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Data collected in
October-November
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Strengthening Emergency Needs Assessment
Capacity (SENAC)

Lao PDR: Comprehensive Food Security and Vulnerability Analysis (CFSVA)

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All Annexes are available on the CD provided with the report. For any queries on this document or the SENAC project, please contact ODAN_info@wfp.org or visit www.wfp.org/odan/senac

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Currency Equivalents, Acronyms and Abbreviations

Currency Equivalents

Currency Unit	Kip
US\$ 1	9,975 kip (Exchange rate effective November 2006)

Acronyms and Abbreviations

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Area
AHTN	ASEAN Harmonised Tariff Nomenclature
ANOVA	Analysis of Variance
ARI	Acute Respiratory Infection
ASEAN	Association of South East Asian Nations
BMI	Body Mass Index
CFSVA	Comprehensive Food Security and Vulnerability Analysis
CI	Confidence Interval
CPI	Consumer Price Index
CPI	Committee for Planning and Investment (now Ministry for Planning and Investment)
CRED	Centre for Research on Epidemiology and Disasters
DFID	United Kingdom Department for International Development
FAO	United Nations Food and Agriculture Organisation
FCG	Food Consumption Group
FCS	Food Consumption Score
FFW	Food for Work
FIVIMS	Food Insecurity and Vulnerability Information and Mapping System
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
GDP	Gross Domestic Product
GLM	General Linear Model
GoL	Government of Lao PDR
ha	Hectare
HAZ	Height for age z-score (stunting)
HH	Household
HQ	Headquarters
IDD	Iodine Deficiency Disorder
Lao PDR	Lao People's Democratic Republic
LCDC	Lao National Commission for Drug Control and Supervision
LDC	Least Developed Country
LECS	Lao Expenditure and Consumption Survey
LGP	Length of Growing Period
LPRP	Lao People's Revolutionary Party
LWU	Lao Women's Union
MAF	Ministry of Agriculture and Forestry
MFA	Multi-Fibre Agreement
MICS	Multiple Indicator Cluster Survey
MLSW	Ministry of Labour and Social Welfare
MoH	Ministry of Health
MPI	Ministry of Planning and Investment
mt	Metric tonnes
MSG	Monosodium glutamate
MUAC	Mid-Upper Arm Circumference
NAFRI	National Agriculture and Forestry Research Institute
NBCA	National Biodiversity Conservation Areas
NCMC	National Commission Mother and Child
NCHS/CDC	National Centre for Health Statistics, Centers for Disease Control
NGO	Non-Governmental Organization
NGPES	National Growth and Poverty Eradication Strategy
NHS	National Health Survey
NSC	National Statistics Centre (now National Statistics Department under MPI)
NSEDP	National Socio-Economic Development Plan
NT2	Nam Theun 2
NTB	Non-Tariff Barriers

NTFP	Non-Timber Forest Product
OAA	Other Aquatic Animals
PCA	Principal Component Analysis
PRRO	Protracted Relief and Recovery Operation
SD	Standard Deviation
SFE	State Food Enterprise
US\$	United States Dollar
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
UXO	Unexploded Ordnance
WAZ	Weight for age z-score (underweight)
WHZ	Weight for height z-score (wasting)
WB	World Bank
WFP	United Nations World Food Programme
WHO	United Nations World Health Organization
z-score	Standard score, normal score ¹

¹ The standard score indicates how many standard deviations an observation is above or below the median.

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WFP staff that participated in the study design, data collection, analysis and report writing includes:

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Executive Summary

Why do a comprehensive food security and vulnerability study?

This is the first country-wide food security study undertaken in rural Lao PDR. It provides WFP and its partners with a good understanding of the nature and extent of rural food insecurity and suggests sustainable interventions that could address these issues.

This is done through an analysis of: who is vulnerable to food insecurity, how many they are, where they are located, why they are food insecure, and how food or other forms of assistance can help reduce food insecurity and support their livelihoods.

This CFSVA has other more specific objectives which include:

- Exploring the links between implementation of national policies and food security;
- Providing an overview of how food markets are functioning;
- Exploring the role of different livelihood strategies in providing food security;
- Assessing risks to food security from different types of shocks, and subsequent mitigation responses (coping strategies) employed by households;
- Exploring 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;
- Profiling food insecure households;
- Exploring links between nutritional status of children and women, and food security;
- Conducting causal analyses of food insecurity.

How was the study done?

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

- Primary data collection lasted six weeks from early October to Mid-November 2006. Approximately 400 village heads were interviewed through a key informant questionnaire in the sampled villages, and 3,926 households were also 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: agro-ecological zones (based on World Bank classification) and ethno-linguistic groups.
- Primary data analysis was complemented by secondary information.

Main conclusions

The study's main conclusions can be summarized as follows:

- Chronic malnutrition in rural Lao PDR is alarmingly high. 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 past 15 years, has not translated into improved nutritional status of the rural Lao population. Chronic malnutrition is as high today as it was ten years ago.
- Thirteen percent of the rural households have poor food consumption² (at harvest time).
- Two thirds of the rural households have a livelihood portfolio that puts them at risk of becoming food insecure should one or more shocks occur in a given year.
- The Sino-Tibetan ethnic groups are the most disadvantaged and food insecure followed by the Hmong-Mien and the Austro-Asiatic. Most of these groups live in the Northern Highlands and in the Central and Southern Highlands.

² See Chapter 6 for the description of poor, adequate, and borderline food consumption

- Dietary intake of fat is too low. Use of vegetable oil in the diet is rare, and most of the fat comes from animal sources.
- Managed access to wild meat and aquatic resources (animal protein) is critical for ensuring food security for 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 can currently not compensate for a potential loss of access to and availability of wildlife.

Who are the food insecure?

A total 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 either unskilled labourers or farmers who seldom fish and hunt. They practice upland farming on a small plot of land in fragile areas with steep slopes. Often, they do not possess kitchen gardens. 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?

Although few households (13 percent) show a food consumption pattern that would categorize them as food insecure (poor or borderline food consumption), risk analysis indicates that a high number are vulnerable to becoming food insecure due to different types of shocks.

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

The political context

The implementation of some governmental policies such as the ban on opium cultivation 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 2001-2010 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 implementation of the resettlement programme has increased vulnerability to food insecurity where resources and services were inadequate for the resettled populations.

Therefore, it is very important to closely monitor the implementation of the above-mentioned policies and their impacts on food security. The development community should help the Government of Lao PDR to identify ways of mitigating any negative effects on food security from other development sectors.

Rapid changes in rural Laos, especially in the uplands, are also being driven by other forces that include fast-rising agribusiness (such as large scale plantations of rubber, corn, sugar cane), mining and hydropower development, and other foreign direct investments. The potentials but also potentially adverse effects of these livelihood changes on the Lao people and their particular link to food security and malnutrition have to be evaluated in depth and their evolution closely monitored.

Food, markets and the economy

Economic poverty in Lao PDR has declined from 46 percent in 1993 to 33.5 percent in 2003. This poverty decline is due to sustained economic growth (6-7 percent annually since 1990), in a stable macro-economic environment. However, geographical differences remain: there is

more poverty 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.

Lao PDR's economic outlook is challenged by structural factors: a young population with limited education and skills; mountainous and sparsely populated areas without basic services and infrastructure; fragile forest and water resources; limited national and local government capacity to enforce laws and regulations which could promote trade competitiveness and mobilize revenue; a predominantly agrarian economy vulnerable to climatic changes; Unexploded Ordnance (UXO) contamination and rapidly industrializing neighbours.

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

With the 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 Lao PDR.

Over the past years, the consumer price index has been driven upward mainly by food price increases, especially 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 Lao PDR.

In general, market centres are not well integrated into rural areas in Lao PDR because of: i) limited road access; ii) poor road conditions, especially during the wet season, which in many instances, leads to a relatively long period of isolation; and iii) a quasi one-way trade direction from traders/agents to communities. This one-way trade direction compensates for the communities' limited access to markets but transaction costs tend to be higher due to a lack of market information.

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 up 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 thus 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 when compared with farmers in the lowlands. The CFSVA shows that there is a link between acceptable food consumption scores and paddy ownership.

There are differences between ethnic groups as well. The Lao-Tai are mainly paddy producers (1.8 hectare (ha) per household on average) and are only minimally involved in upland production (0.4 ha). In contrast, the Sino-Tibetan groups have only 0.4 ha of paddy production, and 1.4 ha of upland production. Other groups have an equal amount of paddy

production (0.9 ha) and upland production (1.0 ha). There are similar patterns for land entitlements: whereas 63 percent of the Lao-Tai report ownership of land, only 17 percent of the Sino-Tibetan report the same. 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: The level of education is 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.

Physical assets: Less than one in ten villages has a health centre, although many have a health volunteer and/or medical kit. 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 than the quality of the water source itself.

Ownership of productive and non-productive assets varies across the country. A wealth index was constructed to capture this variation and separate households who own a wide variety of assets from those who own few assets. In the poorest quintile (poorest 20 percent of the sample), there is an overrepresentation of households from Phongsaly, Sekong and Luangprabang. Further, more than half of the Sino-Tibetan households fall among the poorest quintile. The Austro-Asiatic group is also overrepresented among the poorest households. The Lao-Tai is the only group where there are fewer poor households than in the general rural population.

Financial and social assets: All households in the survey reported having access to credit (in cash) in case of need. Only eight percent of the households reported receiving remittances. Regarding ethnic groups, the Hmong-Mien (15 percent) and Lao-Tai (14 percent) seem to have tighter links and more support from outside than the Austro-Asiatic (3 percent) and the Sino-Tibetan (6 percent) groups.

Household livelihood strategies

Agriculture is the most important livelihood activity in all provinces (in total reported by 95 percent of the households), whereas livestock rearing and selling is the second most important in most provinces (29 percent). Collection of non-timber forest products (NTFP) was also important in most provinces. While agricultural-based activities remain the most important, there is some involvement in unskilled non-agricultural labour.

Rice is the dominant crop in agricultural production. Glutinous rice is by far the main crop (reported as main crop by 71 percent of the households), however there are important differences between ethnic groups: while the Lao-Tai and Austro-Asiatic groups are hardly involved in non-glutinous rice production (less than 10 percent), 67 percent of the Sino-Tibetan groups and 48 percent of the Hmong-Mien groups report non-glutinous rice as their main crop (compared to 29 percent and 37 percent respectively for glutinous rice). The current rice harvest is expected to last on average eight and a half months.

Cash crops are also of importance to many households. Although as much as 34 percent of households did not report planting a second crop, 15 percent planted maize and 6 percent planted cassava as their second crop. Only half of all households reported having a kitchen garden, most of them used it for growing vegetables. Important differences in household reporting of a kitchen garden were noted between provinces (from 86 and 71 percent of households in Bolikhamxay and Huaphanh to only 25 percent Phongsaly).

Overall, the reported 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 Sekong provinces (74 percent).

Weekly household food consumption

As of harvest time (October/November) 2006, 13 percent of the rural population had poor food consumption (2 percent food insecure and an additional 11 percent borderline).

It is likely that the proportion of households with poor food consumption will increase during the peak of the lean season.

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 the intake of fat, protein and micro-nutrients.

Most households eat rice, or rice coupled with other staples such as maize or cassava, every day. 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. Thus it cannot be stated that rice insecurity necessarily implies insufficient access to staples.

Over the seven-day recall period, big wildlife was reported to be eaten by 6 percent of the households, small wildlife by 26 percent, river fish by 81 percent, other aquatic animals by 55 percent, pond fish by 20 percent, poultry and pork each by 41 percent, and buffalo/cow meat by 42 percent of the households, stressing a high importance of wild animal protein and fat sources. Wild meat and fish sources are more important as protein and fat sources than domestic meat and fish/aquatic resources.

To safeguard the continuous and managed access to viable wild animal populations (including wildlife, fish and other aquatic animals) thus becomes a necessity in the food security sector, including various forms of natural resource management such as sustainable wildlife management (and harvest), biodiversity conservation, but also stronger enforcement of national environmental regulations in foreign direct investment schemes, in particular with regard to hydropower development.

As wild food sources may not be able to cover all needs, more consumption of domestic meat and fish should be fostered. Changes in cultural habits, from eating domestic meat largely on ceremonial occasions to making it 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 as a source of energy and due to its importance for the absorption of vital vitamins. The usage of fat or vegetable oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is low. Only 14 percent of the households reported adding vegetable oil or lard to their daily cuisine; 44 percent reported to not have added fat at all over the past seven days.

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

Children's nutritional status

The level of chronic malnutrition, or stunting, is alarmingly high 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. Wasting is at 8 percent for the same group. There has been no improvement in the chronic malnutrition in Lao PDR over the past 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 remains a big challenge.

The statistical analysis shows that ethnic groups (especially Sino-Tibetan and Austro-Asiatic) are highly vulnerable to nutritional problems, and that people from certain agro-ecological zones are disadvantaged. The highest prevalence of wasting was found in the economically

better off Mekong Corridor. Furthermore, children from families with better road access do not necessarily have better nutritional status.

Other surveys have shown (MICS III) that stunting increases significantly after the first year. The CFSVA confirms this finding. This is most likely linked to inappropriate breastfeeding and complementary feeding practices.

Research has proven that growth stunting in infants is a risk factor for increased mortality, poor cognitive and physical development and other impairments. Lao children, who are malnourished and living in poverty, cannot fulfil their development potential. They may perform badly at school and have low productivity in adulthood. As a result, these children pass on poverty and deprivation to future generations.

Women's nutritional status

Mothers' health and nutritional status is important for the intra-uterine development of children. Poor nutritional status of mothers impair the development of the children even before they are born, making the children start their life disadvantaged.

Although there are no consistent measurements of the prevalence of underweight in women of reproductive age in Lao PDR, previous measurements indicate that the prevalence may be the same or slightly decreased since 1995. CFSVA data show that 12 percent of women in reproductive age are underweight. Some geographical differences exist, with a trend of lower prevalence in the Northern Highlands and Lowlands, and in the Vientiane Plain.

Regression analysis indicates that wealth is the strongest predictor of Body Mass Index (BMI). However, wealth can be considered a basic factor of nutrition, and is closely related with many of the other indicators. Further, improving sanitation and increasing the food consumption (as measured by the Food Consumption Score) may have a positive 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 its 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, those involved 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 and malnutrition in Lao PDR are linked to many factors and that they can only be adequately addressed through a multi-sector approach. Household food security is linked with education, infrastructure, and the agricultural and environmental sectors, among others. The high levels of chronic malnutrition (stunting) in rural Laos vary significantly between ethnic groups and agro-ecological zones, calling for effective nutrition interventions. However, stand-alone interventions will have a limited effect unless the overall policy environment is more multi-sectoral and favourable. There is an urgent need for more nutrition friendly policies and regulations combining nutrition, food security, basic and preventative health services, improved water and sanitation, poverty and development objectives to address the basic, underlying and immediate causes of malnutrition.

Chapter 10 of this report lists this study's recommendations.

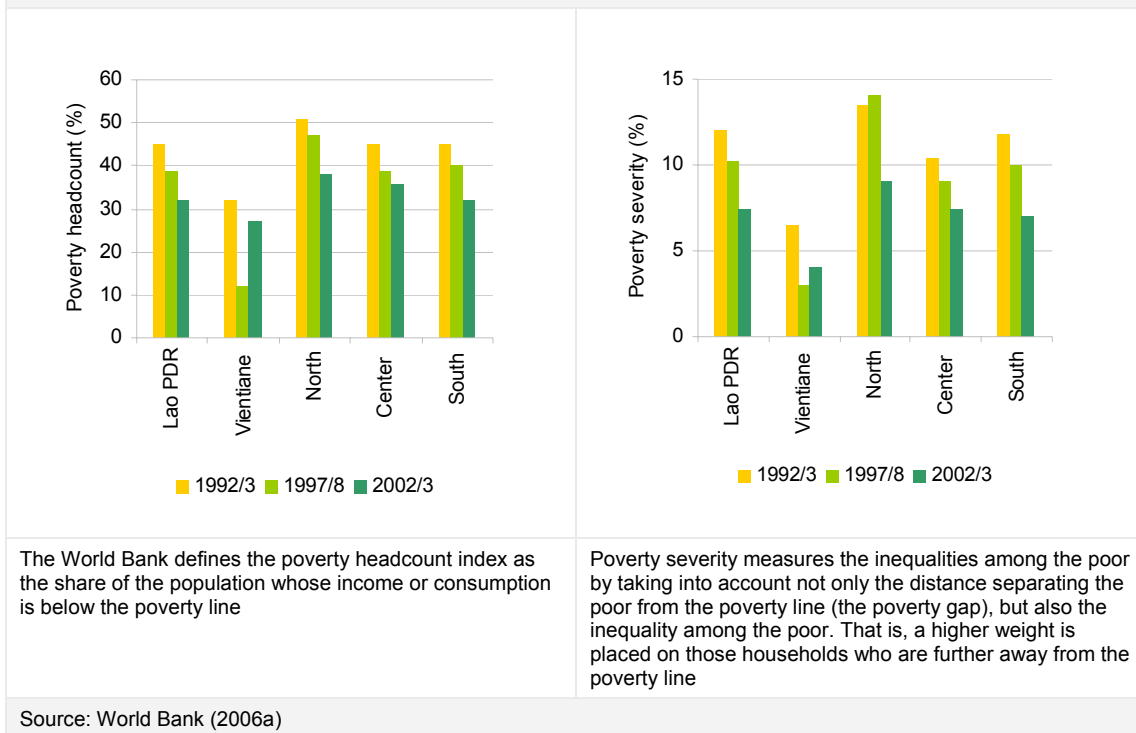
Chapter 1. Introduction

1.1. General information on Lao PDR

The Lao People’s Democratic Republic (Lao PDR) was established in 1975. It succeeded the Kingdom of Laos, following decades of civil war and heavy involvement in the larger Indochina War in the Eastern and Northeastern provinces³. After the war, many Unexploded Ordnances (UXO) were left from American bombing. Lao PDR was one of the most heavily bombed countries in the world, and UXOs continue to have a major impact on rural lives. Thirty years after the war, lives are still being lost due to UXOs. Further, livelihoods are restricted as agricultural expansion in many areas is impossible until the land is cleared of UXOs. In the Eastern part of the country, along the Vietnamese border, UXOs continue to impact livelihoods and food security for a large number of households.

The Lao PDR is a landlinked 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 people per km².⁴ This is one of the lowest population densities in East Asia⁵. In Lao PDR a very low proportion of the population resides in urban areas. Only 27 percent⁶ of the population live 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.

Figure 1: Poverty headcount and severity by region (1992/3 to 2002/3, in percent)



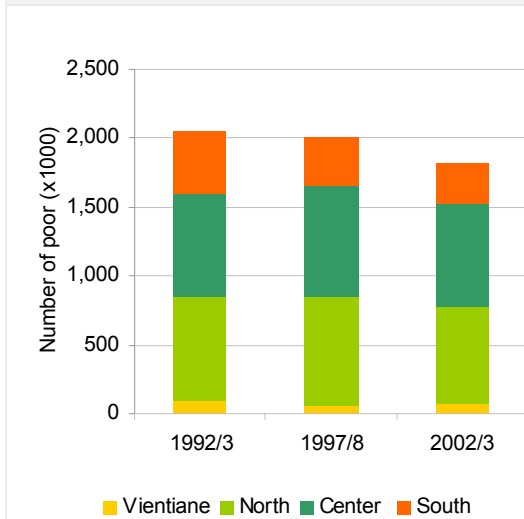
³ Government of Lao PDR and the UN Country Team in Lao PDR (2006)

⁴ National Statistics Centre (2006a)

⁵ UNDP (2006)

⁶ According to ADB 21.6% of the total population in Lao PDR live in urban areas, ADB (2007)

Figure 2: Number of poor per region (in thousands)



Source: World Bank (2006a)

the lowlands versus the uplands⁷. The regions with the largest number of poor are the Central region (due to high population density) and the North. Income inequality is higher in the 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 Lao PDR has acknowledged 49 different ethnic groups⁸. Linguists claim that the country's population is comprised of more than 200 linguistic subgroups⁹. The highest level of distinct ethnic diversification can be found in the uplands¹⁰. Through ethno-linguistic classification these 49 groups can be classified into four main groups: the Lao-Tai, the Austro-Asiatic, the Sino-Tibetan and the Hmong-Mien.

The majority group, the Lao, only make up 55 percent of the population. If one includes ethnic groups with similar language (the Tai), the majority group increases to approximately 65 percent. Other ethnic groups make up as much as approximately 35 percent 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 languages, different cultural belief systems and practices, and this can be seen as a very valuable asset for the country. However, 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 for the Lao Government to deliver primary education to all children in their mother tongue. Similarly, the market integration is increasing in Lao PDR. It is very challenging to enhance the development of traditional subsistence economies (often shifting cultivation) through the appropriate level of innovation.

⁷ World Bank (2006a)

⁸ Lao Front for National Construction (2005)

⁹ Chamberlain (2002a)

¹⁰ UNDP (2002)

The Lao PDR is classified by the United Nations as a 'Least Developed Country' (LDC). The other three countries in the region that have the same status are Cambodia, Myanmar and Timor Leste. Per capita income in Lao PDR 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.

Nevertheless, a significant decline in poverty has been achieved during the past decade, although spatial disparities remain (see figure 1). Using the 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 versus those without; along the Thai border than along the Vietnamese border; and in

Table 1: Overview of ethnic grouping in Lao PDR

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

Source: Adapted from the Census 2005

Chapter 2. Objectives and Methodologies

2.1. Objectives

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

The overall objective of a CFSVA is to provide information to WFP decision makers and other actors focusing on food insecurity and on how best to programme food assistance. The analysis shows 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 livelihoods.

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

- Exploring the interplay between the implementation of Government policies and food security;
- Providing an overview of how well food markets are functioning and integrated;
- Exploring the importance of different livelihood strategies and their relative success in providing food security;
- Exploring risks to food insecurity from different types of shocks and households' response (coping strategies) to them;
- Exploring 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;
- Providing profiling of food insecure households;
- Exploring linkages between nutritional status of children and women, and food security; and
- Conducting 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. Further definitions are given in the risk analysis section (chapter 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 life¹¹.

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 aid¹².

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.

¹¹ FAO (1996)

¹² WFP (2005)

Food Consumption Score (FCS): 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 share their resources in order to jointly provide for their basic needs, at a minimum their food consumption ("eating from the same pot"), on a daily basis.

Livelihoods are the resources used and the activities undertaken in order to live. The resources can 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). Livelihood strategies are activities and choices that people make, using 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 services¹³. A livelihood group is composed of people who utilize similar livelihood strategies.

Coping strategies are 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 consumption patterns or one-off responses such as asset sales. Long-term alterations of income earning or food production patterns might also be a response to a shortfall of food, but will not be included in the term "coping strategy" in this report¹⁴.

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

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

Ethno-linguistic groups:

This stratification is based on data collected by the National Statistics Centre during the 1995 Census. It classifies the 49 recognized ethnic groups into 4 main groups. The data indicates the main ethnic group of each village. The household questionnaire did not distinguish between the Austro-Asiatic and the Sino-Tibetan ethnic groups, so households living in Austro-Asiatic and the Sino-Tibetan villages were given the main ethnic group from their village, which is not 100 percent 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 ethno-linguistic groups are:

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

In the following they will simply be referred to as ethnic groups.

Agro-ecological zones: Since many provinces have large geographical differences, an additional geographical grouping of the survey results was considered beneficial. Thus, based on a World Bank study¹⁵, agro-ecological zones are used to present results. These zones are based on districts, where districts are assigned to a zone based upon indicators related to

¹³ DFID (2006)

¹⁴ Maxwell et al (2003)

¹⁵ World Bank (2006c)

agricultural potential and ecological similarity. This grouping is more useful than the traditional main regions: North, Centre, and South.

The agro-ecological zones used in this report are:

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

Road access: The classification from the National Statistics Centre (NSC) was used to differentiate between households living in villages with road access from households living in villages without road access. Villages were assigned the same status as during the 2005 Census.

Sloping class: In order to explore differences between villages situated in flat areas and 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 percent¹⁶. Each district was then classified according to the proportion of its area that is fragile. 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

Primary data collection took place during six weeks from early October to Mid-November 2006. Two instruments were created to collect primary data; a key informant questionnaire administered to 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 five years, administered to sampled households. The instruments were first developed in English and subsequently translated into Lao.

The primary data collection was conducted by provincial Government staff from the Ministry of Labour and Social Welfare (MLSW), the Ministry of Agriculture and Forestry (MAF), the Lao Women's Union (LWU) and the Committee for Planning and Investment (CPI). The enumerators had a one-week training course prior to data collection. Nutritionists from WFP's Regional Bureau in Bangkok led 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 four enumerators.

Key informant interviews

For each visited village, the head of the village was interviewed as key informant with a structured questionnaire. A total of 398 village heads were interviewed. Topics covered included resettlement, access to services and community infrastructure, markets, and UXO contamination. This information was then used to contextualize the results from the household questionnaire.

Household questionnaire

The study gathered information through 3,926 household questionnaires. The questionnaire included sections on demographics, housing and facilities, assets and access to credit,

¹⁶ This means that for each 100 meters horizontal movement, the land rises 16 meters vertically

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 measurements

Anthropometric measurements were also taken such as height, weight, Mid-Upper Arm Circumference (MUAC) for children between 6 and 59 months old and women between 15 and 49 years old. 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 by 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 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.

A Qualitative Rapid Livelihoods Assessment¹⁷ on the livelihoods and food security impact of government-led resettlement was conducted in August 2006. This assessment provided up-to-date programme information for the WFP Lao PDR Country Office in order to design a new Protracted Relief and Recovery Operation (PRRO) (starting April 2007). The assessment provided information on issues such as resettlement, nutrition knowledge, access to services, market integration, and food security. The assessment identified gaps in the food security knowledge in Lao PDR, and highlighted 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 has heterogeneous cultural practices and beliefs, and many different ethnic groups exist. Their practices differ when it comes to child care and feeding practices, livelihood strategies, and living conditions. While some groups have lowland paddy rice production as their main livelihood, others practice shifting cultivation in mountainous areas.

It is difficult to create a sample that will capture the diversity within provinces. It was thus decided to stratify based on provinces 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^{18,19} 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, four were selected by the enumerator teams to be replacement villages to be included only if one of the remaining 25 villages could not be

¹⁷ WFP (2006)

¹⁸ 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 percent of total households in the village use electricity, 3) More than 70 percent 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

¹⁹ National Statistics Centre (2006a)

reached. This process introduced a certain bias in the sample, as the enumerators often 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 adequately describe their situation.

In the second stage, ten 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, listed all households in the village. Based on this list, a systematic random sample was utilized to pick ten households. Thus ten 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

Access software was used by WFP Headquarters for both the household and community questionnaire. The data entry itself was conducted by the NSC in Vientiane. NSC checked 10 percent of the questionnaires, and based on this, the data was deemed to be of satisfactory quality. Further checking was done by a WFP team at a workshop held in Vientiane in December 2006.

2.6. Study limitations

Limitations of the study include:

- Bias towards accessible villages: due to the exclusion of four villages per province by the enumerator teams, a certain bias towards accessible villages was introduced. Some of the villages were difficult 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 Government of Lao PDR. These groups have different cultural practices, including food consumption patterns, livelihood strategies, and care and feeding practices. Thus, a sample survey cannot capture this diversity.
- Translation from Lao to ethnic languages: The questionnaire was translated from English 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 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 data accuracy.
- Lack of health information: There are three underlying causes for nutritional outcomes; 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. Although information was collected on health and illnesses, the data were not of adequate quality to be used for analysis. The causal analysis of nutritional status is, therefore, skewed towards food consumption. However, the MICS survey, conducted by the Ministry of Health, NSC and UNICEF, will provide information on links between nutritional outcomes and health status and care practices. Since the MICS survey does not cover food consumption patterns, the two surveys are complementary.
- Formal education and literacy in Lao: While investigating into formal education, the CFSVA did not cover informal education networks, i.e. social networks, through which the rural population learn and exchange practices.

- Malnutrition rates for older children: Other nutritional studies suggest²⁰ that malnutrition rates are higher among children older than five years as opposed to children below five years of age. These two reference studies examined children from 3 to 15 years of age. Yet, children older than 5 years of age were not included in the CFSVA.
- Seasonal variation in food consumption and livelihood patterns: The primary data for the CFSVA was collected during 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 is likely to be better. This may give an artificially good picture of the food consumption in Lao PDR. Second, this 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.
- Use of the food consumption score: The standard CFSVA methodology uses the food consumption score (FCS) as a preferred single indicator of 'current' household food security. The FCS calculation is standardized, describes diet (therefore can also be linked more closely with WFP food-type interventions), and is repeatable and transparent. It also serves well as a monitoring tool. Limitations to the use of the FCS may include the fact that it is a very temporal specific indicator (the 'current' qualifier) at the household level. The FCS is aimed at consumption, not 'diet', which implies a larger range of factors-including micronutrient consumption. It is not based on cultural patterns and does not look at the amount of food items eaten. The calculation of the thresholds is based on the consumption of pulses which are not customarily consumed by many ethnic groups in Laos.
- Livelihood activities: When asked to list their 4 main livelihood activities, many households only reported one. This clearly does not reflect the diversity of livelihood activities that characterizes rural households in Laos. Asking for the main activities probably lead to artificially discarding some as secondary. For example, many households did not report hunting and gathering of non-timber forest products (NTFP) 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. Thus, information from the community questionnaire should be only for contextual information and must be treated with caution, since error margins are wider.

²⁰ Miyoshi 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 established in 1991, recognizes the Lao People's Revolutionary Party (LPRD) as the leading nucleus of the political system²¹. Lao PDR is comprised of 17 provinces and 141 districts. The Government is run by the Council of Ministers, which provides the main legislative arm of government operations. Political power rests with the LPRD; the Politburo and the Central Committee make policy guidelines. Their decisions are ratified by party congresses held at five year intervals, with the last congress held in March 2006. Over the past decade, the Government has been undertaking public administration reform to improve the structures, functioning, and management of government organizations. Efforts are currently underway to assert greater central authority and accountability (fiscal and administrative) over provincial finances and programme operations.

The implementation of several national policies affects the food security situation in Lao PDR. Some policies deal directly with food security, such as the Food Security and the planned Nutrition Policy while others have an indirect effect, such as the Opium Eradication and Land Reform and Resettlement policies. These latter policies have an impact on food security. Therefore, when assessing food security, it is necessary to look into the implementation status of all relevant policies which may have an effect on the country's food security.

3.1.1. Poverty reduction and food security policies

The National Growth and Poverty Eradication Strategy of 2004 (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) (NSED) works to meet the Millennium Development Goals by 2015 and beyond. NSED aims to completely abolish seasonal hunger (rice scarcity) at the household level by 2010 and reduce malnutrition (underweight) in children under five to below 30 percent by 2015.

The Government of Lao PDR has set ambitious goals for economic development and poverty eradication which should significantly improve the national food security situation. However, the Government's implementation plan is not clear on the 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 still focus mainly on rice availability as equal to food security. Even though attempts to diversify agricultural production are slowly advancing, forestry (wildlife and NTFP management), fisheries and natural resource management are still not considered as key sectors pertaining to households' food security. Furthermore, there is the need to expand the narrow definition of household and national food security indicators. Nationally, this is the "overall availability of rice"; at household level this is the "household's access to rice".²²

In order to address chronic malnutrition, a better understanding of the existing nutritional inadequacies is needed. The focus on rice must shift towards encouraging the intake of fats, proteins and micronutrient rich foods (see chapter 6). Without such measures, it is unlikely that malnutrition rates will decline despite national efforts to increase carbohydrate consumption.

²¹ UN Country Team Lao PDR and Government of Lao PDR (2006)

²² The Sixth National Socio-Economic Development Plan (2006-2010) (English translation) states (p. 106): "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"

3.1.2. Opium eradication policy

In 2000, the Government of Lao PDR embarked upon a rapid implementation of an Opium Eradication Policy. In less than a decade, the country went from being one of the major opium producers to virtually eliminating the crop by 2006²³. The opium eradication 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 assistance²⁴. The result of this policy is threatening food security for a large number of upland villages in Northern and Eastern Lao PDR. Developing alternative livelihood activities will take time. The success of these initiatives will determine whether these communities will return to cultivating poppies, albeit illegally.

3.1.3. Land reform and land use planning

The objective of the Land Allocation Policy is to protect and to promote the long term management of forests and natural resources in the Lao PDR. It was meant to prevent illegal logging by giving ownership of forest land and resources to villages, and to contribute to poverty reduction in the Lao PDR.

This policy was implemented in association with the policy on the eradication of shifting cultivation and combined with the 'focal site' approach of bringing villages closer together (see below).

Critics point out that the unintended result of the land allocation policy increasing hardship for the poorest households²⁵. The local negotiations regarding forest classifications are open to exploitation by the forest industry: they make profitable deals by reclassifying zones into productive forests. Logging and plantation concessions to commercial interests are threatening access to land for local farmers and are not contributing to the protection of the forest resources. As a result, more farmers may be pushed off their land. Thus, local villages may not be the real beneficiaries of this policy, and the unintended outcome could be increased food insecurity.

3.1.4. Resettlement

Even though resettlement or relocation is not an official policy²⁶, it is used to pursue other objectives such as reducing shifting cultivation, eradicating opium cultivation, and providing social services. Three important instruments are generally used for community or household resettlement:²⁷

First, the *focal sites*, which bring households from various ethnic groups into selected areas. In these areas, they are cost-effectively provided with development. Focal sites were first initiated in the early 1990s and remain a major component of the Government of Lao PDR's rural development strategy. In general, the sites are infrastructure-oriented (roads, schools, health clinics, irrigation, and market facilities).

Second, *village consolidation* combines scattered smaller settlements into larger permanent villages, so that the Government of Lao PDR can more easily administrate them. Although

²³ On 14th February 2006, Lao PDR declared its opium free status. Major donors and the United Nations Office on Drugs and Crime (UNODC) supported the implementation of the poppy eradication policy

²⁴ UNODC (2006)

²⁵ Ducourtieux et al (2005)

²⁶ Evrard and Goudineau (2004)

²⁷ WFP (2006)

village consolidation has been ongoing since the 1970s, resettlements have increased with the Government's poverty reduction strategy.

Finally, the *land and forest classification's* goal is to improve land-use planning and natural resource management. The 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 may oblige 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 both²⁸. Even though the Lao people have a history of migration, the current resettlement only involves moving people from the uplands to the lowlands with the aim of promoting sedentary settlements. It is difficult for external agencies to get an overview of recent and planned resettlement.

This resettlement 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 in a few years. It is difficult to justify investments in locations that soon could be abandoned. Some agencies are trying to develop upland villages with the aim of preventing resettlement. Although this may be successful, it risks prioritizing interventions that may not be what people want or need but rather what will prevent resettlement.

Relocation of villages due to road constructions, hydropower activities, mining activities is of increasing concern. The decree No192/PM on "Compensation for Resettlement of People Affected by Development Projects" was adopted in 2005. It seeks to ensure that affected people are compensated so that they are "not worse off" than they would have been without an intervention. But in a study published in 2007, GTZ²⁹ notes that 'the decree has not yet been well disseminated, and even among government officials, awareness about its contents and stipulations are not widespread'.

Resettlements can change livelihood opportunities sometimes resulting in households' diminished availability of food. A livelihood assessment carried out by WFP cautioned that many resettled households had lost their livelihood activities such as upland farming and collection of NTFP³⁰. In order to compensate for this loss, households need to develop new livelihood activities. This takes time and may require external assistance. Such assistance is not always forthcoming and thus increases the risk of food insecurity.

3.1.5. Ban on shifting cultivation

The policy to ban shifting cultivation began in the early 1980s based on the assumption that it is an inefficient use of natural resources which should be replaced with lowland wet rice agriculture. In 1994, the Government of Lao PDR set a goal to eliminate shifting cultivation by 2000. Since 1996, eradicating shifting cultivation is seen as a way of providing individuals with a better living by moving them to the lowlands where they can obtain paddy land. It is also seen as a way to prevent deforestation, soil degradation and erosion in the uplands.

The main strategy to reduce shifting cultivation is land allocation. In the past five years, 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. This land was allocated to reduce shifting cultivation and ensure sedentary highland and lowland cultivation³¹. 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.

²⁸ Evrard and Goudineau (2004)

²⁹ Ngaosrivathana and Rock (2007)

³⁰ WFP (2006)

³¹ Government of Lao PDR (2006)

Studies conducted in the remote upland areas show that families faced with the reduction of available surface areas for shifting cultivation may adopt soil depleting farming practices. Without soil improvements these lead to reduced yields. Although labour inputs remain the same, yields have decreased "in many cases to less than half of the original pre-Land Allocation amounts"³².

Further more, when the eradication of shifting cultivation is combined with resettlement the availability and quality of potential paddy lands for sedentary cultivation are among the constraining factors; availability of funds to convert the land into paddy is another one.

Finally, social scientists, agronomists and botanists have demonstrated that shifting cultivation can be a sustainable practice that contributes to the food security of highland people, if the population to area ratio is low³³. Lao PDR still has one of the lowest population densities in all of East Asia.

3.1.6. Forestry strategy

Forests are a source of food and income for many population groups. The latest Forestry Strategy was established in 2005. It has three main objectives: 1) to sustainably develop forest potential for commercial activities such as logging and tree plantations; 2) to maintain access to NTFP for the local population; and 3) to preserve endangered species and habitats through managing the harvest of animals and plants. However, these objectives can sometimes conflict. The strategy itself recognizes that some of these policies are not always well understood by the local people and administrators. This has led to cases, under the land and forest allocation exercise, where the villagers have not benefited³⁴. There is a danger that commercial interests will take precedence over the interest of the local community.

The importance of NTFPs for food security is established in this report. While the reliance on hunting and gathering is declining, it will be important, from a food security perspective, to monitor how access to forest products is managed and what the alternatives are.

3.1.7. Biodiversity strategy

The Lao PDR is home to one of South-East Asia's most biologically diverse areas. These forest areas are of 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 pressure. The biggest threat to access to natural resources for rural communities is 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 threatens to reduce the forested area.

Concessions given to setting up large commercial plantations, for products such as rubber, coffee, fruits and maize are also limiting the land available for villages. Although the Government of Lao PDR is working to curb these developments, these forces threaten traditional use of and access to natural resources for rural, especially upland, villages. These forces threaten food security by reducing access to food sources for many 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. The Ministry of Agriculture and Forestry gives guidance on wildlife management, deciding who can harvest what species during which season. 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 traditional high amounts of wild

³² ADB (2001)

³³ Evrard and Goudineau (2004)

³⁴ Ministry of Agriculture and Forestry (2005)

food sources in the Lao diet, proper management of the environment would help provide food security to rural Lao PDR.

Up until now, the fisheries sector has received little attention from the Government. However, the Ministry of Agriculture and Forestry is currently in the process of drawing a National Fisheries Sector Strategy, which is intended to help the Government identify the policy and legal issues that need to be addressed, partly in order to maintain viable fish stocks. The management of aquatic biodiversity remains paramount for household food security and income generation.

3.1.8. Food security strategy

The Food Security Strategy³⁵, 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 until 2010. It is directed towards higher rice production in order to produce sufficient rice to meet the necessary caloric intake for the entire population. This strategy falls short of addressing malnutrition, lack of dietary diversity and nutrition knowledge. It has had little impact, compared to more prioritized initiatives such as opium eradication and resettlement.

3.1.9. National nutrition policy

Over the past decade nutrition ranked low on the international Government's agenda, as it did elsewhere in the world. The legislation on nutrition has been very limited. Subsequently, there has been poor coordination in nutrition activities - few activities have been implemented with very low capacity and limited funding. Insufficient nutrition indicators and data made it difficult to assess and monitor the situation.

Currently, the Ministry of Health together with other line ministries (Ministry of Agriculture and Forestry, Ministry of Education, Ministry of Planning and Investment, Ministry of Justice, Water and Resource and Environmental Administration, etc), the National Commission of Mother and Child under the Ministry of Foreign Affairs, mass organizations and other ministry equivalent organizations are developing a National Nutrition Policy with the support from UN agencies notably, FAO, WHO, UNICEF and WFP.

This policy will serve as a legally binding document to substantially reduce levels of malnutrition, especially of vulnerable groups, and to mainstream nutrition in national socio-economic development plans (NSEDPs) in line with the implementation of the National Growth and Poverty Reduction Strategy (NGPES).

This policy will be submitted for approval to the Lao National Assembly in the first half of 2008. After approval, a National Nutrition Strategy, a National Nutrition Action Plan and a National Investment Plan will be developed. The UNICEF-supported MICS survey and CFSVA findings will provide the scientific background data for all the documents.

3.2. Socio-economic developments

Lao PDR started shifting from a centrally planned to a market driven economy in 1986. This resulted in strong economic growth for over a decade. The GDP in the 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)³⁶. Agriculture remains the driving sector of the economy, contributing 45 percent of GDP (2005) and employing 80 percent of the labour force; industry accounts for 29 percent and services 26 percent.

³⁵ Government of Lao PDR (2000)

³⁶ IMF (2006)

Recent economic growth has been driven mainly by industrial growth, expanded activity in gold and copper mines, and the Nam Theun 2 (NT2) hydroelectric dam. These projects, combined with growth in tourism and non-traditional exports, have offset the impact of the expiry of the Multi-Fiber Agreement (MFA) quota system and the increase in international oil prices³⁷. Overall, industrial growth from 1992 to 2004 averaged 10.6 percent, compared to only 4.7 percent in agriculture.

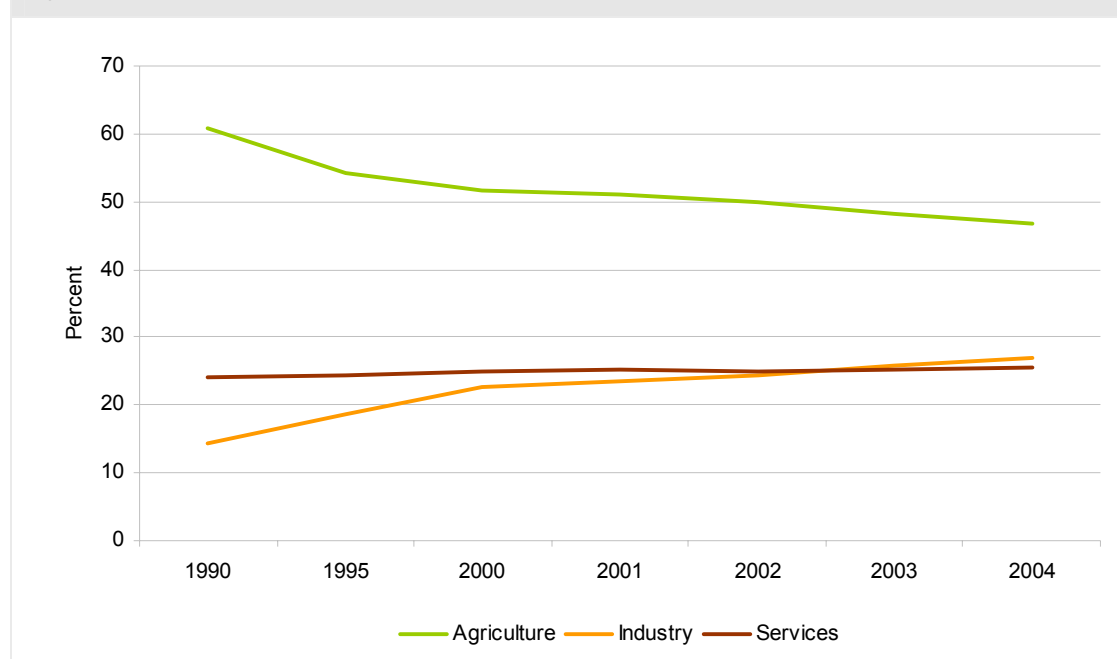
Rapid changes in rural Laos, especially in the uplands, are being driven by fast-rising agribusiness (plantations), mining and hydro-electricity investments. These changes are significantly reducing the land availability, the forest cover and people's access to managed natural resources.

The poor performance in the agriculture sector reflects the impact of changing weather conditions on subsistence-oriented agriculture. Agricultural growth has fallen since 1999 and reached 3.5 percent in 2005.

Farmers are being pressured to shift from subsistence farming - with hunting and gathering activities - to commercial farming. Large scale commercial agro-forestry concessions (rubber plantations are a predominant example) are already decreasing the forests' biodiversity thereby endangering the availability of the forest products, the rural household's traditional safety net. Reduction in surface areas available for planting also reduces grazing lands leading to increased conflict between arable and pastoral resources.

The effects of these pressures and transitions on the livelihoods strategies and their link to food security have to be evaluated in depth and their evolution closely monitored.

Figure 3: Sectoral contribution to GDP (1990-2004, constant price 1990)



Source: IMF (2006), Asian Development Bank (2007)

Over the past few years, economic growth was also favoured by stable macroeconomic conditions. Slow progress could jeopardize this growth. The national currency (Kip) has traded within a narrow band, because of close links with the US dollar. Exchange rate management has ensured that the parallel market premium has been kept below two

³⁷ IMF (2006)

percent. Inflation has curved to 6.8 percent in 2006, down from the hikes of the previous three years. Consumer price increases from 2003 to 2005 resulted from supply shocks in 2003-2004 (drought and flood) and oil price increases. Domestic fuel prices were raised by around 45 percent in 2005, since the government passed on the increase in international oil prices. External reserves have remained at around three months of imports for the past 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/ km ²	20.0	22.0	24.0	26.0
Population Growth	2.5	2.1	1.8	1.8
Urban Population (percent)	17.2	19.8	21.6 ³⁸	-
Agriculture/ GDP (percent)	55.2	51.2	45.0	-
Industry/ GDP (percent)	19.1	23.7	29.3	-
Services/ GDP (percent)	25.7	25.1	25.7	-
GDP Growth (percent)	7.1	5.8	7.0	7.1
Agricultural Growth (percent)	3.1	3.8	3.5	-
Industrial Growth (percent)	13.1	10.1	12.5	-
Per Capita GDP (US\$)	385.1	338.9	460.0	500.0
Consumer Price Change (percent)	-	7.8	7.2	6.8
Food Price Change (percent)	-	6.7	7.7	-
External Public Debt Service (percent of Revenues)	-	15.5	21.7	20.2
Overall Fiscal Deficit (percent GDP)	-	-4.4	-3.5	-4.0
Gross Official Reserves (months)	-	2.4	3.0	3.0

Source: IMF (2006), Asian Development Bank (2007)

The IMF trade restrictiveness index for 2004 shows Lao PDR's overall rating at seven on a scale of ten, with low average tariffs (less than 10 percent) but high non-tariff barriers (NTB) (more than 25 percent of production covered by NTB)³⁹. With the increase in debt service and the wage bills over the past two years, the budget - especially non-wage spending - has come under increasing pressure due to weak revenue administration and mobilization. Revenue mobilization is impeded by the lack of consensus on how to strengthen the central government's control over provincial tax, customs, and treasury operations. Currently, more than 50 percent of revenues are controlled by provincial authorities.

3.2.1. Development challenges

Long-term economic development is undermined by poor infrastructure⁴⁰. Despite substantial improvements over the past two decades, there is still no railway system and a very low-density road network - less than hundred meters of road per km² - and less than half of the roads are paved. A quarter of the district centres lack year-round access and the situation is worse in the villages. The lack of infrastructure impedes the development of an integrated domestic market and access to export markets. In some instances, local Lao producers are disadvantaged compared to imported goods because the latter are better connected to the market than potential Lao producers. In other instances, local Lao producers are shielded from outside competition due to the inaccessibility of the area. As a result, Lao consumers pay higher prices for the goods. This also applies to food.

Cumbersome customs procedures and governance problems at the border increase 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.

³⁸ According to the 2005 National Population and Housing Census, 27.1% of the total population in Lao PDR live in urban areas

³⁹ The overall rating of the trade restrictiveness ranks on a scale of 1 (most open) to 10 (most restrictive)

⁴⁰ World Bank (2006a)

Figure 2 displays trends on roads, health centres, and schools from 1985 to 2004⁴¹. 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 centres by one third; and health centres by two fifths. The number of primary schools had already decreased by 15 percent during the second half of the 1980s, and in 1995 they were only slightly above the 1985 level. This is important given the 30 percent rise in the school-age population.

After 1995, there were some infrastructural improvements. The length of tarred roads in 2004 was 80 percent more than in 1990. The number of health centres remained at about one fifth below the 1990 level in 2004. Although hospital beds and health centres have not increased 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.

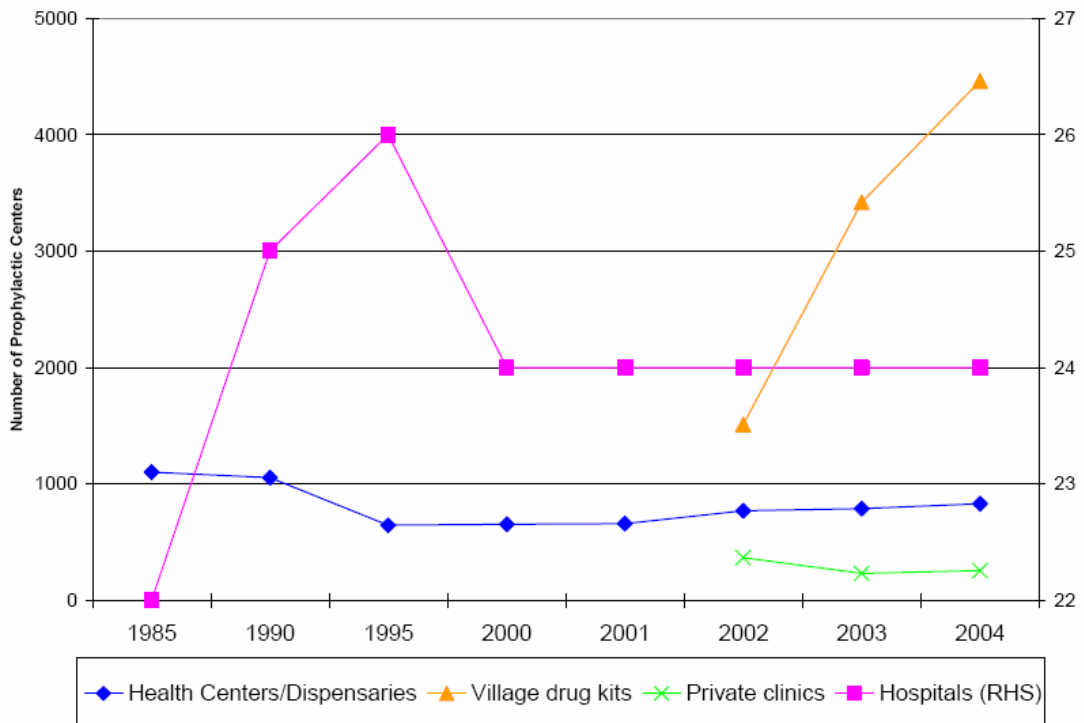
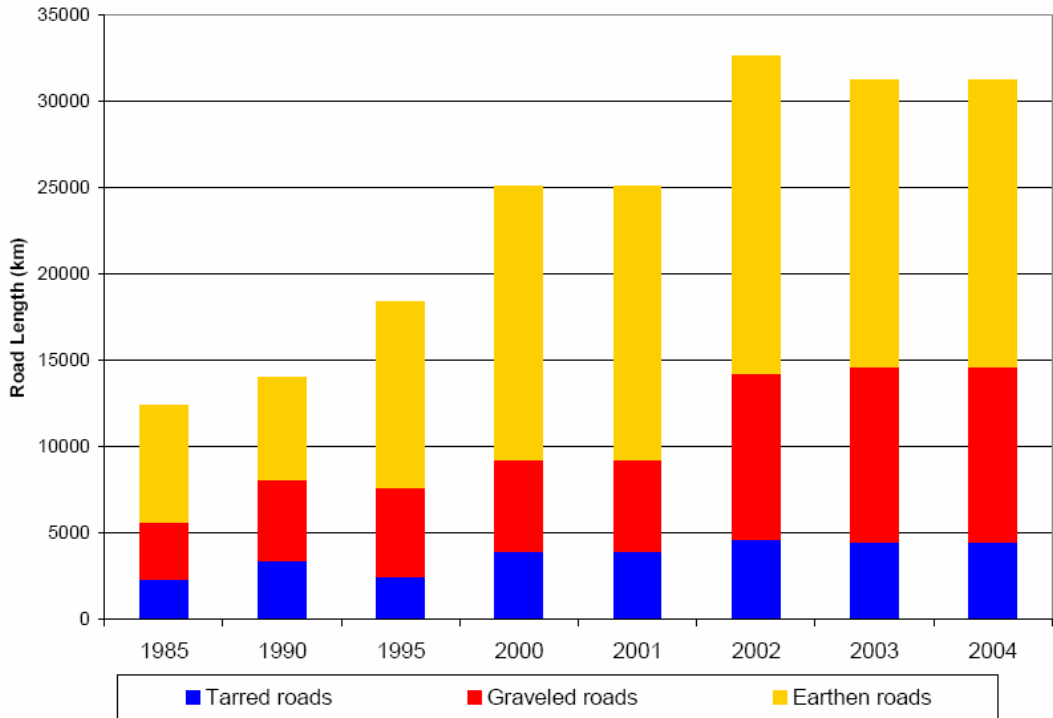
This CFSVA confirms the lack of infrastructure in villages. Four indicators were used to construct a Village Infrastructure Index⁴² which ranges from zero (no infrastructure) to six (all infrastructures present). Seventy-three percent of the villages received a score of two or less - indicating, at most, a gravel paved road and a primary school. In 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 rural Lao PDR. UXO contamination is also a constant threat to development, especially in the agricultural sector, since expansion of new land in many places requires prior UXO clearance.

⁴¹ World Bank (2006b)

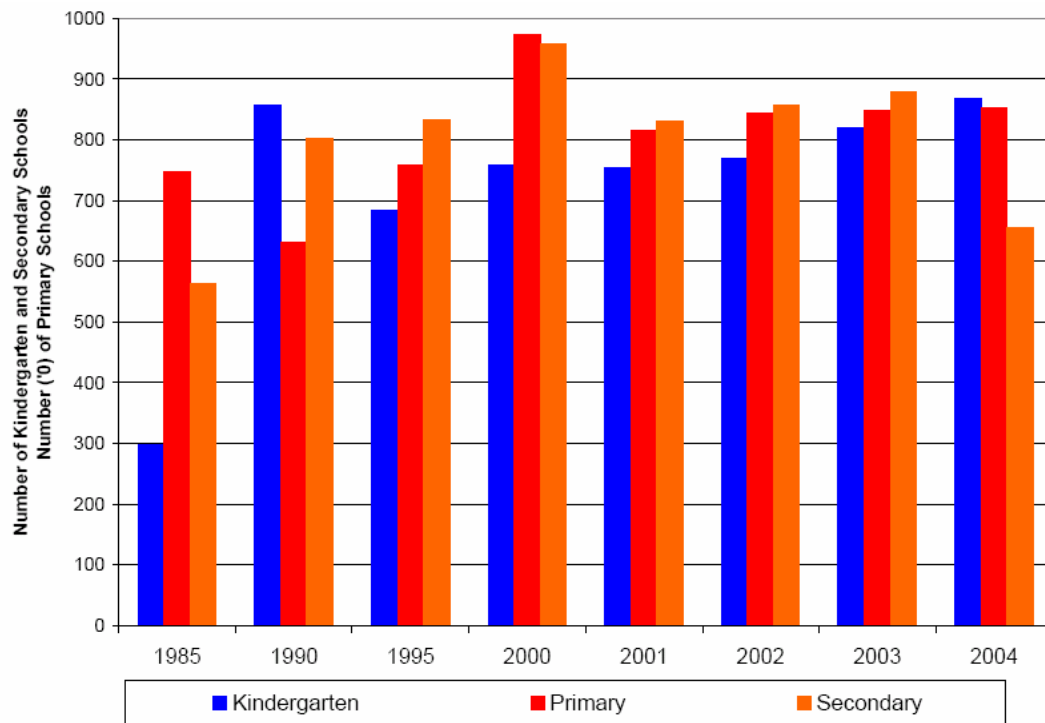
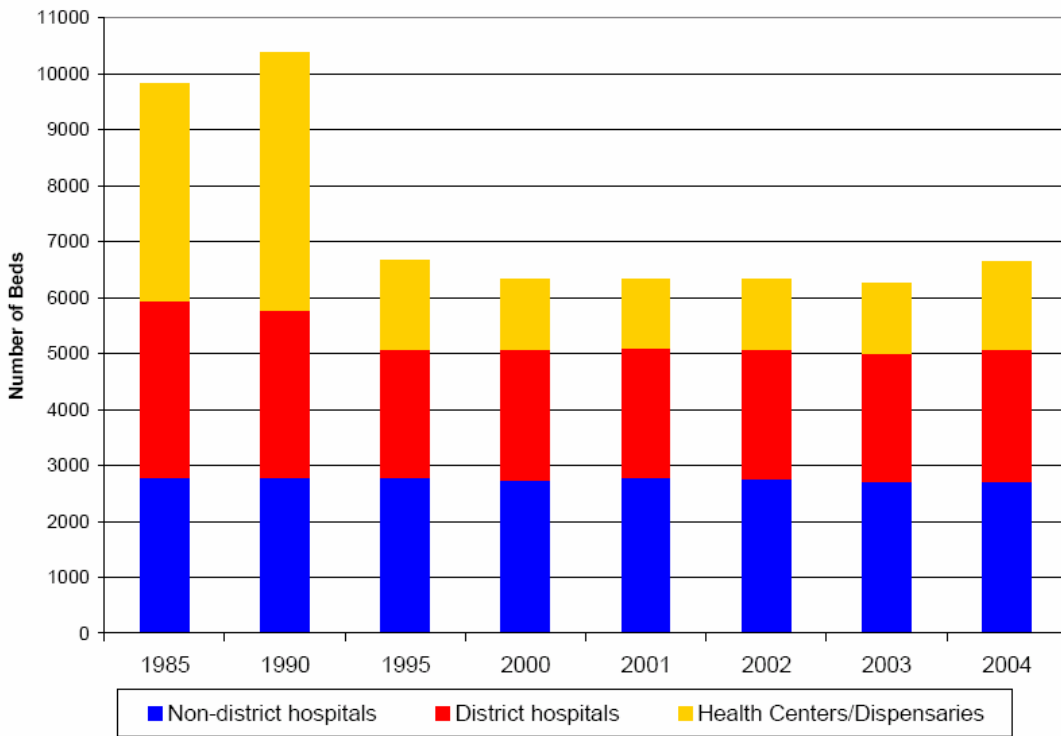
⁴² Principal Component Analysis was conducted using several indicators, but only four indicators were retained in the final index. The infrastructure index is calculated by: presence of primary school (1/0) + 2 presence of secondary school (1/0) + 2 presence of health centre (1/0) + presence of a tarred or gravelled road (1/0).

Figure 4: Infrastructure trends (1985-2004)



Source: World Bank (2006a)

Figure 4 (continued): Infrastructure trends (1985-2004)



Source: World Bank (2006a)

3.3. Availability of food 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. All this can affect food availability for rural populations.

3.3.1. Cereal self-sufficiency status

In Lao PDR only four percent of the total land area is cultivated. Rice constitutes 70 percent of the net cropped area⁴³. Most 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 land is irrigated. Upland rice productivity is estimated at about 2.04 metric tonnes (mt) per ha against 3.65 mt for the lowlands. Rice is by far the main cereal produced in the country. However, the share of maize production has increased from about 5 percent of total cereal production (2.45 million mt) in 2001 to 13 percent of the estimated 2.94 million mt of cereals produced in 2005.

According to the Ministry of Agriculture and Forestry⁴⁴, the total net production and the self-sufficiency status of rice have improved during the past years but marketable surplus is still 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 improved enough to generate significant marketable surpluses. Over the past five years, the surplus rice accounts for less than 10 percent of the net production. Given the dependency of the country on rain-fed production, this means that natural disasters, such as droughts and floods, could seriously affect food security where large-scale commercial imports and food aid would be necessary⁴⁵.

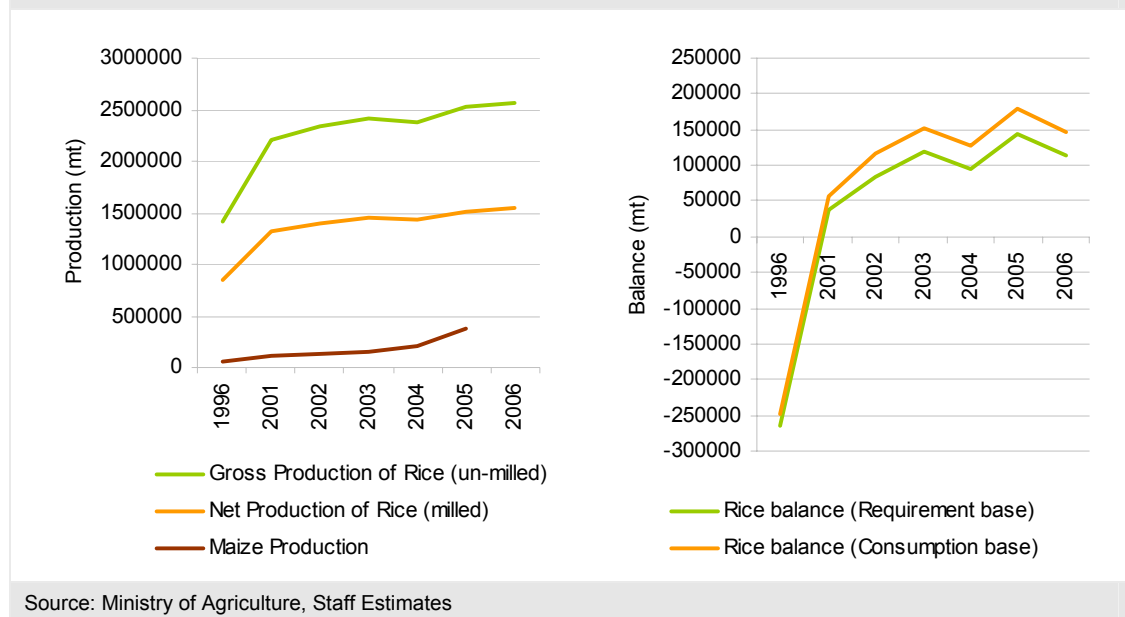
⁴³ According to official figures of the Ministry of Agriculture and Forestry, the total net cropped area is estimated at 1,020,400 ha of which 736,000 ha is occupied by rice production

⁴⁴ 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. One percent is assumed to go to other uses. Thus, the net availability of paddy for human consumption is 14 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 Lao Expenditure and Consumption Survey (LECS)-III (575 g) as a proxy of per capita requirement of rice. The average calorie content of different types of rice would result into a per capita requirement of 592 g per capita per day. The opening stocks from previous years carry forwards were also added to the production to capture the total domestic production

⁴⁵ According to the Ministry of Agriculture and the National Agriculture and Forestry Research Institute (NAFRI), about 30,000 to 70,000 ha of land are affected by floods and droughts every year

Figure 5: Self-sufficiency status of local rice production (1996-2006, in tonnes)



Differences exist in the levels of rice self-sufficiency among provinces⁴⁶. Per capita net production in the Northern provinces is low when compared to both the per capita requirement and the actual consumption over the past 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 g per day) each year.

The Central region is rice sufficient with the exception of two provinces - Xiengkhuang and the former special region of Xaysomboun, which have deficits similar to the Northern provinces. Bolikhamxay has unstable self-sufficiency patterns. Most of the rice surplus in the country is due to the Southern region, where only Sekong province is a net deficit production area. Many deficit provinces have mountainous landscapes. Poor roads to these remote locations are a disincentive for traders to move food commodities, due to high transaction costs and low purchasing power of the communities.

⁴⁶In the absence of district level rice balance sheets, the analysis is conducted at provincial level, acknowledging the limitation of this approach which ignores intra-province disparities

Table 3: Net per capita rice production as a percentage of requirements per province (2001-2005, percent)

North	2001	2002	2003	2004	2005	Average
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	2001	2002	2003	2004	2005	Average
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
Bolikhamxay	-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	2001	2002	2003	2004	2005	Average
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 g per day. The self-sufficiency status does not change with the actual per capita consumption which is estimated at 582 g in 1998 (LECS II) and 575 g in 2002 (LECS III).

Source: Ministry of Agriculture, Staff Estimates

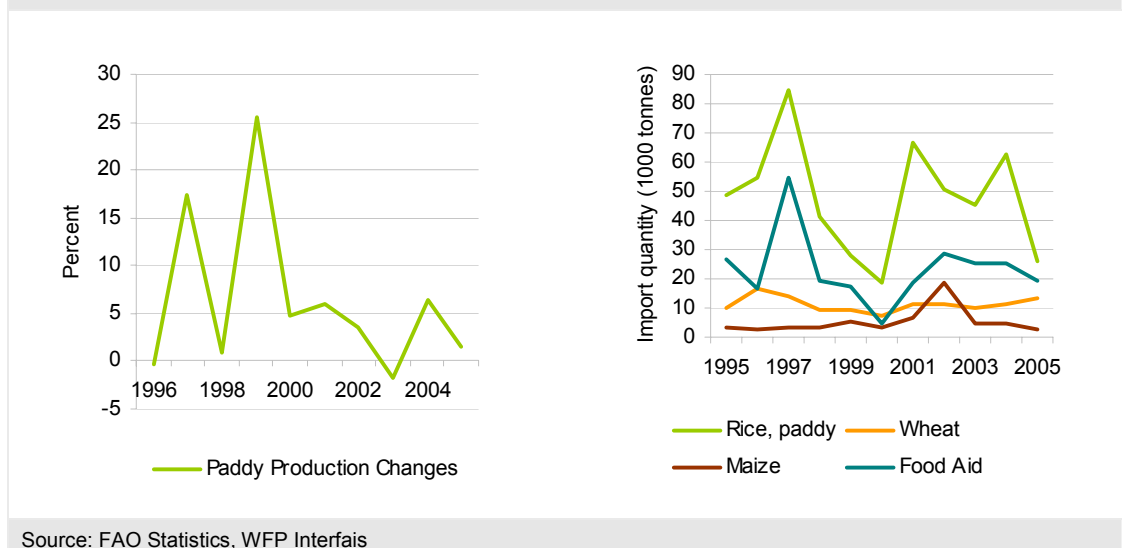
3.3.2. Food import profile and trade regime

Cereal imports (rice, wheat, maize) fluctuated with major surges occurring every 3-4 years (Figure 6). 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 total cereal imports. Import and food aid increases tend to occur simultaneously and compensate for 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 imports (private and humanitarian). Rice accounts for about 90 percent of total food aid per year and follows the same pattern as rice imports (Figure 6).

Most trade in Lao PDR still requires authorization from several national and provincial authorities, which creates 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 government⁴⁷. Border control is weak throughout the country, and border trade is poorly controlled. A large number of approvals and informal payments are still required to move food.

Figure 6: Trends of paddy production and food grain imports (1995-2005, in thousands of tonnes)



Source: FAO Statistics, WFP Interfais

Lao PDR has implemented the ASEAN Harmonized Tariff Nomenclature (AHTN), which has resulted in a tariff reduction on ASEAN origin products of 5 percent. As 80 percent of Lao PDR's external trade is with ASEAN countries, its participation in the ASEAN Free Trade Area (AFTA) is a significant liberalizing step. However, Lao PDR 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), which weakens the private sector capacity to meet emergency needs. The law⁴⁸ prohibits importing domestically grown agricultural products in quantities sufficient to meet demand. Importers must submit an annual importation plan to the Ministry of Commerce or to relevant provincial authorities and can only import against the plan during the following year. This policy leads to delays in private food imports for emergencies resulting from natural disasters. Lao PDR has no specific law on standards for imported or exported goods. Imported goods are allowed to enter based on certification of the exporting country. Lao PDR has no special labelling 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.

3.3.3. Food market channels and cross-border trade

The analysis of food marketing chain focuses on the rice market as it is by far the most commonly eaten food item in Lao PDR. The rice market chain links small traders (retailers) with farmers and consumers in rural areas.

Few traders are involved in purchasing and selling food and agricultural products in rural areas. The State Food Enterprise (SFE)⁴⁹ of Lao PDR procures rice during harvest for government staff and sells rice stocks to the general population during rice shortage periods.

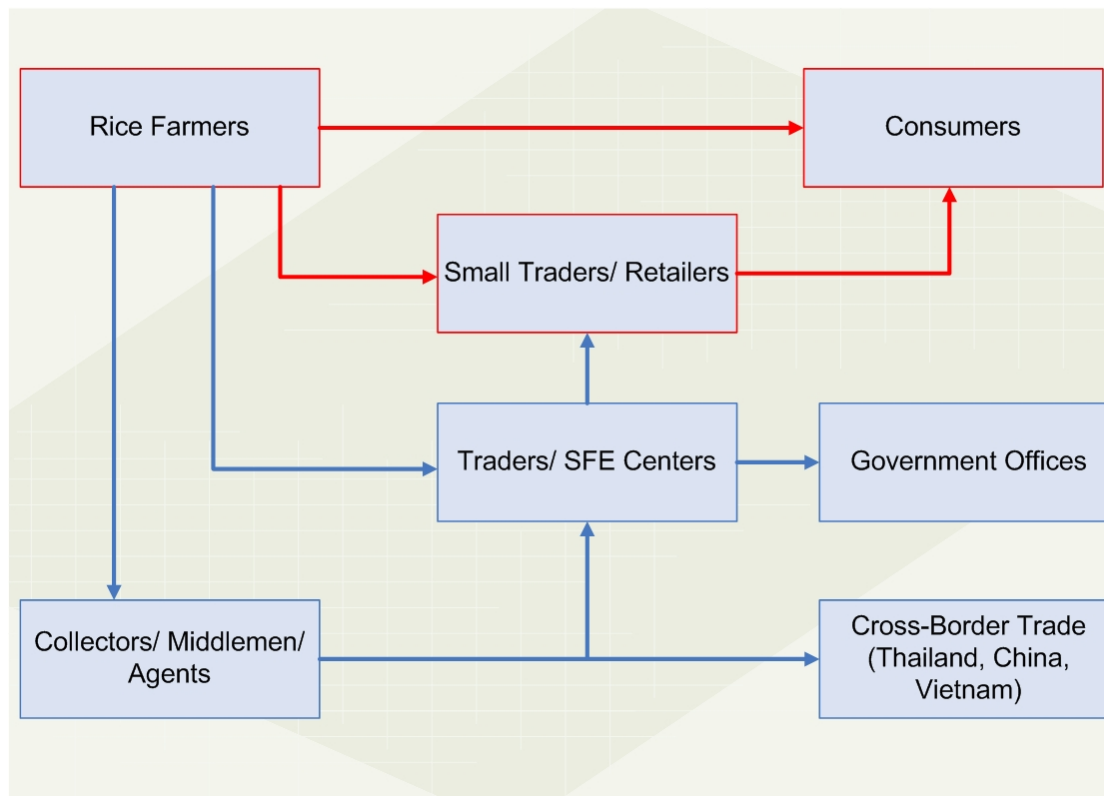
⁴⁷ www.ustr.gov/assets/Document_Library/Reports_Publications, Accessed on 1 May, 2007

⁴⁸ The list of goods subject to import and export prohibitions is set out in Notification of Ministry of Commerce No. 284/MOC.FTD dated 17 March, 2004

⁴⁹ This section is based on personal communication with SFE

This helps to stabilize rice prices. SFE operates as a profit-making organization. In addition to 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 centres in the Central and Southern provinces. The rate offered by the SFE is based on market supply and demand equilibrium prices. The SFE influences market prices as it engages farmers into contract farming, using forward/advance payments to farmers, and distributes seeds and fertilizer to farmers.

Figure 7: 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) centres in the Northern provinces because of the deficit production patterns in the region, combined with limited road access and high transportation costs. Farmers of these areas sell their produce to border markets in China, where they are paid higher prices than they would by selling locally or to other regions. 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 centres and many small private traders. Most farmers sell their surplus produce to local and travelling traders. However, large net producers are reported to also trade with the border markets of Thailand at higher prices.

Cross-border trade is important for food needs in the Northern provinces. The Bank of Thailand estimates that unofficial cross-border trade with Thailand equals 50 percent of

officially recorded trade⁵⁰. In 2000, the official border trade through customs procedures between Thailand and Lao PDR resulted in a trade value of US\$27.6 million; US\$15.2 million in exports and US\$12.4 million in imports. Major export items to Lao PDR are construction materials, fuel and lubricant, consumer goods, and vehicles and spare parts. Main import goods from Lao PDR 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 Lao PDR. According to the Bank of Thailand, trading takes place between Thailand and six provinces in Northern Lao, particularly that of Oudomxay province. Consumer goods are imported and agricultural products (including forest products) are exported by Lao residents. However, all goods put together, northern Lao PDR is net importer in border trade with Thailand.

Informal border-trade occurs both from surplus and deficit areas to border countries such as Thailand, Vietnam and China. However, little is known about the importance of this 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, reduction of rice surplus and an increased pressure on local food availability and domestic prices. An informal inflow of rice would be beneficial for net consumers through its price stabilizing effect, but detrimental to net producers in surplus areas. In rural areas, the lack of market knowledge causes imbalanced pricing transactions between traders and households (producers and consumers)⁵¹.

3.4. Food price patterns

In the absence of rural price collection systems, the analysis of food prices is based on the consumer price series of the National Statistic Centre (NSC). These series are collected from fourteen urban markets in eight provinces since 2000. Urban prices may not reflect prices in rural areas. Improving the market surveillance system of the Ministry of Agriculture and Forestry in rural areas could help provide information on rural household's food security.

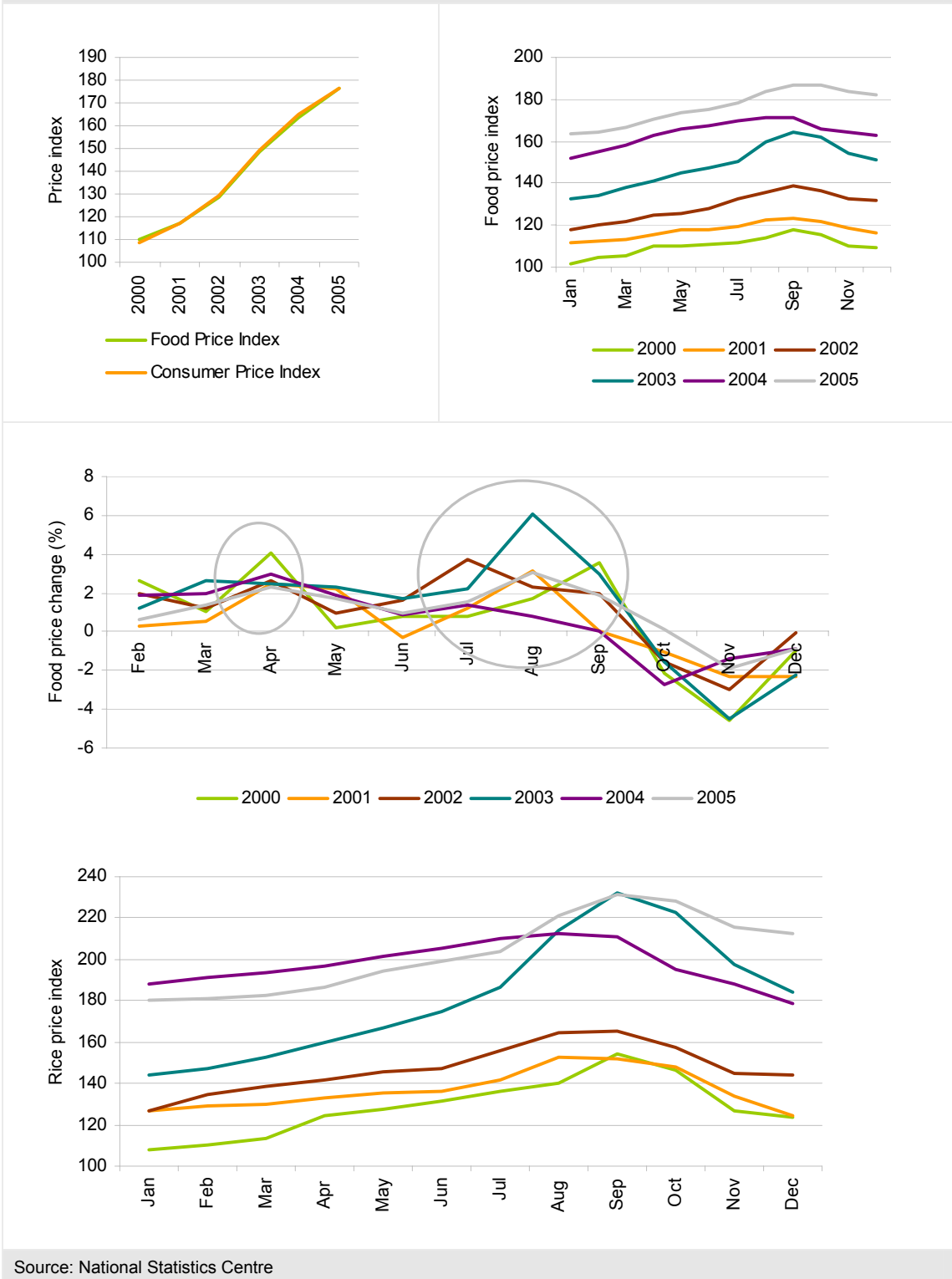
The consumer price index (CPI) indicates an upward trend (in real terms) from 2000 to 2005, due partly to food price increases. Food prices increased significantly in 2003 (15 percent) and 2004 (11 percent) as a result of production shortfalls due to drought. Inflation in the middle of 2005 reflected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

The intra-annual seasonality of food prices remained unchanged, following the seasonal patterns of rice production (Figure 9). Food prices decrease from October to December due to increased availability of rice from the main rice harvest season in the lowland. Subsequent months of rice harvest in the uplands from January to March have less impact on food prices because of the limited production. From March to October, trading of small quantities for non-food needs (including inputs and seeds) and own consumption 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 a short peak in the dry season of April and a long peak during the lean season from July to September, suggesting that food shortages are higher during these periods of the year.

⁵⁰ Bank of Thailand (2003)

⁵¹ WFP (2006)

Figure 8: Consumer price patterns (2000-2005)

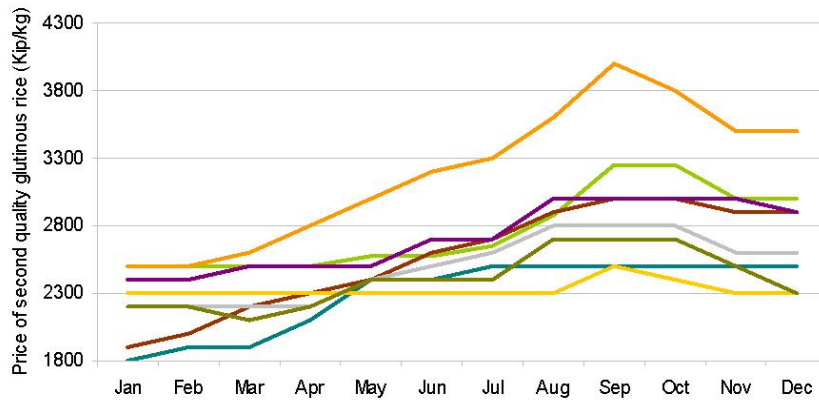
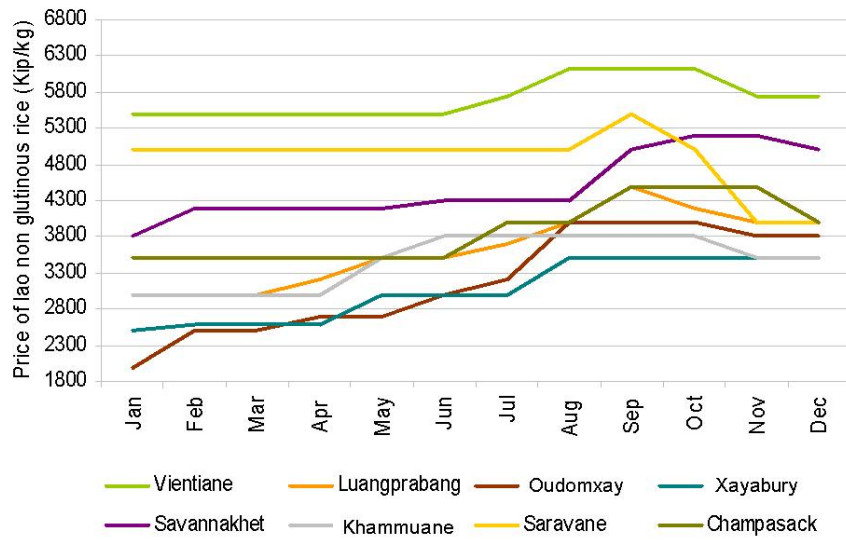


Source: National Statistics Centre

In the provinces, the price of glutinous rice is higher in Vientiane, Savannakhet, Luangprabang and Oudomxay. The higher price in the Northern provinces of Luangprabang

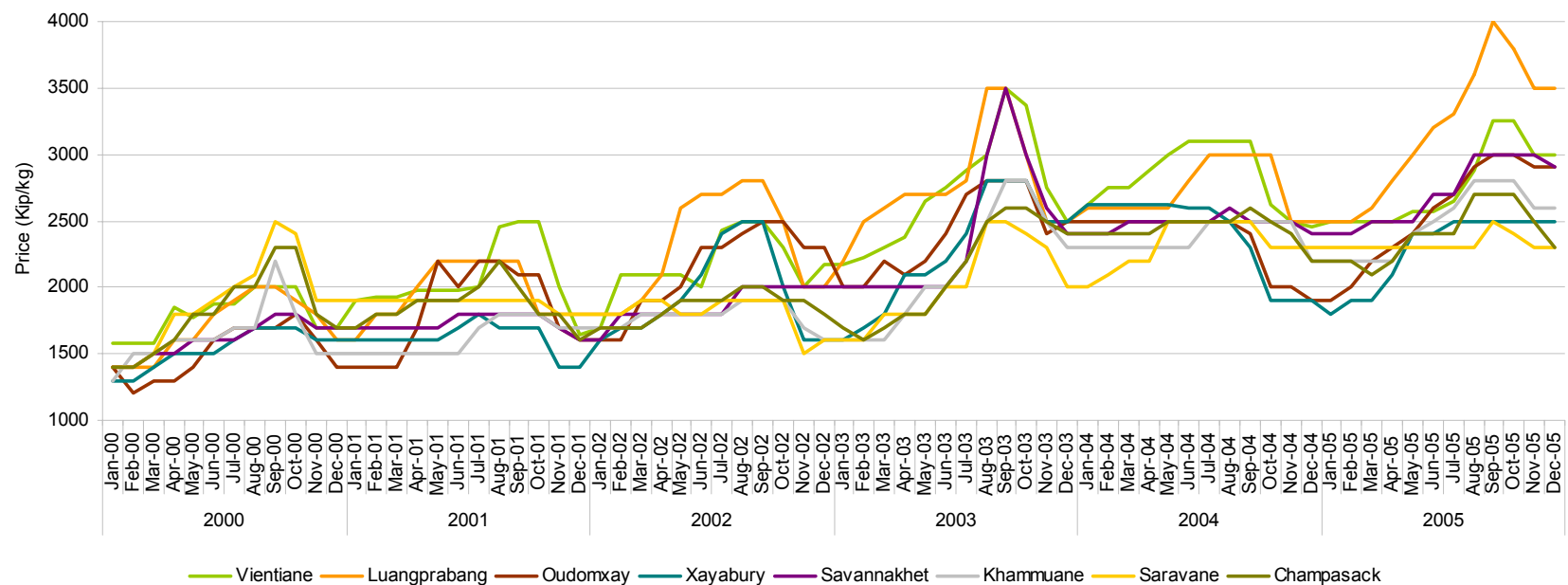
and Oudomxay is due to their rice deficit and their isolation from surplus production areas. The higher prices in these provinces can be attributed to transportation costs and dependence on consumer goods from Thai markets which are closer than Lao surplus provinces of the South. The higher prices in Vientiane and Savannakhet are due to the demand pressure related to the urban population.

Figure 9: Monthly price patterns of non-glutinous rice and glutinous rice (2005, in Kip/kg)



Source: National Statistics Centre

Figure 10: Monthly price patterns of second quality glutinous rice (2000-2005, in Kip/kg)



Source: National Statistics Centre

The price of glutinous rice is lowest in surplus areas of the south such as Saravane, Khammuane and Champasack. The prices of glutinous rice and non-glutinous rice are also low in Xayabury, despite its recurrent deficit situation. Xayabury is a central transit point for imports from Thailand, thus stabilizing prices. Every year, the prices in Luangprabang, a deficit area, 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 centres and delivery points.

Price fluctuations are more an issue of seasonality than of volatility. 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 demand. 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 Xayabury. Locally, mainly glutinous rice is produced. Glutinous rice prices follow 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 B1).

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 centres, physical access to markets can be used to measure potential market integration. Information about road access and locations of major cities and towns is one measure. High access to roads for motor vehicles should provide better access to markets.

Another measure is travel time. Travel time to cities or markets depends on road and traffic conditions, the means of transport, and weather conditions. Time conditions may reduce market integration through high transaction costs, especially between remote rural areas and market centres.

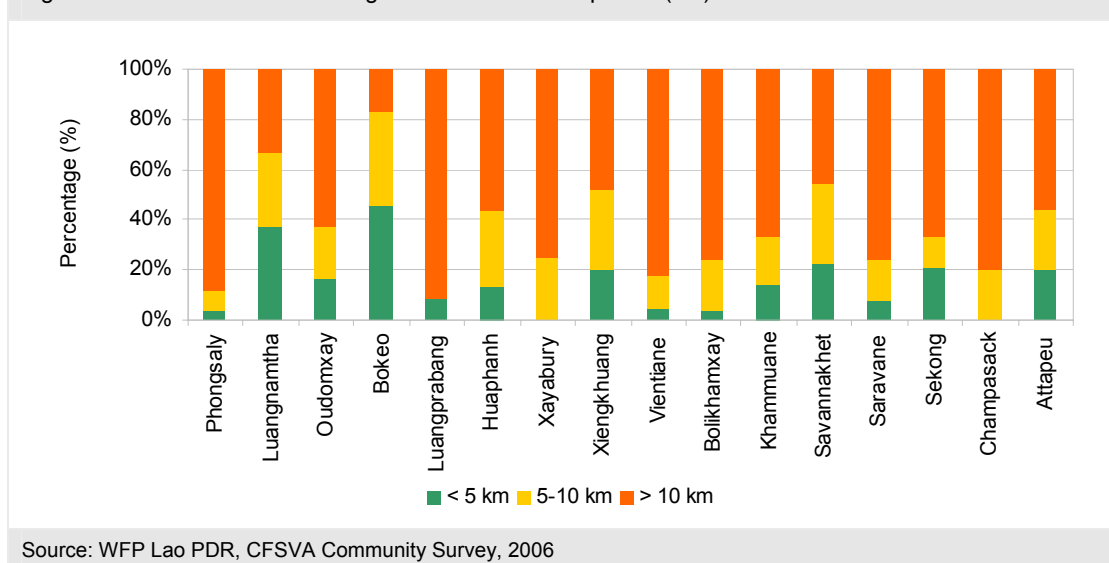
Difficult transport conditions in Lao villages reduce access to markets. In the 398 surveyed villages in the CFSVA sample, travel distances to district centres are higher than ten kilometres, except in Phongsaly and Khammuane provinces (Table 4). However, most of the roads in these two provinces are of a low standard. Most surveyed villages have low or moderate access to motor roads. Villagers travel primarily by foot to district centres, indicating long travel times. Above 10 Km, the travel time by foot is estimated at 4 hours (one way)⁵², indicating that most communities are located at travel distances equivalent to a working day to reach the closest market.

The Lao people also travel by motorbikes, bicycles and hand tractors. Local buses are not a main mean of transportation, because of poor road conditions. Poor road conditions are mentioned by most communities as the main reason for the lack of physical access to markets, except in Bokeo and Luangprabang (Annex B2). Luangprabang province has relatively good roads, but many villages are located far from markets. In addition, insecurity seems to limit market access in a few provinces such as Savannakhet, Saravane and Sekong.

Limited access of communities to markets is compensated by traders' many visits to villages. More than two-thirds of the surveyed village heads 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. This almost one-way trade direction is a source of lack of market information, resulting in high transaction costs for communities.

Seasonal access to roads reduces access to markets. In general, access to markets is reduced in the wet season between May and November (Figure 12). Sekong and Attapeu villages have the longest periods of isolation, between four to six months (Annex B2). 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.

⁵² WFP (2006)

Figure 11: Distance between villages and main market places (km)⁵³

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Table 4: Road access and transport conditions by province

Province	Average distance to district centre (km)	Main Type of Road (percent of villages)		Motorable Road Availability Score*	Main Means of Transport (percent 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)	Bicycle (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)	Bicycle (8)
Vientiane	20.6	Gravel (52)	Paved (32)	3	Motorbike (50)	Hand Tractor (21)
Bolikhamxay	40.1	Gravel (64)	Paved (24)	3	Motorbike (20)	Hand Tractor (16)
Khammuane	5.0	Gravel (52)	Earth (32)	2	Bicycle (24)	Motorbike (20)
Savannakhet	32.2	Gravel (52)	Track (25)	2	Hand Tractor (42)	Bicycle (21)
Saravane	10.7	Gravel (38)	Track (29)	2	Hand Tractor (24)	Foot (20)
Sekong	14.3	Paved (48)	Earth (44)	2	Foot (46)	Bicycle (33)
Champasack	31.4	Earth (29)	Track (29)	1	Motorbike (36)	Hand Tractor (20)
Attapeu	23.2	Gravel (48)	Earth (24)	2	Bicycle (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).

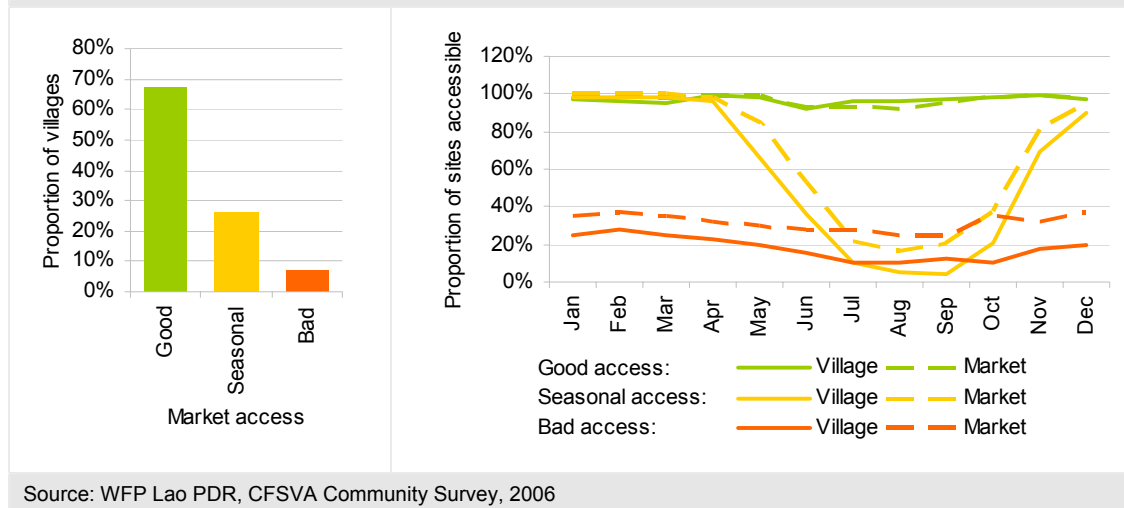
Source: WFP Lao PDR, CFSVA Community Survey, 2006

⁵³ Results for Bokeo can be explained by the fact that it is close to the Thai border and that households and traders go to nearby Thai markets. The regional population also relies heavily on boats and rivers. Therefore the road distance estimation as asked in the questionnaire could be skewed

3.5.1. Accessibility of the village

Through Principal Component Analysis (PCA) and cluster analysis, villages have been grouped based on their accessibility during the year.

Figure 12: Village accessibility (proportion of accessible sites)



Most villages (63 percent) have good access throughout the year. However, for 10 percent, access is poor most of the year. The remaining villages have good access during the dry seasons, and roads become less accessible during the rainy seasons.

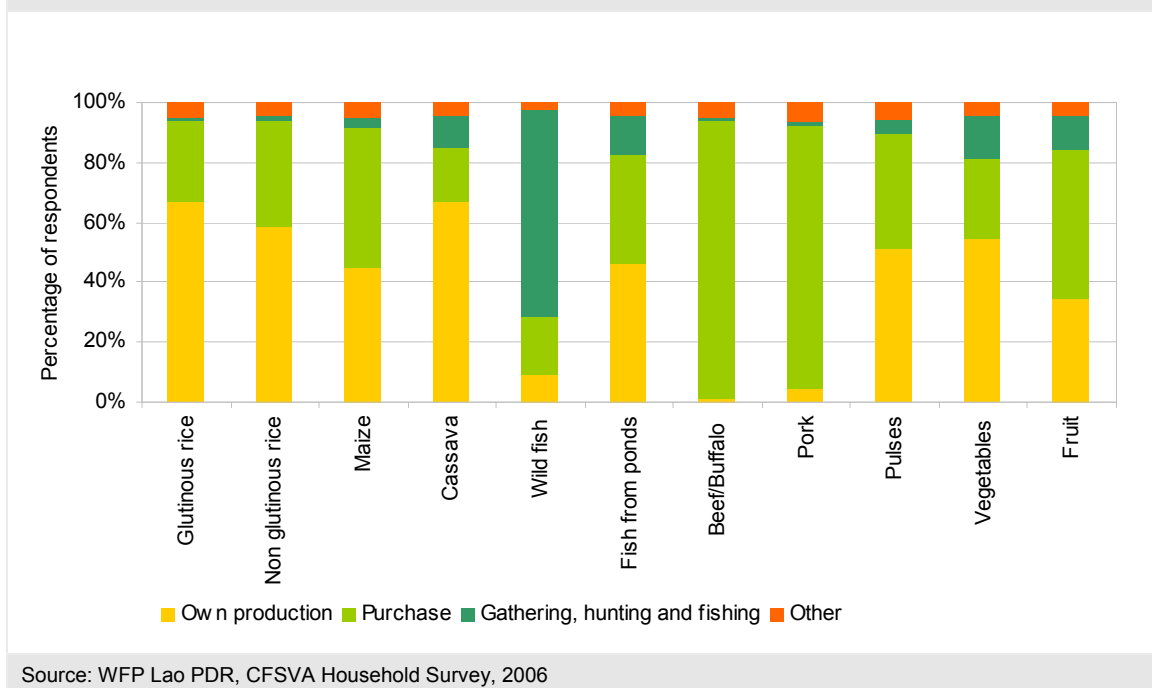
3.6. Households' participation in food markets

On the supply side, limited surplus production is sold on the markets due to the subsistence nature of the rice farming and limited physical access to markets. In general, animals (cows, buffaloes, chickens and pigs) and handicrafts (baskets, mats and kitchen tools), NTFPs and vegetables provide other sources of income for rice farmers.

Many respondents considered markets as primary or secondary sources of food. The majority of the respondents indicated own production as the first or second source of cereals, tubers, pulses, vegetables and fish. Markets are the main source of meat products (more than 80 percent of respondents).

About 60 percent of the respondents get glutinous rice and non-glutinous rice from their own production. A production shortfall would therefore increase households' vulnerability to food insecurity. 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 rely on substitutes such as forest products to mitigate some of the negative impact of rice shortages, but these sources are not sustainable. Other crops such as maize and cassava are not yet produced at a level where they are reliable alternatives.

Figure 13: Distribution of food sources (percent of respondents)



Source: WFP Lao PDR, CFSVA Household Survey, 2006

3.7. Unskilled wage rate

Casual labour is an income source for villagers, especially during the lean season and for non-farm activities. The existing demand is for unskilled labour, mostly as agricultural labour (bush cleaning, paddy land maintaining or land fencing) for neighbours⁵⁴. The practice of agricultural casual labour or labour exchange is common in the wet season and during the lean season to meet household food needs. In general, payments are made either in kind (with some five kg of paddy rice/day) or in cash.

According to the community survey, the daily wage rate of unskilled labour is between 10,000 and 20,000 Kip. The highest rates are paid in Vientiane and Bolikhamxay provinces while the lowest are paid in Phongsaly and Luangprabang provinces (table 5).

⁵⁴ WFP (2006)

Table 5: Daily wage rates for unskilled labour by province (Kip)

	Mean	HH	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
Bolikhamxay	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
Champasack	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

Villagers prefer permanent agricultural activities since non-farm activities are considered to be temporary and low paying. In general, a lack of skills puts villagers at a disadvantage in both finding and keeping employment opportunities in non-farm activities, such as mining, logging, building roads and constructing houses.

Summary: Chapter 3

Chapter 3 examined the political and socio-economic environment in relation with food security.

There are several policies that directly or indirectly affect food security. The Opium Eradication Policy resulted in successful eradication of cultivation of opium poppies, but also in the loss of an important income source for many communities.

The implementation of the resettlement strategy has in some instances led to increased vulnerability to food insecurity. This has been caused by a lack of access to agricultural land for settlers in the new location and partly by a lack of adequate social services for the affected populations, and by missed opportunities in the strategy itself (lack of appreciation of traditional ways of living).

It is important to closely monitor the implementation of policies and to identify mitigating measures when necessary. Malnutrition needs to be prioritized by both the Government of Lao PDR and the donor community.

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) continue to 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 Lao PDR.

The increasing consumer price index has to a large extent been driven by rice price increases. 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.

Market centres are not well integrated in rural areas in Lao PDR because of: i) limited road access; ii) poor roads, especially during the wet season; and iii) a one-way trade direction from traders/agents to communities, creating high transaction costs and lack of information for communities.

Markets constitute the second most important source of food for households after their own production. An increase of food commodity prices or a decrease of income levels would have a negative impact on households' purchasing power and also on the pattern of their food consumption.

Chapter 4. Asset ownership

In the Sustainable Livelihoods Framework⁵⁵, the term 'asset' is referring to 5 groups 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 livelihood activities.

It is difficult to combine these assets - also called 'capitals' - into a 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 used for. One cannot understand 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 constraints lie. The following chapter looks at the asset ownership of the rural population of Lao PDR.

4.1. Natural capital

4.1.1. Geography

The country has traditionally been divided into three topographical regions⁵⁶. The lowland flood plain 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 for animal husbandry. The third and largest region is the uplands which is only suitable to shifting cultivation (under certain conditions) and forestry development.

Sloping levels help show if the land is suitable for agricultural production. Land with a gradient of more than 16 percent⁵⁷ has been defined as fragile land, not suitable for intensive agricultural production. Fifty-eight percent of the area of Lao PDR can be characterized as fragile land. This varies across the provinces. Champasack and Savannakhet have 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). Fragile lands have reduced agricultural opportunities.

In addition to mountains, rivers are another geographical characteristic of Lao PDR. Eighty-seven percent of the land area is within the Mekong River Basin System⁵⁸ which has 28 big tributary rivers. In the northeast of the country there are also four other rivers that drain through to Vietnam. These rivers normally have water throughout the year, even in the dry season. These rivers are therefore a potential irrigation source for intensive agricultural production, something which is increasingly occurring in parts of the lowlands of the country. However, irrigated land makes up less than one fifth of the agricultural land⁵⁹.

A third geographical feature characterizing Lao PDR is large areas covered by forests⁶⁰. Recent studies show that forests with more than 20 percent canopy density cover 41.5 percent of the

⁵⁵ Department for International Development (2006)

⁵⁶ Government of Lao PDR (2000)

⁵⁷ This means that for every 100 meter horizontal movement, the land has risen 16 meters. Land with slopes steeper than 16 percent is considered unsuitable for intensive agricultural production

⁵⁸ Government of Lao PDR (2000)

⁵⁹ FAO (2006)

⁶⁰ Ministry of Agriculture and Forestry (2005)

land area. In the mid-sixties, this figure was estimated at 70 percent⁶¹. 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.

Unexploded Ordnance

Laos 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 Laos, dropping more than two million tonnes of bombs⁶². Severe UXO contamination still affects 15 of the provinces. The most severely hit provinces are: Savannakhet, Xiengkhuang, Saravane, Khammuane, Sekong, Champasack, Huaphanh, Attapeu and Luangprabang⁶³.

The affected areas represent 50 percent of all agricultural land. The Government of Lao PDR launched the Lao National Unexploded Ordnance Programme (UXO Lao) to clear land for development and safety. Since 1999, this programme has cleared land area in districts where about 40 percent of the rural population live, amounting to 6 percent of the land area affected. It will take another 10 years to clear or mark all land highly impacted with UXO in Lao PDR⁶⁴. 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 reported that their land was not UXO contaminated. Eleven percent said that their land has not been cleared, and 4 percent have land that has been cleared. Only 3 percent of the households reported owning agricultural land that is not in use due to UXO contamination. The national figures from the CFSVA survey on UXO-related problems are probably too low and do not reflect the high presence of UXO contaminated agricultural land in the most affected provinces (Xiengkhuang, Khammuane, Savannakhet, Saravane, Sekong and Attapeu). There may be many reasons why households did not report these problems, one of them being that land labelled as UXO contaminated will have to be cleared before being put into use, and this may take years. Many households may prefer to risk farming in a non-cleared area rather than to wait for clearing.

4.1.2. Productive land

Without access to land, it is difficult to produce agricultural outputs. The households in the survey were asked to estimate how much paddy land⁶⁵ and upland⁶⁶ they were cultivating this season. On average, households cultivated 1.2 ha of paddy land and 0.7 ha of upland.

The distribution between paddy land and upland is mostly determined by geography. In mountainous regions, upland cultivation dominates and for flat areas, such as the Mekong Plains, paddy cultivation is the most important. Households in Champasack report the highest paddy cultivation with 2.8 ha, followed by Savannakhet (2.2 ha) and Attapeu (1.8 ha). The lowest paddy cultivation is found in Phongsaly and Oudomxay with 0.4 ha. The highest upland production is in the mountainous regions of Xiengkhuang (1.6 ha) and Phongsaly (1.4 ha).

The difference between the ethnic groups also gives a very distinct picture. The Lao-Tai are mainly paddy producers (1.8 ha on average) and are only minimally involved in upland production (0.4 ha). In contrast, the Sino-Tibetan groups with only 0.4 ha of paddy production, but 1.4 ha of upland. Other groups have an equal amount of paddy (0.9 ha) and upland (1.0 ha).

⁶¹ Ministry of Agriculture and Forestry (2005)

⁶² UN Country Team Lao PDR and Government of Lao PDR (2006)

⁶³ Government of Lao PDR (2004)

⁶⁴ Journal of Mine Action (2006)

⁶⁵ Paddy land refers to flat land suitable for cultivation of wet rice

⁶⁶ Upland refers to land on slopes, only suitable for dry rice (often based on shifting cultivation) and not wet rice

There seems to be a clear link between food consumption and access to paddy land. Households with acceptable food consumption cultivated 1.6 ha of paddy land, whereas households with poor food consumption only cultivated 0.6 ha⁶⁷.

Land ownership or entitlement is also an important asset. When ownership of land is secure, households have bigger incentives to invest in their land. The Government is currently undertaking a land titling process, and this has progressed at different paces in different parts of the country. Thus, ownership of land differs across the country. In the provinces of Huaphanh, Saravane and Phongsaly, less than 10 percent of households report legal entitlement of the land they tilled. In contrast, more than 80 percent of the households in Xayabury, Bolikhamxay and Attapeu report 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 groups. Whereas 63 percent of the Lao-Tai groups report entitlement to their land, only 17 percent of the Sino-Tibetan groups report the same. Of the two other groups approximately 35 percent have land titles.

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 percent) and Luangnamtha (59 percent). More than 80 percent of households in the provinces of Savannakhet, Saravane, Attapeu, Sekong and Luangprabang use rain water as main source.

Households were also asked which tools they used for working their land (see 4.3.1: Productive assets)

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

Table 6: Lao cropping calendar

	Dry season				Rainy season							Dry season	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Upland rice, rainfed	Land selection, preparation, slashing and burning				Planting and weeding		Grow	Grow	Grow/Harvest	Harvest			
Low-land rice, rainfed					Land preparation	Transplanting and weeding		Grow	Grow	Grow/Harvest	Harvest		

Source: Ministry of Agriculture and Forestry, Department of Agriculture

4.1.4. Livestock ownership

Consumption of livestock is limited in rural Lao PDR. Livestock is treated by most households as capital (draught power or savings) rather than for food consumption. This applies in particular to larger animals. Livestock is also important for ritual purposes amongst many ethnic minority groups. Nine out of ten households report keeping livestock. On average a

⁶⁷ See Chapter 6 for an explanation of poor, borderline and acceptable food consumption

household in rural Lao PDR 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 chickens (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 was released in 2006. The CFSVA authors used these data for an 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 Census⁶⁸ 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 of the household 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 divided by number of adults) for Lao PDR is not 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 one 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 to their household members. Other provinces with a high dependency ratio are Sekong (1.21) and Luangprabang (1.19).

Most households (93 percent) are headed by males. There are only 7 percent female-headed households in the sample. As there are not enough female-headed households in the sample it is thus difficult to statistically establish whether these are particularly vulnerable. On average, 7 percent of the households are headed by an elderly person (65 or above). This varies from 12 percent in Champasack to 2 percent in Xiengkhuang and Huaphanh.

4.2.2. Access to health centres

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 centre in their village. This lack of physical access to health centres is a problem in maintaining people's health status. However, villages which do not have health centres may be located within reasonable distance of such centres. 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.

Health volunteers have seldom received more than first aid training and are not able to treat major illnesses. A livelihood assessment conducted by WFP revealed that cost for treatment and medicines was also an impediment for many villagers in seeking medical assistance when needed⁶⁹.

The MICS survey conducted by the Ministry of Health, NSC and UNICEF provides more information on the access to health services and health status in the Lao PDR.

⁶⁸ National Statistics Centre (2006a)

⁶⁹ WFP (2006)

4.2.3. Education levels

The level of formal education among the surveyed households is low. Fifty-one percent of household heads have no or incomplete primary education. Only 21 percent have more than primary education. The situation is worse for their spouses, with respectively 71 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 formal education levels and ethnicity. The Lao-Tai groups have received far more education than the other groups. Ethnic minority women (spouses) in particular lag behind. This may be linked to the challenges faced by the Government in delivering quality education to ethnic groups with more than 200 different mother tongues, some of them residing in areas of very difficult physical access. According to the 2001 PPA, 'in many cases villages have consciously chosen not to participate in education because they feel it has no relevance to their lives'. The Sino-Tibetan groups in particular seem to be less formally educated: 66 percent of the heads of household and 89 percent of their spouses among these groups have no schooling.

The census⁷⁰ shows that 80 percent of all villages had a primary school in their village. However, only 36 percent had a complete primary school⁷¹. Not all villages need to have a school within their premises. Nearby villages can share one school without affecting the children's educational potential. But a village without a school is still an indicator of an educational gap. In Phongsaly, Saravane, Luangnamtha and Oudomxay, respectively 15, 18, 23 and 23 percent of villages do not have a complete primary school. The issue of education quality is beyond the scope of the CFSVA.

4.2.4. Literacy levels

Lao PDR 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 household can read and write a simple message. For spouses the proportion was 53 percent. Women (or spouses) in Phongsaly, Bokeo and Luangnamtha are especially lagging behind when it comes to literacy (20, 28 and 35 percent respectively can read and write a simple message). 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 differences between regions and ethnic groups regarding literacy. The Northern provinces of Phongsaly, Luangnamtha and Oudomxay 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 simple messages 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.

While 67 percent of Lao-Tai spouses are literate, only 5 percent of Sino-Tibetan spouses report the same. This shows the limited human capital that the minority groups have at their disposal. The lack of formal education and ability to communicate through reading and writing hinder these spouses from participating in society and acquiring knowledge of ways in which to improve their livelihoods.

⁷⁰ National Statistics Centre (2006b)

⁷¹ A complete primary school is a school that provides teaching in all 5 primary-level grades

4.3. Physical assets

4.3.1. Productive assets

Households were asked if they own a number of productive assets (used for agricultural production, rice processing, and transportation). Ownership of productive assets enhances agricultural production and processing and the ability to engage in agricultural or fish-based livelihood activities.

Ninety-three percent of all households own a shovel or a spade and 89 percent own 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.

Households might not own buffaloes or a tractor, but they would still be able to increase their production if they had access to any of these either through borrowing or renting. The hand tractor is the most commonly used tool for tilling the land in paddy production. This is most prevalent in Bolikhamxay (78 percent of households), Xayabury (69 percent) and Khammuane (53 percent). Hand tools, which are the only tools suitable for upland rice production, are most common in Luangprabang (77 percent) and Phongsaly (73 percent).

In the South, there is a more even spread between different methods. A substantial proportion of households reported using hand tools and hand tractors. The provinces of Champasack (42 percent), Attapeu (40 percent) and Savannakhet (39 percent) also reported using animal draught power. Access to motorized tools is very limited within the Sino-Tibetan and Austro-Asiatic groups with less than 10 and 20 percent of households, respectively. In comparison, more than half of the Lao-Tai groups have access to such tools.

At the other end of the rice production cycle is rice dehusking. The CFSVA distinguishes between pounding mills (activated by foot or hand) and electricity or fuel powered rice mills. About one in four households owns a pounding mill. Pounding mill ownership is highest in the Northern provinces. The same applies to fuel-powered rice mills. Champasack, Khammuane and Vientiane provinces report low ownership of any type of rice mill. Most likely other milling arrangements are in place, but the survey data does not yield such information.

Owning fish nets can be an indicator of the ability to engage in fishing. On average, 58 percent of 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 Bolikhamxay and Vientiane with 83 and 76 percent respectively. The ownership of a fishpond was not covered by the CFSVA.

4.3.2. Non-productive assets

The housing conditions of the Lao people were described in the recent census. The census describes housing structures (floor, wall, roof, size), in addition to information on toilet facilities, electricity and drinking water. The CFSVA also covers some of these issues with identical questions to the census. The census shows a large difference in housing structures between rural and urban areas. Urban areas rely more on cement, bricks, tiles and 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. Grass provides less protection and can 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 Bolikhamxay provinces (9, 14 and 15 percent respectively).

Nearly 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 do not differ much regarding housing conditions.

The CFSVA differs somewhat from the census in the approach of describing toilet facilities. Whereas 47 percent of households 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 shows a discrepancy between provinces with regard to improved sanitation facilities. Only 10 and 11 percent report having such facilities in Savannakhet and Phongsaly provinces (according to 2005 census data 21.7 and 13.5 percent have access to toilets with flush respectively) and as many as 85 and 80 percent in Xayabury and Bolikhamxay (according to 2005 census data 54.6 and 64.9 percent have access to toilets with flush respectively). It is difficult to interpret these differences, the way the enumerators recorded the answers probably had an effect. Having access to improved sanitation facilities can be very important for containing diseases like diarrhoea, which can negatively affect people's nutritional status.

Wood is 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 percent), Saravane (17 percent) and Xayabury (17 percent) is charcoal also a significant contributor to energy for cooking.

Laos has many rivers and streams, but many villages still lack access to safe drinking water. The most important improved source of drinking water (36 percent of households) is from mountain sources. This is often called a gravity fed 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 to be safe. In any case, such a system does provide cleaner water than what would alternatively be available near the village, such as a river.

If we consider piped water and protected wells or boreholes as safe water sources, then 31 percent of households have access to safe water. The census reported 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 reported access to safe water, less than 10 percent in the provinces of Phongsaly, Oudomxay, Bokeo, Luangprabang and Huaphanh reported access to safe water. 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 from 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 nine out of ten households have ten 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.

At the end of the dry season, from March to June water is less readily available. 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 and Huaphanh report unavailability of the main water source.

About half of the households who reported unavailability of the main water source in April or May have mountain sources as main sources. Twenty percent have protected wells or boreholes and 19 percent have unprotected wells or boreholes. 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 an impediment to nutrition-related interventions. Although the CFSVA did not integrate the volume of water available it is known to be an important concern for rural villagers.

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 possible, but tedious. The enumerators would need both accounting skills and to make assumptions about the valuation of assets. Therefore, an easily obtainable wealth index, which can be used in ranking and categorizing households, has been constructed.

First, a principal component analysis of wealth (or poverty) related indicators was 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 (productive and non-productive) assets in the household and ownership of various types of livestock. Since owning a wooden pounding mill, which is associated with a poor rural lifestyle, is correlated with a lower wealth status, it was removed from the analysis⁷².

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 this underlying variable.

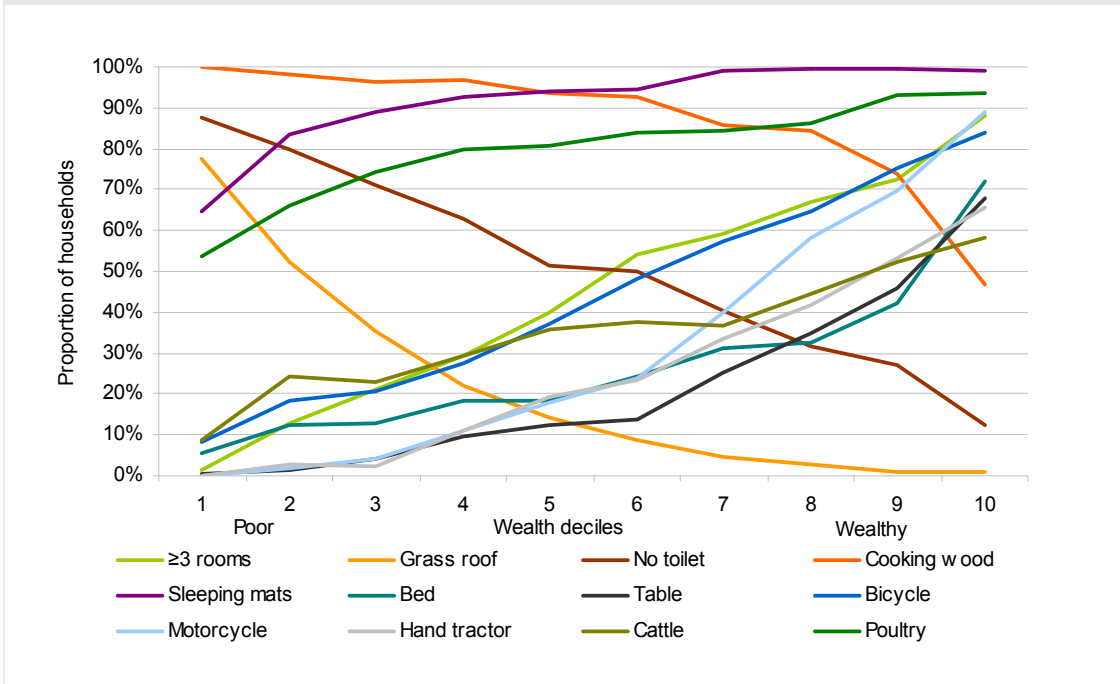
The first principal component of the factor analysis was then used to construct an index, which assigns a weight to all the indicators included in the analysis. This factor reflects the wealth status of households.

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 modified so that the theoretical minimum is zero and the maximum is 100. This slightly simplified wealth index has a correlation of 0.994 with the original factor.

Figure 14 shows the association of the various indicators with the underlying wealth status of households. The wealth index is strongly associated with food security.

⁷² 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

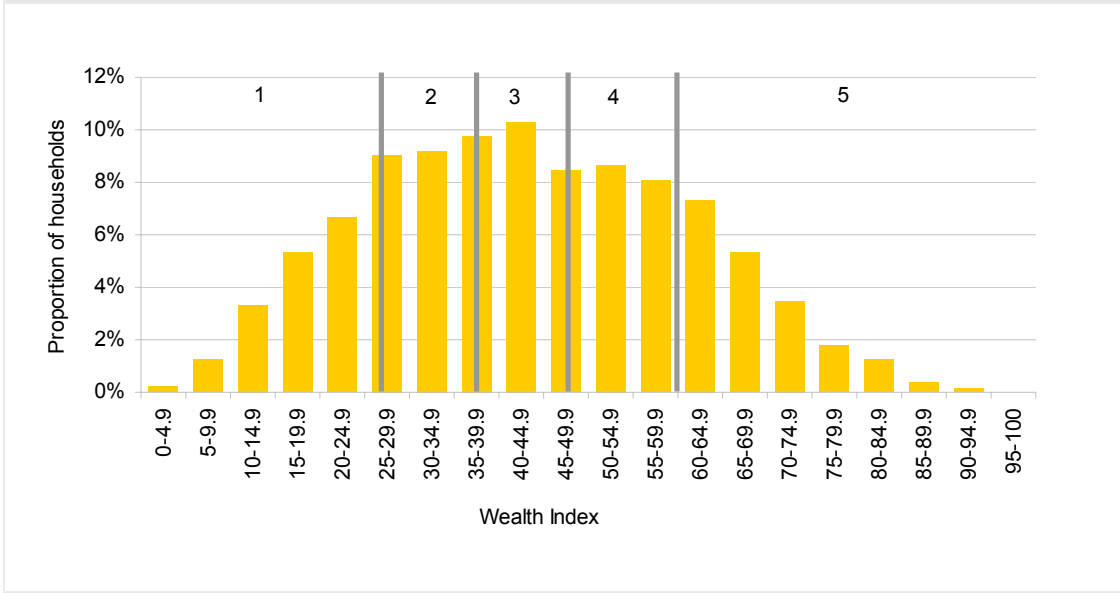
Figure 14: Evolution of selected indicators with household wealth (proportion of households)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

4.3.4. Distribution of wealth

Figure 15: Distribution of the wealth index by quintiles (proportion of households)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Households in the sample had a score of between 2 and 93 (see Annex B5). The distribution of the score is slightly 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, and wealth terciles.

Wealth is unequally distributed across the country. Looking at the distribution of the poorest quintile (poorest 20 percent of the sample), there is an 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 an 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 are among the poorest 20 percent for the whole sample. The Austro-Asiatic are also overrepresented among the poorest households. There is a small overrepresentation among the Hmong-Mien households, whereas the Lao-Tai is the only group that has a lower proportion of poor households than the general rural population.

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 make investments in your livelihood activities. These investments may help you increase the outputs from your future activities.

All households in the survey reported having access to credit (cash) if they needed it. Two sources were mentioned: the village head and middlemen⁷³. Eighty-five percent said they had access to credit from their village head, whereas 16 percent reported access to credit from middlemen. The access to credit from middlemen seems to be most common in Phongsaly, with 36 percent of households. Interestingly, only 60 percent of households from the Sino-Tibetan groups reported access to credit from their village head, but 40 percent of the same households report access to credit from middlemen. As middlemen are less likely to be a secure source of credit, these groups may be in a weaker position when it comes to access to financial resources.

Relatives and/or friends were surprisingly not mentioned as a source of credit for households. This is difficult to interpret but might be due to the fact that the social support network – which is known to play a major role when households are in need – was not considered by the respondents as an official source of credit. This could be because the way the money is borrowed (exchange of cash for work, or interest free borrowing from relatives or friends) is different from the “official” credit the households might get from the village head or middlemen.

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

⁷³ The term “middlemen” 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. Middlemen are usually external to the community.

4.4.2. Access to remittances

Capturing social assets in surveys is difficult. However, one indication of social links that households can use are remittances. Households were asked if they had received any support in the form of cash or kind from friends or relatives living outside the household, over the past 12 months. Only eight percent of the households reported receiving such support. Very few reported receiving 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 percent), Champasack (17 percent) and Savannakhet (15 percent). Five provinces reported less than five percent of households with remittances last year: Phongsaly, 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 percent) and Lao-Tai (14 percent) seem to have tighter links and more support from outside than the Austro-Asiatic (3 percent) and the Sino-Tibetan (6 percent) groups.

Again, the CFSVA household questionnaire did not go into detail on the forms of cooperation that exist between households. It is likely, therefore, that in reality social networks play a more important role than is suggested by the above analysis. In fact, qualitative studies have shown that these forms of cooperation are very important in rural Lao communities⁷⁴. More in depth research is needed on human and social capital to adequately describe the rural households' social safety nets and to capture the many support mechanisms that exist in such a diverse ethnic society.

⁷⁴ ADB (2001)

Summary: Chapter 4

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 CFSVA shows that there is a link between acceptable food consumption patterns and paddy ownership (see Chapter 6). The Lao-Tai are mainly paddy producers (1.8 ha on average per household) and only minimally involved in upland production (0.4 ha). In contrast, the Sino-Tibetan groups have only 0.4 ha of paddy production, and 1.4 ha of upland production. The other groups have an equal amount of paddy production (0.9 ha) and upland production (1.0 ha). Similar patterns also apply when looking at entitlements to land.

Less than one in ten villages has a health centre, although many villages have a health volunteer and/or medical kit. The level of education is low, especially for women. Seventy-one percent of spouses of household heads have no or incomplete primary education. 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 communicate information through reading and writing hinder them in participating in society and acquiring knowledge on how to improve their livelihoods.

Access to proper toilet facilities and safe water sources is a problem throughout the country. Physical access to water is less of a problem than the quality and year round volume 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 percent of the sample), there is an overrepresentation of poor households in Phongsaly, Sekong and Luangprabang. More than half of the Sino-Tibetan households are among the poorest quintile. Austro-Asiatic households are also clearly overrepresented among the poorest households. There is a small overrepresentation among the Hmong-Mien households, whereas the Lao-Tai are underrepresented.

In depth qualitative studies are needed to capture the extent of the support network and the very diverse support mechanisms that exist in rural Laos. The CFSVA only gives an indication of the social capital that is used in case of need. In the survey, all households reported having access to credit, but it was limited to two sources: the village head and middlemen. Eight percent of the households reported receiving support in cash or kind from friends or relatives living outside the household. In terms of ethnic groups, the Hmong-Mien (15 percent) and Lao-Tai (14 percent) seemed to have tighter links and more support from outside than the Austro-Asiatic (3 percent) and the Sino-Tibetan (6 percent) groups.

Chapter 5. Households' livelihood strategies

5.1. Main livelihood activities and income sources

This chapter looks at how households use their 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. They could choose out of a list of 17 activities.

It is commonly assumed that rural households in Laos make their living out of a combination of farming and non-farming activities, including hunting and gathering of NTFPs. Nevertheless, even if they could list up to four options, the majority of households interviewed for the CFSVA reported to earn their living with only one or two 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. This is surprisingly low and clearly does not reflect the diversity of livelihood activities that characterises rural households in Laos. Asking for the main activities probably lead to discarding some as secondary whereas they in fact are an important part of the households' livelihood strategy. These results ask for more in depth qualitative studies to adequately describe the diversity of livelihood activities in the rural Lao PDR.

A recent WFP assessment noted that some resettled villagers were collecting less NTFPs than before resettlement due to the increased distance to the forest resources⁷⁵. Thus, undertaking certain activities might have decreased because of Government restrictions and reduced access to forest resources. Further more the reporting of the same activities might have been reduced due to the sensitive nature of the question.

Almost 95 percent of households were engaged in agriculture and 29 percent were involved in livestock rearing/selling. Fishing/hunting was reported by slightly less than 8 percent 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 not confirmed by analysis of the sources of consumed food, which shows that a much larger proportion of the households were consuming products stemming from fishing and hunting.

Another 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 their main activity, rice production, while excluding the secondary activity, fishing. Collection of NTFPs shows similar under-reporting: only 15 percent of households listed NTFP collection among their livelihood activities.

A small number of households were involved in other activities. On average, 1 percent of households were engaged in brewing, collecting aquatic animals, hunting, commercial activities, remittances, collecting scrap metal/explosive powder, and receiving government allowances. Similarly, about 3 percent engaged in salaried work and skilled labour, 5 percent engaged in artisan handicraft, 6 percent in petty trading, 7 percent performed agriculture and non-agriculture unskilled labour, and 8 percent engaged in other non-specified activities.

The table below shows households' activities by provinces. As expected, almost all households are engaged in some sort of agricultural activities.

⁷⁵ WFP (2006)

Table 7: Percent of households engaged in the 4 main activities per Province (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%)
Bolikhamxay	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%)
Champasack	Agriculture (90%)	Livestock (31%)	Fishing (20%)	Other (15%)
Attapeu	Agriculture (77%)	Livestock (31%)	Non-agri unskilled lab. (17%)	Petty trade (12%)

Source: WFP Lao PDR, CFSVA Community Survey, 2006

As noted in section 4.1.4, nine out of ten households reported keeping livestock. In most provinces, livestock rearing and selling was the second most common activity. However, while 66 percent of the households living in Bolikhamxay and 61 percent of those in Oudomxay were engaged in this activity, only 6 percent reported the same in Xayabury. The households in Xayabury still ranked livestock rearing and selling as the second 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 percent), while the remainder were found to undertake two activities. Livestock rearing and selling was frequently reported also in Huaphanh (43 percent), Vientiane (40 percent), Saravane, Champasack and Attapeu (31 percent).

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

It is often noted in livelihoods literature that households that are better off are less engaged in agricultural activities and have some additional income from non-farm activities. In Laos, while agricultural-based activities remain by far the most important, there is some involvement in unskilled agricultural and non-agricultural labour. However one should be cautious when linking these non farm activities to more successful livelihood strategies, because unskilled and casual labour are often coping strategies used by households in need.

Agricultural unskilled labour was frequently reported in Khammuane (18 percent), Sekong (15 percent), Savannakhet (10 percent), and Oudomxay (9 percent) while non-agricultural unskilled labour was reported in Khammuane (18 percent), Attapeu (17 percent) and Vientiane (6 percent). Interestingly, handicraft was reported in Vientiane (13 percent) and Luangprabang (10 percent). These two provinces are close to two main tourist destinations

where 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 additional 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 percent report as main crop), Luangnamtha (34 percent) and Attapeu (38 percent). 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 than 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, 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 percent as secondary crop) and the Hmong-Mien (25 percent) 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. These differences need to be linked to the agro-ecological and topographical factors and to the nature of the traditional livelihood systems, in some cases for example pigs are being reared on maize, in other cases 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 ranges from 5.2 months in Khammuane province to 11.2 months in Xayabury. Sixty-eight percent of households in Khammuane report 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, Xayabury 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 reported using their own stock for seeds. The remaining households rely on a combination of purchases, borrowing or receiving seeds from different sources such as the Government or neighbours. Only in the three provinces of Luangnamtha, Oudomxay and Xayabury do 10 percent of the households purchase their seeds. There seems to be little seed support for the farmers in Lao PDR.

On average, 43 percent of the households report using some form of fertilizer. 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 more fertilizer

use. Only 9 percent of the households in Champasack are not using fertilizer. Farmers in Khammuane and Savannakhet also reported a high use of fertilizer.

Ninety-four percent of the farmers in the Northern Highlands and 78 percent of farmers in the Northern Lowlands report no use of fertilizers, whereas 84 percent of farmers in the Mekong Corridor use 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 use pesticides/herbicides. The use is highest in the Vientiane Plains (14 percent) and the Northern Lowlands (7 percent). 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 type of storage facility. Fifteen percent store their rice in bags inside their house. Hardly anyone stores 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 throughout the year. Eighty-eight percent of households with a kitchen garden have vegetables as their main produce from this type of garden. A few households also have 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 Bolikhamxay and Huaphanh respectively keep kitchen gardens, only 25 percent of households in Phongsaly currently benefit from kitchen gardens. Only 35 percent (the lowest of all groups) of the Sino-Tibetan households keep a kitchen garden.

5.3. Livelihood groups

One of the objectives of the CFSVA is to describe household food insecurity and vulnerability by household characteristics. Household livelihood strategies have an 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 estimated cash & in-kind value revealed that households systematically underestimated 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.

Second, it was found that only a few households reported exploiting natural resources⁷⁶ as one of their livelihood activities. This is surprising, especially when consulting 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 NTFPs⁷⁷. 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 information, variables reporting percentage of consumed food from hunting, fishing and from gathering were analyzed

⁷⁶ 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)

⁷⁷ Ministry of Agriculture and Forestry (2005)

together with the activities. Finally, a variable reporting percentage of consumed food from own production was added to the set of variables in order to differentiate among households that mainly produced and households that mainly purchased their own food.

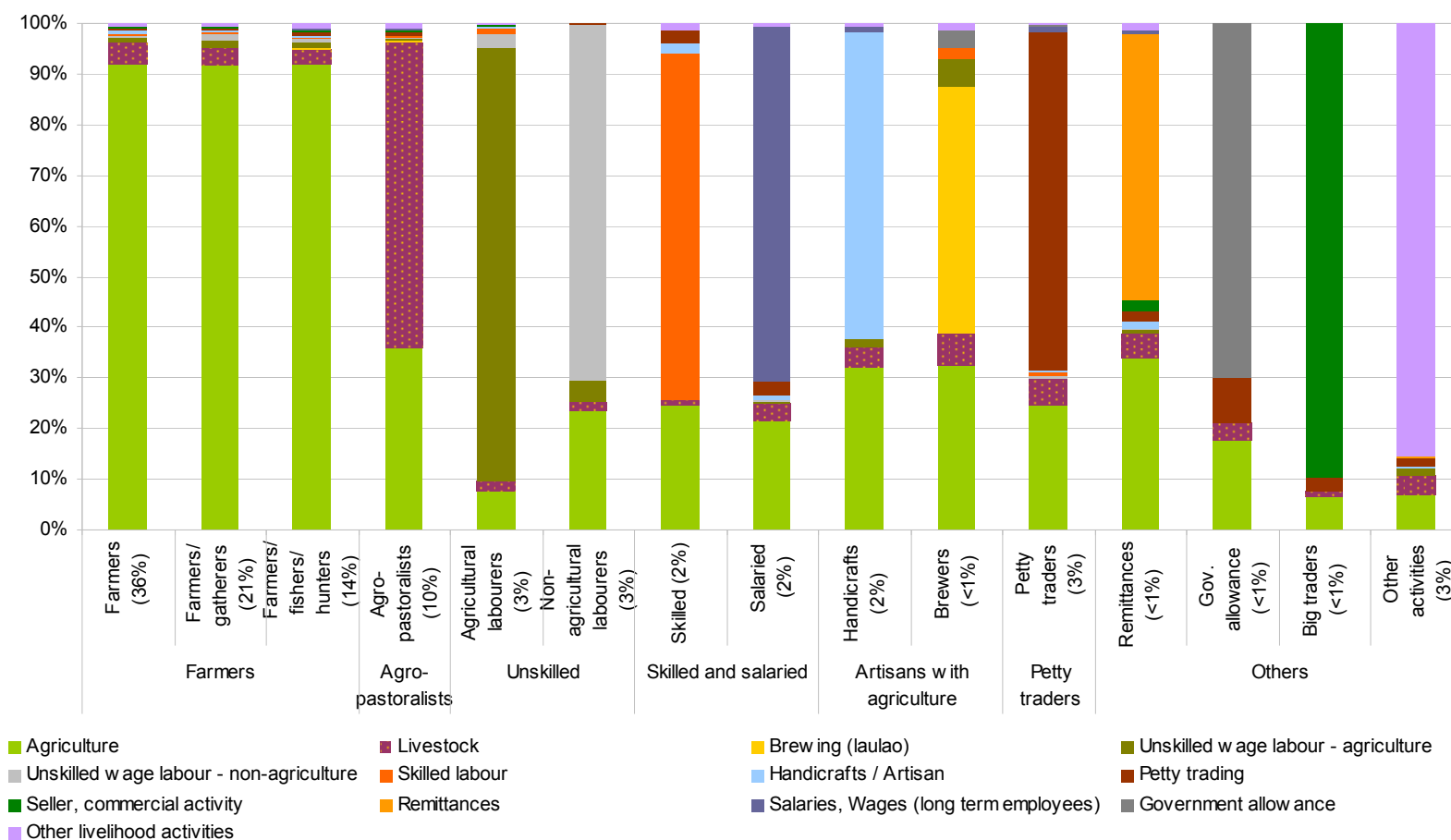
The cluster analysis resulted in the profiles below.

Livelihood main activity profile		HH	Weighted percent	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%) came from own production, whereas purchasing contributed 38% and gathering 10%.
Farmers /gatherers		658	21	These households were mainly engaged in agriculture (95%) with little livestock (3%). However, households in this group differentiate from other farmers as 38% of their consumed food came from gathering. Another 38% was purchased and just 19% came from household's own production.
Farmers/ fishers/ hunters		521	14	These households depend nearly exclusively on agriculture. The share of consumed food coming from natural resources (hunt/fish/gather) was significant but different from the previous group. 17% of the food consumed came from fishing/ hunting and 12% from gathering. Own production was about 31%.
Agro-pastoralists		428	10	Livestock was still the main activity (60%), but a considerable share of their livelihood came from agriculture (36%). This group had the second highest share of consumed food from own production (39%), even if the majority of the food was purchased (42%). 15% of the food came from gathering.
Unskilled	Agricultural labourers	100	3	This sub-group of households are unskilled labourers engaged in agriculture work. Unskilled labour provided most of their living (on average, 85%), complemented by some agriculture (8%). On average, one fourth of the food consumed was own produced, about one fifth was gathered and almost half was purchased.
	Non-agricultural labourers	125	3	Non-agriculture labour accounted for 70%. An average of 24% was from production and sale of agricultural crops. Similar proportions as agriculture labourers, without any statistical significant difference.
Skilled & salaried	Skilled	59	2	Skilled labour made up 68% of these households' livelihoods. Agriculture accounted for 25% and petty trade for 3%. Purchasing was the main food source (57%); own production followed with 26%. Gathering contributed 11%.
	Salaried	123	2	70% of their livelihood came from salaries. Agriculture contributed 20%. 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. Half of the consumed food was purchased, over 33% own produced and over 10% gathered.
	Brewers	20	<1	Brewing provided almost half of the livelihood. Agriculture contributed for 32%, livestock 7%. Food sources similar to the other artisan household group.
Petty traders		85	3	Depended on petty trade activity (67%), agriculture (25%) and livestock (5%). Food came from purchase (58%), own production (26%) and gathering (12%).
Others	Remittances	29	<1	Households relied on remittances (53%), agriculture (34%) and livestock (5%). Almost half of food was purchased, 33% own produced and about 15% gathered.
	Government allowances	9	<1	Government allowances were main contribution (70%). Agriculture was second (34%), livestock third (5%). Over half of the food was purchased, 20% own produced and 15% gathered.
	Big traders	32	<1	Households earned a living from large scale trading (89%) and little production or sale of agriculture products. 77% of food was purchased, and very little came from own production and gathering.
	Other activities	121	3	A mix of remittances, unskilled and skilled non-agricultural labour (86%) and agriculture (7%). Food sources similar to above.

Source: WFP Lao PDR, CFSVA Community Survey, 2006

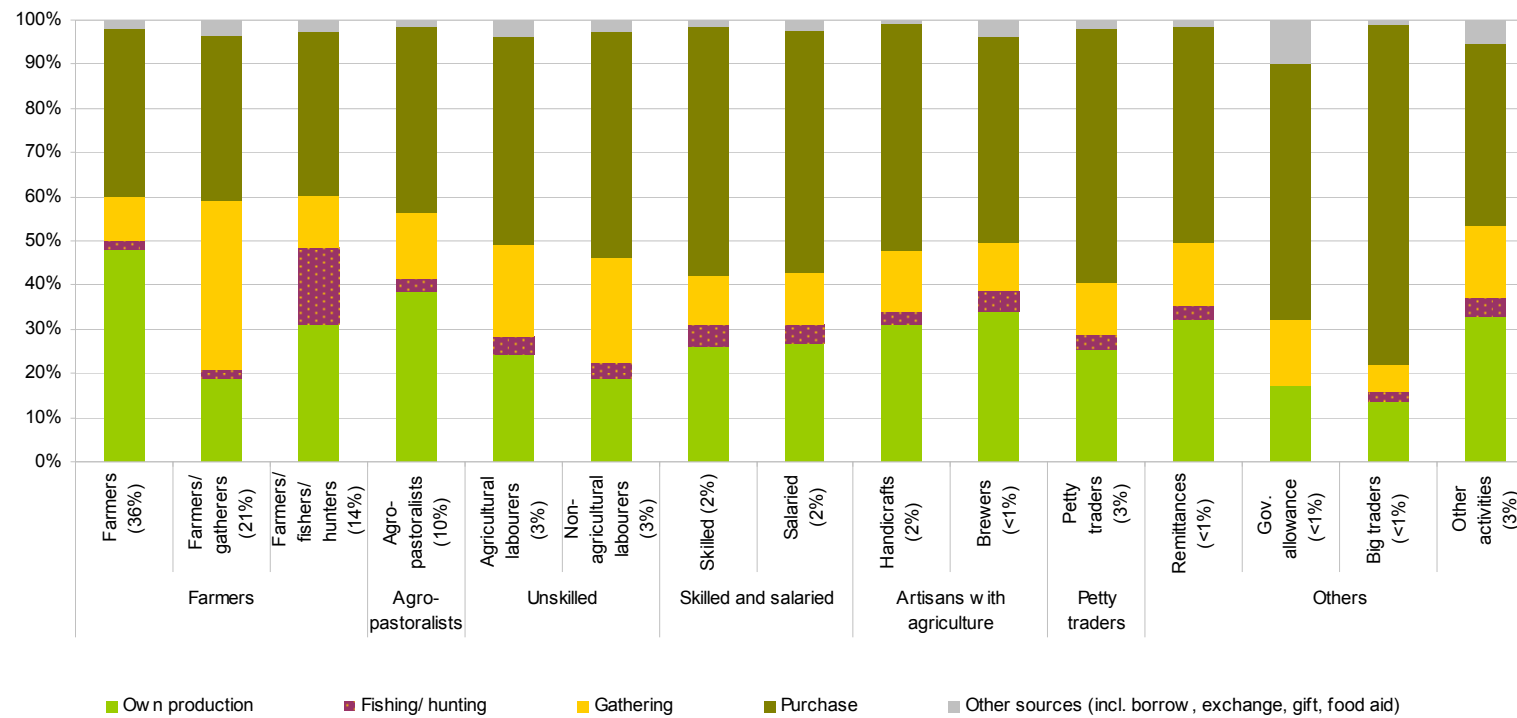
Figure 16 and Figure 17 illustrate the parameters for each livelihood profile: estimated contribution from different activities conducted by households and shares of consumed food from different sources.

Figure 16: Estimated contribution from different activities conducted by households according to their livelihood group (percent households)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Figure 17: Shares of consumed food from different sources by livelihood group (percent households)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

The analysis using 15 livelihood groups was very precise and yielded homogeneous livelihood groups, but the groups were small and many of them were fairly similar to each other. Therefore, according to interpretation of the specific groups' activities, the groups were reorganized in order to obtain meaningful groups also characterized by a statistical significant number of households. Nine main livelihood groups were thus identified: farmers (36 percent of households in the sample), farmers/gatherers (21 percent), farmers/fishers/hunters (14 percent), agro-pastoralists (10 percent), unskilled labourers (6 percent), skilled labourers and salaried workers (4 percent), artisans with agriculture (2 percent), petty traders (3 percent), and households engaged in other activities (5 percent). 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 30 days prior to the survey. In addition, for items for which expenditures are more infrequent (school fees, farming equipments), but nonetheless important, expenditures were recorded for a six-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 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 (LECS) is a more appropriate source.

The rural Lao economy is still 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). Estimates of subsistence food consumption were therefore included to adjust the total picture of expenditure patterns.

5.4.1. Cash and credit outlets

The total cash and credit outlets per month and per household 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 45 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 of 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 per household, 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.

Monthly expenditure levels of female-headed households were at 583,000 kip compared to 765,000 for their male counterparts. This can reflect a disadvantage in terms of cash but also the smaller size of the female headed household.

The proportion of monetary resources spent on food items also differed across groups. 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 link between food consumption⁷⁸ and expenditure levels was confirmed when looking at the expenditure levels of households with different levels of food security. Households with poor and borderline food consumption patterns reported 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, also devoted a larger proportion of their expenditures to food. Whereas households with acceptable food consumption devoted 41 percent of their expenditures to food, households with poor or borderline food consumption devoted 68 and 48 percent. This shows that as households struggle to access food, a larger proportion of their expenditures are spent on food, thus limiting the funds available for other basic necessities.

5.4.2. Monetary value of goods directly consumed by the households

In order to understand the importance of food items in households' overall expenditure patterns, values for own produced food were incorporated into the expenditure analysis. This helped 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 under-reporting of some livelihood activities. Those activities that would most likely provide more own-produced food, such as exploitation of natural resources, seem 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, but rather to show the share of resources, both cash and from own production, that households devoted to food.

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

With the inclusion of food from own production, 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 Sekong provinces (74 percent). However, while households in Sekong had an already high food/total expenditure ratio calculated as cash and credit only (61 percent), the increment in Khammuane was much more important, increasing from 51 percent as cash and credit only to 74 percent while incorporating directly consumed goods. The highest increment was calculated in Huaphanh, from 36 percent when considering cash and 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 percent).

Analysis of cash and 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 percent of their resources to acquire food, while households with road access spent significantly less for food (64 percent, $p < .000$). This shows the importance of road access for market integration (see chapter 3.5). Food is a more important component of remote households' economy, but less of this food is

⁷⁸ See Chapter 6 for an explanation of poor, borderline and acceptable food consumption

accessed through the 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 to access food. This may be difficult for many of them as they already spend most of their resources on food.

Province	Share of cash consumption value on food (%)	Share of food monetary value to total consumption (cash and in-kind) (%)	Difference in percentage points
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
Bolikhamxay	41	55	+13
Khammuane	51	74	+23
Savannakhet	41	64	+23
Saravane	45	67	+22
Sekong	61	74	+13
Champasack	50	68	+18
Attapeu	58	70	+12
Total	45	65	+20

Source: WFP Lao PDR, CFSVA Community Survey, 2006

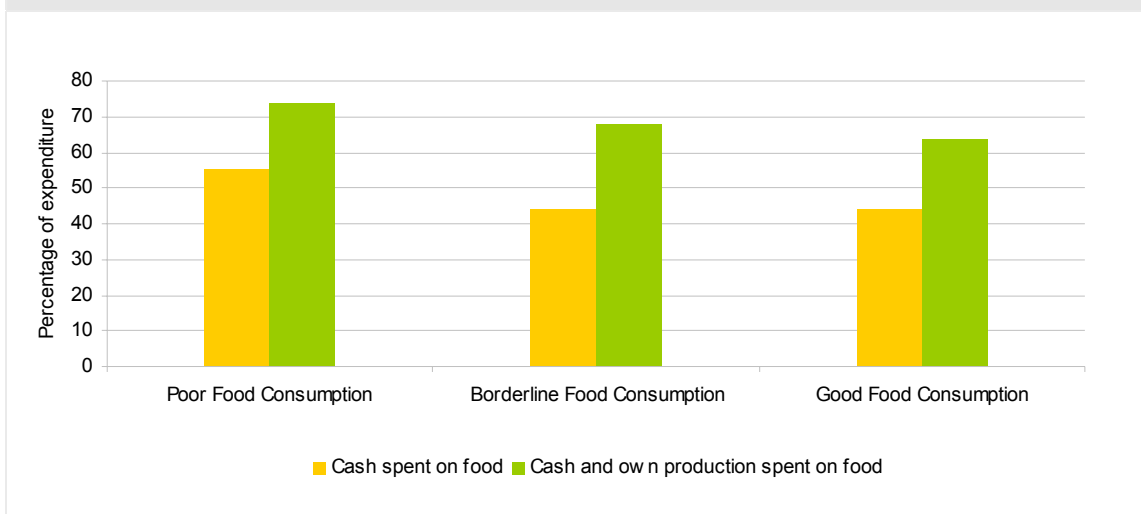
5.4.4. Poorer households spend more of their resources on food

Households with poor food consumption spent more of their resources on food (75 percent) compared to the other food consumption groups, in line with the pattern found when only considering cash and credit outlays.

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 this 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 for investments in future activities. And without such investments, their meagre resources will have to continue being devoted to providing food for immediate survival.

Figure 18: Percentage of cash expenditure spent on food and food from own production per food consumption group



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Summary: Chapter 5

Almost all households are engaged in agriculture. Twenty-nine percent of households were involved in livestock rearing and selling. Fishing and hunting was reported by 8 percent of households. Agriculture is the most important livelihood activity in all provinces, whereas livestock rearing and selling was the second most important. Harvesting of non timber forest products is also important. While agricultural-based activities are the most important, there is some involvement in unskilled non-agricultural labour.

Rice is the dominant crop in agricultural production in Laos. 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 than 10 percent both as main and secondary crop). In contrast, 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 current rice harvest is expected to cover food needs for eight and a half months.

Although rice dominates, cash crops are also important 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 planted cassava.

A little over half of all households keep kitchen gardens. Disparities can be noted among regions: eighty-six and 71 percent of households in Bolikhamxay and Huaphanh respectively keep kitchen gardens, but only 25 percent of households in Phongsaly currently benefit from kitchen gardens. Most households use their kitchen garden for vegetables.

The 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 45 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 Sekong provinces (74 percent). 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?

The current study shows the consumption of different food items by different population groups to an extent not presented before. Diets in the Lao PDR are as diverse as the cultural beliefs and livelihood systems. Although rice is the main staple for most households, there is no Lao diet per se. Some of the culinary, dietary, and sharing principles of the various ethnic groups are fundamentally different from each other. However, despite this diversity, similarities in Lao diets exist: high food variety; uncertain and fluctuating food supply; high consumption of wild foods such as vegetables, shoots, fruits, insects, wildlife, wild fish, and other aquatic animals (OAA); high seasonality; and overlap of food plants with medical plants⁷⁹.

6.1.1. Staples

For the seven day recall, staples were grouped into glutinous rice, non-glutinous rice, maize, cassava and other roots and tubers. Rice is the main staple of all diets. Eighty-eight percent of the sampled households eat glutinous rice daily. These households are mostly the Lao-Tai and Austro-Asiatic groups. The 14 percent of the households who eat non-glutinous rice daily are mainly of Hmong-Mien and Sino-Tibetan origin, although many of these groups also eat glutinous rice daily. On average, glutinous rice was consumed approximately seven days per week among the Lao-Tai and Austro-Asiatic groups, and approximately three days per week among the Sino-Tibetan and Hmong-Mien groups.

Given the preference for 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 own production. In general, non-glutinous rice is cheaper than glutinous rice (see also Figure 9, chapter 3.4). In these two provinces, 37 percent of the glutinous rice is purchased (while the survey average is 27 percent). An explanation for this high consumption may be that for many villagers in the South, the preparation of meals with non-glutinous rice serves as a coping strategy when lacking glutinous rice. For instance *Khao piak* - a rice soup made from non-glutinous rice - can be cooked even with small amounts of rice kernels.

The LECS 2002/2003⁸⁰ estimates an average rice intake of 575g per person per day (mean for all age groups, cooked rice), suggesting urban/rural differences. The urban population consumes 15 percent less rice than the rural population. People in the North tend to eat more rice than people in the Central and in the Southern regions.

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 a coping strategy for some households, to make dwindling rice stocks last longer. In the CFSVA, 7 percent of roots and tubers consumed were collected from the forests. Usually, roots and tubers are either steamed fresh and eaten with rice or chopped into little chips and steamed together with the rice.

The CFSVA shows that many households eat non-rice staples on a daily basis: 4 percent eat maize, 5 percent cassava and another 6 percent eat other roots and tubers. This is remarkable for the harvest period⁸¹, when there should be enough rice available.

⁷⁹ Krahn (2005); Krahn (2003)

⁸⁰ Government of Lao PDR (2004)

⁸¹ The CFSVA fieldwork was undertaken during October-November, which constitutes the time when most villagers harvest their rice, especially in the uplands

Table 10: Mean weekly household food consumption for main ethnic groups (HH=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	Pig	Cow/Buffalo	Big wildlife	Small wildlife	Pulses	Milk	Eggs	Oil, lard	Fresh fruits	Other vegetables	Green leafy vegetables	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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Over the seven-day recall period, 24 percent had consumed cassava, 31 percent other roots and tubers, and 15 percent had consumed maize. Maize consumption can be expected to be higher during other months, as it was not in season during the survey period. Cassava can be harvested all year round, as many other roots and tubers, which explains their higher consumption in comparison to maize. However, most of forest roots and tubers are best harvested from May to June. Preferences by ethnic groups for non-rice staples can be seen in Table 10). These differences overlap partly with the agro-ecological zoning. Households in the Central and Southern Highlands, mainly inhabited by Austro-Asiatic groups, are the highest consumers of cassava and other roots and tubers (about five times higher than in the Northern Highlands). The Province of Sekong has the highest consumption levels for roots and tubers, especially for cassava. Examining households who often eat non-rice staples (283 households with an average of six days per week), we note that rice-substitution and staple-mix consumption is not necessarily related to a low consumption of other food groups. These 283 households exhibit a high consumption of wild fish (six days per week) (see Table 14).

In conclusion, the data shows 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

The following animal groups were used for the seven day recall: big-bodied and small bodied wildlife, wild fish, other aquatic animals (OAA), pond fish, and domestic meat such as buffalo/cow, chicken, pork and goat.

Wildlife (big and small bodied animals, wild fish, and OAA) 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). OAA could be freshwater snails, crabs, and shrimps or little water insects. Terrestrial insects which are known to be frequently consumed in Lao PDR (e.g. crickets, cicadas), were not included in the study.

Over the seven-day recall period, big wildlife was eaten by 6 percent of the households, small wildlife by 26 percent, wild fish by 81 percent, OAA by 55 percent, fish from ponds by 20 percent, poultry and pork each by 41 percent, and buffalo/cow meat by 42 percent of the households. This shows the importance of wild animal protein and fat sources. Out of all reported animal protein consumption days⁸², wild fish alone made up 35 percent. These findings are supported by other studies highlighting the importance of freshwater biodiversity resources for the Lao diets⁸³.

Wild fish consumption was highest in the Mekong Corridor and among the Lao-Tai groups (4-5 days per week), followed by the Austro-Asiatic groups (2-3 days per week). Yet, a considerable amount of fish and OAA was 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 domesticated animals (see Table 10 above).

However, there is increasing pressure on these wild food resources, due to trade demands, unmanaged harvest, foreign investment schemes (in particular hydropower and mining, large-scale plantations) and large scale infrastructure development⁸⁴. As a consequence, consumption of small-bodied wildlife is increasing⁸⁵, while consumption of big wildlife is decreasing. The CFSVA establishes that big wildlife was eaten more in the better-off households (with higher food consumption scores), while there is no such differentiation for

⁸² Total sum of reported days of individual animal protein items: wild fish, fish from ponds, other aquatic animals, poultry, pig, goat/sheep, cow/buffalo, small and large wild animals and eggs

⁸³ Meusch et al. (2003); Bush (2005)

⁸⁴ Nooren and Claridge (2001), Chamberlain et al. (2002), Johnson et al. (2004), World Bank (2005), Krahn, Johnson (2006)

⁸⁵ Johnson et al. (2003), Krahn (2005)

small wildlife. This may support the notion that big wildlife increasingly is entering the market where it is purchased by better-off households.

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

The LECS 2002/03 data determined a total consumption of meat of about 50-60g per person per day and slightly more for of fish (around 70 g per person per day)⁸⁶. The CFSVA data suggests that households which consume large amounts of domestic meat do not consume less wild fish, OAA and wildlife. Thus, domestic meat is not eaten as a substitute for wildlife. Among many ethnic groups, domestic meat is not used for the daily cuisine, but only for special occasions⁸⁷.

In summary, wild meat and fish sources together are more important as protein and fat sources than domestic meat and fish sources. Since these food sources are increasingly under threat, biodiversity conservation, wildlife management and enforcement of Lao environmental regulations are important measures for maintaining viable population of wildlife and fish for household food security. In parallel, consumption of domestic meat and pond fish should be encouraged. This may involve changing cultural habits, since domestic meat is normally only eaten at festivals.

6.1.3. Vegetables

Vegetables were classified into three groups: green leafy vegetables; shoots/mushrooms; and other vegetables. Almost half of the surveyed households (46 percent) had eaten green leafy vegetables daily. In addition, 35 percent had eaten other vegetables daily. Only 19 percent of households consumed shoots and mushrooms on a daily basis. This may be due to the fact that during the time of data collection, the consumption of wild vegetables is normally shifting from mushrooms and fresh shoots towards more leaves and herbs.

The LECS 2002/03 shows that in the North 173 g per person per day of vegetables are consumed, much more than in the Centre or the South. In the CFSVA, the Hmong-Mien groups consume few shoots and mushrooms (1.3 days per week) in contrast to a consumption of 3-4 days per week by the other groups. All ethnic groups often consume leafy vegetables (4-5 days per week).

Other vegetables were on average consumed three days per week. In about 2 percent of the households these vegetables were the only food eaten with the rice, depicting an involuntary vegan diet for these households (see Section 6.2.1). Vegetable consumption depends on the season. If garden vegetables (upland fields or kitchen garden) are not available, various studies have shown that the consumption of forest vegetables is related to the time a household allocates to its collection and to the actual availability of and access to forest products.

Many surveys in Lao PDR have detailed the diversity of wild vegetables forming up to 80 percent of the overall vegetable intake.

The CFSVA data indicates a higher consumption of leafy vegetables (5.1 days per week) in villages without road access, compared to villages with road access (4.5 days per week). The same trend can be seen for mushrooms and shoots (3.8 days compared to 3.2 days per week). Green leafy vegetable consumption was highest in the Northern Highlands, while the consumption of mushrooms and shoots was highest in the Mekong Corridor and the Central and Southern Highlands.

⁸⁶ The MRC estimates the total yield of inland fish and OAA based on consumption studies at 208,503 t as fresh whole animal equivalent weights, MRC (2007)

⁸⁷ ADB (2001), Krahn (2005)

6.1.4. Fruits

The consumption of fresh fruits is often underreported in food consumption studies, since fruits are often snacked in the fields or forest and are not considered part of a meal. Also, the CFSVA recorded a low consumption of fruits. Half of the survey households reported to not have eaten fruits at all in the past seven days, and only 10 percent 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 10).

Most forest and garden fruits are available in seasons other than the survey period and fruits are rarely purchased. However, a national average consumption of 1.6 times per week is very low. Fruit consumption differed among provinces. Consumption was lowest in Bokeo province (0.1 day per week), and highest in Phongsaly and Oudomxay provinces (3.5 and 2.7 days per week). The fruit consumption in the Northern Highlands was equal to the Vientiane Plain (two days per week).

Usually, many ethnic groups value fruits as being “good for the body”, and save fruits for their children. Adults consume fewer fruits than children. According to the LECS 2002/2003, fruit consumption averages between 60-70g per person per day.

6.1.5. Fats and oils

The consumption of fat/oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is very low. Only 14 percent of households used vegetable oil or lard (especially pork lard) in their daily cuisine; 44 percent had not added fat at all over the past seven days. The Northern groups such as the Sino-Tibetan and Hmong-Mien groups had used fat in cooking 3.4 and 3.7 days per week, while only 1 day per week was reported by the Austro-Asiatic groups. The Lao-Tai consumed slightly more with 2.1 days per week. This parallels the national average, which indicates that oil/lard was added only 2.1 days per week into the cooking pot. The lowest fat consumption was found in Saravane (0.5 days per week), followed by Attapeu and Khammuane (0.6-0.8 days per week). Female-headed households added less fat/oil to their meals than male-headed households.

For many households fat intake usually originates from wild fish or meat – and not from added vegetable oil or lard. Customarily fat was extracted from pork or wildlife such as from wild boar, badger, binturong or porcupine⁸⁸, today less wild animal fat is available.

Overall, the CFSVA shows the fat intake is marginal or too low and needs attention. Applying the overall monthly expenditures of 6,394 Kip for vegetable oil, and dividing the expenditures by an average litre price of oil of 10,000 Kip⁸⁹, we can estimate that approximately 0.6 litre of vegetable oil is used per household per month (or approximately 0.1 litre per capita per month). The low fat intake in rural diets has been highlighted in other consumption surveys⁹⁰.

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 percent of the households reported to have eaten beans/tofu on a daily basis. The Lao-Tai consume the most milk and/or dairy products. In total, only 10 percent of households reported consuming milk or dairy products in the past seven days, and only 2 percent daily. Ninety percent of households did not consume any milk or dairy products.

⁸⁸ Krahn (2005)

⁸⁹ No official statistics are available for the whole country on the price of vegetable oil, but it can be assumed that it is approximately 10,000 kip per litre

⁹⁰ Kaufmann et al. (2001); Klingner and Schmid (2001); Krahn (2005)

6.2. Dietary diversity: food consumption score

There is a significant correlation between the diversity of a diet and nutrient adequacy, children's and women's anthropometry and socio-economic status⁹¹. The CFSVA in Laos builds on other WFP work on dietary diversity. WFP is customizing the "food consumption score" (FCS) worldwide in order to capture as much differentiation as possible among households that have different consumption patterns, in terms of both number of consumed food groups and their specific consumption frequency.

The frequency weighted diet diversity score or "food consumption score" is an internationally used WFP standard score calculated by the frequency of consumption (number of days per week) of different food groups consumed by a household during the seven-day recall period. Information on the different food items was reorganized into specific food groups (see Table 11).

Consumption frequencies of food items belonging to the same group were added up and values above 7 were recoded as 7⁹². The value obtained for each food group was multiplied by its weight. The food consumption score is the sum of the weighted food groups.

The table below illustrates collected food items, food groups and their relative weights internationally used by WFP⁹³.

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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Two FCS thresholds were identified to distinguish different food consumption levels. A score of 21 was set as a bare minimum: the value comes from an expected daily consumption of staples (frequency * weight, 7 * 2 = 14) and vegetables (7 * 1 = 7). Below 21, a household is expected to not 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, and is composed by daily consumption of staples and vegetables complemented by a frequent (4 days/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 and availability of food occur. Households that score above 35 are estimated to have an acceptable food consumption consisting of sufficient dietary diversity for a healthy life.

⁹¹ Ruel (2003)

⁹² As 7 is the maximum number of days per week

⁹³ "Standard" food group weights and score thresholds have been test piloted and used in a few WFP assessments. Tufts University and IFPRI are currently conducting external validations.

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

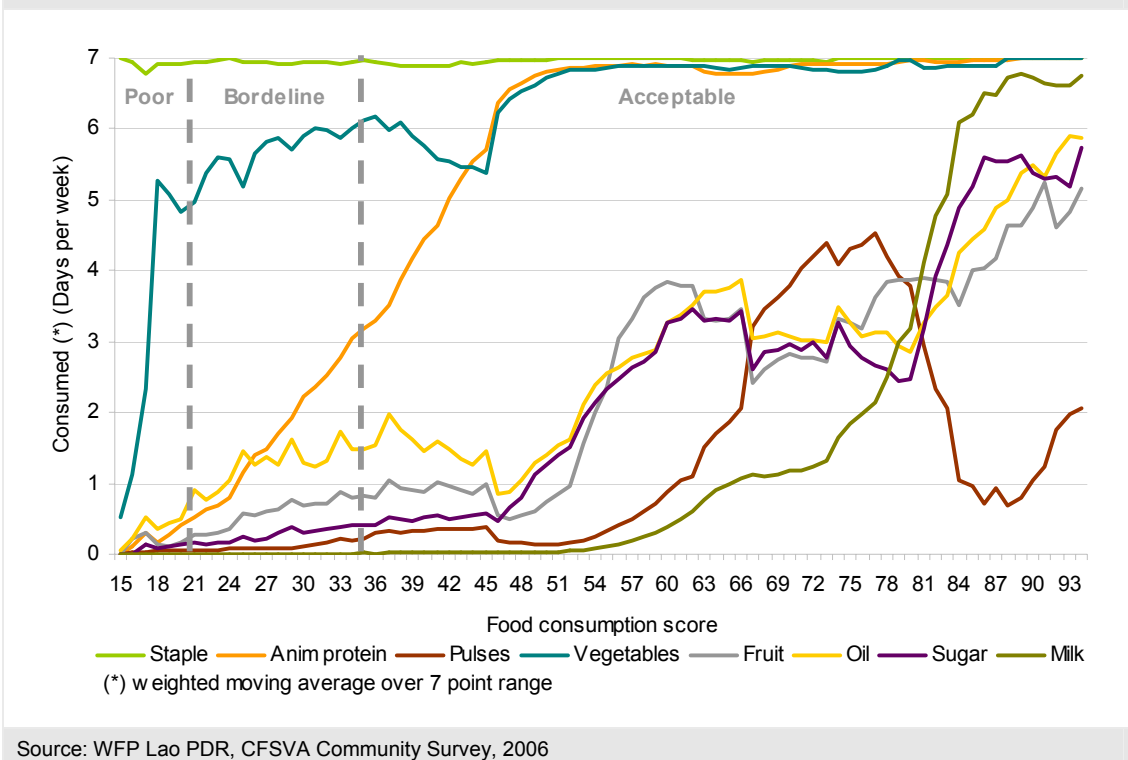
The questionnaire did not take into account that food items could have been consumed in very small quantities. This applies mostly to animal protein consumption. It was difficult for the enumerators to decide when a fish was a substantial meal and when it was a condiment. A small fish may be substantial 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 protein.

6.2.1. Description of thresholds and food consumption groups

Figure 19 shows the consumption frequency of the different food groups. Staple and vegetable consumption was the base of the diet for households. However, increased FCS was not due to consumption of oil (fats) and pulses (vegetable proteins), as WFP has established in other countries, but due to an almost linear (up to a score of 50) increase in consumption (in terms of days per week) of animal protein items. In rural Laos protein intake is better guaranteed by food from animal origin rather than from plant origin (apart from the contribution of rice protein).

The FCS indicates that the consumption of fat appears to reach a substantial 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 days/week consumption of all the other four food groups.

Figure 19: Food consumption score and number of days per week each food group is consumed (days/week)



Up to a FCS of 21, households consumed staples and vegetables on a daily basis and seldom other food groups. This group of households (n=83) is almost, but most likely involuntary, vegan. Total animal consumption for this group ranks between 0 and 1 day per week. This marginal animal protein intake was mainly based on a single day of consumption. This could be due to the low availability of wildlife or wild fish and the low propensity to slaughter livestock.

Of this same group, 5 percent of households consumed wild fish, 1 percent OAA, and 3 percent 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 Monosodium Glutamate (MSG), salt and dried or freshly pounded chili and/or water, but lacking meat and vegetables other than a handful of herbs). These 83 household were regionally scattered: 4 percent within the Northern Highlands, 2 percent within the Northern Lowlands, 3 percent within the Central and Southern Highlands, 1 percent within the Mekong Corridor. Interestingly, not a single household from the Vientiane Plains ranks with such low FCS. More uplanders fall in this group than lowlanders. Most affected were the provinces of Bokeo and Sekong.

Consumption of animal fats and oil increased with households scoring greater than 21. However, it is only above a threshold of 50 that oil and fat items were consumed on a more frequent basis (more than 2 days per week). As mentioned before, a closer look into the various food items shows that the incremental increase of animal protein is mainly made up of wild fish and OAA, not so much from domestic meat. This pattern continues until a FCS of about 45.

Between a FCS of 21 and 35, 39 percent of households consumed wild fish, 17 percent OAA, 19 percent poultry, 11 percent pork, 11 percent beef, 11 percent small wildlife, but only 1 percent big wildlife. For households with a FCS above 35, domestic meat consumption was more frequent: poultry was consumed by 44 percent of these households, pork by 45 percent, and beef by 46 percent. However, we can assume that the amounts were limited, as 86 percent also consumed wild fish and 61 percent OAA.

The greatest number of households with borderline food consumption was found among the Austro-Asiatic groups (17 percent of this group), but the greatest share with borderline food consumption was found among the Hmong-Mien groups (23 percent). 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 suggest that the continued but managed access to viable wildlife and fish populations are crucial for households with borderline food consumption. This does not only apply to protein intake, but also to fat intake. Until a FCS of 60 is reached, most of the fat intake derives directly from wild fish, OAA or animal meat sources and not from additional fats/oils used in meal preparation. Only within households with an FCS of greater than 60, fats and oil are consumed more often than 3 days per week.

The increase of fat, sugar and oil (items not deriving from own production) follow a similar trend after a threshold of 50. Pulses are only customarily eaten by the Sino-Tibetan groups, while they do not influence the general food consumption pattern in Lao PDR.

Following the methodology described above, the CFSVA households can be classified into three main groups, as indicated in the table below.

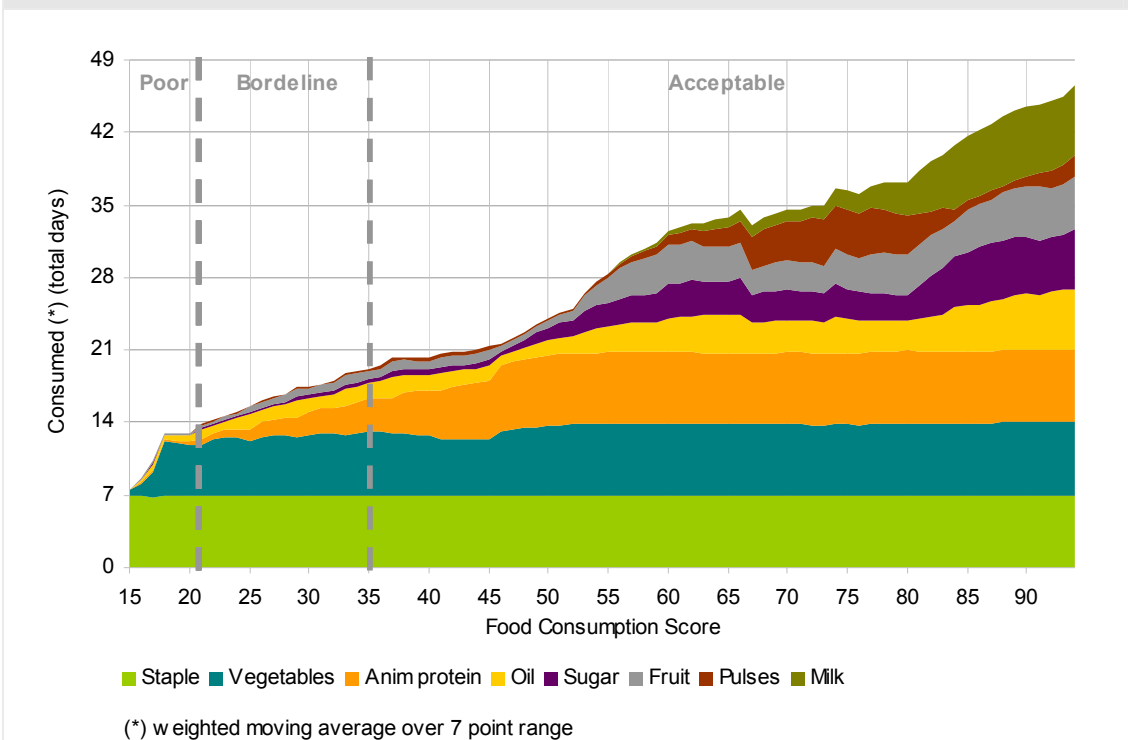
Table 12: Description of food consumption groups and their importance among the surveyed households (percent)

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			100.0

Source: WFP Lao PDR, CFSVA Community Survey, 2006

This classification is only a snapshot of the food consumption situation at the moment of the data collection, and does not represent household food consumption throughout the year. In addition, since fishing (wild fish and OAA) and hunting are opportunistic activities, the proportion of households with borderline or acceptable food consumption fluctuates. The lower threshold for poor food consumption, however, is less volatile.

Figure 20: Food consumption score and total number of days



Source: WFP Lao PDR, CFSVA Community Survey, 2006

From figure 20 it is safe to conclude that addressing low consumption of staples (rice) and securing overall caloric intake is less urgent than promoting a higher intake of animal protein, oil/fat and fruits. Given the high levels of chronic malnutrition in rural areas, this should go in pair with increasing the overall micro-nutrient intake, and in particular with enhancing the bio-availability of non-haem iron and beta-carotene (through fat).

6.2.2. Validation of the food consumption score as a proxy indicator for food security

To validate the use of the food consumption score to measure food security, correlation tests were performed with indicators that have a well-supported and known directional relationship with food security: 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). Indicators with a much-skewed distribution were logarithmically transformed⁹⁴.

	Food Consumption Score	Significance
Wealth index	0.333	0.000
Lasting of rice harvest	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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

The correlation tests were significant and, as expected, the proportion of expenditures dedicated to food was negatively correlated with the food consumption score and positively with the other indicators.

In addition, several regression models were constructed (see Annex B4) with the various access indicators as predictors of the food consumption score. The indicator for self-consumed production was found to be a very weak determinant of the food consumption score while the variable "How many months does your rice harvest normally last for your family?" performed better. The latter is an indicator of food which is produced and consumed by the household. The two consistently strong determinants of the food consumption score were the wealth index and the total monthly per capita expenditures.

Both the correlation and the regression tests confirm that the food consumption score shows a similar trend to other proxy indicators of food access and security. In further analysis the CFSVA will therefore use the FCS as a proxy indicator for food security.

6.3. Household food consumption profiles

A cluster analysis was performed on food group variables in order to detect different dietary patterns among sampled households. This analysis explores how households combine the different food groups in order 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. The staples were divided into 3 major food groups: glutinous rice; non-glutinous rice; and non-rice staples (coloured in yellow in the table below). Animal products were regrouped into: wild fish and OAA; domestic meat including eggs; and wild meat (brown). Vegetables were divided into: domestic vegetables; and wild vegetables (green). Other food items, such as pulses, oil, sugar, milk/dairy products and fruit were considered as 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.

⁹⁴ Nevertheless the analysis using the untransformed variables leads to very similar results

Table 14: Household food consumption profiles (percent and number of days per week each food group is consumed)

Group Ranking	Number of H	Percent	Glutinous rice	Non-glutinous rice	Non-rice staples	Pulses	Oil/lard	Sugar	Milk /dairy products	Wild fish & aquatic animals	Domestic meat	Wild meat	Domestic vegetables	Wild vegetables	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	

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Of the 11 profiles, none has a combination of food consumption that can be labelled 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 to not have daily access to specific items but nevertheless frequently (4-5 days per week) consumed vegetables and animal products through diversification. These 507 households live largely in the Mekong Corridor and are mainly of Lao-Tai and Austro-Asiatic origin.

Other household groups consumed rice and wild vegetables daily, and had 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 pork.

Groups 3 and 4 (mainly Austro-Asiatic and Lao-Tai households living in the Mekong Corridor and the Northern Highlands and Lowlands) relied more on wild fish and OAA for their animal product intake (4 days/week), but used 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 exhibits an interesting example of households, as they complement their staples with roots and tubers. The reported animal protein, vegetables, fruits and oil consumption, however, undermine the assumption that mixing staples means poor food consumption, stemming from low availability of other foods. Mixing rice with roots and tubers might be a decision of choice. Group 6 was mainly comprised of Lao-Tai (68 percent of households) and Austro-Asiatic groups (32 percent).

Also in 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, a regular consumption of pulses allowed for lower animal protein intake (still ranking second on the FCS). The group with the highest FCS consists mainly of Lao-Tai groups (87 percent).

The table below shows the results obtained from the two food consumption analysis methodologies.

Table 15: Food consumption profiles in relation to food consumption groups

		Food consumption profiles (from cluster analysis)		
		Borderline (%) (Cluster 1 only)	Acceptable (%) (Clusters 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	87.3
	Total	12.1	87.9	100.0

Source: WFP Lao PDR, CFSVA Community Survey, 2006

The cluster analysis did not uncover poor food consumption patterns. Households with poor food consumption did not have similar dietary patterns, and consumed different items with different, but rare frequency. This group of households is not a homogeneous group; this challenges nutrition interventions. Nevertheless, their food consumption score is so low that their diet is nutritionally unbalanced and inadequate despite whatever items they consumed.

Annex B5 presents the distribution of FCS groups by dietary profiles. An extra category was created for illustration purposes only to show the prevalence of households with very high food consumption (FCS \geq 51 median).

The profiles of groups with poor consumption may be used to help address the worst dietary patterns. It seems that access to sources of proteins and fats are the biggest problem for the groups with the poorest food consumption score. Relief assistance to such households should contain oil and proteins (pulses or canned fish). However these food items are not a common part of many people's diets. Interventions addressing lack of these nutrients with food aid might be more successful if preceded by nutritional education programmes.

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

6.4. Food security profiling

The purpose of this section is to describe typical food insecure households and pinpoint particular groups with higher food insecurity rates. Cross tabulation of main household characteristics (based on underlying causes of the framework) with food consumption categories (using weighted data) is used. In this section, food insecure households will be defined as households with poor or borderline food consumption based on the food consumption score.

6.4.1. Where are the food insecure?

Table 16: Food security status of households in rural Lao PDR

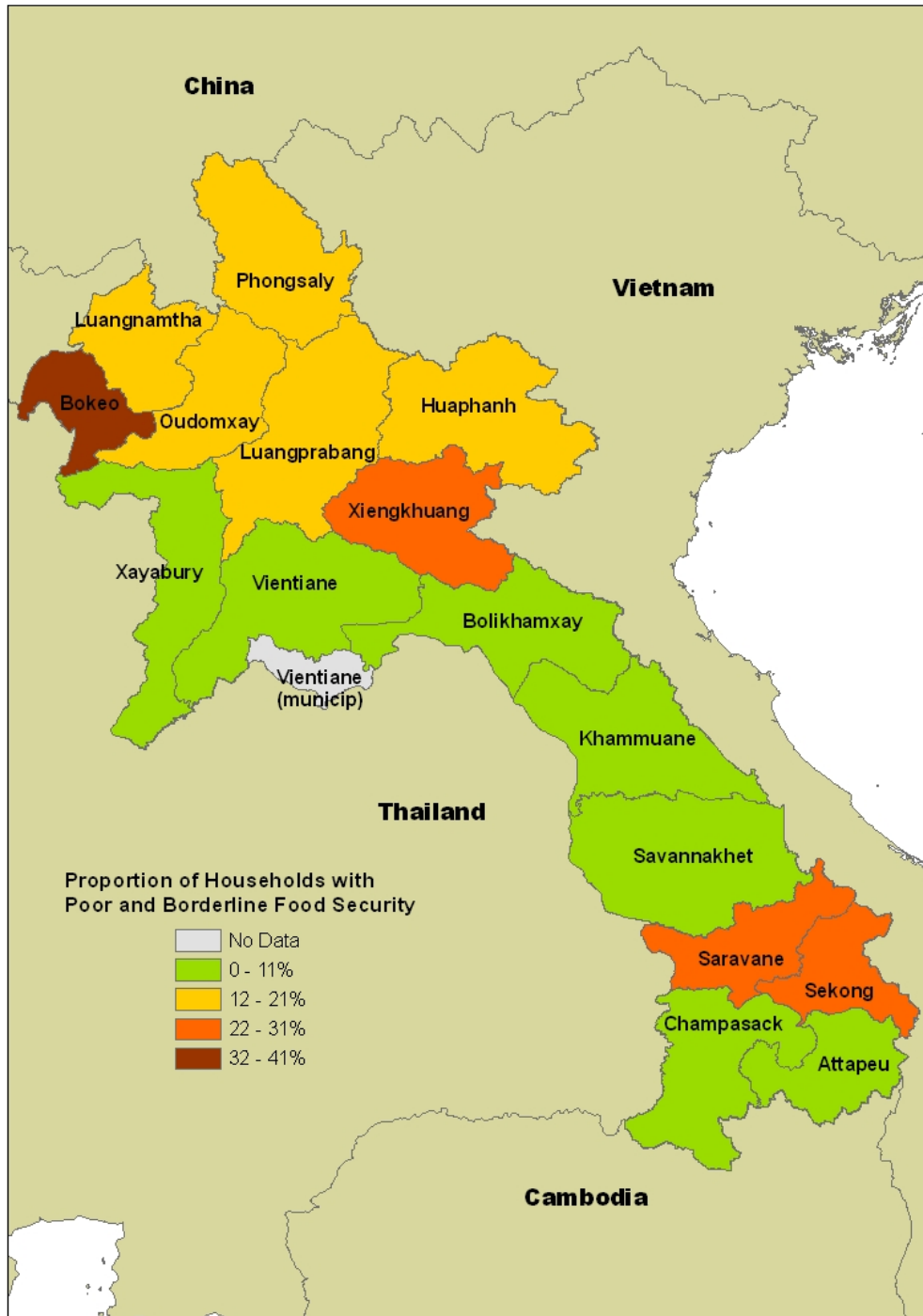
Food Consumption										
Province	Poor				Borderline				Acceptable	Total rural HH
	Percent of HHs	HHs	95 percent CI		Percent of HHs	HHs	95 percent CI		HHs	HHs
			from	to			from	to		
Phongsaly	4	1,100	500	2,300	14	3,400	2,200	5,000	20,000	24,400
Luangnamtha	2	300	100	800	15	3,000	2,000	4,300	17,100	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
Bolikhamxay	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
Champasack	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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Seventy percent of households with poor and borderline food consumption live in only seven provinces. They live in Saravane and Sekong in the Southern Highlands (22 percent of poor and 20 percent of borderline); Oudomxay and Bokeo in the Northern Highlands (28 percent of poor and 17 percent of borderline) and also in Luangprabang, Huaphanh and Xiengkhuang (20 percent of poor and 31 percent of borderline)⁹⁵. In some provinces there are very few households with poor or borderline food consumption, especially in the Vientiane Plain and the Mekong Corridor.

⁹⁵ These seven provinces make up only 31 percent of the total population

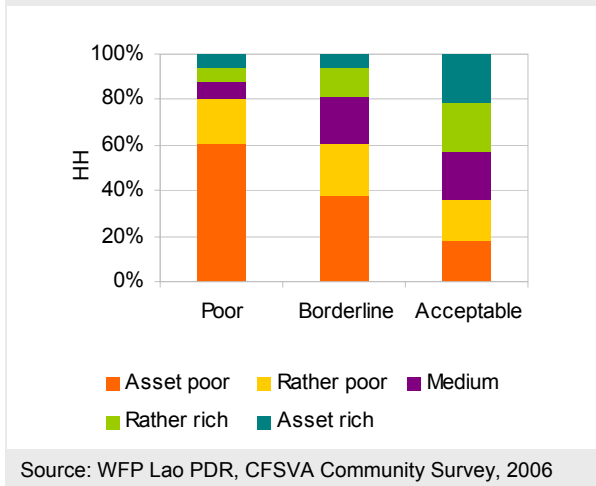
Map 1: Food security status of rural villagers in Lao PDR, by province



Source: WFP Lao PDR, CFSVA Community Survey, 2006

6.4.2. Asset wealth of food (in)secure households

Figure 21: Households' asset wealth by food security status



Source: WFP Lao PDR, CFSVA Community Survey, 2006

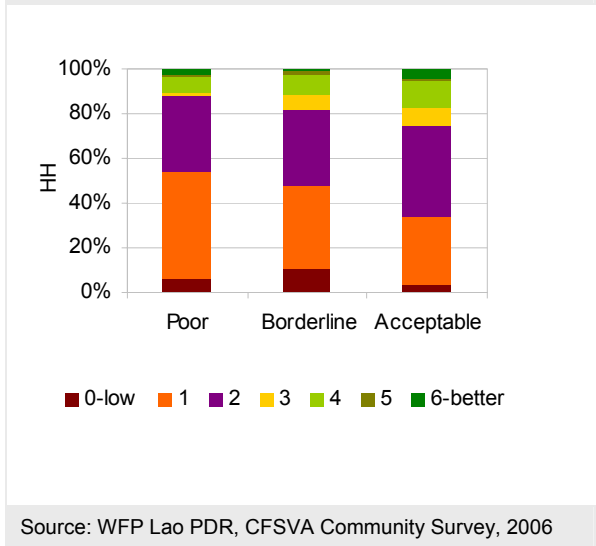
As shown in chapter 4, asset ownership is linked to food security. Food insecure households are mainly asset-poor households.

Eighty percent of households with poor food consumption belong to the poor and rather poor asset quintiles; 64 percent 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 infrastructure by food security status



Source: WFP Lao PDR, CFSVA Community Survey, 2006

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

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

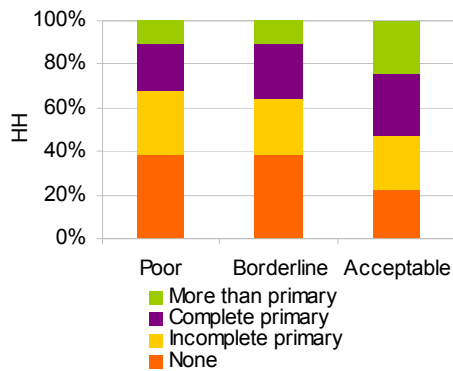
UXO contamination continues to be an obstacle to agricultural production and to the collection of NTFPs in large parts of the country, thus reducing the potential livelihood outcomes for many households. Seventeen percent of households living in villages with UXO problems have poor or borderline food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

In terms of demographic characteristics, eighteen percent of single headed households (often female) compared to only 12 percent of the others were food insecure. Similarly, 19 percent of

households with disabled household heads were food insecure compared to 12 percent 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 percent 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



Source: WFP Lao PDR, CFSVA Community Survey, 2006

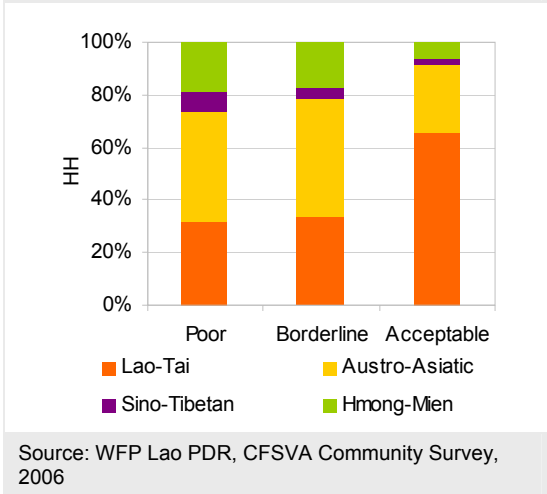
Many households with low levels of formal education levels are food insecure. The head of 71 percent of households with poor food consumption and 66 percent of those with borderline food consumption has no or incomplete primary education. Among the remaining households only 49 percent have no or incomplete primary education. This underlines the important link between formal education and food security. Furthermore, food insecure households tend to have a 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. Spouses' literacy may be even more important for food security, since spouses are the people most likely to take care of and feed the children. Their 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.

6.4.5. Ethnicity and food (in)security

Figure 24: Main ethnic groups by food security status

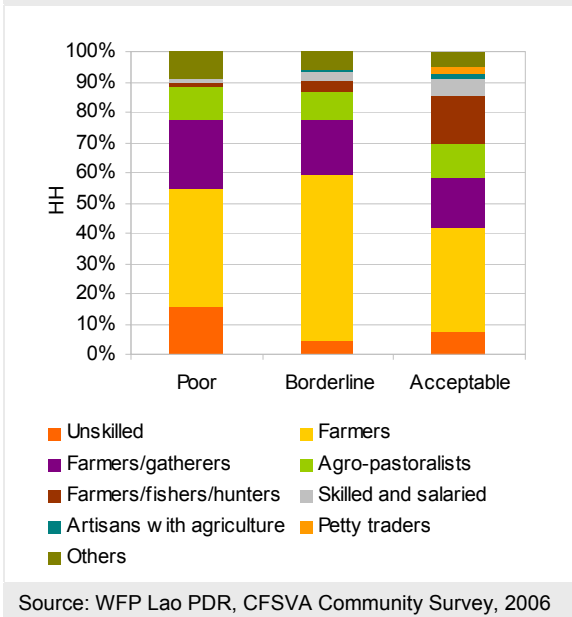


Typically, food insecure households do not belong to the Lao-Tai ethnic group, but rather to other ethnic groups. Only 7 percent of the Lao-Tai are in fact food insecure. This is in contrast to Hmong-Mien groups where 28 percent are food insecure and 22 and 20 percent from the Sino-Tibetan and Austro-Asiatic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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

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

Figure 25: Livelihood groups by food security status

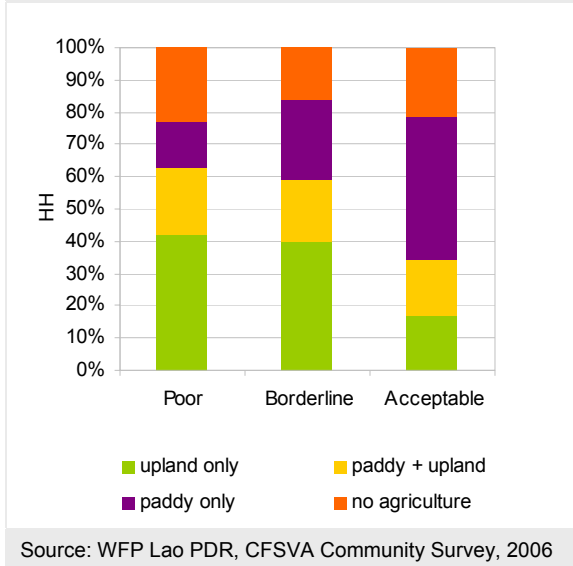


In terms of livelihoods, the food insecure households are mainly farmers and unskilled labourers. Seventy-two percent of the food insecure households are farmers who do not report any fishing or hunting activities. Fourteen percent of households with poor food consumption and 9 percent of households 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.

Source: WFP Lao PDR, CFSVA Community Survey, 2006

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

Figure 26: Type of agriculture by food insecurity status

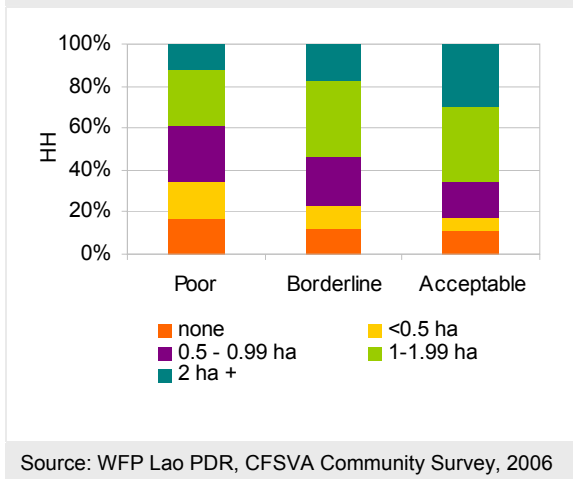


The proportion of upland farmers among the food insecure households is much higher than among the food secure households; forty-two percent of the poor and 40 percent of the borderline food consumption households are exclusively upland farmers, whereas the upland farmers represent only 17 percent of the food secure households.

The Government of Lao PDR aims to eradicate upland shifting cultivation. Areas available for such farming have been severely reduced in the past few years due to concessions for commercial activities such as plantations. The food insecurity of upland farmers may be more due to this increasing limitation to and changes in their traditional livelihood system than to a lack of paddy land.

6.4.8. Agricultural land of food (in)secure households

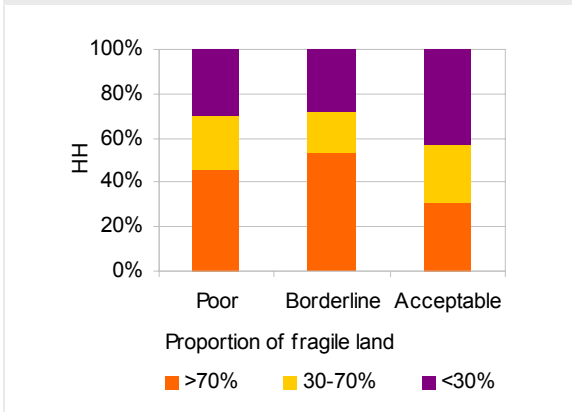
Figure 27: Area cultivated by food security status



In terms of access to land, the food insecure households are usually farmers with less than 1 ha of agricultural land. The land area of 45 percent of households with poor food consumption and 33 percent of households with borderline food consumption is between 0.01 and 0.99 ha, whereas among the remaining households only 23 percent have 0.01 to 0.99 ha. Access to kitchen gardens improves food security. Seventy-three percent of households with poor food consumption and 62 percent of households with borderline food consumption had no kitchen garden, whereas among households with acceptable food consumption only 45 percent lack kitchen gardens. Thus, a steady access to vegetable and other crops from kitchen gardens helps households maintain a varied diet.

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

Figure 28: Fragility of land by food security status

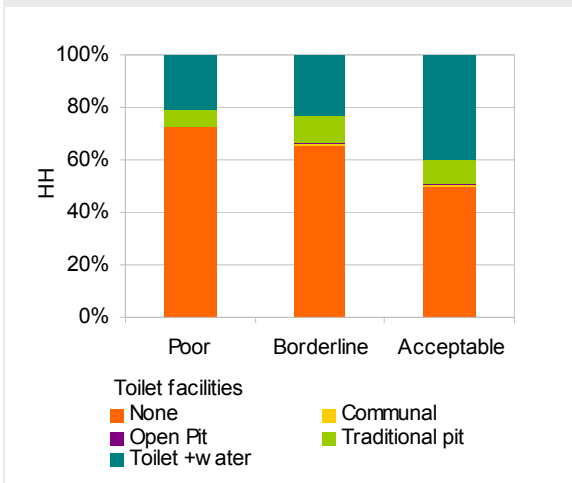


Source: WFP Lao PDR, CFSVA Community Survey, 2006

An important component of the ability to farm in Lao PDR is the sloping gradient of the land. Large parts of the country have steep hills making farming more difficult. Fifty-two percent of food insecure households live in areas where more than 70 percent of the land is fragile⁹⁶. This compares to 27 percent of food secure households. This is in line with 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



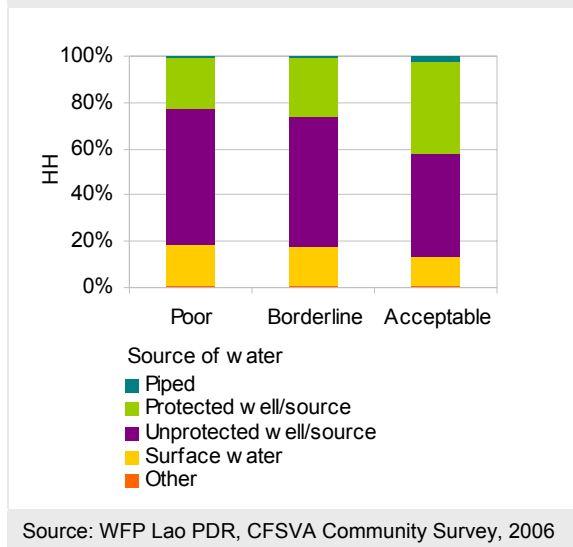
Source: WFP Lao PDR, CFSVA Community Survey, 2006

Disposal of human waste of 68 percent of food insecure households is inappropriate. The same is true for 51 percent of households with acceptable food consumption. Access to proper sanitary facilities is a problem for most households in rural Lao PDR, but the problem seems to be bigger for the food insecure household.

⁹⁶ 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.

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 unsafe water sources, compared to 58 percent of households with acceptable food consumption. Access to safe drinking water is a persistent problem in all of rural Lao PDR.

6.4.12. Targeting

In summary, 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 differentiate food insecure from food secure households. Food insecure households are typically farmers with low engagement in fishing and hunting or unskilled labourers. They practice upland farming on small plots of land in fragile areas with high sloping. Often, they do not possess kitchen gardens. They are mostly asset poor, low attainments in formal education, illiterate and from non-Lao-Tai 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 can assist to develop more appropriate targeting tools for future food security interventions. These targeting tools may need to be adapted to different geographical and cultural settings, as the rural areas of Lao PDR are very diverse. These characteristics can also indicate which types of intervention could help reduce people's vulnerability to food insecurity. Addressing issues such as low literacy and low levels of formal education, poor sanitary conditions and lack of access to safe drinking water, as well as safeguarding access to productive land will also help address food insecurity in many areas.

Summary: Chapter 6

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

Most households either eat glutinous rice or non-glutinous rice coupled with other staples, such as maize or cassava, seven 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. Rice insecurity does not necessarily mean staple insecurity.

Over the seven-day recall period, big wildlife was eaten by 6 percent of the households, small wildlife by 26 percent, wild fish by 81 percent, OAA by 55 percent, fish from ponds by 20 percent, poultry and pork each by 41 percent, and beef by 42 percent 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 domestic meat and aqua-cultured resources. However, these sources are under increasing threat. To safeguard the continuous and managed access to viable wild animal populations (including wildlife, fish and OAA) thus becomes a necessity in the food security sector, including various forms of natural resource management such as sustainable wildlife management, biodiversity conservation, but also stronger enforcement of national environmental regulations in foreign direct investment schemes, in particular with regard to hydropower development. In parallel, the consumption of domestic meat and fish sources needs to be fostered, as wild food sources may not be able to cover all needs in the long term. Changes in cultural habits, where domestic meat is used more for ceremonial occasions than as part of a regular diet, should be encouraged.

Vegetable consumption 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 or underreporting.

Fat and vegetable oil intake is crucial in any diet, due to its importance as an energy source and for the uptake of vital vitamins. Without adequate fat intake, the body is not able to absorb some vitamins, even if they are part of the diet. The use of fat or vegetable oil in the rural Lao diets differs between ethnic groups, but for the rural population as a whole it is critically low. Only 14 percent of the households used vegetable oil or lard in their daily cuisine; 44 percent had not added fat at all over the past seven days. Generally, a great share of fat intake originates from fish or meat – not from added vegetable oil or lard.

The analysis showed that the main component differentiating households with acceptable food consumption from households with poor or borderline food consumption is animal protein intake, mostly from wild fish/OAA and wild meats. Managing availability of and access to these food sources is therefore paramount in order to ensure acceptable food consumption and hence, nutrient intake. Promotion of a higher intake of fruits, oil and fat would also be 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 practise upland farming on small plots of land in fragile areas with steep slopes. Often, they do not possess kitchen gardens. They are mostly asset poor, low-formally 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.

Chapter 7. Food utilization and nutritional status

A child's full potential for survival, normal growth but also cognitive 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 and maternal and child care practices, low knowledge on good nutrition and on the causes of malnutrition - together with inadequate nutrient intake and high frequency of diseases - are major underlying factors for high levels of malnutrition among children, beginning with intra-uterine growth retardation.

While the CFSVA collected data on food consumption and took anthropometric measures of women and children, data on 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, traditional beliefs and education. What is common across different ethnic groups is that pregnant and lactating women and children 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 carrying heavy firewood baskets). After delivery, many mothers follow stark food restrictions (often for a period of one month) and in many cases, start heavy work tasks after a few days. Agricultural production often resumes after a week.

Cultural-specific attitudes have a major impact on child-caring practices⁹⁷. By comparison, the Hmong-Mien group shows most appropriate breast feeding and weaning practices: children are breastfed immediately after birth and complementary food is introduced only at the age of six months. Contrary, mothers or caretakers in other ethnic groups, especially those belonging to the Austro-Asiatic groups, feed their babies with pre-chewed sticky rice or water. On a national average only 27 percent⁹⁸ of the children are exclusively breastfed⁹⁹, followed by poor weaning and too late feeding of complementary foods. Feeding practices not improve during early childhood, as special foods for children are often not prepared. Young children are only fed three or four times per day. 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 diarrhoea is around 6 percent, with the most vulnerable group aged between 6 to 11 months old¹⁰⁰. Frequent diarrhoea together with intestinal losses of nutrients aggravates poor diets. This situation is worsened by high incidences of parasitic infections. Often one individual is affected by various parasites at the same time.

In general, diarrhoeal diseases together with malaria and acute respiratory infections (ARI) are major causes of morbidity and mortality.

⁹⁷ Holmes et al. (2003)

⁹⁸ National Statistics Centre (2007), this figure refers to children aged 0-5 months

⁹⁹ 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

¹⁰⁰ MICS II (2000)

Malaria and diarrhoeal diseases are more frequent during the rainy season than during the dry season¹⁰¹.

These high levels of diseases are unsurprising given the very low levels of hygiene and sanitation. In the CFSVA, 52 percent reported to have 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 2002-2003. Improved water access is over 10 percent lower for the poor than the non-poor¹⁰². The CFSVA indicates that 60 percent of households do not use a safe water source¹⁰³.

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

7.1.3. Health services

Despite high occurrence of sickness in rural 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 or self-healing. Many ethnic groups still consider health and well-being as a consequence of spiritual equilibrium rather than as a result of a sufficient food intake and health care practices¹⁰⁴. In many cases, spiritual belief systems prevent villagers from leaving the village in times of illness. In many villages, the high prevalence of infectious diseases is accepted as normal.

At the same time, the health system of the Lao PDR, especially at district level, is badly maintained. Villagers abstain from high costs for medicine. In many cases, villagers experienced to be overcharged for medicine¹⁰⁵.

Many mothers of ethnic groups deliver their babies in the forest, partly due to the customary regulations but also to unhygienic conditions in delivery rooms. In addition, in the remote uplands, health services are often difficult to access. The distance to health centres increased from 10.7 km in 1992-1993 to 11.7 km in 2002-2003 for the poor, while it fell from 7.4 km to 6.5 km for the non-poor¹⁰⁶.

The World Bank concludes that the health care system is still in the middle of a difficult transformation¹⁰⁷. 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 take place in the near future¹⁰⁸. Immunization coverage has fallen in recent years and has been recognized by the Government of Lao PDR as a serious challenge¹⁰⁹.

7.2. Children's nutritional status

Growth stunting in childhood is a risk factor for increased mortality, poor cognitive and physical development and other impairments. 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.

¹⁰¹ FAO (2003)

¹⁰² World Bank (2006a)

¹⁰³ Safe water source includes: piped water, protected well/borehole. Unsafe water includes: unprotected well/borehole, river stream or dam, and mountain source.

¹⁰⁴ Holmes et al. (2003)

¹⁰⁵ Krahn (2005)

¹⁰⁶ World Bank (2006a)

¹⁰⁷ World Bank (2006a)

¹⁰⁸ Government of Lao PDR (2004); World Bank (2006a)

¹⁰⁹ World Bank (2006a)

7.2.1. Background

UNICEF¹¹⁰ notes that the appearance of high levels of malnutrition in Southeast Asia, despite the economic prosperity experienced in the region, is a paradox. This reflects the widening disparity both between and within countries. This pattern is also seen in the Lao PDR¹¹¹.

In the Lao PDR, the first national nutrition survey of children under five years of age was conducted in 1993 under the auspices of FAO (n=2,950). From then until 2000, as indicated by the first Lao National Health Survey (NHS) global stunting levels dropped from 47 percent to 41 percent. On the other hand, levels of global wasting increased from 11 to 15 percent. Levels of global underweight remained fairly constant.

The National Health Survey of 2000 (n=1,347), was jointly undertaken by the Ministry of Health and UNICEF. The data from the follow-up survey, which was collected in April 2006, was not available for CFSVA comparison¹¹².

Given Lao cultural diversity, malnutrition is inextricably linked to ethnicity. Various case-studies confirm higher levels of malnutrition among ethnic groups compared to the Lao-Tai groups. In many cases their standard deviation units ranked below the national average indicated in the MICS. A study by Kaufmann in 1999 on the Khamu and Akha in Muang Sing reported 70 percent of stunting¹¹³. A survey in Attapeu in 2002 found stunting levels of over 50 percent¹¹⁴, and one-third suffered from severe stunting. In the neighbouring province of Sekong, Krahn¹¹⁵ identified global stunting levels of 32-63 percent in four Katu villages (n=197), whereby the village with the best economic development potential scored worst. Another study in Sekong and Luangnamtha identified global stunting levels of 63 percent in Kaleum District, and 74 percent in Long District, mainly ethnic minority areas¹¹⁶.

In a survey conducted by the World Bank in 2006, 11,472 children between 3-14 years in Phongsaly, Oudomxay and Luangnamtha provinces scored in their height-for-age -2.25 standard deviations (SD) below the median reference standard and -0.54 SD for their weight-for-height ratio¹¹⁷. A nutrition survey in Bolikhamxay (n=1,514) in 2001 mainly in Lao-Tai villages established that 43 percent of children below 5 years were stunted, 28 percent underweight, and 4 percent were wasted, with the most vulnerable group ranging between 36 and 59 months¹¹⁸.

Apart from the NHS and MICS, there is no other national representative data available on the level of iodine deficiency disorders (IDD), iron deficiency anaemia and vitamin deficiency related diseases. The NHS indicates that 4 percent of the rural children under five years of age had visual problems, as well as 13 percent of rural women in the child bearing age during their last pregnancy. Vitamin A deficiency (with retinol levels $\leq 0.7\mu\text{mol/l}$) was found in 27 percent at the national level, with children under five years of age (38 percent) being the most vulnerable group. Goitre rates of children age 6-12 years (9 percent at national level) were found to be higher in Southern Lao PDR than in Central and Northern Lao PDR. One percent of the surveyed population had haemoglobin levels below 7g/dl (which is the cut-off for anaemia). Children below five years of age are most vulnerable, as well as women and people in the Southern Lao PDR.

¹¹⁰ UNICEF (2005)

¹¹¹ World Bank (2006)

¹¹² The preliminary results (National Statistics Centre (2007)) show malnutrition rates using the old NCHS standards

¹¹³ Kaufmann (1998)

¹¹⁴ Meusch et al. (2003)

¹¹⁵ Krahn (2005)

¹¹⁶ Miyoshi et al. (2005)

¹¹⁷ Buttenheim and McLaughlin (2006)

¹¹⁸ Klingner and Schmid (2001)

7.2.2. The CFSVA

In the CFSVA, 2,541 children under five years of age were measured for age, weight and height or length in order to calculate levels of stunting, wasting, and underweight¹¹⁹. These three nutritional indicators are expressed in standard deviation (SD) units (z-score) from the median of the new WHO and the NCHS/CDC reference standards, with cut-offs set at -2 SD and -3 SD.

Cases with unreasonable results were excluded (flagged) from the analysis for each specific indicator. The number and type of flags between the NCHS/CDC standards and the WHO standards are very similar. Some degree of age heaping as well as height and weight rounding were observed. The 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.

The CFSVA findings do not reflect the national prevalence of stunting, wasting, and underweight, but just that of the rural population¹²⁰ (see section 2.4). The CFSVA results are not meant to replace other surveys such as the MICS whose primary goal is measuring nutritional status. All the data is presented with 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 17 provides the mean figures calculated with both the NCHS/CDC and the WHO reference standards.

	NCHS/CDC z-scores			WHO z-scores		
	WAZ	WHZ	HAZ	WAZ	WHZ	HAZ
	underweight	wasting	stunting	underweight	wasting	stunting
N	2,428	2,335	2,284	2,414	2,288	2,252
Mean	-1.57	-0.53	-1.69	-1.38	-0.4	-1.86
SD unweighted ¹²¹	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)

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Comparing the CFSVA data with the NHS¹²² from 2000 (using the NCHS/CDC reference standard), levels of stunting remain similar, from 41 percent in 2000 to 45 percent according to the CFSVA. Underweight remained fairly constant at 38 percent (40 percent in 2000), and

¹¹⁹ In general, stunting (height-for-age z-score = HAZ) reflects an assessment of body growth and is often referred to as chronic malnutrition. Wasting (weight-for-height z-score = WHZ) is an indicator for acute malnutrition or thinness, whereas underweight (weight-for-age z-score = WAZ) 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 diarrhoea), several nutrient deficiencies probably occur simultaneously in growth-stunted children.

¹²⁰ Weighting of the data to adjust for differences in population sizes in the different provinces have been undertaken, but not detailed weighting according to the population's age and sex structure

¹²¹ 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 standard deviations here are all slightly high, most likely due to inaccurate data (age heaping, height and weight rounding)

¹²² Different sampling universes were used

wasting decreased from 15 percent in 2000 to 7 percent in 2006. Despite the success in reducing economic poverty levels, levels of chronic malnutrition are still very high.

For the subsequent analysis, only calculations using the new WHO reference standards are presented. The data is aggregated for agro-ecological zones, road access, land sloping, and main ethnic group. For definition of the aggregation variables please see chapter 2.

By aggregating the data for five agro-ecological zones, a different picture is obtained than by using the classical division for North, South, and Central Lao PDR. There is a clearer division between populations living in the Mekong Corridor from people in the Central and Southern Highlands along the Vietnamese border, which are usually merged into the group of Central Lao PDR. This geographical division strongly complements the aggregation by ethnic groups in describing the nutritional situation in rural Laos.

Table 18 shows some significant differences in the prevalence of nutritional status between agro-ecological zones. The children living in the Vientiane Plain tend to have the best nutritional status (Table 18). The significantly highest prevalence of stunting was found in the Northern Highlands. Surprisingly, the highest prevalence of wasting was found in the economically better off Mekong Corridor.

Table 18: Nutritional status (as prevalence of malnutrition) by agro-ecological zones			
Agro-ecological zone	Prevalence (%) \leq - 2SD (95 % CI)		
	Underweight	Wasting	Stunting
Vientiane Plain	18.7 (11.8, 28.3)	4.6 (1.7, 11.9)	34.6 (27.7, 42.3)
Central and 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 Highlands	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 Bolaven Plateau			
Source: WFP Lao PDR, CFSVA Community Survey, 2006			

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

Table 19: Nutritional status (as mean z-score) by presence of fragile land (greater 16 percent sloping)			
Sloping class	Prevalence (%) \leq - 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)
Source: WFP Lao PDR, CFSVA Community Survey, 2006			

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

Table 20: Nutritional status (as mean z-score) by road access

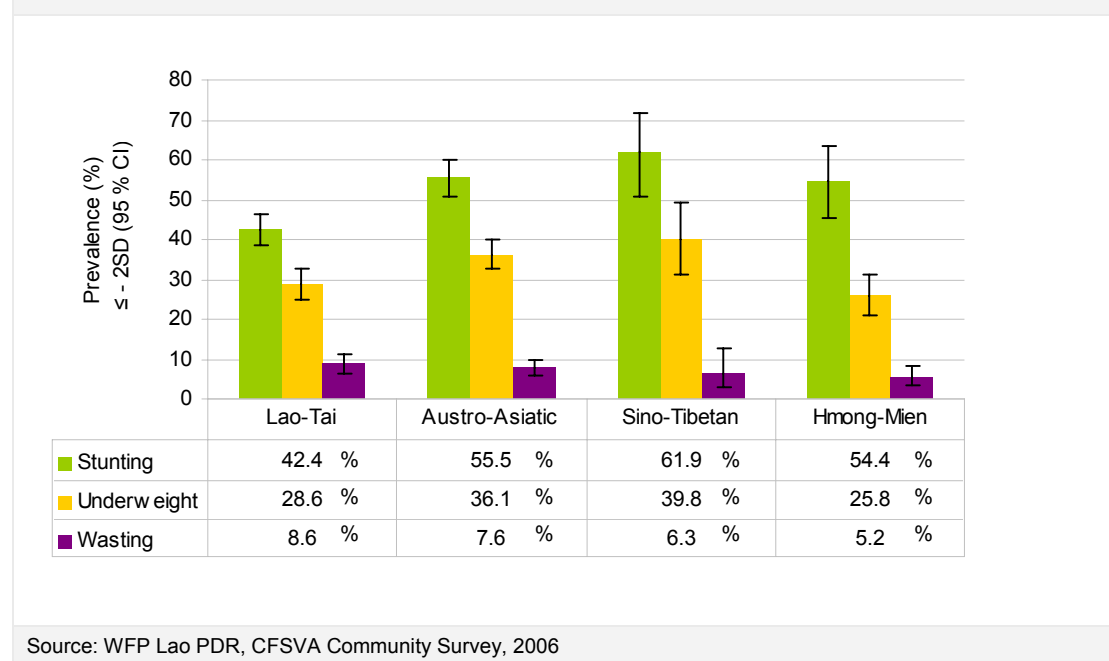
District road access	Prevalence (%) \leq - 2SD (95 % CI)		
	Underweight	Wasting	Stunting
Rural with road access	32.8 (29.8, 35.9)	8.2 (6.6, 10.1)	51.3 (47.7, 54.9)
Rural without road access	29.5 (24.8, 34.7)	6.7 (4.6, 9.5)	48.2 (42.6, 53.9)

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Ethnic groups

The CFSVA allowed for a disaggregation of malnutrition data by ethnolinguistic groups, information that is not available from other sources. The highest levels of stunting were found among the Sino-Tibetan groups (62 percent), followed by the Austro-Asiatic (56 percent) and Hmong-Mien groups (54 percent). The Lao-Tai have the lowest prevalence (42 percent), which is significantly lower than the Austro-Asiatic and the Sino-Tibetan. There were no significant differences between ethnic groups in wasting or underweight however the highest levels of wasting were found among the Lao-Tai.

Figure 31: Nutritional status by ethnic group



Seasonality

Seasonality in nutrition is not yet studied intensively in Lao PDR. However, acute malnutrition rates are expected to be much higher during the rainy season (April – September)¹²³. The rainy season is the peak season for intensive labour in the rice fields, and rice storages are often already depleted. During this time, villagers do not have enough time for food collection and preparation, and diarrhoeal incidences are more frequent.

¹²³ FAO (2003)

Girls and boys

Table 21: Prevalence of underweight, wasting and stunting by sex

Sex	Prevalence (%) \leq - 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)

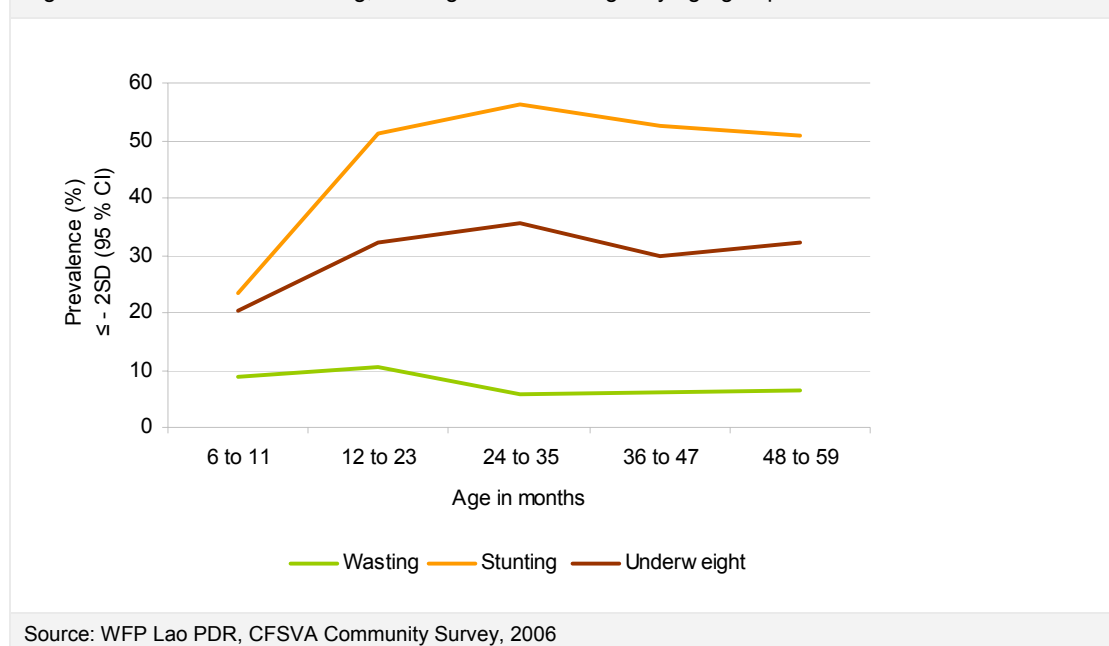
Source: WFP Lao PDR, CFSVA Community Survey, 2006

The CFSVA data suggest that boys have higher levels of stunting, wasting, and underweight than girls, although none of these differences are significant. In other studies, the difference was also marginal¹²⁴. The MICS, however, found a higher percentage of stunting and underweight levels (below -2SD) for boys, but suggested that girls were more frequently wasted.

Age groups

Below is a graph of stunting, wasting, and underweight for different age groups, illustrating different patterns in age groups.

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



Stunting increases with age, particularly after the first year and in the age group 24-35 months (55 percent of cases). This is also the true for underweight, with a prevalence of 33 percent in the same age group, but with a less sharp increase. This pattern is in line with findings from the MICS survey¹²⁵.

Wasting levels decrease slightly after the first two years of age. Most wasted children are found in the early age groups between 6 and 24 months. This data supports the argument from chapter 7.1.1 that inappropriate (and not exclusive) breastfeeding and complementary

¹²⁴ Klingner and Schmid (2001); Miyoshi et al. (2005)

¹²⁵ National Statistics Centre (2007)

feeding practices hamper early childhood development. More research is needed to investigate if and how the early feeding of pre-mastized rice (often in the first month) is harmful to the undeveloped intestinal system of young children. The CFSVA data does not control for diarrhoea and breastfeeding practices.

7.2.3. Mortality rates

In Southeast Asia, poor nutritional status of infants and children causes over half of all deaths, according to UNICEF¹²⁶. Other causes of mortality are diarrhoea, malaria, acute respiratory infections, dengue, measles and meningitis¹²⁷.

Child and maternal mortality in Lao PDR are among the highest in the region. Life expectancy increased from 52 years for women and 50 years for men in 1995 to 63 years for women and 59 years for men in 2005¹²⁸.

7.3. Women's nutritional status

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

7.3.1. Background

Two major surveys in the past ten years give us an indication of the situation with regard to women's nutritional status in Lao PDR¹²⁹. Women's nutritional status is normally measured using Body Mass Index (BMI¹³⁰). 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.

7.3.2. The CFSVA

5,101 women of reproductive age were measured, of which 3,456 were included eligible for analysis (others had incomplete data, others were excluded due to pregnancy). Of those eligible, only 13 cases were 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 should not have a large impact on the results.

Table 22 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 percent (95 percent CI, 10.1-13 percent). This figure is lower than the reference points for 1995 and 2000, but two major differences in these studies should be noted. First, the CFSVA data are based on women aged 15-49 years, whereas the two other studies refer to women aged 18 (in 1995) and 15 (in 2000) and above, respectively. Second, the CFSVA data only include women from rural areas, whereas the other studies include urban residents. Direct comparison is therefore not possible. Nonetheless, it indicates that there have been no major changes in the nutritional status of women over the past ten years.

¹²⁶ UNICEF (2005)

¹²⁷ Government of Lao PDR (2004)

¹²⁸ National Statistics Centre (2006)

¹²⁹ FAO (2003)

¹³⁰ Calculated as weight in kg divided by squared height in meters

	WHO cut-offs	Prevalence (%)	95 % CI	
			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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Table 23 shows the prevalence of underweight among women of reproductive age by agro-ecological zone. The only observed difference is that the Northern Lowlands have a significantly lower prevalence than both the Mekong Corridor and the Central and Southern Highlands. However, the Vientiane Plain also shows a trend (not significant) towards lower prevalence than the Central and Southern Highlands and the Mekong Corridor.

Agro-ecological zones	Prevalence of underweight (%)	95 % CI	
		Lower	Upper
Northern Lowlands	8.6	6.7	11
Vientiane Plain	10	7	14.1
Northern Highlands	10.4	8.3	13.0
Mekong Corridor	13.4	10.7	16.6
Central and Southern Highlands	16	11.2	22.4

Source: WFP Lao PDR, CFSVA Community Survey, 2006

These patterns among the agro-ecological zones are similar to those of wasting among children under five, where the Central and Southern Highlands and Mekong Corridor also show a higher (though not significant) prevalence of wasting than other zones.

Table 24 shows the prevalence of underweight among women of reproductive age by ethnic groups. There are no significant differences between any of the ethnic groups.

Main Ethnic Group	Prevalence of underweight (%)	95 % CI	
		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

Source: WFP Lao PDR, CFSVA Community Survey, 2006

Summary: Chapter 7

Chronic malnutrition, or stunting, is at an alarmingly high level in Lao PDR. Every second rural child under five years of age is stunted. There has been no improvement in the chronic malnutrition in Lao PDR over the past 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 show that ethnic groups (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 economically better off Mekong Corridor. The data show that children from families with better road access do not necessarily have a better nutrition status.

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 inappropriate complementary feeding practices, especially with regard to timing and choice of weaning foods.

Growth stunting in childhood is a risk factor for increased mortality, poor cognitive and physical development and other impairments. 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 disadvantaged.

Although there are no consistent measurements of the prevalence of underweight in women of reproductive age in Lao PDR, 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 for women of reproductive age, with a trend of lower prevalence in the Northern Highlands and Lowlands, and in the Vientiane Plain.

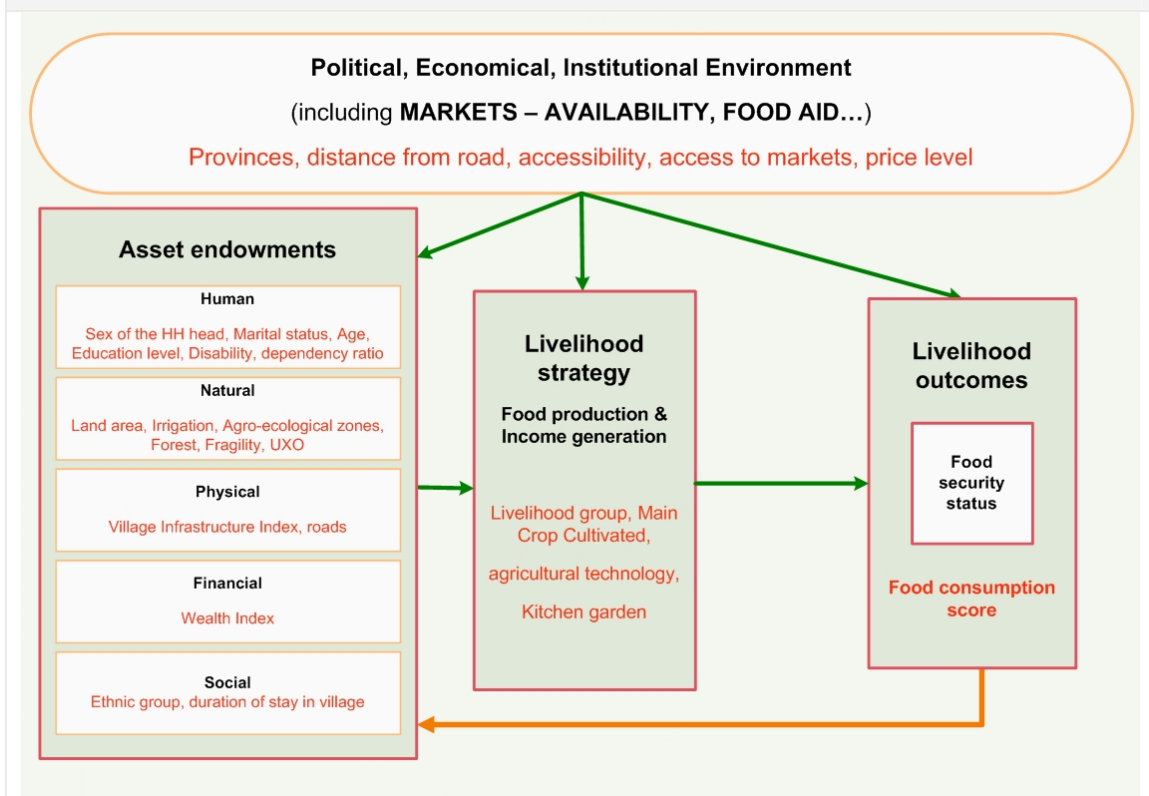
Chapter 8. Determinants of food security

This chapter looks at why some households are food insecure and others are not. 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



The General Linear Model (GLM) is being used (integrating Multiple Linear Regression with Analysis of Variance - ANOVA), it 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 GLM¹³¹ allows assessing the effect of each “determinant” (or independent variable) on food-consumption, while controlling for all the other factors in the model. We can thus study the “net effect” of each variable without confusing this effect with the influence from other factors that might be correlated with the particular variable 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 B4)). Two variations of the model are given. A third model

¹³¹ SPSS 14 GLM for complex samples is utilized to analyze the data

includes factors related to agriculture and includes only those households which are involved in agriculture.

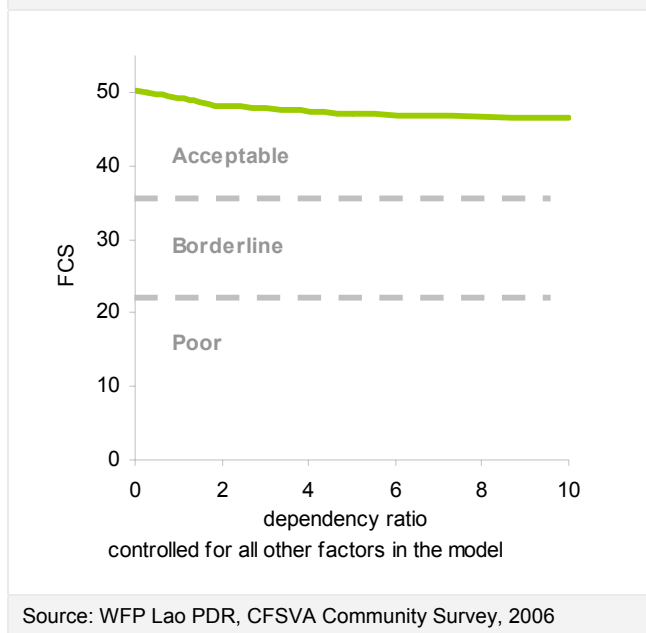
However, not all factors show the expected effect in this data set. No statistically significant effect was observed from the age or sex of the household head, mechanisation level, marital status, educational level, or the main crop cultivated. Even land area under cultivation, the use of pesticides and irrigation did not yield any results. The distance to district markets and road quality 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 only weakly describe 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 and food security status



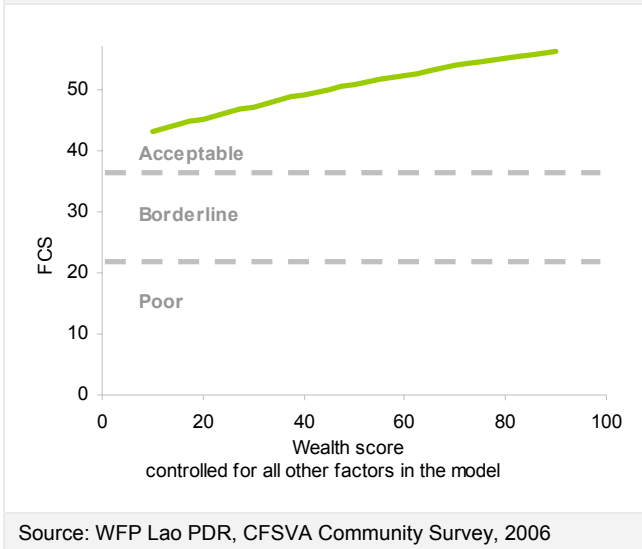
According to the model high dependency ratio (number of dependents/number of adults) has a negative effect on household food security. More mouths have to be fed by fewer providers.

It should however be noted here that the statistical significance of the relationship is inflated by the fact that both the dependency ratio and the per capita consumption value are calculated by dividing with the household size.

Other family characteristics, such as the education level of the household heads are usually also found to be important. Education levels are associated with the livelihood strategy of the household which, in turn, is a strong determinant of food security. However, this indicator did not yield any statistically significant results in the model.

8.2.2. Effect of household asset wealth on household food security

Figure 35: Wealth and food security status



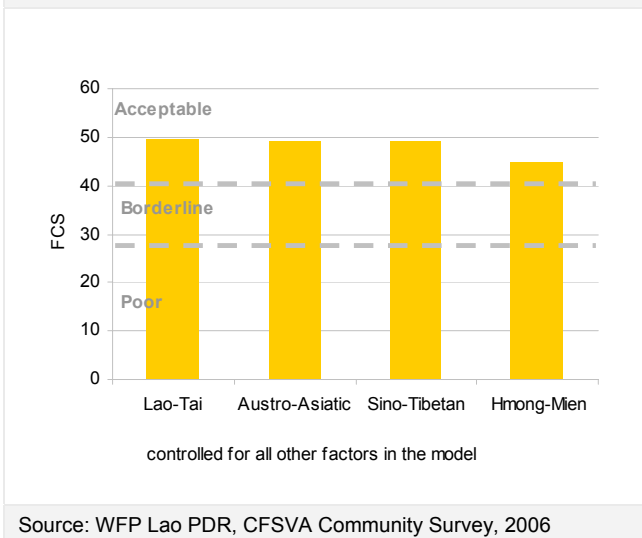
The statistical analysis shows that asset wealth (such as quality of housing and possession of assets) has a strong effect on food security.

More in depth research would be needed to adequately describe the relationship between the two.

One interpretation could be that asset wealth permits productive investments and hence better production, that 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.

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

Figure 36: Ethnicity and food security status



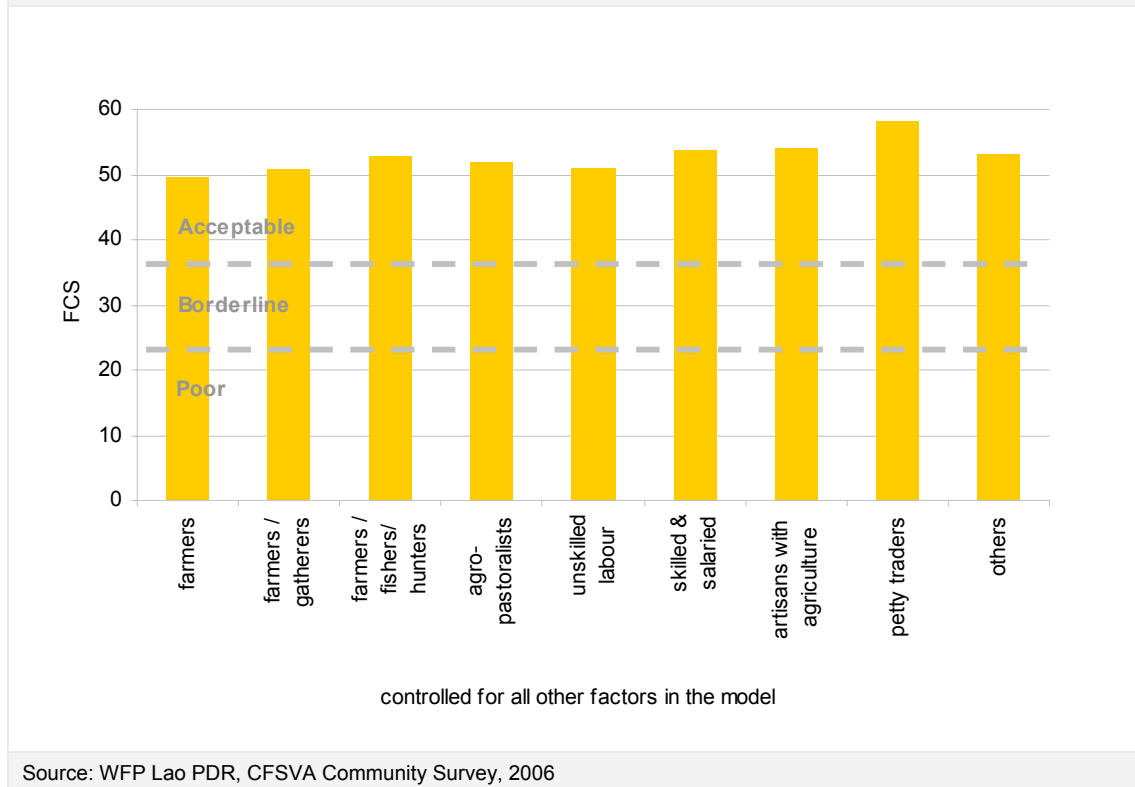
After results are corrected for all other associated factors, the Hmong-Mien still have lower food consumption scores than the other ethnic groups.

This is caused by other factors than the ones already included in the model and calls for more in depth research on the nutritional habits of ethnic groups.

Source: WFP Lao PDR, CFSVA Community Survey, 2006

8.2.4. Effect of the livelihood strategy on household food security

Figure 37: Livelihood strategies and food security status



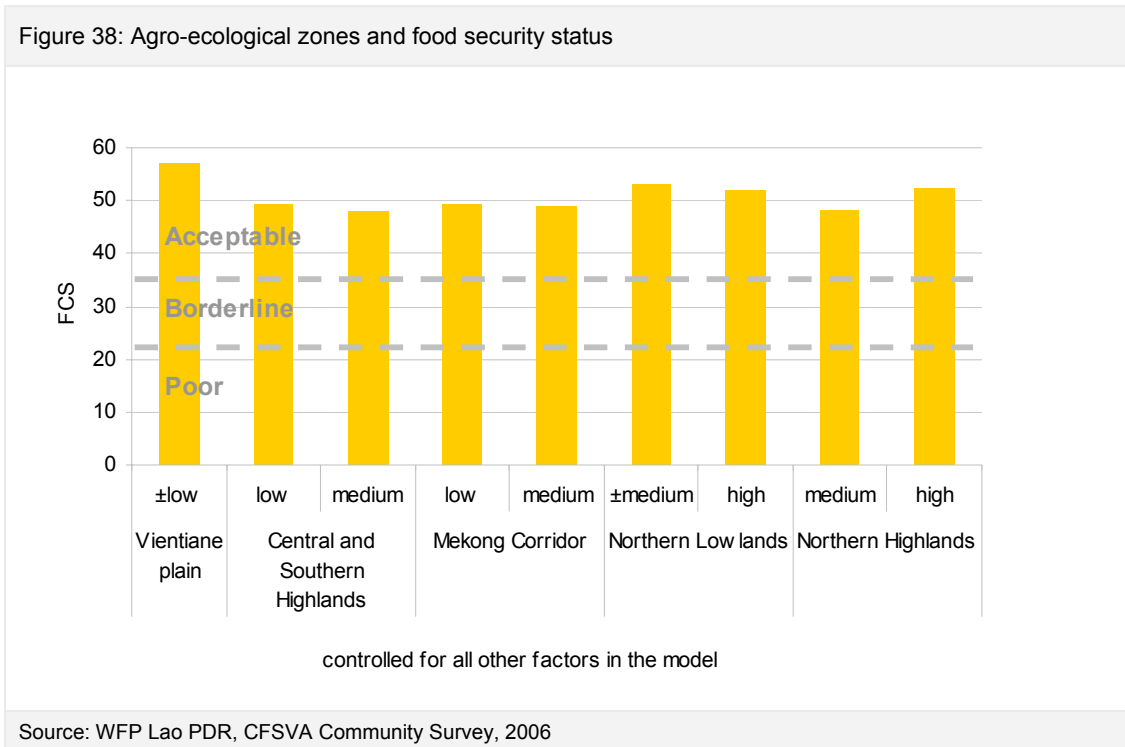
The livelihood strategy that a household chooses impacts their food security. This choice may be voluntary, but in many cases is limited by the livelihood assets a household has at its disposal. The analysis of livelihood groups shows that farmers are worse off, except if they also rely on fishing or hunting or on livestock.

Unskilled labour is also a livelihood strategy with poor results. 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 one's livelihood strategy is not an easy task, however, as it depends on the assets available.

Promoting long-term food security requires an understanding of different livelihood opportunities, and how promoting certain assets (natural, physical, human, social or financial) can enhance these opportunities.

Typically this involves education and development of physical infrastructure and institutions. For example, presence of kitchen gardens increases the food consumption score with two points. This is the equivalent of two extra days per week with vegetables.

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



The model suggests that the Vientiane Plain, with little or no slope, (low fragility: <30 percent of fragile lands) has the best agro-ecological circumstances for food security. This is probably linked to a higher production potential, especially for paddy production. In addition, the access to land is not as restricted by the presence of UXO as other low-lying areas. The parts of the Central and Southern Highlands with medium fragility have 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.

8.3. Findings for agricultural systems

In a variation of the model, the initial model is complemented with some agricultural factors and tests only households who reported agricultural activities.

According to the model, households practicing upland agriculture are less food secure than those who cultivate paddy. Households that exclusively cultivate paddies have a higher consumption score. This is probably linked to the fact that paddy rice production has double the yield of upland farming. However, rather unexpectedly, no significant effect from irrigation is observed while it also significantly increases rice production for a household.

From this, one should not conclude that movement of people from high-lying to low-lying areas and a shift from upland to paddy farming is the obvious solution to improve the food security status of upland farmers. There may not be sufficient land or water available for the new paddy producers, the soil may be of bad quality, financial resources for paddy expansion are not always sufficient and new farmers may lack the necessary skills and resources to use new farming techniques effectively and to adapt to their new environment.

Figure 39: Agricultural systems and food security status

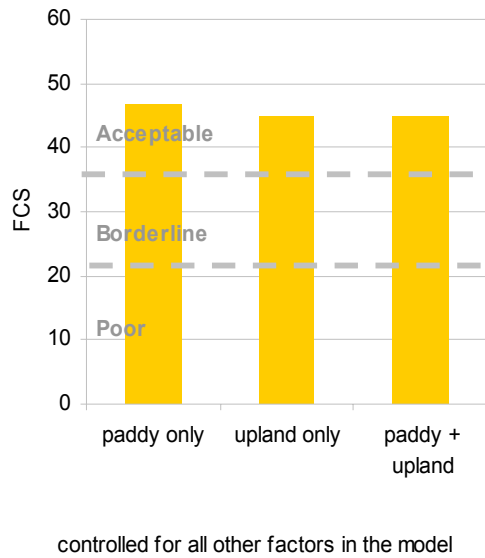
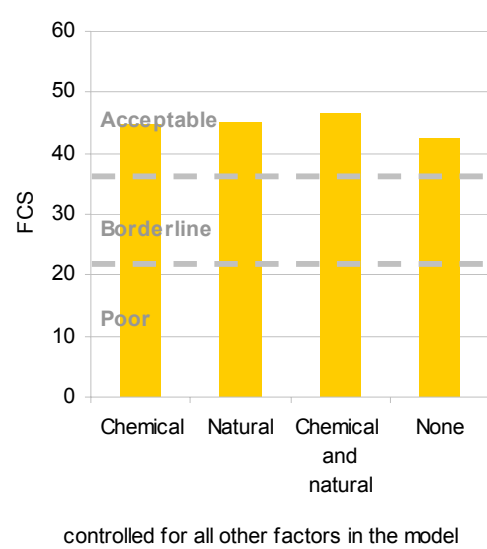


Figure 40: Fertilization of crops and food security status



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Instead, assets that are important for existing livelihood opportunities should be strengthened. This could be as much a matter of human, social and financial capital as a matter of natural capital.

The model suggests that households that use chemical fertilizer together with manure and compost are more food secure than those who do not. Again more detailed analysis of the way the fertiliser is used is needed to understand when the link is causal (households are more food secure because they use fertiliser) and when the use of fertilisers is the result of past successful livelihood strategies (people who are more food secure have enough resources to apply fertiliser). No similar effect was observed for the use of pesticides.

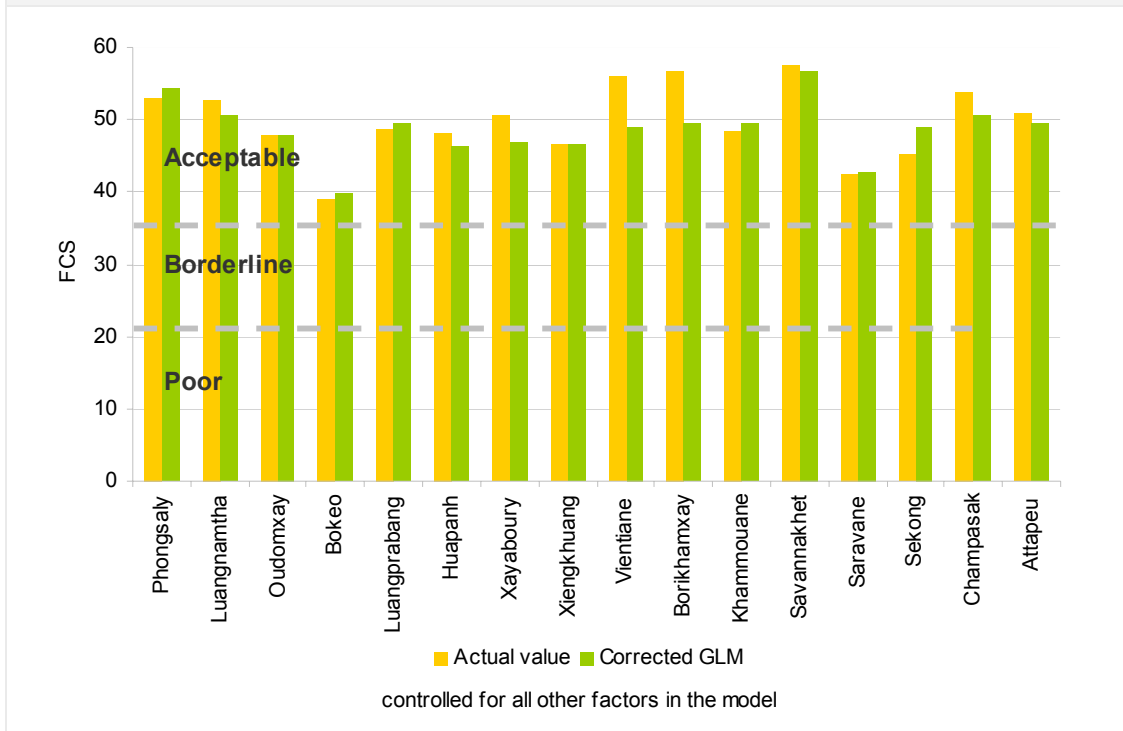
8.4. Other factors

Other geographical factors, not described in the model, also have an impact on food security.

For instance, the provinces of residence have a strong additional effect on food security.

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 high, probably because it is already situated in a very favourable agro-ecological zone, the Vientiane Plain, the effect of which is already taken into account and corrected in the model.

Figure 41: Province of residence and food security status



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Summary: Chapter 8

The analysis conducted in this chapter confirms that there is a link between asset wealth and food security. In addition, the food security status of the households is linked to their livelihood strategy; households involved in non-farming activities such as petty trading and skilled and salaried work have a better food security status than pure farming households, whereas households engaged in unskilled labour are relatively less food secure.

Farmers involved in fishing and hunting were more food secure than pure farming households. Analysis of different farming systems shows, unsurprisingly, that paddy farmers are doing better than upland farmers. Geographical differences also impact food security, through sloping of the land and other factors not captured in the model.

Understanding livelihood opportunities in different locations of the country is important to better guide what type of interventions can 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 were enhanced.

Chapter 9. Risks to food security

9.1. The approach¹³²

9.1.1. Risk analysis

Risk analysis helps identify populations that are likely to experience food insecurity in the future, due to effects of a particular hazard or shock. Risk analysis can identify geographic areas and populations at risk. This enables decision-makers to define proper interventions, highlight factors contributing to increased vulnerability among households, and estimate the effects of these factors on households.

The analysis has three main stages: first, the occurrence of various hazards, their geographical and temporal extent and historical impact is studied. Second, the analysis explores households' vulnerability to a particular type of shock. Third, from the first two steps, the number households who are at risk of becoming food insecure because of a specific hazard are estimated.

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 regard to food security) resulting from interactions between hazards and vulnerable conditions.¹³³

It is difficult to evaluate the magnitude and extent of a specific shock, whether natural or human-induced. Therefore, it is hard to estimate the impact of shocks on populations and their livelihoods. A specific follow-up assessment is always needed after a shock. Thus, 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. Social networks or access to forest resources are also important. Households that are currently food secure (high 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. Further, if the probability of a severe shock occurring to them is high, the risk of food insecurity for these households is also high.

¹³² More details on the approaches/methodology and results can be found in Annex B6.

¹³³ Risk can be understood as $Risk = Hazards \times Vulnerability$. For more general definitions, see also UN-ISDR: Terminology on disaster risk reduction

9.2. Various hazards in Lao PDR

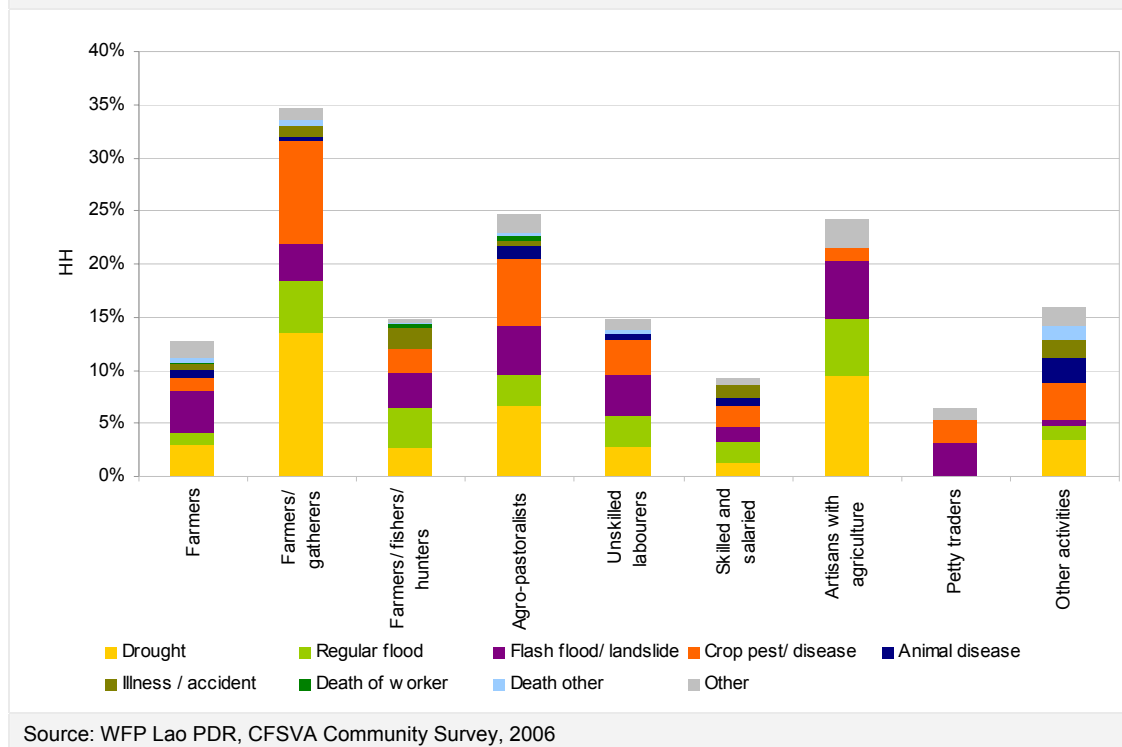
Climate risks are not new to Lao farmers. For example, midseason dry spells damaging young plants and late-season floods just before harvest causing severe crop loss are recurrent threats to this livelihood.

Table 25: Summary of natural disasters in Lao PDR from 1966 to 2002

	# of events	Total number of people affected
Flood	16	3,244,150
Epidemic	7	19,929
Drought	5	4,250,000
Wind Storm	4	1,307,312

Source: OFDA/CRED International Disaster Database (EM-DAT)

Figure 42 : Shocks reported by various livelihood groups



In the household survey, the households were asked to report shocks they experienced during the previous year. Only 16 percent of households reported one or more shocks last year. The most common shocks reported were drought, flood (regular and flash-), crop pest and disease. The number of households affected by shocks varied greatly depending on their livelihood strategies.

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

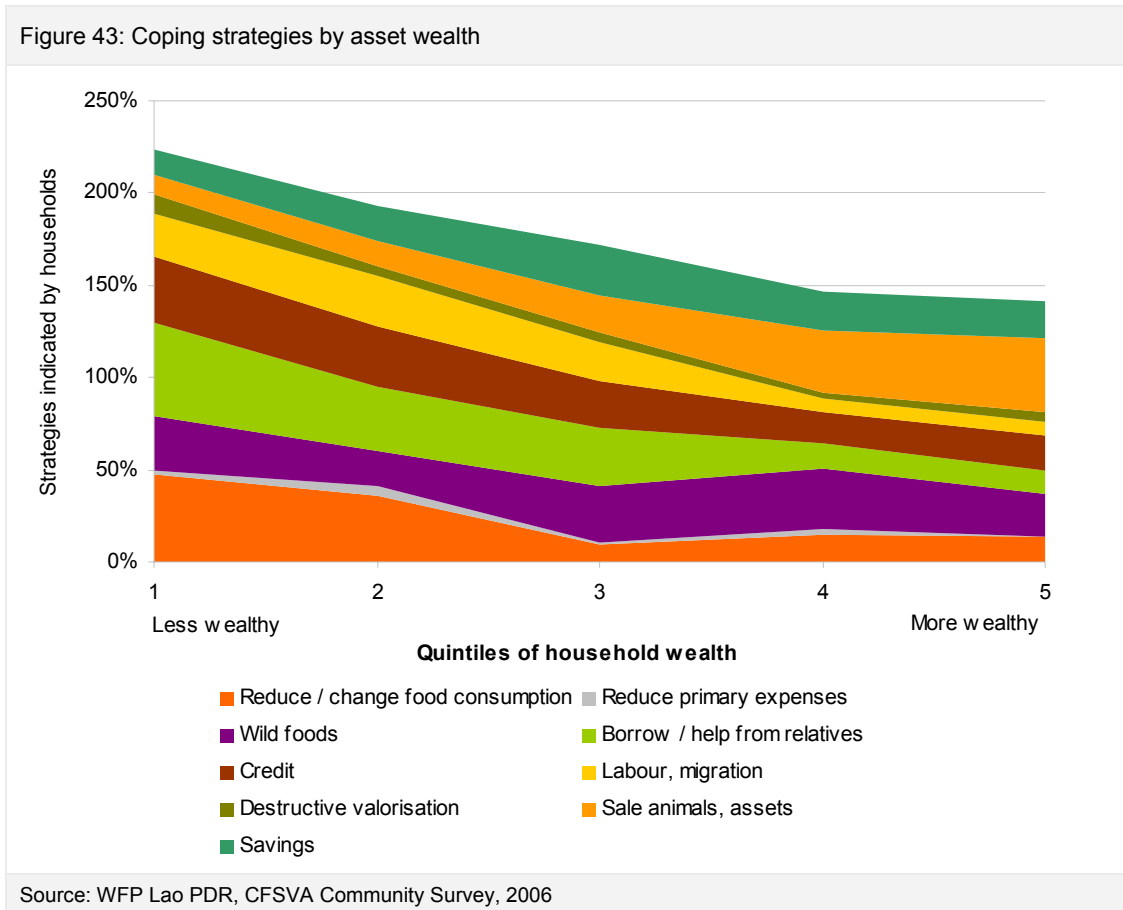
9.3. Households' capacity to cope

Those households who reported shocks (16 percent of the whole sample) also indicated which coping strategies were applied to handle the effects of the shock(s) experienced in the past 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 not as severe as in previous years, some trends in the use of coping strategies can be seen¹³⁴.

The most common coping strategies employed, regardless of the shock experienced, are reduction or change of food consumption, borrowing and help from relatives and friends, consumption of wild foods, and 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 livelihood orientation of households. Unskilled labourers usually work for food and migrate, agro-pastoralists sell livestock and petty traders use savings. All groups rely to some extent on gathering of wild foods as a coping strategy (especially farmers/gatherers). This coping strategy may become less available as access to forest resources is threatened, forcing households to look for other ways to compensate for losses.



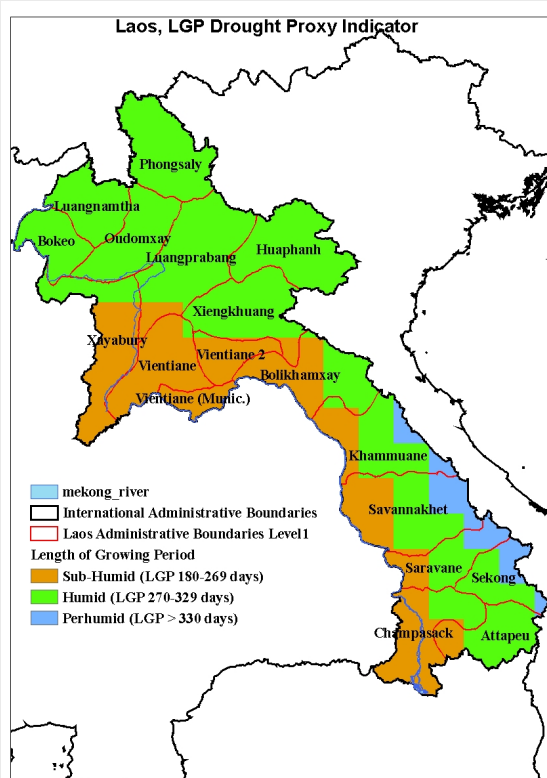
¹³⁴ The occurrence of various coping strategies is shown in Annex B6

Asset poor households employ simultaneous strategies to cope with shocks. The types of strategies these households use illustrate the difficulties the households have in coping with shocks. Half of those households reduce or change their food consumption; and 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 shocks. They often sell some assets or use their savings.

Wealthier households have also more often access to remittances from migrated relatives. Asset wealth may therefore be a useful proxy¹³⁵ for coping capacity during vulnerability and risk assessment.

9.4. Analysis of the risk of natural disasters

Map 2: Drought prone areas in Lao PDR



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 change of power in 1975. In 1977, severe drought conditions throughout the country reduced the national rice harvest by 40 percent relative to that of 1976 (which was already a deficit year). Some Southern provinces experienced a decline of up to 95 percent¹³⁶. It was estimated that more than 350,000 mt of rice aid were required to prevent famine conditions in 1977.

In 1978, serious flooding occurred. In some areas of Central and Southern Lao PDR, crop losses up to 90 percent 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 mitigate the food crisis.

Partly in response to the impact of the 1977 and 1978 disasters, 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 yields by about one-third, again forcing the government to rely on food aid for its domestic requirements.

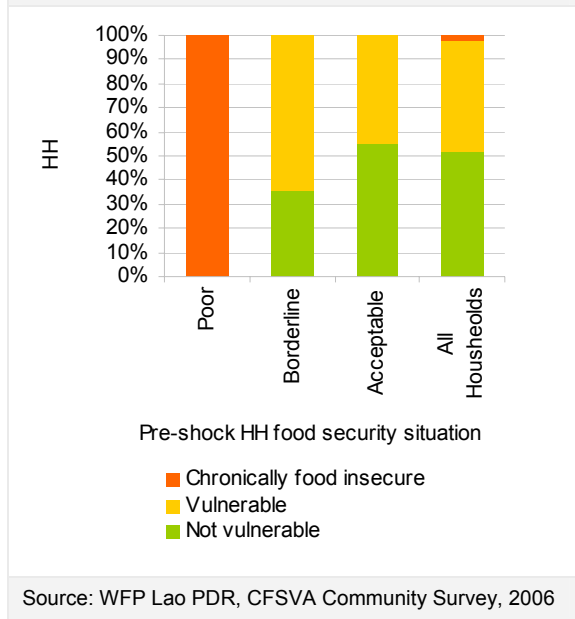
¹³⁵ Some coping strategies like the possibility to rely on local networks are difficult to assess. It might be that these possible coping strategies are not correlated with household wealth. The proxy might overlook them

¹³⁶ Evans (1988)

Areas affected by droughts are difficult to detect with precision, so the “length of growing period” (LGP) has been chosen as proxy for drought. From literature review, droughts occur throughout the country.

9.4.1. Household vulnerability to drought

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

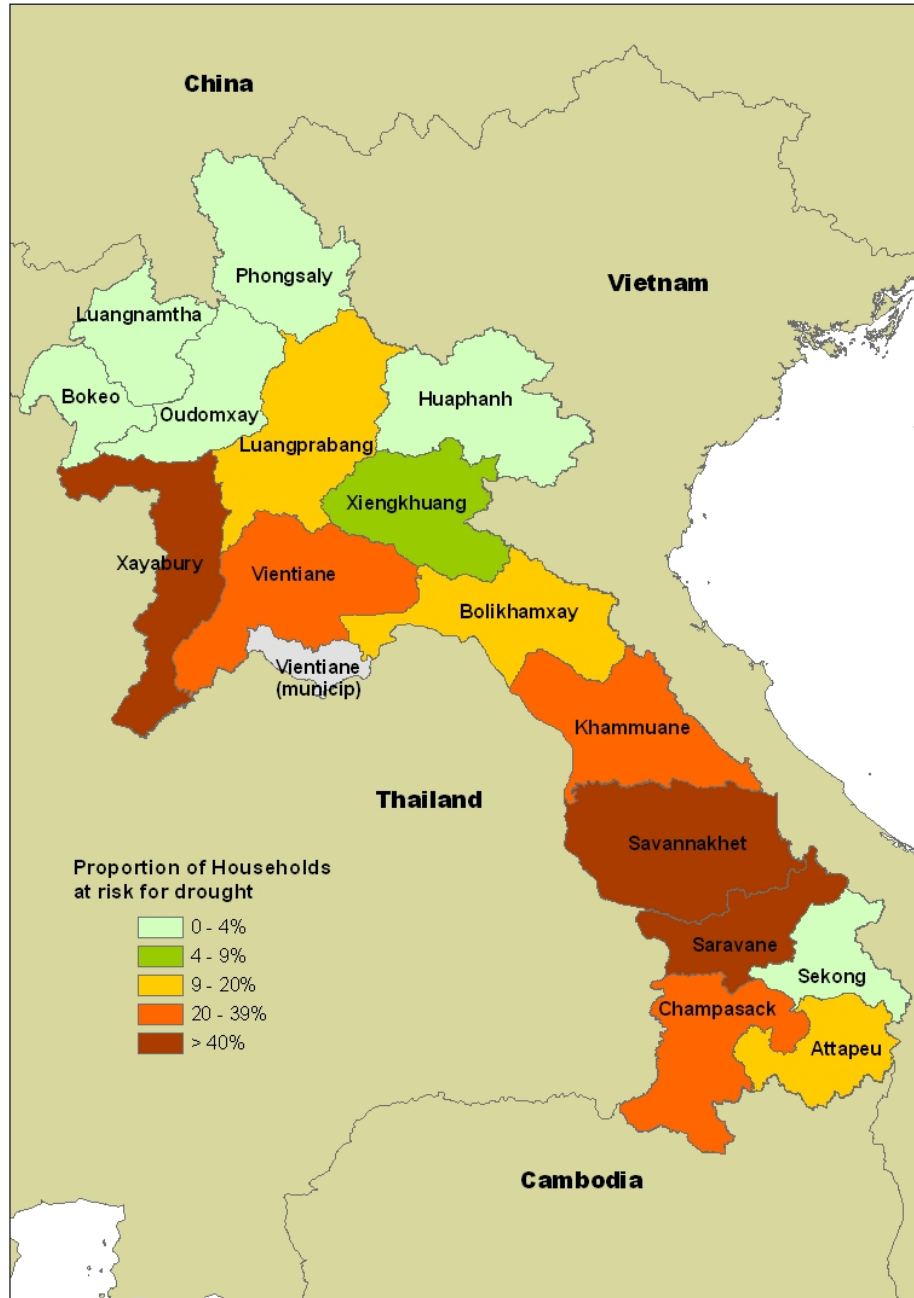


Households’ vulnerability to drought is proportional to their livelihoods’ exposure (non irrigated agriculture, farm labour) to drought, and to the resilience of the household. It is estimated that 46 percent of the rural population in Lao PDR is vulnerable to drought, most of whom are located in the lowlands, especially in the Southern regions and in the provinces of Xayabury and Luangprabang. This is in addition to the 2 percent who are already chronically food insecure. Most households vulnerable to drought are farmers or (agricultural) unskilled labourers. Twelve percent of agropastoralists are also considered vulnerable to drought. A severe drought would hardly affect the other livelihood groups.

9.4.2. Household food security at risk because of drought

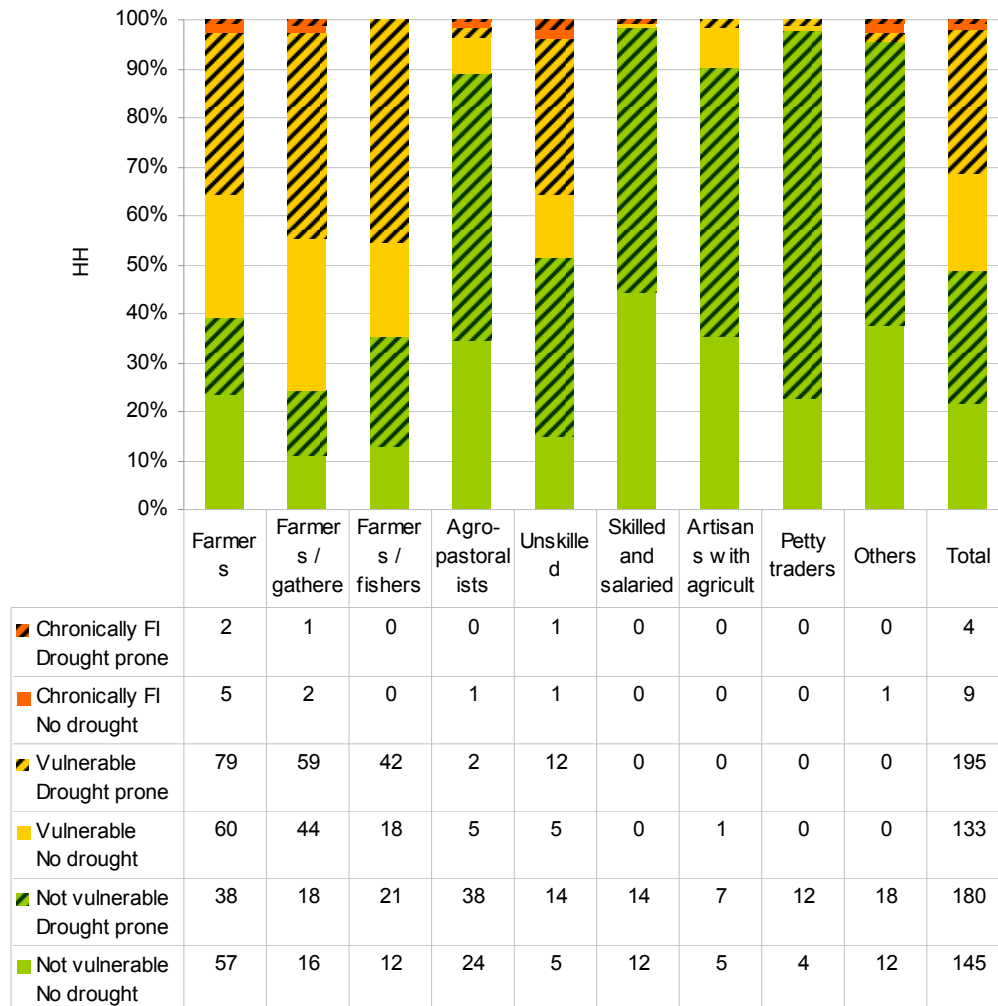
Population at risk are households that are vulnerable to becoming food insecure because of drought and that live in areas where the hazard to drought is important. It is estimated that around 188,000 households are at risk of food insecurity because of drought. These vulnerable households are mostly located in Khammuane, Savannakhet, Saravane, Champasack, Xayabury and Vientiane provinces.

Map 3: Households at risk of becoming food insecure because of droughts (excluding chronically food insecure)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Figure 45: Drought: vulnerable households and households at risk, by livelihood group (in percentage in graph, in thousands of HH in table)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

As shown in Figure 45, households at risk of drought are mainly farmers, farmers/gatherers and farmers/fishers/hunters, since they depend on rain-fed agriculture.

9.5. Analysis of flood risk

A flood was defined as an unusual significant rise of water level in a stream, lake, reservoir or coastal region, potentially resulting in significant losses¹³⁷.

Flooding is the main natural disaster in the country, both in terms of frequency and consequences. Severe floods occurred in 1966, 1978, 1983, 1990, 1991, 1993 and 1995. Usually, floods happen from August to September in the Central and Southern parts of the country.

¹³⁷ The definition is very similar to the one in the EM-Dat Disaster Database

Table 26: Number of floods since 1966 in Lao PDR

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

Source: OFDA/CRED International Disaster Database (EM-DAT)

The annual floods along the Mekong river are looked upon as part of the natural landscape, and communities have lived with yearly floods for generations. Villagers recognize the benefits of flooding, such as the increased availability of fish and OAA in wetlands. Even though they might lose the rice crop during a flood, the next year's rice production is likely to improve.

Many factors contribute to an individual's resilience following a flood, such as health, age, and sex, but the question of livelihoods is ultimately played out at the household level. Family members rely strongly on each other to share income and labour. Their combined assets before and after an event determine their vulnerability to floods¹³⁸.

Floods in this region do not often lead to deaths. However, large floods do cause housing damage, loss of equipment, and other asset damage that can impact on households' well-being. According to CRED¹³⁹, the number of people affected in each major flood ranged from 2,000 to more than 590,000. Although rice losses and paddy field damage is a common and immediate impact on the households, most villagers reported that losing livestock was hardest for livelihood and family security.

In Lao PDR, as in many other developing countries, the family's buffaloes and cows are used as a saving mechanism. When a disaster strikes or there is a medical emergency, families rely on selling livestock. 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 buffaloes in the 1996 flood. Buffaloes are very valuable, so this is a serious setback for many households. 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. Gastrointestinal diseases may persist for weeks after a flood. In addition to human health impacts, diseases may also affect many of the animals surviving a flood.

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

The loss of forest and biodiversity resources is one of the main environmental challenges that the Lao PDR faces. The high dependency on natural resources for food security and income generation makes the rapid environmental degradation an issue of particular concern and calls for enforcement of national and international environmental regulations.

As such, the strict enforcement of the National Biodiversity Conservation Areas (NBCA) is supposed to improve management of natural resources. So far, however, the full set of

¹³⁸ Mekong Wetland Biodiversity Conservation & sustainable use programme (2005)

¹³⁹ CRED – Number of people affected between the years 1966 – 2002. Source: <http://www.emdat.net/disasters/Visualisation/emdatselectors.php>

management regulations has been established and is enforced only in one NBCA, namely the Nam Et Phou Louey Protected Area in Huaphanh Province. According to the Lao government, NBCAs constitute "source areas" of reproduction, allowing spawning of fish and the dispersal of wildlife via corridors to other areas ("sink areas") where they can be harvested. The NBCAs could also limit the sources of food and income available to the local villagers, since gathering of forest products, hunting and removal of plant and animal species are restricted in the conservation core zone¹⁴⁰.

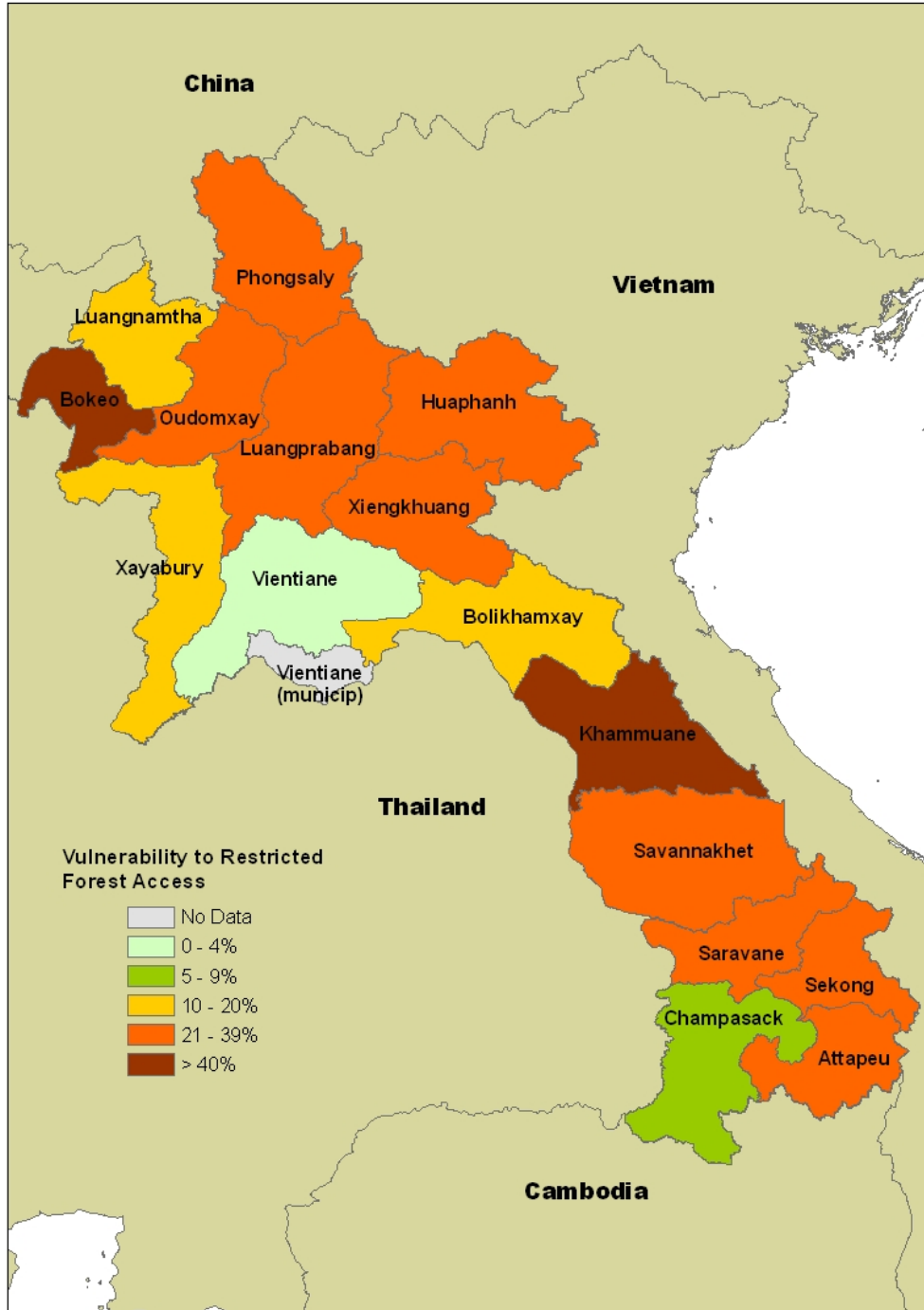
The CFSVA establishes that households affected by continuous degradation of forest resources, or by reduced access to natural resources, would have less access to wild vegetables, fruits, fish, OAA and wild meat. A limited number of households would also lose cash income from selling forest products. Overall, it is estimated that around 157,000 ($\pm 20,000$) households, or 24 percent of the people in rural Lao PDR, would become food insecure if fishing, hunting and gathering were less productive or reduced¹⁴¹. In this risk analysis, other factors such as threats due to trade, unsustainable harvest, and environmental degradation following the development of hydropower and mining schemes, rapid and uncontrolled land use planning and management (e.g. large-scale concessions for rubber plantations) are not factored in.

While restricted access to NBCAs could potentially adverse impact on a small portion of the population currently hunting and gathering in these areas, the likelihood of such a sudden occurrence is low. However, the continuous degradation and loss of these resources could be a serious long-term threat.

¹⁴⁰ Ministry of Agriculture and Forestry (2003)

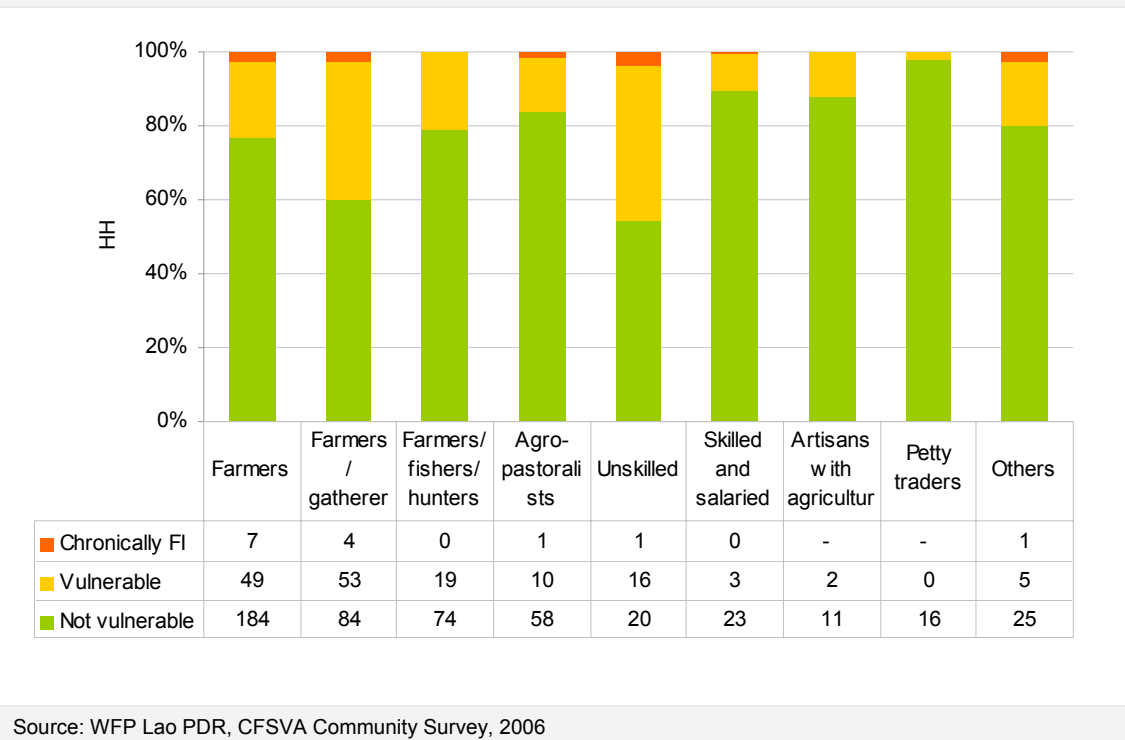
¹⁴¹ Taking into account how much the household diet depends on natural resources and their capacity to cope with the loss of these resources

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



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Figure 46: Vulnerability of livelihood groups to loss of access to forest resources (in percent HH in graph, in thousands of HH in table)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Twenty five percent of households in rural Lao PDR are vulnerable to become food insecure from loss of access to forest areas. Most of the vulnerable households are farmers. Unskilled labourers (42 percent) and the farmers/gatherers (37 percent) are especially vulnerable. The unskilled labourers get 20 percent of their food from gathering in the forests. Long term effects of restrictions and also of the degradation of the natural resources would depend on how households can adopt new livelihood strategies.

9.7. Analysis of the risk of staple food price increase

Households' vulnerability to price increases depends on how the households' 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 for classifying them as vulnerable or not, taking into account their coping capacity.
- Risk: Households at risk are those 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), five months after harvest, and eleven months after harvest.

9.7.1. Hazard of food price increase

In the markets section (see 3.3.1) price fluctuations of glutinous and non-glutinous rice are strongly correlated¹⁴². Thus, the differences between glutinous and non-glutinous rice can be overlooked, and we only consider the price increase of rice. Moreover, purchase of maize and tubers is 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. In certain regional markets, increases even reached 100 percent. 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 markets of Luangprabang, as these are rice deficit areas. Hence areas close by (Luangprabang, Huaphanh and to some extent Xiengkhuang provinces), are considered to 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. Other markets in the North of the country (Xayabury and Oudomxay) do not show this strong increase, and these areas are not considered to be as prone to price increases.

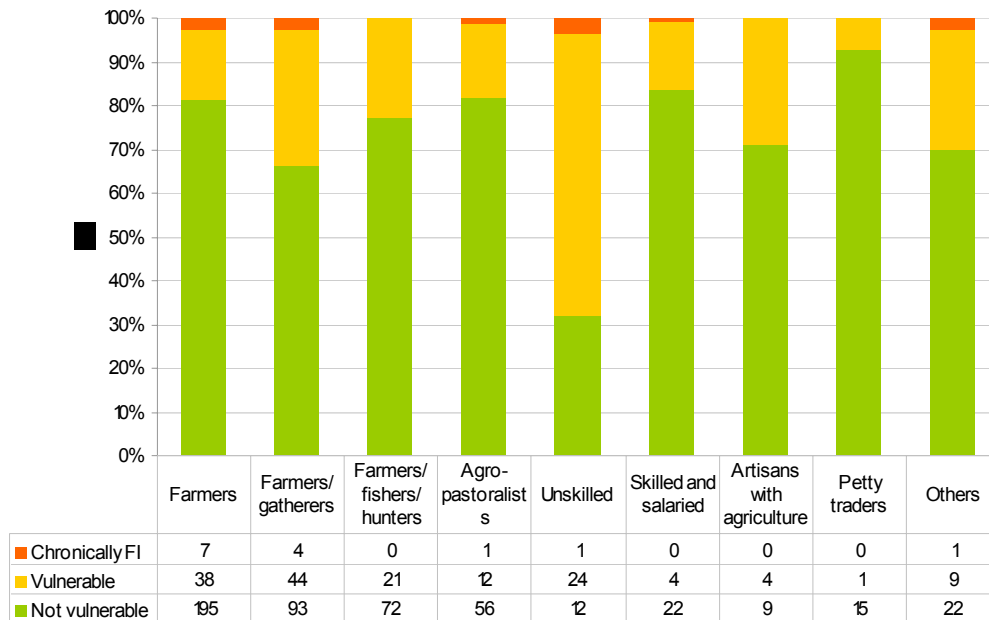
Poor access to rural markets destabilises the prices, since non-integrated markets may have higher variability. In these markets, trade flows do not adequately fill the gaps between supply and demand. Therefore, areas with bad access to markets during lean season are considered to be prone to high price increases.

Vulnerability to price increases is strongly linked to the agricultural season. During the lean season, stocks are depleted and households rely more on markets. Vulnerability to price increases is also linked to livelihood strategies. Dependence on markets exposes a household to shocks, especially if cash income is low. The people most vulnerable to price increases would be the unskilled labourers, with 64 percent at risk (in addition to the 2 percent chronically food insecure). In total, 23 percent of households in rural Lao PDR are vulnerable to a price shock of 60 percent around the time of the survey.

Petty traders, skilled labourers and agro-pastoralists are less vulnerable to price shocks. As the importance of agriculture inevitably declines in the Lao PDR, more people will find their livelihood outside of the agricultural sector, especially for the poorer households with low education. The stability of rice prices will thus be even more important to food security in the future.

¹⁴² In six of the eight main markets, the correlation is 0.77 or higher, in Oudomxay it is 0.67 and in Luangprabang 0.41

Figure 47: Vulnerability of livelihood groups to a price increase of rice 1 month after harvest (in percent HH in graph, in thousands of HH in table)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

9.7.2. Household food security at risk because of price increase

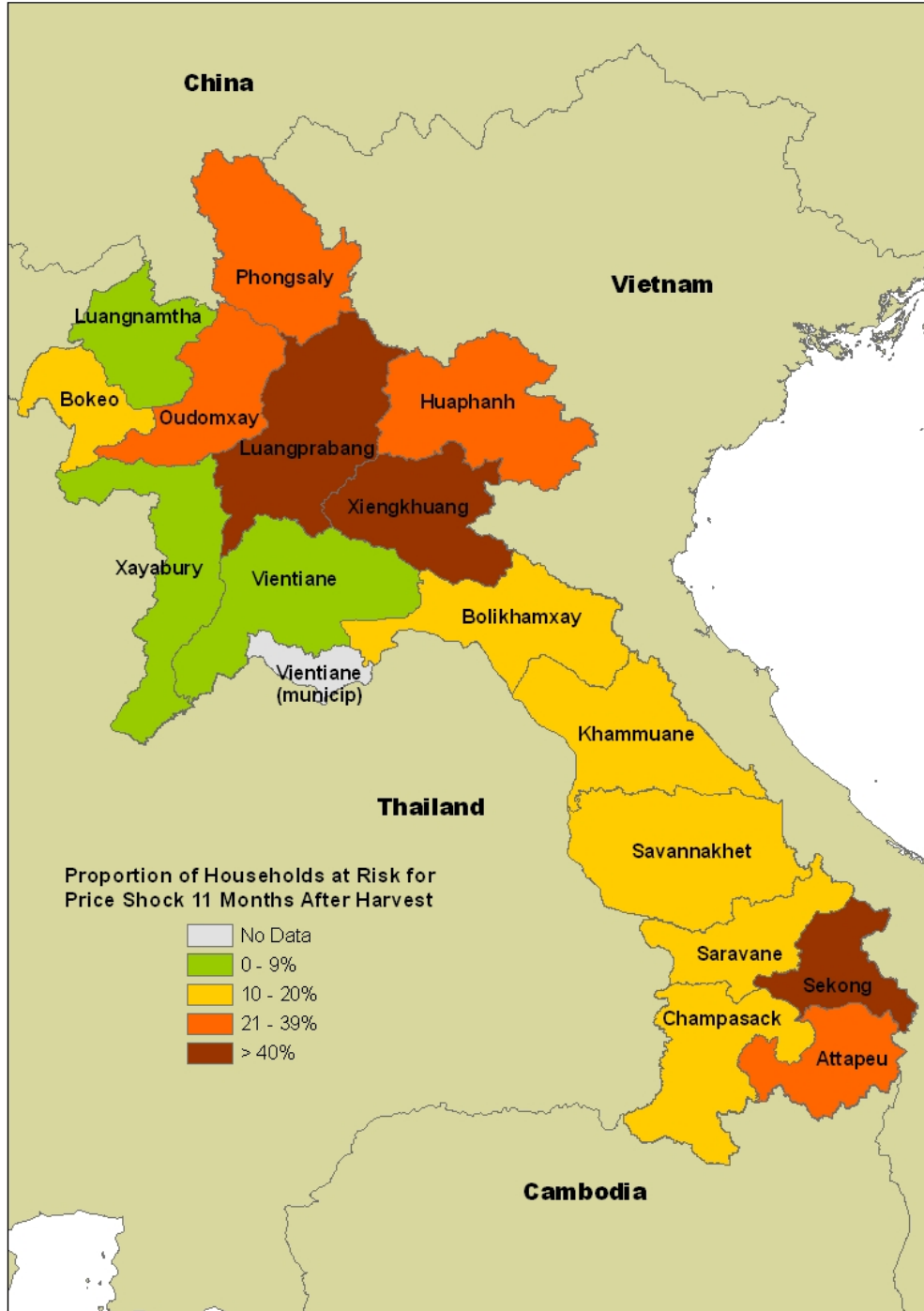
As described earlier, rice prices increase in the months of July, August and September, by about 30 percent. In the province of Luangprabang the increase is often more than 60 percent. This phenomenon can be described as an annual cycle of low prices after harvest and high prices during the lean season. These are price changes for well-integrated, large markets.

However, for remote villages, price increases may be even higher. It is therefore assumed that remote villages experience increases of about 60 percent. Such price increases occur regularly every lean season (roughly from July to September). Households from remote villages can thus 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 shocks in August. Since these shocks regularly 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.

In contrast, about 155,000 households live in these price shock prone areas, but are not vulnerable to price increases.

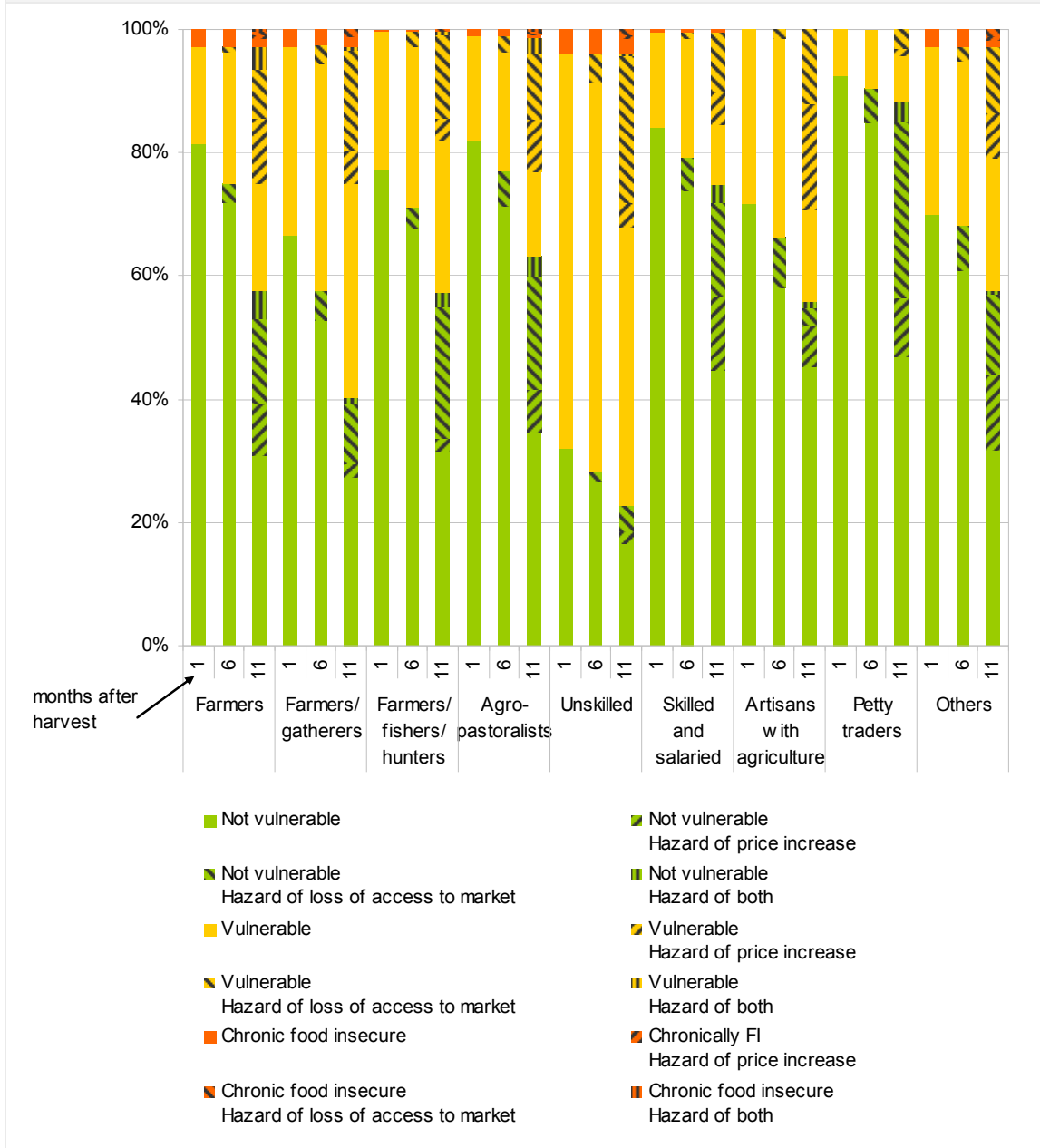
Map 5: Households at risk of becoming food insecure following price increase (excluding the chronically food insecure)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Unskilled labourers are the most vulnerable group. Six months after harvest, 68 percent of these are vulnerable (73 percent after 11 months). Those households largely dependent 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 (percent of HH)

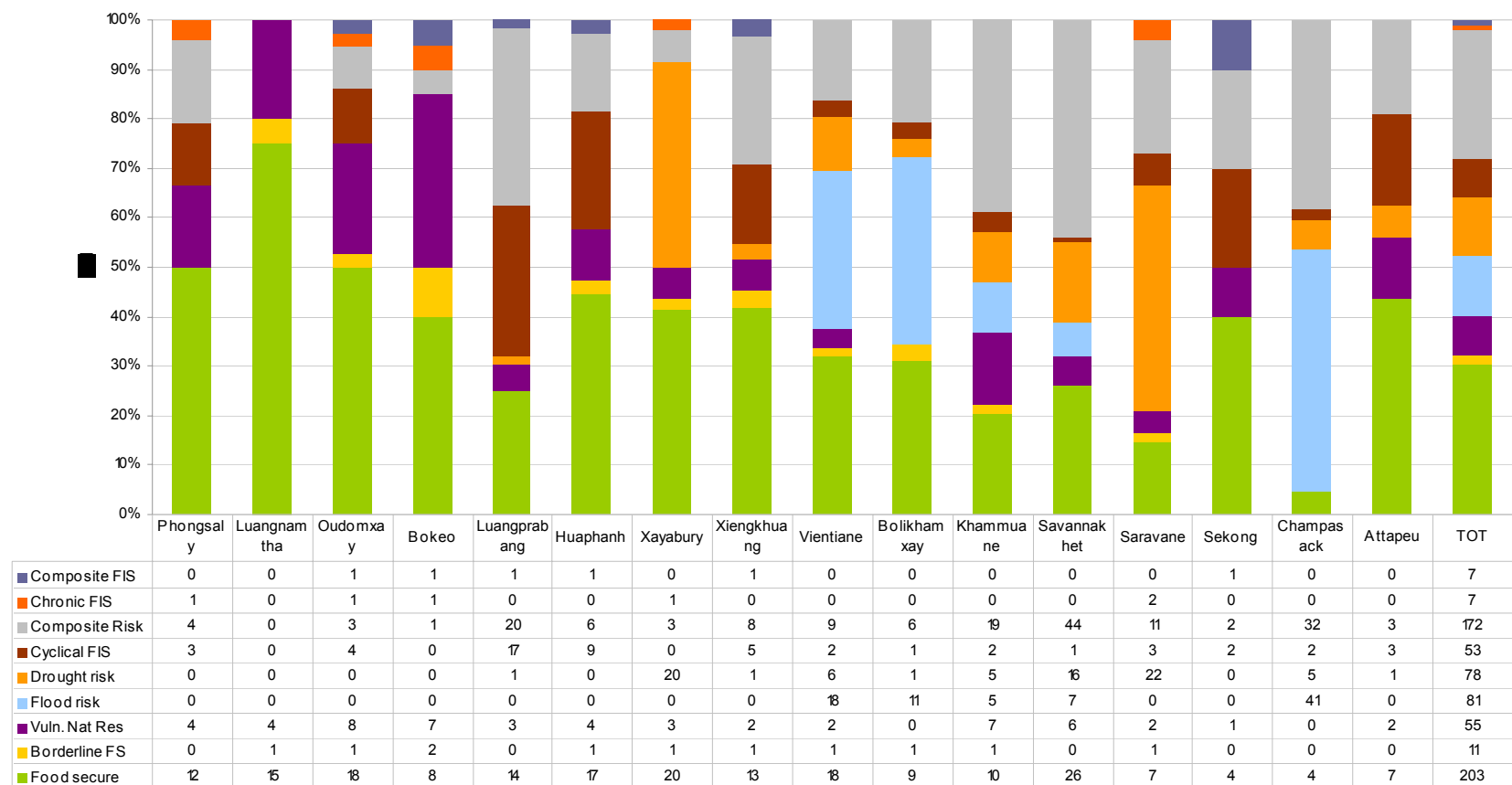


Source: WFP Lao PDR, CFSVA Community Survey, 2006

Between 16 and 27 percent of all livelihoods are at risk including the cyclically food insecure. The only exceptions are petty traders. Forty percent of the petty traders live in areas prone to price increases, but very few are vulnerable to these.

Overall, 21 percent of rural households suffer from cyclical food insecurity (due to price increases). An additional 1 percent is chronically food insecure and 1 percent suffers from both cyclical and chronic problems.

Figure 49: Levels of food insecurity by province (in percent HH in graph, in thousands of HH in table)



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Summary: Chapter 9

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

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 percent) faces multiple risks ("composite risk"). Another 40 percent is at risk of becoming food insecure due to 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 that rely on farming and/or hunting and gathering are most vulnerable to natural hazards and loss of access to forests. Both unskilled labourers and farmers are vulnerable to price shocks.

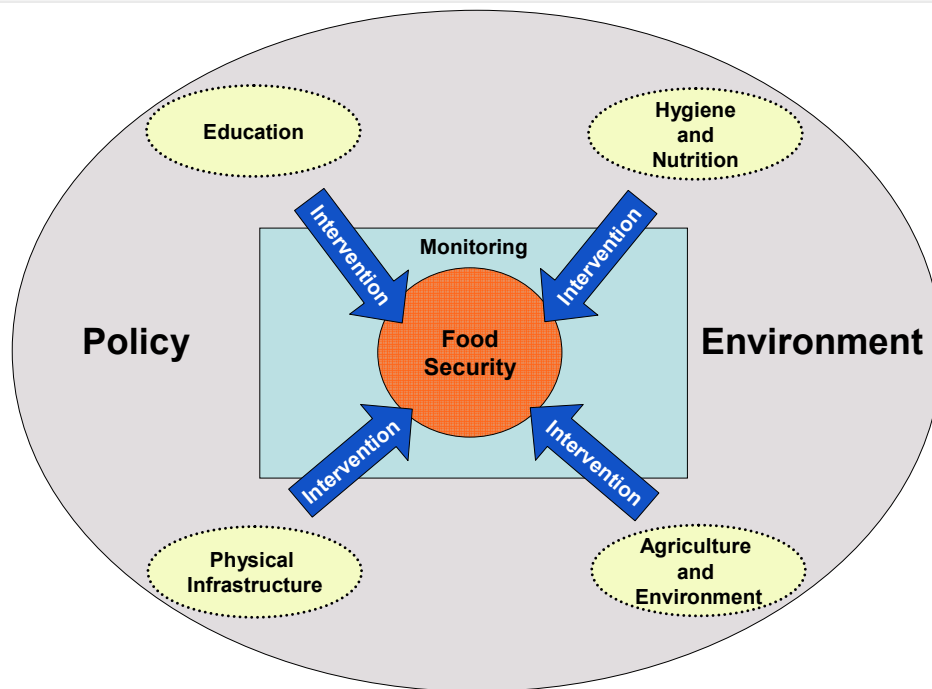
Drought is the biggest threat, as 46 percent of the rural population is vulnerable to becoming food insecure due to this natural hazard. A price increase of 60 percent during the lean season (11 months after harvest) is also likely to cause food insecurity for 43 percent of the rural population. A similar price increase 6 months after harvest is likely to cause food insecurity for 29 percent of the rural population. Only 9 percent of the rural population is vulnerable to food insecurity from loss of access to forest resources.

Chapter 10. Recommendations

This report has shown that food insecurity in Lao PDR has many causes which can only be adequately addressed through a multi-sector approach. Household food security is linked with education, hygiene and nutrition, the physical infrastructure, and the agricultural and environmental sector. However, stand-alone interventions within these sectors will have a limited effect unless the overall policy environment is favourable to food security.

It is not sufficient to focus on poverty reduction. Food insecurity and malnutrition need to be explicitly addressed.

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



Source: WFP Lao PDR, CFSVA Community Survey, 2006

Figure 50 illustrates that the policy environment is central to all efforts at addressing food insecurity, since it may facilitate and enhance interventions in any given sector. Poor education is often causing food insecurity and malnutrition. Agricultural production and the environment are vital both as a source of income and food. Improving the rural physical infrastructure will also positively affect food security.

Efforts in all these sectors, within a policy environment that puts food security at centre stage, will be necessary to start reducing the alarming levels of chronic malnutrition among Lao children and providing food security for all.

General policy recommendations are given below. These are followed by recommendations within the sectors of hygiene/nutrition, education, agriculture/environment and physical infrastructure. Lastly, recommendations are provided on food security monitoring 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. General policy recommendations

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	Ministries/agencies
The high levels of chronic malnutrition are not adequately reflected in the latest national poverty eradication strategies	1. Addressing malnutrition should be priority	Decision-makers in the Government of Lao PDR, donor agencies, UN agencies and other stakeholders	Government of Lao PDR, UNICEF, WFP, FAO, donor agencies
Intake of fat and protein is more important than caloric intake. 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 on food utilization and dietary quality	Decision makers in the Government of Lao PDR and all stakeholders involved in food security in general, and in particular people 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 relevant sectoral policies and their implementation plans.	3. Monitoring the impact of sectoral policies on food security	Decision makers in the Government of Lao PDR and all stakeholders involved in food security	Prime Minister's Office, Ministry of Planning and Investment, National Commission for Mother and Child, National Food Security Committee, FAO, WFP
Differences in food security, 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, Government of Lao PDR 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 relocating villagers	Government of Lao PDR, UN, donors and partners

10.2. Recommendations on hygiene and nutrition factors

The analysis led to the following recommendations on hygiene and nutrition.

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
The rural population should be better informed about the need to consume fats and proteins	6. General education campaign on nutrition and food consumption	Country	Ministry of Health, Ministry of Education, Ministry of Agriculture and Forestry, mass organizations, FAO, WFP, UNICEF, NGOs
Households with poor food consumption show very low intake of fat and protein, and are thus very 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 use of sanitation facilities is very low throughout the country.	8. Build improved sanitation facilities and provide information on how to use them	All rural areas	Ministry of Health, UNICEF, NGOs

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
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

The analysis led to the following recommendations on education.

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
Food insecure households are often also uneducated and illiterate.	10. Continuation of country-wide programme to bring education and literacy to all people	Country	Ministry of Education, mass organizations, UNICEF
The non-Lao-Tai ethnic groups are disadvantaged with regard 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 provinces, women are lagging behind 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 the Northern provinces and other provinces where the gender gap is particularly big	Ministry of Education (Non-Formal Education Department and the Non-Formal Education Centre), UNICEF, WFP, NGOs

10.4. Recommendations on agricultural and the environment

The analysis led to the following recommendations on agricultural and the environment.

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
Meat and fish from hunting and fishing are the most important sources of fat and protein in the Lao diet. These wild sources are under threat partly due to competing demands on the forests, and population movements away from these sources.	13. Sustainable management of wildlife and aquatic food resources in accordance with Lao forest, wildlife and environmental laws and promote nutrition friendly agriculture forestry, and water management	District and provincial authorities	Ministry of Agriculture and Forestry, Water Resource and Environment Administration, National Land Management Authority, Ministry of Energy and Mining, Ministry of Planning and Investment, UN, NGOs
There are large inequalities in 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 from these programmes	Non-Lao-Tai rural households	Ministry of Labour and Social Welfare, WFP

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
Households with kitchen gardens tend to be more food secure. Kitchen gardens may provide vital nutritious vegetables.	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 uplands 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 uplands	Remote villages in the uplands	Ministry of Agriculture and Forestry, UN, NGOs

10.5. Recommendations on physical infrastructure

The analysis led to the following recommendations on physical infrastructure and food markets.

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
Many rural villages struggling with food insecurity also lack 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 rice production and marketing. There is little evidence that local rice purchases by food aid agencies will distort markets. 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, NGOs
There are still many food insecure villages without access to roads. This limits farmers' abilities to sell and purchase commodities at markets.	19. Road construction through FFW	Remote food insecure villages without road access	Ministry of Labour and Social Welfare, WFP
UXO contamination still limits the access to potentially productive land	20. UXO clearance of potentially productive land	Food insecure villages in UXO contaminated areas	WFP, UXO Lao, other UXO clearing agencies

10.6. Recommendations for food security monitoring

The analysis led to the following recommendations on food security monitoring.

Cause of the intervention	Type of intervention	Primary target groups	Ministries/agencies
Food insecurity needs to be better monitored.	21. Further develop the established FIVIMS structure	Decision-makers in the Government of Lao PDR and Donor/UN agencies	Ministry of Agriculture and Forestry, Ministry of Health, FAO, WFP
Monitoring household food security will also improve understanding of seasonal food insecurity patterns.	22. Regular monitoring of household food insecurity across regions and seasons	Decision-makers in the Government of Lao PDR and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP
Impact on food security of extensive plantations (especially rubber) are likely to be significant and are not understood	23. Monitor the impact on livelihoods of extensive plantations in the uplands especially rubber trees	Decision makers in the Government of Lao PDR and all stakeholders involved in food security	Ministry of Agriculture and Forestry, National Food Security Committee, National Land Management Authority, Ministry of Planning and Investment, FAO, WFP, NGOs
The impact of transition in the agricultural sector on livelihood strategies and food security is not well known	24. Monitor the impact of transitions in the agricultural sector on food security	Decision makers in the Government of Lao PDR and all stakeholders involved in food security	Ministry of Agriculture and Forestry, National Food Security Committee, FAO, WFP, NGOs
Cross-border trade, particularly of rice, influences food security.	25. Monitor cross-border trade of specific food commodities such as rice and maize to track trade along key borders	Decision-makers in the Government of Lao PDR 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.	26. Initiate market studies on rice trade within the country	Decision-makers in the Government of Lao PDR and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP, Donors
It is important to better understand where there are rice shortages and food insecurity.	27. Set up rice price monitoring system	Decision-makers in the Government of Lao PDR and Donor/UN agencies	Ministry of Agriculture and Forestry, FAO, WFP, Donor agencies

10.7. Follow-up

The implementation and effects of these recommendations should be evaluated before the end of 2011, five years after the current CFSVA. WFP should commission this evaluation. The evaluation will provide direction in the actions against food insecurity and identify areas that will need enhanced priority. The evaluation could be a CFSVA with a review of the recommendations provided in this document.

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