies

2.1. Objectives

A Comprehensive Food Security and Vulnerability Analysis (CFSVA) is usually undertaken every 5 years in a country where WFP operates. However, this is the first CFSVA undertaken for Lao PDR.

The overall objective of a CFSVA is to provide information to WFP decision makers and other actors focusing on food insecurity on how best to programme food assistance through an analysis of which and how many people are vulnerable to food insecurity, where these people are located, why they are food insecure, and how food or other forms of assistance can make a difference in reducing hunger and supporting their livelihoods.

A secondary objective is to improve the depth, scope and availability of country reports and datasets (numerical and spatial) for detailed secondary data analysis. More specific objectives of this study include:

- Explore the interplay between Government policies and food security;
- Give an overview of how well food markets are functioning and integrated;
- Explore the importance of different livelihood strategies and their relative success in providing food security;
- Explore risks to food insecurity from different types of shocks and households response (coping strategies) to them;
- Explore the food consumption patterns of the Lao people, in particular:
  - The importance of wild food sources to the Lao diet and their role in providing proteins and fat
  - The relative importance of rice consumption versus other food sources, and the appropriateness of rice consumption as a food insecurity indicator in Lao PDR;
- Provide profiling of food insecure households;
- Explore linkages between nutritional status of children and women, and food security; and
- Conduct causal analysis on food security

2.2. Definitions, terminology and concepts

Below is a list of definitions and explanations for some key concepts used in this report. In addition, some definitions are given in the risk analysis section (Part 9).

Food Security: Food security can be defined as the condition when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life[8]. The *current household food security* situation, refers to a situation where the household members have at a certain moment access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. This is measured by the Food Consumption Score

Food security is normally divided into three aspects: Food Availability, Food Access and Food Utilization

Food availability is the amount of food that is physically present in a country or area through all forms of domestic production, commercial imports and food aid[9].

Food access is the households' ability to regularly acquire adequate amounts of food through a combination of their own stock and home production, purchases, barter, gifts borrowing or food aid.

Food utilization refers to: a) households' use of the food to which they have access, and b) individuals' ability to absorb nutrients – the conversion efficiency of food by the body.

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8 FAO, (1996)
9 WFP, (2005)

Food Consumption Score: Throughout this report households are characterized by their food consumption score and divided into groups with **poor**, **borderline** or **acceptable** food consumption. For a detailed description of the basis for the food consumption score and how the cut-off points for the different categories are determined, please see section 6.2 and table 11.

A **household** is defined as a group of persons who are dependent on the common resources for their livelihood and well being. These people may or may not be related by blood, but make common provision for food and other essentials for living, sleep in the same compound and eat from the same pot.

Livelihoods can be described as a combination of the resources used and the activities undertaken in order to live. The resources might consist of individual skills and abilities (human capital), land, savings, and equipment (natural, financial and physical capital, respectively) and formal support groups or informal networks that assist in the activities being undertaken (social capital). A livelihood strategy can then be defined as the range or combination of activities and choices that people make, drawing upon their asset base, in order to achieve the most optimal livelihood outcomes. Such livelihood outcomes may include food security, general well-being, ensuring schooling for children, or being able to afford or access health services[10]. A livelihoods group is composed of people who utilize similar livelihood strategies.

A **coping strategy** in this report is defined as activities or decisions made by households to compensate for or meet a shortfall of food. This does not describe a regular situation but a response to a shortfall of food that can be described as a shock. These coping strategies can be short-term alterations of consumptions patterns or one-off responses such as asset sales. More long-term alterations of income earning or food production patterns could also be a response to a shortfall of food, but will not be included in the term "coping strategy" in this report[11].

Uplands and **Highlands** are synonymous in this report. In the agro-ecological zoning the term Highlands is used, whereas it is common to refer to upland farming and upland rice. All these terms refers to the mountainous areas with high degree of sloping.

The primary data analysis in this study uses a number of post-survey stratifications to present the results. The stratifications were made possible merging different geo-referenced village location data with the survey data. These are explained below:

Ethnic groupings:

This stratification is based on data collected by the National Statistics Center during the Census in 1995. It classifies the 49 recognized ethnic groups into 4 main groups. The data provides the main ethnic group for each village. The classification in the household questionnaire did not distinguish the Austro-Asiatic and the Sino-Tibetan ethnic groupings, households living in Austro-Asiatic and the Sino-Tibetan villages were ascribed the main ethnic group from their village, which is not 100% accurate. The classification of 4 main groups is based on languages and has been developed by the Lao Front for National Construction.

The 4 main ethnic groups are:

- Lao-Tai
- Hmong-Mien
- Austro-Asiatic
- Sino-Tibetan

Agroecological zones: As many provinces include large geographical differences within them, an additional geographical grouping of the survey results would be beneficial. Thus, based on a World Bank study[12], agro-ecological zones are used to present results. These zones

10 DFID, (2006)
11 Maxwell, D., Watkins, B., Wheeler, R and Collins, G (2003)
12 http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/PEN_full_report.pdf

are based on districts, where districts are assigned to a zone based upon indicators related to agricultural potential and ecological similarity. This grouping is more useful than the traditional main regions: North, Central, and South.

The agro-ecological zones used in this report are:

- Vientiane Plain
- Central and Southern Highlands (including the Bolovan Plateau)
- Mekong Corridor
- Northern Lowlands
- Northern Highlands

Road access: For differentiating between households living in villages with road access from households living in villages without road access, the classification from the National Statistics Center was used. Villages were assigned the same status as during the 2005 Census.

Sloping class: In order to explore differences between villages situated in flat areas with villages located in more sloped or mountainous areas, a classification on sloping was created. Fragile land was classified as land with a sloping gradient of more than 16%[13]. Each district was then classified according to the proportion of its area that is fragile land. The categories used in the report are as follows:

- 0-30 percent presence of fragile land
- 31-70 percent presence of fragile land
- More than 70 percent presence of fragile land

2.3. Sources of data

2.3.1. Primary Data Collection

The primary data collection took place during 6 weeks from early October to Mid-November 2006. Two instruments were created to collect primary data; a key informant questionnaire administered at the village head in each of the sampled villages and a household questionnaire, including an anthropometric section for women of reproductive age (15-49) and children less than 5 years, administered to sampled households. The instruments were first developed in English and subsequently translated into Lao.

The primary data collection was undertaken by provincial Government staff from the Ministry of Labour and Social Welfare, the Ministry of Agriculture and Forestry and the Committee for Planning and Investment. The enumerators underwent a one-week training prior to data collection, including field testing. Nutritionists from WFP Regional Bureau in Bangkok were leading the training on taking anthropometric measurements. They also developed, in collaboration with the enumerators, a seasonal calendar for capturing the age of children. Each province was then covered by a team of 4 enumerators.

2.3.1.1. Key Informant Interviews

For each visited village, the head of the village was interviewed as key informants with a structured questionnaire. A total of 398 village heads were interviewed. The topics covered included resettlement, access to services and community infrastructure, markets, and contamination of unexploded ordnances (UXO) contamination. This set of information is used to contextualize the results from the household questionnaire.

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[12]This means that for each 100 meters horizontal movement, the land rises 16 meters vertically.

2.3.1.2. Household questionnaire

The main component of the study stems from information gathered through 3,926 household questionnaires. The questionnaire included sections on demographics, housing and facilities, assets and access to credit, agriculture, livelihoods, expenditures, food consumption and sources, shocks, and women and child health and nutrition. Some questions in the housing facilities section were replicated from the recent Census (2005) in Lao PDR. This was done to be able to compare the results with the Census.

Anthropometric measures were also taken such as height, weight/length, Mid-Upper Arm Circumference (MUAC) for all children between 6 and 59 month old and all women between 15 and 49 year old within the sampled households. This information was used to calculate nutritional indices based on Z-scores, and women's Body Mass Index (see Chapter 7).

2.3.2. Secondary sources

The primary data analysis was complemented with secondary data analysis. The literature review for this study was undertaken in several stages. A general review of food security literature in Lao PDR was undertaken prior to survey design to inform the latter. A special review of food market literature and data was carried out in June 2006 to prepare for a more thorough investigation during the primary data collection and to inform the market section of the study. This information has been integrated into the report.

Further, a Qualitative Rapid Livelihoods Assessment[14] highlighting the livelihoods and food security impact of government-led resettlement was carried out in August 2006. This assessment provided up-to-date programme information for WFP Laos Country Office in order to design a new PRRO (starting April 2007) and qualitative information on issues such as resettlement, nutrition knowledge, access to services, market integration and food security. The assessment was used to identify gaps in the food security knowledge in Laos, and to highlight key issues of concern that should be investigated during the primary data collection phase, such as the importance of wild food sources for the Lao diet.

2.4. Sampling procedures

Lao PDR is a very heterogeneous country in terms of cultural practices, beliefs and languages. More than 200 ethno-linguistic groups exist, and their practices differ when it comes to child care and feeding practices, livelihood strategies, and living conditions. While some have lowland paddy rice production as their main livelihood, others practice shifting cultivation in mountainous areas. However, it is impossible to create a sample that will adequately capture diversity also reflected within provinces. It was thus decided to stratify based on provinces, in order to make the sample representative at provincial level, and then seek different post-survey stratifications.

The sampling frame was based on the data from the recent Census (2005). This is the most up-to-date overview of the population of Lao PDR. It was decided to only include rural households[15][16] and also to exclude the capital province, Vientiane Capital. The remaining sampling frame was organized according to 16 provinces. Subsequently, a two-stage cluster sample procedure was applied. In the first stage, 29 villages per province were randomly selected proportional to population size. Out of these 29 villages per province, 4 were selected by the enumerator teams to be replacement villages, only to be included if one of the

[14] WFP, (2006).
[15] The sample frame was based on the definitions of rural and urban villages from the Census 2005 and included all villages determined as rural. Villages were defined as urban if they met at least 3 of the following 5 criteria: 1) Village situated in district or provincial capital, 2) More than 70% of total households in the village use electricity, 3) More than 70% of total households in the village use pipe water, 4) Village accesses to the road in two seasons, 5) Village has permanent market operating whole day.
[16] National Statistics Center, (2006a)

remaining 25 villages could not be reached. This process introduced a certain bias in the sample, as the enumerators in many cases chose to exclude remote villages that would be very difficult to reach. It can be assumed that these villages possess certain characteristics that are different from the rest of the sample. However, a sufficient number of remote villages remain in the final sample to be able to describe their situation adequately.

In the second stage, 10 households in each of the 25 remaining villages in the 16 provinces were selected for participation in the survey. A systematic random sampling technique was chosen for this stage. The team leader, together with the village head, drew up a list of all households in the village. Based on this list, a systematic random sample was utilized to pick 10 households. Thus 10 households, from 25 villages, from 16 provinces were chosen to participate in the survey, amounting up to 4,000 households. Out of these, 3,926 households actually participated in the survey.

2.5. Data entry

A data entry tool using Access software was created by WFP HQ for both the household and community questionnaire. The data entry itself was conducted by the National Statistics Center (NSC) in Vientiane. NSC conducted cleaning of 10% of the questionnaires, and based on this, the data was deemed to be of satisfactory quality. Further cleaning was done by the WFP analysis team at a workshop held in Vientiane in December 2006.

2.6. Limitations of the study

While efforts have been made to address most of the known weaknesses of this study, a number of potential limitations that warrant attention remain. Among these are:

- *Bias towards accessible villages:* due to the exclusion of 4 villages per province by the enumerator teams, a certain bias towards accessible village was introduced. This was a necessity as some of the villages are very hard to reach because of rain and security issues. Despite this constraint, a fairly large number of very remote villages were visited.
- *Ethnic diversity*: Forty-nine different ethnic groups are officially recognized by the GoL and, anthropologists claim that more than 200 different ethno-linguistic groups exist in Lao PDR. These groups have very different cultural practices, including food consumption patterns, livelihood strategies, and care and feeding practices. Thus, a sample survey will not be able to do justice to this diversity.
- *Translation from Lao to ethnic languages:* The questionnaire was translated to Lao, as most of the enumerators were not fluent in English. However, an additional layer of translation had to be introduced in many villages, as some villagers, especially women who responded to the food consumption and mother and child health sections, only spoke rudimentary or none Lao. In these cases, the enumerators had to use interpreters. Although the enumerators were well trained in the questionnaire, we have little control over the translation from Lao to the different ethnic languages. Confusion of some concepts may limit the accuracy of the data.
- *Lack of health information*: In general, there are three underlying causes for the nutritional outcome; dietary intake, care practices and health status. This survey focuses particularly on dietary intake. The number of variables on care and health related factors are limited. Though information was collected on health and illnesses, the data were not deemed of adequate quality to be utilized for analysis. The causal analysis of nutritional status is, therefore, skewed towards food consumption. However, the MICS survey, conducted by the Ministry of Health, the National Statistics Center and UNICEF, will provide information on links between nutritional outcomes and health status and care practices. As they do not cover food consumption patterns, the two surveys can be seen as complimentary.

- *Malnutrition rates for older children*: Other nutritional studies suggest[17] that malnutrition rates are higher among children above five years as opposed to children below 5 years. These two reference studies examined children from 3 to 15 years of age. Yet, children above 5 years of age were not included for anthropometric measurement in the CFSVA.
- *Seasonal variation in food consumption and livelihood patterns*: The primary data for the CFSVA was collected at the height of the rainy season, just before or during harvest. This is not an ideal time for collecting such information. This leads to two kinds of limitations. Firstly, the food consumption is likely to be higher and more varied than during the dry season. Both the access to rice (at least during harvest) and to wild food sources from the forest and water bodies are likely to be better. This may give an artificially good picture of the food consumption in Lao PDR. Secondly, and this applies to any food security survey; data will only provide a snapshot of the food consumption. If the survey had been conducted at a different time of the year, a different food consumption pattern may have appeared. The same may apply to livelihood activities. Although respondents were asked to record livelihood activities over a whole year, it is likely that they may have highlighted activities they were currently engaged in, and reported less on activities that were important at other times of the year. However, attempts have been made to address this issue in the vulnerability and risk analysis.
- *Livelihood activities:* A majority of households reported only one livelihood activity. Large underreporting of certain activities that are considered illegal such as hunting certain wild animals and opium production can be expected. For example, many households did not report hunting and gathering of NTFPs while their food consumption pattern displays food that was in fact either hunted or gathered.
- *Community questionnaire as contextual information:* The information from the key informants was collected through a structured questionnaire, but the sample is not designed to be statistically representative for villages in Lao PDR. So information from the community questionnaire must be treated with caution, knowing that error margins are wider, and only taken as indicative contextual information in order to better understand the results from the household level analysis.

[17] Miyoshi, Phommasack et al. (2005); Buttenheim and McLaughlin (2006)

Chapter 3. Political and Socio-Economic Environment

3.1. Political context

The constitution of Lao PDR, which was promulgated in 1991, recognizes the Lao People's Revolutionary Party (LPRD) as the leading nucleus of the political system[18]. Lao PDR comprises 18 provinces and 141 districts. The Government is run by the Council of Ministers, whose decrees provide the main legislative basis for government operations. Political power rests with the LPRD whose Politburo and Central Committee are the organs for making policy guidelines. Their decisions are ratified by party congresses held at 5 years intervals, with the last congress held in the first quarter of 2006. Over the last decade the Government has been undertaking public administration reform, targeting improvements to the structures, functioning, and management of government organizations. The current governance system conforms to a centralized pattern with additional administrations at the Provincial and District Level. Efforts are currently underway to assert greater central authority and accountability (fiscal and administrative) over provincial finances and programme operations.

There are several national policies that affect the food security situation in Lao PDR. Some deal directly with food security, such as the Food Security and the planned Nutrition Policy while others have an indirect effect, like Opium Eradication and Land Reform policies. These latter policies, while necessary, may have an even harsher impact on the food security at least in the short run. Therefore, when assessing the food security situation, it is necessary to look into the implementation status of all relevant policies that may have a direct or indirect effect on the country's food security.

3.1.1. Poverty Reduction and Food Security Policies

The National Growth and Poverty Eradication Strategy (NGPES) is designed to meet the national objectives of poverty reduction, socio-economic development and food security. The Sixth National Socio Economic Development Plan (2006-2010) (NSEDP) specifies the implementation plan to meet the Millennium Development Goals by 2015 and beyond. NSEDP aims to completely abolish seasonal hunger (rice scarcity) at the household level by 2010 and reduce malnutrition (underweight) in children under-5 to below 30 percent by 2015.

The GoL has set ambitious goals for economic development and poverty eradication which, if materialized, will significantly improve the national food security situation. Yet the implementation plan is unclear on the type of food security and nutritional interventions needed to attain these goals. Although food security is listed as a first priority, especially for the 47 poorest districts in the country, the food security specific strategies do not go beyond equating food security to rice availability. The main issue is the narrow definition of food security where rice is seen as the only key commodity both for improving national (overall availability of rice) and household food security (access to rice at household level).[19]

Addressing high levels of chronic and acute malnutrition first needs a better understanding of the existing nutritional inadequacies. The sole focus on rice must be expanded to include fats, proteins and micronutrient consumption (see chapter 6). Without such measures it is unlikely that malnutrition rates will decline despite national efforts to increase carbohydrate consumption.

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[18] This section is based on: UN Country Team Laos and Government of Laos, 2006:*"United Nations Common Country Assessment Lao PDR*".

[19] The Sixth National Socio-Economic Development Plan (2006-2010) states: "Food (rice) security is a pressing concern for the population in general, and for the poor in particular. Geographic and seasonal pockets of rice scarcity persist, and many communities still lack adequate coping mechanisms. Availability of adequate quantities of rice throughout the year is the key component of food security", page 106.

3.1.2. Opium Eradication Policy

GoL embarked upon a massive opium eradication policy in early 2000s. In less than a decade, the country went from being one of the major opium producers to virtually eliminating the crop by 2006.[20] Notwithstanding the positive outcomes of opium eradication, this has also eliminated a major livelihood source for many poor farmers. The Government, through its Lao National Commission for Drug Control and Supervision (LCDC), jointly with UNODC, has compiled a list of 1100 former opium producing villages that are now in need of assistance, including many requiring emergency food assistance.[21] The result of this policy is a major threat to food security for a large number of upland villages in Northern and Eastern Laos. The development of alternative livelihood activities will take time, although large-scale funding now seems to be forthcoming. The level of success of these initiatives will determine the food security status for many communities for years to come and whether they would be forced back to poppy cultivation albeit illegally.

3.1.3. Land reform and Land Use Planning

The land allocation policy in Lao PDR is derived with an objective of poverty reduction and environmental protection: a) increase land tenure security to enable farmers to invest in their lands and use it as collateral to secure credit when necessary; and b) protect forests by classifying uncultivated lands into different categories ranging from protected forests (all activities are forbidden) to degraded forests (village reserve that can be turned into farm land).

This policy leaves much room for interpretation and thus is exploited by external interests. Critics point out that the unintended result is often not poverty reduction but rather widening disparity and increasing hardship for the poorest households[22]. The local negotiations regarding forest classifications are open to exploitation by the forest industry, which make profitable deals by reclassifying zones into productive forests. Logging and particularly plantation concessions to commercial interests are increasingly threatening access to land for local farmers. This issue is on the rise, and unless mitigating measures are put in place, more and more farmers may be pushed off their land. Thus, the local villages are often not the real beneficiaries of this policy, and the unintended outcome in many instances is increased food insecurity.

3.1.4. Resettlement Strategies

Even though resettlement or relocation is not an official policy,[23] it is used to pursue other objectives such as reduction in shifting cultivation, eradication of opium cultivation, and provision of social services. Three important instruments are generally used for community or household resettlement:[24]

First, the *focal sites,* which bring large numbers of households from various ethnic groups into selected areas so that they can be provided with the development assistance in an efficient and cost-effective manner. Focal sites were first initiated in the early 1990s and remain a major component of the GoL's rural development strategy. In general, they are infrastructure-oriented (roads, schools, health clinics, irrigation, market facilities, etc.).

Second, the *village consolidation* mechanism is designed to combine scattered smaller settlements into larger permanent villages, so that the GoL can more easily administrate

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[20] On 14th February 2006, Lao declared its opium free status. Major donors and the United Nations Office on Drugs and Crime (UNODC) supported the implementation of poppy eradication policy.
[21] UNODC, (2006).
[22] Ducortiuex et al 2005
[23] Evrard, Olivier and Goudineau, Yves, (2004).
[24] WFP, (2006).

them. Although village consolidation has been ongoing since the 1970s, efforts to promote this resettlement instrument have increased with the GoL's poverty reduction strategy.

Finally, *land and forest classification*, as explained above, has the goal of improving land-use planning and natural resource management. This initiative started in 1990, with pilot projects supported by donors, and became a national policy through the adoption of Decree No186 in 1994. It places severe restrictions on upland shifting agriculture, raising concerns about its implications in terms of food shortages. These restrictions are seen as a major factor obliging upland farmers to follow government recommendations to resettle into the lowlands or along the roads.

It is difficult to ascertain whether the relocation is voluntary, involuntary or both[25]. Even though the people of Lao have a long history of migration, what is new with the current resettlement is that it only involves moving people from the upland to the lowland with the aim of promoting sedentary settlements. The end result is a highly volatile situation making it difficult for external agencies to get an overview of recent and planned resettlement. This has several implications: Planning development interventions has become very difficult in the uplands, because it is not always clear whether the village will still be there a few years down the line. It is hard to justify high investments in locations that soon could be abandoned. Some agencies are trying to develop upland villages with the aim of preventing resettlement. This may be successful, but runs the risk of prioritizing interventions that may not be what people need but rather what will prevent resettlement.

From a food security perspective, resettlements can change livelihood opportunities sometimes resulting in diminished ability of households to access food. A livelihood assessment carried out by WFP cautioned that many resettled households had partly or entirely lost their livelihood activities such as upland farming and collection of non-timber forest products (NTFP). [26] In order to compensate for this loss, households need to develop new livelihood activities, which may take time and require substantial external assistance. Such assistance is not always forthcoming and hence increases the risk of food insecurity for many.

3.1.5. Ban on Shifting Cultivation

The policy to ban shifting cultivation or swidden agriculture begun in the early 1980s based on the assumption that it is an unproductive practice and an inefficient use of natural resources which should be replaced with lowland wet rice agriculture. In 1994, GoL set a goal to eliminate swidden cultivation by 2000. Since 1996, eradication of shifting cultivation is seen as a way to provide individuals with an opportunity to earn a better living by moving them to the lowlands where they could obtain paddy land. This is also seen as a way to prevent deforestation, soil degradation and erosion in the uplands.

Resettlement has been the main strategy to reduce shifting cultivation. In the past five years, reportedly over 1.09 million ha of arable land and 3.6 million ha of forestlands were allocated to 7,125 villages or 419,250 households, to reduce shifting cultivation while ensuring sedentary highland and lowland cultivation to reduce poverty[27]. As a result, the shifting cultivation area declined from 118,900 ha in 2001 to 29,400 ha in 2005, mainly in the Northern Provinces (26,800 ha) with the remainder in the Southern Provinces (2,600 ha). The number of farm families practicing shifting cultivation is reported to have decreased from 174,036 in 2000 to 32,790 in 2005.

However, the eradication of shifting cultivation is constrained by the availability of potential paddy and other lands for sedentary cultivation either by the original villages of the highlands or in potential relocation sites on valley floors, raising concerns about food security. In addition, there are critics who claim that shifting cultivation in many instances can be

[25] Evrard and Goudineau (2004)
[26] Ibid.
[27] GoL (2006).

sustainable, if the population to area ratio is kept at a low level.[28] It is worth noting that Lao PDR still has one of the lowest population densities in all of East Asia.

3.1.6. Forestry Strategy

The latest Forestry Policy was established in 2005. It has serious implications given that forests are an important source of food and income for many population groups. It has three main objectives: 1) forest potential for commercial activities such as logging and tree plantations; 2) access to NTFP for the local population; and 3) preserving endangered species and habitats through restrictions on hunting and gathering. However, these objectives are sometimes conflicting. The policy itself recognizes that some strategies, despite being in place for some time, are not always well understood by local people and administrators. This has led to cases, under the land and forest allocation exercise, where the villagers have not benefited[29]. There is thus a danger of commercial interests, due to their negotiating skills, taking precedence over the interest of the local community.

The importance of NTFPs for food security is firmly established in this report. The policies that regulate access to these resources therefore become highly significant. While the reliance on hunting and gathering most likely will have to be reduced, it will be important, from a food security perspective, to monitor how access to forest products is managed.

3.1.7. Biodiversity Policy

The Lao PDR is home to one of South-East Asia's most biologically diverse areas. These forest areas are of great importance to most rural communities in Lao PDR, both as a direct source of food and as an income source in the form of collected NTFPs. However, access to natural resources in Lao PDR is under increasing pressure. The biggest threat to access to natural resources for rural communities is the competition from outside commercial actors, such as logging companies and large-scale plantations. While some logging has been sanctioned by the Lao Government, illegal logging is increasingly threatening to reduce the forested area. Concessions given to actors setting up large commercial plantations, for products such as rubber, coffee, fruits and maize are also limiting the land available for villages. Although recent steps have been taken by the Lao Government to curb this development, these forces are all threatening the traditional use of and access to natural resources for rural, especially upland, villages. If these forces go largely unchecked, it may seriously threaten food security by reducing access to important sources of food for a large number of people.

The Environmental Protection Law of the Lao PDR from 1999 is the principal environmental legislation in the country and includes measures for the protection, mitigation and restoration of the environment as well as guidelines for environmental management and monitoring. Laws and regulations from the Ministry of Agriculture give guidance on wildlife management, deciding who can harvest what species during which season. As with the forestry strategy, these regulations are not well known at lower administrative levels, resulting in poor management, and exploitative relationships between outside economic forces and local population groups. With the traditional high amounts of wild food sources in the Lao diet, proper management of the environment becomes of utmost importance in providing food security for all in rural Lao PDR.

3.1.8. Food Security Strategy

The Food Security Strategy,[30] under the Ministry of Agriculture and Forestry, is the only policy document that directly addresses food security. This strategy was adopted in 2000 and runs

[28] Evrard, and Goudineau, (2004).
[29] MFA, (2005)
[30] Government of Lao PDR, (2000).

until 2010. It is almost exclusively directed towards higher rice production with an overall aim to produce sufficient rice to meet the necessary caloric intake for the entire population. This strategy falls short of addressing the pressing issues of malnutrition, lack of dietary diversity and nutrition knowledge. It has had little impact, compared to better-funded and/or more prioritized initiatives such as opium eradication and resettlement. It can therefore be seen as a missed opportunity to address the underlying causes of malnutrition and food insecurity in the country.

3.1.9. National Nutrition Policy

Laos has had a Nutrition Policy, but with very little impact. Few activities have been directed at addressing specific nutritional challenges including: little improvement in nutrition indicators and a general shortage of trained nutritionists. Currently, a working group consisting of key Government ministries (Ministry of Health (lead), Ministry of Agriculture and Forestry, Ministry of Education) and UN agencies (FAO, WHO, UNICEF and WFP) are developing a new Nutrition Policy expected to address these challenges.

The current attempt aims at highlighting the urgency in addressing the high malnutrition rates in the country and in widening the understanding of food security. Focus is on the importance of nutrition education and access to food sources other than rice. Results from the UNICEF-supported MICS survey, expected to be published this year, and CFSVA findings will provide problem analysis for the planned Nutrition Policy and Strategy. This policy could be a very important tool in balancing how certain other policies negatively affect food security. However, many challenges remain. There are large capacity problems within the government in terms of implementing nutritional interventions and a general lack of appreciation of this important issue, both within the government and the donor community. Very little resources have so far been committed to directly address malnutrition and therefore there is an urgent need to convince the donor community about the importance of this issue. However, there are clear signs that this is slowly changing and that the Government will put an increasing emphasis on addressing malnutrition.

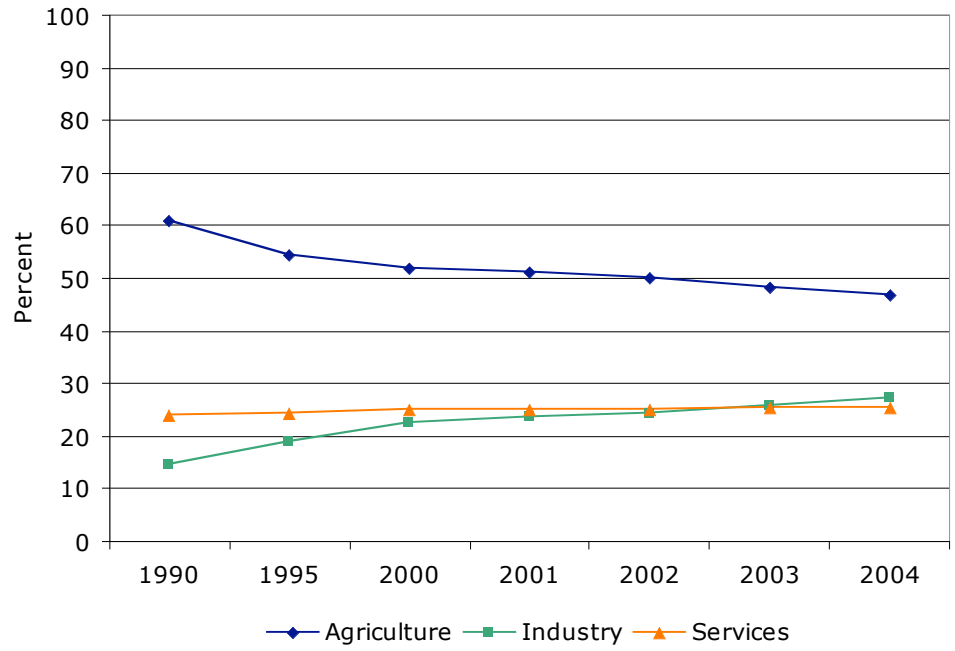
3.2. Socio-Economic Developments

The economic focus of Laos began to shift from a centrally planned to a market driven economy in 1986. This resulted in strong economic growth for over a decade. The GDP in 1990s grew at an average annual rate of 6.3 percent despite the regional economic crisis of 1997-1999. In 2006, real GDP grew by 7.1 percent and it is expected to stay in the same range over the medium term (Table 1).[31] Agriculture remains the driving sector of the economy, contributing around 45 percent of GDP (2005) and employing nearly 80 percent of the labor force; industry accounts for a bit more than 29 percent and services nearly 26 percent.

Recent economic growth has been driven mainly by industrial growth and particularly an expansion in activity at the Oxiana gold and copper mines, and the construction of the Nam Theun 2 (NT2) hydroelectric dam. The stimulus from these large projects, combined with buoyant growth in tourism and non-traditional exports, more than offset the impact of the expiry of the Multi-Fiber Agreement (MFA) quota system and the sharp increase in international oil prices[32]. Overall, industrial growth from 1992 to 2004 averaged 10.6 percent, compared to only 4.7 percent in agriculture. The low performance in the agriculture sector reflects mainly the impact of changing weather conditions on subsistence-oriented agriculture. Agricultural growth has tended to fall since 1999 and reached 3.5 percent in 2005.

[31] IMF (2006).
[32] IMF (2006)

Figure 2: Sectoral Contribution to GDP (1990-2004, Constant Price 1990)



In the last few years, economic growth was also favoured by stable macroeconomic conditions, but slow progress on the fiscal front can jeopardize the achievements. The national currency (Kip) has traded within a relatively narrow band, because of the high level of dollarization. Exchange rate management has been sufficiently flexible to ensure that the parallel market premium is kept below 2 percent. Inflation has curved to 6.8 percent in 2006, down from the hikes of the previous three years. Consumer price hikes from 2003 to 2005 resulted from supply shocks in 2003-2004 (drought and flood), and the impact of the oil price increases on the international market. Domestic fuel prices were raised by around 45 percent in 2005, as the government largely passed through the increase in international oil prices. External reserves have remained comfortable at around three months of imports for two consecutive years (2005-2006).

Table 2: Selected Socio-Economic Indicators

Indicators	1995	2001	2005	2006 (estimate)
Total population (million)	4,58	5,38	5,62	5,72
Population Density/ Km²	20,0	22,0	24,0	26,0
Population growth	2,5	2,1	2,1	1,8
Urban Population (%)	17,2	19,8	21,6	-
Agriculture/ GDP (%)	55,2	51,2	45,0	-
Industry/ GDP (%)	19,1	23,7	29,3	-
Services/ GDP (%)	25,7	25,1	25,7	-
GDP Growth (%)	7,1	5,8	7,0	7,1
Agricultural Growth (%)	3,1	3,8	3,5	-
Industrial Growth (%)	13,1	10,1	12,5	-
Per Capita GDP ($)	385,1	338,9	460,0	500,0
Consumer Price Change (%)	-	7,8	7,2	6,8
Food Price Change (%)	-	6,7	7,7	-
External Public Debt Service (% of Revenues)	-	15,5	21,7	20,2
Overall Fiscal Deficit (% GDP)	-	-4,4	-3,5	-4,0
Gross Official Reserves (Months)	-	2,4	3,0	3,0

Source: IMF (2006), Asian Development Bank (2006)

Though the real effective exchange rate is not a source of concern for competitiveness, trade restrictions could undermine this advantage. The IMF trade restrictiveness index for 2004

shows Lao PDR's overall rating at 7 on a scale of 10, with low average tariffs (less than 10 percent) but high non-tariff barriers -NTBs (more than 25 percent of production covered by NTBs)33. With debt service and the wage bill rising significantly over the past two years, the budget – especially non-wage spending- has come under increasing pressure due to weak revenue administration and mobilization. The key impediment to revenue mobilization is the lack of consensus on how to strengthen the central government's control over provincial tax, customs, and treasury operations. At present, more than 50 percent of revenues are controlled by provincial authorities.Development Challenges

Long-term economic development is undermined by poor infrastructure, which lags far behind other countries of the region.[34] Despite substantial improvements over the last two decades, there is still no railway system and a very low-density road network—less than hundred meters of road per square kilometer—where less than half of the roads are paved. A quarter of the district centers lack year-round access and the situation is even worse at the village level. This lack of infrastructure is a major obstacle to the development of an integrated domestic market as well as access to export markets. In some instances, Lao producers are at a disadvantage towards imported goods because the latter are better connected to the market in question than potential Lao producers. In other instances, local Lao producers are shielded from outside competition due to the inaccessibility of the area. In both cases, the losers are the Lao consumers who have to pay a higher price for the goods. This also applies to food.

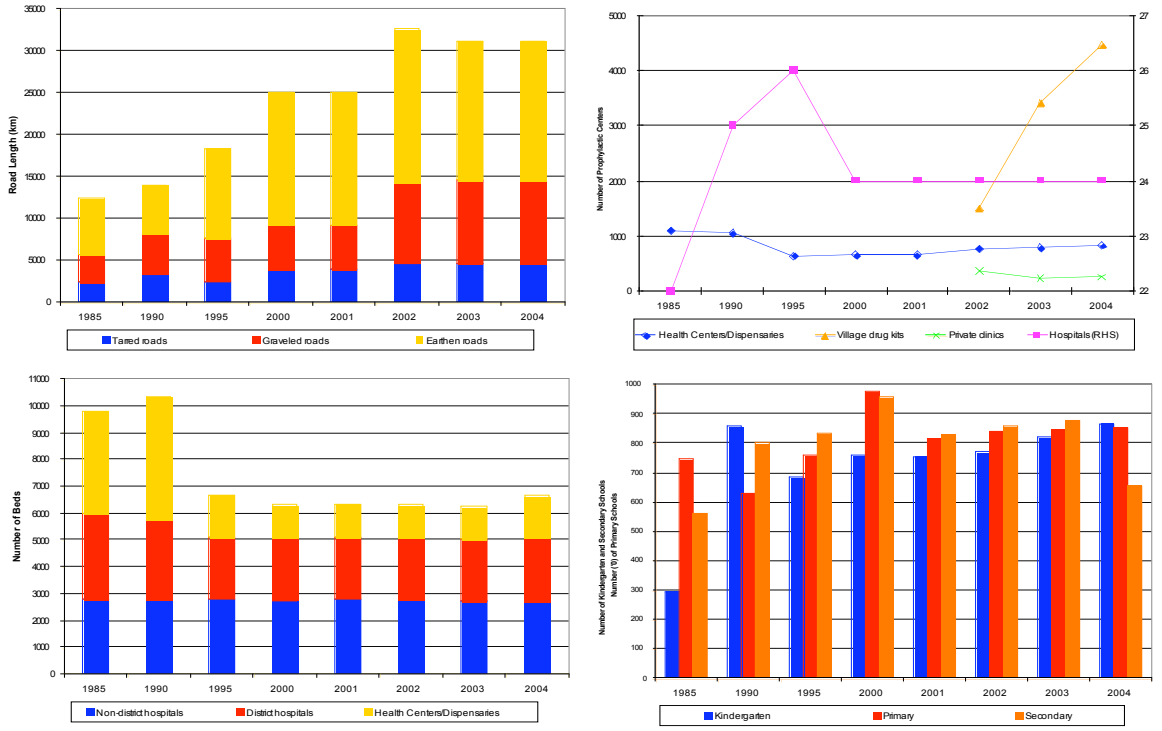
Cumbersome customs procedures and governance problems at the border further exacerbate the problem through increased transport costs and delivery times. As a landlocked country, Lao PDR's trade is also sensitive to the transit procedures in neighbouring countries, which can add to the overall transaction costs.

Figure 2 displays trends on roads, health centers, and schools from 1985 to 2004[35]. They show a deterioration of infrastructure during the first half of the 1990s. Between 1990 and 1995, the length of tarred roads declined by almost one quarter; the number of hospital beds and health centers by over one third; and health centers by about two fifths. Primary schools had already contracted by 15 percent during the second half of the 1980s, and in 1995 they were only slightly above the 1985 level. This is a significant issue given the 30 percent rise in the school-age population size.

After 1995, significant improvements where achieved despite a slowdown during 2002 to 2004. The length of tarred roads in 2004 was 80 percent more than in 1990. While the number of health centers remained at about one fifth below the 1990 level in 2004. Though hospital beds and health centers have remained stagnant since 1995, private clinics and village medical kits partly made up for the shortfall. Despite high population growth the number of primary schools has increased by only one third since 1990.

[33] The overall rating of the trade restrictiveness ranks on a scale of 1 (most open) to 10 (most restrictive).
[34] World Bank (2006a).
[35] World Bank (2006b)

Figure 3: Infrastructure Trends, 1985-2004



Source: World Bank (2006): Poverty Assessment

This CFSVA analysis confirms the rather bleak infrastructure base at the village level. Four indicators were used to construct a Village Infrastructure index[36]which ranges from 0 (no infrastructure) to 6 (all infrastructures present). Almost three quarters (73%) of the villages received a score of 2 or less—indicating at most presence of a gravel/paved road and a primary school. In only about 4 percent of the villages, all infrastructures were present, while 5 percent of the villages had no infrastructure at all.

Natural hazards, such as floods, droughts, pest infestation and fire continue to pose serious threats to development in Lao PDR. UXO contamination is also a constant threat to development, especially in the agricultural sector, as expansion of new land in many places requires prior UXO clearance. These issues will be explored further in later chapters.

3.3. Aggregate Availability and Markets

This section explores market functions and distortions—such as staple food production, trade, irregular supplies, physical access to markets, inadequate purchasing power, consumer price indices and shocks—that can affect food availability and access for most populations living in rural areas.

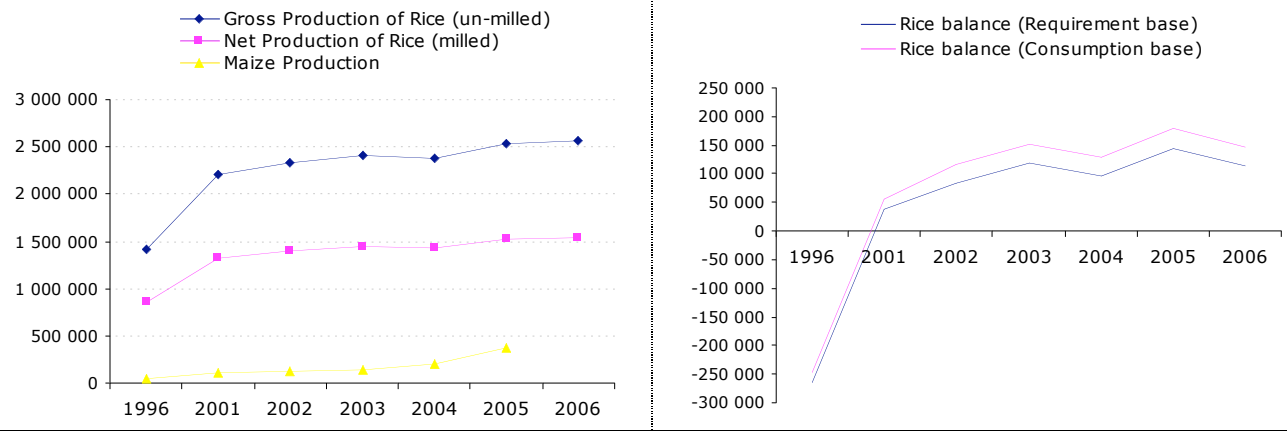
[36] PCA was conducted using several indicators, but only 4 indicators were retained in the final index. The Infrastructure index is calculated in the following way: presence of primary school (1/0) + 2 presence of secondary school (1/0) +2 presence of a health centre (1/0) + presence of a paved or gravel road (1/0).

3.3.1. Cereal Self-Sufficiency Status

In Laos only four percent of the total land area is cultivated. Rice constitutes about 70 percent of the net cropped area.[37] Most of the rice production is rain-fed. The agricultural land in the country is classified into three groups—lowland, upland and irrigated land—based on the general cropping conditions for rice. Lowland rice accounts for about 77 percent, upland 14 percent and the remaining is irrigated land. The upland rice productivity is estimated at about 2.04 tons per hectare against 3.65 tons for the lowlands. Rice is by far the largest of all cereals produced in the country. However, the share of maize production has increased from about five percent of total cereal production (2.45 million Mt) in 2001 to about 13 percent of the estimated 2.94 million Mt of cereals produced in 2005.

According to the Ministry of Agriculture and Forestry,[38] the total net production and the self-sufficiency status of rice have improved during the last years but marketable surplus is still very low. The net rice production increased from 1.32 million Mt in 2001 to 1.66 million Mt in 2006. As a result, the country has moved from a rice deficit situation in 1996 to surplus production in 2006. However, the balance has not yet improved enough to generate significant marketable surpluses. The surplus rice accounts for less than 10 percent of the net production over the last five years. Given the dependency of the country on rain-fed production this means that any substantial natural disaster, such as droughts and floods, could seriously affect food security where large-scale commercial imports and food aid may become necessary.[39]

Figure 4: Self-Sufficiency Status of Local Rice Production (1996-2006, in MT)



Source: Ministry of Agriculture, Staff Estimates

37 According to official figures of the Ministry of Agriculture and Forestry, the total net cropped area is estimated at 1,020,400 Ha of which 736,000 Ha is occupied by rice production

38 The hypotheses used by the Ministry of Agriculture are as follows: the conversion rate of paddy into non-glutinous rice is 60 percent. Post harvest and production losses are estimated at 10 percent and 3 percent of the gross production is considered as seed and feed use. About 1 percent is assumed to go into other uses. Thus the net availability of paddy for human consumption is 13 percent less than the gross production of paddy. The net production of milled rice is therefore 52 percent of the gross production of paddy.
Using the mid-year population estimations between 1995 (Census) and 2005 (Census), the total requirement of food has been estimated. MAF estimate of rice balance sheet is based on per capita actual consumption estimated by the LECS-III (575 grams) as a proxy of per capita requirement of rice. The average calorie content of different type of rice would result into a per capita requirement of 592 grams per capita per day. The opening stocks from previous years carry forwards were also added to the production to capture the total domestic production.

39 According to the Ministry of Agriculture and the National Agriculture and Forestry Research Institute (NAFRI), about 30,000 to 70, 000 hectares of land are affected by floods and droughts every year.

Significant differences exist in the levels of rice self-sufficiency amongst provinces.[40] Per capita net production in the Northern provinces has been recurrently low when compared to both the per capita requirement and the actual consumption over the last five years. Four of the seven provinces (Phongsaly, Oudomxay, Luangprabang and Huaphanh) of the Northern region have a deficit of more than a third of the estimated per capita requirement (592 grams per day) each year. The Central region is moderately rice sufficient with the exception of two provinces—Xienkhuang and the former special region of Xaysomboun, which have deficits similar to the Northern provinces. Borikhamxay is on the borderline with unstable self-sufficiency patterns. Most of the rice surplus in the country is due to the Southern region, where only Sekong province is recurrently a deficit net production area. In general, a high share of upland and mountainous landscape characterizes all the deficit provinces. The remoteness of these localities and the poor road conditions become a disincentive for traders to move food commodities given a combination of high transaction costs and low purchasing power of the communities.

Table 3: Net Per Capita Rice Production as a Percentage of Requirements per Province (2001-2005, %)

	2001	2002	2003	2004	2005	Average
North						
Phongsaly	-35.8	-33.0	-39.8	-51.7	-53.0	-42.6
Luangnamtha	-9.9	-13.8	8.9	6.5	-37.6	-9.2
Oudomxay	-19.0	-32.8	-29.9	-30.8	-58.3	-34.2
Bokeo	-20.4	-32.5	-14.5	-11.7	-10.3	-17.9
Luangprabang	-39.5	-40.1	-41.0	-43.1	-48.9	-42.5
Huaphanh	-43.1	-42.0	-33.1	-28.0	-33.5	-35.9
Xayabury	-27.0	-23.1	-18.7	-15.2	-7.6	-18.3
North Total	**-30.6**	**-32.6**	**-27.5**	**-27.7**	**-36.1**	**-30.9**
Central						
Vientiane Municipality	-50.1	4.9	10.5	12.9	9.6	-2.4
Xiengkhuang	-44.6	-27.3	-25.1	-28.2	-28.7	-30.8
Vientiane	-26.5	12.5	53.7	50.8	25.4	23.2
Borikhamxay	-63.1	42.5	13.1	-1.2	28.7	4.0
Khammuane	-29.5	15.9	8.0	33.1	48.5	15.2
Savannakhet	4.2	40.3	46.9	55.4	39.5	37.3
Xaysomboun (Special Region)	-55.2	-12.8	-40.0	-31.7	-37.6	-35.5
Central Total	**-28.2**	**17.9**	**23.4**	**28.1**	**23.2**	**12.9**
South						
Saravane	9.7	48.7	68.3	75.7	79.5	56.4
Sekong	-63.3	-43.7	-38.6	-35.1	-39.7	-44.1
Champasack	-13.1	36.8	27.8	14.2	21.6	17.5
Attapeu	-26.9	18.5	-2.0	14.5	14.2	3.6
South Total	**-11.5**	**32.5**	**31.6**	**28.2**	**32.9**	**22.7**
Lao PDR	**-25.7**	**4.6**	**8.8**	**10.4**	**6.4**	**0.9**
Per Capita Requirement (Grams)	**591.6**	**591.6**	**591.6**	**591.6**	**591.6**	**591.6**

NB: Per capita requirement is estimated at 592 grams per day. The self-sufficiency status does not change with the actual per capita consumption which is estimated at 582 grams in 1998 (LECS II) and 575 grams in 2002 (LECS III).
Source: Ministry of Agriculture, Staff Estimates.

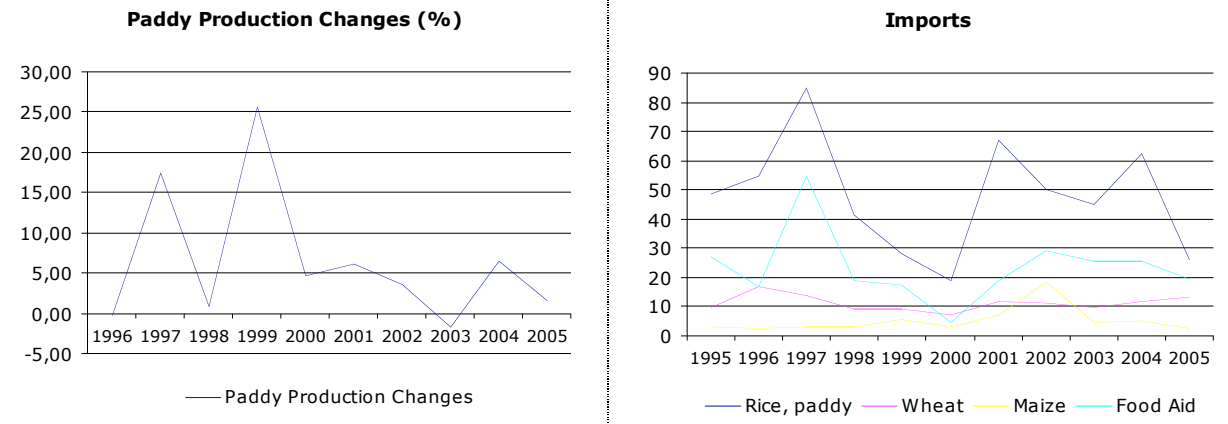
[40]In the absence of district level rice balance sheet, the analysis is conducted at provincial level, acknowledging the limitation of this approach which misses out intra-province disparities.

3.3.2. Food Import Profile and Trade Regime

Cereal imports (rice, wheat, maize) have fluctuated from year to year with major surges occurring every 3-4 years (figure 3). On average, about 65,000 MT of cereals are annually imported through the commercial sector. Rice is the main item, accounting for more than 70 percent of the total cereal imports. Import and food aid increases tend to occur simultaneously to compensate production failures mostly due to droughts. Over the decade (1995-2005) global food aid averaged some 23,000 MT a year, accounting for about 25 percent of total import (private and humanitarian). Rice accounts for about 90 percent of the total food aid per year and follows the same pattern as the rice imports (figure 3).

Most trade in Laos still requires authorization from several national and provincial authorities, creating opportunities for corruption, and hence potentially high transaction costs. Provincial authorities collect customs levies at international border crossings in their respective areas, only a portion of which is rendered to the central government[41]. Border control is weak throughout the country, and border trade is poorly controlled. As a result, a large number of approvals and informal payments are still required to get those approvals.

Figure 5: Trends of Food Grain Imports (1995-2005, in '000 tons)



Source: FAO Statistics, WFP Interfais.

Laos has implemented the ASEAN Harmonized Tariff Nomenclature (AHTN), which has resulted in a reduction of the average tariff on ASEAN origin products to 5 percent. As 80 percent of Laos' external trade is with ASEAN countries, its participation in the ASEAN Free Trade Area (AFTA) is a significant liberalizing step. However, Laos retains 88 items of special concern on which tariffs remain high – the highest number of such special status products in ASEAN.

There are non-tariff barriers on a number of products (including agricultural products), weakening the private sector capacity to meet emergency needs. The law[42] prohibits the importation of domestically grown agricultural products in quantities sufficient to meet demand. All importers must submit an annual importation plan to the Ministry of Commerce or to relevant provincial authorities and may only import against the plan during the following year. As shown above, this policy leads to a delay in private food imports to meet emergency needs resulting from natural disasters. Laos has no specific law on standards for imported or exported goods. Imported goods are allowed to enter based on the certification of the country of export. Laos has no special labeling or marking requirements.

All goods and services are subject to a turnover tax of either 5 percent or 10 percent, with lower rates or exemptions applied to domestic products.

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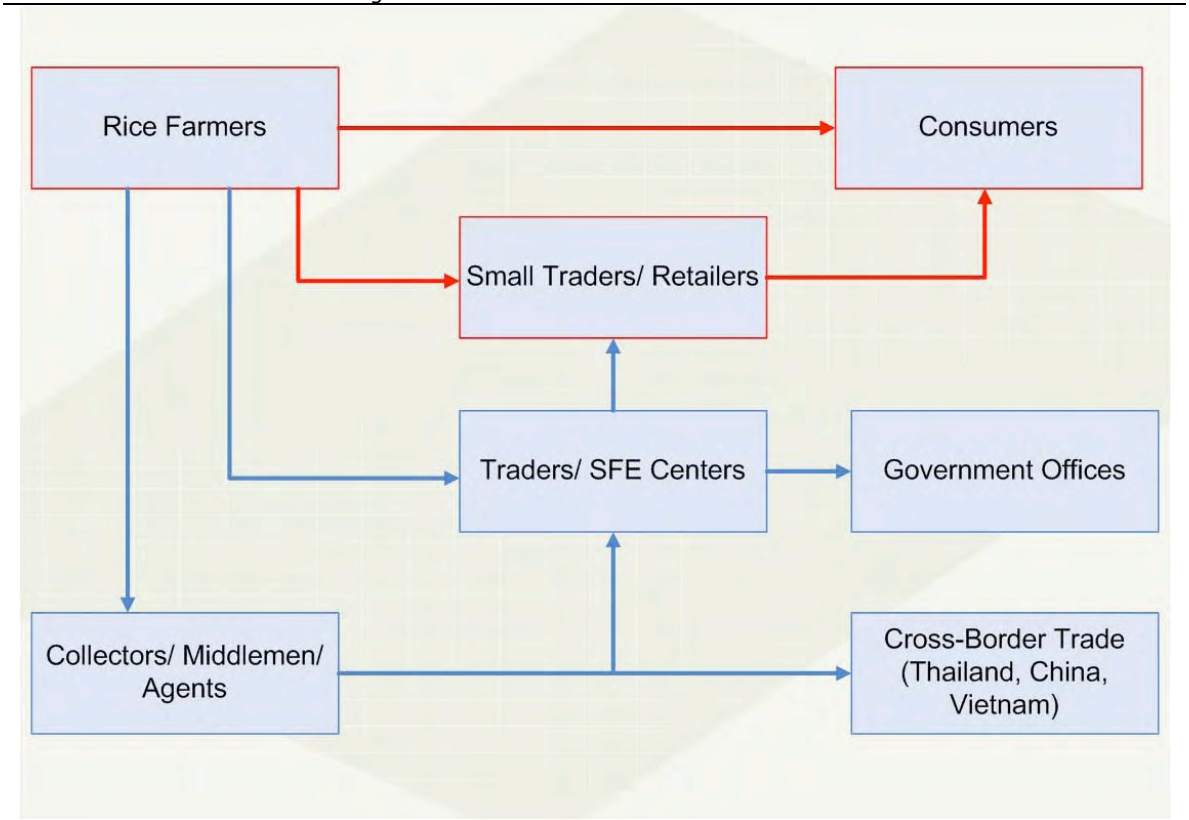
41 www.ustr.gov/assets/Document_Library/Reports_Publications, Accessed on May 1, 2007.
42 The list of goods subject to import and export prohibitions is set out in Notification of Ministry of Commerce No. 284/MOC.FTD dated March 17, 2004

3.3.3. Food Market Channels and Cross-Border Trade

The analysis of food marketing chain focuses on the rice market as it constitutes by far the most commonly eaten food item in Lao PDR. The rice market chain is predominantly one of a primary market, linking small traders (retailers) with farmers and consumers in rural areas, as shown below.

Very few traders are involved in purchases and sales of food and agricultural products in rural areas. The State Food Enterprise (SFE) of Lao PDR is a major player in the rice marketing system by procuring rice during harvest for government staff and selling out rice stocks to the general population during rice shortage periods to stabilize prices. It operates as a profit making organization. Besides other foodstuffs, the SFE procures about 20 to 25 thousand Mt of rice per year through its network of food procurement from farmers and traders at 14 procurement centers in the central and southern provinces. The official rate offered by the SFE is said to be based on market supply and demand equilibrium prices. The SFE influences indirectly the market price as it engages farmers into contract farming, using forward/advance payment to farmers and distributing seeds and fertilizer to the tied-up farmers.

Figure 6: Indicative Market Channels for Rice



Source: WFP Lao PDR, CFSVA, Key Informant Interview, 2006
The red lines indicate the dominant chain involving farmers, retailers and consumers. The blue lines represent the chains that involve fewer stakeholders.

The market structure of the Northern provinces is less competitive than the Southern provinces. SFE has no trading (procurement and selling) centre in the Northern provinces because of the deficit production pattern of the region, combined with limited road accessibility and high transportation cost. Farmers of these areas would sell their produce to border markets in China, where they fetch a much higher price than selling locally to collectors or to other regions such as the central part of the country. In the southern low-land areas, the marketing channels involve small private traders, the SFE and trading across the border. The market structure is more competitive due to the presence of large scale traders such as SFE trading centers and many small private traders. The majority of farmers sell their surplus

produce to local and ambulant traders. However, large net producers are reported to trade as well with the border markets of Thailand, at higher prices.

Cross-border trade is important to make up food needs in the Northern provinces. Estimates by the Bank of Thailand indicate that unofficial cross-border trade with Thailand is about 50 percent of officially recorded trade[43]. In 2000, the official border trade through customs procedures between Thailand and Lao PDR resulted in trade value of US$27.6 million dollar, of this US$15.2 million dollar was exports and US$12.4 million dollar was imports. Major export items to Laos are construction materials, fuel and lubricant, consumer goods, and vehicles and parts. Main import goods from Laos are wood and wood products, coal, lignite, agricultural products, and forest products. Some agricultural products such as paddy are processed in Thai border provinces and re-exported to Laos. According to the Bank of Thailand, intense flow of trade takes place between Thailand and six provinces in northern Lao, particularly that of Udomxay province, in the form of import of consumer goods and export of agricultural products (including forest products) by Lao residents. However, all goods put together, Northern Lao is net importer in the border trade with Thailand.

Informal border-trade is most likely taking place both from surplus and deficit areas to border countries such as Thailand, Vietnam and China. However, not much is known about the importance of such cross-border trade and its impact on the actual food availability and price dynamics. An outflow of rice would result in a depletion of domestic stocks, further reduction of the already tiny rice surplus and an increased pressure on local food availability and domestic prices. An informal inflow of rice would in return be beneficial for net consumers through its price stabilizing effect but detrimental to net producers in surplus areas. Reportedly, the lack of market knowledge and information is suspected to cause imbalanced pricing transactions between traders and households (producers and consumers) in rural areas[44].

3.4. Food Price Patterns

In the absence of rural price collection system, the analysis of food prices is based on the consumer price series of the National Statistic Center (NSC). These series are collected from 14 urban markets in 8 provinces since 2000. It is acknowledged that the urban prices may not reflect correctly the price behavior in rural areas. Resuscitating the former market surveillance system of the Ministry of Agriculture in rural areas would therefore help to address this limitation and provide useful information on the food security situation of rural households.

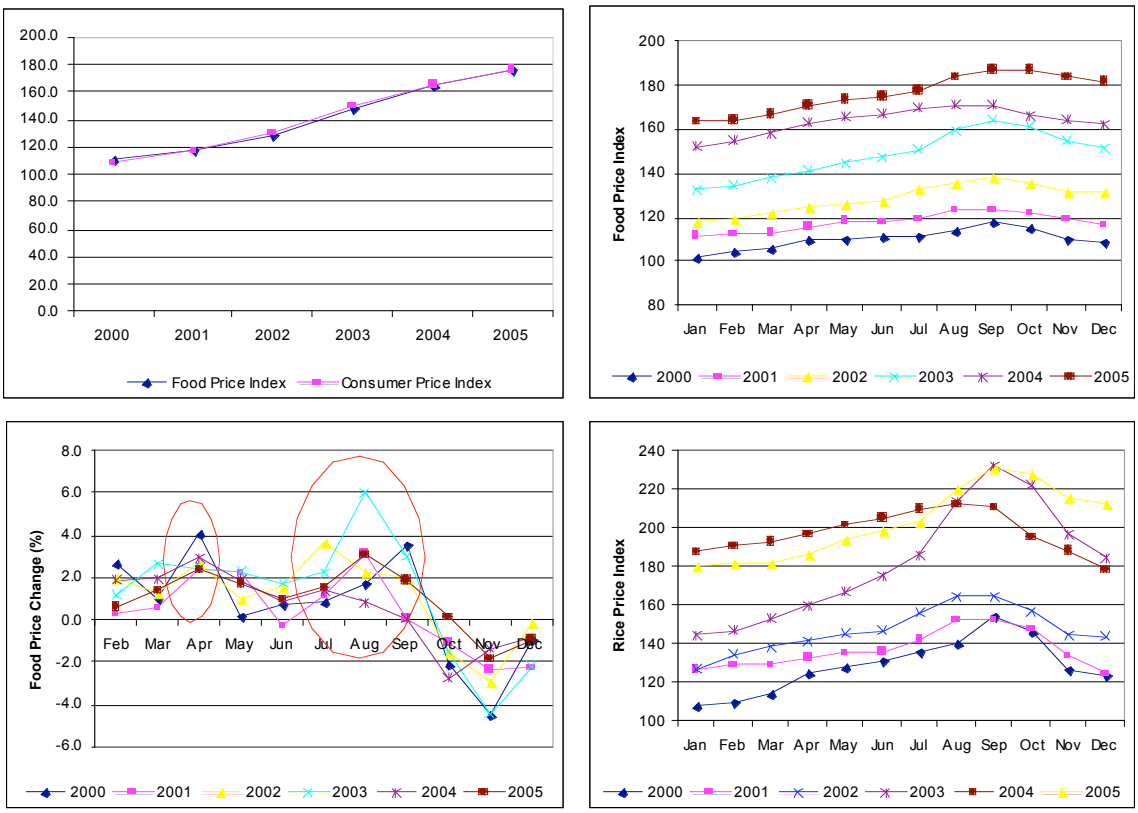
The consumer price index (CPI) indicates an upward trend (in real terms) from 2000 to 2005, due partly to food price increases. On average, food prices increased significantly in 2003 (15 percent) and 2004 (11 percent) as a result of the production shortfalls due to drought. Inflation picked up in the middle of 2005, reflecting an increase in rice prices, which were adversely affected by floods along the Mekong River, and a large adjustment to domestic fuel prices. The co-movement of food prices and the general inflation suggests that major food (especially rice) supply shocks have a significant impact on general inflation and household purchasing power.

The intra-annual seasonality of food prices remained unchanged, following the seasonal patterns of rice production (figure 5). On a yearly basis, food prices would generally decrease from October to December due to increased availability of rice from the main rice harvest season in the low land. Subsequent months of rice harvest in the upland from January to March have less impact on food prices than the low land harvest because of the limited production. From March to October, trading of small quantities for non-food needs (including inputs and seeds) and own consumption together reduce the availability of food, resulting in an upward trend of food (especially rice) prices. During this period, the monthly pattern of food prices indicates recurrently a short peak in the dry season of April and a long peak during

[43] Bank of Thailand, (2003)
[44] WFP Lao PDR, (2006).

the lean season from July to September, suggesting that food shortages are higher during these periods of the year.

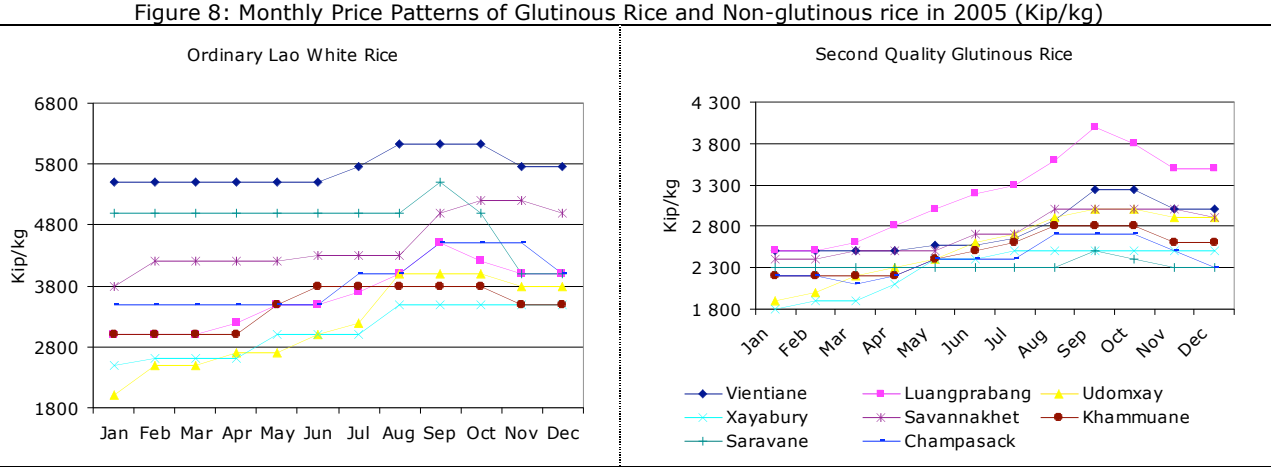
Figure 7: Consumer Price Patterns (2000-2005)



Source: National Statistic Centre.

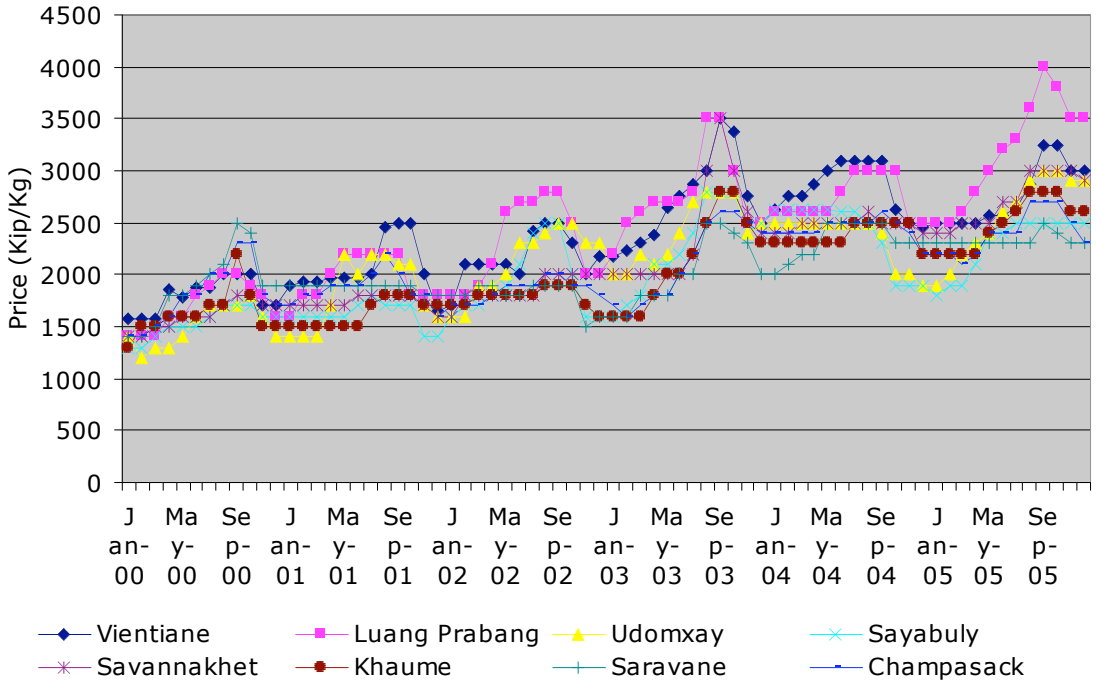
At provincial level, the price of glutinous rice is relatively higher in Vientiane, Savannakhet, Luangprabang and Udomxay than other provinces. The higher price in the Northern provinces of Luangprabang and Udomxay is due to their rice deficit situation and their relative isolation from surplus production areas. The higher price in these provinces can be attributed to high transportation cost and their relative dependence on consumer goods from Thai markets which are closer than Lao surplus provinces of the south. The higher price in Vientiane and Savannakhet is mainly due to the demand pressure related to the higher concentration of the urban population.

Figure 8: Monthly Price Patterns of Glutinous Rice and Non-glutinous rice in 2005 (Kip/kg)



Source: National Statistics Centre.

Figure 9: Monthly Price Patterns of second quality Glutinous Rice from 2000 to 2005 (Kip/kg)



The lowest prices of glutinous rice are observed in surplus areas of the south such as Saravane, Khammuane and Champasack. The prices of glutinous rice and non-glutinous rice are also very low in Xayabuly, despite its recurrent deficit situation. Xayabuly is a central transit point for imports from Thailand, hence the stabilizing effects on price. Every year, the prices in Luangprabang, a deficit area, systematically increase more than in the other parts of the country. Any further spatial price integration analysis could not be conducted due to inadequate information on price and transport cost differences between supply centers and delivery points.

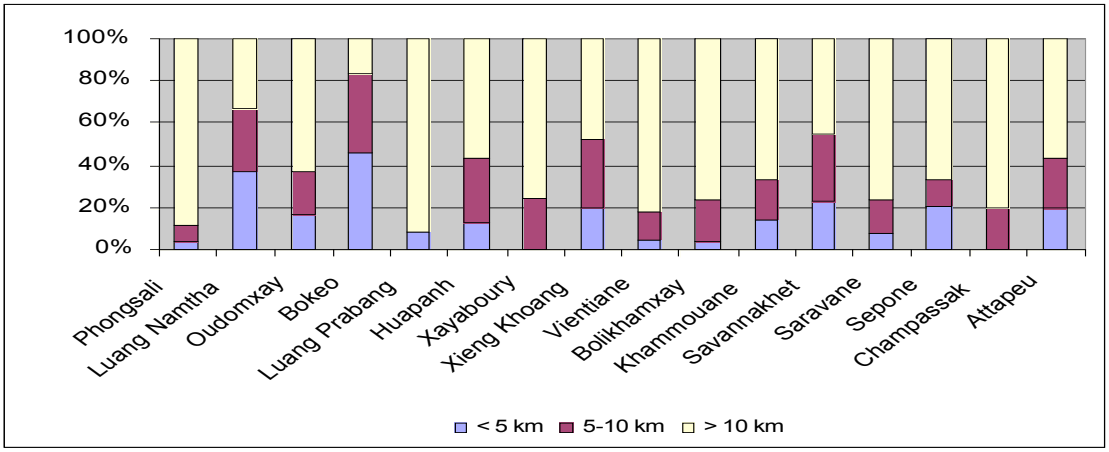
Overall, price fluctuations are more of a seasonality issue than a volatility issue. While the price of glutinous rice follows an upward trend from February to September, the price of non-glutinous rice is generally stable in most of the provinces, except during the lean season because of the demand pressure. The stability of the non-glutinous rice price is determined by the low demand of non-glutinous rice (except during the lean season), the stabilizing effect of government subsidized non-glutinous rice and rice import in some provinces such as Xayabuly. On the other hand, glutinous rice is the main local rice production. Therefore, its price follows the seasonal patterns of the production. A volatility test, using a GARCH (1,1) model, indicates that rice price volatility is not statistically significant at provincial level (annex 1).

3.5. Physical Access to Markets and Potential Market Integration

In the absence of information on price differentials and transaction costs between rural areas and market centers, the conditions of physical access to markets can be considered as a measure of potential market integration. Information about road access and location of major cities and towns is one measure. High access to roads for motor vehicles is likely to provide better access to markets. Another measure is travel time. Actual travel time to the closest city or market depends on road and traffic conditions, the means of transport, weather conditions, which may reduce market integration through high transaction costs, especially between remote rural areas and market centers.

Transport conditions in Lao villages are relatively difficult, reducing access to market opportunities. In the 398 surveyed villages in the CFSVA sample travel distances to district centers are higher than 10 km, except in Phongsaly and Khammuane provinces (figure 7). However, most of the roads in these two provinces are not motor roads. As shown in table 2, the surveyed villages within a province have, in general, low or moderate access to motor roads. Villagers travel primarily by foot to join district centers, suggesting long travel times with regard to the relatively high travel distance above mentioned. Above 10 Km, the travel time by foot is estimated at 4 hours (one way)[45], suggesting that most of the communities are located to a travel distance equivalent to a working day to reach the closest market. While motorbikes, bicycles and hand tractors serve also to travel, local buses are not considered as a main mean of transport, because of poor road conditions. Poor road conditions are mentioned by most of the communities as the main reason for the lack of physical access to markets, except in Bokeo and Luangprabang (annex 2). Despite its relatively good road infrastructure, long distances constitute the main constraint in Luangprabang province. In addition, insecurity seems to limit market access in a few provinces such as Savannakhet, Saravane and Sekong. The limited access of communities to markets is compensated by a relatively high frequency of visits of traders and agents to villages. More than two-third of the surveyed villages indicate that traders and agents visit their villages at least once a week or twice a month, except in Phongsaly where only 12 percent of villages benefit from such visits against 44 percent villages which are never visited. This almost one-way trade direction is a source of lack of market information, resulting in high transaction costs borne by communities.

Figure 10: Distance between villages and main market places (Km)[46]



Source: WFP Lao PDR, CFSVA Community Survey, 2006.

Seasonal access to roads further reduces physical access to markets. In general, access to secondary and tertiary roads as well as access to markets is reduced in wet season between May and November (figure 8). Surveyed villages in Sekong and Attapeu face the longest periods of isolation, between 4 to 6 months (annex 2). During the rainy season, most of the rural roads are slippery, muddy and flooded, hence reducing communities' access to markets and increasing their dependency on own production.

[45] WFP Lao PDR, (2006)

[46] Results for Bokeo could be explained by the fact that it is closed to Thailand border and that households and traders are going to Thai markets nearby. The population of the region also relies heavily on boats and rivers and therefore the road distance estimation as asked in the questionnaire could be skewed.

Table 4: Road Access and Transport Conditions by Province

Province	Average distance to district center (Km)	Main Type of Road (% of villages)		Motorable Road Availability Score*	Main Means of Transport (% of villages)	
		First	Second		First	Second
Phongsaly	7.1	Track (42)	Earth (25)	1	Foot (68)	Local Bus (16)
Luangnamtha	15.6	Gravel (43)	Paved (30)	3	Foot (68)	Motorbike (20)
Oudomxay	22.2	Earth (52)	Paved (36)	2	Foot (80)	Motorbike (16)
Bokeo	34.1	Gravel (58)	Track (25)	2	Foot (40)	Bicylce (28)
Luangprabang	31.1	Paved (48)	Gravel (43)	3	Foot (32)	Motorbike (20)
Huaphanh	28.8	Earth (32)	Track (28)	1	Foot (60)	Motorbike (24)
Xayabury	49.6	Gravel (48)	Earth (48)	2	Hand Tractor (52)	Foot (20)
Xiengkhuang	29.2	Gravel (44)	Paved (24)	3	Foot (68)	Bicylce (8)
Vientiane	20.6	Gravel (52)	Paved (32)	3	Motorbike (50)	Hand Tractor (21)
Borikhamxay	40.1	Gravel (64)	Paved (24)	3	Motorbike (20)	Hand Tractor (16)
Khammuane	5.0	Gravel (52)	Earth (32)	2	Bicylce (24)	Motorbike (20)
Savannakhet	32.2	Gravel (52)	Track (25)	2	Hand Tractor (42)	Bicylce (21)
Saravane	10.7	Gravel (38)	Track (29)	2	Hand Tractor (24)	Foot (20)
Sekong	14.3	Paved (48)	Earth (44)	2	Foot (46)	Bicylce (33)
Champassak	31.4	Earth (29)	Track (29)	1	Motorbike (36)	Hand Tractor (20)
Attapeu	23.2	Gravel (48)	Earth (24)	2	Bicylce (60)	Foot (40)

Number of Villages=398

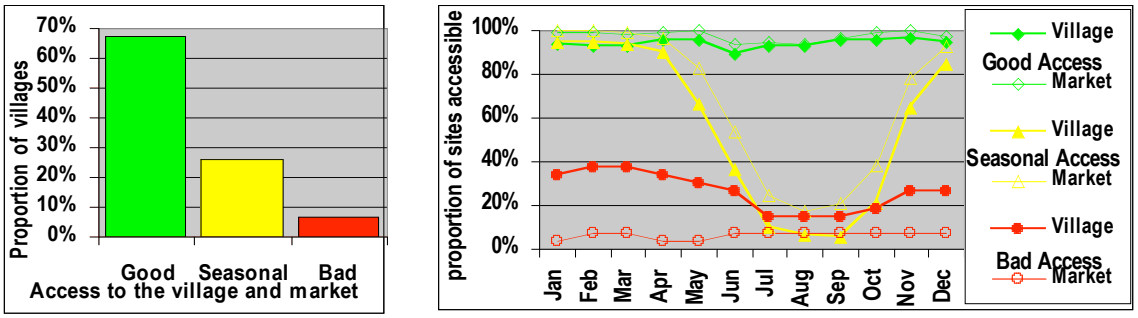
(*): 1= Low access (track and earth roads); 2=Moderate access (Gravel/Paved and Track/Earth Roads); 3=Better access (Gravel and Paved Roads).

Source: WFP Lao PDR, CFSVA Community Survey, 2006

3.5.1. Accessibility of the village

Through PCA and cluster analysis, villages have been grouped base on their accessibility during the year.

Figure 11: Village accessibility



Most villages (63%) have good access all year round, but for 10%, access is poor most of the year. The remaining villages have good access during the dry season, but their access road becomes less accessible during the rainy season.

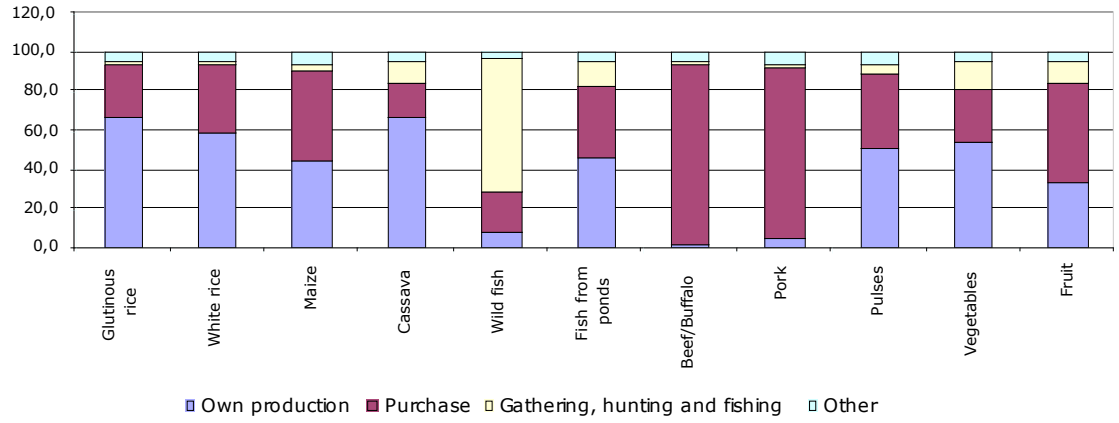
3.6. Households Participation in Food Markets

On the supply side, very limited surplus production is sold on the markets due to the subsistence nature of the rice farming and limited physical access to markets, as shown above. However, the subsistence farming of rice is allied with the cultivation of upland cash crops, livestock rearing, handicraft production, and the collection of non-timber forest products. In general, animals (cows, buffalos, chickens and pigs) and handicrafts (baskets,

mats and kitchen tools) constitute important sources of income while additional incomes are drawn from the sale of non-timber forest products and vegetables.

On the demand side, a significant proportion of respondents consider markets as first or second source of food, though the patterns differ between food groups (figure 12). While the majority of respondents (from 45 to 67 percent) indicate own production as the first or second source of food for cereals, tubers, pulses, vegetables and fish, their main (first and second) source of meat products is market (more than 80 percent of respondents). About 67 and 59 percent of the respondent get glutinous rice and non-glutinous rice from their own production, respectively. Any production shortfall would therefore increase households' vulnerability to food insecurity, given the dependency of their food access on rice production. Rice production shortfalls would also result in pressure on market prices of rice, given that market purchases are the second source of food. Household can to some extent rely on substitutes such as forest products to mitigate the negative impact of rice shortages, but these sources are not sustainable in the long run. Other crops such as maize and cassava are not yet produced at a level where they are reliable alternatives.

Figure 12: Distribution of Food Sources (% of Respondents)



Source: WFP Lao PDR, CFSVA Household Survey, 2006

3.7. Unskilled Wage Rate

Casual labor is an important part of income sources of villages, especially during the lean season and for non-farm activities. The existing demand is for unskilled labor, mostly as agricultural labor (bush cleaning, paddy land maintaining or land fencing) for neighbors[47]. The practice of agricultural casual labor or labor exchange is common in wet season and mainly during the lean season to meet household food needs. In general, payments are made either in kind with some 5 kg of paddy rice/day or in cash. According to the community survey, the daily wage rate of unskilled labor is confined between 10,000 and 20,000 Kip, with large variations among villages in each province. The highest rates are paid in Vientiane and Borikhamxay provinces while the lowest are paid in Phongsaly and Luangprabang provinces (table 5).

[47] WFP Lao PDR, (2006)

Table 5: Daily Wage Rates for Unskilled Labor by Province						
	Mean	N	Std. Deviation	Median	Minimum	Maximum
Phongsaly	11,667	18	3,865	10,000	5,000	20,000
Luangnamtha	19,250	24	7,747	20,000	3,000	30,000
Oudomxay	14,870	23	4,732	15,000	6,000	25,000
Bokeo	14,062	21	4,922	13,500	8,500	30,000
Luangprabang	12,560	25	4,341	12,000	5,000	20,000
Huaphanh	16,095	21	3,767	15,000	10,000	25,000
Xayabury	15,748	23	4,197	15,000	10,000	26,000
Xiengkhuang	17,833	24	4,114	18,000	7,000	25,000
Vientiane	19,318	22	4,412	20,000	10,000	27,000
Borikhamxay	19,417	24	3,775	20,000	10,000	26,000
Khammuane	17,789	19	4,894	20,000	5,000	25,000
Savannakhet	18,174	23	2,406	20,000	15,000	20,000
Saravane	15,889	18	5,016	15,000	10,000	27,000
Sekong	18,591	22	8,623	16,500	10,000	45,000
Champassak	17,304	23	4,456	20,000	5,000	25,000
Attapeu	14,167	24	3,852	15,000	8,000	20,000

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Non-farm activities offer limited employment opportunities and cash income but are less preferred than permanent agricultural activities because they are considered by villagers as temporary and risky, hence low paying with regard to the effort required. In general, the lack of skills put villagers at a disadvantage in both finding and keeping employment opportunities in non-farm activities such as mining, logging and road and house construction.

Summary: Chapter 3

Chapter 3 has looked at the relevance and influence of the political and socio-economic environment on food security.

There are several policies that directly or indirectly affect food security. The side effects of policies such as the ban on opium production, land allocation and resettlement, have arguably had a bigger impact than the food security policy itself. The opium eradication policy was swiftly implemented mainly due to strong political will and donor support. The result was successful eradication of opium production but also of an important income source for many communities. The resettlement programme has received less donor support yet the political will is nevertheless there to push for its implementation. But partly lack of funds to provide adequate social services for the affected populations coupled with missed opportunities in the policy itself (lack of appreciation of traditional ways of living) may have resulted in increased vulnerability to food security. Hence it is very important to closely monitor the implementation of the above policies and maintain a dialogue between the GoL and development partners to identify and implement mitigation measures when and if they become necessary.

As per the food balance sheet, the net production of food grains (rice) is just enough to meet per capita consumption or requirements in Lao PDR, with major rice deficits in the Northern provinces. This means that food imports (commercial and food aid) play an important role in providing complementary supply to food deficit areas or during years of production shortfalls. Cross-border trade plays a significant role in food supplies in Laos.

Over the past years, the upward trend of the consumer price index has been driven mainly by food price increases, especially the price of glutinous rice. Rice price increases are due to a combination of supply shocks (droughts and floods) and external shocks (oil price increases). Seasonal price variation of glutinous rice is seen as an important constraint to household access to food, especially during the lean season. These findings suggest that any substantial rice production shortfall would have a significant impact on general inflation and household purchasing power in Laos.

In general, market centers are not well integrated with rural areas in Laos because of: i) limited road access; ii) poor road conditions, especially during the wet season; and iii) a quasi one-way trade direction from traders/agents to communities, which creates potentially high transaction costs because of lack of market information for communities' decision making.

Markets constitute the second source of food for households after their own production (45 percent). Combining their limited income opportunities with some dependence on markets for food at certain times of the year, an increase of food commodity prices or a decrease of income levels would have a negative impact on households' purchasing power and consequently the pattern of their food consumption.

Chapter 4. Asset Endowments

The combination or portfolio of household's assets is an important determinant of the success households will have with their livelihood activities. In the Sustainable Livelihoods Framework[48], the term 'asset' is taken in a broad sense, referring to 5 groups or classes of assets: physical, natural, human, financial and social. Livelihood outcomes, such as the degree of food security at household level, depend on these assets and how well households combine them in pursuing their different livelihoods activities. It is very difficult to combine all these assets into statistical analysis, as they are of different nature (e.g. education levels (human assets) and agricultural tools (physical assets)). Further, the value of the different assets, from a livelihoods outcome perspective, changes depending on which activity they are utilized for. One cannot therefore 'read out' the livelihoods outcome (e.g. food security) from only looking at the assets. But looking at the availability of certain assets among the population can indicate the opportunities that exist for sustainable livelihood activities and may also indicate where some of the major constraints lie. The following chapters take a closer look at the different asset endowments of the rural population of Lao PDR.

4.1. Natural Capital

4.1.1. Geography

Lao PDR has an area of 236,000 km², and is a land-locked country surrounded by Thailand, Myanmar, China, Vietnam and Cambodia. The country has traditionally been divided into three topographical regions[49]. The lowland delta region is characterized by being relatively flat and suitable for the development of food crops and aquaculture. These are the most productive areas of Lao PDR. The second region is the midlands/plateau which is less suitable for paddy rice production, but is still suitable for industrial crops such as coffee and fruit trees and also to animal husbandry. The third and largest region is the uplands which is only suitable to shifting cultivation (under certain conditions) and forestry development with all its byproducts.

These three regions are not easily distinguishable, but another way of describing the topography, and the suitability for agricultural production, is to look at sloping levels. Land with a gradient of more than 16 percent[50] has been defined as fragile land, not suitable for intensive agricultural production[51]. Fifty-eight percent of the area of Lao PDR can be characterized as fragile land. This varies across the provinces. Champassak and Savannakhet have by far the least presence of fragile land in the country, with only 14 and 15 percent respectively. Saravane is also fairly flat, with only 28 percent fragile land. This is in marked contrast with provinces, mostly located in the northern part of the country, such as Huaphanh, Luangprabang, Phongsaly, Luangnamtha, Oudomxay and Xiengkhuang (between 75 and 85 percent fragile land). This topography seriously reduces the opportunities in these provinces for effective agricultural production.

In addition to the mountains, rivers are another geographical feature that characterizes Lao PDR. Eighty-seven percent of the land area is within the Mekong River Basin System[52] that comprises 28 big tributary rivers. In the northeast of the country there are also 4 other big rivers that drain through to Vietnam. All these rivers normally have water throughout the year, even in the dry season. These are therefore a potential irrigation source for intensive

[48] Department for International Development (DFID), 2006
[49] Government of Lao PDR, (2000)
[50] This means that for every 100 meter horizontal movement, the land has risen 16 meters. Land with steeper slopes than 16 percent is considered unsuitable for intensive agricultural production.
[51] The Mekong River Commission
[52] Government of Lao PDR, (2000)

agricultural production, something that is increasingly taking place in parts of the lowlands of the country. However, irrigated land make up less than one fifth of the agricultural land[53].

A third geographical feature characterizing Lao PDR is the large areas covered by forests[54]. Recent studies have shown that current forests which have more than 20% canopy density cover approximately 41.5 percent of the land area. In the mid-sixties this figure was estimated at 70 percent[55]. The Ministry of Agriculture and Forestry states that the accompanying decline and loss of wildlife, plant habitats and changes in species composition is as alarming as the loss of the forests themselves.

4.1.1.1. The impediments of UXOs

Lao PDR is the most heavily bombed country in the world per capita. During the Indochina war from 1964 to 1973, US bombing records indicate that 580,000 bombing missions were carried out over the country, dropping more than two million tones of bombs[56]. Severe UXO contamination still affect 15 of the provinces, with the most severely hit provinces being Savannakhet, Xiengkhuang, Saravane, Khammuane, Sekong, Champasack, Huaphan, Attapeu and Luangprabang[57]. The areas affected represent 50 percent of all agricultural land. To respond to this threat, the GoL launched the Lao National Unexploded Ordnance Program (UXO LAO) to clear land for development as well as for safety. Since 1999, this program has cleared land area in districts where about 40 percent of the rural population live, amounting to around 6 percent of the land area affected. It is estimated that it will take no less than 10 years to clear or mark all highly impacted land of UXO in Lao PDR[58] Nevertheless, the UXO presence still affects access to land, making it more difficult to plant crops, herd animals, and collect fuel, water and NTFPs.

Eighty-five percent of the surveyed households report that their land is not UXO contaminated. Eleven percent says that their land has not been cleared, whereas 4 percent have land that has been cleared. Further, only 3 percent of the households report owning agricultural land that is not in use due to UXO contamination. The figures from the CFSVA survey on UXO-related problems are probably too low. There may be many reasons why households do not report these problems, one of them being that land labeled as UXO contaminated will have to be cleared before being put into use and this may take years. Many households may prefer risking to farm in a non-cleared area rather than to wait for clearing. In any case, UXO contamination remains a constant threat or limiting factor in terms of agricultural production. This has to be kept in mind when analyzing the current and potential production of agricultural products.

4.1.2. Productive land

One of the main inputs to agricultural production is land. Without access to land, it is difficult to produce agricultural outputs. The households in the survey were asked to estimate how much paddy land[59] and upland[60] they were cultivating this season. On average households cultivated 1.2 hectares of paddy land and 0.7 hectares of upland.

The distribution between paddy land and upland is mostly determined by geography. In mountainous regions upland cultivation will dominate and for flat areas, such as the Mekong Plains, paddy cultivation will be the most important. Households in Champasack report the highest paddy cultivation with 2.8 hectares, followed by Savannakhet (2.2) and Attapeu (1.8).

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[53] FAO (2006).
[54] Ministry of Agriculture and Forestry (2005), Forestry Strategy to the year 2020 of the Lao PDR.
[55] Ibid.
[56] United Nations Common Country Assessment for Lao PDR, 2006.
[57] Government of Lao PDR: "National Growth and Poverty Eradication Strategy", 2004.
[58] Journal of Mine Action, (2006).
[59] Paddy land refers to flat land suitable for cultivation of wet rice.
[60] Upland refers to land on slopes, only suitable for dry rice (often based on shifting cultivation) and not wet rice

The lowest paddy cultivation is found in Phongsaly and Oudomxay with 0.4 hectares. The highest upland production is found in Xiengkhuang (1.6) and Phongsaly (1.4), two very mountainous provinces.

The difference between the ethnic groupings also gives a very distinct picture. The Lao Tai are mainly paddy producers (1.8 hectares on average) and are only minimally involved in upland production (0.4). At the opposite end are the Sino-Tibetan groups with only 0.4 hectares of paddy production, but 1.4 hectares of upland. The other groups have an equal amount of paddy (0.9) and upland (1.0). With the superior yields on paddy land as compared to upland areas, paddy rice fields reportedly produce at least double the yields of upland areas[61], the Sino-Tibetan groups are clearly disadvantaged when it comes to potential for agricultural production. There seems to also be a clear link between food consumption and access to paddy land. Households with acceptable food consumption cultivated on average 1.6 hectares of paddy land, whereas households with either borderline or poor food consumption only cultivated 0.6 hectares[62].

Land ownership or entitlement is also an important asset. When ownership of land is secure, households have a bigger incentive to invest in their land. The Government is currently undertaking a land titling project, and this has progressed at a very different pace in different parts of the country. Thus, ownership of land differs significantly across the country. In the provinces of Huaphan, Saravane and Phongsaly, less than 10 percent of the household report legal entitlement of the land they tilled. On the other hand, more than 80 percent of the households in Xayabury, Bolikhamsay and Attapeu report having such entitlements. It seems like the entitlements have progressed further in the lowlands compared to the highlands. Eighty percent of households in the Vientiane Plains and 56 and 57 percent in the Mekong Corridor and the Northern Lowlands respectively report land ownership. In the Central and Southern Highlands and the Northern Highlands the comparative figures are 39 and 34 percent, respectively. Following the geographical pattern, land ownership also seems to be unequally distributed among the ethnic groupings. Whereas 63 percent of the Lao-Tai groups report entitlement to their land, only 17 percent of the Sino-Tibetan groups report the same. The two other groupings fall in between with approximately 35 percent.

Households were also asked what tools they used for working their land. Households may not own a buffalo or a tractor, but they would still be able to increase their production if they have access to any of these either through borrowing or renting. Hand tractor is the most commonly used tool for tilling the land. This is most prevalent in Bolikhamsay (78 percent of households), Xayabhoury (69%) and Khammuane (53%). Hand tools, the least efficient way, is most commonly used in Luangprabang (77%) and Phongsaly (73%). In the South, there is a more even spread between different methods. In addition to having a substantial proportion of households reporting usage of hand tools and hand tractors, the provinces of Champasack (42%), Attapeu (40%) and Savannakhet (39%) also report substantial usage of animal draught. Access to motorized tools is very limited within the Sino-Tibetan groups with less than 10 percent of households. Also the Austro-Asiatic group is disadvantaged when it comes to access to motorized tools with less than 20 percent. In comparison, more than half of the Lao-Tai groups have access to such tools.

In terms of irrigation, canals/dams are the most commonly used system (13 percent of all households) followed by irrigation from rivers (8 percent). Irrigation is most commonly used in Huaphanh (67 %) and Luangnamtha (59%). More than 80 % of households in the provinces of Savannakhet, Saravane, Attapeu, Sekong and Luangprabang use rain water as main source.

4.1.3. The Cropping Seasons

The climate in Lao PDR is tropical with monsoon rains. The rainy season stretches approximately from May to October, with the dry season from November to April. Below is a

[61] Ministry of Agriculture and Forestry, 2000: "*Lao PDR Food Security Strategy in the Period of 2001-2010*". Vientiane, Lao PDR

[62] See Chapter 6.2 for an explanation of poor, borderline and acceptable food consumption.

cropping calendar that depicts the main weather seasons and the cycle for the main crops in Lao PDR; paddy rice and upland dry rice:

Table 6: Cropping Calendar - Lao PDR

	Dry season				Rainy season						Dry season	
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Upland rice, rainfed					Planting		Plant/ Grow	Grow	Grow/ Harvest	Harvest		
Low-land rice, rainfed						Planting		Plant/ Grow	Grow	Grow/ Harvest	Harvest	

Source: Ministry of Agriculture and Forestry, Department of Agriculture

4.1.4. Livestock Ownership

As others parts of this report will show, consumption of livestock is limited. Livestock seems to be treated by households more as a capital, either in the form of draught power or of liquidable assets, than for food consumption. This applies in particular to larger animals. Nine out of ten households report keeping livestock. On average a household in rural Laos has two cows/bullocks, one buffalo, one goat/sheep, fifteen chickens and one pig. Households in the Vientiane Plain keep the largest number of cows/bullocks (4.9), buffaloes (1.9) and chicken (21.7), whereas pigs seem to be most common in the Northern Lowlands (2.7) and the Northern Highlands (2.1). In terms of ethnicity, the Hmong-Mien groups report the highest involvement in livestock keeping, followed by the Lao Tai groups. Even though the Austro-Asiatic and Sino-Tibetan groups possess less livestock, the latter have the highest level of ownership of horses (0.9) and pigs (3.2).

4.2. Human capital

4.2.1. Demographics

A national Census was conducted in Lao PDR in March 2005, and data were released in 2006 enabling authors of the CFSVA to have a fairly recent overview of the population development and to make comparisons between the two studies. Average household size in the CFSVA was 6.1 persons whereas in the Census[63] it was 6.0 persons for rural areas. There are regional differences in the CFSVA data, with Xiengkhuang reporting the highest average household size at 7.1 persons and Khammuane the lowest at 4.8. In order to determine the effect on food security of household size, the composition will have to be taken into account. With more people, there are more mouths to feed, but with more able-bodied adults there are also more household members that can contribute labour to the household.

The simple dependency ratio from the CFSVA data (number of children and elderly by number of adults) for Lao PDR is not particularly high. On average every adult has to support 1.08 other person. This varies from 0.85 in Xayabury to 1.33 in Xiengkhuang. The difference between these provinces is illustrated by 1 additional dependent person for every two adults in a household in Xiengkhuang compared to Xayabury. This adds an additional burden on the households in Xiengkhuang and may make it more difficult for them to provide food security for their household members. Other provinces with a relatively high dependency ratio are Sekong (1.21) and Luangprabang (1.19).

Most households (93%) are male headed. With only 7 percent female headed households in the sample, it is hard to establish if female headed households are a particularly vulnerable group. On average, 7 percent of the households are headed by an elderly person (65 or

[63] National Statistics Center, (2006a)

above). This varies from 12 percent in Champasack to 2 percent in Xiengkhuang and Huaphanh.

Access to medical treatment is important in maintaining health and thus the ability to work. According to the Census, only 8 percent of all villages have a health center in their village. This lack of physical access to health centers is a serious problem in maintaining people's health status. However, the picture may not be as bleak as this. Several villages may be located within reasonable distance to a health center, although they may not be hosting one themselves. The CFSVA results show that a majority of the villages visited have a health volunteer and/or a medical kit at their disposal within the village.

On the other hand, these health volunteers have seldom received more than first aid training and will not be able to treat any serious illnesses. In addition, the lack of physical access in particular in villages with no road access, is very often compounded by a lack of financial access. A Livelihood assessment conducted by WFP revealed that cost for treatment and medicines was a serious impediment for many villagers in seeking medical assistance when needed[64].

4.2.2. Education levels

The level of education among the surveyed households is fairly low. Fifty-one percent of household heads have no or incomplete primary education. Only 21 percent have more than primary education. The situation is even worse for their spouses with respectively seventy-one percent and 9 percent. The situation is somewhat better in the Vientiane Plain and the Northern Lowlands. There seems to be a clear link between education levels and ethnicity, as the Lao Tai groups have received far more education than the other groups. Especially the women (spouses) in the other groups lag far behind. This may be linked to the challenges faced by the Government in delivering education to ethnic groups with more than 200 different mother tongues. The Sino-Tibetan groups seem to be particularly vulnerable when it comes to education. Sixty-six percent of the head of households and 89 percent of their spouses among theses groups have no schooling.

4.2.3. Literacy levels

Laos still faces a problem with low literacy rates. Literacy can be an important asset for poor people in utilizing their other assets efficiently and can mean the difference between food security and insecurity.

The CFSVA found that 75 percent of heads of households can read and write a simple message. For spouses the proportion was 53 percent. As most household heads are men, this clearly shows that women are lagging behind men in education, especially women (or spouses) in Phongsaly (20%), Bokeo (28%) and Luangnamtha (35%) are lagging behind when it comes to literacy. This is also confirmed in the Census data. The literacy rate for men over 15 years of age in the Census was 82.5, whereas the corresponding figure for women was 63.2.

There are also huge differences between regions and ethnic groups when it comes to literacy. It is mostly the northern provinces of Phongsaly, Luangnamtha and Oudomxay that have the lowest rates. While, in terms of ethnic groups, 81 percent of the Lao Tai household heads report to be able to read and write a simple message in any language, this is true for only 33 percent of the Sino-Tibetan, 71 percent for the Austro-Asiatic and 60 percent for the Hmong-Mien groups. For spouses the situation is even starker. While 67 percent of Lao Tai spouses are literate, only 5 percent of Sino-Tibetan spouses report the same. This clearly shows the limited human capital that the minority groups have at their disposal. The lack of formal education and the ability to acquire and communicate information through reading and writing hinder them in participating in the wider society.

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[64] WFP Lao PDR, (2006)

The Census[65] shows that 80 percent of all villages had a primary school in their village. However, only 36 percent had a complete primary school[66]. Not all villages need to have a school within their premises. Several villages located in proximity to each other can share one school without affecting the children's educational potential. But the proportion of the villages with a school is still an indicator of the potential for addressing educational gaps. The situation is worst in Phongsaly, Saravane, Luangnamtha and Oudomxay, with respectively 15, 18, 23 and 23 percent of villages with a complete primary school. The issue of quality education is beyond the scope of the CFSVA.

4.3. Physical assets

4.3.1. Productive assets

Households were asked if they own a number of productive assets, mainly assets used for agricultural production and rice processing, and for a few transportation assets. Ownership of productive assets enhances agricultural production and processing, and the ability to successfully engage in agricultural or fish-based livelihood activities. Ninety-three percent of all households own a shovel or a spade and 89 percent a sickle. A plough, on the other hand, is only owned by 29 percent of all households, ranging from 54 percent in Champasack to 5 percent in Xayabury. At the other end of the rice production cycle is the milling. About one in four households owns a pounding mill, but the level of ownership is highest in the Northern provinces. The same applies to fuel-powered rice mills. Champasack, Khammuane and Vientiane provinces report a remarkably low ownership of any type of rice mill. This could be due to the fact that other milling arrangements are in place, but the survey data does not yield such information.

Owning fish nets can be one indicator for the ability to engage in fishing. On average, 58 percent of the rural households own fishing nets. The level of ownership of fishing nets is lowest in Luangprabang and Sekong with 39 percent of households and highest in Borikhamxay and Vientiane with 83 and 76 percent respectively.

4.3.2. Non-Productive Assets

The housing conditions of the Lao people have been extensively described in the recent Census. This report outlines the condition of the housing structures (floor, wall, roof, size), in addition to information on toilet facilities, electricity, and drinking water. The CFSVA also cover some of these issues with identical questions to the Census. The Census clearly shows a huge difference in housing structures between rural and urban areas, with urban areas relying more on cement/bricks/tiles/zinc as construction material, whereas the rural villages rely heavily on wood and bamboo. A roof made of tile/sipax or zinc will provide better protection during the rainy season, and is thus the preferred choice of roofing. On the other hand, grass will provide less protection and may threaten the safety of food stocks. Forty-three percent of households in Xiengkhuang and 41 percent of households in Huaphanh report using grass as roofing material. This contrasts with Champasack, Vientiane and Borikhamxay provinces (9, 14 and 15% respectively).

Close to all households report owning their house. The average number of rooms per house is 2.4. This varies from 1.5 in Phongsaly to 3.0 in Huaphanh. Overall, the CFSVA and the Census does not differ much when it comes to housing conditions.

The CFSVA differs somewhat from the Census in the approach of describing toilet facilities. Whereas 47 percent report having no access to toilet facilities according to the CFSVA, 62 percent of rural households report the same in the Census. The CFSVA data show a large discrepancy between provinces in terms of improved sanitation facilities. Only ten and eleven

[65] National Statistics Center, (2006b)
[66] A complete primary school is a school that provides teaching in all 5 primary-level grades.

percent report having such facilities in Savannakhet and Phongsaly provinces respectively and as many as 85 and 80 percent in Xayabury and Borikhamxay. Having access to improved sanitation facilities can be very important for containing certain diseases like diarrhea, which in turn may negatively affect people's nutritional status.

Wood is by far the most commonly used source of energy for cooking in all provinces. The CFSVA data show that 92 percent of all rural households use wood as their main source of energy for cooking, compared to 86 percent in the 2005 Census. The CFSVA data show that only in Champasack (43%), Saravane (17%) and Xayabury (17%) is charcoal also a significant contributor to energy for cooking.

Lao PDR has an abundance of rivers and streams, but many villages still lack access to safe drinking water. The most important source of drinking water (thirty-six percent of households) is mountain sources. This is often called a gravity feeder system and normally involves pipes leading water from a source in the mountains down to the village. Normally the villagers will share such a source. The safety of the water coming from the system depends on where the water is sourced from, and this may differ. The Census does not consider this type of water as safe. In any case, such a system does provide cleaner water than what would alternatively be available close to the village, such as a river.

If we consider piped water and protected well or borehole as safe water sources, then 31 percent of households have access to safe water. The Census report 35 percent, but this includes urban households. According to the CFSVA data, there are large differences between provinces, agro-ecological zones and ethnic groups. Whereas more than 60 percent of households in the three provinces of Savannakhet, Saravane and Champasack report access to safe water, less than 10 percent do in the provinces of Phongsaly, Oudomxay, Bokeo, Luangprabang and Huaphan. Similarly, for the agro-ecological zones, 72 percent of the households in the Vientiane Plains have access to safe water, compared to only 7 percent of households in the Northern Highlands. The Sino-Tibetan groups are also worse off, with only 10 percent, compared to 51 percent for the Lao-Tai groups.

Distance to water does not seem to be a major problem in Lao PDR. Less than 1 percent of households have to walk more than 30 minutes to fetch water. Approximately 9 out of 10 households have 10 minutes or less to walk to the main water source, indicating that the water source is within the village. These findings are in line with the Census.

In terms of availability of main water source, the end of the dry season, from March to June seems to hold some problems, although for most provinces this is not a major issue. Overall, 7 percent of households report unavailability of main water source in April and 6 percent in May. The problem seems to be greatest in the north. For the month of April, approximately 1 out of 5 households in Phongsaly, Bokeo, Huaphanh report unavailability of main water source. These provinces report the highest problems in May as well. About half of the households reporting unavailability of main water source in April or May have mountain source as main source, whereas 20 percent have protected well/borehole and 19 percent have unprotected well/borehole. Although the main problem with accessing water does not appear to be drying up of sources, nor distance to the water source itself, this underlines the need for providing safe drinking water to the rural population of Lao PDR. Only in small pockets does physical access to water appear to be a problem. The main problem is the quality of the water source. With water-borne diseases being quite common in Lao PDR, this is a serious impediment to any nutrition-related intervention.

4.3.3. Household Wealth Index

As mentioned before, it is difficult to estimate the total value of a household's assets, especially since some assets are tangible (physical, natural and financial) and some are intangible (human and social). The tangible assets, however, are more easily captured and can be combined as an expression of wealth. Wealth is thus the value of all natural, physical and financial assets owned by a household, reduced by the liabilities against them. Measuring wealth is potentially possible, but would be very tedious and would require accounting skills amongst the enumerators and lots of assumptions about the valuation of assets. Therefore, an

easily obtainable wealth index, which can be used in ranking and categorizing households, has been constructed.

Firstly, a principal component analysis of wealth (or poverty) related indicators were conducted. These economic status indicators include roofing material, the number of rooms, type of toilet facilities, main source of energy for cooking, source of drinking water, the possession of a variety of (productive and non-productive) assets in the household and the ownership of various types of livestock. Since ownership of a wooden pounding mill, which is associated with a poor rural lifestyle, is correlated with a lower wealth status, it was removed from the analysis[67].

Wealth is considered an underlying variable, which cannot be directly observed, but which is associated with the above-mentioned indicators. Factor analysis is the statistical procedure best suited to uncover such an underlying variable.

The first principal component of the factor analysis was then used to construct an index, which assigns a weight to all the indicators included in the analysis. This factor reflects the wealth status of the households.

To simplify and to allow easy replication of the score by other surveys, the factor-scores were rounded and indicators with very small scores were removed. The score is so modified that the theoretical minimum is 0 and the maximum is 100. This slightly simplified wealth index has a correlation of 0.994 with the original factor and can hence be used with hardly any loss of information.

Figure 13: Evolution of selected indicators with household wealth

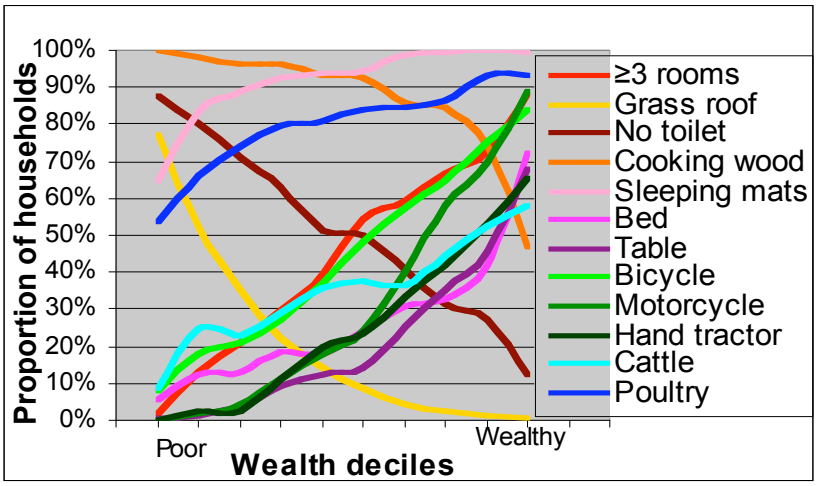


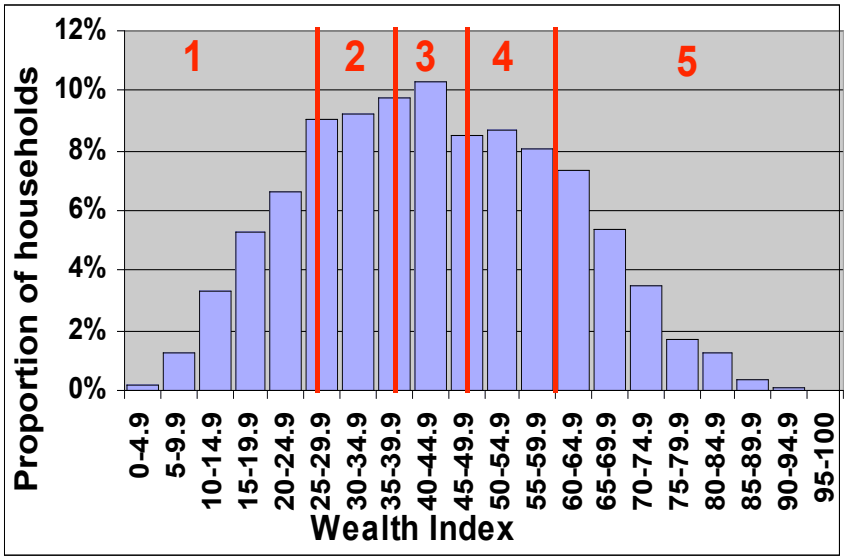
Figure 13 clearly shows the association of the various indicators with the underlying wealth status of households.

As will be further explored in the report, the wealth index is strongly associated with food security.

[67] If we were to compare two similar rural households, one possessing a pounding mill and the other not, we would have wanted to attribute a higher wealth status to the household with the pounding mill. However, the original PCA gave a negative score to ownership of such a mill.

4.3.4. Distribution of wealth

Figure 14: Distribution of the wealth index



Households in the sample had a score between 2 and 93 (see Figure 14). The distribution of the score is lightly skewed compared to the normal distribution. Most households are situated between 20 and 65. The same wealth index is used to create wealth deciles, wealth quintiles, wealth terciles, etc.

Wealth is unequally distributed across the country. Looking at the distribution of the poorest quintile (poorest 20 % of the sample), there is a clear overrepresentation of poor households in Phongsaly, Sekong and Luangprabang. The pattern across the agro-ecological zones is similar to what we find for other indicators. There is a clear overrepresentation in the Northern Highlands and to some extent in the Central and Southern Highlands, whereas hardly any of the households in the Vientiane Plains can be characterized as asset poor.

The pattern across ethnic groups also shows a familiar pattern. More than half of the Sino-Tibetan households fall among the poorest 20 percent for the whole sample. The Austro-Asiatic is also clearly overrepresented among the poorest households. There is a small overrepresentation among the Hmong-Mien households, whereas the Lao-Tai is the only group where the representation among the poorest households is proportionally smaller.

4.4. Financial and social capital

4.4.1. Access to credit

Access to credit or a place to borrow money is used here as a measurement for financial assets in the livelihoods framework. If you are able to access credit, you can more easily undertake necessary investments into your livelihood activities, and these investments may help you increase the outputs from your activities in the future. All households in the survey report access to credit, but it is limited to two sources; the village head and middle men[68]. Eighty-five percent say they have access to credit from their village head, whereas 16 percent report access to credit from middle men. The access to credit from middle men seems to be most common in Phongsaly, with 36 percent of households. Interestingly, only 60 percent of households from the Sino-Tibetan groups report access to credit from their village head, but 40 percent of the same households report access to credit from middle men. As middle men

[68] The term "middle men" refers to traders or merchants who come to the village to buy the villagers produce (mostly rice, other agricultural products and NTFPs) and also to sell goods that the villagers require. They are mostly external to the community.

are less likely to be a secure and favorable source of credit, these groups may be in a weaker position when it comes to access to financial resources.

Households were also asked how often they had used credit or borrowed money to buy food in the last 3 months. Seventy-nine percent of households report never to use such services for buying food. Ten percent report having used such services once in the last 3 months, and eight percent report using it twice or more in the same period. There are no large differences between provinces, but Savannakhet and Sekong are reporting the highest incidence of borrowing money to buy food.

4.4.2. Access to remittances

Capturing social assets in surveys are difficult, but one indication of social links that households can draw upon for building their livelihoods are remittances. Households were asked if they had received any support in the form of cash or kind over the last 12 months from friends or relatives living outside the household. Only 8 percent of the households reported receiving such support. Very few receive support regularly, and the majority of those receiving support only get it occasionally. Households in Saravane reported the highest incidence of support (20 percent of households), followed by Vientiane (18%), Champasack (17%) and Savannakhet (15%). Five provinces reported less than 5 percent of households with remittances last year: Phonggsaly, Oudomxay, Khammuane, Sekong and Attapeu. The pattern is similar when asked about expectation of remittances the coming year. In terms of ethnic groups, the Hmong-Mien (15%) and Lao-Tai (14%) seems to have tighter links and more support from outside than the Austro-Asiatic (3%) and the Sino-Tibetan (6%) groups.

Summary: Chapter 4

Livelihoods analysis usually distinguishes between natural, human, physical, financial and social assets. Although one cannot ascertain the livelihoods outcome (e.g. food security level) from the combination of assets a household possesses, it gives an indication as to the level and types of assets different groups can access, and which areas where intervention may be helpful.

It is clear that in terms of potential for agricultural production, farmers in the upland areas, Northern Highlands and Central and Southern Highlands, have less and more insecure natural assets at their disposal compared to farmers in the lowlands. The difference between the ethnic groups also affects this picture. The Lao Tai are mainly paddy producers (1.8 hectares on average) and only minimally involved in upland production (0.4 hectares). At the opposite end are the Sino-Tibetan groups with only 0.4 hectares of paddy production, and 1.4 hectares of upland production. The other groups have an equal amount of paddy production (0.9 hectares) and upland production (1.0 hectare). Similar patterns also apply when looking at entitlements to land. Whereas 63 percent of the Lao-Tai groups report ownership of their land, only 17 percent of the Sino-Tibetan groups report the same. The two other groups fall in between with approximately 35 percent. It is thus clear that the Sino-Tibetan ethnic groups are disadvantaged when it comes to access to natural capital. To some extent, this also applies to the Austro-Asiatic and the Hmong Mien groups.

Less than one in ten villages has a health centre, although many have a health volunteer and/or medical kit. The level of education is fairly low, especially for women. Seventy-one percent of spouses of household heads have no or incomplete primary education. The education levels are particularly low among the Sino-Tibetan groups. This disadvantage among women in general and people from the Sino-Tibetan groups is also reflected in their low literacy levels. Their lack of formal education and the ability to acquire and communicate information through reading and writing hinder them in participating in the wider society and in being able to take full advantage of new opportunities.

Access to proper toilet facilities and safe water sources appear to be a serious problem throughout the country. Physical access to water is less of a problem than the quality of the water source itself.

Ownership of productive and non-productive assets varies widely across the country. A wealth index was therefore constructed to capture this variation and separate those households who own a wide variety of assets from those who only own a few. Looking at the distribution of the poorest quintile (poorest 20 % of the sample), there is a clear overrepresentation of poor households in Phongsaly, Sekong and Luangprabang. Further, more than half of the Sino-Tibetan households fall among the poorest quintile. The Austro-Asiatic is also clearly overrepresented among the poorest households. There is a small overrepresentation among the Hmong-Mien households, whereas the Lao-Tai is the only group where the representation among the poorest households is proportionally smaller.

All households in the survey report access to credit, but it is limited to two sources; the village head and middle men. Eighty-five percent say they have access to credit from their village head, whereas 16 percent report access to credit from middle men. Only 8 percent of the households reported receiving remittances. In terms of ethnic groups, the Hmong-Mien (15%) and Lao-Tai (14%) seem to have tighter links and more support from outside than the Austro-Asiatic (3%) and the Sino-Tibetan (6%) groups.

Chapter 5. Livelihood Strategies of Households

5.1. Main livelihood Activities and Income Sources

Previous chapters have looked at the asset base of Lao households. This chapter looks at how households are using these assets in their livelihood strategies. A household's livelihood strategy is best captured through the combination of livelihood activities that they engage in. In an attempt to capture these combinations of activities, households sampled in the CFSVA were asked to name their top four livelihood activities. Even if they were able to list up to four options, very few households actually reported to earn their living from many activities. Less than 3 percent reported four activities, 17 percent reported three, 47 percent declared to live on two, and 32 percent stated their household was engaged in one activity only.

The list of possible livelihood activities was reasonably comprehensive and included 17 different activities. It is commonly assumed that rural households make their living out of a combination of farming and non-farming activities, including hunting and gathering of Non-Timber Forest Products (NTFPs). It is therefore interesting to note that the majority of households reported only one or two activities. Further, some specific activities, those related to exploitation of natural resources, appear to have been underreported. This may be linked to the ban imposed by the Lao Government on hunting of certain animal species and restrictions on use of forest resources. In addition, a recent WFP rapid qualitative livelihoods assessment noted that *[…] collection of NTFPs […] has been made more difficult for villages that have been relocated the farthest. […] Most of the resettled villages have reduced their collection of NTFPs due to the increased distance to the forest and/or the increasing population relying on the same resources*[69].

It may therefore be that engagement in such activities has been reduced in the last years, as forest resources have become more limited.

Findings in this section have therefore to be read keeping this double warning in mind: firstly, *undertaking* certain activities might have decreased because of Government restrictions and reduced access to forest resources; secondly, *reporting* the same activities might have been reduced due to the sensitive nature of the question.

Almost 95% of the households reported to be engaged in agriculture, regardless of its relative importance to the household's overall livelihood, while 29% was involved in livestock rearing/selling. Fishing/hunting was reported by slightly less than 8% of households. This is clearly underreported. As mentioned above there may be several reasons for this. This low level of engagement in fishing/hunting was also not confirmed by analysis of the sources of consumed food. This shows that a much larger proportion of the households were consuming products stemming from fishing and hunting. One possible explanation for the low reporting of fishing might be that some households catch fish and other aquatic animals from rice fields while tending these. It may be that they only reported the main activity, rice production, while excluding the secondary activity, fishing. Collection of NTFPs appears to have gone through a similar under-reporting: only 15% of households listed NTFP collection among their livelihood activities.

A small number of households were to some extent involved in other activities. On average, about 1% of the households were engaged in brewing (laolao), collection of aquatic animals, hunting, commercial activities, remittances, collecting scrap metal/explosive powder, and receiving government allowances. Similarly, about 3% declared to undertake salaried work and skilled labour, 5% declared to do artisan handicraft, 6% to do petty trading, 7% agriculture and non-agriculture unskilled labour, and 8% in other non specified activities. This

[69] WFP Lao PDR, (2006)

piece of information will be analyzed in more depth in the livelihood groups section of the report.

A multiple response analysis was applied to assess the four main livelihood sources. The table below presents some differences in term of engagement of households in the different activities by provinces. As expected, almost all households are engaged in some sort of agriculture activities, regardless of its relative ranking for the household. Households in Phongsaly, Attapeu and Khammuane scored the lowest percentage of households reporting farming activities (76%, 77% and 78% of their households respectively) as the most important activity.

Table 7: Percent of households engaged in the 4 main activities (regardless of importance)

Province	Most reported activity	2nd most reported activity	3rd most reported activity	4th most reported activity
Phongsaly	Agriculture (76%)	Other (26%)	Livestock (22%)	Fishing (9%)
Luangnamtha	Agriculture (100%)	Livestock (20%)	NTFPs (18%)	Petty trade (5%)
Oudomxay	Agriculture (97%)	Livestock (61%)	NTFPs (29%)	Agri unskilled lab. (9%)
Bokeo	Agriculture (100%)	NTFPs (47%)	Livestock (17%)	Fishing (5%)
Luangprabang	Agriculture (96%)	NTFPs (46%)	Livestock (32%)	Handicraft (10%)
Huaphanh	Agriculture (98%)	Livestock (43%)	NTFPs (31%)	Fishing (13%)
Xayabury	Agriculture (97%)	Livestock (6%)	NTFPs (3%)	Agri unskilled lab. (3%)
Xiengkhuang	Agriculture (82%)	Other (25%)	Livestock (18%)	NTFPs (7%)
Vientiane	Agriculture (97%)	Livestock (40%)	Handicraft (13%)	Non-agri unskilled lab. (6%)
Borikhamxay	Agriculture (91%)	Livestock (66%)	Fishing (22%)	NTFPs (14%)
Khammuane	Agriculture (78%)	Fishing (20%)	Non-agri unskilled lab. (18%)	Agri unskilled lab. (18%)
Savannakhet	Agriculture (97%)	Livestock (21%)	NTFPs (14%)	Agri unskilled lab. (10%)
Saravane	Agriculture (100%)	Livestock (31%)	Petty trade (6%)	NTFPs (5%)
Sekong	Agriculture (87%)	Livestock (19%)	Agri unskilled lab. (15%)	Salaries (13%)
Champassak	Agriculture (90%)	Livestock (31%)	Fishing (20%)	Other (15%)
Attapeu	Agriculture (77%)	Livestock (31%)	Non-agri unskilled lab. (17%)	Petty trade (12%)

As noted in section 4.1.4, nine out of ten households reported keeping livestock. In most of the provinces, livestock rearing and selling was the second most common activity. However, while 66% of the households living in Borikhamxay and 61% of those in Oudomxay were engaged in this activity, only 6% reported the same in Xayabury. The households in Xayabury still ranked livestock rearing and selling as the 2nd most important activity in terms of household involvement. This reflects the fact that most of the households in Xayabury reported to live on one activity only (about 80%), while the rest were found undertaking a second activity only. Livestock rearing and selling was frequently reported also in Huaphanh (43%), Vientiane (40%), Saravane, Champassak and Attapeu (31%).

Collection of NTFPs was reported by a significant percentage of households in Bokeo (declared by 47% of households), Luangprabang (46%), Huaphanh (31%) and Oudomxay (29%). Fishing was reported the most in Borikhamxay (22%), Khammuane (20%), Champassak (20%) and Huaphanh (13%).

It is often noted in livelihoods literature that households that are doing better off are less engaged in agricultural activities and have some additional income from non-farm activities. In rural areas, a possible first step into a more market-based livelihood portfolio goes through unskilled labour. Engagement in such activities can sometimes be difficult to interpret, as it may be voluntary and beneficial or it may be involuntary and unstable. While agricultural-based activities remain by far the most important, there is some involvement in unskilled agricultural and non-agricultural labour. Agricultural unskilled labour was frequently reported in Khammuane (18%), Sekong (15%), Savannakhet (10%), and Oudomxay (9%) while non-

agricultural unskilled labour was reported in Khammuane (18%), Attapeu (17%) and Vientiane (6%). Interestingly, handicraft was reported in Vientiane (13%) and Luangprabang (10%). These two provinces are close to two main tourist destinations were markets for handicrafts are larger. This may provide a healthy source of non-agricultural-based income source for an increasing number of households, in particular in these areas. Other areas may also provide such income-generating opportunities should the stream of tourists to the country continue to increase.

5.2. Agricultural Production

5.2.1. Main crops

Agricultural production is clearly the most important livelihood activity undertaken by Lao rural households. Unsurprisingly, rice is the dominant crop in this activity. Seventy-one percent report glutinous rice as their main crop, and an addition 14 percent report non-glutinous rice as their main crop. Maize is only considered as main crop for 2 percent of the sample.

In no province is non-glutinous rice more important as a main crop than glutinous rice, but substantial involvement in non-glutinous rice production is reported in Phongsaly (38% report as main crop), Luangnamtha (34%) and Attapeu (38%). However, we see a much clearer pattern when looking at ethnic groups. The Lao-Tai and Austro-Asiatic groups are hardly involved in non-glutinous rice production (less then 10 percent both as main and secondary crop). On the other hand, non-glutinous rice is more important than glutinous rice among the Sino-Tibetan and the Hmong-Mien groups. Sixty-seven percent of the Sino-Tibetan groups report non-glutinous rice as main crop compared to 29 percent for glutinous rice. Among the Hmong-Mien groups it is more even, with 48 percent reporting non-glutinous rice as main crop compared to 37 percent reporting glutinous rice.

Rice is clearly, either glutinous or non-glutinous, the main staple of Lao PDR and the preferred crop to grow. However, looking at secondary crops, it seems that some cash crops are also of importance to many households. Although as much as 34 percent of the entire sample report not planting a second crop, 15 percent planted maize and 6 percent planted cassava as their second crop. It seems like the Sino-Tibetan (39% as secondary crop) and the Hmong-Mien (25 %) groups are more engaged in the maize production than the other groups, and the bulk of the production is taking place in the Northern Highlands and Lowlands. It is likely that this production is taking advantage of the market demand for maize in nearby China.

The average expected number of months that the current rice harvest would last is eight and a half. This average hides a range from 5.2 months in Khammuane province to 11.2 months in Xayabouri. Sixty-eight percent of households in Khammuane reports that their rice production will last less than 8 months, leaving them with a significant gap that has to be covered through purchases.

Similarly, 64 percent in Sekong and 54 percent in Attapeu report the same. The prospects for this particular season look better in Luangnamtha, Xayabouri and Huaphanh, where 16, 20 and 20 percent respectively report such a rice gap.

5.2.2. Agricultural Inputs

Nine out of ten farming households report using their own stock for seeds. This is uniform across the country. The remaining households rely on a combination of purchases, borrowing or receiving seeds from different sources such as the Government or neighbors. Only in the three provinces of Luangnamtha, Oudomxai and Xayabouri do approximately 10 percent of the households report purchasing their seeds. There seems to be very little seed support for the usual farmer in Lao PDR.

On average, 43 percent of the households report using some form of fertilizer but the use of fertilizer varies widely across the country. Ninety-nine percent of households in Phongsaly do not use any fertilizer on their agricultural fields. Similarly, more than 90 percent of households

in the northern provinces of Oudomxay, Bokeo and Luangprabang report the same. The southern part of the country shows a more intensive use of fertilizer. Only 9 percent of the households in Champassak are not using fertilizer. Farmers in Khammuane and Savannakhet are also reporting a high usage of fertilizer. The same pattern can be seen when looking at agro-ecological zones. Ninety-four percent of the farmers in the Nortern Highlands and 78 percent of farmers in the Northern Lowlands report no use of fertilizers, whereas 84 percent of farmers in the Mekong Corridor are using some form of fertilizer. The most commonly used fertilizer, used by 20 percent of the households, is natural fertilizer, such as animal dung. Nine percent report using chemical fertilizer and 13 percent report using a combination of chemical and natural fertilizer.

Only 5 percent of households engaging in agricultural production are using pesticides/herbicides. The usage is highest in the Vientiane Plains (14 percent) and the Northern Lowlands (7 percent). Interestingly, the Sino-Tibetan ethnic groups report the highest use of pesticides/herbicides (16 percent) among the different ethnic groups, whereas they also report the lowest (almost none) use of fertilizer.

The most common way to store rice is to have a separate storage hut for the rice. Eighty-two percent of households report using this storage facility. Fifteen percent store their rice in bags inside their house. Hardly anyone store their rice in rice banks. There is little difference across the country in ways of storing rice.

5.2.3. Kitchen Gardens

Kitchen gardens are a source of vegetables and other produce throughout the year, and can be a very important source of micronutrients for all household members. Eighty-eight percent of households with a kitchen garden have vegetables as their main produce from this type of garden. A few households are also focusing on fruits, maize, beans and cassava. However, only just over half of all households keep a kitchen garden. This varies across the provinces. Whereas 86 and 71 percent of households in Borikhamxay and Huaphanh respectively keep a kitchen garden, only 25 percent of households in Phongsaly currently benefit from the produce of a kitchen garden. Only 35 percent (the lowest of all groups) of the Sino-Tibetan households keeps a kitchen garden.

5.3. Livelihood Groups

One of the objectives of the CFSVA is to describe household food insecurity and vulnerability on the basis of household characteristics. Household livelihood strategies have a direct impact on food access and food security. The goal of livelihood profiling is to group households that are engaged in the same activities or combination of activities. Cluster analysis is used to create these groups.

Households were asked what activities they conducted throughout the year to sustain their livelihoods. They were also asked to estimate the value of each activity both as cash income and as direct consumption (in-kind). Two issues regarding data quality resulted from this analysis.

A first point concerns the reliability of "cash & in-kind" estimation. A comparison of reported expenditure and estimate cash & in-kind value revealed that households systematically underestimate the total value of their activities. Therefore, absolute cash values from each activity were transformed into proportions or contributions of each activity to the household livelihood as a way of providing relative comparison between what households reported to be engaged in.

Secondly, it was found that only a few households reported exploitation of natural resources[70] as one of their livelihood activities. This is quite surprising, especially when consulting

[70] Activities considered as exploitation of natural resources were: hunting, fishing, collection of aquatic animals other than fish, collection and/or sale of forest products (NTFPs)

secondary literature on the subject. The Ministry of Agriculture and Forestry estimates that as much as one third of rural villagers' income stems from sale of NTFPs[71]. Moreover, analysis of the sources of consumed food, explored later in the document, showed a considerable share of food coming from fishing/hunting and gathering. In order to capture this piece of information, variables reporting percentage of consumed food from hunting/fishing and from gathering were analyzed together with the activities. Finally, a variable reporting percentage of consumed food from own production was added to the set of variables under analysis in order to differentiate among households that mainly produced and households that mainly purchased their own food.

The above information was used in the cluster analysis (preceded by Principal Component Analysis) and resulted in the profiles described below[72]. Fifteen livelihood profiles were detected based on the CFSVA data. The table below provides a description of each profile.

Table 8: Livelihood groups

Livelihood main activity profile		N. sample (3805)	% in the population weighted	Short description
Farmers		1443	36%	This group of households reported to rely almost entirely on agriculture for their livelihood (92%) with little livestock (4%). About half of the food they consumed (48%) come from own production, whereas purchasing contributed 38% and gathering 10%.
Farmers /gatherers		658	21%	These households are mainly engaged in agriculture (95%) with little livestock (3%). However, households in this group differentiate from other farmers as 38 percent of their consumed food comes from gathering. Another 38% was purchased and just 19% comes from household's own production.
Farmer /fish-hunters		521	14%	Depend nearly exclusively on agriculture. The share of consumed food coming from natural resources (hunt/fish/gather) is significant but different from the previous group. Seventeen percent of the food consumed comes from fishing/ hunting and 12% from gathering. Own production is about 31%.
Agro-pastoralists		428	10%	Livestock is still the main activity (60%), but a considerable share of their livelihood comes from agriculture (36% of the total). This group has the 2nd highest share of consumed food from own production (about 39%), even if the majority of the food is purchased (42%). Fifteen percent of the food comes from gathering.
Unskilled labourers	Agric labourers	100	3%	This sub-group of households are unskilled labourer engaged in agriculture work. Unskilled labour provides most of their living (on average, 85%), complemented by some agriculture (8%). On average, one fourth of the food consumed is own produced, about one fifth is gathered and almost half is purchased.
	Non-agric labourers	125	3%	Non-agriculture labour accounts for 70%. An average of 24% is coming from production and sale of agricultural crops. Similar proportions as agriculture labourers, without any statistical significant difference.
Skilled labourers & salaried	Skilled labourers	59	2%	Skilled labour makes on average 68% of these households' livelihoods. Agriculture accounts for about 25% and petty trade for 3%. Purchasing is the main food source (57%); own production followed with 26%. Gathering contributes for 11% on average.
	Salaried	123	2%	Seventy percent of their livelihood comes from salaries. Agriculture contributes about 20 percent. The proportion of food sources was similar to the skilled labourers' one.
Artisans with Agriculture	Handicrafts	52	2%	Households derived 60% of their livelihood from handicraft and 32% from agriculture. About 50% of the consumed food is purchased, over 33% own produced and over 10% gathered.
	Brewers	20	<1%	Brewing is providing almost half of the livelihood. Agriculture contributes for 32%, livestock 7%. Food sources similar to the other artisan household group.
Petty traders		85	3%	Depend on petty trade activity (67%), agriculture (25%) and livestock (5%). Food comes from purchase (58%), own production (26%) and gathering (12%).
Other activities	Remittances	29	<1%	Households relied on remittances (53%), agriculture (34%) and livestock (5%). Almost half of food is purchased, 33% own produced and about 15% gathered.

[71] Ministry of Agriculture and Forestry, (2005)
[72] See annex 4, Technical methodology for Livelihood grouping.

	Gov. allowance	9	<1%	Government allowances are main average contribution (70%). Agriculture is secondary (34%), livestock third (5%). Over half of the food is purchased, 20% own produced and 15% gathered.
	Big traders	32	<1%	Households earn a living from large scale trading (89%) and little production or sale of agriculture products. 77% of food is purchased, and very little comes from own production and gathering.
	Other	121	3%	A mix of remittances, unskilled and skilled non-agricultural labour (86%) & agriculture (7%). Food sources similar to above.

Figure 15 and Figure 16 below illustrate the main sets of parameters for each livelihood profile: estimated contribution from different activities conducted by households and shares of consumed food from different sources.

Figure 15: Estimated contribution from different activities conducted by households

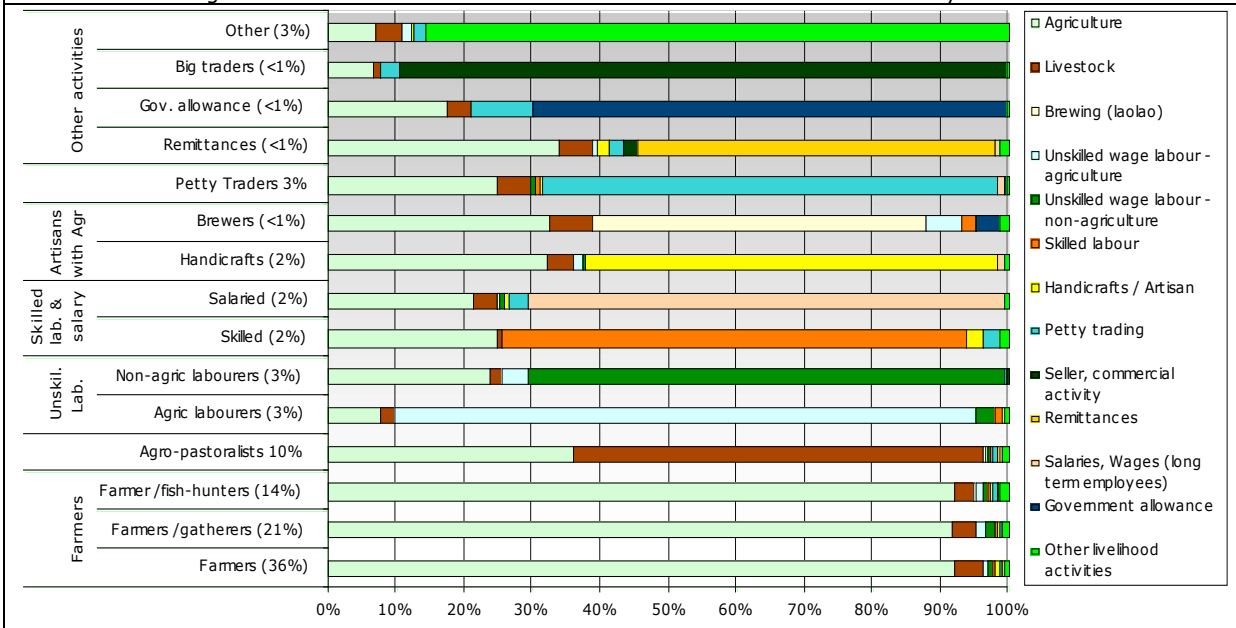
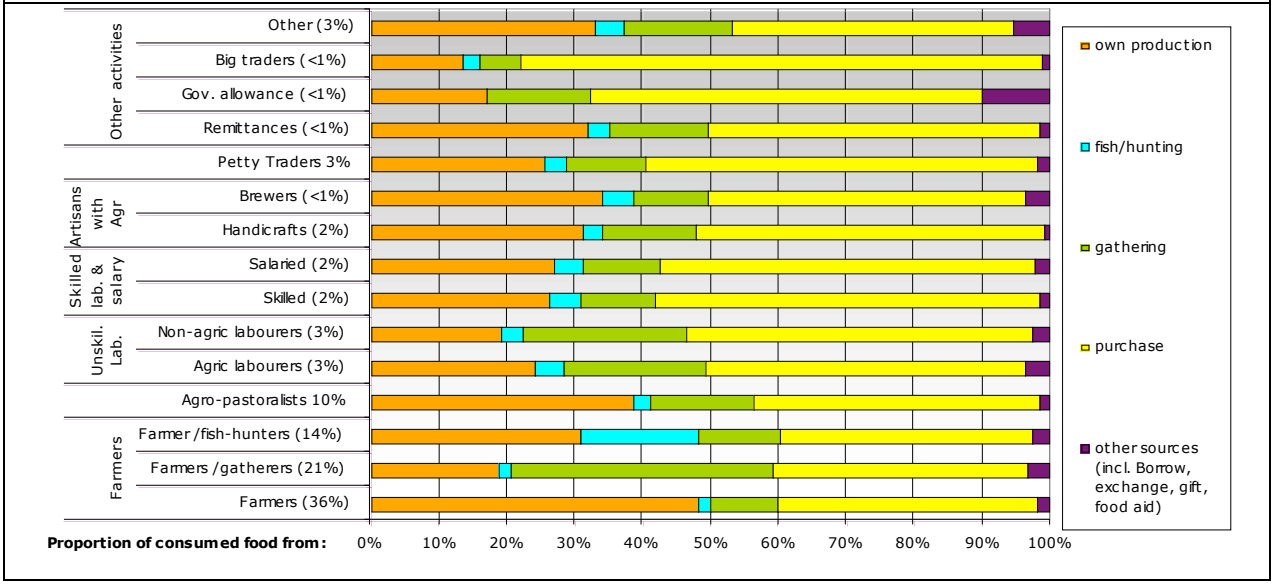


Figure 16: shares of consumed food from different sources



The analysis displaying 15 livelihood groups, although being very precise and homogenous, yielded few very small groups or groups of households engaged in activities that could be considered similar in term of social status or possible wealth outcome. Therefore, according to

interpretation of specific groups' activities, it was decided to re-group some of them in order to obtain meaningful groups also characterized by a statistical significant number of households. Nine main livelihood groups were therefore identified: farmers (36% of households in the sample), farmer/gatherers (21%), farmer/fish-hunters (14%), agro-pastoralists (10%), unskilled labourers (6%), skilled labourers and salaried workers (4%), artisans with agriculture (2%), petty traders (3%), and households engaged in other activities (5%). This classification will be used in the following sections of the report.

5.4. Household expenditures

The CFSVA collected information on household expenditures (both cash and credit) over the last 30 days prior to the survey. In addition, for some items for which expenditures are more infrequent (school fees, farming equipments), but nonetheless important, expenditures were recorded for a 6-month recall period. The main purpose of collecting this information was to assess the overall expenditure levels and patterns, especially between food and non-food expenditures. Although a very detailed list of items was beyond the scope of the CFSVA, the figures give a reasonable overview of the expenditure patterns in rural Lao PDR. However, for more detailed and accurate estimates, the Lao Expenditure and Consumption Survey is a more appropriate source.

The rural Lao economy is still, to a large extent, an economy based on subsistence production. This means that expenditure patterns based exclusively on cash and credit outlets may not appropriately represent the true picture, especially when it comes to relations between food outlets (large portion subsistence based) and non-food-outlets (mostly cash and credit outlets). We have therefore tried to include an estimation of subsistence food consumption to adjust the total picture of expenditure patterns (see later in this chapter).

5.4.1. Cash and credit outlets

Overall, the reported average cash and credit outlets per month were 758,000 kip. Of this, 397,000 kip went to food items. This means that when only considering cash and credit outlets, the households in the survey spent 44 percent of their monetary resources on food. The overall level of expenditures differed among regions and population groups. Whereas the total average household expenditure levels were as high as 1,333,000 kip in the Vientiane Plains, it was less than half this in the Northern Highlands with 634,000 kip. The corresponding figure for the Mekong Corridor was 706,000 kip. The Lao-Tai group reported an average cash and credit outlet of 815,000 kip, whereas the Sino-Tibetan and the Austro-Asiatic group reported outlets of 604,000 and 632,000 kip respectively. The last group, the Hmong-Mien, who has a fairly strong network and access to remittances, recorded an average monthly outlet of 736,000 kip. The disadvantage in terms of access to cash for female-headed households can also be seen. Their monthly expenditure levels were at 583,000 kip compared to 765,000 for their male counterparts.

In terms of proportion spent on food items, this also differed across groups. Again the households from the Vientiane Plains showed the healthiest pattern, with only 31 percent of their cash and credit expenditures going to food items. This compared to 48 percent in the Central and Southern Highlands and 44 and 43 percent in the Mekong Corridor and the Northern Highlands respectively. The Lao-Tai spent only 39 percent of their expenditures on food compared to 56 percent for the Sino-Tibetan groups. The Sino-Tibetan groups also had the lowest reported overall expenditures, underlining their lack of integration into the cash economy. The Austro-Asiatic group reported 50 percent of their expenditures devoted to food items and the corresponding figure for the Hmong-Mien groups was 41 percent.

The linkage between food consumption[73] and expenditure levels is confirmed when looking at the expenditure levels of households with different levels of food security. Household with poor

[73] See section 2.2 for explanation of food consumption levels and chapter 6 for more details on food consumptions patterns.

and borderline food consumption patterns report expenditure levels of 483,000 and 491,000 kip respectively, compared to 787,000 for households with acceptable food consumption. Household with poor or borderline food consumption, in addition to having lower overall expenditure levels, are also devoting a larger proportion of their expenditures to food. Whereas households with acceptable food consumption devote 41 percent of their expenditures to food, the corresponding figures for households with poor and borderline food consumption are 68 and 48 percent. This clearly shows that as households are struggling to access food, a larger proportion of their expenditures are spent on food, and thus limiting the funds available for other basic necessities.

5.4.2. Monetary value of goods directly consumed by the households

In order to have a rough estimate of the importance of food items in the household's overall expenditures pattern, an attempt was made to incorporate values for own produced food into the expenditure analysis. This way we would be able to combine the value of purchased and own-produced food.

The last component, the value of own-produced food, was derived from the livelihood activity module, where households were asked to report on their main livelihood activities, the estimate value of yearly output from each activity and the share of each of these activities that was directly consumed by the household.

The major caveat that has to be highlighted deals with the already mentioned problem of under-reporting of some livelihood activities[74]. Those activities that would most likely provide more own-produced food, such as exploitation of natural resources, seems to be particularly under-reported. This might result in a biased underestimation of resources that are directly consumed.

However, the goal of this analysis is not to provide a precise estimate of the value of the own production, rather to show the share of resources, both cash and from own production, that households had to devote to food.

5.4.3. Own-produced food increases share of overall expenditure devoted to food

As a result, the share of resources that was spent on food increased on average from 45 to 65 percent. The highest level of expenditures devoted to food was found in Khammuane and in Sekong province (74%). However, while households in Sekong had an already quite high food/total expenditure ratio calculated as cash & credit only (61%), the increment in Khammuane was much more important, moving from 51% as cash & credit only to 74% while incorporating directly consumed goods. The highest increment was calculated in Huaphanh, from 36 percent when considering cash & credit only to 67 percent when incorporating directly consumed goods, an increase of 31 percentage points).

Looking at sex of household head, an equal increment was registered among male and female headed households (20 percentage points), with female headed households consuming a significant higher ($p<.000$) share of their resources to acquire food (70%).

Interestingly, while looking at cash & credit only showed households without road access having lower food/total expenditure ratio than households with road access (42 and 46 percent respectively), the opposite relationship was observed with the integration of directly consumed goods. Households without road access spent 69% of their resources to acquire food, while households with road access spent significantly less for food (64%, $p<.000$). This shows the importance of road access to market integration. Food is a more important component of remote households' economy, but less of this food is accessed through the

[74] See 5.1, Main livelihood Activities and Income Sources page 56

market. Further, remote households without road access are more reliant on wild/own-production, including hunting and gathering, than households with better physical access to markets. As this own-production becomes more difficult (for instance through shrinking access to forests), these households will have to rely more on the market for accessing food. This may be difficult for many of them as they already spend the bulk of their resources on food.

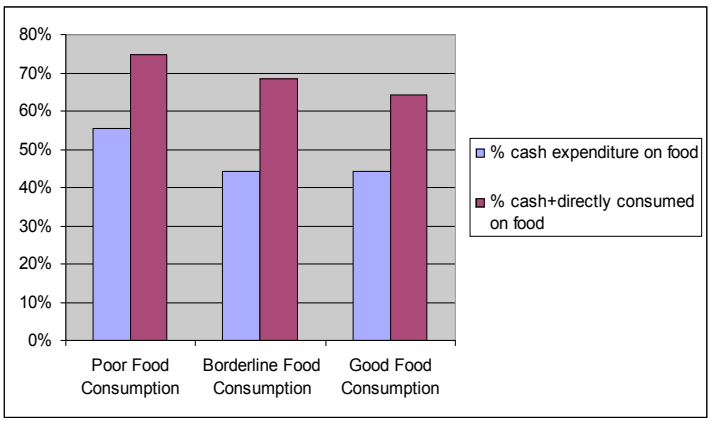
Table 9: Share of overall expenditure devoted to food per province

Province	Share of CASH consumption value on food	Share of food monetary value to total consumption (exp CASH & IN-KIND)	Difference
Phongsaly	52%	66%	+14%
Luangnamtha	48%	69%	+20%
Oudomxay	44%	65%	+22%
Bokeo	41%	63%	+22%
Luangprabang	40%	64%	+23%
Huaphanh	36%	67%	+31%
Xayabury	46%	64%	+18%
Xiengkhuang	36%	58%	+22%
Vientiane	43%	58%	+15%
Borikhamxay	41%	55%	+13%
Khammuane	51%	74%	+23%
Savannakhet	41%	64%	+23%
Saravane	45%	67%	+22%
Sekong	61%	74%	+13%
Champassak	50%	68%	+18%
Attapeu	58%	70%	+12%
Total	**45%**	**65%**	**+20%**

5.4.4. Poorer households spend more of their resources on food

A higher ratio was found among poor food consumption households (75% of their resources went on food) compared to the other food consumption groups, in line with the pattern found when only considering cash and credit outlays.

Figure 17: Percentage of cash expenditure on food and auto consumption per food consumption group



Looking at livelihood groups, the unskilled labourers, although gaining the smallest increase from own-produced food, had the highest proportion of their expenditures devoted to food, at 76 percent. With this much going to food consumption for groups with a low overall expenditure level, there is very little left for other expenditure needs. These needs may include other basic necessities such as soap, medical expenses or school books for children.

But it also leaves very little financial resources available for investments in their livelihood activities. These households are trapped in a vicious cycle where most of their resources are geared towards providing food and very little is available for investment that can produce

future increased gains. And without such gains, their meager resources will have to continue being devoted to providing food for immediate survival.

Summary: Chapter 5

Almost 95 percent of the households reported to be engaged in agriculture, while 29 percent was involved in livestock rearing/selling. Fishing/hunting was reported by 8 percent of households. This is clearly underreported. Agriculture was the most important livelihood activity in all provinces, whereas livestock rearing and selling was the second. Harvest of NTFPs was also important in most provinces. While agricultural-based activities remain by far the most important, there is some involvement in unskilled non-agricultural labour.

Rice is the dominant crop in agricultural production in Lao PDR. Seventy-one percent report glutinous rice as their main crop, and an additional 14 percent report non-glutinous rice as their main crop. The Lao Tai and Austro-Asiatic groups are hardly involved in non-glutinous rice production (less then 10 percent both as main and secondary crop). On the other hand, 67 percent of the Sino-Tibetan groups report non-glutinous rice as main crop compared to 29 percent for glutinous rice. Among the Hmong-Mien groups, non-glutinous rice is also the predominant crop, with 48 percent (compared to 37 percent for glutinous rice). The average expected number of months that the current rice harvest would cover food needs is eight and a half.

Although rice dominates, it seems like some cash crops are also of importance to many households. As much as 34 percent of the entire sample report not planting a second crop but 15 percent planted maize and 6 percent cassava. A little over half of all households keep a kitchen garden. Disparities can be noted among regions: Eighty-six and 71 percent of households in Bolikhamxay and Huaphanh respectively keep a kitchen garden, but only 25 percent of households in Phongsaly currently benefit from produce from a kitchen garden. Most households use their kitchen garden for vegetables.

Overall, the reported average cash and credit outlets per month were 758,000 kip. Of this, 397,000 kip went to food items. This means that when only considering cash and credit outlets, the households in the survey spent 44 percent of their monetary resources on food. When own-produced food was included in the calculation, the share of resources that was spent on food increased on average to 65 percent. Both the overall expenditure levels and the proportion spent on food differed widely across the country. The highest level of expenditures devoted to food was found in Khammouane and in Sekong province (74%). It is also clear that the less diverse food consumption a household enjoys, the larger proportion of the overall expenditures goes towards food.

Chapter 6. Household Food Security and Vulnerability

6.1. Household Food Consumption: What is in the cooking pot?

Diets in the Lao PDR are as diverse as the cultural beliefs and livelihood systems. Although rice is the main staple for most Lao households, there is no Lao diet per se. Some of the culinary, dietary, and sharing principles of the various ethnic minority groups are fundamentally different from each other. However, despite this cultural diversity, commonalities in the diets of the Lao PDR can be described as follows: a) high diversity of food items, b) uncertain and fluctuating food supply, c) high consumption of forest plants, wildlife, wild freshwater fish, and other aquatic animals (OAA), d) high seasonality and e) overlap of food plants with medical plants[75].

6.1.1. Staples

In this study, staples were grouped into glutinous rice, non-glutinous rice, maize, cassava and other roots and tubers. Rice was found to be the main staple of all diets. Eighty-eight percent of the sampled households prefer to eat glutinous rice daily. These households are mostly the Lao-Tai and Austro-Asiatic groups. The 14% of the households who eat non-glutinous rice daily are mainly of Hmong-Mien and Sino-Tibetan origin, although a significant proportion of these groups are also eating glutinous rice on a daily basis. On average, glutinous rice was consumed approximately 7 days per week among the Lao-Tai and Austro-Asiatic groups, and approximately 3 days per week among the Sino-Tibetan and Hmong-Mien groups.

Table 10: Mean weakly household food consumption for main ethnic groups (N=3,926)

Main ethnic group in village	Glutinous rice	Non-glutinous rice	Maize	Cassava	Other roots and tubers	Wild fish	Aquatic animals	Fish from ponds	Poultry	Pork	Buffalo	Wild meat large	Wild meat small	Beans, tofu	Milk	Eggs	Oil, lard	Fresh fruits	Vegetables	Green leafy vegetables	Bamboo shoots, mushrooms	Salt	Sugar
Lao Tai	6.9	0.9	0.7	0.7	1.0	4.3	2.3	0.7	1.1	1.0	1.3	0.1	0.5	0.6	0.6	1.6	2.1	1.8	4.4	4.7	3.6	6.8	2.1
Austro-Asiatic	6.5	1.0	1.0	0.7	0.7	2.7	1.6	0.4	0.7	0.7	0.7	0.2	1.0	0.7	0.2	0.7	1.1	1.4	3.2	4.5	3.2	6.9	0.9
Sino-Tibetan	2.9	5.3	5.3	0.6	1.1	1.5	0.9	0.1	0.5	1.3	0.5	0.3	0.7	2.3	0.1	1.0	3.4	2.7	3.3	5.4	4.2	6.8	0.7
Hmong-Mien	2.8	4.6	4.6	0.5	0.6	1.7	0.3	0.5	1.0	1.0	0.5	0.0	0.5	0.5	0.3	0.6	3.7	1.7	3.3	5.1	1.4	6.9	0.6
Total	6.4	1.3	0.5	0.7	0.9	3.6	1.9	0.6	0.9	1.0	1.0	0.1	0.7	0.7	0.4	1.3	2.0	1.7	3.9	4.7	3.3	6.8	1.7

Given this customary preference of glutinous rice over non-glutinous rice by the Austro-Asiatic groups, the uncustomary high consumption of non-glutinous rice in Sekong (2.6 days/week) and Attapeu Province (3.8 days/week) might indicate that people in these provinces buy non-glutinous rice on the market due to low rice productivity. In general, non-glutinous rice is cheaper than glutinous rice (see also Figure 8, chapter 3.4). On average, in these two provinces 37% of the glutinous rice is purchased (while the survey average is 27%). Khao piak – a rice soup made from non-glutinous rice - can be cooked even with small amounts of rice kernels. For many villagers in the South, this meal is more a coping strategy when faced with lack of sufficient access to rice.

[75] Krahn (2005); Krahn (2003)

The LECS[76] estimates an average rice intake of 575g per person (mean for all age groups, cocked rice), suggesting a clear urban/rural differential. The urban population consumes 15% less rice than the rural population, while there is little difference between rural areas with access to road and without access to road. People in the north tend to eat more rice than people in the center and in the south.

Customarily, many ethnic groups, especially those practicing shifting cultivation, substitute or mix rice with maize, roots and tubers, especially in the months before the rice harvest (June-September). This is also seen as a coping strategy by some households, whereby the dwindling rice stocks are made to last longer. The CFSVA corroborate this argument, as many households are eating non-rice staples on a daily basis: 4% for maize, 5% for cassava and another 6% for other roots and tubers. This is remarkable for the harvest period[77], when there should be enough rice available. Looking at a full-week spectrum; 24% had consumed cassava, 31% other roots and tubers, and 15% maize. Maize consumption can be expected to be higher during other months, as it was not in season during the survey period. Cassava, on the other hand, can be harvested all year round, as many other roots and tubers, which explains their higher consumption in comparison to maize. However, most of the forest roots and tubers are best harvested during May –June. Cultural preferences for non-rice staples can be seen in Table 9. These differences overlap partly with the agro-ecological zoning, showing that households in the Southern Central Highlands, mainly inhabited by Austro-Asiatic groups, are the highest consumers of cassava and other roots and tubers (their consumption is about five times higher than in the Northern Highlands).

On a national level, the Province of Sekong is clearly sticking out with the highest consumption levels for roots and tubers, especially for cassava. Looking at the source of other roots and tubers at a national level, about 7% are coming from the wild. Usually, roots and tubers are steamed fresh and eaten with rice, or chopped into little chips and steamed together with the rice. Looking at those households who eat a lot of non-rice staples (283 households with an average of 6 days per week) it is obvious that rice-substitution and staple-mix consumption is not necessarily related to a low consumption of other food groups. These 283 households rather exhibit a high consumption of wild fish (6 days per week). See Table 13

In conclusion, what we can infer from the data is that rice insecurity does not necessarily mean staple insecurity, or an insufficient supply of calories from staples.

6.1.2. Meat, fish, and other aquatic animals

Nation-wide detailed information on food consumption has so far not been available in Laos, and the current study sheds some light on consumption of animal protein and fat which to this extent have not been presented in Laos before. The CFSVA used the following animal groups: big-bodied and small bodied wildlife, freshwater fish, pond fish, other aquatic animals, and domestic meat of beef, chicken, pork and goat. First of all, wildlife (here defined as big and small bodied animals, freshwater fish, and other aquatic animals) was found to be consumed much more frequently than domestic meat. Big and small wildlife could be deer, civet, macaque, badger, rat, squirrel, bat or birds (such as wild pigeons, pheasants, partridges, buttonquails, sunbird, and bulbuls). Other aquatic animals (OAA) could be snails, crabs, and shrimp or little water insects. Terrestrial insects which are known to be frequently consumed in Laos (e.g. crickets, cicadas), were not included in the CFSVA.

Over the 7-day recall period, big wildlife was reported to be eaten by 6% of the households, small wildlife by 26%, wild fish by 81%, other aquatic animals by 55%, fish from ponds by 20%, poultry and pork each by 41%, and buffalo/cow meat by 42% of the households, stressing a high importance of wild animal protein and fat sources. Out of all reported animal

[76] GOL (2004)
[77] The CFSVA fieldwork was undertaken mainly during the months of October, which constitute the time when most villagers harvest their rice, both in the upland and lowland.

protein consumption days[78], wild fish alone made up 35 %. These findings are supported by other studies highlighting the importance of freshwater biodiversity resources for the Lao diets[79].

In the CFSVA, fish consumption was found to be highest in the Mekong Flood Plain and among the Lao-Tai groups (revolving around 4-5 days per week), followed by the Austro-Asiatic groups (2-3 days per week). Yet, a considerable amount of fish/OAA is also eaten in the uplands. For the Sino-Tibetan and Hmong Mien groups living in the uplands, wild fish consumption was found to be higher than the consumption of domestic animals (see Table 9 above).

Besides aquatic biodiversity resources the consumption of wildlife and birds is still very important for rural households. Pressure on these resources has increased tremendously, mainly because of burgeoning trade demands[80]. As a consequence, consumption of small-bodied wildlife increases[81], while consumption of big wildlife is less frequent. The CFSVA establishes that big wildlife was eaten more in the better-off households (with a higher Food Consumption Score), while there is not such differentiation for small wildlife. This may support the notion that big wild life in particular is increasingly entering the market where it is purchased by better-off household with purchasing-power.

The consumption of domestic animal meat averages around one day or less for all the different species listed. There is a slight propensity for pork meat among the Sino-Tibetan groups, for buffalo meat for the Lao-Tai, and for poultry among the Hmong-Mien and again Lao-Tai groups.

The LECS 2002/03 determines a total consumption of meat of about 50-60g per person per day (including domestic meat, wildlife and offal). The CFSVA data suggest that in those households with higher consumption of domestic meat, the consumption of wild fish, OAA and wildlife is not lower. This may indicate that domestic meat is not eaten as a substitute for wildlife. Generally, it is common among many ethnic groups that domestic meat is not used for the ordinary, daily cuisine, but only eaten on special occasions[82].

Wild meat and fish sources are clearly more important as protein and fat sources than domesticated meat and fish sources. This means that access to or lack thereof, these wild meat and fish (and OAA) sources is of clear concern from a food security point of view. As these sources are under increasing threat, proper wildlife management becomes a food security concern. It also points to the need for fostering more consumption of domesticated meat and fish sources. This may involve encouraging changes in cultural habits such as only eating domestic meat for festivals.

6.1.3. Vegetables

In the CFSVA, vegetables were classified into three groups: green leafy vegetables, shoots/mushrooms, and other vegetables. Vegetables, after rice, form the second major consumed food group. During the time of the survey, 19 percent of households consumed shoots and mushrooms on a daily basis. This may be due to the fact that during this season the consumption of wild vegetables is shifting from mushrooms and fresh shoots towards more leaves and herbs). Almost half of the surveyed households (46%) reported to have eaten green leafy vegetables daily. In addition, 35% reported to have eaten other vegetables daily.

The LECS 2002/03 shows that in the North on average 173g/cap/d of vegetables are consumed, much more than in the Center or the South. In the CFSVA, the Hmong-Mien

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[78] Total sum of reported days of individual animal protein items: wild fish, fish from ponds, other aquatic animals, poultry, pork, goat/sheep, cow/buffalo, small and large wild animals and eggs.
[79] Meusch, Yhoung-Aree et al. (2003); Bush (2005)
[80] Nooren and Claridge (2001); Chamberlain, Phomsombath et al. (2002); Johnson, Boonaratana et al. (2004); WorldBank (2005)
[81] Johnson, Singh et al. (2003); Krahn (2005)
[82] ADB (2001), Krahn (2005)

groups show a low propensity for shoots and mushrooms (1.3 days per week) in contrast to a consumption of 3-4 times per week by the other groups. All ethnic groups showed a high consumption of leafy vegetables (4-5 times per week) though. We found a moderate consumption of 3 times per week for other vegetables, which was slightly higher for the Lao-Tai groups (4 times per week), potentially due to better access to markets. In about 2% of the households we can assume that these vegetables were the only food eaten with the rice: this attest of a probable involuntary vegan diet for these households (see Section 6.2.1). Vegetable consumption is strongly dependent on the season. If garden vegetables (upland fields or home garden) are not available, various studies have shown that the consumption of forest vegetables is related to the time a household allocates to its harvesting and to the actual availability of forests. Many surveys in Laos have detailed the diversity of wild vegetables harvested from the forest, forming in some communities more than 80% of the overall vegetable intake. The CFSVA data indicate a higher consumption of leafy vegetables (5.1 days per week) in villages without road access, in comparison to villages with road access (4.5 days per week). The same trend can be seen for mushrooms and shoots (3.8 days in comparison to 3.2 days per week). Green leafy vegetable consumption was found to be highest in the Northern Highlands, while the consumption of mushrooms and shoots was found to be highest in the Mekong Corridor and the Central Southern Highlands.

6.1.4. Fruits

As in many other nutrition surveys worldwide, it is likely that the consumption of fresh fruits was underreported in the CFSVA. Fruits are often snacked in the fields or forest and are not considered part of a meal. The CFSVA has recorded a very low consumption of fruits. Half of the survey households reported not to have eaten fruits at all in the seven day recall and only 10% has reported daily consumption. The highest fruit consumption was found among the Sino-Tibetan groups, followed by the Lao-Tai and Hmong-Mien groups (see Table 9 above). Yet, it should be kept in mind that fruits are rarely purchased, and most of the forest and garden fruits are available in seasons other than the survey period. However, a national average consumption of 1.6 times per week can be classified as very low. Fruit consumption differed considerable among provinces. Consumption was found to be lowest in Bokeo Province (0.1 times per week), and highest in Phongsaly and Oudomxay Province (3.5 and 2.7 times per week). On average, the fruit consumption in the Northern Highlands was found to be equal to the Vientiane Plain (revolving around 2 days per week). Many ethnic groups value the nutritional benefit from fruit consumption as being "good for the body" and save them for their children. Adults consume much less fruits than children.

According to the LECS, fruit consumption averages between 60-70g per person per day. The literature lists a lot of species of wild fruits in Laos, complementing the commonly Southeast Asian garden species, namely banana, pineapple, papaya, mango, guava, rambutan, and melon.

6.1.5. Fats and oils

The usage of fat/oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is critically low. Only 14% of the households reported to use vegetable oil or lard in their daily cuisine; 44% reported not to have added fat at all over the last 7 days. The Northern groups such as the Sino-Tibetan and Hmong-Mien groups reported to have used fat in cooking 3.4 and 3.7 times per week, while only 1 time per week was reported by the Austro-Asiatic groups. The Lao-Tai ranked slightly higher with 2.1 times per week. This parallels the national average, which indicates that oil/fats were added only 2.1 days per week into the cooking pot. The lowest profile of fat usage was found in Saravane(0.5 days per week), followed by Attapeu and Khammuane (0.6-0.8 days per week). Female headed households were shown to add less fats/oils to their meals than male headed households.

Generally, it is safe to conclude that a great share of the fat intake originates from fish or meat – and not from added vegetable oil or lard (see later discussion on the consumption

profiles from the MCA). While in the past fat was customarily extracted from pork or wildlife such as from wild boar, badger, porcupine[83], today less and less animal fat is available and it can be assumed that the overall fat intake is marginal or too low. Applying the overall monthly expenditures of 6,394 Kip for vegetable oil indicated by the CFSVA, and dividing the expenditures for an average litre price of oil as of 10.000 Kip[84], we can estimate an average usage of oil of approximately 0.6 litres per household per month (or approximately 0.1 liter per month per capita). On a national average no data is available on the per capita consumption, as for instance in the LECS. The low fat intake in rural diets has been highlighted in other consumption surveys[85].

6.1.6. Other food groups

The Sino-Tibetan groups have a much higher consumption of beans/tofu than other ethnic groups. In general, 5% of the households reported to have eaten beans/tofu on a daily basis. The Lao-Tai stand out with the highest consumption of milk and/or dairy products. In total though, only 10% of households reported consumption of milk or dairy in the 7 day-recall, and only 2% daily. 90% of households did not consume milk and dairy at all.

6.2. Dietary Diversity: Food Consumption Score

Scientific research attests that there is a significant correlation between the diversity of a diet and nutrient adequacy, children's and women's anthropometry and socio-economic status[86]. WFP has built on previous work done on dietary diversity, customizing the tool in order to capture as much differentiation as possible among households that have different consumption patterns, in term of both number of consumed food groups and their specific consumption frequency.

The frequency weighted diet diversity score or "Food consumption score" (FCS) is a score calculated by the frequency of consumption (number of days per week) of different food groups consumed by a household during the 7 days before the survey. Information on the different food items was reorganized into specific food groups.

Consumption frequencies of food items belonging to the same group were summed and values above 7 were recoded as 7[87]. The value obtained for each food group was multiplied by its weight. The food consumption score is the sum of the weighed food groups.

The table below illustrates collected food items, food groups and their relative weights.

Table 10: Collected food items, food groups and their relative weights

	Food items	Food groups	Weight
1	Glutinous, non glutinous-rice, maize	Cereals and Tubers	2
2	Cassava, other roots and tubers (sweet potato, yam, taro)		
3	Pulses (including beans, tofu, bean curd)	Beans	3
4	Vegetables (including green, leafy vegetables, bamboo shoots and mushrooms)	Vegetables	1
5	Fruits	Fruit	1
6	Wild meat, wild fish and other aquatic animals, domestic meat (poultry, pork, buffalo), eggs	Meat and fish	4
7	Milk / milk products	Milk	4
8	Sugar	Sugar	0.5
9	Oils, fats	Oil	0.5

[83] Krahn (2005)
[84] No official statistics are available for the whole country on price of vegetable oil, but it can be assumed that the price will be approximately 10.000 kip per liter.
[85] Kaufmann, Phanlavong et al. (2001); Klingner and Schmid (2001); Krahn (2005).
[86] Ruel M., (2003)
[87] As 7 is the maximum number of days per week.

Two standard thresholds have been identified to distinguish different food consumption level.

A score of 21 was set as a bare minimum: the value comes from an expected daily consumption of staple (frequency * weight, 7 * 2 = 14) and vegetables (7 * 1 = 7). Scoring below 21, a household is expected NOT to eat at least staple and vegetables on a daily basis and therefore considered to have poor food consumption. These households can be considered as chronically food insecure. The second threshold was set at 35, being composed by daily consumption of staple and vegetables complemented by a frequent (4 day/week) consumption of oil and pulses (staple*weight + vegetables*weight + oil*weight + pulses*weight = 7*2+7*1+4*0.5+4*3=35). Between 21 and 35, households can be assumed to have borderline food consumption, meaning that they are vulnerable to becoming food insecure should a small decrease in their access to food occur. Households that score above 35 are estimated to have an acceptable food consumption consisting of sufficient dietary diversity for a healthy life[88].

FCS	Consumption profiles (diversity and nutritional density)
0-21	Poor
21.5-35	Borderline
> 35	Acceptable

The questionnaire did not take into account that food items could have been consumed in very small quantities. This applies mostly to animal protein consumption. It was difficult for the enumerators to decide when a fish was a substantial meal and when it was a condiment. A small fish may be substantial for one person, but when shared amongst 6-7 household members, the dietary contribution from this food item is minimal. Due to such limitations, there might have been an overestimation of the household consumption of particularly animal proteins.

6.2.1. Validation of thresholds

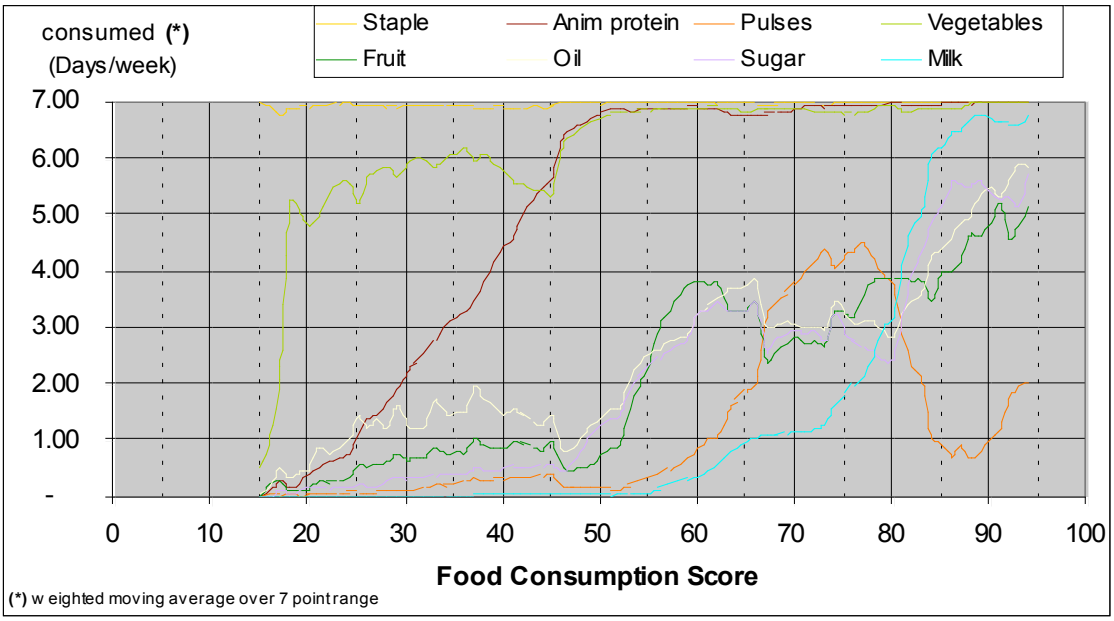
A second and perhaps more relevant concern deals with the theoretical expected food consumption on the two thresholds and the actual measured ones. Figure 18 below shows the consumption frequency of the different food groups.

As described in the previous section, staple and vegetable consumption was found being the base of the diet across all the households. However, the progressive increase of the FCS was not due to oil (fats) and pulses (vegetable proteins) consumption – as what WFP has established in other countries, but to an almost linear (up to a score of 50) growing consumption (in term of days per week) of animal protein items.

While the protein intake is better guaranteed by food from animal origin rather than from vegetable origin, the FCS captures what has already been pointed out earlier in the report, that consumption of fat appears to reach a significant frequency level (at least 3-4 days/week) only when the total dietary pattern is very rich, with daily consumption of staples, vegetables, animal products and a 3-4 day/week consumption of all the other 4 food groups.

[88] "Standard" food group weights and score thresholds have been test piloted and used in a few WFP assessments. External validations are currently undertaken by Tufts University and IFPRI. Results might lead to a different use of the food consumption score indicator.

Figure 18: Food consumption scores and number of days per food groups



Up to a FCS of 21, households consumed on average staple and vegetables on a daily basis and other food groups very seldom. This group (n=83hh) could be seen as those who become almost, but probably involuntary, vegan, due to low availability of and access to wildlife (including wild fish) and low propensity to slaughter livestock. Total animal consumption for this group ranks between 0 and 1 day per week. The marginal animal protein intake was mainly based on a single day of consumption. In total, 5% of households consumed wild fish, 1% OAA, and 1-3% domestic meat. This group could potentially contain households with a typical *cheo seu seu* meal. Such meals consist almost exclusively of glutinous rice, at which rice balls are dipped into a bowl of *cheo* (in the worst case containing only MSG, salt and dried or fresh pounded chili and/or water, but lacking meat and vegetables other than a handful of herbs). These poor consumption patterns are mainly found in the North: 4% within the Northern Highlands, 2% within the Northern Lowlands, 3% within the Central Southern Highlands, 1% within the Mekong Corridor. Interestingly, not a single household from the Vientiane Plains ranks with such a low FCS. More uplanders fall in this group than lowlanders. Most affected were the provinces of Bokeo and Sekong.

Consumption of animal/fats and, to a lesser extent, of oil increased with households scoring greater than 21. However, it is only above a threshold of 50 that oil/fats items were consumed on a more frequent base (more than 2 days/week). A closer look into the various food items shows that the incremental increase of animal protein mainly derives from wild fish and other animals, not so much from domestic meat. This pattern continues until a FCS of about 45.

Between a FCS of 21 and 35, thirty-nine percent of households consumed wild fish, 17% OAA, 19% poultry, 11% pork, 11% beef, 11% small wildlife, but only 1% big wildlife. For households with a FCS above 35, domestic meat consumption was more frequent: poultry was consumed by 44% of these households, pork by 45%, and beef by 46%. However, we can assume that the amounts were limited, as 86% also consumed wild fish and 61% OAA as well. The greatest number of households with borderline food consumption was found among the Austro-Asiatic groups (17% of this group), but the greatest share with borderline food consumption was found among the Hmong-Mien groups (23%). Given the limited information we have on the amounts consumed, the diverse amount of meat should not be overestimated in terms of nutrient intake. In fact, the low but diverse meat and fish consumption may suggest that these food sources are erratic.

These findings suggests that stable access to wild food sources, especially wild meats and fish, is crucial for households with borderline food consumption. This does not only apply for protein

intake, but also for fat intake. As a FCS of 60 is reached, most of the fat intake derives directly from wild fish, OAA or animal meat sources and not so much on additional fats/oils used in meal preparation. Only within households with a FCS greater than 60 is fats/oils consumed more frequent than 3 days per week.

What is also interesting to note is that the increase of fat, sugar and oil (items not deriving from own production) follow a similar trend, commencing after a threshold of around 50. Pulses are only commonly eaten by the sino-Tibetan groups, and do not influence the general food consumption pattern in Lao PDR.

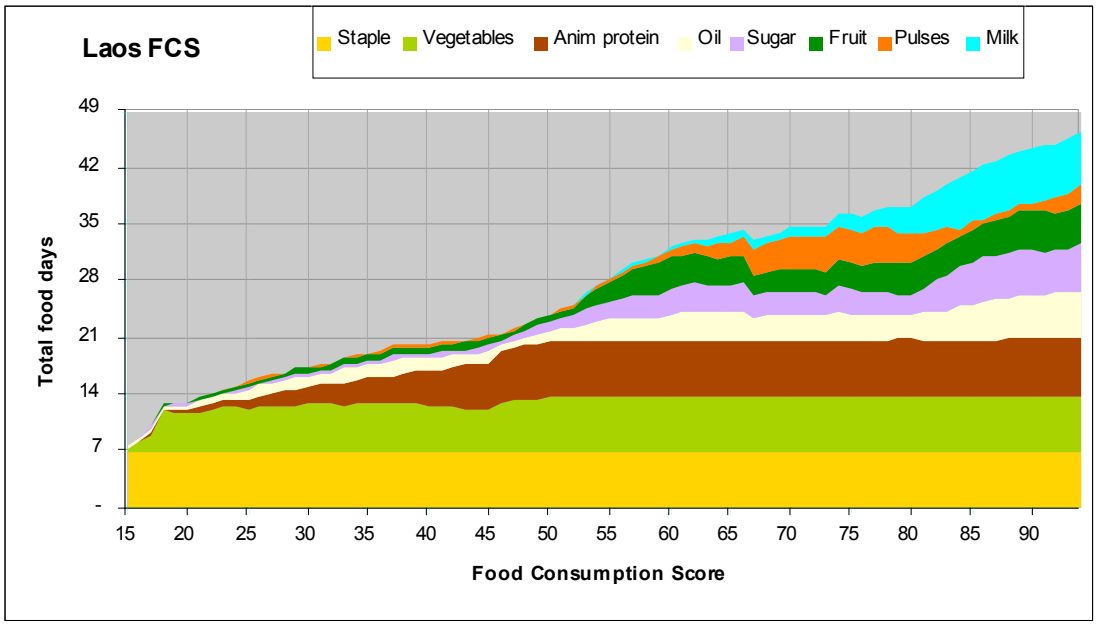
Following the methodology described above, the CFSVA households can be classified into 3 main groups, as indicated in the table below and as further illustrated in the following table.

Table 11: Description of food consumption groups and their distribution

Food Consumption Group	Description	FCS Cut-off point	Percent
Poor	Almost vegan Marginal diversity and foods with low nutrient density	≤ 21	2.1
Borderline	Vegetable based diets with marginal and opportunistic meat intake Borderline diversity and foods with nutrient diversity, yet low frequency	21.5-35	10.6
Acceptable	Balanced food group ratios with meat intake > 3 days/week Sufficient diversity and potential for adequate nutrient intake through regular consumption of foods with nutrient density	> 35	87.2
		Total	**100**

It has to be underlined that this classification seems to only be a relatively precise snapshot of the food consumption situation at the moment of the data collection, without pretending to represent the household food consumption throughout the year. This concept will be developed later in the report, when seasonality and risk aspects will be brought into the picture. In addition, as fishing (wild fish and other aquatic animals) and hunting are rather opportunistic activities, the proportion of households with borderline or acceptable food consumption is likely to present a dynamic figure with seasonal fluctuations. The lower threshold for poor food consumption, however, is likely to be less volatile.

Figure 19: Food consumption score and total number of days



The above figure shows the need for interventions that can increase animal protein consumption. In addition, promotion of a higher intake of fruits, oil and fats would be highly desirable. It appears that addressing low consumption of staples (rice) and also vegetables is

less urgent than animal protein, oil/fat and fruits. This is of special importance in regard of enhancing bio availability but also for vitamin and micro-nutrient intake.

6.2.2. Validation of the food consumption score with other access indicators

To validate the FCS we correlate it with indicators having a well supported, known, directional relationship with food security. We selected an indicator of wealth (the wealth index), production indicators (per capita value of self consumed and monetized production from livelihoods activities) and indicators of purchasing power (total monthly per capita cash expenditures and the proportion of expenditures dedicated to food).

Table 12: Correlation of the food consumption score with access indicators

	Food Consumption Score	**Significance**
Wealth Index	0.333	0.000
How long does the rice harvest usually last	0.131	0.000
Log of per capita value of self consumed production	0.052	0.001
Log of per capita value of cash income	0.209	0.000
Log of per capita monthly expenditures	0.305	0.000
Proportion of expenditures dedicated to food	-0.062	0.000

Indicators with a much-skewed distribution have been logarithmically transformed[89]. As expected the proportion of expenditures dedicated to food is negatively correlated with the food consumption score and the other indicators positively, which confirms the consistency of the dataset.

Several regression models were constructed (see annex 4) with the various access indicators as predictors of the food consumption score. The indicator for self consumed production is a very weak determinant of the food score while the "*usual duration that the harvest lasts*" performs better. The latter is used in the Laos dataset as an indicator of food which is produced and consumed by the household. The two consistently strong determinants of the food consumption score are the wealth index and the total monthly per capita expenditures.

6.3. Household Food Consumption Profiles[90]

A cluster analysis was performed on the food group variables in order to detect different dietary patterns among sampled households. This analysis aims at exploring how households really combine the different food groups, to identify the main combinations and to compare these diet profiles with the theoretical thresholds poor, borderline and acceptable food consumption

In order to detect the consumption frequency of specific items within specific dietary patterns, a different food item grouping was used. Starting from the original item list, the staples were divided into 3 major food groups (glutinous rice, non-glutinous rice and non-rice staples, colored in purple in the table below); animal products were regrouped into wild fish & aquatic animals, domestic meat including eggs, and wild meat, all in light blue; vegetables were divided into domestic and wild vegetables. The other food items, pulses, oil, sugar, milk/dairy and fruit were considered stand-alone variables.

According to the explained methodology, 11 different dietary profiles were obtained. For each profile, the average of the FCS was calculated in order to compare the results.

[89] Although the analysis using the untransformed variables lead to very similar results.
[90] Methodology in Annex 4.

Table 13: Household Food Consumption Profiles

Group Ranking	NUM	%	Glutinous rice	Non-glutinous rice	Non-rice staple	Pulses	Oil	Sugar	Milk /Dairy	Wild fish & aquatic animals	Domestic meat	Wild meat	Domestic vegs	Wild vegs	Fruit	**FS SCORE**
1	507	12.1	7	0	1	0	1	1	0	3	2	0	2	2	1	**39.4**
2	505	8.9	0	7	1	1	4	1	0	2	3	1	3	6	1	**43.7**
3	715	17.3	7	0	1	0	0	0	0	4	2	1	1	7	1	**44.0**
4	393	10.9	7	0	1	0	1	1	0	4	2	0	6	7	1	**45.2**
5	370	8.6	7	0	0	0	5	1	0	2	5	0	5	7	3	**51.9**
6	283	9.3	7	2	6	0	1	2	0	6	5	1	5	7	2	**53.0**
7	443	13.8	7	1	1	0	2	3	0	6	5	0	5	6	1	**55.3**
8	176	4.7	7	1	2	1	2	2	0	5	4	6	5	6	3	**56.9**
9	184	6.1	7	2	3	1	4	6	0	6	6	0	6	7	5	**62.1**
10	188	4.0	6	2	2	7	2	1	0	4	4	1	4	7	3	**67.8**
11	150	4.2	7	1	2	1	4	5	7	5	5	1	5	6	3	**86.8**
TOT.	**3,914**	**100**	**6**	**1**	**2**	**1**	**2**	**2**	**0**	**4**	**4**	**1**	**4**	**6**	**2**	

Of the 11 profiles, no one has a combination of food consumption that can be labeled poor. Just the first group has a combination that is close to borderline consumption: glutinous rice is consumed on a daily basis, and vegetables, wild fish and meat 2-3 days per week. Households appeared not to have a daily access to specific items but nevertheless they managed to have frequent (4-5 days/week) consumption of vegetables and animal products through diversification. These 507 households live mainly in the Mekong Corridor and comprise mainly of Lao-Tai and Austro-Asiatic groups.

The other household groups had a daily consumption of rice and wild vegetables and different consumption frequencies of various animal protein groups. The group characterized by non-glutinous rice consumption (group 2) comprises mainly of Hmong-Mien households living in the Northern Lowlands and Highlands. Its animal consumption is mainly based on pork meat.

Groups 3 and 4 (mainly comprising of Austro-Asiatic and Lao-Tai households living in the Mekong Corridor and the Northern Highlands and Lowlands) relied more on wild fish and aquatic animal for their animal product intake (4 days/week) but use only a bit of oil. This might be linked to cultural dietary habits, which have been explored in other parts of the report.

Group 6 exhibit an interesting example of households, as they complement their staples with roots and tubers. The reported animal protein, vegetable, fruit and oil consumption, however, undermine the common assumption that mixing staples means poor food consumption, derived for example out of low availability of other foods. This mixing of rice with roots and tubers might in fact be a rather deliberate decision. Group 6 mainly comprises of Lao-Tai (68% of households) and Austro-Asiatic groups (32%).

Also in the subsequent groups with higher FCS non-rice staples complement the rice intake, confirming the benefits from a diversified diet. All households within groups 9-11 show a non-rice staple of a minimum of 2 days, and the average score is very high. In group 10, it also becomes apparent that a regular consumption of pulses allow for a lower animal protein intake (still ranking 2nd on the FCS). The group with the highest FCS consists mainly of Lao-Tai groups (87%).

The table below reports the cross-tabulation between the results obtained from the two food consumption analysis methodologies.

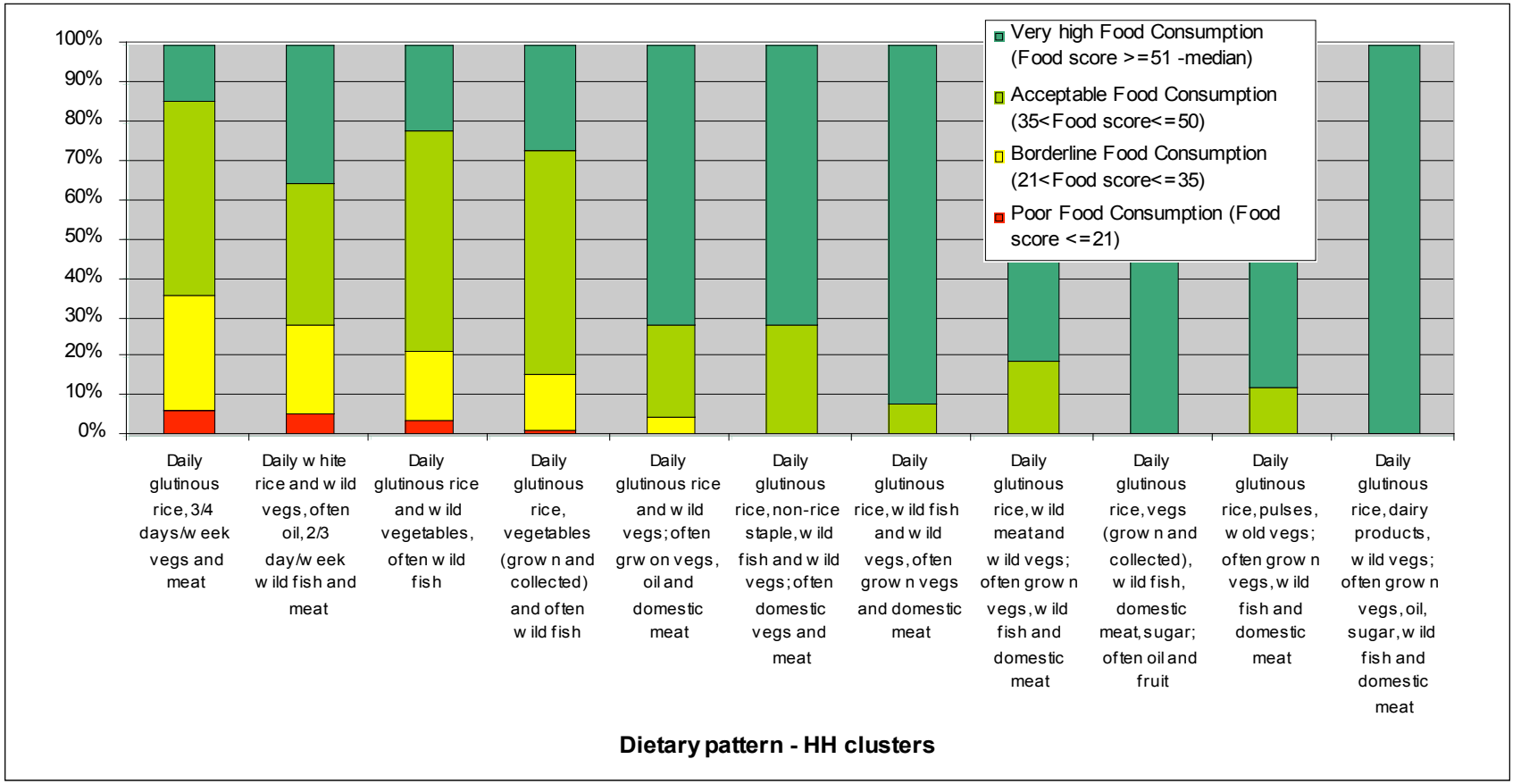
		FCG 3 from 11 clusters		
		Borderline (Cluster 1 only)	Acceptable (Cluster 2-11)	**Total**
Food consumption groups (from FCS)	Poor FC	0.8%	1.4%	**2.1%**
	Borderline FC	3.5%	7.1%	**10.6%**
	Acceptable FC	7.8%	79.5%	**87.2%**
	Total	12.1%	87.9%	**100.0%**

As it was stated above, the cluster analysis did not manage to uncover the poor food consumption patterns. This is likely to be due to the fact that the households with poor food consumption did not have similar dietary patterns, but rather consumed different items with different, but rare, frequency. In other words, this is not a homogenous group. That being said, their food consumption score is so low that their diet is nutritionally unbalanced and inadequate whatever items they consumed.

Figure 20 presents the distribution of FCS groups by dietary profiles. An extra category was created for graphic purpose only to show the prevalence of very high Food Consumption (FCS ≥51 median of the FCS distribution) households across dietary profiles.

For analytical use, household groups based on the FCS will be used throughout this report to evaluate the household food security situation and household characteristics related to their potential vulnerability conditions.

Figure 20: Distribution of FCS groups by dietary profiles



The profiles of groups with poor consumption could be of use for programming purposes that may help address the worst dietary patterns. It seems that access to sources for proteins and fats are the biggest problem for the groups with the poorest food consumption score. This may indicate that especially relief assistance to such households should contain oil and some form of proteins (pulses or canned fish). However, there are cultural barriers to such distributions, as these food items are not a common part of many people's diet. Interventions addressing lack of these nutrients with food aid may be more successful if they are preceded by nutritional education programmes aiming to alert the population towards the need for an increased consumption of proteins and fat and a more balanced diet in general.

6.4. Food security profiling

The purpose of this section is to describe the typical food insecure households and also to pinpoint particular groups with higher food insecurity rates. Cross tabulation of main household characteristics (based on underlying causes of the framework) with the food consumption categories (using weighted data) is used for these purposes. In this section, we will define food insecure households as households who had a poor or borderline food consumption based on the Food Consumption Score.

6.4.1. Where are the food insecure?

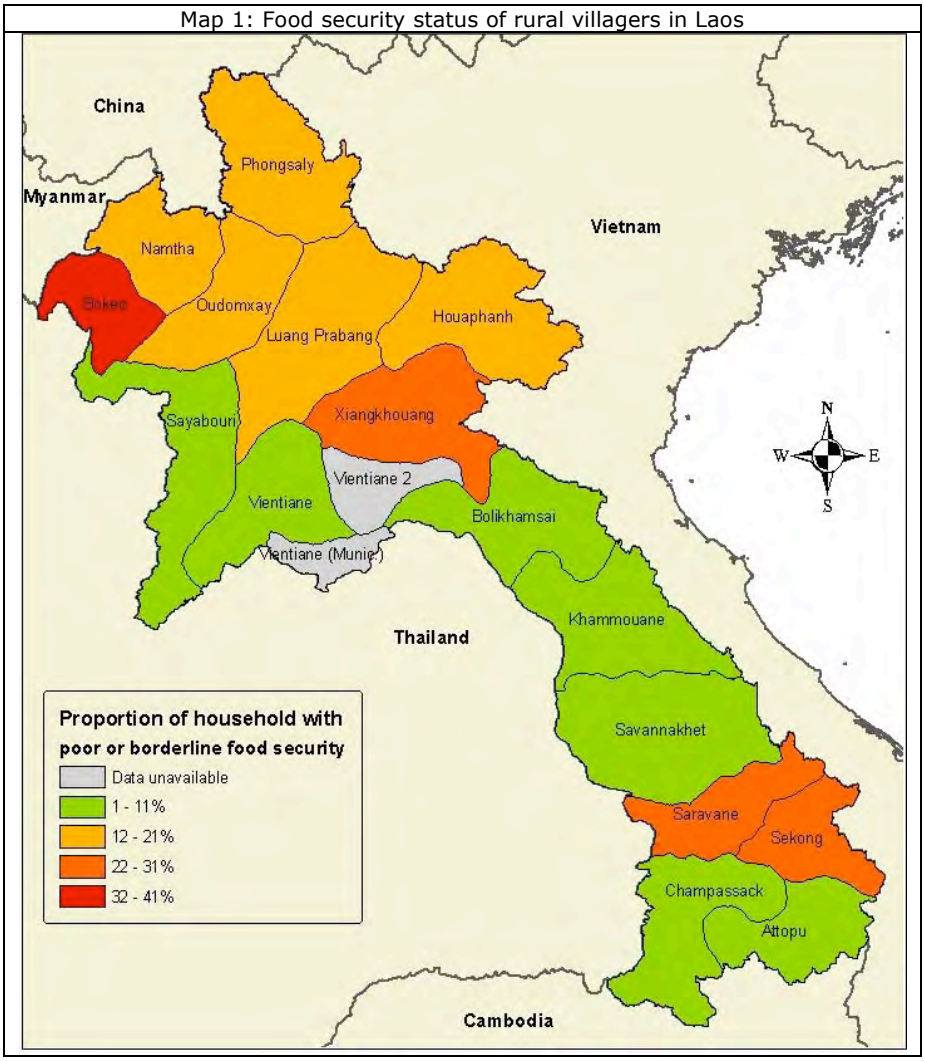
Table 14: Food insecure households in rural Laos

Food Consumption										
	Poor				Borderline				Acceptable	Total
Province	% of hh's	hh's	95 % CI from	95 % CI to	% of hh's	hh's	95 % CI from	95 % CI to	hh's	
Phongsaly	4	1,100	500	2,300	14	3,400	2,200	5,000	20,000	24,400
Luangnamtha	2	300	100	800	15	3,000	2,000	4,300	17,100	20,400
Oudomxay	4	1,400	700	3,100	15	5,200	3,600	7,300	29,100	35,800
Bokeo	11	2,500	1,400	4,200	30	6,700	5,200	8,400	12,800	22,000
Luangprabang	2	1,400	700	2,800	14	7,900	4,900	12,400	47,800	57,100
Huaphanh	2	600	200	1,500	19	7,200	4,900	10,400	29,700	37,600
Xayabury	1	600	100	2,300	9	4,200	2,400	7,000	42,700	47,500
Xiengkhuang	3	800	400	1,700	22	6,600	4,500	9,200	21,900	29,300
Vientiane	0	0	0	0	4	2,000	1,000	4,000	54,400	56,400
Borikhamxay	1	200	0	1,500	3	900	400	1,900	26,900	28,000
Khammuane	1	400	100	1,600	9	4,100	2,800	5,900	43,800	48,400
Savannakhet	1	900	200	3,400	3	2,800	900	8,500	97,000	100,700
Saravane	4	2,000	900	4,100	26	12,600	9,600	16,100	33,500	48,100
Sekong	10	1,000	600	1,600	14	1,300	900	1,800	7,400	9,700
Champassak	0	300	0	2,300	1	1,000	400	3,000	83,100	84,500
Attapeu	1	200	100	600	8	1,300	800	1,900	14,800	16,300
Total	**2**	**14,000**	**11,000**	**18,000**	**11**	**70,000**	**61,000**	**81,000**	**582,000**	**666,200**

Seventy percent of households with poor and borderline food consumption live in only 7 provinces. They live in Saravane and especially Sekong in the Southern Highlands (22% of poor and 20% of borderline); Oudomxay and especially Bokeo in the Northern Highlands (28% of poor and 17% of borderline) and also in Luangprabang, Huaphanh and Xiengkhuang (20% of poor and 31% of borderline)[91]. In some provinces there is hardly any poor or borderline food consumption, especially in the Vientiane Plain and the western lowland agricultural areas.

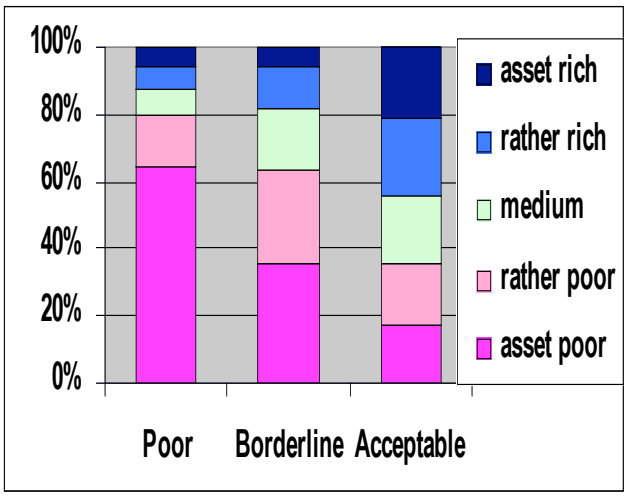
[91] These 7 provinces make up only 31 percent of the total population.

Map 1: Food security status of rural villagers in Laos



6.4.2. Asset wealth of food (in)secure households

Figure 21: Households' asset wealth by food security status



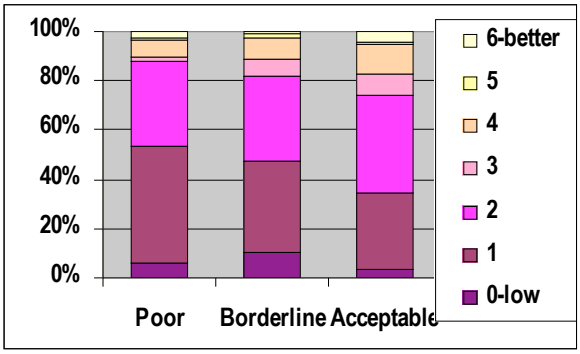
As shown in chapter 4, asset ownership is clearly linked to food security. Food insecure households are mainly asset-poor households.

Eighty percent of households with poor food consumption belong to the poor and rather poor asset quintiles; 64% of households with borderline food consumption come from the same quintiles.

Asset ownership may therefore be a good indicator for identifying food insecure households, and can be used, alone or together with other indicators, for household-level targeting of food security interventions.

6.4.3. Village infrastructure where food (in)secure households live

Figure 22: Village infrastructures where food insecure households live



Forty-nine percent of the food insecure households (54% of households with poor food consumption and 48% of households with borderline consumption) live in villages with little or no key infrastructure, compared with 34% of households with acceptable food consumption. Furthermore, households recently settled in the village are more often food insecure: 23% of households living in the village for less than 5 years compared to only 12% of the others are food insecure.

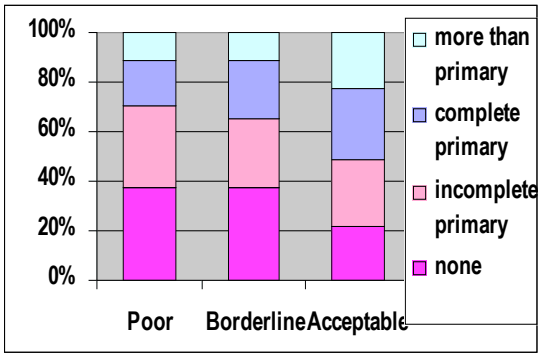
This may indicate that resettlement causes temporary food insecurity for some villagers. Thus, the Government of Lao and partners should take special care when resettling people, ensuring that their access to vital food sources is not compromised. Alternatives to resettlement could be a way to ensure that vulnerable group's access to food is not deteriorating, and should be encouraged.

UXO contamination continues to be a major obstacle to agricultural production and collection of NTFPs in large parts of the country, thus reducing the potential livelihood outcomes for many households. Seventeen percent of households living in villages with UXO problems have poor or borderline food consumption against 12% of households in other villages. This underlines the continued need for supporting UXO clearance as an integral part of livelihoods support aiming to enhance agricultural production.

In terms of demographic characteristics, a few potential indicators stand out. Eighteen percent of single headed households (often female) compared to only 12% of the others were food insecure. Similarly, 19 % of households with disabled HH heads were food insecure compared to 12% of other households. Dependency ratio is another indicator that potentially could identify the most food insecure households. Fifteen percent of households with high dependency ratio (higher than 1.25) compared to 10% of households with low dependency ratio (below 0.67) had such characteristics.

6.4.4. Education level of the head of food (in)secure households

Figure 23: Education level of the head of food (in)secure households

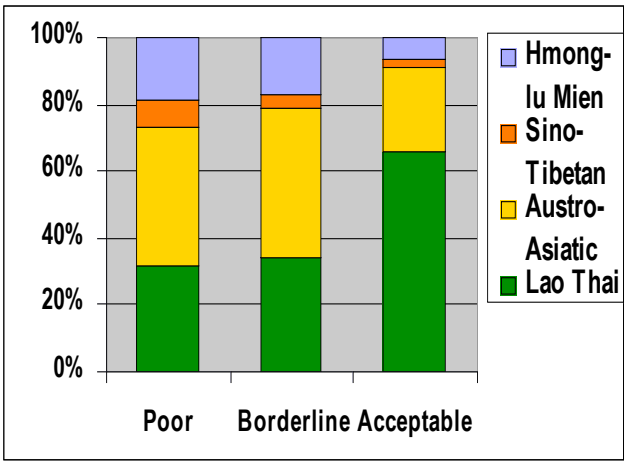


The food insecure are mainly households with low education levels. The head of 71% of households with poor food consumption and 66% of those with borderline food consumption has none or incomplete primary education Among the remaining households only 49% have no or incomplete primary education. This underlines the important link between education and food security. Furthermore, food insecure households tend to have lower literacy rate than food secure households.

Whereas 61 percent of the heads of household among the food insecure households can read and write a simple message, 77 percent of the food secure households can do the same. The literacy of the spouses, who in most cases are the women, may be even more important for food security, as they are the ones most likely to take care of and feed the children. Their knowledge and ability to acquire new knowledge on nutritional issues may depend on their literacy. Among the food insecure households only 36 percent of the spouses are literate, compared to 57 percent among the food secure households. This underlines the importance of addressing illiteracy, especially among women, in order to improve nutrition for children. Households with low education and literacy skills are more prone to become food insecure than others.

6.4.5. Ethnicity and food insecurity

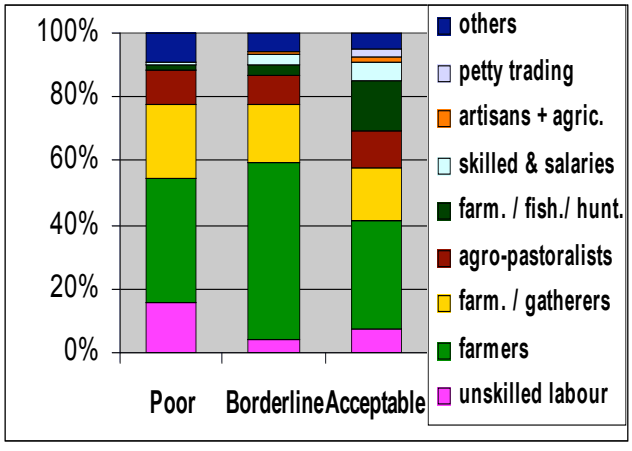
Figure 24: Food security status by ethnic group



Typically, food insecure households do not belong to the majority Lao-Tai ethnic group, but rather to the other ethnic groups. Although the Lao-Tai makes up 34 percent of the food insecure households, only 7 percent of the Lao-Tai are in fact food insecure. This is in contrast to Hmong-Mien groups where 28 percent are food insecure and 22 and 20 percent from the Sino-Tibetan and Austro Asiatic groups respectively. In terms of numbers, the Austro-Asiatic groups make up the largest share of the food insecure, with 44 percent of these households.

6.4.6. Livelihood strategies of the food (in)secure households

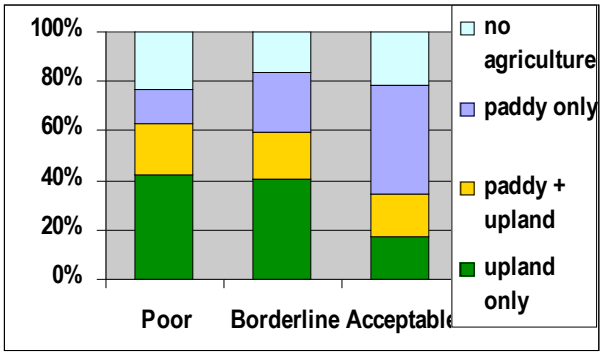
Figure 25: Food security status by livelihood groups



In terms of livelihoods, the food insecure are mainly farmers and unskilled labourers. Seventy-two percent of the food insecure households are farmers who are not substantially engaging in fishing and hunting. Fourteen percent of households with poor food consumption and 9 percent of households with borderline food consumption are unskilled labourers. The corresponding figures for households with acceptable food consumption are 57 percent for farmers and 10 percent for unskilled labourers.

6.4.7. Type of agriculture of food (in)secure households

Figure 26: Type of agriculture by food insecurity status

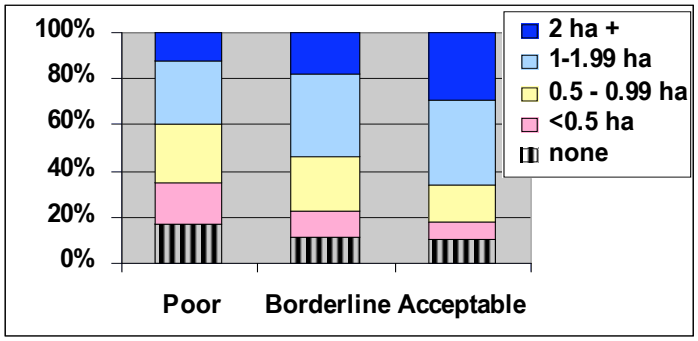


Among the food insecure, there is an overrepresentation of upland farmers. The farming system of 42% of the poor and 40% of the borderline households is exclusively upland, whereas among the remaining households the farming system of only 17% of them is exclusively upland. This may indicate a need to increase access to paddy land for food insecure households, but it may also be a reflection of competing demands for upland areas.

As described in chapter 2, upland shifting cultivation is not favoured by the Lao Government and area available for such farming has been severely reduced in the last decade, due partly to conservation and partly to concessions for commercial activities such as plantations. The food insecurity of upland farmers may be more due to this increasing limitation to their traditional livelihood system than to lack of paddy land.

6.4.8. Agricultural land of food (in)secure households

Figure 27: Area cultivated by food security status

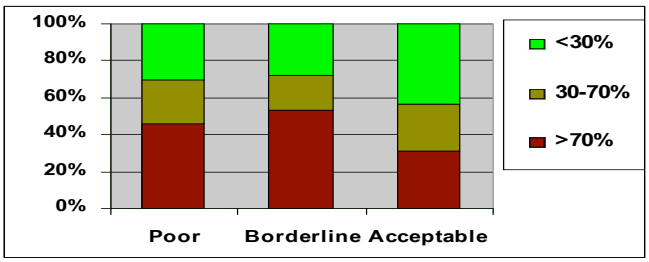


In terms of access to land, the food insecure are most often farmers with less than 1 ha of agricultural land. The land area of 45 % of households with poor food consumption and 33 % of households with borderline food consumption is between 0.01 and 0.99 ha, whereas among the remaining households only 23% have 0.01 to 0.99 ha.

Access to a kitchen garden also seems to help in terms of food security. Seventy-three percent of households with poor food consumption and 62 percent of households with borderline food consumption have no kitchen garden, whereas among households with acceptable food consumption only 45% lack a kitchen garden. Thus, a steady access to vegetable and other crops from a kitchen garden is clearly helping households maintain a more varied diet.

6.4.9. Fragility of the lands where food (in)secure households live

Figure 28: Fragility of land by food security status

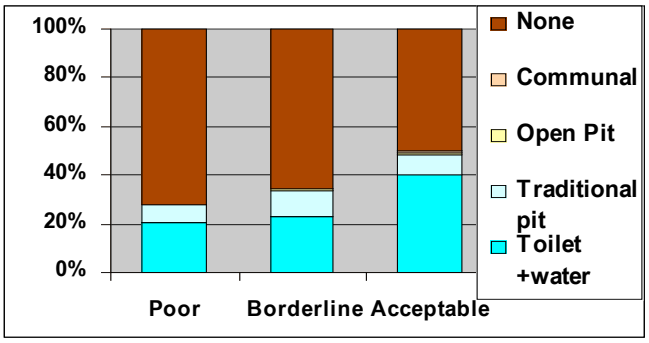


An important component of the ability to farm in Lao PDR is the sloping gradient of the land. Being a mountainous country, large parts of the country have such steep hills that farming is made more difficult and less efficient.

Fifty-two percent of food insecure households live in areas where more than 70 % of the land is fragile[92]. This compares to 27 % of food secure households. This is in line with the findings regarding upland farming, as upland farming is mostly undertaken on highly sloped land.

6.4.10. Toilet facilities of food (in)secure households

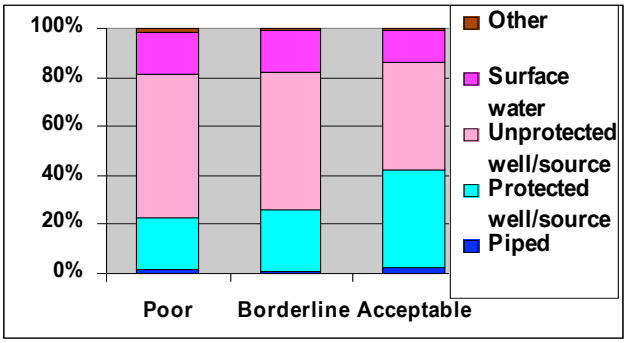
Figure 29: Toilet facilities by food security status



The disposal of human waste of 68% of food insecure households is inappropriate. The same is true for 51% of households with acceptable food consumption. Access to proper sanitary facilities is a problem throughout rural Laos, food secure and food insecure households alike, but the problem seems to be bigger for the food insecure household.

6.4.11. Source of drinking water of food (in)secure households

Figure 30: source of water by food security status



Three quarters of households with poor or borderline food consumption depend on an unsafe water source, compared to 58% of households with acceptable food consumption. Similar to the situation for toilet facilities, the problem of access to safe drinking water is persistent problem in all of rural Lao PDR, but it seems to be even more so for the food insecure households.

6.4.12. Targeting

There is no single indicator that can easily identify food insecure households and that can be employed for targeting food security interventions. However, several characteristics that differentiate food insecure from food secure households can be described. Food insecure households are typically farmers with low engagement in fishing and hunting or unskilled labourers. They are practising upland farming on a small plot of land in fragile areas with high sloping. Often, they do not possess a kitchen garden. They are mostly asset poor, lowly educated, illiterate and from minority ethnic groups. They live in villages with little or no key infrastructure, and suffer from bad sanitary conditions.

While the above may not give a sufficiently accurate description for developing targeting criteria, it gives an indication of the factors that are correlated with food insecurity. These characteristics are more easily observed than the underlying food insecurity itself and may therefore assist in developing more appropriate targeting tools for future food security interventions. These targeting tools may need to be adapted to different geographical settings, as the rural areas of Lao are very diverse. These characteristics may also indicate, in line with other findings in this report, which type of interventions could help reduce people's

[92] Fragile land is defined as land with a gradient of more than 16 percent, i.e. for every hundred meters vertical movement, the land surface increases 16 meters horizontally.

vulnerability to food insecurity. It is clear that addressing issues such as low illiteracy and education levels, poor sanitary conditions and access to safe drinking water will also help address food insecurity in many areas.

Summary: Chapter 6

Overall, the food consumption pattern in Lao PDR is very varied. Households rely on a tremendous variety of food items for their diets. However, amounts are not always sufficient, intake of key nutrients, such as fat, is often insufficient, and seasonal scarcities exist among parts of the population. There is a large difference between ethnic groups in their dietary composition.

Most households eat rice, or rice coupled with other staples such as maize or cassava, 7 days a week. Glutinous rice is the preferred staple by the Lao-Tai and the Austro-Asiatic groups, whereas the Sino-Tibetan and the Hmong-Mien groups prefer non-glutinous rice. The data shows a fairly high consumption of non-rice staples. It can thus not be stated that rice insecurity necessarily means staple insecurity.

Over the 7-day recall period, big wildlife was reported to be eaten by 6% of the households, small wildlife by 26%, wild fish by 81%, other aquatic animals by 55%, fish from ponds by 20%, poultry and pork each by 41%, and buffalo/cow meat by 42% of the households, stressing a high importance of wild animal protein and fat sources. Wild meat and fish sources are clearly more important as protein and fat sources than domesticated meat and fish/aquatic resources. This means that access to these wild meat and aquatic resources is of clear concern from a food security point of view. As these sources are under increasing threat, proper management of wildlife and aquatic resources becomes a food security concern. It also points to the need for fostering more consumption of domesticated meat and fish sources, as wild food sources may not be able to cover all needs. Changes in cultural habits, where domesticated meat is more used for ceremonial occasions than as part of a regular diet, may need to be encouraged.

Consumption of vegetables is very seasonal, but at the time of the survey the average consumption of vegetables was sufficient. Fruit consumption, however, was very low, but this could be due to seasonality issues and/or underreporting.

Intake of fat and oil is crucial in any diet, due to its importance for the uptake of many vital vitamins. Without adequate fat intake, the body will not be able to absorb these vitamins, even if they should be part of the diet. The usage of fat/oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is critically low. Only 14% of the households reported to use vegetable oil or lard in their daily cuisine; 44% reported to not have added fat at all over the last 7 days. Generally, it is safe to conclude that a great share of the fat intake originates from fish or meat – and not from added vegetable oil or lard.

The analysis shows that the main component differentiating households with acceptable food consumption from households with poor or borderline food consumption is animal protein intake, mostly wild fish and meats. Access to such food sources is therefore critical in order to ensure acceptable food consumption for all. Promotion of a higher intake of fruits, oil and fat would also be highly desirable.

The proportion of the rural population which has poor, or critically low, food consumption is 2 percent. An additional 11 percent has borderline, or low, food consumption. In total, this is the equivalent of 84,000 households. This was the situation at harvest time (October/November 2006). It is likely that the proportion increases significantly during the peak of the lean season.

Although no single indicator can easily identify the food insecure, food insecure households can be described as farmers with low engagement in fishing and hunting or unskilled labourers. They are practising upland farming on a small plot of land in fragile areas with high sloping. Often, they do not possess a kitchen garden. They are mostly asset poor, lowly educated, illiterate and from minority ethnic groups. They live in villages with little or no key infrastructure, and suffer from bad sanitary conditions.

Chapter 7. Food utilization and Nutritional Status

A child's full potential for survival, normal growth and development is predetermined by conditions in intra-uterine life beginning at conception. Conditions in post-natal life determine whether that potential is achieved.

In the Lao PDR, poor hygienic care practices (pre-pregnancy, pregnancy and child care) - together with an inadequate nutrient intake - have resulted into high levels of malnutrition among children commencing with intra-uterine growth retardation.

While the CFSVA has mainly collected data on food consumption and food security, data for the description of hygienic behaviour and care practices are mainly derived from secondary analysis.

7.1. Health, Hygiene, feeding and care practices

7.1.1. Maternal and child care and child feeding practices

Care practices in the Lao PDR are strongly related to culture and education. What is common for all across different ethnic groups is that pregnant and lactating women and children alike do not receive any special care. During pregnancy food intake is not necessarily increased or diversified; women often work continuously until the day of delivery (including tasks like carrying heavy firewood baskets). In many cases, mothers take up their heavy work tasks a few days after delivery (as early as 3 days in some cases). Cultural-specific attitudes have a major impact on caring child practices[93]. The Hmong-Mien show most appropriate breast feeding and weaning practices: the children are breastfed immediately after birth and complementary food is introduced only at the age of six months. However, other ethnic groups, especially those belonging to the Austro-Asiatic groups, feed their babies with pre-chewed sticky rice with water, especially when the mother is away in the field. On a national average only 27%[94] of the children are exclusively breastfed[95] followed by poor weaning and complementary foods, which also do not improve during early childhood, as often special foods for children are not prepared. Often, young children are only fed three or four times per day. Similarly, malnutrition in any form is often not perceived as a problem. Children who are wasted do not receive particular attention.

7.1.2. Health, hygiene and sanitation

According to the MICS and other studies, data suggest that in general incidence of diarrhea revolves around 6% with the most vulnerable group being those between 6 to 11 months old[96]. Frequent bouts of diarrhea together with intestinal losses of nutrients aggravate a poor diet. This situation is worsened by high incidences of parasitic infections. Often one individual is affected by various parasites at the same time.

In general, diarrheal diseases together with malaria and acute respiratory infections (ARI) are reported to be major causes of morbidity and mortality; however the relationship between these diseases and malnutrition appears to be poorly understood.

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[93] Wendy Holmes, Damian Hoy, Anonh Xeuatvongsa, (2003)
[94] National Statistics Center, *(*2007). This figure refers to children aged 0-5 months.
95 No correlation can be made in the CFSVA between the nutritional status of the child and the mother's breastfeeding practice, because in the interview breastfeeding and pregnancy were combined in one variable.
[96] (MICS 2000)

Malaria and diarrheal diseases are known to be of higher frequency during the rainy season than during the dry season[97].

These high levels of diseases are unsurprising given the very low levels of hygiene and sanitation. In the CFSVA, 52% reported having no toilet facilities (open defecation). These conditions are aggravated by poor access to safe water and very poor environmental conditions. Safe water access increased from less than 20 percent in 1995 to over 50 percent in 2002/3. Improved water access is over 10 percent lower for the poor than the non-poor[98]. The CFSVA indicates that 60% of households do not use a safe main drinking water source[99].

Children are also often poorly clothed for the sometime extreme weather conditions and are exposed to high levels of indoor pollution from open fires for cooking and heating in the house.

7.1.2.1. Access to and usage of health services

In stark contrast to the high level of sickness suffered in the communities, the governmental health facilities are seldom visited. Only one in seven sick people receives modern health care treatment, most people rely on self-medication and/or reliance on self-healing. Many ethnic groups still consider health and well-being as a consequence of spiritual balance rather than as a result of a sufficient food intake, health and care practices[100]. At the same time, the health system of the Lao PDR, especially at district level is badly resourced, maintained and villagers abstain from often high costs for medicine. In many cases, villages experienced to be overcharged for medicine[101]. Also, in many other cases spiritual belief systems prevent villagers from leaving the village in times of illness. This goes together with the fact that many mothers of ethnic minority groups deliver their babies in the forest, partly due again to the customary regulations but also to unhygienic conditions in the delivery rooms. In addition, in the remote uplands, health services are often difficult to access. As such, the distance to health centers increased from 10.7 km in 1992/3 to 11.7 km in 2002/3 for the poor, while it fell from 7.4 km to 6.5 km for the non-poor[102]. In many villages, the high prevalence of infectious diseases has become an accepted norm.

The World Bank concludes, that the health care system is still in the middle of a difficult transformation[103]. Therefore, it is questionable that some of the positive trends can be sustained since significant improvement in health infrastructure, access, and services are unlikely to improve in the near future[104]. Of particular concern is the subsequent immunization coverage, which has fallen in recent years and has been recognized by the Government of Laos as a serious situation[105].

At the same time, the increasing disruption of the traditional belief and medical systems (e.g. loss of animal and plant medicine) has left villagers in a vacuum to cope with new diseases, which spread rapidly[106]. The dynamics of resettlement in Laos have accelerated this process, especially for ethnic minorities.

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[97] FAO (2003)
[98] World Bank (2006a)
[99] Safe water source includes: piped water, protected well/borehole. Unsafe water includes: unprotected well/borehole, river stream or dam, and mountain source.
[100] Wendy Holmes, Damian Hoy, Anonh Xeuatvongsa, 2003: LADHCP Report on Health Study Findings.
[101] Krahn (2005)
[102] World Bank (2006a)
[103] WorldBank (2006)
[104] GOL/UN (2004); WorldBank (2006)
[105] Worldbank (2006)
[106] Krahn 2005

7.2. Children's Nutritional Status

7.2.1. Background

In Southeast Asia, UNICEF[107] noted a paradox in the appearance of malnutrition despite economic prosperity for which this region is known, reflecting an enormous and widening disparity between but also within countries. This pattern is also attested for Laos[108].

In the Lao PDR, the first ever national nutrition survey of children under five years of age was conducted in 1993 under the auspices of FAO (n=2950). From then until 2000, as indicated by the first Lao National Health Survey (NHS) global stunting levels dropped from 47% to 41%. Yet, on the other hand, levels of global wasting increased from 11 to 15%. Levels of global underweight remained fairly constant. The National Health Survey from 2000 (n=1347), was jointly undertaking by the Ministry of Health and UNICEF and constitutes a milestone. Up until now, it serves as the single available references for nutritional surveys. The data from the follow-up survey, which was collected in April 2006, is not yet available for CFSVA comparison[109]. Given Lao cultural diversity, malnutrition is inextricably linked to ethnicity. The World Bank's Poverty Assessment[110] indicates that 34% of the Lao-Tai under five years of age are underweight, compared to 43% of Mon-Khmer children, 41% among the Sino-Tibetan, and 37% among the Hmong Mien, summing up to an average of 39%.

Various other case-studies confirmed higher levels of malnutrition among ethnic minority groups compared to the Lao-Tai groups. In many cases their standard deviation units ranked below the national average indicated in the NHS. A study by Kaufmann on the Khamu and Akha in Muang Sing reported 70% of stunting[111]. A survey in Attapeu in 2002 observed stunting levels of over 50%[112], where even one-third suffer from severe stunting. In the neighbouring province of Sekong, Krahn[113] identified global stunting levels of 32-63% in four Katu villages (n=197), whereby the village with best development potential scored worst. Another study in Sekong and Luangnamtha identified global stunting levels of 63% in Kaleum District, and 74% in Long District, mainly ethnic minority areas[114]. In a joint survey from the World Bank and WFP, 11,472 children between 3-14 years in Phongsaly, Oudomxay and Luangnamtha Province scored in their height-for-age -2.25 SD below the median reference population and -0.54 SD for their weight-for-height ratio[115]. A study of nutrition survey in Bolikhamsay (n=1514) mainly in Lao-Tai villages established that 43% of children below 5 years were stunted, 28% underweight, and 4% were wasted with the most vulnerable group ranging between 36-59 months[116].

Apart from the NHS, there is no other statistical data available on the level of iodine deficiency disorders (IDD), iron deficiency anaemia and vitamin deficiency induced diseases. The NHS indicates that 4% of the rural children under five years of age had visual problems, as well as 12.8% of rural women in the child bearing age during their last pregnancy. Lower retinol levels (≤ 0.7µmol/l) were found in 27% at the national level, with children under five years (38%) being the most vulnerable group. Goiter rates of children age 6-12 years (9% at national level) were found to be higher in Southern Laos than in Central and Northern Laos and higher in girls (10%) than in boys (8%). 1.2% of the MOH survey population were identified as having haemoglobin levels below 7g/dl (which is the cut-off for anaemia) with

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[107] UNICEF 2005
[108] WorldBank (2006)
[109] The preliminary results (National Statistics Center, (2007)) show only malnutrition rates using the old NCHS standards.
[110] WorldBank (2006)
[111] (Kaufmann 1998)
[112] (Meusch, Yhoung-Aree et al. 2003)
[113] Krahn (2005)
[114] Miyoshi, Phommasack et al. (2005)
[115] (Buttenheim and McLaughlin 2006)
[116] (Klingner and Schmid 2001)

children below the year of five years being most vulnerable, as well as women and people in the Southern Laos (1.7%)

7.2.2. The CFSVA

In the CFSVA, in order to determine the nutritional status of survey population, 2,541 children under five years of age were measured for age, weight and height/length in order to calculate levels of stunting, wasting, and underweight[117]. These three nutritional indicators are expressed in standard deviation units (Z-score) from the median of the new WHO and the old NCHS reference population, with cut-offs set at -2 SD and -3 SD.

From the 2,541 data entries, flagged cases were excluded from the analysis for each specific indicator. The number and type of flags between the NCHS reference and the WHO reference are very similar[118]. Some degree of age heaping as well as height and weight rounding were observed. These errors in measurement are likely to increase the standard deviation of the z-scores, and will also decrease the strength of observed associations between nutritional status and other indicators, particularly when observing the mean z-scores. However, if the rounding/heaping errors are randomly biased up or down, the effect on observed prevalence will be less.

Additionally, it should be kept in mind that the survey data presented here should be read with caution. The findings do not reflect the true national prevalence of stunting, wasting, and underweight, but just that of the rural population[119] (see section 2.4). These results should be regarded as tentative estimates, and are not meant to replace other surveys whose primary goal is measuring nutritional status. All the data presented in the following show the un-weighted number of cases, however, the data is weighted in analysis to correct for different probabilities of selection, and the sampling design (clusters) are taken into account when Confidence Intervals (CI) are given. This also applies to the results for Women's nutritional status in section 7.3.

Table 15 below indicates the mean figures by comparing results from applying both the NCHS and the WHO reference population.

Table 15: Nutritional status of children under 5 years

	NCHS z-Score			**WHO z-Scores**		
	WAZ	**WHZ**	**HAZ**	**WAZ**	**WHZ**	**HAZ**
	underweight	wasting	stunting	underweight	wasting	stunting
N	2428	2335	2284	2414	2288	2252
Mean	-1.57	-0.53	-1.69	-1.38	-0.4	-1.86
SD (unweighted)[120]	1.25	1.26	1.75	1.3	1.23	1.76
% below -2 SD (95% CI)	38.1% (35.5%, 40.8%)	7.3% (5.9%, 8.8%)	45.2% (42.3%, 48.1%)	31.2% (28.7%, 33.7%)	7.5% (6.3%, 9%)	50% (47.2%, 52.9%)
% below -3 SD (95% CI)	10% (8.6%, 11.7%)	1.5% (1.0%, 2.4%)	20.4% (18.3%, 22.6%)	9.8% (8.4%, 11.5%)	2.2% (1.5%, 3%)	24.6% (22.2%, 27.1%)

[117] In general, stunting (height-for-age z-score) reflects an assessment of body growth is often referred to as chronic malnutrition. Weight-for-height is an indicator for acute malnutrition or thinness, whereas weight-for-age is a measurement of both acute and chronic malnutrition. While wasting can be the result of an acute insufficiency, mainly a calorie-reduced diet or acute disease (commonly diarrhea), several nutrient deficiencies probably occur simultaneously in growth-stunted children.

[118] Please see annex 6 for details

[119] Weighting of the data to adjust for differences in population sizes in the different provinces have been undertaken, but not detailed weighting according the population age and sex structure.

[120] WHO standard acceptable SD range for WAZ is 1 to 1.2, for WHZ is 0.85 to 1.1, and for HAZ is 1.1 to 1.3. The SDs here are all slightly high, most likely due to inaccurate data (age heaping, height and weight rounding).

Comparing the CFSVA data with the NHS[121] from 2000 (using the NCHS reference standard) levels of stunting remain similar, from 41% in 2000 to 45% according to the CFSVA, underweight remained fairly constant at 38% (40% in 2000) and wasting did decrease from 15% in 2000 to 7% observed in the CFSVA. Despite the success in reducing economic poverty levels, the levels of malnutrition and under nutrition are still very high, and remain higher than in neighbouring countries.

For the subsequent analysis, only data based on calculations applying the new WHO reference population are presented. The data will be aggregated for agroecological zones, road access, land sloping, and main ethnic group. For definition of the aggregation variables please see chapter 2.

By aggregating the data into 5 agroecological zones, a different picture is obtained by applying the classical division for North, South, and Central Laos. A clearer division is achieved between populations living in the Mekong Floodplain from people in the mountainous area along the Vietnamese border, which are usually merged into the group of Central Laos.

Referring to 16, there are only a few significant differences in nutritional status prevalences between agro-ecological zones. The children living in the Vientiane Plain tend to show the best nutritional status.

Table 16: Nutritional status (as prevalence of malnutrition) for agro-ecological zones

Agro-ecological Zone	WAZ (underweight)	WHZ (wasting)	HAZ (stunting)
Vientiane Plain	18.7% (11.8%, 28.3%)	4.6% (1.7%, 11.9%)	34.6% (27.7%, 42.3%)
Central Southern Highlands*	35.9% (28.3%, 44.2%)	9.3% (5.5%, 15%)	55.3% (46.5%, 63.8%)
Mekong Corridor	34% (28.6%, 39.7%)	9.4% (6.7%, 13.2%)	44.7% (38.9%, 50.7%)
Northern Highland	32.8% (29%, 36.7%)	6.5% (5%, 8.5%)	58% (53.3%, 62.6%)
Northern Lowlands	25.5% (22%, 29.5%)	6.2% (4.3%, 8.8%)	45.7% (41.2%, 50.3%)
*including the Bolovan Plateau			

Looking at nutritional status by sloping class (percent of land sloped greater than sixteen percent), the data shows that highest levels of stunting (54%) were found in areas with more than 70% of fragile land. No significant differences were found in underweight or wasting prevalences between sloping classes.

Table 17: Nutritional status (as mean Z-score) for presence of fragile land (greater 16% sloping)

Sloping class	prevalence ≤ - 2SD (95% CI)		
	Underweight	Wasting	Stunting
0-30%	32.8% (28.1%, 37.9%)	7.8% (5.6%, 10.8%)	48.3% (42.7%, 54%)
31-70%	28.6% (24.2%, 33.5%)	9.1% (6.5%, 12.7%)	45.3% (40.9%, 49.8%)
more than 70%	31.3% (28.2%, 34.6%)	6.3% (5%, 8%)	54.2% (50.1%, 58.2%)

When looking at access to roads, it appears that children living in areas with poor road access tend to have lower prevalences of malnutrition (underweight, stunting and wasting), although these differences are not significant.

Table 18: Nutritional status (as mean Z-score) district road access

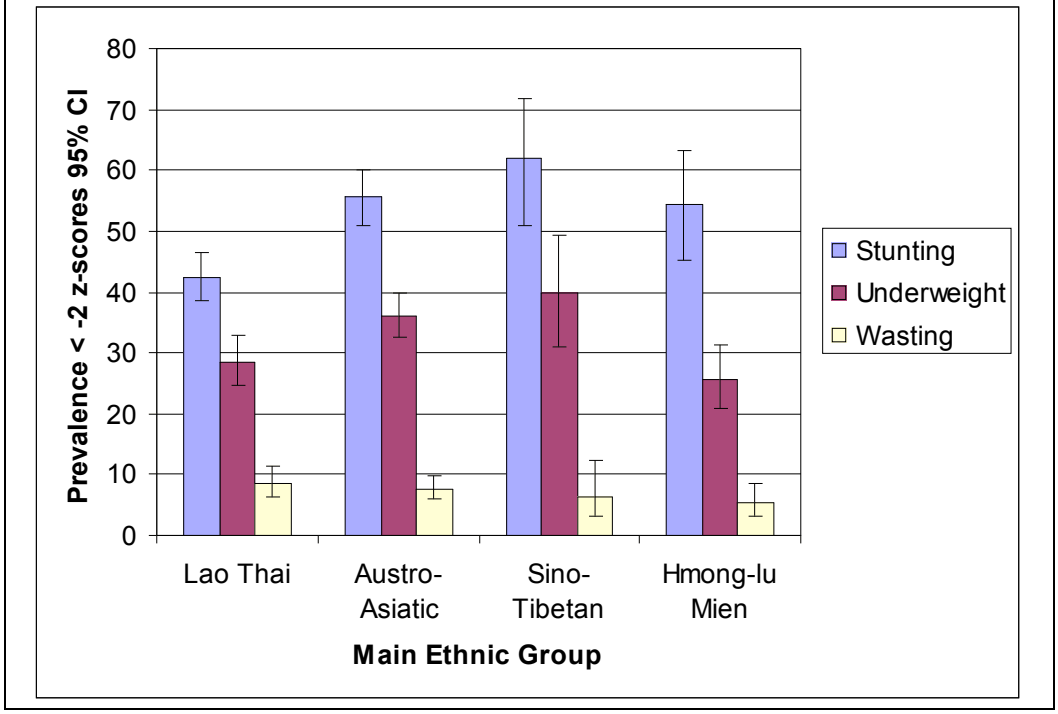
District road access	**prevalence ≤ - 2SD (95% CI)**		
	Underweight	**Wasting**	**Stunting**
Rural with road access	32.8% (29.8%, 35.9%)	8.2% (6.6%, 10.1%)	51.3% (47.7%, 54.9%)
Rural without road access	29.5% (24.8%, 34.7%)	6.7% (4.6%, 9.5%)	48.2% (42.6%, 53.9%)

[121] Different sampling universes were used.

7.2.2.1. Ethnic groups

The highest levels of stunting were found among the Sino-Tibetan groups (62%), followed by similarly high levels among Austro-Asiatic groups (56%) and Hmong-Mien groups (54%). The Lao Tai have the lowest prevalence (42%), which is significantly lower than the Austro-Asiatic and the Sino-Tibetan. No significant differences between main ethnic groups are found in wasting or underweight prevalences.

Figure 31: Graph: Nutritional status per ethnic group



7.2.2.2. Seasonality

Seasonality in nutrition is not yet studied intensively in Lao PDR. However, according to various sources[122], acute malnutrition rates are expected to be much higher during the rainy season (April – September). It is suggested, that at this time there is the peak season for intensive labour on the rice field, while rice storages are often already used up. It is also a time of high workload; villagers do not have enough time for food collection and preparation. Subsequently, during this time caring capacity is low as well.

7.2.2.3. Girls and Boys

Table 19: Prevalence of underweight, Wasting and Stunting by sex

Sex	prevalence ≤ - 2SD (95% CI)		
	Underweight	Wasting	Stunting
Male	33.9% (30.4%, 37.7%)	8.5% (6.7%, 10.7%)	52.9% (48.9%, 56.8%)
female	28.3% (35.4%, 31.3%)	6.5% (5%, 8.4%)	47.1% (43.6%, 50.6%)

The CFSVA data seems to suggest that boys have higher stunting, wasting, and underweight prevalences than girls, although none of these differences are significant. In other studies as

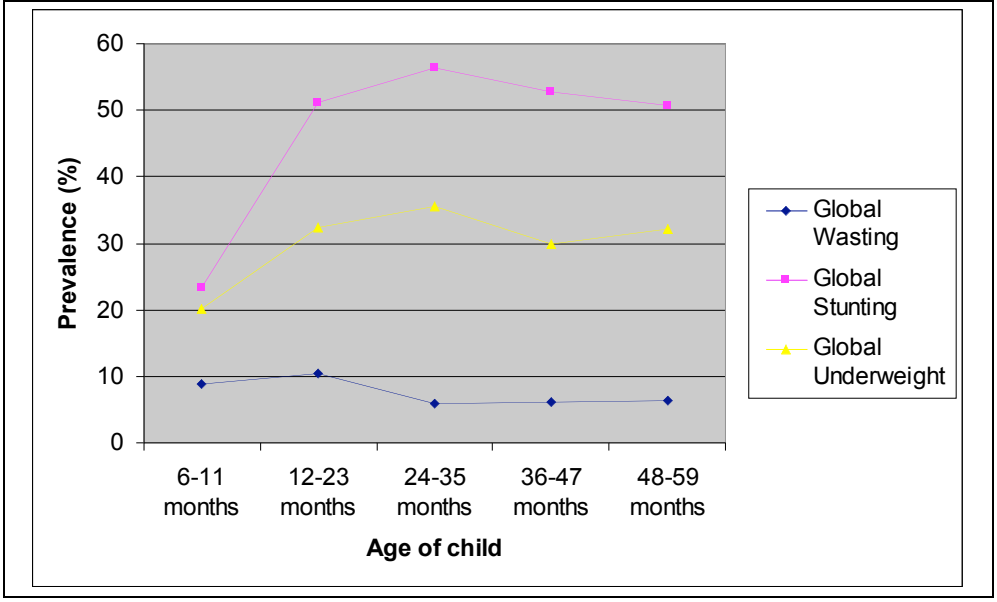
[122] FAO, (2003)

well the percent difference was only marginal[123]. The NHS however also found a higher percentage stunting and underweight levels (below -2SD) in boys, but suggested that girls were more frequently wasted.

7.2.2.4. Age groups

Below is a graph showing prevalence of stunting, wasting, and underweight for different age groups, illustrating the different patterns of evolution:

Figure 32: Prevalence of stunting, wasting and underweight per age group



Stunting increases with age, particularly after the first year. Stunting peaks in the age group 24-35 months (55% of cases). This is also the case for underweight, with a prevalence of 33 percent, but with a less sharp increase. This pattern is in line with findings from the MICS survey[124]

Wasting levels appear to decrease slightly after the first two years of age. More specifically, most wasted children are found in the early age groups between 6 – until 24 months. This data supports the argumentation from chapter 7.1.1 that inappropriate and late timing of weaning foods hamper child's development, together with the too early administration of pre-chewed rice. However, research is needed to investigate if the too early application of sticky rice is harmful to the undeveloped intestinal system of young children. The CFSVA data set does not allow controlling for the common influencing factors of diarrhea and breastfeeding practices.

7.2.3. Mortality rates

According to UNICEF, poor nutritional status of infants and children is an immediate or predisposing cause of over half of all deaths[125]. But also diarrhea together with malaria, acute respiratory infections and dengue, measles or meningitis are the major causes of mortality[126].

[123] Klingner and Schmid 2001; Miyoshi, Phommasack et al. 2005
[124] National Statistics Center, (2007)
[125] UNICEF (2005)
[126] GOL/UN (2004)

Child mortality indicators in Laos, though gradually improving, are still among the poorest in the region. Between 1990 and 2000, infant mortality fell from 134 to 82 per thousand live births. The under five mortality fell from 170 to 106 per thousand live births.

Remarkable progress has been made in reducing the number of women dying as a consequence of childbirth. Between, 1990 and 2000, the maternal mortality rate fell by almost one third from 750 to 530 deaths per 100,000 live births[127]. The fall in mortality rates helped to lift average life expectancy from 52 years for women and 50 years for men in 1995 to 63 years for women and 59 years for men in 2005[128].

7.2.4. Underlying factors

Differences in levels of malnutrition may be the outcome of immediate and underlying factors such as nutrient intake, health/disease status, and care practices. In order to further explore the immediate underlying causes of malnutrition in children under 5, linear regression analysis[129] was used. The low amount of variation explained (low R^2 value) by the underlying factors explored are likely due to the age heaping and the height and weight rounding, as well as the lack of some key predictive indicators such as breastfeeding status and child morbidity data; however, several interesting relationships were found.

Looking at underweight z-score, when controlling for the other factors in the model[130], it is found that unsafe water supply is significantly related to lower underweight z-score, that boys have a significantly higher mean z-score than girls, that underweight z-score decreases with age, and that an improved wealth score is related to improved underweight z-score. Underweight z-score is not significantly related to sanitation, having soap in the household, or the food consumption score.

Running regression analysis on wasting and stunting does not reveal any additional strong relationships between the immediate causes and the underlying causes. Using similar indicators as in the underweight and stunting regression analyses, adjusted R^2s of less than 0.01 were achieved. This may be in part due to the high standard deviations caused by age heaping, and rounding off of height and weight measurements, and also to the fact that key underlying causes, such as child morbidity and weaning practices, are not present in the database. However, the data may merit further exploration of the underlying and basic causes, which was not performed in this analysis.

7.3. Women's nutritional status

7.3.1. Background

Two major surveys in the last 10 years give us an indication of the situation with regards to women's nutritional status in Lao PDR[131]. Women's nutritional status is normally measured using Body Mass Index (BMI[132]). In 1995, FAO conducted a nutritional survey indicating that 14.8 percent of women aged 18 years and above were underweight. A similar study conducted by the Ministry of Health in 2001 put the percentage of underweight women at 18.1. These figures are not entirely comparable as this latter study was conducted on women aged 15 years and above.

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[127] GOL/UN (2004)
[128] National Statistics Center, (2006)
[129] Weights were used but clusters were not accounted for in the regression analysis.
[130] See annex 6 for details
[131] This section based on FAO, (2003)
[132] Calculated as weight in kg divided by squared height in meters.

7.3.2. The CFSVA

5,101 women of reproductive age were measured; of which 3,456 were included eligible for analysis (some had incomplete data, others were excluded due to pregnancy). Of those eligible, only 13 cases were then removed due to impossible BMI values (because of an impossible weight or height). Moderate heaping of height and weight was observed due to frequent rounding of heights to the nearest centimetre and weights to the nearest 0.5 kg. However, this is not expected to have a large impact on the results.

Table 20 below indicates the prevalence of nutritional status of women broken down by sub-categories. The overall prevalence of underweight (BMI < 18.5) among women of reproductive age is 11.5% (95%CI 10.1%, 13%). This figure is thus lower than the reference points for 1995 and 2000, but two major differences in these studies should be noted: the CFSVA data is based on women aged 15-49 years, whereas the two other studies refers to women aged 18 and 15 and above, respectively. The other point is that the CFSVA data only consider women from rural villages, whereas the other studies include urban residents. Direct comparison is therefore impossible; nonetheless it indicates that there have been no major changes in the nutritional status of women over the last 10 years.

Table 20: Prevalence of nutritional status of women by sub-category

	WHO cutoffs	Prevalence (%)	95% Confidence Interval	
			Lower	Upper
Underweight (<18.5)	severe thinness (<16)	1.1	0.7	1.6
	moderate thinness (16-16.99)	2.0	1.4	2.8
	mild thinness (17-18.49)	8.4	7.3	9.6
	Total underweight (<18.5)	***11.5***	***10.1***	***13***
Normal (18.5 to 24.99)		77.2	75.3	78.9
Overweight (>25)	pre-obese (25-29.99)	10.1	8.9	11.5
	Obese (≥30)	1.2	0.9	1.7

Table 21 shows the underweight prevalence among women of reproductive age by agro-ecological zone. The only observed significant differences are observed in comparison with the Northern Lowlands, which has a significantly lower prevalence than both the Mekong Corridor and the Central Southern Highlands. However, Vientiane plain also shows a trend (not significant) towards lower prevalence than the central southern highlands and the Mekong corridor.

Table 21: Underweight prevalence of women of reproductive age by agroecological zones

Agroecological zones	Prevalence of underweight (%)	95% Confidence Interval	
		Lower	Upper
Northern Lowlands	8.6	6.7	11
Vientiane Plain	10	7	14.1
Northern Highland	10.4	8.3	13.0
Mekong Corridor	13.4	10.7	16.6
Central Southern Highlands	16	11.2	22.4

These patterns among the agro-ecological zones are similar to those of wasting among children under 5, where the central southern highlands and Mekong corridor also show higher (though not significantly) prevalences than other zones.

Table 22 shows the underweight prevalence among women of reproductive age by the main ethnic groups. Although it appears that the Sino-Tibetan have the highest prevalences, there are no significant differences between any of the ethnic groups.

Table 22: Underweight prevalence of women of reproductive age by ethnic group			
Main Ethnic Group	**Prevalence of underweight (%)**	**95% Confidence Interval**	
		Lower	**Upper**
Lao-Tai	11.2	9.5	13.1
Austro-Asiatic	13.1	10.3	16.4
Sino-Tibetan	18.1	10.3	30
Hmong-Mien	8.7	5.6	13.2

7.3.2.1. Underlying causes

A series of regression analyses were run on the BMI of women of reproductive age to explore the immediate and underlying causes. However, basic causes were not explored in this analysis.

Variables considered include the following:

Class of indicator	Indicator
Food consumption	Food Consumption Score
Access to health care	Presence and type of health care facility in village
Sanitation	Drinking Water Source
	Toilet Type
	Use of soap in hand washing
Controlling factors	Age, Age squared (of woman)
	Composite Wealth Score

Although these models have a poor predictive power, some important results were found[133]. Model one is considered the best description of the underlying causes, as it contains only immediate and underlying causes. However, with the addition of wealth (a basic cause) models 2 and 3 show other important relationships, although they are more difficult to interpret.

Controlling for the presence and type of health care facility in the community and age of the woman, it was found that:

- Having an improved sanitation facility is associated with increased BMI. This relationship is weaker when controlling for wealth using the composite wealth score, as there is a relationship between increased wealth and toilet type.
- Improved water source is NOT associated with BMI except when controlling for food consumption (FCS) and wealth. However, this relationship is weak and slightly counterintuitive. It is most likely due to the relationship of water source with both FCS and wealth.
- Food Consumption, as measured by the FCS, is positively associated with BMI. However, this relationship is not apparent when controlling for wealth. This is likely due to the strong correlation between wealth and food consumption.
- Wealth, as measured by the composite wealth score, is the best predictor of BMI.
- Soap use is also positively associated with BMI, however, this relationship disappears when controlling for wealth, as wealthier houses are also likely to use soap.
- No relationship is seen between the presence and type of health facility and women's BMI.

[133] The key models considered are outlined in annex 6.

Summary: Chapter 7

Chronic malnutrition, or stunting, is at an alarmingly high level in Lao PDR. Every second rural child under 5 years of age is stunted. There has been no improvement in the chronic malnutrition in Lao PDR over the last 10 years. A small reduction in underweight has been noted, and some reduction in wasting. These reductions are positive, but the persistently high chronic malnutrition rate is alarming.

The data from the CFSVA, despite its limitations, shows that ethnic minorities (especially Sino-Tibetan and Austro-Asiatic) are highly vulnerable to nutritional problems, and that populations from certain agro-ecological zones are disadvantaged. The highest prevalence of wasting was found in the Mekong Corridor, even higher than in the highlands. The data indicates that children from families with better road access are not necessarily better off when it comes to nutrition.

Like other surveys have shown (such as MICS III), the CFSVA confirms that stunting increases significantly after the first year. This is most likely linked to unhealthy weaning practices, especially with regards to timing and choice of weaning foods.

Growth stunting in childhood is a risk factor for increased mortality, poor cognitive and motor development and other impairments in function. Lao children, who are malnourished and living in poverty, cannot fulfil their development potential. They may do badly at school and have low productivity in adulthood. As a result they pass on poverty and deprivation to future generations.

Mothers' health and nutritional status is extremely important for the intra-uterine development of children. Bad nutritional status of mothers impair the development of the children even before they are born, making many of them start their life with a serious disadvantage.

Although there are no consistent measurements of the prevalence of underweight in women of reproductive age in Laos, comparison to previous measurements indicate that the prevalence may be the same or slightly decreased since 1995. Some geographical differences exist in the prevalence of underweight of women of reproductive age, with a trend (only some are significant) of lower prevalence in the northern highlands and lowlands, and in the Vientiane Plain.

It can be concluded from the regression analysis that wealth is the strongest predictor of Body Mass Index (BMI) of all indicators included. However, wealth can be considered a basic factor of nutrition, and is closely related with many of the other indicators considered. So caution is warranted when interpreting these results. Further, improving sanitation may have a positive impact on the nutritional status of women. Higher food consumption (as measured by the Food Consumption Score) may also have an impact on the nutritional status of women.

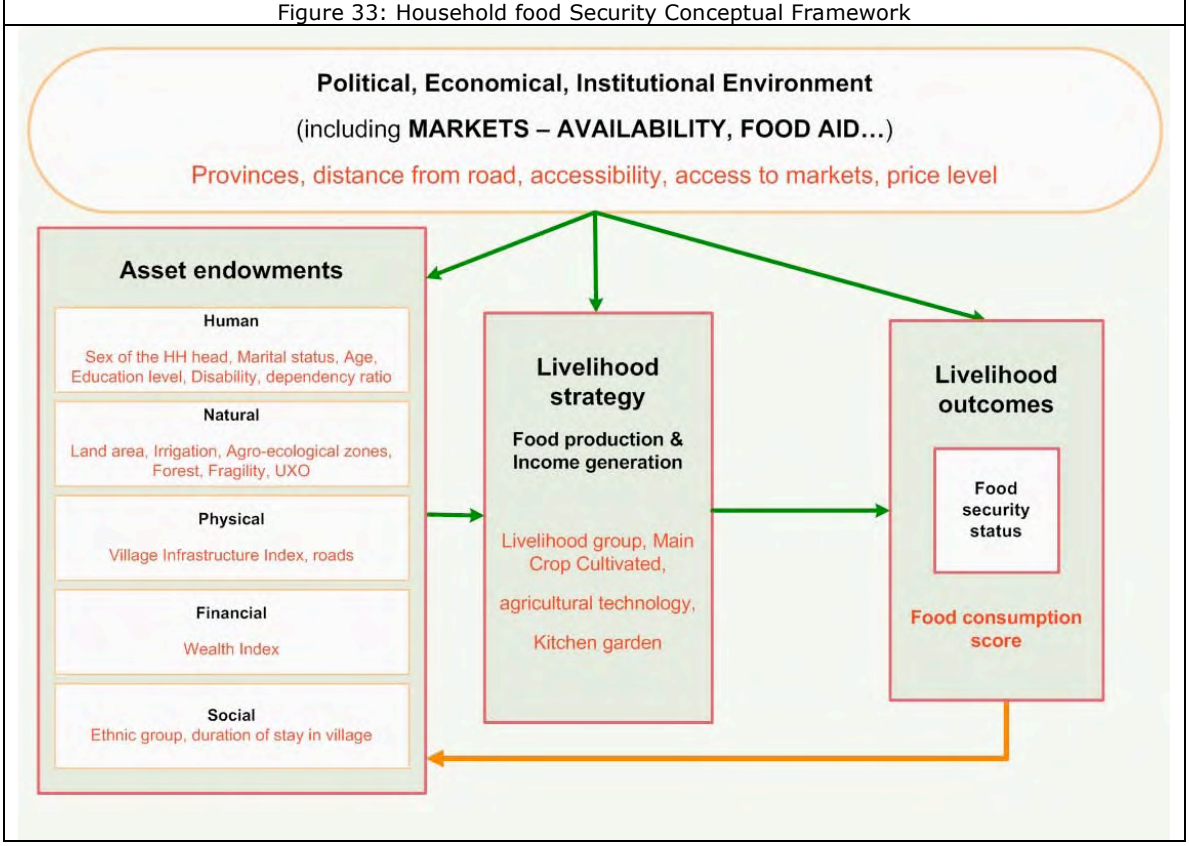
Chapter 8. Determinants of Food Security

This chapter looks at why some households are food insecure and others are not. To answer this question, regression analysis is used to isolate the key underlying factors affecting food security.

8.1. The Household Food Security Conceptual Framework

The Household food Security Conceptual Framework is the basis for the causal analysis. Based on this framework, indicators for the underlying causes for the observed variation in food security are selected from the household survey, community questionnaire and from geo-referenced secondary data. These indicators are specific for the Lao context.

Figure 33: Household food Security Conceptual Framework



We are using the General Linear Model (GLM) (integrating Multiple Linear Regression with ANOVA) which allows for factorial and continuous independent variables at the same time. The dependent variable (linear) which the model tries to explain is the Food Consumption Score. The independent variables (linear – categorical) are indicators of asset endowments of the households, of the political, economic and institutional environment they are in, and of their adopted livelihood strategies.

The GLM[134] allows assessing the effect of each "determinant" (or independent variable) on food-consumption while controlling for all the other factors in the model. As such we can study the "net effect" of each underlying cause without confounding this effect with the influence from other factors that might be correlated with the particular cause under study. The model fits reasonably well for a household survey (R^2 = 0.269 - see summary tables on main effects and regression coefficients (see annex 4). Two variations of the model are given. A third

[134] SPSS 14 GLM for complex samples is utilised to analyse the data.

model includes factors related to agriculture and includes only those households who are to some extent involved in agriculture.

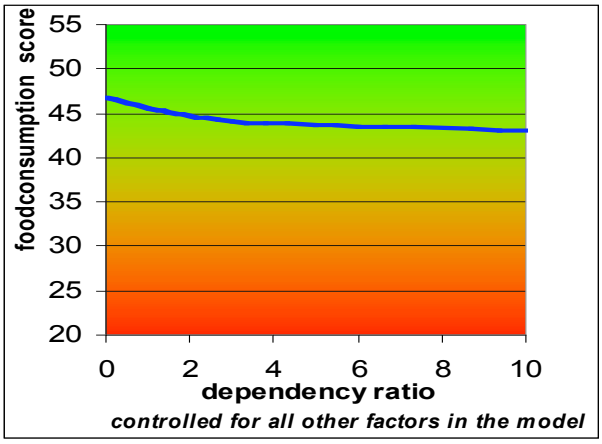
However, not all factors show the expected effect in this data set: no statistically significant effect was observed from the age or sex of the household head, mechanisation level; marital status, educational level, the main crop cultivated. Even the land area under cultivation, the use of pesticides and irrigation did not yield any results. The distance to the district market and the kind of road that services the village also did not show any significant effect. The same is true for the presence of UXOs and the distance between the village and the forest.

Hence, all these factors are only weak underlying causes of differences in food security in the rural Lao context. However, they may still be associated with food insecurity. For instance, single headed households are also more food insecure because they have a higher dependency ratio and lower education level. Other non-significant factors are partly captured by other factors in the model. For instance, forest cover is associated with the agro-ecological zoning and with the sloping gradient of the area. The observed effect of agro-ecological zoning hence includes access to forest resources.

8.2. General Findings from the Model

8.2.1. Effect of the dependency ratio on household food security

Figure 34: Dependency ratio effect on food security

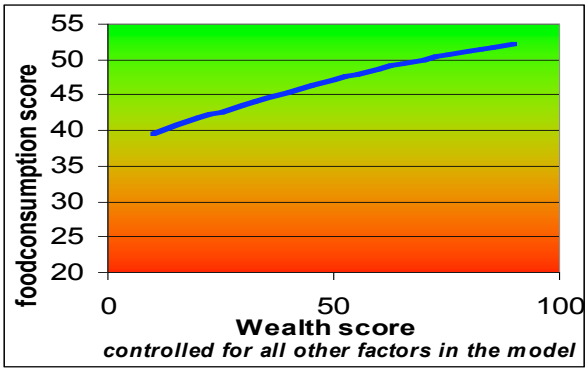


A high dependency ratio (number of dependents / number of healthy adults) has a negative effect on household food security. More mouths have to be fed by fewer providers.

Other family characteristics, such as the education level of the household head are also important. However, this indicator does not yield any statistically significant results in the model. On the other hand, it should be kept in mind that the education level is associated with for instance the livelihood strategy of the household which, in turn, is a strong determinant of food security.

8.2.2. Effect of household asset wealth on household food security

Figure 35: Wealth effect on food security status

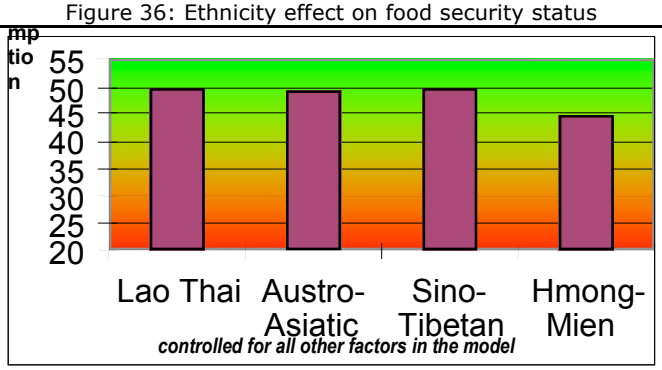


Asset wealth (such as quality of housing and possession of assets) has a strong effect on food security. It permits productive investments and hence a better production. It also offers possible coping strategies in case of problems, allowing households to draw on their reserves. However, household wealth is also affected by the "backward link" in the conceptual framework and it is an indicator of past successful livelihood strategies.

It is therefore difficult to ascertain whether asset wealth is a determinant of food security or an outcome of successful livelihood strategies.

8.2.3. Effect of the ethnicity of the household on their food security

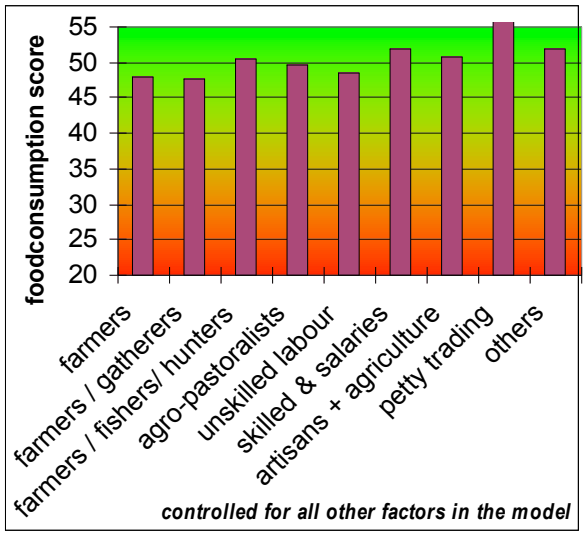
Figure 36: Ethnicity effect on food security status



After results are corrected for all other associated factors, the Hmong-Mien are still more food insecure than the other ethnic groups. This is caused by other causes than the ones already included in the model, associated with the Hmong-Mien, such as reduced opportunities or cultural practices.

8.2.4. Effect of the livelihood strategy on household food security

Figure 37: Livelihood strategy effect on food security



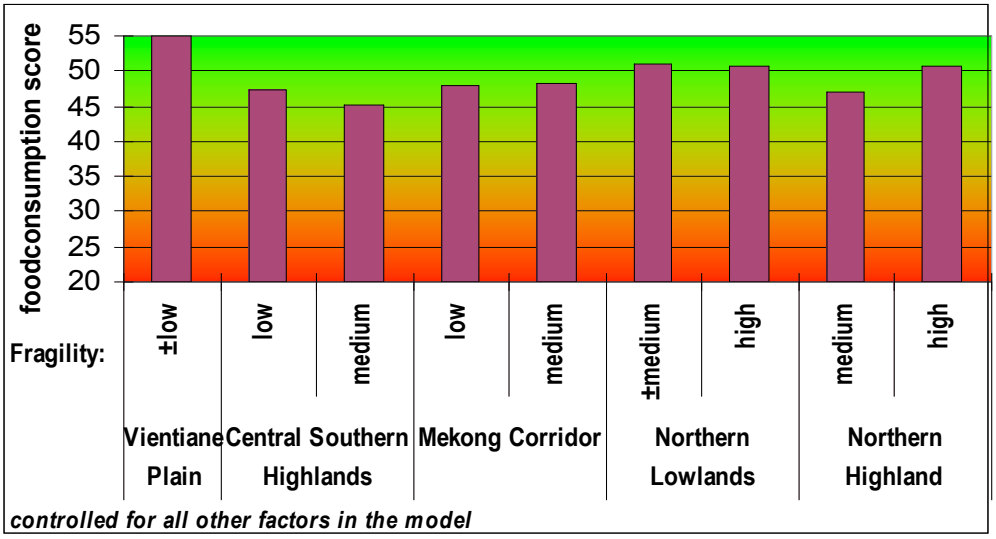
Which livelihood strategy a household chooses is clearly affecting the food security outcome. This choice may be voluntary, but in many cases it will be severely limited by the livelihood assets a household has at its disposal. The results of the analysis show that farmers are worse of, except if they also rely on fishing or hunting or on livestock raising. Unskilled labour is also a livelihood strategy that is performing worse than the rest. Petty trading, on the other hand is a better performing livelihood strategy. This analysis shows the importance of livelihood strategies for food security outcomes. Changing ones livelihood strategy is not an easy task, though, as it depends on the assets at ones disposal.

But it points to the fact that ensuring long-term food security will require a full understanding of different livelihood opportunities, and how promoting certain assets, be they natural, physical, human, social or financial, could enhance these opportunities.

Typically this will involve education and development of physical infrastructure and institutions. For example, the presence of a kitchen garden improves the food security of the household, by increasing the food consumption score with 2 points. This is the equivalent of two extra days per week with consumption of vegetables.

8.2.5. Effect of the agro ecological zoning and the slope on household food security

Figure 38: Agro ecological zoning effect on food security



The Vientiane plain, with little or no slope, (Low fragility: <30% of fragile lands) has the best agro-ecological circumstances for food security. This is probably linked to higher production potential, especially for paddy production. In addition, the access to land is not so much restricted by the presence of UXO as other low-lying areas. The parts of the Central Southern Highlands with medium fragility show the lowest food consumption score. In the northern lowlands and highlands, the highly fragile areas are as food secure as the medium fragile ones. This could be due to the fact that livelihoods in these areas are adapted to the natural conditions, taking advantage of the possibilities that these conditions give them.

8.3. Findings for Agricultural Systems

In a variation of the model, the initial model is complemented with some agricultural factors and test only households with some agricultural activity.

Upland agriculture is a livelihood strategy that does not provide as much food security as paddy cultivation. Households exclusively cultivating paddies are better off, as this type of rice production has approximately double the yield of upland farming. However, rather unexpectedly, no significant effect from irrigation is observed. This does not mean that movement of people from high-lying to low-lying areas and a shift from upland to paddy farming is the obvious solution. There may not be sufficient land available for new paddy producers, and often new farmers lack the necessary skills and resources to take up new farming techniques effectively.

Figure 39: Agricultural system effect on food security status

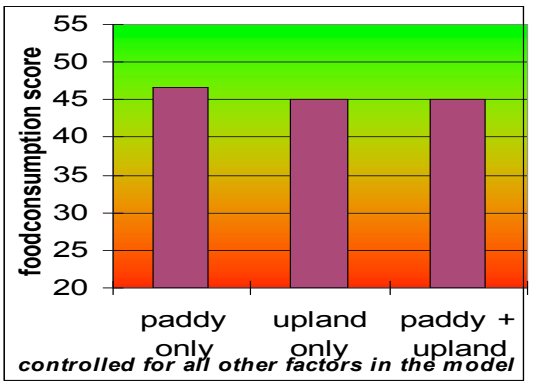
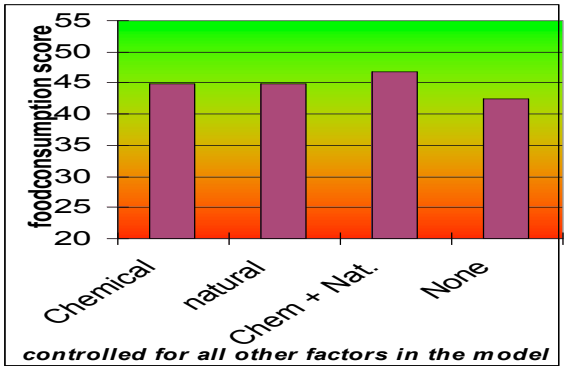


Figure 40: Fertilization of crops effect on food security status

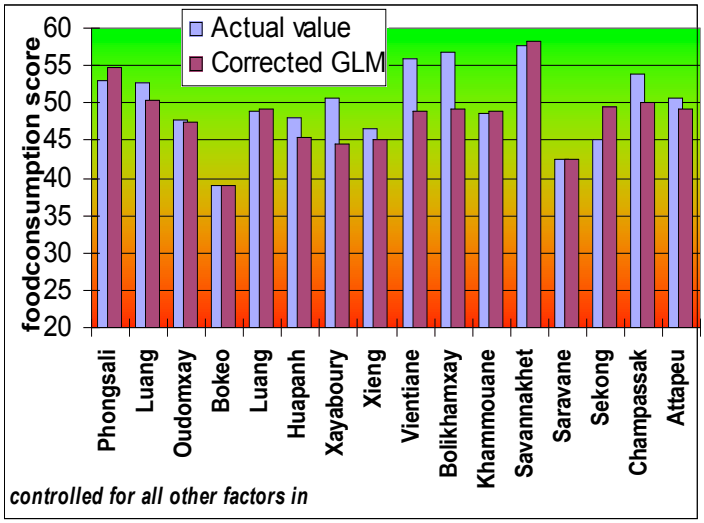


Rather, a focus should be kept on analyzing the livelihood opportunities already existing in the different parts of the country, and try to strengthen assets that are important for taking advantage of these livelihood opportunities. This could be as much a question of human, social and financial capital as a question of natural capital.

It seems that the recommended practice of using **chemical fertilizer together with manure and compost leads to better food security** than when no fertilizer at all is applied. No similar effect was observed for the use of pesticides.

Aside from the variation in food security caused by the agro-ecological conditions, other geographical factors, not described in the model, have an impact on food security: for instance, **the provinces of residence** have a strong additional effect on food security.

Figure 41: Effect of province of residence on food security status



Households living in Savannakhet and Phongsaly have a better food security than would be expected from all the other conditions and strategies that are already described in the model. In Bokeo, households have lower food security than predicted by the other factors in the model.

The intrinsic value of for instance Vientiane is not that high, because it is already situated in a very favourable agro-ecological zone, the Vientiane plain, which effect is already taken into account.

Summary: Chapter 8

The analysis conducted in this chapter shows the strong effect of asset wealth on food security. In addition, the livelihood strategy that a household employs will affect the food security outcome. Households involved in non-farming activities such as petty trading and skilled and salaried work have a better food security than purely farming households, although households engaged in unskilled labour are also not doing well. However, among the farmers, involvement in additional activities such as fishing and hunting clearly did better than pure farming households. Analysis of different farming systems shows, unsurprisingly, that paddy farmers are doing better than upland farmers. Geographical differences are also having an impact, through the sloping of the land and other factors not captured in the model.

This shows the importance of understanding livelihood opportunities in different locations in the country, to better guide what type of interventions could help promote better food security. These livelihood opportunities may be enhanced if certain assets are strengthened. A livelihood strategy that is currently not providing food security or not available to many households may work better or become available if crucial assets for these activities are enhanced.

Chapter 9. Risks to food security

9.1. The approach[135]

9.1.1. Risk analysis

The objective of risk analysis is to identify populations that are likely to experience declines in their future food security status due to effects of a particular hazard/shock. Risk analysis could identify geographic areas and populations at risk, enabling decision makers to define proper interventions, highlight the key factors contributing to increased vulnerability among households and estimate the potential effects of these factors on households. The analysis has 3 main stages: first, the occurrence of various hazards, their geographical and temporal extent and their historical impact is studied. Next, the analysis puts the emphasis on households' vulnerability to a particular type of shock. Finally, from the first two steps, it is estimated that vulnerable those households who live in areas exposed to a particular hazard are at risk.

Definitions:

- Hazard (hazard risk): probability of occurrence of a potentially damaging phenomenon within a given time period and area.
- Vulnerability: increased susceptibility of households to the impact of specific hazards.
- Risk: probability of harmful consequences, or expected losses (specifically with regards to food security) resulting from interactions between hazards and vulnerable conditions.[136]

It is difficult to evaluate the magnitude and extent of a specific shock, be it from natural hazards or human induced ones. Therefore it is hard to estimate the impact of shocks on populations and their livelihood. In case of any shock, a specific follow-up assessment is always needed and **the analysis presented below remains indicative**. Moreover, some thresholds are based on subjective choices and **the numbers should not be interpreted as absolute, but rather as relative in order to compare risk between regions and populations groups.**

9.1.2. Vulnerability analysis

Vulnerability to becoming food insecure because of a particular shock depends on the exposure of a household to that shock and on its capacity to cope with the effects of the shock. **Exposure** to a shock depends mainly on how extensively households depend on livelihood activities that will be negatively affected by a particular shock. For example, farmers are more exposed to droughts than petty traders. For this reason households reduce their exposure (ex ante) by diversification and try to depend on various livelihood activities that are exposed differently to hazards.

The coping capacity of a household depends on the strategies it deploys to obtain sufficient food, in spite of the effects of the shock. The coping capacity is strongly associated with the wealth and assets of the household, but other, not captured factors, such as social networks or access to forest resources, are also important. Moreover, households who are currently food secure (as reflected by a high value of the food consumption score) are less likely to slide into food insecurity because of a shock. Hence households with high exposure to a shock and weak coping capacity (low wealth, borderline food consumption) are **vulnerable** to that shock.

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[135] More details on the approaches/methodology and results can be found in Annex 5.
[136] Risk can be understood as *Risk = Hazards x Vulnerability*. For more general definitions, see also UN-ISDR: Terminology on disaster risk reduction.

Further, if the probability of a severe shock occurring to them is high, the risk for food insecurity of these households is also high.

9.2. Various Hazards in Laos

Table 23: Summarized Table of Natural Disasters in Lao P. Dem Rep from 1966 to 2002

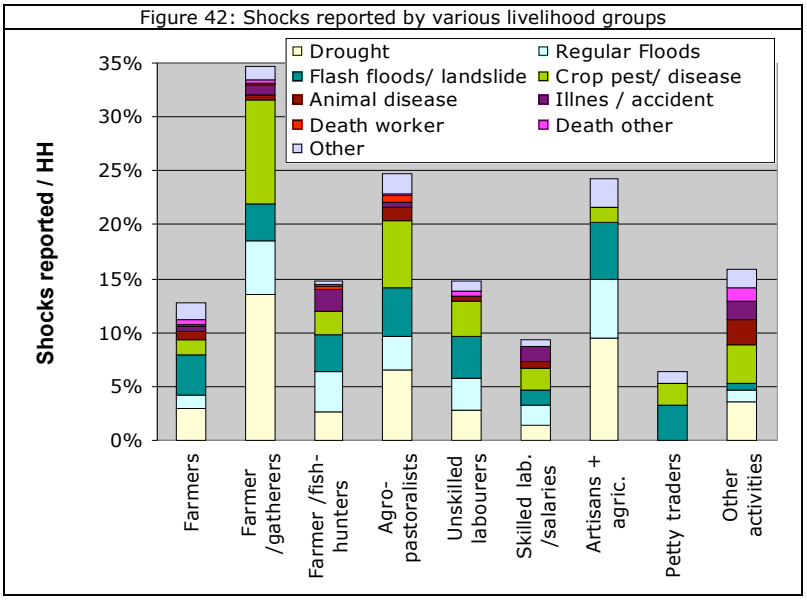
	# of Events	Total Affected
Flood	16	3,244,150
Epidemic	7	19,929
Drought	5	4,250,000
Wind Storm	4	1,307,312

Source: "EM-DAT: The OFDA/CRED International Disaster Database

Climate risks are not new to farmers of the lower Mekong. For example, midseason dry spells that can damage young plants and late-season floods just before harvest that can cause severe crop loss are recurrent threats to this livelihood.

In the household survey, the households were asked to report shocks they experienced during the previous year. Although, only 16% of households reported one or more shocks last year, the most common shocks reported were also drought, floods (regular and flash-), crop pests and diseases. The number of households affected by shocks varies greatly depending on the livelihood strategies; in fact shocks are experienced differently depending on the household's activities.

Figure 42: Shocks reported by various livelihood groups



As a consequence, 34 percent of farmers, who rely more on gathering for their food, and 23% of farmers/artisans and agro-pastoralists reported at least one shock whereas skilled labourers and petty traders seem to less frequently experience shocks than the rest of the population. As noted above, this is not surprising as most of the shocks are natural hazards that have a higher effect on farming activities than on non-farming activities.

9.3. Household's Capacity to cope

Those households who reported shocks (16 percent of the whole sample) also indicated which coping strategies are applied to handle the effects of the shock(s) experienced in the last year. Even if it represents only a slight proportion of the sample, mainly because covariate shocks like drought and flooding were not very common and probably not as severe as in previous years, some trends in the use of coping strategies can be extracted from the analysis[137].

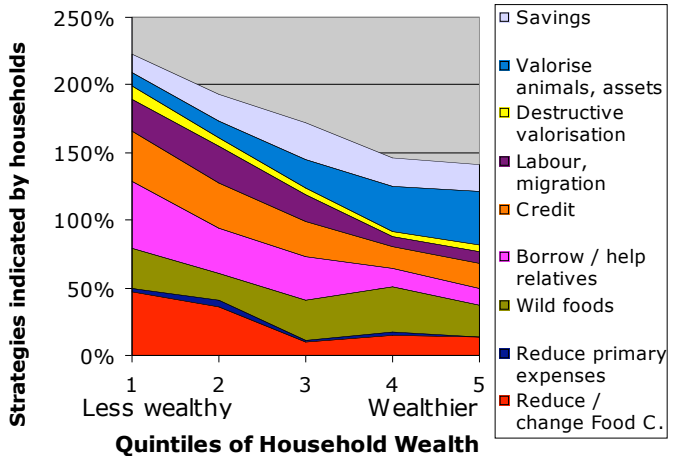
[137] The occurrence of various coping strategies is shown in annex 5.

The most common coping strategies employed regardless of the shock experienced are the reduction or change of food consumption, borrowing and help from relatives and friends, consumption of wild foods and the use of credit. However, the use of savings seems to be less common for slow onset covariate shocks such as drought, crop pests and diseases and regular floods, whereas it is more used for flash floods and land slides.

Households use a variety of coping strategies. It should also be kept in mind that not all households have the opportunity to employ the same strategies.

The choice of coping strategy depends on the common livelihood orientation of households. Unskilled labourers regularly work for food and migrate, agro pastoralists more often sell livestock and petty traders frequently use savings. It is worth mentioning that all groups to some extent rely on gathering of wild foods as a coping strategy; in particular the farmers/gatherers. This coping strategy may become less available as access to forest resources is under permanent threat, forcing households to look for other ways to compensate for losses due to shock.

Figure 43: Coping strategies by asset wealth



Asset poor households employ more strategies at the same time to cope with a shock. The types of strategies these households use, illustrate the difficulties the households have in coping with in the aftermath of a shock. Half of those households reduce or change their food consumption; they have to rely on neighbours and friends and get, if possible, food on credit. On the other hand, the wealthier households can more easily deal with the effect of a shock. They often sell some assets or use their savings.

Households with a better wealth status have also more often relatives who migrated and are capable of sending remittances if need arises. Asset wealth may therefore be a useful proxy[138] for coping capacity during vulnerability and risk assessment.

9.4. Analysis of the risk of drought

Meteorological drought was defined as a sustained period (three months or more) in which monthly precipitations at a given location are significantly below the long-term average. By definition, desert regions are perpetually dry and therefore do not reflect the type of deficient precipitation considered here.

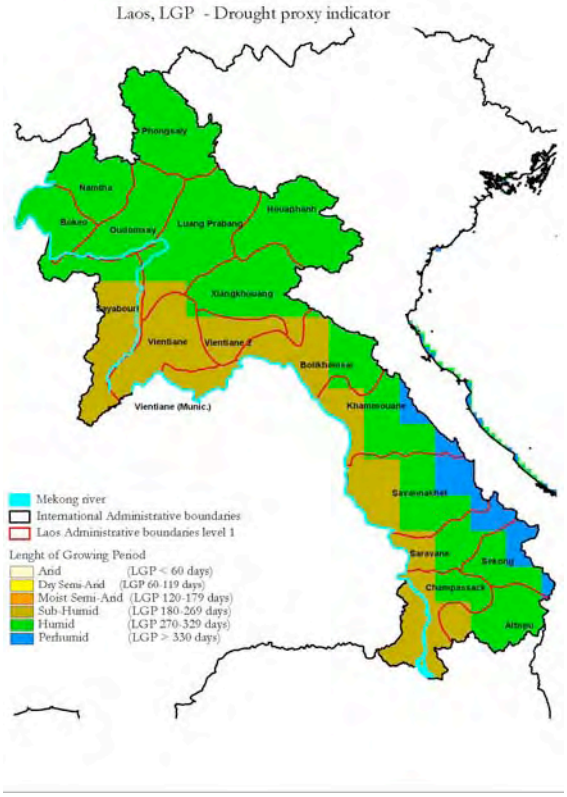
In the 1966 to 2002 period, for every year, at least part of the country was affected by either drought or flood, or a combination of both. The potential impact on rice production was dramatically demonstrated shortly after the LPRP came to power in 1975. In 1977, severe drought conditions throughout the country reduced the national rice harvest by 40% relative to that of 1976 (which was already a year of deficit), with some southern provinces experiencing a decline of up to 95%[139]. It was estimated that more than 350,000 Mt of rice aid were required to prevent famine conditions in 1977.

[138] Some coping strategies like the possibility to rely on local networks are difficult to assess. It might be that these possible coping strategies are not correlated with household wealth. The proxy might overlook them.
[139] Evans (1988)

In 1978, a disaster of the reverse order—serious flooding— occurred. In some areas of central and southern Laos, crop losses in the range of 90% were reported. At the time, it was estimated that half the population was potentially affected by famine conditions. In both years, without reserve stocks of rice, the government depended on rice donations from the international community to avert potentially serious catastrophes. It was partly in response to the impact of the 1977 and 1978 disasters that the government initiated the agricultural cooperatives movement in an effort to improve rice production and achieve a higher level of rice self-sufficiency. In 1988 and 1989, severe droughts cut annual yield by about one-third, again forcing the government to rely on food aid for its domestic requirements.

Areas affected by droughts are difficult to be detected with precision, so the Length of Growing Period has been chosen as proxy for drought. From literature review, droughts occur throughout the country but mainly in the lowland areas, as shown in brown colour on Map 2.

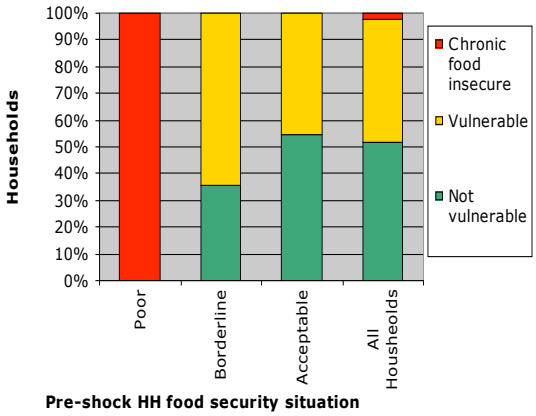
Map 2: Drought prone areas in Laos.



9.4.1. Household vulnerability to drought

Household's vulnerability to drought is therefore proportional to the exposure of their livelihoods (non irrigated agriculture, farm labour) to drought and to the resilience of the household. It is estimated that **46% of the rural population in Laos is vulnerable to drought** most of which are located in the lowlands areas and especially in the southern regions of the country and in the province of Xayabury and Luang Pradang, in addition to the 2% who is considered chronically food insecure. Almost all households vulnerable to drought are farmers and (agricultural) unskilled labourers. 12% of agro-pastoralists are also considered vulnerable to drought. A severe drought would hardly affect the other livelihood groups if a shock would occur.

Figure 44: Vulnerability to becoming food insecure from drought in relation to pre-shock food security



9.4.2. Household food security at risk because of drought

Population at risk are households that are vulnerable to becoming food insecure because of drought and that live in areas where the hazard to drought is important. It is estimated that around **188,000 households are at risk for their food security because of drought**.

These vulnerable households mostly live in the South West in Savannakhet, Saravane, Champassak, and also in the West in Xayabury and Vientiane. They are very different from the ones considered chronic food insecure, in the North and South East of the country.

Map 3:Households at risk to become food insecure because of droughts

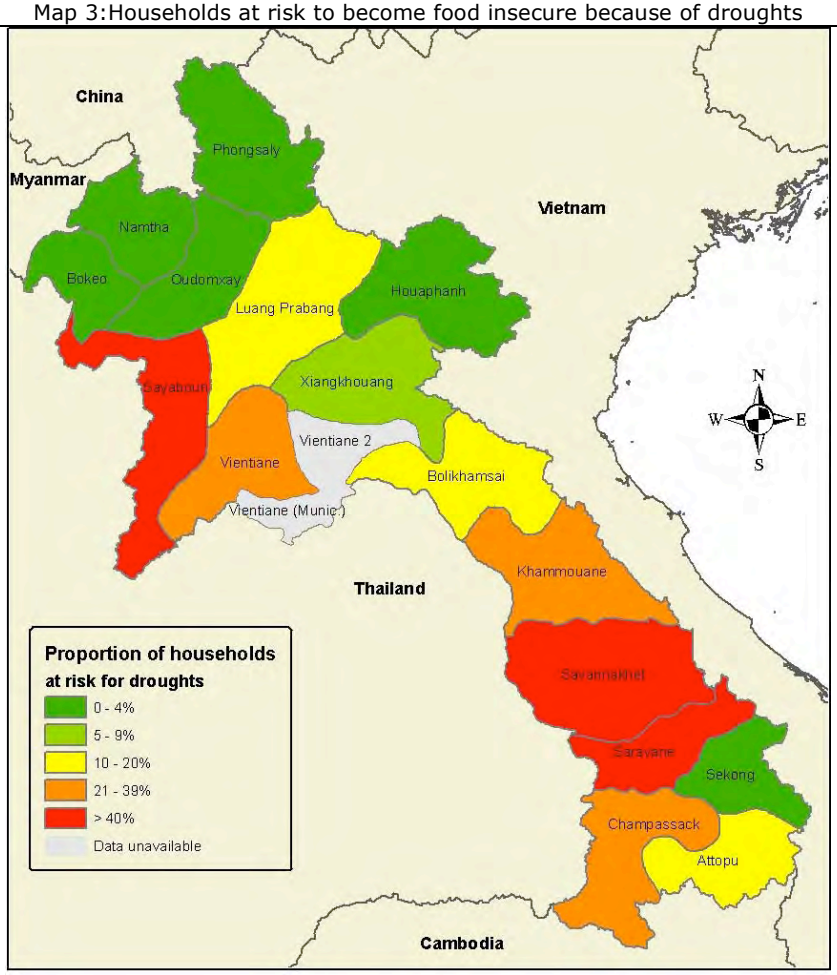
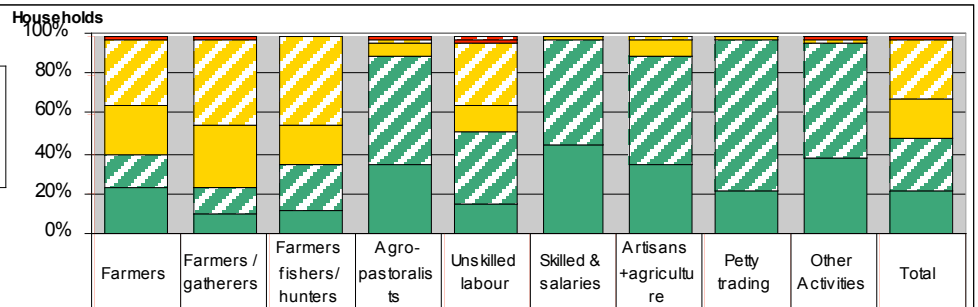


Figure 45: Drought: vulnerable households and households at risk, by livelihood group



	Farmers	Farmers / gatherers	Farmers fishers/ hunters	Agro-pastoralists	Unskilled labour	Skilled & salaries	Artisans +agriculture	Petty trading	Other Activities	Total
Chronic + drought prone	2	1	0	0	1	0	0	0	0	4
Chronic. food ins.	5	2	0	1	1	0	0	0	1	9
Vuln + drought prone	79	59	42	2	12	0	0	0	0	195
Vulnerable - no drought	60	44	18	5	5	0	1	0	0	133
Not Vul + drought prone	38	18	21	38	14	14	7	12	18	180
Not vulnerable - no drought	57	16	12	24	5	12	5	4	12	145

in thousands of households

As shown on Figure 45, the households at risk to drought belong mainly to the livelihood group of farmers, farmers/gatherers and farmers/fishers/hunters, since they to a large extent depend on rain fed agriculture.

9.5. Analysis of the risk of flood

A flood is here defined as an unusual significant rise of water level in a stream, lake, reservoir or coastal region, potentially resulting in significant losses[140].

Flooding is the main natural disaster in the country, both in terms of frequency and consequences. The most severe floods in the country during the last 40 years occurred in 1966, 1978, 1983, 1990, 1991, 1993 and 1995. Usually, floods happen from August to September in the central and southern provinces of the country.

Table 24: Number of floods since 1966 in Lao PDR

Province	**Number of events since 1966**	**Districts**
Province	**Number of events since 1966**	**Districts**
Vientiane	3	Keo oudom, Phonhong Thoulakhom
Vientiane Capital	8	Naxaithong, Sikhottabong, Chanthabuly, Sisattanak, Xaysetha, Xaythany, Maypakngum, Hadxaifong
Borikhamxay	3	Thaphabath, Paksane, Pakkading
Khammuane	3	Thakhek, Nongbok, Xebangfay
Savannakhet	4	Xaybuly, Champhone, Songkhone, Xonbuly

The annual floods along the Mekong are looked upon as part of the natural landscape, and communities have lived with the yearly pulse of flooding for generations. Villagers recognize the benefits of flooding, such as the increased availability of fish and other aquatic species in wetlands. Even though they might loose the rice crop during a flood, the next year's rice production is likely to improve. While there are many factors that contribute to an individual's resilience following a flood, such as health, age, and gender, the question of livelihoods is ultimately played out at the household level. Family members rely strongly on each other to share income and labour, and it comes down to the families as a whole that are affected. Their combined assets before and after an event determine their vulnerability to floods[141].

Floods, as they occur in this region, do not often lead to deaths. However, the bigger ones do cause a large amount of housing damage, loss of equipment, and other asset damage that can have longer-lasting impacts on household's well being. According to CRED[142], the number of people affected in each major flood disaster ranged between 2,000 up to more than 590,000. Although rice losses and paddy field damage is a common and immediate impact on the household, most villagers reported that losing livestock was the most serious blow to long-term livelihood and family security. In Lao PDR, as in many other developing countries, the family's buffalos and cows are used as a saving mechanism. When a disaster strikes or there is a medical emergency, families rely on the sale of livestock for large expenditures. They act as a safety net and are often the most valuable asset in the household. Across all wealth categories, the average family lost half of its cows and/or buffalos in the 1996 flood. Considering that in rural Lao PDR, one buffalo can buy enough rice to feed four or five people for an entire year (WFP, 2001), this is a serious setback in the family's savings. Cows and buffaloes also play a key role in livelihood as draught animals in the paddy fields. Following a flood, sanitation is a major concern in the village. People reported a number of gastrointestinal diseases that would persist for weeks after a flood. In addition to human health impacts, diseases also struck many of the animals surviving a flood.

All households in a flooded area will be affected, irrespective of their wealth status and choice of livelihood strategies. However, households will however be worse off if they depend on

[140] The definition is very similar to the one in the EM-Dat Disaster Database
[141] Source: http://www.mekongwetlands.org/Common/download/Laos_Vulnerability_Assessment_w_cover.pdf
[142] CRED – Number of people affected between the years 1966 – 2002. Source: http://www.em-dat.net/disasters/Visualisation/emdatselectors.php;

agricultural crop production, livestock production, labour and other activities inside the flooded area. In view of the above, all households living in flood prone areas are considered to be "at risk".

9.6. Analysis of the risk of loss of natural resources

Natural resources are in general decline in Laos[143]. The strict enforcement of the National Biodiversity Conservation Areas (NBCA), is supposed to introduce a more rational management of natural resources; the NBCAs being a source area, allowing the dispersal of wildlife via corridors to other areas (sink areas) but could also in the short term have an impact on the sources of food and income available to the local occupants as gathering of forest products, hunting and removal of plant and animal species are forbidden in the restricted areas and corridors[144].

This means that households affected by overall degradation of forest resources or by reduced access to natural resources would mainly miss out in their diet on vegetables and aquatic food, fish and some wild meat. A limited number of households would also forgo cash income from selling forest products.

Overall, based on how much household diet depends on natural resources and their capacity to cope with the loss of these resources, it is estimated that **around 157,000 (±20,000) households, or 24% of rural Laos, are estimated to have food security problems if fishing, hunting and gathering were reduced**. However, complete degradation of forest resources is a slow, gradual process and access restriction to NBCAs would only affect a small portion of the population currently hunting and gathering in these areas hence, the likelihood of such a sudden occurrence is low for these households. If however nothing is to be done, it would be a serious threat in the long term.

[143] Ministry of Agriculture and Forestry, (2005)
[144] Ministry of Agriculture and Forestry, (2003)

Map 4: Vulnerability of households to restricted forest access (excluding chronic insecure)

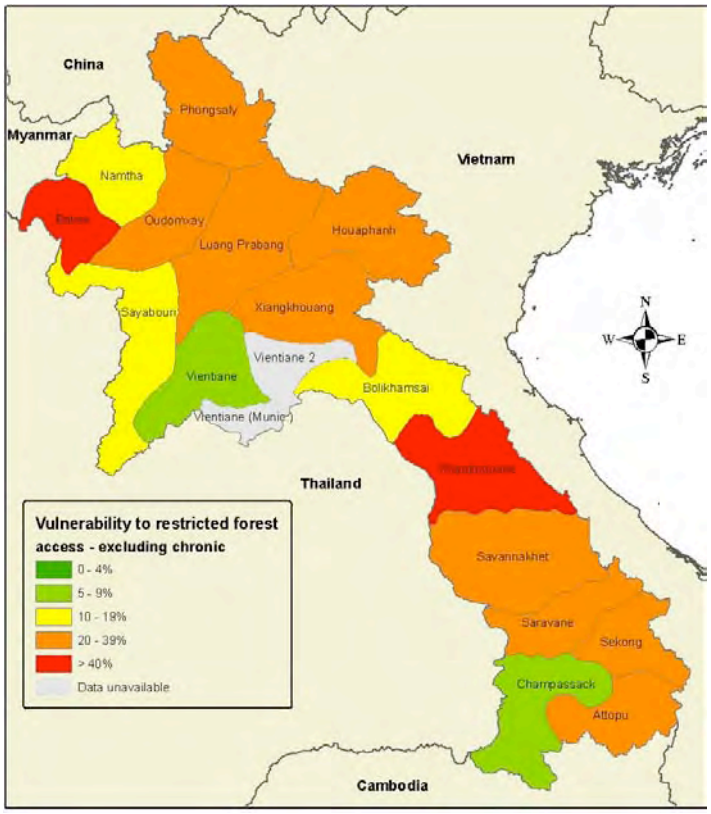
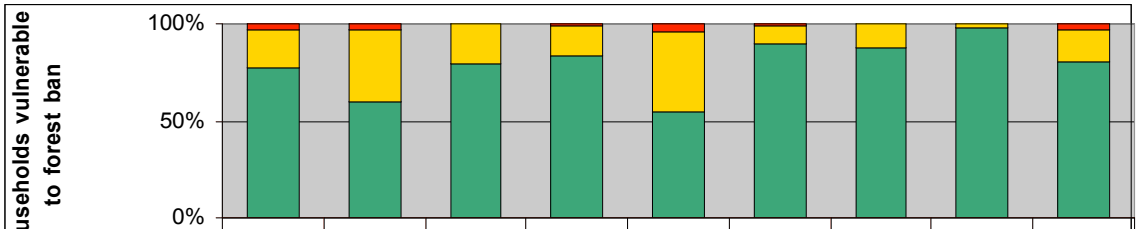


Figure 46: Vulnerability of livelihood groups to lack of access to forest resources



	Farmers	Farmers / gatherers	Farmers fishers/h	Agro-pastorali	Unskilled labour	Skilled & salaries	Artisans +agricult	Petty trading	Other Activities
Chronic. food ins.	7	4	0	1	1	0	-	-	1
Vulnerable	49	53	19	10	16	3	2	0	5
Not vulnerable	184	84	74	58	20	23	11	16	25

in thousands of households

Most of the vulnerable households are farmers with one out of four being vulnerable to restricted access to NBCA. Among them, the unskilled labourers (42%) and the farmers/gatherers (37%) are especially vulnerable. The unskilled labourers, specifically the non-agricultural labourers group, as shown in chapter 5.3 get one fifth of their food from gathering. Long term effects of eventual restrictions would depend on how the households could adapt or develop new livelihood strategies.

9.7. Analysis of the risk of staple food price increase

Hazard is based on the market analysis. The areas around Luangprabang have higher prices than the rest of the country, especially in the lean season. This area is a net importer of rice. A second factor is the accessibility of village markets, nation wide, assuming that inaccessibility leads to bad market integration, hence higher volatility and hence higher prices during lean season. Accessibility also changes during the year.

Household's vulnerability depends on how the household's livelihood is exposed to price shocks and on how well households can cope with such an increase.

- Exposure: households who rely on the market (possibly by early depletion of harvest stocks) are more exposed to an eventual price shock.
- Coping capacity: households who are wealthy and who are currently food secure will cope better with an eventual shock
- Vulnerability: the proportion of the budget households would spend on rice after a serious price increase is the basis to classify them as vulnerable or not, taking into account their coping capacity.
- Risk: Households at risk are the vulnerable households living in areas with a serious price hazard (= inaccessible markets or the region known for high price increases). The risk was assessed during the time of the survey (one month after harvest), 5 months after harvest and 11 months after harvest.

9.7.1. Hazard of food price increase

In the markets section (see 3.3.1 - Cereal Self-Sufficiency Status, page 32 – Figure 5: Trends of Food Grain Imports (1995-2005, in '000 tons), price fluctuations of glutinous and non-glutinous rice are shown as strongly correlated[145], therefore the differences between glutinous and non-glutinous rice can be overlooked and we only consider the price increase of rice, in general. Moreover, purchase of maize and tubers is negligible and is especially rare among the most food insecure households. Therefore, from a food security point of view, only exposure to price increases of rice is considered.

Between 2000 and 2005 price rises of around 30 percent were common every season. For example, in 2003 a nation wide increase in the rice price index of 60 percent was observed, from the lowest of the year. In certain regional markets, differences even reached 100%. In rural markets this might have been even more pronounced. Every year, typically in August and September, the most pronounced price increases take place in the reference markets of Luangprabang, as these are rice deficit areas. Hence the hinterland (Luangprabang province, Huaphanh and to some extend Xianghouang) are considered to also be exposed to price increases (as seen in chapters 3.3 and 3.4). The data from the community questionnaire also indicate high prices in these areas. Since other reference markets in the North of the country (Xayabury and Oudomxay) do not show this strong increase, these areas are not considered to be as prone to price increases.

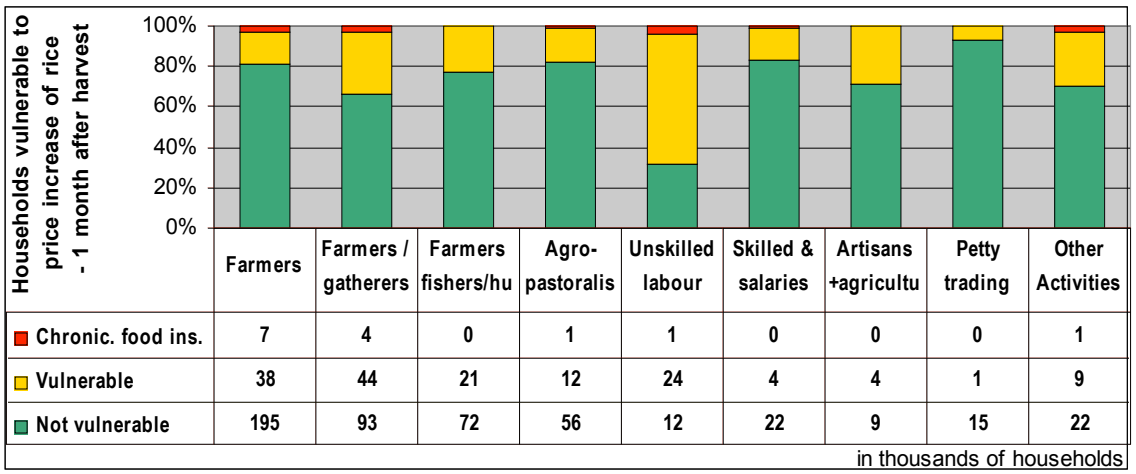
It is assumed that poor access to rural markets destabilises the price as non-integrated markets may have higher variability since trade flows do not help filling the gaps between supply and demand, therefore, areas with bad access to markets during lean season are considered to be prone to high price increases.

Vulnerability to price increase of households is strongly linked to the agricultural season as vulnerability increases when the lean season approaches and when the stocks of many farmers is getting depleted. It is also linked to their livelihood strategies: dependence on the markets exposes a household to shocks particularly if cash income generated is also low. The most vulnerable to price increases would be the unskilled labourers with 64% of them at risk (in addition to the 4% chronic food insecure households). Based on resilience of the

[145] In six of the 8 main markets, the correlation is 0.77 or higher, in Udomxay it is 0.67 and in Luangprabang 0.41.

households, about 23% of rural Laotians are vulnerable to a hypothetical price shock of 60 % around the time of the survey.

Figure 47: Vulnerability of livelihood groups to a price increase of rice



	Farmers	Farmers / gatherers	Farmers fishers/hu	Agro-pastoralis	Unskilled labour	Skilled & salaries	Artisans +agricultu	Petty trading	Other Activities
Chronic. food ins.	7	4	0	1	1	0	0	0	1
Vulnerable	38	44	21	12	24	4	4	1	9
Not vulnerable	195	93	72	56	12	22	9	15	22

in thousands of households

The petty traders, the skilled labourers and the agro pastoralists seem to be less vulnerable to price shocks. It should be kept in mind that as the importance of agriculture inevitably declines in the Lao PDR, more people will find their livelihood outside the agricultural sector, especially for the poorer segments of the population with low education. It can therefore be assumed that the stability of rice prices will be even more important for food security in the future.

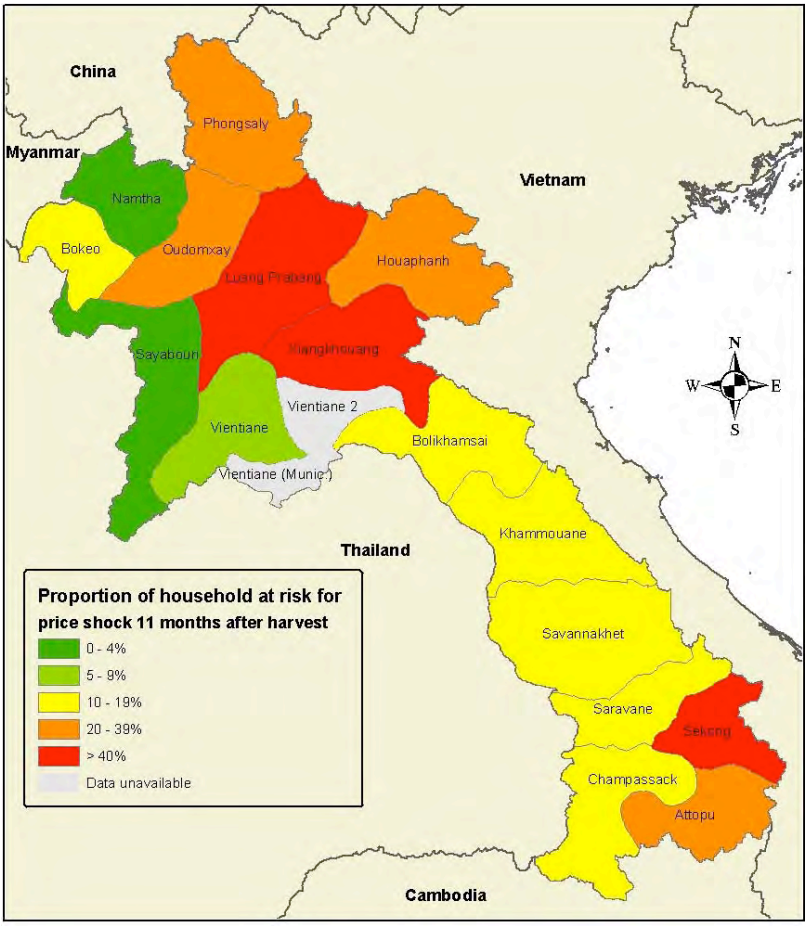
9.7.2. Household food security at risk because of price increase

As described earlier, every year rice prices increase around the months of July, August and September, with about 30% but in the region of Luangprabang this is often 60% or more. The phenomenon can be described as an annual cycle of low prices after harvest and high prices during the lean season. These are price changes for large markets who are relatively well integrated. However, for those villages that have access difficulties during that time of the year one can expect even higher price increases, it is therefore assumed that villages with access problems also know an increase of 60%. Since such a price increase occurs regularly every year in the lean season, the risk for these households will be present every year before the harvest (roughly from July to September) and these households can be considered to suffer from **cyclical food insecurity**.

Moreover, about half of the chronically food insecure live in places likely to be affected by price and market shocks around August. Since these shocks hardly ever fail to occur, these households can be considered to suffer from **composite food insecurity:** on top of their chronic situation, a seasonal condition makes their situation even worse.

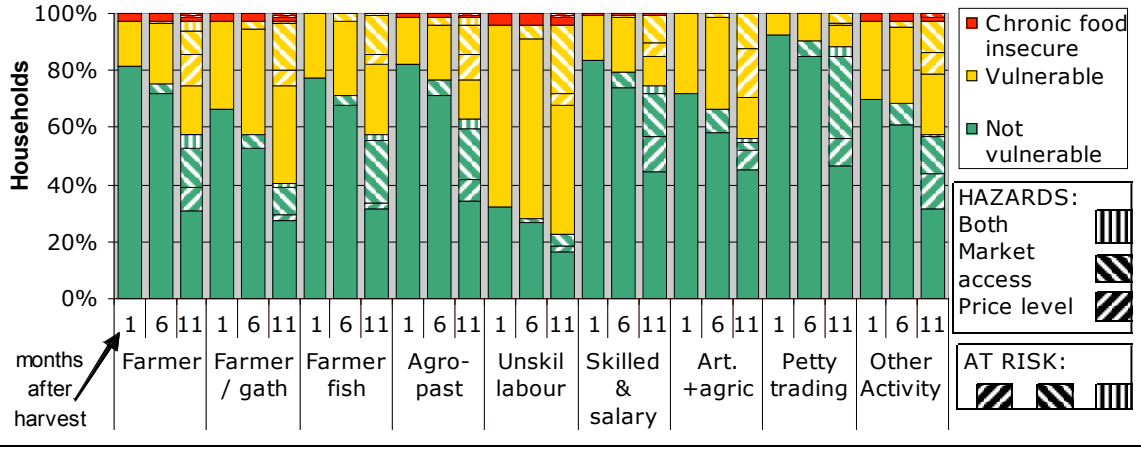
On the other hand, about 155,000 other households live in these price shock prone areas who are not vulnerable to price increases.

Map 5: Households at risk of become food insecure following price increase



Unskilled labourers are the most vulnerable group, 6 months after harvest 68% are vulnerable (73% after 11 months). Those households depending a lot on farming are more often vulnerable 11 months after harvest.

Figure 48: Vulnerability of livelihood groups to rice price increases 1, 6 and 11 months after harvest



Taking the high likelihood of market and price shocks in consideration, between 16 and 27 % of all livelihoods are at risk, or in fact cyclically food insecure. The only exceptions are the

households belonging to the petty traders who would mainly remain food secure. Around 40% of them live in areas prone to price increase, but only very few are vulnerable.

Overall, 21% of the households suffer from cyclical food insecurity (because of prices), especially in the North East of the country, another 1% is chronically food insecure and 1 percent suffers form both cyclical problems on top of their chronic problems.

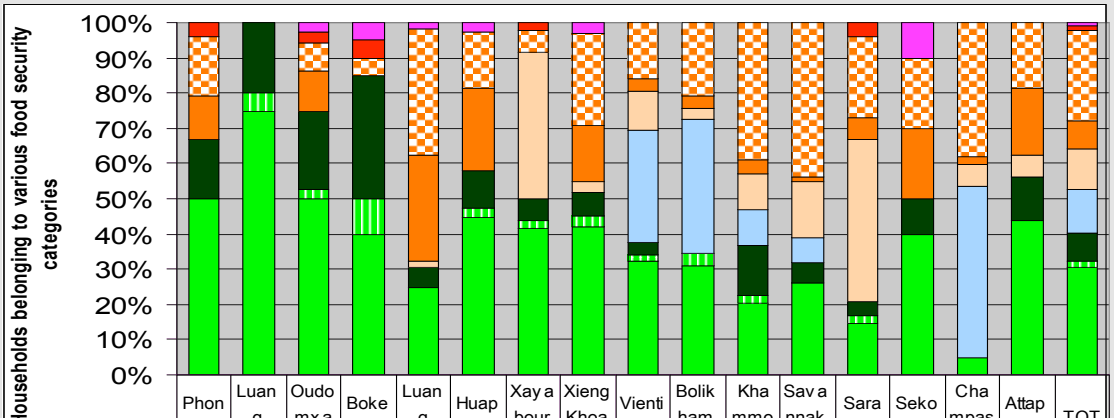
Summary: Chapter 9

Although few households currently show food consumption patterns that would make them food insecure at the time of the survey, the risk analysis conducted in this chapter shows that a high number is vulnerable to becoming food insecure due to different types of shocks.

Only about one third of the rural population of Lao PDR can be considered food secure in the strict sense. The rest of the population faces risks that endanger their food security. One quarter (26%) faces multiple risks ("composite risk"). Another 40% is at risk to become food insecure because of either loss of access to natural resources, flood, drought or the market cycle.

Different types of households are vulnerable to different types of shocks. Households relying mostly on farming and/or hunting and gathering are most vulnerable to natural hazards and loss of access to forests, whereas unskilled labourers in particular, but also farmers, are more vulnerable to price shocks. Drought seems to be the biggest threat as 46 percent of the rural population is vulnerable to becoming food insecure due to this natural hazard. A price increase of 60 percent during the lean season (11 months after harvest) is also likely to cause food insecurity for 43 percent of the population, whereas a similar price increase 6 months after harvest is likely to cause food insecurity for 29 percent of the rural population. Only 9 percent is vulnerable to food insecurity from loss of access to forest resources, but this figure may be understated as explained earlier in the report.

Figure 49: Levels of food insecurity by province



	Phongsali	Luang Namt	Oudomxay	Bokeo	Luang Prab	Huapanh	Xayaboury	Xieng Khoang	Vientiane	Bolikhamxay	Khammouane	Savannakhet	Savane	Sekong	Champasak	Attapeu	TOT
Composite FIS	0	0	1	1	1	1	0	1	0	0	0	0	0	1	0	0	7
Chronic FIS	1	0	1	1	0	0	1	0	0	0	0	0	2	0	0	0	7
Composite Risk	4	0	3	1	20	6	3	8	9	6	19	44	11	2	32	3	172
Cyclical FIS	3	0	4	0	17	9	0	5	2	1	2	1	3	2	2	3	53
Drought risk	0	0	0	0	1	0	20	1	6	1	5	16	22	0	5	1	78
Flood risk	0	0	0	0	0	0	0	0	18	11	5	7	0	0	41	0	81
Vuln. Nat Res	4	4	8	7	3	4	3	2	2	0	7	6	2	1	0	2	55
Borderline FS	0	1	1	2	0	1	1	1	1	1	1	0	1	0	0	0	11
Food secure	12	15	18	8	14	17	20	13	18	9	10	26	7	4	4	7	203

in thousands of households

Chapter 10. Recommendations

This report (see sections on the political and economical environment, determinants of food security and risk analysis) has shown that food insecurity in Lao PDR has many causes and that it can only be adequately addressed through a multi-sector approach. Household food security is inextricably linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. However, stand-alone interventions within any of these sectors will have a limited effect unless the overall policy environment is favourable to food security. It is not enough to just focus on poverty reduction since it is a necessary but not a sufficient condition for improved food security and nutrition, issues that need to be explicitly addressed.

Figure 50: Framework for responses to improve food and nutrition security in Laos

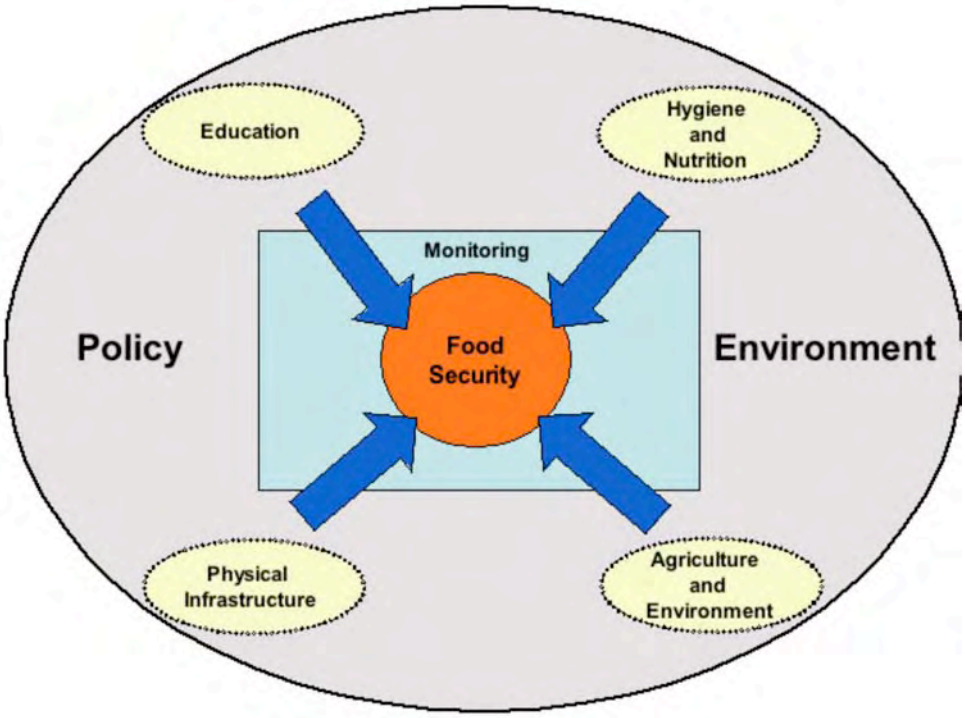


Figure 50 illustrates these relations. The policy environment is central to all efforts at addressing food insecurity as it may facilitate and enhance interventions in any given sector. Investments in the education sector can have a positive effect given that poor education is often the cause of food insecurity and malnutrition. Agricultural production and the environment are also vital both as a source of income and food. Improvements in the rural physical infrastructure will also have a positive effect on food security. Efforts in all these sectors, within a policy environment that puts food security at centre stage, will be necessary to start bringing down the alarming levels of chronic malnutrition among Lao children and providing food security for all.

Overarching policy recommendations are given below. These are followed by overall and specific recommendations within the sectors of hygiene/nutrition, education, agriculture/environment and physical infrastructure. Lastly, recommendations are provided on what should be the focus in efforts at monitoring food security to keep track of progress and inform decision makers about potential threats. Wherever possible, potential key partners or stakeholders, who should have a key role in addressing the recommendation in question, are identified.

10.1. Policy Recommendations to put Food Security at Center Stage

The following high-level policy initiatives are recommended in order to create a favourable environment to address food insecurity:

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
The high levels of chronic malnutrition are not adequately reflected in the latest national poverty eradication strategies	**1. Highest priority should be given to addressing malnutrition**	Decision-makers in Lao Government, donor agencies, UN agencies and other stakeholders	Government of Lao PDR, UNICEF, WFP, Donor agencies
Intake of fat and protein is more important than calories per se. Quality of the diet rather than availability of rice is the key food security issue in Lao PDR.	**2. Expanding food security concepts including awareness of food utilization and dietary quality.**	Decision makers in Lao Government and all stakeholders involved in food security in general, and in particular those responsible for developing the National Nutrition Policy	Ministry of Health, Ministry of Agriculture and Forestry, WFP, FAO, UNICEF
Links to food security need to be clearly defined in the food security relevant sectoral policies and their implementation.	**3. Monitor the impact of policies on food security**	Decision makers in Lao government and all stakeholders involved in food security	National Food Security Committee, FAO, WFP
Vast differences in food security status, nutrition, education, land access, etc. exist between ethnic groups	**4. Address chronic disadvantages among ethnic groups**	Hmong-Mien, Sino-Tibetan and Austro-Asiatic groups	WFP, FAO, UNICEF, GoL and other partners
Strong indications that resettlement may cause temporary food insecurity	**5. Dialogue on the implementation of the resettlement policy**	In situ sustainable development in the uplands and support to the relocating villagers	GoL, UN, donors and partners

10.2. Recommendations on Hygiene and Nutrition Factors

The analysis leads to the following recommendations linked with hygiene and nutrition factors.

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
The rural population should be better informed about the need for consumption of fat and proteins.	**6. General education campaign on nutrition and food consumption**	Country	Ministry of Health, Ministry of Education, Ministry of Agriculture and Forestry, FAO, WFP, UNICEF, NGOs
Households with poor or borderline food consumption show very low intake of fat and protein, and are therefore extremely vulnerable to shocks to their access to food	**7. Include sources of fat and protein (such as vegetable oil, canned fish and/or pulses) in emergency relief and recovery food baskets**	WFP beneficiaries	WFP
Access to and usage of sanitation facilities is very low throughout the country.	**8. Build improved sanitation facilities and provide information on their proper usage**	All rural areas	Ministry of Health, UNICEF, WFP, NGOs
The quality of the water, rather than access to water, is a major food security threat.	**9. Build and provide protected sources of water.**	All rural areas	Ministry of Health, UNICEF, WFP, ADB/WB

10.3. Recommendations on Education Factors

The analysis leads to the following recommendations linked with education factors.

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
The food insecure households are mostly also the uneducated and the illiterate.	**10. Continuation of country-wide programme to bring education and literacy to all people**	Country	Ministry of Education, UNICEF
The non Lao-Tai ethnic groups are disadvantaged when it comes to education.	**11. Special programme in bringing non-Lao-Tai ethnic children to school. WFP school feeding programmes to prioritize these children**	Non Lao-Tai School children	Ministry of Education, UNICEF, WFP
Across all ethnic groups and all provinces, women are lagging in literacy and education. This puts them at a disadvantage in ensuring food security for themselves and their families.	**12. Provide basic adult literacy classes for illiterate women**	Rural women, in particular in the Northern Provinces, but also in other provinces where the gender gap is particularly stark	Ministry of Education (Non-Formal Education Department and the Non-Formal Education Center), UNICEF, WFP, NGOs

10.4. Recommendations on Agricultural and the Environmental Factors

The analysis leads to the following recommendations linked with agricultural and environmental factors.

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
Meat and fish form hunting and fishing are the most important source of fat and protein, two critical components, in the Lao diet. These wild sources are under threat partly due to competing demands on the forests where most of these sources are located, and from population movements away from these sources.	**13. Sustainable management of wildlife and aquatic food resources in accordance with Lao Forest Law and Hunting Regulations**	District and Provincial level authorities	Ministry of Agriculture and Forestry
There are large inequalities when it comes to access to and ownership of land, and the non-Lao Tai ethnic groups are disadvantaged.	**14. FFW programmes that focus on creating access to land through paddy expansion should ensure that all ethnic groups benefit equally from these programmes**	Non Lao-Tai rural households	Ministry of Labour and Social Welfare, WFP
Households with kitchen garden tend to be more food secure. Kitchen gardens may provide vegetables that are vital for people's nutritional wellbeing.	**15. Promote programmes that encourage and facilitate development of kitchen gardens**	All rural households	Ministry of Agriculture and Forestry, FAO, WFP, NGOs

The agricultural-based livelihood systems in the Highlands, in all parts of the country, are more vulnerable to food insecurity than households living in the lowlands.	**16. Promote alternative development programmes in the Highlands**	Remote villages in the Highlands	Ministry of Agriculture and Forestry, UN, NGOs

10.5. Recommendations on physical infrastructure

The analysis leads to the following recommendations linked with physical and market infrastructure factors.

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
Many rural villages struggling with food insecurity are also lacking infrastructure such as roads, schools and health centres.	**17. Rural infrastructure development, especially in areas with high food insecurity**	Remote rural villages	Ministry of Labour and Social Welfare, Ministry of Communication, Transport, Post and Construction, Poverty Reduction Fund, WB/ADB, WFP
There is a need to improve local production and marketing of rice. There is little evidence that local purchases of rice by food aid agencies will significantly distort markets, as it is unlikely that rice or other commodities purchased from food surplus areas would otherwise be accessible to vulnerable groups in food deficit areas.	**18. Local purchases of rice and/or other commodities by Food Aid Agencies**	Food Aid Agencies, Small Scale commercial Farmers	WFP
There are still many food insecure villages without access to roads that hampers their ability to sell and/or purchase commodities from markets.	**19. Road Construction through FFW**	Remote food insecure villages without road access	Ministry of Labour and Social Welfare, WFP
UXO contamination is still a serious threat to food insecurity	**20. UXO clearance of potentially productive land**	Food insecure villages in UXO contaminated areas	WFP, UXO Lao, other UXO clearing agencies

10.6. Recommendation for Food Security Monitoring

The analysis leads to the following recommendations on monitoring changes in and threats to food security.

Cause of the intervention	Type of intervention	Primary target groups	Key ministries/ agencies
There is an urgent need to scale up food insecurity monitoring efforts in the country.	**21. Further develop the FIVIMS structure that has been set up**	Decision-makers in the GoL and Donor/UN agencies	Ministry of Agriculture and Forestry, Ministry of Health, FAO, WFP
Regular monitoring of food security at household level will also improve understanding of seasonal food insecurity patterns.	**22. Regular monitoring of household-level food insecurity across regions and seasons**	Decision-makers in the GoL and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP

Cross-border trade, in some parts of the country, plays an important role in food security, particularly rice.	**23. Cross-border trade monitoring of specific food commodities such as rice and maize to track trade along key borders**	Decision-makers in the GoL and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP
Trade in rice within the country is not well integrated, as there is no smooth flow of surplus production to deficit areas.	**24. Initiate market studies on rice trade within the country informing trade stimulating policies**	Decision-makers in the GoL and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP, Donor agencies
It is important to better understand where there are rice shortages and potential food insecurity.	**25. Set up rice price monitoring system**	Decision-makers in the GoL and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP, Donor agencies

10.7. Follow-up

An evaluation of the status of these recommendations, both in terms of implementation and effects, should be undertaken before the end of 2011, five years after the current CFSVA. WFP should commission this evaluation. This will give an indication on where we stand in the struggle against food insecurity and give direction on what areas will need enhanced focus in the years to come. This evaluation could take the form of a CFSVA with an additional review of the recommendations given in this document.

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