



Lao PDR

Risk and Vulnerability Survey 2012/13 Analysis Report

Vientiane, May 2013.



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AUSTRALIAN AID

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Rice for Sale in Khammouan Province

WFP/Bounmee Maokhamphiou, March:

Akha Women Prepare Food Using NTFPs, Luang Namtha Province

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Lao PDR

*Risk and Vulnerability
Survey 2012/13*
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Foreword

With the 2015 deadline for the Millennium Development Goals fast approaching, Lao PDR is renewing its commitments towards addressing the MDG food security and nutrition targets. It was for this reason that in the late stages of the 2010/11 Lao PDR Agricultural Census, the Ministry of Agriculture approached FAO to support the development of a Risk and Vulnerability Survey. This survey process would focus on the links between food security and malnutrition, adding to the existing information gathered during the agriculture census.

This report is the culmination of efforts begun in June 2011, and has involved a wide range of stakeholders from the Government of Lao PDR, the United Nations, and the international NGO sector. Working collaboratively, these partnerships supported fieldwork involving more than 4,000 households in every province of Lao PDR. For the first time, data collection was not limited to quantitative data, but includes qualitative information as well. Showcasing collaboration between MAF and MoH at every administrative level, field teams collected data on agricultural production and livelihoods and nutrition alike.

It was always the intention that this process be a collaborative exercise, such that each participating institution would bring its own strengths and expertise to bear, and that a stronger result would be the outcome. In this regard, the RVS process has succeeded well. Colleagues from different sectors visited villages across the country together, shared ideas, and contributed to the overall analysis with a spirit of open collaboration which we hope will be repeated in the years to come. We are grateful for the contributions of colleagues from Ministry of Agriculture itself, LSB of the Ministry of Planning and Investment (MPI), the Ministry of Health (MoH), UNICEF, the UN World Food Programme (WFP), CARE International and FAO.

The findings of this report indicate that while some aspects of food security are robust, major challenges remain, especially regarding chronic malnutrition. It is hoped that stakeholders committed to reducing food insecurity and malnutrition in Lao PDR will be able to make use of these findings as they continue their work in addressing these challenges.

We welcome feedback on this report from any interested readers. Once again, our sincere thanks to all who supported and participated in developing this report.

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This report is the culmination of efforts of all of those individuals listed above, plus the contributions of many others. Most importantly, we appreciate the thousands of people who took the time to answer questions as part of this process.

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List of Acronyms

ACO	Agricultural Census Office
ADB	Asian Development Bank
AusAID	Australian Aid
CDDS	Childhood Dietary Diversity Score
CFS	Committee for World Food Security
CFSVA	Comprehensive Food Security and Vulnerability Assessment
CU2	Children Under Two
CU5	Children Under Five
DoS	Department of Statistics (now known as LSB)
EC	European Commission
FAO	UN Food and Agriculture Organization
FCS	Food Consumption Score
GDP	Gross Domestic Product
HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Score
IFI	International Financial Institution
IYCF	Infant Young Child Feeding
LCA	Lao PDR Agricultural Census
LSB	Lao Statistics Bureau
LSIS	Lao Social Indicators Survey
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MPI	Ministry of Planning and Investment
NAFRI	National Agriculture and Forestry Research Institute
NDMO	National Disaster Management Office
NERI	National Economics Research Institute
NGO	Non Governmental Organization
NioPH	National Institute of Public Health
NTFP	Non Timber Forest Products
OAA	Other Aquatic Animals
RVS	Risk and Vulnerability Survey
SUN	Scaling Up Nutrition initiative
U5MR	Under Five Mortality Rate
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children’s Fund
USD	US Dollars
UXO	Unexploded Ordnance
WB	World Bank
WFP	World Food Programme
WFS	World Food Summit

Executive Summary

This report presents the findings of the Risk and Vulnerability Survey, a food and nutrition security survey exercise conducted in 2012-2013 in Lao PDR. Designed to explore the linkages between food security and nutrition, the RVS collected qualitative and quantitative data from 4,000 households across the country, and as such represents a key source of information for both government and its development partners engaged in food and nutrition security policymaking and programming.

Key data are summarized based on the food security pillars of availability, access and utilization. Anthropometric data on nutrition and qualitative data on nutrition knowledge and education are also presented. Data are analyzed by agro-ecological zone, income quintiles, and at the provincial levels as applicable.

Over the past seven years, Lao PDR has achieved steady economic growth of approximately 8 percent per year and has seen steady reductions in overall poverty. Over the past 20 years, the proportion of the population living in poverty had declined from 46 percent in 1992 to 25.6 percent in 2009-10 (GoL/UN 2010). Despite the improvement in income poverty, food and nutrition security remains a persistent challenge. Rates of chronic malnutrition (stunting and underweight) persist at high levels with progress towards the Millennium Development Goals (MDGs) classified as 'off track' or 'seriously off track'.

In 2011, the Ministry of Agriculture and Forestry requested FAO's support in developing a risk and vulnerability survey. Working from the data generated from the 2010-11 Agricultural Census, the risk and vulnerability survey (RVS) would explore the links between food security and nutrition, further information on vulnerability, and seek to understand the determinants of food security. Working with an interdisciplinary group of stakeholders from Government, the UN and the NGO sector, the RVS was developed with an innovative approach which included both qualitative and quantitative components.

The overall aim of the Risk and Vulnerability Survey was to increase understanding and availability of information for decision-makers working to reduce risk and improve food security. The specific objectives were to (1) provide information on food security, risk and vulnerability, as well as on the linkages between food security and malnutrition, (2) promote multi-sectoral and multi-agency collaboration on food security risk and vulnerability issues, and (3) support governmental and non-governmental capacity building in food security, vulnerability and risk analysis. All in all, some 4,308 households in 288 villages across the country participated in the survey, as illustrated in the map that follows.

In terms of findings, the RVS data suggests that on the whole, household food consumption is good in Lao PDR, with 12 percent showing poor and borderline food consumption and only 11 percent of households reporting that they had problems with food in the last month. Malnutrition, on the other hand, remains high, with more than 40 percent stunted and one in four children underweight. Key indicators of child feeding indicate that food is not being given to children in an appropriate or optimal manner, suggesting a lack of nutrition knowledge.

Disaggregated by agro-ecological zone (AEZ), the proportion of household with poor and borderline consumption is greater in the central and southern highlands, as well as in the northern highlands. In the central/southern highlands, one in four households (24.8 percent) has poor or borderline consumption, the highest recorded levels in the country. Shown through the 24-hour recall (HDDS), the central/southern highlands and northern highlands also have greater proportion of households with low dietary diversity. Poor and borderline food consumption patterns are most common among the poorest populations in Lao PDR, with just under 30 percent of households in the lowest quintile classified as poor or borderline FCS.

The typical Lao meal consisted of rice, vegetables and condiments. On average, 90 percent of households stated they had enough cereals to eat during in all months of the year. During the traditional lean season (approximately May-October), up to 15 percent of households may not be able to meet their rice needs through own production. At national level, own production still accounts for a significant proportion of the food consumed in the average weekly diet, although purchasing accounts for slightly more. Sourcing from the wild accounts for 10 percent of the weekly diet.

On average, rice and condiments were consumed almost every day, supplemented by vegetables (4.74 days per week), fish (3). The overall composition of the diet has also seen little change over the past seven years, with the exception of increasing consumption of animal protein (including meat, fish, other aquatic animals and eggs). Among households with poor or borderline consumption, protein consumption drops considerably to 1.8 days per week.

Disaggregated by agro-ecological zones, malnutrition in Lao PDR is found to be worse in the northern regions, with stunting rate at 50 and 58 percent in the northern lowlands and northern highlands respectively. These rates represent more than double the prevalence level in Vientiane Plain. Underweight shows a much more consistent prevalence across AEZs, with a slightly higher rate in the central and southern highlands.

The data indicate that while household dietary diversity is high, that diversity is not proportionately shared within the household. In every region except Vientiane Plain, among household with sub-optimum dietary diversity, children under five have significantly less diversity than adults, ranging from 43 percent in the northern lowlands to 76 percent in the central and southern highlands. Even among the richest quintile, children's diets are still inadequate in 30 percent of households. This suggests that stunting may be a function of inadequate diversity in the diets of children less than 5 years of age.

In line with global observations and recommendations, RVS also found that poor practices of timely introduction of complementary foods for infants, poor dietary diversity and poor frequency of feeding for children under two. In combination with the observation of high starting prevalence of malnutrition already at 6 months of age, the data strongly points toward the importance of maternal nutrition, health, and care pre-, during, and post-pregnancy.

Based on analysis of malnutrition and various measures of food access, including food consumption score, and dietary diversity, there appears to be weak relationships between food consumption and malnutrition in other words, malnutrition appears to persist even households with better consumption. However, there appears to be a clearer relationship between diet and improved sanitation, whereby malnutrition prevalence is lower in households with access to improved sanitation. This suggests that approaches to reducing

malnutrition must be multi-sectoral, tackling improved access to better sanitation, improved practice of hygienic practices, and improved nutrition knowledge simultaneously.

The report concludes by making recommendations related to key findings of the survey, including:

- With stunting the prevailing food and nutrition security priority for Lao PDR, malnutrition must therefore be a first-order priority for policy and programming across relevant sectors, including agriculture, public health, water/sanitation and trade. It is noted that the Government of Lao PDR is well aware of this issue and that comprehensive approaches to address this issue are already in place. It is recommended that the relevant stakeholders consider ways in which to renew collective commitments to address stunting.
- With this as general recommendation, potential areas for nutrition programming to be addressed within the food security context include, *inter alia*: improving research on nutrition among pregnant mothers, improved nutrition for pregnant mothers, , improving infant and young child feeding (IYCF) practices among children less than two years of age, nutrition awareness and knowledge, household food expenditure patterns, changing access to wild foods (including fish and NTFPs), and the role of women in rural Lao PDR. On the non-food side, renewed focus on water and sanitation infrastructure and hygienic practice is also of significant importance.
- Nutrition knowledge and understanding of safe and hygienic food preparation practice was noted to be incomplete and inaccurate. Among survey respondents, malnutrition was broadly understood to be a function of rice intake. There is a need to ameliorate nutrition and food safety education through formal educational channels and development programming. While rice consumption remains the cornerstone of the Lao diet, there is a need to rebalance the share of macronutrients, such that rice consumption does not contribute to inadequate protein and oil/fat intake.
- Seasonality is still a strong factor in food insecurity in Lao PDR, influencing dietary diversity, consumption patterns, livelihoods and vulnerability. While more research is required into the role of seasonal variations in overall vulnerability, it is recommended that additional efforts be made to mitigate that variability for rural households. This can be achieved through a) providing more consistent food supplies over the course of the year, b) mitigating the impact of severe weather on rural households, c) developing off-farm income opportunities (in non-weather contingent livelihoods)

Key RVS Data

		Rural population	Agro-ecological zone				
			Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/Southern Highlands
Demographics	Avg. HH size	5.8	4.9	5.8	6.0	5.7	6.5
	% female-headed households	8.4	12.0	4.5	3.9	14.3	5.3
	% of HH heads with no formal education	23.6	19.0	19.8	29.6	19.4	37.4
	% of HH heads with primary education	54.4	44.9	58.2	52.7	56.1	51.1
	% of HH heads with secondary or tertiary	20.9	36.1	20.2	16.7	23.2	11.0
	% Lao-Tai	56.1	88.4	41.2	17.5	85.1	21.3
	% Mon-Khmer	31.6	7.8	29.3	55.3	14.5	78.7
	% Hmong-Mien	9.1	3.8	24.5	17.2	0.4	--
	% Chinese-Tibetan	3.2	--	4.9	10.1	--	--
	% of school-age children (6 to 17 yrs) currently attending school	83.1	93.4	89.0	87.4	79.0	71.9
Availability	Mean hectares of land cultivated in 2012	1.8	2.0	2.0	1.6	1.9	1.8
	% producing rice	93.9	94.6	24.5	17.2	0.4	--
Access	% with poor/borderline consumption (FCS)	11.2	2.3	4.8	12.2	15.7	24.8
	% with low dietary diversity (<5 food groups), HDDS	19.0	3.8	15.0	28.1	14.8	36.0
	Mean dietary diversity score (HDDS)	6.4	7.9	6.7	5.9	6.6	5.7
	% reporting inability to obtain sufficient food in past month	11.9	0.6	7.7	16.5	13.2	18.6
Nutrition	% stunted (children <5)	46.2	27.1	50.7	58.7	39.5	40.2
	% wasted (children <5)	25.3	20.7	23.2	25.6	25.2	28.4
	% underweight (children <5)	5.4	4.4	4.9	4.0	7.3	6.1
Utilization	% with Improved sanitation	53.5	95.4	67.5	48.0	45.6	19.6
	% of children <5 with diarrhoea	11.9	8.7	9.8	12.7	10.2	15.4
	% of children <5 with sub-optimal diet	55.2	19.7	42.9	59.2	50.7	76.8
	% of women with no education	35.7	20.7	28.4	46.3	24.9	57.0
	% of women with secondary or tertiary education	20.3	38.0	22.4	12.9	25.7	8.0

PART 1: BACKGROUND

Introduction

Over the past seven years, Lao PDR has achieved steady economic growth of approximately 8 percent per year and has seen steady reductions in overall poverty. Over the past 20 years, the proportion of the population living in poverty had declined from 46 percent in 1992 to 25.6 percent in 2009/10 (GoL/UN 2010). Despite the improvement in income poverty, food and nutrition security remains a persistent challenge. Rates of chronic malnutrition (stunting and underweight) persist at high levels with progress towards the Millennium Development Goals (MDGs) classified as 'off track' or 'seriously off track'.

In recognition that improvements in food and nutrition security were not keeping pace with Lao PDR's development in other sectors, and in keeping with renewed policy level commitment to addressing these challenges though, *inter alia*, the Agricultural Development Strategy, the SUN Initiative, and the National Nutrition Strategy and Plan of Action, in 2011 the Ministry of Agriculture and Forestry requested FAO's support in developing a risk and vulnerability survey. Working from the data generated from the 2010/11 Agricultural Census, the risk and vulnerability survey (RVS) would explore the links between food security and nutrition, further information on vulnerability, and seek to understand the determinants of food security. In February 2012, AusAID agreed to fund the proposed survey process.

Working with an interdisciplinary group of stakeholders from Government, the UN and the NGO sector, the RVS was developed with an innovative approach which included both qualitative and quantitative components, such that the deductive approach of the quantitative process would be joined with an inductive qualitative process to provide the richest possible data. With this approach in mind, the six key organizations of the RVS process (including CARE International, MAF, MoH, FAO, WFP and UNICEF) developed unique collaborative working arrangements, collaborating to develop a report which is reflective of their combined expertise and institutional mandates.

In so doing, it is hoped that the RVS is indicative of a wide spectrum of commitment and engagement on food and nutrition security, and reflective of the high priority attached to the issue.

This report begins with a concise summary of the lead-up to the survey. It summarizes the methodologies that were devised for the desk review, quantitative component and qualitative component (Part Two), followed by the summary of the extensive Desk Review process, in which more than 40 secondary reports were reviewed (Part Three). Part Four provides a synthesis of findings for the RVS primary data, and Part Five highlights linkages between food security and malnutrition arising from the RVS. Finally key observations and recommendations for policymakers are presented in Part Six. An extensive set of supporting Annexes is also included for reference purposes.

From the 2010/2011 Agriculture Census to the RVS

In 2010/11, the agricultural census conducted by the Lao PDR Ministry of Agriculture (MAF) enumerated 1.1 million households with a basic set of questions to assess their involvement in agriculture. Based on these questions, households were classified as farmers or non-farmers. In total, some 770,000 households were categorized as farmers.

From those, 42,000 households were selected to be further interviewed on topics including agricultural practices and production, livestock holdings, farm labour, farm management, forestry and fishery. Village level information on village infrastructure, socio-economic conditions, and environmental factors were carried out in 2,620 villages.

In the final stages of this process, MAF identified a need to further refine its information on food and nutrition security, especially with the renewed interest in these topics as a result of the SUN initiative and the impending 2015 deadline for the MDGs. To that effect, MAF requested FAO's support to develop a follow-on risk and vulnerability survey, which would provide insight on the following topics:

- Levels of food insecurity in the country;
- Determinants of food insecurity;
- Vulnerability to natural hazards; and
- Linkages between food insecurity and malnutrition.

Based on a request submitted by MAF to AusAID in February 2012, funding was provided to FAO to facilitate MAF's commitment to the RVS survey. Throughout the course of 2012, staffing and implementation arrangements were established, and partnerships developed to undertake the survey. The Inception Workshop was held in Vientiane in September 2012, and fieldwork design began shortly thereafter. CARE International volunteered to undertake the qualitative component, with a Letter of Agreement signed between FAO and CARE in November 2012. Fieldwork for both qualitative and quantitative began in earnest in late November 2012, and was completed in late January 2013. Preliminary results were presented in late April 2013, and the overall report finalized by May 31, 2013.

Objectives

The overall aim of the Risk and Vulnerability Survey was to increase understanding and availability of information for decision-makers working to reduce risk and improve food security. The specific objectives were to (1) provide information on food security, risk and vulnerability, as well as on the linkages between food security and malnutrition, (2) promote multi-sectoral and multi-agency collaboration on food security risk and vulnerability issues, and (3) support governmental and non-governmental capacity building in food security, vulnerability and risk analysis.

More specifically, the survey would:

1. **Provide information on food security, risk and vulnerability:** Based on the Integrated Phase Classification framework and current global thinking on food and nutrition security, the survey would contribute to timely, detailed information on food security and nutrition in Lao PDR. With vulnerability and risk assessed in general, focus

would be on issues related to food insecurity. Bearing in mind the high rates¹ of chronic malnutrition found by WFP during their 2006 Comprehensive Food Security and Vulnerability Analysis (CFSVA) and reiterated by LSIS 2011/12, a general need to understand the relationship between food insecurity and high malnutrition rates was identified.

2. **Promote multi-sectoral and multi-agency collaboration on food security risk and vulnerability issues:** The RVS represented a unique opportunity to bring together different agencies to discuss and assess food security risk and vulnerability in Lao PDR. On MAF's recommendation, FAO made efforts to actively involve governmental and non-government organizations and partners in the planning of the study at every stage. With leadership from MAF-DoP, other governmental ministries such as Ministry of Health and LSB of the Ministry of Planning and Investment (LSB) have been active members of the technical working group. International organizations regularly participating in the exercise included WFP, UNICEF, CARE International, and GIZ.
3. **Support governmental and non-governmental capacity building in food security, vulnerability and risk analysis:** The survey was an opportunity to improve the capacity of government and non-government staff in integrated food security analysis through on-the-job training, fieldwork and training workshops. Such workshops brought together a wide range of colleagues, including national and international senior experts from all participating institutions, and resulted in extended networks of food security and nutrition professionals in both Vientiane and the field.

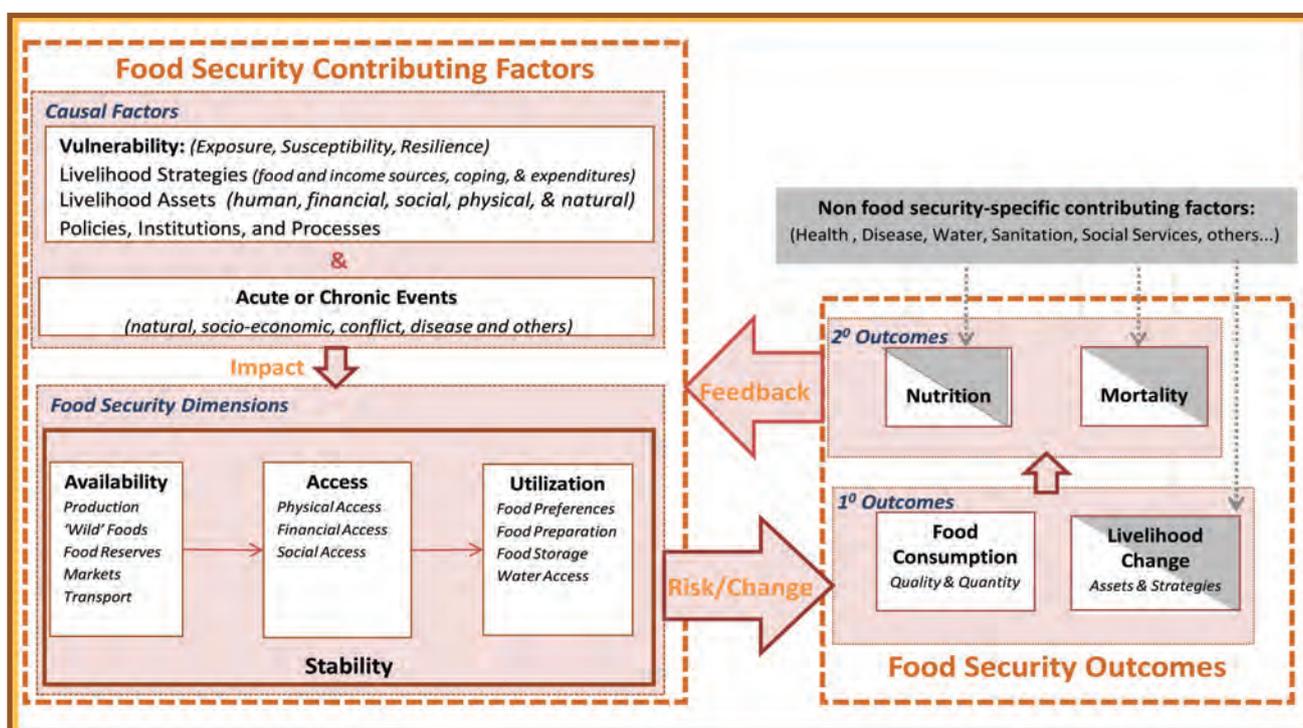
1 The CFSVA found that 45.2% of children under 5 years old had height for age below -2 standard deviations.

PART 2: SURVEY METHODOLOGY

Analytical framework

From the beginning of the RVS process, the Intergrated Phase Classification, or IPC analytical framework served as an overall guideline for how to approach a multisectoral survey of this nature². The IPC Framework draws together conceptual frameworks on nutrition, food security and livelihoods, and organizes them into a coherent whole.

FIGURE 1: IPC ANALYTICAL FRAMEWORK



In this regard, the three key elements of the survey, the desk review, the quantitative component, and the qualitative component would bring together causal factors, food security dimensions and level I food security outcomes through the desk review and the quantitative exercises, and level II outcomes via the anthropometric data collected. The qualitative components would add detail and nuance to information on livelihood strategies and assets, and therefore on livelihood change.

² A full introduction to the IPC can be found at <http://www.ipcinfo.org/>

The Desk Review Process

Early in the process, the RVS working group undertook a review of available secondary data on food security and nutrition in Lao PDR. The intention of the review was to ensure that the conceptual framework, design and analysis of the RVS data built upon available qualitative and quantitative information. Also, the review process served as a platform for institutions and organizations participating in the Risk and Vulnerability Survey to develop a common understanding of the general context of food and nutrition security in Laos.

In total, some 40 documents from the Government of Lao People's Democratic Republic, UN agencies, IFIs, NGOs, and academia were reviewed over the course of August and September 2012, details of which can be found in the Annexes section. As an output of this process, the narrative summary was drafted, and a matrix of key data was developed, both of which presented in the Inception workshop in September 2012, and approved by the RVS Steering Committee in November 2012. A second round of revisions was conducted in May 2013 in preparing the RVS final report.

Applying the newly updated 2012 Committee for World Food Security (CFS) definition of food and nutrition security to the Lao PDR context, the desk review included a dual track approach, in which the food security context in Lao PDR examined issues pertaining to food availability, access, utilization and stability. A parallel process was conducted on nutrition, with comparisons and key data cross-checked across both sectors throughout the process. In addition, based on the IPC food security analytical model vulnerability, hazards, and livelihood strategies were also explored. This summary report served to bring these different strands of enquiry together.

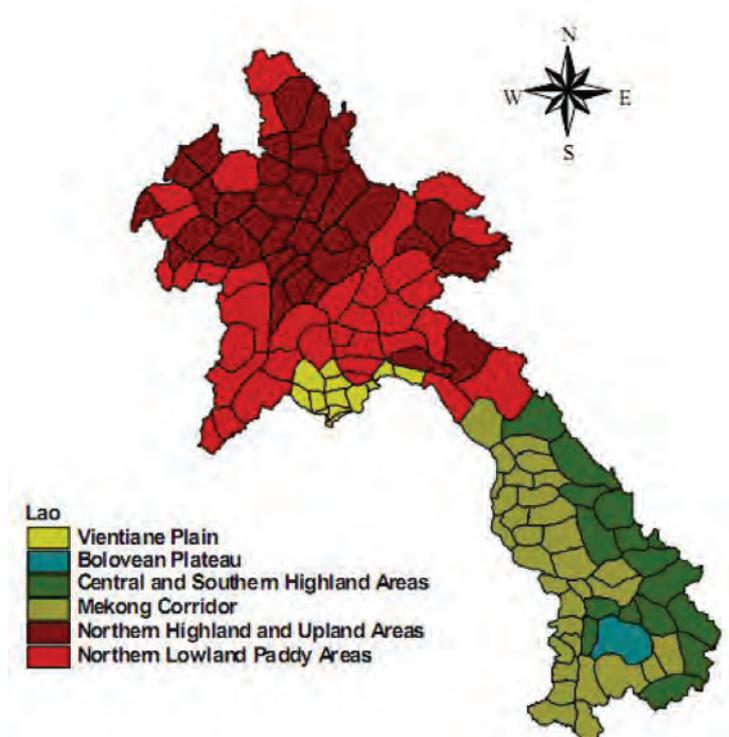
Quantitative Component

Key underpinnings of the analytical approach of the quantitative component were defined as follows:

1. Agro-Ecological Zone level analysis: Agro-ecological zoning for Lao PDR was developed by the World Bank's Rural Development and Natural Resources Sector Unit of the East Asia and Pacific Region in May 2006 (see figure 1, and Annex II for a full description). Since then, assessments used these zones to better analyse food security and agriculture patterns, including the Rice Assessment done by MAF in partnership with FAO in 2008, and the Comprehensive Food Security and Vulnerability Analyses (CFSVA) done by WFP in 2006. The main rationale for conducting analysis by agro-ecological zones was that agricultural livelihoods, and therefore rural food security characteristics are broadly contingent on environmental factors rather than administrative boundaries.

Because Lao PDR has only six agro-ecological zones, analyses at that level would allow a more manageable, less costly sample size. Nevertheless, because decision makers need information at provincial levels, extrapolation of findings from agro-ecological zones to provinces should be included where possible.

FIGURE 2: AGRO-ECOLOGICAL ZONES FOR LAO PDR



Source: Lao PDR: Rural and Agriculture Sector Issues Paper, Rural Development and Natural Resources Sector Unit, East Asia and Pacific Region World Bank, May 2006. Extracted from WFP Food Security Atlas (<http://www.foodsecurityatlas.org/lao/country/availability/agricultural-naturalresources>)

2. Focus on Rural Areas: Even though urban risk and vulnerability are believed to be a major issue in Lao PDR, the assessment would focus only on rural areas. Different field instruments are required for rural and urban survey work, necessitating design complexity beyond the scope of the RVS.
3. Focus on Farming and Non-farming Households: The survey would include all households living within rural areas, these being either farming or non-farming households. This was seen as a means towards including rural households with limited agricultural activity, which might therefore be experiencing higher levels of vulnerability.

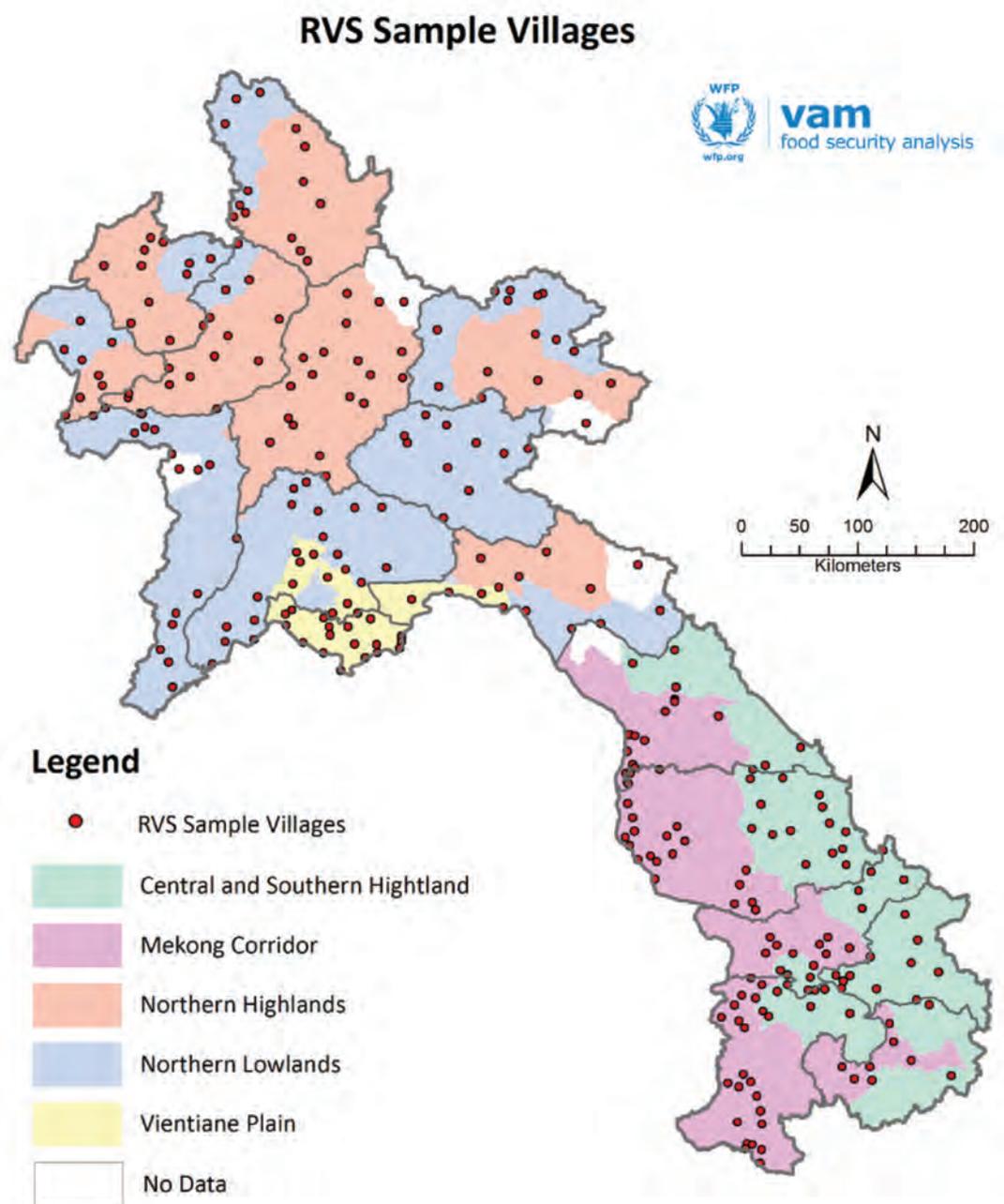
Sample Design

The RVS sampling plan was designed to allow statistically representative results at national and agro-ecological, with potential limited extrapolations at provincial levels, and to allow for linkages with the Lao Census of Agriculture (LCA). A multi-stage sampling design was employed, a strategy intended to reduce operational challenges while prioritizing the poorest districts. In three of the agro-ecological zones, the Northern Highlands, Northern Lowlands, and the Mekong Corridor, a three-stage sampling plan was employed to allow for prioritization of poor and priority poor districts. In stage one, districts were stratified by province according to their designation as poor or non-poor. All districts in the poor stratum were selected while a sample of districts from the non-poor stratum was selected using probability-proportional-to-size (PPS).

Stratification and Selection of villages

The sample was selected as a sub-sample of the LCA 2010/11 sample villages. This was done to maximize the overlap with the LCA 2010/11 and also to sufficiently include non-farming households. In LCA 2010/11, villages were stratified by urban/rural for the selection of villages. The RVS sample of villages was selected from the LCA 2010/11 rural stratum. Systematic random sampling was used to ensure good representation of villages according to road access. Thus, all villages with road access were listed first followed by all villages without road access, and a suitable skip interval was applied. Given the strong correlation between poverty and food security, district poverty characteristics were used in the sample design to improve reliability. Figure 3 shows the distribution of villages across agro-ecological zones.

FIGURE 3: MAP OF RVS SAMPLE VILLAGES



Selection of households

Household sampling was done before the field work, whereby enumerators were provided with a list of 15 households to interview and 5 replacement households. A skip interval (S) was calculated by dividing the number of households in the village by the village sample size. A random number (R) was selected between the 1 and the skip interval. The selected households were R, R+S, R+2S, etc. Individual data for children was collected from a maximum of three children per household.

The sample design was to collect data from 4335 households, 289 villages and 103 districts. The teams successfully interviewed 4308 households in 288 villages in 103 selected districts. The sample allocation to zones and provinces is shown in Table 1.

TABLE 1: SAMPLE DISTRIBUTION

Province	Number of HHs	Agro-Ecological Zone	Number of HHs
Vientiane Capital	270	Vientiane Plain	481
Phongsaly	208	Northern Lowlands	1060
Luang Namtha	180	Northern Highlands	970
Oudomxai	225	Mekong Corridor	1003
Bokeo	135	Central/Southern Highlands	794
Luang Prabang	282	Total	4308
Houaphan	225		
Xayabury	238		
Xiengkhouang	165		
Vientiane	374		
Borikhamxay	209		
Khammouan	256		
Savannakhet	538		
Saravan	256		
Sekong	150		
Champassak	447		
Attapeu	150		
Total	4308		

Sample Weighting

In order for the sample estimates from RVS to be representative of the population, the data was multiplied a sampling weight. The household weight was calculated as the number of households in the village divided by the number of sampled households in the village. The household weight was then multiplied by the village weight to calculate the household sample weight.

Instruments

The survey consisted of three complementary instruments – household, child nutrition, and key informant questionnaires. For the purposes of brevity, only the household survey

instrument is included here as an annex, but other questionnaire formats are available from FAO and MAF on request. The instruments were designed and reviewed by a joint FAO-WFP technical team together with a government team consisting of staff from both the Ministry of Agriculture and Forestry (MAF) and the Ministry of Public Health (MoPH). The MAF team with support from the FAO technical team led the translation of the instruments into the Lao Language.

The household questionnaire was designed to collect information on a comprehensive suite of indicators related to livelihoods and food security. Sections included (1) demographics, (2) household characteristics, (3) water and sanitation, (4) household assets, (5) livelihoods (6) access to credit (7) external assistance/remittances (8) land, irrigation and forests (9) crop production (10) household expenditure (11) food stocks and consumption (12) sources of cereals (13) participation in social groups (14) household food insecurity (15) shocks and hazards.

Five additional sections focusing on child health and nutrition were included in the household questionnaire to allow for investigation of linkages between household-level food security and child nutrition. These sections were (16) maternal information (17) basic child information, (18) child dietary diversity (19) child illness, and (20) child nutrition status. Anthropometric measurements of weight and height were taken for all children under the age of five years. A key informant questionnaire was conducted with the head of village and focused on village-level characteristics. Topics discussed included wage labour opportunities, trends in access to forests and fishing, and market access.

In December 2012, a total of 48 enumerators participated in a 5-day training designed to familiarize them with the survey instruments, methods of data collection, and sampling plan. The enumerators were divided into teams of three covering the northern, central and southern provinces respectively. Two supervisors from MAF and the Lao Statistical Bureau (LSB) were assigned to each region. Within these regional teams, enumerators were further grouped into teams of three.

Field Work

Enumerators were divided into teams of three covering the northern, central and southern provinces respectively. Two supervisors from MAF and the Lao Statistical Bureau (LSB) were assigned to each region. Within these regional teams, enumerators were further grouped into teams of three. In total, data was collected by 48 enumerators from December 2012 - February 2013.

The enumerators participated in a 5-day training designed to familiarize them with the survey instruments, methods of data collection, and sampling plan. Team composition included two staff from MAF and one from MoPH to conduct key informant and household interviews. In households with children under the age of five, the enumerator from MoPH was designated to take the anthropometric measurements. Supervisors visited enumerator teams periodically to provide support and ensure the quality of data collection. In addition, the supervisors conducted field visits that included market visits, ad hoc interviews with market traders and meetings with the Provincial Agriculture and Forestry Officer (PAFO).

Data entry and Analytical Methods

Data capture and entry was conducted by MAF staff in February and March 2013 using the

software package, Census and Survey Processing System (CSPro). The data was then exported to the statistical software package, SPSS Statistics, for data editing and analysis. Primary data analysis was complemented by Microsoft Excel and Geographic Information Systems (GIS) packages. Statistical tests (ANOVA, chi-square, t-tests) were used to assess the validity of the differences between groups.

The conceptual frameworks described above were used to inform the analysis of the various thematic areas. The findings were contextualised during a data analysis workshop in early May 2013, which was attended by a number of stakeholders including staff from MAF, MOH, LSB, NAFRI, other UN Agencies (WFP, UNICEF), and INGOs (CARE International, Oxfam). The findings were also contextualised using secondary information derived from sources such as the Lao Agricultural Census, LSIS, CFSVA, LECS among others.

Qualitative Component

In November-December 2012, CARE International conducted the qualitative component of the survey with fieldwork in 9 villages across three provinces in November- December 2012, interviewing some 214 people. With interest attention at the global and national level in qualitative approaches in food security assessment, the methodology is presented in considerable detail, in the hope that it will be of use for field practitioners in designing future surveys.

In keeping with the overall conceptual approach applied in the wider RVS process, Integrated Phase Classification conceptual framework would also be the basis for the qualitative component. Emphasizing the iterative, inductive approach implicit in qualitative approaches, group work from a multi-stakeholder working group on qualitative data relevant to the RVS (including government, UN and NGO participants) indicated strong interest in exploring issues of gender and women's roles in rural Lao PDR. Thematically this was broadly consistent with findings from the RVS background review, which indicated elevated levels of food insecurity and malnutrition among female populations.

For the purposes of the RVS final report, the findings of the qualitative and quantitative components have been incorporated into a single document, with references to the source of information as applicable.

Sampling

Based on the overall RVS design, which applied sampling at the level of Agro Ecological Zone³, selection of districts and villages for the qualitative component proceeded on a similar basis. Based on budgetary and time constraints, a total of three AEZs were proposed for inclusion. Village selection was based on CARE's previous experience based on past and on-going programming. CARE's wide range of programming was an advantage in this case, as it has teams and projects in two AEZs; sites in two agro-ecological zones, (the Northern Uplands, and Southern Highlands) were therefore easily identified. For the Mekong Corridor, although CARE does not have on-going programs, it had previously operated in Nhommalath district, which was therefore selected for inclusion. This allowed for a more directed, efficient purposive sampling process, which expedited the overall process.

³ For a fuller description of the six agro-ecological zones of Laos, please see the summary document included here as annex IV.

Noting the limits of time and budget, it was determined that AEZ-level sub teams would target nine villages, or three per AEZ. At the village level, focus group discussions and household interviews would be conducted. In order to compensate for the relatively small sample size, the research teams were encouraged to cross-check and triangulate data, in order to generate as deep an understanding of the local food security context as possible. A table of village names and locations is included here as Table 2.

TABLE 2: VILLAGES SELECTED FOR THIS SURVEY

Agro-ecological zone	Northern Highland and Uplands	Mekong Corridor	Central and Southern Highlands
Province	Phongsaly	Khammouan	Sekong
District	Samphan	Nyommalath	Kaleum
Remote traditional Farming Village	Laoleo (Akha)	Phonesaed (Kaleung)	Thamdeng (Katu)
Village with good market access	Namloy (Khmu)	Nafaimai (Makong)	Vakneua (Griang)
Relocated Village	Houaythong (Khmu)	Natherd (Makong)	Jing (Griang)

(ethnic group in parenthesis)

Instruments

Based on the approaches outlined above, specific data collection tools included the following:

- **Social Mapping**

At the village level, social mapping was conducted by village representatives and/or the village committee. Drawn by hand using graphics and text on large whiteboard sheets, the social map gave an overview of the different dimensions of the village, including wealth ranking of households, village infrastructure, wealth indicators, numbers and locations of very vulnerable households (including female headed households and PWD). Additional questions regarding maternal and children’s health, hygiene, and livestock vaccination coverage were also raised during this exercise.

- **Natural Resource Mapping**

Village resource mapping offered an overview of the forest zones (community forest, spirit or sacred forest, conservation forest and protection forest) agricultural land use, upland fields, paddy, garden, fish pond, streams and livestock grazing areas. In addition, a hazard timeline was developed with the same group of men.

- **Food Source Ranking**

This tool was conducted through focus group discussions with women. Women were asked to reflect on the different sources and amounts of food from various food sources, now and compared to ten years ago. Six food groups (staples, vegetables, fruits, calcium, meat and meat alternatives, and fat and oil) were proportionally ranked to estimate the share of the three food sources. 10 stones or seeds presented 100 percent. The ranking included six rounds, one for each food group.

- Gender Activity Profiles

Gender activity profiles were conducted with both men and women's focus group discussions. This led to discussion and elaboration of the division of labour between men and women, specific domains of men and women, and proposals how to better share workloads in the future.

- Food Utilization Statements

At the end of the focus group discussions, the research team challenged the villagers to give their individual opinion to four particular food utilization statements related to intra-household food consumption, workload and responsibilities and decision making on food. There were them aggregated by total number of responses per gender.

- Household Interviews.

Based on the social mapping exercise described above, six households were selected for interview in each village: two high income, two middle and two poor. As this instrument was focused on intrahousehold consumption, interviews were conducted with women. Interviews covered such topics as household status within the community, informal support networks, assets, education, ethnicity, poverty situation, and demographic information were all included. A sample household questionnaire is included as an annex. In Sekong only women of poor or medium wealth range were interviewed, and in Khammouan the number also varied from village to village. Overall 58 women were interviewed.

Field Work

Field teams were led by CARE International personnel and supported by CARE field staff and government counterparts. One Research Coordinator and two research advisors (CARE staff members) were recruited, under the overall supervision of the CARE Rural Development Coordinator. Research team members included students, graduates and lecturers from NUoL and Pakpassak Technical School working on a voluntary basis, as well as Ministry of Agriculture staff seconded to the survey.

During a four day pre-field training, the research team reviewed a variety of qualitative research methods to be used in the course of the survey. Documenting data (field notes, audio files) and regular debriefing techniques were also discussed. Methodologies to be used included:

- Participant Observation
- Semi-structured interviews
- Focus Group Discussions including mapping / ranking tools from the PRA toolbox
- Non-directive interviewing as developed by Rogers⁴, consisting of empathic skills (to enter another individual's world without judgment), congruence and unconditional positive regard (acceptance of other people's feelings, opinions, and values).

In this training, interview techniques were practiced, including methods of probing, and interview guidelines were reviewed in full. Throughout the process, teams were encouraged to look for positive strategies and findings, not to concentrate exclusively on problematic issues.

4 Rogers, C. (1951): Client-centred therapy: its current practice, implications, and theory, Boston, MA, Houghton Mifflin.

While some of the information was quantifiable, i.e. by ranking and scoring, most data was subjective and individual, and not easily collated. Over the course of the survey, the team systematically followed a qualitative data collection approach, applying three basic principles:

- Triangulation

In practice, triangulation included:

- **Team composition:** each team included members from a variety of disciplines and experiences and were gender balanced.
- **Instrument design:** mapping, ranking and scoring, focus group discussions, household interviews and observation techniques were designed to reinforce findings across different tools
- **Data collection:** applied by asking the same questions to people in different wealth and gender groups.

- Self-critical Awareness

A key asset of qualitative research is non-dominant and non-superior attitudes and behaviours while conducting interviews in households and villages. Research team members were encouraged to use comfortable and non-hierarchical seating arrangements, conduct interviews in private when possible, to cook or help cook in the villagers' kitchen as appropriate. Teams followed the general suggestion of rural development researcher Robert Chambers: "Sit, listen, learn, respect, don't hurry, be nice to people". Taken together, these steps contributed to trust and confidence building, increasing the probability of authentic and honest discussion.

- Step by step analysis

Throughout the fieldwork, visual aids were used and notes were taken in the public. This encouraged villagers to get actively involved in the discussion. Using this approach, villagers were able clarify, criticize, and verify the findings as they presented.

Analytical Methods

At the end of each working day, research teams work to collect the findings from each location, based on data collects across all tools (social mapping, gender activity profiles, food utilization statements, household interviews, etc). Once fieldwork was completed, all research team members gathered for three days in Vientiane, and began to cluster the cards, first by village and AEZ, identifying common themes at the district level. A second round of analysis was then undertaken, where by the cards were clustered by thematic area. From out of this process, nine key topics emerged and included

1. Village Infrastructure
2. Gender Inequity
3. Education
4. Health and Hygiene
5. Access to food markets
6. Access to labour markets and access to employment
7. Food availability, access to land and forest
8. Hazards
9. Food utilization practices

This analytical process reinforced the triangulation approach, ensuring that data could then be presented at both the AEZ and thematic level.

Challenges

The richness and depth of data collected from the field was reliant on the diligence of note taking by research teams. Every effort was made to retain the locally specific detail noted in each village visited, however, some detailed information, in particular quantitative information related to demography, land and livestock was not collected systematically in all villages – This was also due in part to the fact, that village statistics were not always readily available.

Although the primary lens applied to the fieldwork was gender related, cultural mores in Laos meant that women respondents in all settings felt more comfortable responding positively and refraining from answers which might be construed as complaints. This was offset somewhat by holding all-women focus groups, but this was not a failsafe - on some occasions men remained in earshot or active participants for some or all of the discussion. The team however tried many approaches, and was able to overcome male over-participation as and when it arose.

PART 3: THE DESK REVIEW

The desk review served as the first step in the implementation of the 2012 Risk and Vulnerability Survey. A data matrix and narrative compiling a wide range of source data and documents published by the Government of Lao People's Democratic Republic, FAO and UN agencies, IFIs, NGOs, and academia related to food and nutrition security, risk and vulnerability was developed, the summary version of which forms this chapter is in turn informed the development of the field instruments and overall survey design.

It was submitted and approved by the Project Steering Committee in November 2012.

Overview

Guided by the IPC Food Security Analytical Framework (included here as Annex I), this review identifies key factors within the four pillars of food security (availability, access, utilization, and stability), provides an overview of the state of malnutrition as a primary outcome of food and nutrition insecurity, and reviews the hazards and vulnerabilities impacting food insecurity in Lao PDR. Key findings include:

- **Food availability:** Rice, the staple of the Lao diet, dominates agricultural production in Lao PDR with annual national yields around three million metric tons. The country's forests, rivers, lakes and mountains also provide a wide range of foods, known as Non-Timber Forest Products (NTFPs), which play an important role in the Lao diet. Recent trends towards commercial agriculture and increased production of cash crops have implications for labour and livelihood patterns, as well as availability of NTFPs.
- **Food access:** There are important economic, physical, and social factors affecting a household's access to food in Lao PDR. Shifts in agricultural livelihoods to include greater cash-based activities (wage labour, production of cash crops) are increasing household income, but simultaneously increasing reliance on markets as a food source, increasing pressure on household expenditures, and potentially opening up new risk vectors in the form of exposure to market instability and price volatility. Commercial expansion of cash crops may equally improve gross household income, but are contingent on regional market dynamics for key commodities such as rubber and maize.

While the country overall has seen improvements in rural electrification, and expansion of road networks and market infrastructure, these changes have yet to fully reach populations living at higher altitudes, particularly in the far North and South of the country. Households in these areas tend to have less access to food as a result of limited infrastructure and limited opportunities for settled agriculture. These households also tend to be from non-Lao speaking ethnic groups compounding the challenges for participation in the market economy. Access to NTFPs has diminished as a result of increasing commercial agriculture, land tenure and access to land.

- **Food utilization:** Multiple factors impact the body's ability to utilize nutrients effectively, including disease, maternal health, infant and young child feeding (IYCF) practices, and access to improved water and sanitation in the household. In Lao PDR, the typical diet is diverse but imbalanced, with greater consumption of carbohydrates and inadequate consumption of fats and proteins. It has also been noted that dietary diversity may not extend to young children. Rates of exclusive breastfeeding appear to have improved regional disparities remain, with particularly low rates in the south. This geographic variation in part reflects the different practices of the Laos' many ethnic groups: the Hmong-Mien and Chinese-Tibetan groups have the highest rates of exclusive breastfeeding and predominate in the North while Lao-Tai and Mon-Khmer have much lower rates.

Access to clean drinking water and improved sanitation facilities has improved in Lao PDR, although again, regional disparities persist with less access in villages in the north compared to the south and central regions and in upland households compared to lowland. Overall greater progress has been made in expanding access to safe drinking water than in access to sanitary facilities.

- **Nutrition:** The prevalence of malnutrition in Lao PDR is characterized by disparities along geographic, social and economic lines. Nationally, rates of chronic malnutrition remain high, with 44 percent of children less than five years of age stunted and 26.6 percent underweight (LSIS 2012). Chronic malnutrition tends to be higher in rural households, in the highlands compared to the lowlands, and in households from the poorest quintiles compared to the richest quintiles. Prevalence also tends to be higher amongst non-Lao speaking ethnic groups who generally reside in the more geographically remote, high altitude regions of the country.
- **Hazards:** The main hazards in Lao PDR include floods, droughts, storms, and agricultural pests and rodent infestations. In many areas, unexploded ordinances (UXOs) remain a critical challenge for agricultural households. Ongoing and emerging challenges include deforestation, price fluctuations (of both staple foods and cash crops grown for export) and climate change.
- **Vulnerability:** Traditionally, vulnerable households in Lao PDR have been identified as farmers with limited activity in fishing and hunting, unskilled labourers, households engaged in upland farming on steep slopes, those living in remote villages with little infrastructure, and those from non-Lao-Tai ethnic groups. As socio-economic changes continue and rural livelihoods shift, vulnerability to food and nutrition insecurity in Lao PDR will also shift and change. Growth in industrial sectors such as mining, hydropower, and commercial agriculture will have variable impacts on rural livelihoods and access to resources and food. Deforestation and climate change will continue to play a role in household vulnerability to food and nutrition insecurity.

Food Security Defined:

Food and Nutrition Security

The general definition of food security was internationally established at the 1996 World Food Summit (WFS) in Rome, at which 190 nations agreed that

Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

Subsequently this definition was adjusted to reinforce the importance of nutrition and social factors in ensuring food security, with the Committee on World Food Security (CFS) releasing the following revised definition in July 2012:

Food and nutrition security exists when all people, at all times, have physical, social and economic access to food which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, *and is supported by an environment of adequate sanitation, health services and care*, allowing for a healthy and active life (CFS 2012).

This revision is reflective of growing global concern about and commitment to addressing malnutrition and hunger as the most serious manifestations of food insecurity and undernutrition. Within Lao PDR, this renewed commitment is seen in the country’s engagement with the Scaling Up Nutrition Initiative (SUN), and is consistent with the undertaking of the present Risk and Vulnerability Survey, which serves to explore linkages between food insecurity and malnutrition at the household level in all areas of the country. The four main dimensions of food security as defined as follows:

TABLE 3: The Four Dimensions of Food Security

Physical AVAILABILITY of food	Food availability addresses the “supply side” of food security and is determined by the level of food production, stock levels and net trade.
Economic and physical ACCESS to food	An adequate supply of food at the national or international level does not in itself guarantee household level food security. Concerns about insufficient food access have resulted in a greater policy focus on incomes, expenditure, markets and prices in achieving food security objectives.
Food UTILIZATION	Utilization is commonly understood as the way the body makes the most of various nutrients in the food. Sufficient energy and nutrient uptake by individuals is a function of good care and feeding practices, food preparation, diversity of the diet, and intra-household distribution of food. Combined with good biological utilization of the foods consumed, this determines the nutritional status of individuals.
STABILITY of the other three dimensions over time	Even if your food intake is adequate today, you are still considered to be food insecure if you have inadequate access to food on a periodic basis, risking a deterioration of your nutritional status. Adverse weather conditions, political instability, or economic factors (unemployment, rising food prices) may have an impact on your food security status.

(EC and FAO 2008)

TABLE 4: INDICATORS FOR MDG GOAL 1

MDG Goal	Indicator
Goal 1: Eradicate extreme poverty and hunger	• 1.8. Prevalence of underweight children under-five years of age
	• 1.8A. Prevalence of stunting in children under five years of age
	• 1.9. Proportion of population below minimum level of dietary energy consumption

Data on MDG 1 indicators 1.8 and 1.8A indicate that although progress has been made in Lao PDR, the MDG goal of reducing hunger by half is likely to remain out of reach by the culmination of the MDGs in 2015.

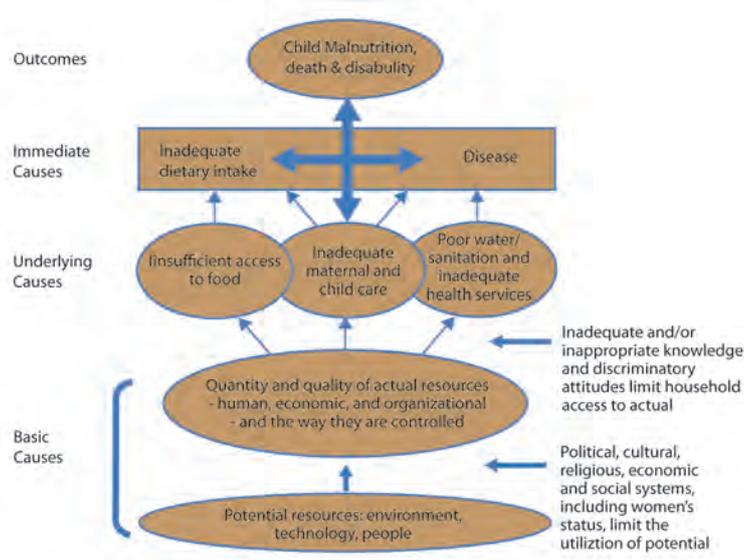
TABLE 5: PROGRESS TOWARDS MDG AND WFS TARGETS IN LAO PDR, 1990-2008

Indicator	1990-92	1999-2001	2004-06	2007-09	2010-12	Change so far (%)
Proportion of undernourishment (percent)	44.6	39.5	33.4	29.4	27.8	-37.7
Number of undernourished(millions)	2	2	2	2	2	-9.2

Child Malnutrition

A complex web of factors affects child malnutrition, from maternal antenatal care and infant and young child feeding practices to drinking water supply and environmental health. While the relative importance of each factor varies across populations and contexts, UNICEF has developed a conceptual framework to categorize factors according to three causal pathways – immediate, underlying and basic causes.

FIGURE 4: UNICEF CONCEPTUAL FRAMEWORK FOR CHILD MALNUTRITION



Source: UNICEF 1997

Having cut the under-five mortality rate (U5MR) by 63 percent between 1990 and 2010, Lao PDR appeared on target in 2010 to reach the 2015 MDG target of reducing child mortality by two thirds (67 percent). However, recent data suggests a reversal of the trend – 2010 data estimated an U5MR of 54 deaths per 1,000 live births while 2012 data placed the estimate at 89 deaths (ADB 2012b, MOH & LSB 2013). The U5MR remains one of the highest in the region.⁵

At the global level, it is estimated that approximately one-third of child deaths can be attributed to child malnutrition, and rates of malnutrition remains a stubborn challenge in Lao PDR. The most recent nationally representative data on nutrition status comes from the 2011/12 Lao Social Indicator Survey (LSIS), which can be analysed for trends with the 2006 Multiple Indicator Cluster Survey (MICS) and a national nutrition survey from 2000. Two additional surveys, World Food Programme’s (WFP) 2006 Comprehensive Food Security and Vulnerability Analysis (CFSVA) and a survey by National Institute of Public Health (NioPH), the Department of Statistics (DoS) and UNICEF in 2010, provide important insight on child malnutrition but are not nationally representative. When comparing nutrition indicators from different surveys, it is important to bear in mind the timing of implementation and the relative impacts that seasonality (lean vs. harvest season) and natural disasters can have consumption patterns.

TABLE 6: NATIONAL LEVEL SURVEYS IN LAO PDR

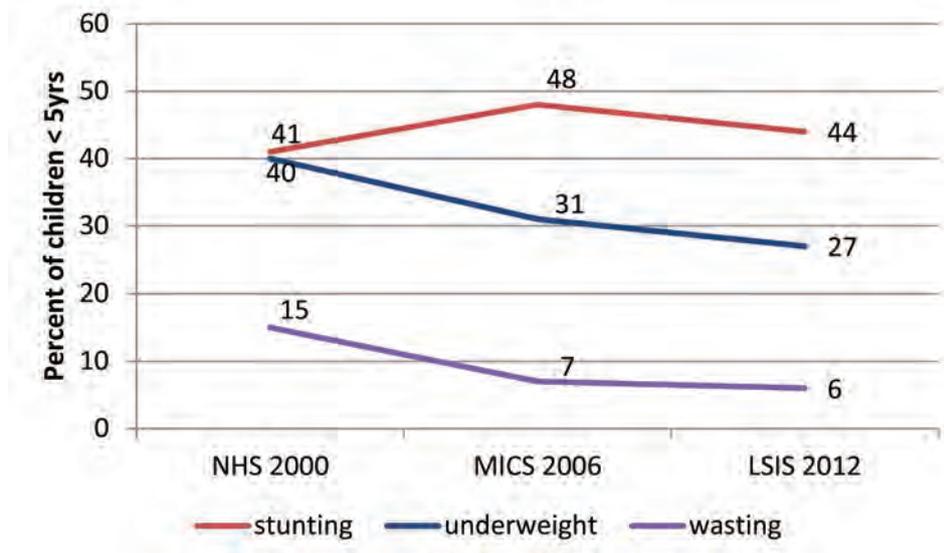
Survey Title	Year(s) of data collection	Sample Size	Coverage
Multiple Indicator Cluster Survey – National Nutrition Survey (MICS-NNS)	March – June 2006	MICS: 5,894 Households • 7,387 women • 4,136 children NNS: 741 Households • 927 women • 577 children	Nationally representative
Comprehensive Food Security and Vulnerability Analysis (CFSVA)	October – November 2006	3,926 Households • 3,456 women • 2,541 children	Rural households only
Nutritional Assessment of 2008-09 Flood- and Typhoon Ketsana-Affected Provinces	May – June 2010	4813 Households • 6,366 children	9 provinces (3 per Northern, Central and Southern regions)
Lao Social Indicator Survey (LSIS)	October 2011 – February 2012	18,843 Households • 22,476 women • 11,067 children	Nationally Representative

Overall, the results from the nationally representative surveys have shown limited improvement in rates of stunting and undernourishment, and greater reduction in wasting (Figure 5). Between 2000 and 2012, rates of underweight have remained between 25 and 40

⁵ According to 2010 figures, the average U5MR for Southeast Asia was 32 deaths per 1,000 live births. In the region, only Myanmar, with an U5MR of 66, ranked worse than Lao PDR (ADB 2012b).

percent while rates of stunting have fluctuated between 40 and 50 percent of children less than five years of age.⁶

FIGURE 5: TRENDS IN MALNUTRITION 2000-2012 ACCORDING TO 3 NATIONALLY REPRESENTATIVE SURVEYS



Sources: National Health Survey 2000 data (FAO 2003); MICS 2006 data (DOS & UNICEF 2006); and LSIS 2011/12 data (MOH and LSB 2013).

Food Security in Lao PDR

Availability

Lao PDR cultivates and produces an abundance of foods, complemented by a wide range of animal and plant foods sourced from its forests, rivers, lakes and mountains (referred to as Non-Timber Forest Products, or NTFPs). In common with other Southeast Asian nations, the prevailing agricultural priority at both national and household level is rice production, with glutinous rice making up 85 percent of total rice consumption (FAO and WFP 2011). In 2010, Lao PDR harvested 3.07 million tonnes of rice, generating surpluses estimated in excess of 300,000 MTs (Thadavong 2012).

FIGURE 6: RICE FOR SALE IN KHAMMOUAN PROVINCE



(Photo Credit: WFP/Annika Harald, February)

⁶ Underweight, stunting and wasting are three primary indicators of malnutrition in children under 5 years of age: Underweight (weight-for-age) is a measure of both acute and chronic malnutrition, stunting (height-for-age) reflects a child's linear growth and is considered an indicator of chronic malnutrition, and wasting (weight-for-height) is an indicator of acute malnutrition.

Production is concentrated in the central region, with five provinces providing 70 percent of the total production (Bolikamxai, Khammouan, Savannakhet, Vientiane, and Xieng Khouang). In terms of overall efficiency of production, the 2010 Agricultural Yearbook reports a yield of 3.59 metric tonnes per hectare at the national level, with the ADB reporting overall production of 1.44 million tonnes of milled rice in 2011 (ADB 2012).

In terms of trends in the agriculture sector, the past ten years have seen a shift from subsistence-oriented agriculture to market-focused agriculture. This transition to commercial agriculture is relevant to food security in a number of ways, with implications in terms of land access, tenure and access to NTFPs. Nevertheless, overall availability of food (per capita availability) at the national level has not been adversely affected: harvest yields and livestock populations have increased steadily over the past decade.

The 2010/11 Agriculture Census notes that 30 percent of Lao PDR's 782,000 agricultural households produce crops mainly for sale (ACO 2012). With this shift in agriculture, increased production of cash crops for export (including cassava, coffee, tea, maize, rubber and sugar cane) has been a major factor in the agricultural context of Lao PDR. There has been a five-fold increase in the overall area planted with maize, At the time of the previous census in 1998, there was no recorded rubber cultivation in Lao PDR. In 2010/11, some 49,000 households, grow rubber on some 66,500 hectares.

In parallel with the shift towards more commercial agriculture is the increase in mechanization. Ownership of tractors and trucks has increased over the past decade, with 61 percent of farm households now owning a two-wheeled (*toktok*) tractor, although this is highly variable at the provincial level. For example, in the far north of the country, less than 25 percent of households in Phongsaly province have tractors, compared to 80 percent along the Mekong valley. Fertilizer use is on the increase, with 59 percent of crop growers using organic and chemical fertilizers, or both. Irrigation coverage remains incomplete, at 22 percent of the 1.62 million hectares under cultivation, with the volume of both dry and wet season rice under irrigation unchanged or declining since 1998/99.

With Lao PDR positioned between two major food exporting nations (Thailand and Vietnam) formal and informal imports are an important feature of food availability, with imports used to cover temporary shortfalls, especially in areas proximate to the borders (FAO and WFP 2011). However, information on informal imports is incomplete, with the result that the role of the informal sector in the overall food availability profile of the country is not fully understood. In terms of formal imports, the total rice imports estimated for 2011 is on the order of 30,000 MTs, equivalent to one percent of total domestic production (FAO and WFP 2011).

Access

Livelihood Strategies & Assets

Agriculture is the dominant livelihood strategy in rural Lao PDR. According to the 2010/11 Agricultural Census, 77 percent of total households are classified as farm households. The percentage has declined marginally from the 84 percent reported by the 1998/99 Census, but appears to be a roughly the same as that reported in the 2009 National Human Development Report (75 percent) (MPI & UNDP 2009). According to the 2006 CFSVA, 81 percent of rural

households were engaged in agriculture, of which 36 percent were classified as predominantly farmers, 21 percent as farmers/gatherers, 14 percent as farmers/fishers/hunters, and 10 percent as agro-pastoralists. The other 19 percent were mainly engaged in skilled and salaried, artisanal, trade or “other” activities (remittances, government allowances, big traders, other activities) (WFP 2007).

Economic Access

In economic terms, continued annual GDP growth of 6 to 8 percent has translated into increases in per capita GDP. In 2010, per capita GDP stood at 1,176 USD, up from 326 USD a decade earlier (World Bank 2012). Even so, poverty remains an important factor, with 33 percent of the population living on less than 1.25 USD per day (UNDP 2011).

With poverty lines derived in part from the cash equivalents required to purchase the minimum calories required per person per day (usually estimated at 2,100 Kcal), poverty and food insecurity have long been correlated. Food insecurity tends therefore to be more prevalent among poorer populations. In Lao PDR, determinants of poverty include geographic remoteness, high altitudes, recurrent exposure to disasters, and ethnic status (MPI 2010). The 2007/8 poverty headcount in villages without road access was 48 percent, compared to 30 percent in villages with road access, and food poverty was also found to be significantly higher in rural villages without road access.

Food access is also influenced by seasonality.⁷ Areas without all-weather roads may be cut off for weeks or months at a time during rainy seasons, with the result that some villages and households may be relatively food secure during certain seasons of the year, and vulnerable or food insecure at other parts of the year. It is also important to note that periods of food insecurity do not track precisely with seasons. As assessments conducted in the months that followed Typhoon Ketsana in 2009 indicated, the more durable and widespread impacts of the typhoon were not experienced in the immediate aftermath of the storm, but four to six months after the event (WFP 2010).

Finally, although nationally representative data is lacking, the transition to commercial agriculture has also resulted in rural indebtedness (Kemp 2012). While the extent of this phenomenon is still not fully understood, it underscores the increasingly monetized rural context in which farmers make significant investments in agricultural inputs in order to meet export market demand for cash crops.

Physical Access

Improvements in market infrastructure, taken to mean not only the markets themselves, but also electrification, road networks, communications, and access to credit, have supported increased access to markets for both purchase and sale of food. Sixty-one percent of Lao PDR has access to electricity (compared to 33 percent in 2002), 84 percent of the country is accessible via road throughout the year, and 42 percent of all citizens own mobile phones (DOS 2009).

⁷ It is some indication of the interlinked nature of food security factors that seasonality can be considered as an access issue or a stability issue. It has been included here under access, but could equally be treated as in the context of stability.

However, positive gains in infrastructure development are offset by increases in inflation, and rising household costs. As the Lao labour force is increasingly engaged in waged labour, there is necessarily a trade-off in terms of subsistence activities (agricultural activity for own production and consumption) meaning that market purchases are an increasingly important source of food supply. Rigg (2006) illustrates that households in Lao PDR can be at once better off (improved incomes, access to markets, better services, electricity, etc) and less food self-sufficient, producing less for their own consumption and becoming more reliant on market purchases.

Marked differences can also be seen between geographic, rural/urban, and/or ethnic affiliation in Lao PDR. Physical capital, human capital, and financial/social capital are often much higher in urban areas compared to rural, reflecting better access to infrastructure and services in urban areas (WFP 2007). Natural capital, in particular productive land, rivers and access to forests, varies geographically across the country, with highly productive land suitable for rice production found in the lowland areas along major rivers, productive land not suitable for rice but appropriate for many cash crops found in the midlands/plateau areas, and less suitable land due to high degree of sloping found in the highlands (WFP 2007).

Also of importance in this context is access to NTFPs. NTFPs are important as a source of dietary diversity in terms of both macro and micronutrients, but also as a source of household income, with NTFPs sold to purchase rice (Foppes et al 2011). Access to food therefore pertains not only to access to productive assets, but also to natural resources. With wild fish and animals constituting the single largest source of protein, access to lakes, rivers and forests is a vital component of household consumption and nutrition (WFP 2007). However, as a result of shifting patterns of agriculture, land tenure and access to land, food foraged and gathered from the wild has declined from 36.6 to 25.9 percent (Foppes et al 2011). This goes to underscore the point that even for rural agricultural households, growing food for own consumption is only one of a series of methods for accessing food, alongside waged labour, sourcing NTFPs, market purchases, and bartering.

Social Access

Social access to food in Lao PDR is conditional on a number of inter-related geographic and cultural factors. The population of Lao PDR is ethnically quite diverse, with sub-populations organized into 49 groups across four linguistic categories: Lao-Tai, Hmong-Mien, Chino-Tibetan, and Mon-Khmer. The Lao-Tai populations, comprising 67 percent of the national total, tend to reside in agriculturally productive lowland areas around Vientiane and along the Mekong corridor. The Hmong-Mien and the Chino-Tibetan groups are generally found in the northern highlands and the Mon-Khmer can be found in both the Northern and Southern regions (WB 2010).

Ethnic groups that live at higher altitudes tend to have less access to food as a result of limited infrastructure and limited opportunities for settled agriculture. Ethnicity also bears important linguistic implications, such that populations unable to speak Lao language may be unable to participate in markets or take advantage of employment opportunities requiring languages other than their own. Proximity to regional opportunities is also important, as populations living along the borders with Thailand and Cambodia are able to take advantage of trade and employment opportunities in neighbouring states, whereas populations along the mountainous border with Vietnam are less able to do so (MPI 2010).

Also of importance in terms of social access is the emergence of landless rural households. The 2012 Lao Agricultural Census (ACO 2012) records a threefold increase in the number of landless rural households over the past decade, amounting to 49,000, equivalent to six percent of the overall rural population.

Finally, the longstanding assumption about food insecurity in Lao PDR has been that it is primarily a rural issue, and as such there is little to no data on food insecurity and malnutrition among urban populations. This represents an outstanding information need to be addressed.

Nutrition in Lao PDR

Distribution of Child Malnutrition

Malnutrition in Lao PDR has important geographic, social and economic determinants, all of which are necessarily interlinked. Based on data from the LSIS 2011/12, a clear geographic distribution of malnutrition can be seen. Children in rural villages, in northern and southern regions, and particularly in the highland areas of the country are more likely to be stunted and underweight than those living in urban, central, lowland areas.

In terms of stunting, LSIS 2011/12 indicated that children living in rural villages are almost twice as likely to be stunted than children living in urban areas (47.8 and 53.8 percent in rural villages with and without road access respectively compared to 27.4 percent in urban villages). LSIS 2011/12 also showed higher rates of stunting among children in the northern and southern regions (51.4 and 46.6 percent) than in the central region (38.1 percent) (MOH and LSB 2013).

Social Factors

Important differences exist in rates of malnutrition between ethno-linguistic groups in Lao PDR (MPI 2010). LSIS 2011/12 found that stunting was higher among the Hmong-Mien (60.5 percent), Chinese-Tibetan (60.9 percent), and Mon-Khmer (55.5 percent) ethnic groups compared to the Lao-Tai group (33.4 percent) (MOH and LSB 2013). Comparison to 2006 data shows little change – according to the MICS 2006, prevalence of stunting among the Hmong was 47.2 percent, 48.5 percent among the Khamu⁸, and 31 percent among the Lao group (DoS and UNICEF 2006).

FIGURE 7: AKHA WOMEN PREPARE FOOD USING NTFPS, LUANG NAMTHA PROVINCE



Photo Credit: WFP/Bounmee Maokhamphiou, March

⁸ The Khamu are the second largest ethnicity in Lao PDR (11 percent of the population) after the Lao ethnicity (55 percent), and represent the largest sub-group of the Austro-Asiatic ethno-linguistic group (Population Census 2005, GoL and ADB 2006)

For both underweight and stunting, LSIS 2011/12 found prevalence rates declined as maternal education improved. The prevalence of underweight among children whose mothers had no formal education was 35.0 percent, among those whose mothers had primary education was 26.2 percent, those with lower secondary was 20.3 percent and amongst those with upper secondary education was 12.8 percent. Likewise, stunting rates were 57.9, 43.2, 34.0, and 23.1 percent among children whose mothers had no education, primary, lower secondary and upper secondary education respectively (MOH and LSB 2013).

Economic Factors

To further contextualize the distribution of malnutrition, a clear pattern emerges according to income quintile. LSIS 2011/12 found inverse correlations between the rate of stunting and income quintile: 55.4 percent of children in the poorest quintile were stunted, 43.6 percent in second quintile, 33.8 percent in the third, 25.5 percent in the fourth, and 14.6 percent of children were stunted in the richest quintile. This is consistent with well-established linkages between poverty and food insecurity, whereby poorer households are more likely to be food insecure.

Maternal Nutrition

The NIOPH 2010 Nutritional Assessment of 4,600 women aged 15-49 years across nine provinces indicated that 14 percent were underweight. The CFSVA (2006) had found rates of 11.5 percent within a smaller sample of 3,500 rural women, as well as 37 percent of women with moderate anaemia and Vitamin A deficiency combined. The National Nutrition Survey (NNS 2006) that supplemented MICS 2006 weighed 927 non-pregnant women and found 14.5 percent underweight. Both the CFSVA and NNS also assessed overweight and obesity among non-pregnant women of reproductive age in Lao PDR. According to the CFSVA, 11.3 percent of the sample was found to have BMI of more than 25, the international threshold for overweight. The NNS 2006 found 14.3 percent overweight and obese. With the correlation between stunting and subsequent risks of obesity well identified (Wells 2012), there is a need for further research into the implications of the double burden posed by over- and undernutrition in Lao PDR.

Hidden Hunger/Micronutrient Deficiencies

Micronutrient deficiencies, also referred to as the 'hidden hunger' because of their negative influence on mental and physical development, have been recognized as an important manifestation of malnutrition. Micronutrient deficiencies are a direct result of a lack of vitamin and mineral rich foods in the diet and/or an inability to absorb certain vitamins due to, for example, the lack of fat in the diet. Data from LSIS 2011/12 is limited to coverage estimates for vitamin A (59.1 percent of children under 5) and for iodized salt (79.5 percent of households). Data from MICS 2006 therefore provides the last national estimates for prevalence of deficiencies as measured from blood and urine analysis.

TABLE 7: SELECTED MICRONUTRIENT DEFICIENCIES, MICS-NNS 2006

	Children (under 5)	Women (12 to 49 yrs)
Vitamin A deficient	42	23
Anaemic	40	36.2 (non-pregnant)
Iodine deficient ⁸	--	14

Food Utilization

In food security contexts, food utilization explores how food obtained is prepared, stored, consumed and then utilized by the body. The body's ability to take up nutrients is a function of factors such as disease status and actual food intake. Thus this component covers aspects of morbidity, care and feeding practices, water, sanitation and hygiene, and food storage.

Immediate causes of Malnutrition¹⁰

A child's dietary intake and disease status directly impact on his/her nutritional status by affecting the (bio)-availability and absorption of essential nutrients. While there is limited data available on individual child dietary intake in Lao PDR, household food consumption patterns can be used as proxies for individual dietary diversity. In general, the available data suggests that while there is a relatively high degree of diversity in the average household, intake of specific food groups, particularly fats and protein, is notably low, leading to an imbalance of the diet, i.e. disproportionately high in carbohydrates relative to other food groups (WFP 2007). A number of smaller studies predominantly conducted in the Northern provinces, while not nationally representative, have nonetheless lent additional support to this conclusion (Krahn 2005, Kaufmann 2008, Foppes et al 2011). Furthermore, dietary diversity does not always extend to children under five, with the NioPH 2010 Nutritional Assessment indicating that 84 percent of children between the ages of 6 to 23 months were receiving a less than adequate diet- that is, comprised of four food groups or less.

While an inadequate diet results in the lack of and/or limited bioavailability of micronutrients, common childhood infections such as diarrhoea, respiratory tract infection, malaria and parasitic infections can severely hamper the body's ability to absorb nutrients. Malnourished children have weakened immune systems making them more susceptible to infection and more at risk for severe and prolonged illness, leading to a cycle of malnutrition and infection. In 2012, 10 percent of children 6 to 59 months had diarrhoea, with greater prevalence in the north (15 percent) compared to the centre (8 percent) and south (7 percent). In addition, 14 percent of children under 5 years of age reportedly had a fever in the two weeks prior to the survey, ranging from 4 to 23 percent by province, and 3 percent reportedly had suspected pneumonia (MOH and LSB 2013). While LSIS did collect data on prevalence of parasitic infections, NNS 2006 found that among children 24 to 59 months of age, 53.9 percent had at least one parasite, with higher levels in the north (70.9 percent). According to a more recent

9 The 2006 MICS-NNS tested levels of urinary iodine as an indicator of recent dietary iodine intake. It based analysis of population level iodine deficiency on the 2007 WHO/UNICEF/ICCIDD guidelines, in which iodine sufficiency for non-pregnant women of reproductive age is established as within the range of 100-299 µg/l.

10 Terminology used in this section and the next (Immediate and Underlying Causes) are derived from the UNICEF nutrition conceptual framework included on page 9.

estimate, prevalence of soil-transmitted helminthes (intestinal worms) among 12-59 month old children is high at 41.6 percent, rising to 62 percent among school-aged children (6-11 years) (Boselli et al. 2011).

Underlying causes of Malnutrition

Maternal Care

The first 1000 days of a child’s life, from inception to 23 months, are viewed as a particularly important ‘window of opportunity’ to improve nutrition outcomes. Maternal care plays a central role in the early health and nutrition status of the foetus and infant, measured by indicators such as antenatal care, iron/folic acid supplementation during pregnancy, birth weight of the infant, and presence of a skilled attendant at birth, among others. Antenatal care is an important means of providing micronutrient support (e.g. iron/folic acid tablets) to pregnant mothers as well as important information on proper nutrition and weight gain during pregnancy. Data from LSIS 2011/12 indicated that only one in three (37 percent) pregnant women have at least 4 antenatal visits, although there are dramatic differences by wealth quintile and level of education. A similar pattern can be seen for presence of a skilled attendant at birth (Table 8).

TABLE 8: PERCENT OF WOMEN RECEIVING THE RECOMMENDED NUMBER OF ANTENATAL CARE VISITS AND ASSISTED DELIVERY BY LEVEL OF EDUCATION AND WEALTH QUINTILE, LSIS 2011/12

	Level of education							Wealth quintile				
	None	Primary	Lower secondary	Upper secondary	Post secondary non-tertiary	Higher	1	2	3	4	5	
4 or more antenatal visits	8.8	34.0	56.0	78.0	84.8	87.0	9.1	19.3	41.4	56.8	82.6	
Delivery by health personnel	16.1	34.8	63.9	86.3	89.6	92.8	10.8	23.9	45.0	64.3	90.7	

Low birth weight of an infant (<2500 grams) is a reflection of both the mother and the child’s health and nutrition status. Newborns’ with low birth weight are at greater risk of cognitive disabilities, illness, and death. In Lao PDR, few babies are weighed at birth: According to LSIS 2011/12, only 42.5 percent of the infants were weighed at birth, and of these infants, 14.8 percent were underweight (MOH and LSB 2013).

Feeding Practices

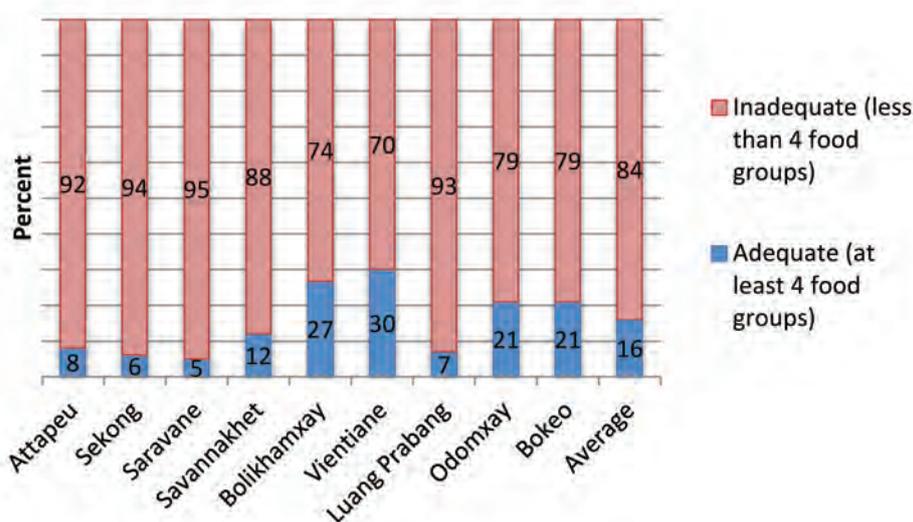
Indicators of appropriate IYCF practices include early initiation of breastfeeding (within the first hour after birth), exclusive breastfeeding for 6 months, timely and appropriate introduction of complementary foods, and minimum dietary diversity for children 6-23 months. LSIS 2011/12 found that 70.5 percent of women in Lao PDR began breastfeeding within the first day (only

39.1 percent began within the first hour) and only 40.4 percent of children less than 6 months were exclusively breastfed.

For all early initiation indicators, rates were higher in urban areas compared to rural and amongst women with higher educational attainment. However, rates of exclusive breastfeeding did not follow the same patterns: only 38.2 percent of children 0 to 5 months exclusively breastfed in urban areas compared to 42.4 and 30.1 percent in rural areas with and without road access; and the proportion of women exclusively breastfeeding appears to be little affected by her level of education.

LSIS 2011/12 also found that only 43 percent of children aged 6 to 23 months were fed 'appropriately', an indicator based on breastfeeding status and age-appropriate minimum thresholds for complementary feeding. Taken all together, these indicators reveal low levels of appropriate breastfeeding and complementary feeding practice in Lao PDR.

FIGURE 8: CHILD FOOD DIVERSITY SCORE FOR CHILDREN 6 TO 23 MONTHS OF AGE, 2010



Source: NloPH-DEC-UNICEF 2010

IYCF practices reflect not only on mother's knowledge of nutrition and care practices, but also on socio-cultural factors influencing the mother's role in the household and in society. The NloPH 2010 Nutritional Assessment noted that

Mothers have no adequate time to give adequate attention to their children, because of workload. They are involved in the collecting of wild food, firewood and water as well as cooking and carrying out other household duties. They are also, involved in providing income and other resources required for feeding the family. It has been reported by the field teams that many mothers left their young children in their house and work on their farmland far from home or went to the forest to look for forest food. This survey coincided with the onset of rainy season when adults, including mothers, were busy in their farmland that might reduce childcare, and increase childhood diseases (like diarrhoea and acute respiratory infections) that would impact on negatively on child nutrition.

As women's traditional roles tend to entail all food preparation, household upkeep, childcare, washing and fuel wood collection, as well as agricultural labour. As a result, feeding practice and food utilization holds significant implications for the role of women in Lao PDR society.

Water and Sanitation

Access to sufficient clean drinking water, a clean and hygienic environment, and practice/ adoption of important sanitary behaviours are also closely linked to child nutritional status. Access to improved water has increased dramatically, with 70 percent of households reportedly using improved sources of drinking water. Of note is the improvement in the north, where 79.4 percent reported using improved sources compared to 64.8 percent in the centre, and 67.1 percent in the south. Common water sources in rural Lao PDR include rivers, streams and dams (ACO 2012).

In terms of sanitation, LSIS 2011/12 identified significant differences between regions, with a greater proportion of households in the north (61.3 percent) and centre (67.8 percent) reporting improved sanitation facilities compared to in the south (34.8 percent). In addition, disposal of child excreta is noted as a particular sanitation concern. LSIS 2011/12 found that only 18.6 percent of households disposed of child excreta safely. The practice increased substantially in households with improved sanitation (35.5 percent) compared to households with unimproved (8.4 percent) or in those resorting to open defecation (1.0 percent).

Food Storage

In terms of rural household level food storage, most households maintain a granary or storeroom for own stocks of un-threshed rice. Granaries are traditionally constructed of locally available natural materials such as bamboo and thatch. Less than 15 percent of Lao villages have rice banks or communal storage facilities (ACO 2011). In Laos, farmers commonly report chronic annual grain losses caused by rodents in the upland environment of up to 30 percent. In addition, many areas have episodic outbreaks of rodent populations that can lead to losses by individual farmers of 50 percent to 100 percent (see also the section below on Hazards/Shocks (Aplin et al 2006)). Pests or rodent infestation in storage may cause additional losses. Traditional milling methods contribute to lower recovery rates (that is, the amount of rice fit for consumption remaining after milling), although such methods also retain more of the rice bran, making the overall nutrient load higher. Although largely limited to rice storage, this data goes to suggest that although overall production rates are high enough to ensure national level self-sufficiency, the total volume of food that makes it into the household pot may be considerably less (and of lower quality) than production figures alone would indicate.

Hazards/Shocks

A hazard, defined by the UN International Strategy on Disaster Reduction, is 'A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage'.

Vulnerability is further defined as 'the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard' (UNISDR online). Thus an individual household's vulnerability to food security and malnutrition can

be expressed as a function of both its exposure to hazard(s) and its ability to cope (available coping strategies), which is in turn informed by the diversity and sustainability of livelihood strategies and available assets.

Hazards

The major natural hazards in Lao PDR include: floods, drought, storms, disease outbreaks and epidemics, and agricultural pests and rodent infestations. Man-made hazards include unexploded ordinances (UXOs), deforestation, hazards related to commercial and industrial growth, and economic shocks such as price fluctuations or market access. In the last 5 years, the country has experienced number of hazards, including:

- Floods in 2008, 2009, and 2011 that affected approximately 241,190 people,
- Flash flooding in 2011 that affected 430,000 people,
- Rodent infestations in Northern Laos in 2008 estimated to have affected 85,000 to 140,000 people,
- Tropical storm Ketsana in 2009 that affected approximately 128,890 people (EM-DAT 2012, WFP 2009a) across four provinces.

Other potential hazards include forest and land fires and earthquakes (NDMO & UNDP 2011). According to National Economic Research Institute, more than 30 earthquakes occurred in Northern Laos between 2009 and 2011, although the number of affected persons is not known (NERI 2012).

TABLE 9: HAZARDS AND AFFECTED POPULATION, 1960-2012

Hazard	# of events 1960- 2012*	Total affected population ¹⁰
Floods	19	3,485,340
Drought	5	4,250,000
Storms	5	1,436,199
Disease outbreaks & epidemics	8	19,929
Flash flood/Landslides	1	430,000

Adapted from EM-DAT International Disaster Database (www.emdat.be)

At a national level, it is anticipated that the frequency of climate-related hazards will continue to rise as global climate change accelerates (Rasabud 2011). This is borne out by perceptions at the village level. According to the 2010/11 Agriculture Census, 79 percent of village heads believed conditions were drier than they were 10 years ago and 73 percent felt the rains are coming later than they used to (ACO 2010/11). Moreover, 31 percent believed the village was more prone to flooding and 70 percent believed it was more prone to drought. Exposure to UXOs is also anticipated to rise as the demand for and pressure on land and natural resources increases. The 2010/11 Agriculture Census reported that one in six villages have agricultural land affected by UXO, covering an estimated 170,000 hectares in total.¹²

¹¹ Affected population encompasses those people requiring immediate assistance during a period of emergency, i.e. requiring basic needs such as food, water, shelter, sanitation, and immediate medical assistance.

¹² The provinces most affected by UXOs, measured by density, include Khammouan, Savannakhet,

Deforestation as a result of timber harvesting or conversion of land to agricultural production is expected to continue as pressure for land and natural resources continues (WB 2008). In addition, urban, environmental or “technological” hazards are likely to increase as industrial growth continues in Lao PDR: in rural areas, growth in hydro-power, mining and commercial agriculture sectors is likely to affect livelihoods and food security in a mixture of ways. On the one hand, growth may reduce access to productive land and natural resources and negatively impact the quality of water and land, while on the other, it may provide opportunities to diversify livelihood strategies (WFP 2007, WFP 2009b, NDMO and UNDP 2011). Finally, while the global financial crisis and price fluctuations in 2006-2008 have by and large had limited impact on Lao PDR (ADB 2010), this is expected to change as a growing number of households engage in commercial agriculture, shift towards a greater reliance on purchased foods and as a result become more vulnerable to fluctuations in price and market access.

Vulnerability and Coping Mechanisms

Coping Mechanisms

A household’s coping strategies are a function of its livelihood strategy and available assets. Applying coping strategies is an important means of supporting household resilience when shocks occur. Capacity to cope is strongly correlated with household wealth. For rural households, common coping strategies include consumption of wild foods, reduction or change in food consumption patterns, borrowing or help from relatives, use of credit to buy food (WFP 2007, WFP 2009b, FAO & WFP 2010). Thus access to forests and/or rivers, strong social networks and access to credit are important household assets (WFP 2007). Other important coping strategies include casual labour and livestock sales. According to the 2010/11 Agricultural Census, the use of outside labour by farm households nearly doubled since 1998/99, from 26 percent to 45 percent.¹³ In general, extreme coping mechanisms are rarely if ever employed in Lao PDR after a shock; most coping strategies are reversible and thereby less damaging to livelihoods and food security in the long run.

Vulnerability

Vulnerability to food insecurity is a dynamic concept. As Lao PDR experiences broad socio-economic changes, both positive and negative, and household livelihoods and coping mechanisms shift, vulnerabilities also shift and change. For example, deforestation and environmental degradation may negatively impact access to natural resources, while growth in key industrial sectors such as commercial agriculture and mining may offer greater opportunities for employment and increased income.

While the growth in specific industrial sectors may negatively impact access to wild foods, the overall impact on household vulnerability is much more complex. As noted in WFP’s 2009 report, *The Impact of Agricultural Commercialization on Food Access and Livelihoods in Lao PDR*, commercial agriculture can open up important opportunities for livelihood diversification and food access (WFP 2009b). One study on contract farming in rice production

Houaphan, Xiengkhouang, Saravan, Sekong and Attapeu (ADPC 2010).

13 The provinces most affected by UXOs, measured by density, include Khammouan, Savannakhet, Houaphan, Xiengkhouang, Saravan, Sekong and Attapeu (ADPC 2010).

provided participating farmers with increased income when compared to the income of non-participating farmers (Setboonsarng et al. 2008). The growth of commercial agriculture and increasing market orientation of many farm households also increases opportunities for seasonal/casual labour which may provide farm and non-farm households with livelihood or coping strategy diversification (WFP 2009b).

Nevertheless, there is wide variation in the level of engagement in commercialization occurring amongst rural households: households that are already more 'asset-rich' are typically engaging to a greater extent, leaving the 'asset-poor' subsistence farmers more vulnerable to the negative aspects of the commercial transition (WFP 2009b). Some of the remaining questions regarding the impact of these industries (commercial agriculture, hydro-power, mining) on rural livelihoods and vulnerability include the impact of a shift from subsistence to cash-based economy and the extent to which these industries will offer upwardly mobile non-farm jobs. As both farm and non-farm households become more market-oriented, they may be increasingly vulnerable to fluctuations in price and market cycles. Little is known about the impact of transitioning to the production of cash crops on household vulnerability and food security.

As mentioned above, use of natural resources from the forest and rivers is a common coping strategy for many rural households: Non-timber forest products (NTFPs), consumed directly or sold to allow for purchase of staples, contribute significantly to household food security particularly in upland areas (NAFRI 2006). According to several studies conducted in the late 1990s and early 2000s, NTFPs are estimated to contribute between 11 and 55 percent of cash income of households, the percentage rising as proximity to forests rises (NAFRI 2006).

Summary

Food and nutrition security remains a national priority due to persistently high levels of malnutrition, manifested as both chronic malnutrition (stunting and underweight), and micronutrient deficiencies. Although malnutrition rates are easily understood, the factors underscoring them are complex and interlinking.

Geographic, social and economic factors suggesting that food insecurity and malnutrition (in all forms, including chronic, severe and hidden hunger) are determined by where households live, what livelihoods they pursue, and the extent to which they are able to benefit from the continued economic growth Lao PDR is experiencing.

As the profile of rural Lao PDR is changing from a subsistence-led model reliant on common access to wild resources (including rivers, forests and fields) to a more market-based rural context in which export oriented cash crops are cultivated alongside subsistence agriculture for own consumption. It is clear that the overall food and nutrition profile of Lao PDR is dynamic, subject to both positive and negative developments. Prevailing high levels of chronic malnutrition, manifesting as stunting, are indicative of a need for concentrated policy and programming focus in Lao PDR.

PART 4. FINDINGS

This section provides an overview of key data resulting from both components of the RVS survey. Where relevant, data has been contextualized with data from 2010/11 LCA, 2011/12 LSIS, 2007/08 LECS or other sources. Where possible, data from both qualitative and quantitative exercises have been combined. Given the difference in methodological approach and sample sizes, this report prioritizes the quantitative findings, using selected qualitative data to add further detail where applicable, but it is worth noting that the qualitative results stand on their own. The full qualitative report contains extensive information on gender roles in agriculture, as well as a fully elaborated qualitative methodology. The full qualitative report is available from CARE International.

In addition to comparisons at the level of AEZ, key indicators are also presented by expenditure quintiles. The RVS collected data on household expenditures within the last month (food and non-food items), as well as within the last six months (health, agricultural inputs, etc). Based on the responses and on household size, a daily per capita expenditure was calculated, and households were grouped into quintiles accordingly.

Summary

		Rural population	Agro-ecological zone				
			Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/Southern Highlands
Demographics	Avg. HH size	5.8	4.9	5.8	6.0	5.7	6.5
	% female-headed households	8.4	12.0	4.5	3.9	14.3	5.3
	% of HH heads with no formal education	23.6	19.0	19.8	29.6	19.4	37.4
	% of HH heads with primary education	54.4	44.9	58.2	52.7	56.1	51.1
	% of HH heads with secondary or tertiary	20.9	36.1	20.2	16.7	23.2	11.0
	% Lao-Tai	56.1	88.4	41.2	17.5	85.1	21.3
	% Mon-Khmer	31.6	7.8	29.3	55.3	14.5	78.7
	% Hmong-Mien	9.1	3.8	24.5	17.2	0.4	--
	% Chinese-Tibetan	3.2	--	4.9	10.1	--	--
	% of school-age children (6 to 17 yrs) currently attending school	83.1	93.4	89.0	87.4	79.0	71.9
Availability	Mean hectares of land cultivated in 2012	1.8	2.0	2.0	1.6	1.9	1.8
	% producing rice	93.9	94.6	24.5	17.2	0.4	--
Access	% with poor/borderline consumption (FCS)	11.2	2.3	4.8	12.2	15.7	24.8
	% with low dietary diversity (<5 food groups), HDDS	19.0	3.8	15.0	28.1	14.8	36.0
	Mean dietary diversity score (HDDS)	6.4	7.9	6.7	5.9	6.6	5.7
	% reporting inability to obtain sufficient food in past month	11.9	0.6	7.7	16.5	13.2	18.6
Nutrition	% stunted (children <5)	46.2	27.1	50.7	58.7	39.5	40.2
	% wasted (children <5)	25.3	20.7	23.2	25.6	25.2	28.4
	% underweight (children <5)	5.4	4.4	4.9	4.0	7.3	6.1
Utilization	% with Improved sanitation	53.5	95.4	67.5	48.0	45.6	19.6
	% of children <5 with diarrhoea	11.9	8.7	9.8	12.7	10.2	15.4
	% of children <5 with sub-optimal diet	55.2	19.7	42.9	59.2	50.7	76.8
	% of women with no education	35.7	20.7	28.4	46.3	24.9	57.0
	% of women with secondary or tertiary education	20.3	38.0	22.4	12.9	25.7	8.0

In terms of overall demographics of the sample, average household size was 5.8 members, with 8.4 percent of households classified as female-headed. Over half of the household heads (54.4 percent) have primary level education, while nearly one in four of household heads have no formal education. Disaggregated by sex, over half (52.8 percent) of female household heads had no formal education compared to 21 percent of male household heads. Some 83 percent of children aged 6-17 were attended attending school

Based on food consumption scores, some 11.2 percent of households were considered food insecure, with the highest concentrations of food insecurity found in the central and southern highlands, and the Mekong Corridor. These AEZ also had the highest reported inability to obtain sufficient food in the past month, as measured by the HFIAS. Malnutrition rates were highest in the northern lowlands and highlands. In terms of utilization, the majority of children less than five years of age had sub-optimal diets (55.2 percent), with the highest proportion found in the central and southern highlands.

Food Availability

Land Availability

Across all agro-ecological zones, over 90 percent of rural households reported having access to agricultural land, with the exception of Vientiane Plain (80 percent). The average household cultivated 1.8 hectares of land in 2012, although the average amount of land cultivated varies by agro-ecological zone, with an average area of 1.6 hectares in the northern highlands compared to an average of 2 hectares in Vientiane Plain and Northern Lowlands.

TABLE 10: AVERAGE HECTARES PLANTED IN 2012 (RVS 2013)

Agro-Ecological Zone	Avg. Ha
Vientiane Plain	2.0
Northern Lowlands	2.0
Northern Highlands	1.6
Mekong Corridor	1.9
Central/Southern Highlands	1.8
Total	1.8

Crop production

Production data from the RVS is largely consistent with that of the LCA, with the exception of maize and rubber. While the RVS survey was designed to be representative of agro-ecological zones and indicative of provinces, the LCA was a larger comprehensive national survey, designed to give more accurate measures at province level. The RVS found 89.2 percent of households were growing rice, compared to LCA's 93.1 percent, enough to indicate the prevailing priority in terms of production. However, where LCA found an important increase in maize production, both in terms of number of growers and hectares under cultivation, equivalent to 24 percent of the total census population, RVS found only 14.9 percent.

This may be a function of how questions in each exercise were formulated- LCA asked for data over the past 12 months, whereas RVS referred only to the previous season. As data was collected directly after the main rice harvest, respondents may not have considered crops planted and harvested earlier in the year. Moreover, as rubber may not be harvested for some years after planting, growing of rubber may also have been under-reported. Data for other crops such as cassava and sugar was consistent across both surveys.

FIGURE 9: PERCENT OF HHS REPORTING PRODUCTION OF SPECIFIC CROPS IN 2012 (RVS 2013)

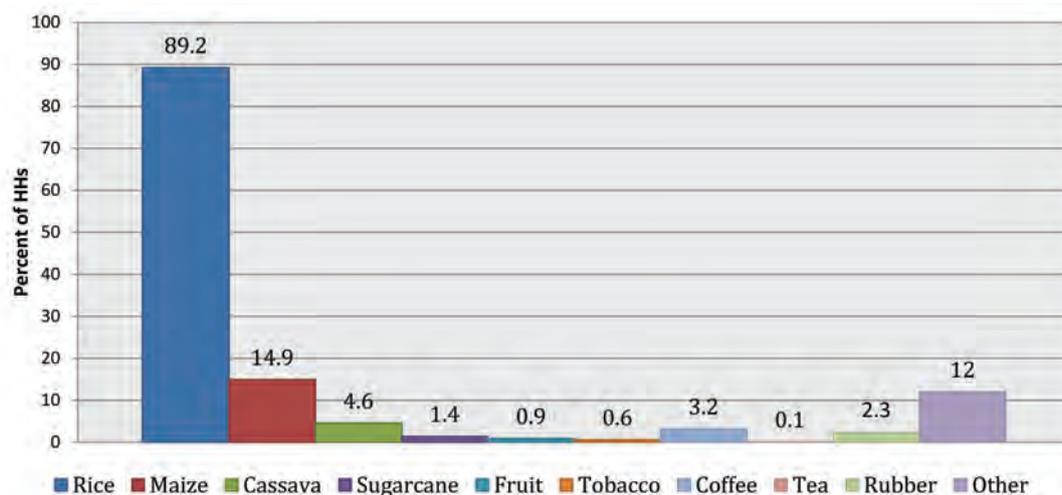
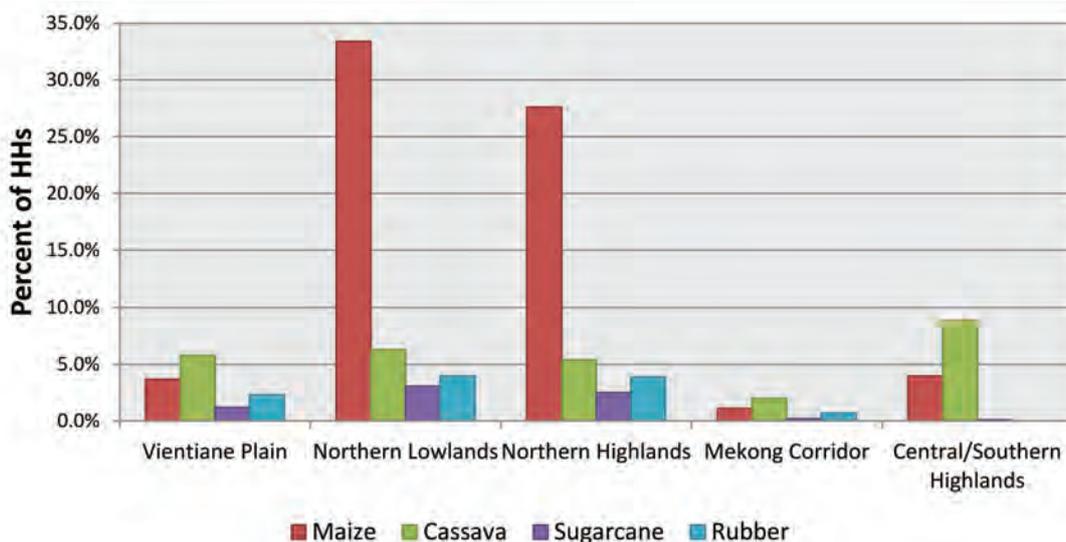


FIGURE 10: PERCENT OF HHS REPORTING PRODUCTION OF SPECIFIC CROPS IN 2012 BY AEZ (RVS 2013)



Comparing RVS data to LCA data requires careful interpretation, as administrative regions do not match precisely with AEZ. Nevertheless, for the purposes of comparison, data from the LCA summary (p.32, 38) is included here, to indicate the expanding importance of maize and rubber in the north of Lao PDR.

TABLE 11: LAO AGRICULTURAL CENSUS DATA ON NUMBER OF GROWERS FOR SELECTED CROPS, PER REGION (PER 100,000)

Region	Total number hholds ¹³ (<i>,000s</i>)	RICE	MAIZE	CASSAVA	SUGAR	RUBBER
North	287.6	265.8	118.5	20.8	7.7	43.3
Central	333.2	319.9	47.2	15.9	3.3	5.2
South	155.8	137.9	21.7	11.2	2.0	0.6
TOTAL	776.7	723.9	187.3	47.9	13.0	49.0

Livestock

Poultry (chicken and ducks) is the most common livestock for rural households in Lao PDR – 80 percent of households have some poultry. Larger flock sizes (more than 21 chicken) are more common in Vientiane Plain and Northern lowlands suggesting greater opportunities for market-oriented livestock production.

Pigs are also commonly owned (51 percent), particularly by households in the northern regions. Some 58 and 69 percent of households owned at least one pig in Northern Lowlands and Northern Highlands respectively. In the north, a greater proportion of households own more than 3 pigs, while in the southern and central highlands and Mekong Corridor, the majority of households with pigs own one or two head.

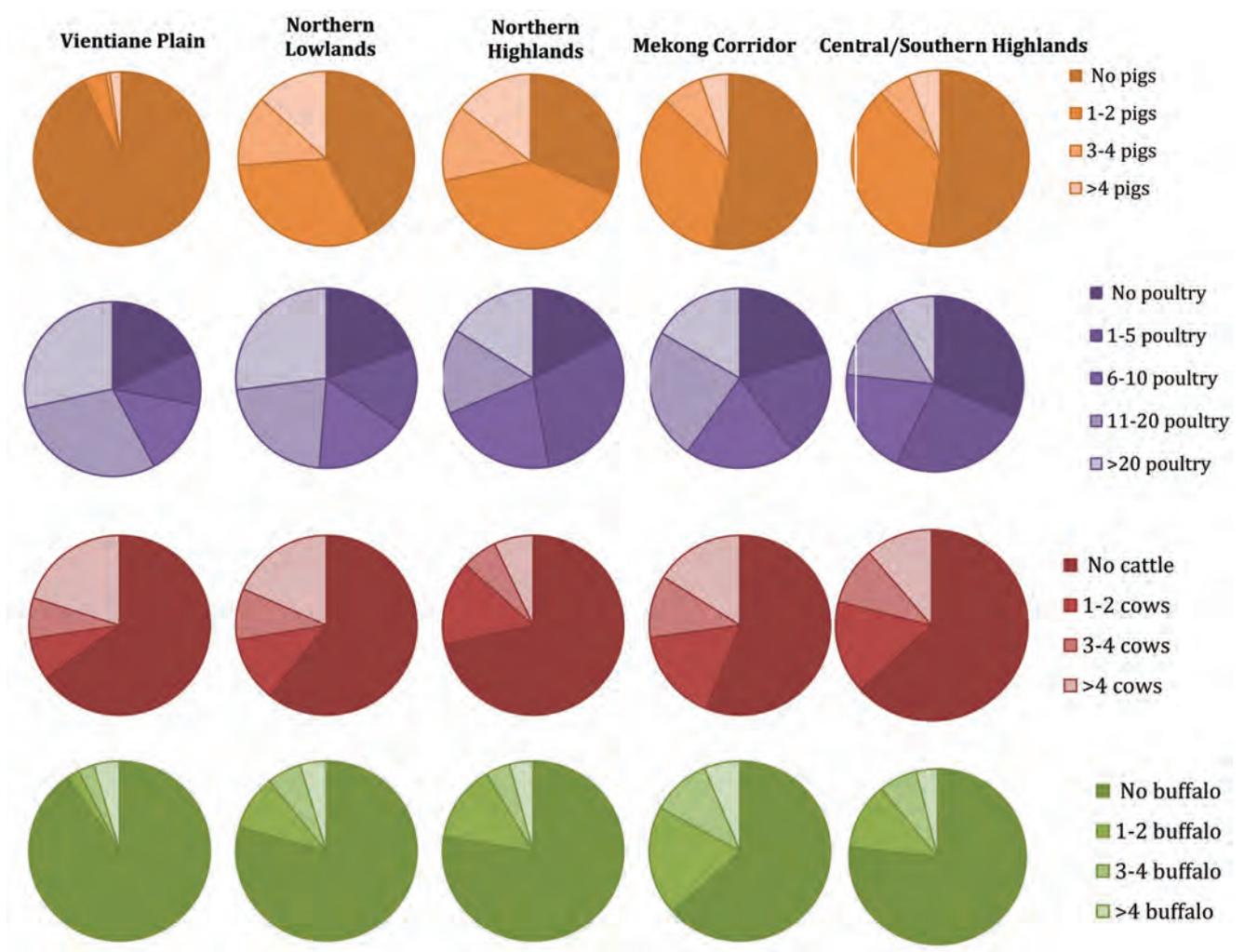
Larger livestock (cattle and buffalo) are less common, with 38 percent of total households owning at least one cow and 26 percent owning at least one buffalo. Ownership of large livestock is more common in the Mekong corridor, although herds are usually larger in the northern lowlands and Vientiane Plain (for cattle) again suggesting greater opportunities for market-oriented livestock production. Buffalo herds are larger in Mekong corridor, although this may be a function of greater rice production and their use as draft animals, rather than for meat or sale.

TABLE 12: HHS THAT OWN AT LEAST ONE OF EACH LIVESTOCK, PER SPECIES (RVS 2013)

HHs that own at least one of each species of livestock					
	Cattle	Buffalo	goat	Pig	poultry
VP	34.9%	9.7%	3.2%	7.1%	82.1%
NL	39.2%	20.7%	6.5%	58.1%	80.5%
NH	28.4%	22.5%	9.5%	68.9%	82.8%
MC	43.9%	36.8%	5.3%	46.9%	79.5%
CSH	36.8%	23.3%	11.6%	48.0%	68.7%
TOTAL	37.8%	25.7%	7.0%	51.0%	79.6%

14 Classified in the LAC summary report as a 'land holding', this refers to a rural household cultivating land for ease of use, it is referred to as a 'household' in this report.

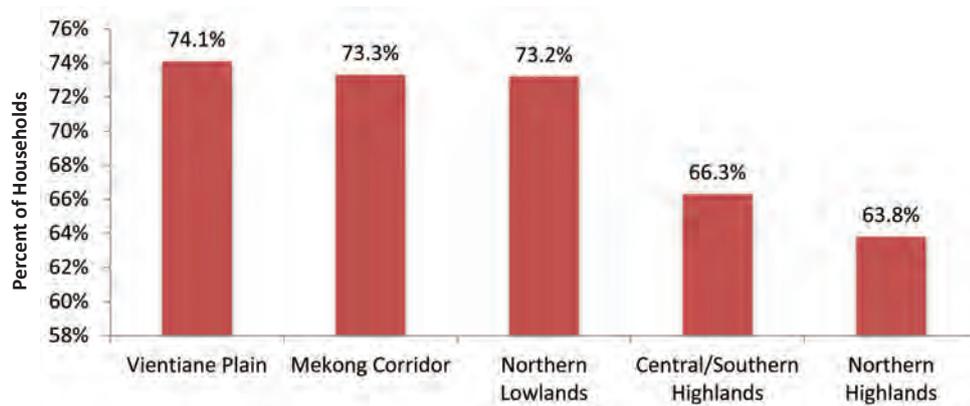
FIGURE 11: LIVESTOCK HERD SIZES BY AEZ (RVS 2013)



Vegetable plots

Nationally 70.5% of rural households have a vegetable garden, which is the same as reported in the LCA. Vegetable plots are slightly less common in the highlands, which may be a reflection of available space and priorities for crop production. Vegetable plots also appear to be less common among households in the lower quintile (62 percent of HHs) compared to the highest (75 percent of HHs).

FIGURE 12: PERCENT OF HHS WITH A VEGETABLE PLOT BY AEZ (RVS 2013)



Tractors and Irrigation

Some 36.8 percent of households reported owning a two-wheel tractor, with an additional 4.7 percent owning a four-wheel tractor. Ownership was highest in the Mekong Corridor, with nearly 60 percent owning a tractor, followed by Vientiane Plain (53.1 percent). Tractor ownership was lowest in the northern highlands (13.9 percent), where terrain makes tractor use difficult. These results track well with LCA, which reported over one-third of households owning a two-wheel tractor. This marks a substantial improvement in mechanization since 1998/99, when only 7 percent of households owned a tractor. Further to this, in asking households if they used a tractor, the LCA found that 61 percent reported using a tractor, suggesting that households likely share tractors.

TABLE 13: OWNERSHIP OF A TWO OR FOUR-WHEELED TRACTOR (RVS 2013)

Agro-ecological zones	Own 2-wheel tractor	Own 4-wheel tractor
Vientiane Plain	50.9	3.2
Northern Lowlands	32.3	6.3
Northern Highlands	11.7	2.4
Mekong Corridor	54.6	5.7
Central/Southern Highlands	31.7	3.3
Total	36.8	4.7

In the 288 villages visited by the RVS, 52 percent reported that they had access to some type of irrigation facilities. The most common kind was a temporary weir. However, access to irrigation facilities does not directly translate to use of the irrigation facilities, or equitable across households.

TABLE 14: PERCENT OF VILLAGES WITH DIFFERENT TYPES OF IRRIGATION FACILITIES (LCA 2010/11)

Type of irrigation	Percent of RVS villages	Type of irrigation	Percent of RVS villages
weir	18.3	temporary weir	26.6
reservoir	7.6	gabions	6.9
pump	9.7	other	3.5
gates	3.1		

Food Access

Household access to food is informed by its asset base, which in turn informs its livelihood strategies for income and for food. Reports of food consumption patterns and sourcing of food at household level provides a critical window into both how and what foods households are capable of accessing. Purchasing power and access to markets are also key factors influencing a household's ability to access a nutritious and diverse diet, particularly for those food items which are not produced locally, as in the case of fats/oil in Lao PDR.

Livelihood Strategies

Village Profiles

Adapted from the findings of the qualitative report, three general village profiles were developed- while not exhaustive, insofar as other village profiles may yet be identified, this classification provides a good snapshot of the overall village level context in rural Lao PDR. Table 15 describes each general livelihood profile.

Market-oriented farming: characteristics of this village profile include: (i) irrigated paddy-based farming systems; (ii) extensive support from district authorities to develop market-based systems; and (iii) off-farm labour opportunities in the lean season. Rice production may be the primary livelihood, or may co-exist with other agricultural production of high-value food and cash crops. Villages in this category maintain decent hygiene and sanitation systems, including sufficient water supply and toilets. There may be abundant NTFP food sources available in the vicinity of the village, but forests foods are mostly collected for own consumption rather than for sale.

Part-time farming: Characterized by good proximity to markets, in terms of both food and rural labour, these villages may have diversified livelihoods, reliant on both on and off farm income to meet their basic needs. Agricultural productivity may be limited, as result of good availability of off-farm employment opportunities close by resettlement, poor land/soil/water quality, or a combination thereof. Rice production may be the primary livelihood, or may coexist with on- and off-farm livelihood activities. Typical for this village category is the lack of natural resources (as a source of food) proximate to the village. Despite generally short distances to district capitals and good access to markets, hygiene and sanitation practice and knowledge may still be low.

Rice-based conservation upland farming: Typical for villages in this category is rice-based upland farming system supporting reasonably stable year-to-year rice production. Due to distances from district centres and major markets, self-sufficient food production continues to be the prevailing form of agricultural activity. Livelihoods are characterized by an abundance of forest resources around the villages. Depending on the extent to which income is generated from cash crops, animal-raising or NTFPs, the areas under shifting cultivation is decreased. Potential exists for expanding upland farming practices through sustainable harvest and domestication of NTFPs or selling of abundant wildlife species (e.g. wild pigs) to meet high market demand for these products.

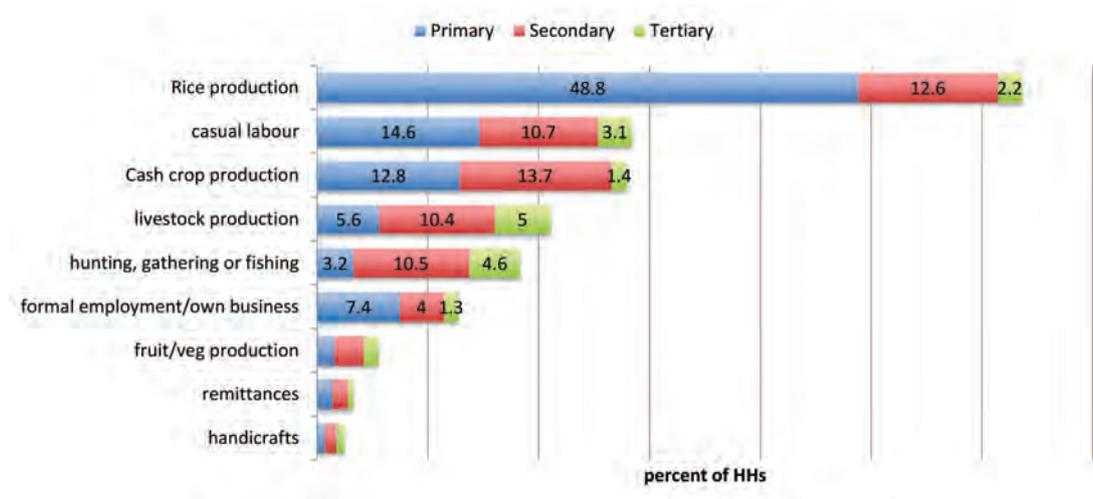
TABLE 15: LIVELIHOOD ASSETS PER VILLAGE PROFILE

Village category	Livelihood Assets						
	Infrastructure (roads, electricity)	Market access (food/inputs)	Access to labour markets	Access to land	NTFPs	Health services	Exposure to hazards
Market-oriented farming	Good – year-round road access to district; electricity, availability of vehicles, TV, radio, phones depending on poverty level of households	Good- cash income from cash crops and livestock form basis for livelihoods, food is more bought on markets	Good – temporary and seasonal employment opportunities	Good - land access is good and based on established customary rules, and irrigation land organized by water user groups. Risks: competing pressures on land use, incomplete formal land titling	Good – primarily collected as for own consumption and to a minor extent as income	Good– sufficient water supply, toilets, use of health centres	High - exposure to natural hazards (flood) and livestock disease outbreaks
Part-time farming	Good – year-round road access; electricity, availability of vehicles, TV, radio, phones depending on poverty level of households	Good- food processing and handicrafts can be sold at markets nearby; food/ inputs can be bought on local markets Risk: indebtedness, change in gender relation family	Good – temporary employment opportunities for men on construction sites, or seasonal opportunities in sawmill Risk: temporary and seasonal labour market	Poor- land pressures on proximate areas, long distance to distant upland areas Risk: competing pressures on land use both for agricultural land, forests, and other natural resources	Poor - increased population pressure on community forests; forests mainly used for vegetables (e.g. fern, bamboo shoots)	Limited - Water supply systems, proximity to district health, no toilets	High - Exposure to natural hazards (flood and drought) and livestock disease outbreaks
Rice-based conservation upland farming system	Limited - road access limited during rainy season; electricity, TV, radio, phones of growing importance, transport means still very scarce	Improving - Cash income of growing importance, market access difficult, but market networks develop fast for vegetables, livestock, NTFPs, plantation crops	Poor –limited infrastructure, and due to lack of Lao language, fewer opportunities	Good - land access is good and based on customary rules. Risk: external claims on land, trees and forest, no land certificates	Very Good- NTFPs an important source of both income and nutrition.	Limited – sufficient water supply, use of district and health centre facilities in emergencies, no toilets	Medium –recurring livestock disease outbreaks, pests (wild pig, rats, Birds) occurrence of minor floods and droughts

Household Sources of Income

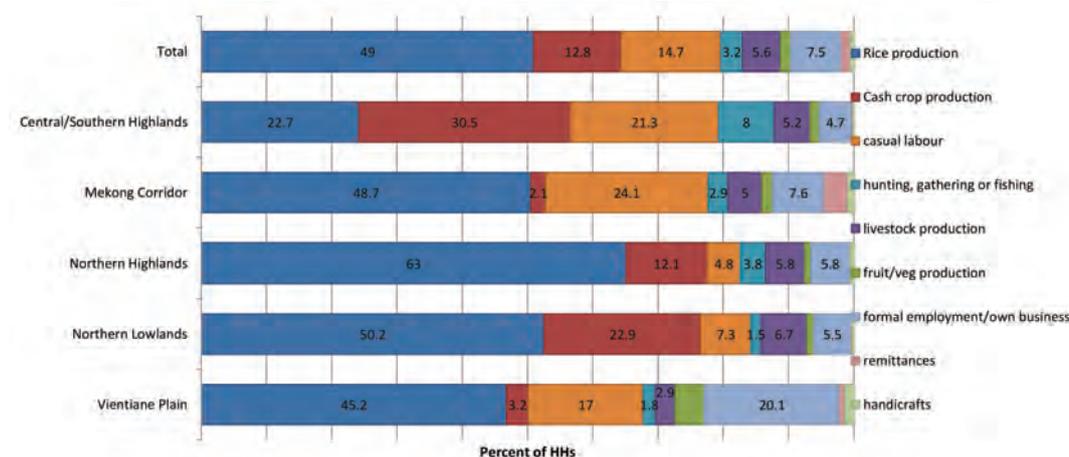
In the quantitative component, households were asked to identify and rank their three most important sources of income. At the national level, rice production was identified by 49 percent of households as the primary source of income. After rice production, 15 percent of households said that casual labour was their most important strategy for generating income, followed by 13 percent of households relying on cash crop production for their primary source of income. Rice production remains the prevailing strategy, more frequently practiced than the next five primary livelihoods combined.

FIGURE 13: PROPORTION OF HHS IDENTIFYING SELECTED LIVELIHOOD STRATEGIES ACCORDING TO THEIR PRIMARY, SECONDARY OR TERTIARY IMPORTANCE AS A SOURCE OF INCOME



When disaggregated by AEZ, 63 percent of households in the northern highlands identified rice production as their main source of income, compared to only 23 percent of households in the central/southern highlands. In the central/southern highlands, cash crop production was reported as the primary income source by 30 percent of households and an additional 21 percent reported casual labour. Casual labour was also reported by one in four households in the Mekong corridor as a primary strategy for generating income.

FIGURE 14: PROPORTION OF HHS PER AEZ IDENTIFYING SELECTED LIVELIHOOD STRATEGIES AS THEIR PRIMARY SOURCE OF INCOME



Food Consumption

Number of Meals Consumed

The number of meals that a household consumes one day prior to an assessment is a quick food access indicator. Under normal circumstances, members of the household over 5 years of age are expected to consume at least three meals a day to enable them to meet their daily calorific requirements. Additionally, a sudden reduction in the number of meals taken by the household may be indicative of reduced access to food. In this analysis, a meal was defined as per the perception of the interviewed households.

Most of the households (97.2 percent) consumed 3 meals and almost all of the households (99.5 percent) considered the number of meals the day prior the survey to be normal. In the central and southern highlands, 8.5 percent consumed less than three meals in the previous day, the highest recorded of the AEZs.

Food Consumption Patterns

The Food Consumption Score (FCS) is a tool developed to calculate dietary diversity by food group and frequency of consumption. Respondents were asked to recall how many days in the past seven days they consumed food from seven food groups. The score is constructed by multiplying the number of days a HH consumed food items within each food group by the group's designated weight, based on the relative nutritive value and its common share in the overall diet. Table 16 details food groups and weights.

TABLE 16: FOOD GROUPS AND WEIGHTS FOR THE FOOD CONSUMPTION SCORE

	Food Items	Food group	Weight
1	Maize, maize porridge, rice, sorghum, millet, pasta, bread, and other cereals	Cereals and Tubers	2
2	Cassava, potatoes, and sweet potatoes		
3	Beans, peas, groundnuts and cashew nuts	Pulses	3
4	Vegetables and leaves	Vegetables	1
5	Fruits	Fruit	1
6	Beef, goat, poultry pork, eggs and fish	Meat and Fish	4
7	Milk, yoghurt and other dairy	Milk	4
8	Sugar and sugar products	Sugar	0.5
9	Oils, fats and butter	Oil	0.5
10	Condiments	Condiments	0

In addition to the food consumption score, household dietary diversity score (HDDS) measures the household food consumption according through a 24-hour recall. Households were asked to recall if they ate a food from 12 food groups yesterday, responding with a yes or no answer. The yes answers are then summed for a score ranging from 0 to 12. A more diversified diet is highly correlated with caloric and protein adequacy and household income.

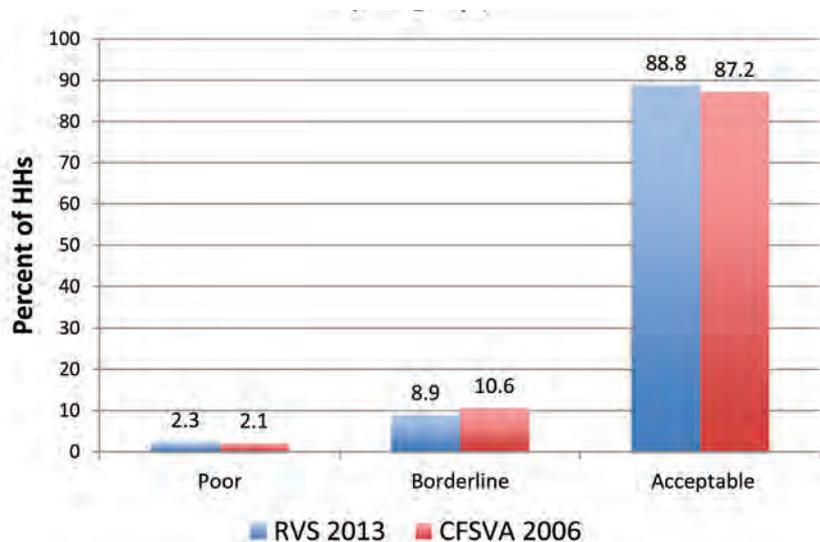
TABLE 17: FOOD GROUPS FOR THE HOUSEHOLD DIETARY DIVERSITY SCORE

1	Cereals	7	Pulses, legumes and nuts
2	Roots and Tubers	8	Milk and dairy products
3	Fish and other aquatic animals	9	Fruits
4	Meat, poultry, offal	10	Oil/fats
5	Vegetables	11	Sugar/honey
6	Eggs	12	Condiments

As will be discussed further in this report, FCS and HDDS take dietary diversity as a proxy for adequate consumption, but it should be noted that neither reveal any information on the quantities consumed or intra-household distribution of that food.

Since the 2006 CFSVA, the pattern of food consumption appears to have changed little for the average rural household in Lao PDR, with the majority (89 percent) consuming an acceptably diverse diet in 2013. Both surveys found around 88 percent consuming an acceptable diet, despite the fact that the surveys were undertaken at different times. The CFSVA was undertaken toward the end of the lean season and just prior to the wet season rice harvest (October and mid-November), when households are beginning to access food from own production again, while the RVS was undertaken immediately after the harvest when most households are expected to have sufficient food.

FIGURE 15: FOOD CONSUMPTION GROUPS, 2006 - 2013



Although at national level only 12 percent were found have poor or borderline consumption, there were significant differences between the proportions of households with poor or borderline consumption by agro ecological zones.

Disaggregated by agro-ecological zone (AEZ), the proportion of household with poor and borderline consumption is greater in the central and southern highlands, as well as in the northern highlands. In the central and southern highlands, one in four households (24.8 percent) has poor or borderline consumption, the highest recorded levels in the country.

Shown through the 24-hour recall (HDDS), the central and southern highlands and northern highlands also have the lowest mean dietary diversity score (see Figure 19 “Mean Household Dietary Diversity Score by AEZ”).

FIGURE 16: FOOD CONSUMPTION GROUP BY AEZ (RVS 2013)

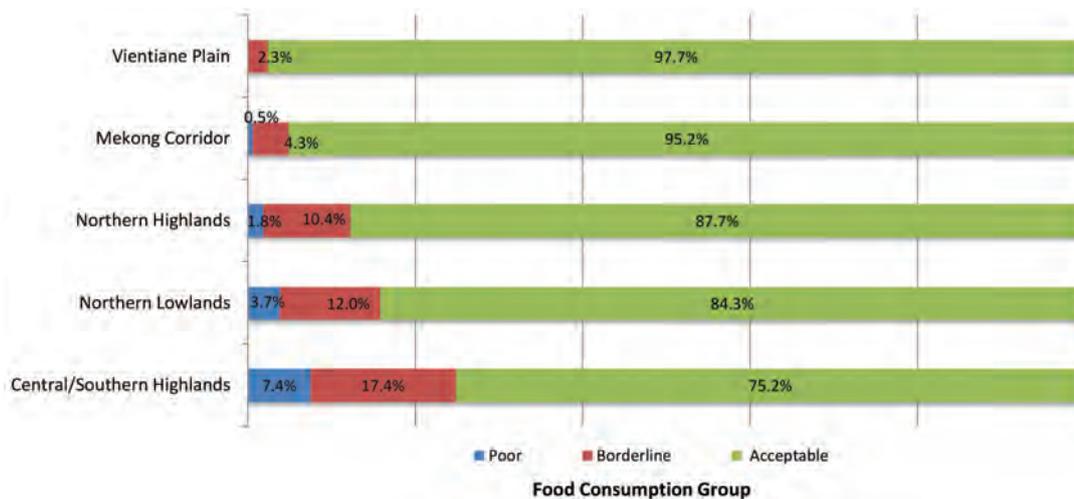
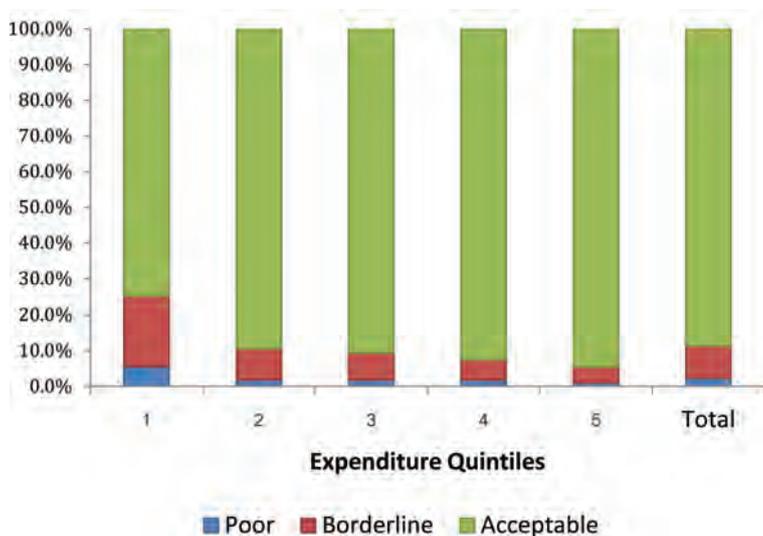


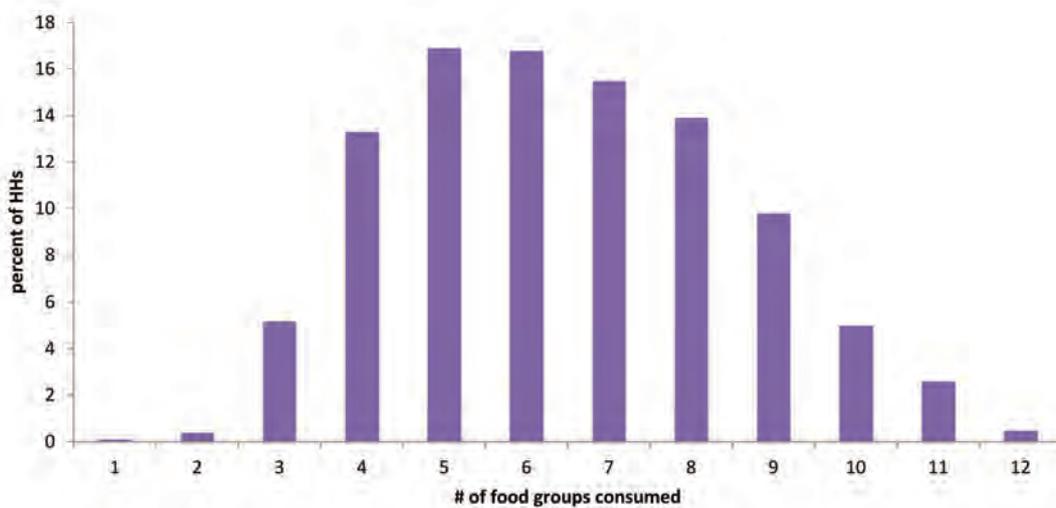
Figure 16 below indicates that households with poor or borderline consumption patterns are more commonly found amongst the poorest populations in Lao PDR, with just under 30 percent of quintile one households classified as having poor or borderline food consumption.

FIGURE 17: FOOD CONSUMPTION GROUPS BY INCOME QUINTILE (RVS 2013)



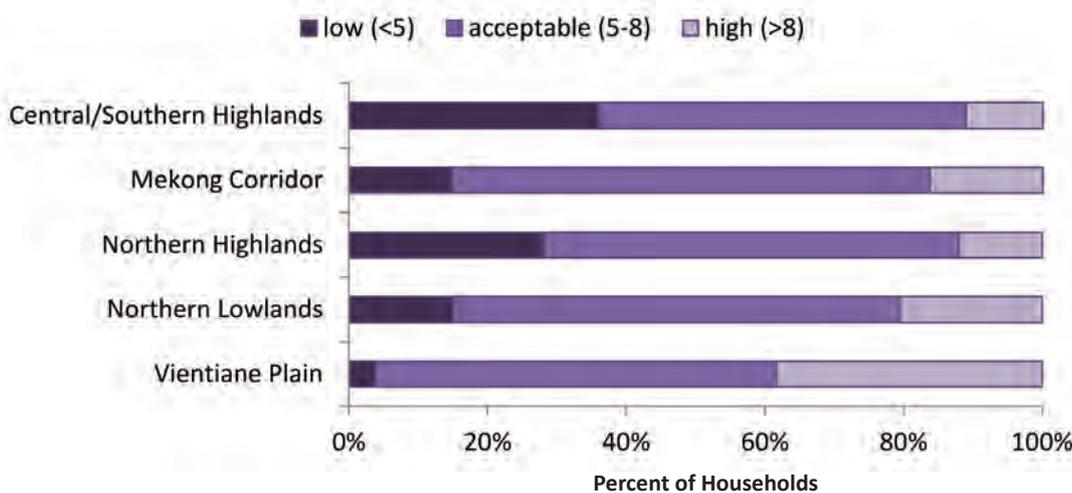
In terms of HDDS, no single internationally determined threshold exists for recommended dietary diversity, as it is dependent on local context. Nonetheless, WHO suggests that an acceptable dietary diversity score falls between 5 and 8 food groups. In Lao PDR, 63.1 percent of households consume between 5 and 8 food items according to 24-hour recall, while 19.0 percent have low dietary diversity (less than 5 food groups) and an additional 17.9 percent have high dietary diversity (more than 8 food groups).

FIGURE 18: HOUSEHOLD DIETARY DIVERSITY SCORE (RVS 2013)



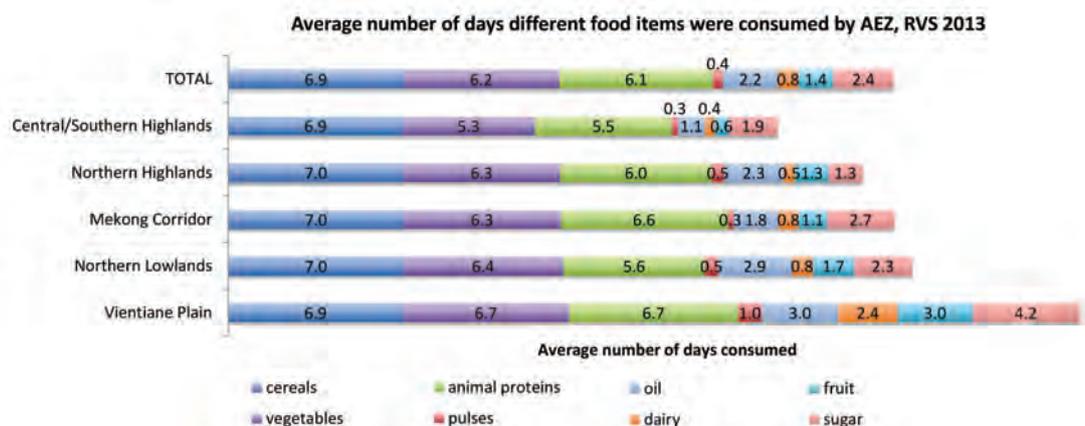
By agro-ecological zone, low diversity diets are more common amongst households in the central and southern highlands (36 percent) and northern highlands (28 percent). To recall, the food consumption scores indicated that central and southern highlands had the highest proportion of households with poor or borderline consumption, followed by the northern lowlands and then northern highlands. This data therefore corroborates the level of poor diversity in the central and southern highlands, but suggests that dietary diversity is generally worse in the northern highlands as compared to the northern lowlands.

FIGURE 19: HOUSEHOLD DIETARY DIVERSITY GROUPS (RVS 2013)



A typical meal in Lao PDR consisted of rice, vegetables and condiments. According to the 7 day recall, weekly food consumption patterns for the average rural household in Lao PDR shows almost daily consumption of staples, consumption of vegetables and animal protein between five and six days a week, and relatively low consumption of oil, fruit, milk and pulses (Figure 20).

FIGURE 20: AVERAGE NUMBER OF DAYS OF CONSUMPTION BY FOOD GROUP AND AEZ (RVS 2013)



Compared to the CFSVA 2006 data, the overall composition of the diet has also seen little change over the past seven years, with the exception of increasing consumption of animal protein (including meat, fish, other aquatic animals and eggs). Specifically, consumption of two of the most common forms of animal protein, poultry and pork, have increased by more than ten percent in each category. Consumption of fish remains high and consistent – 80 percent of households reported eating fish at least one day in the past 7 days, of which 14 percent reported eating fish daily. The average fish consumption across the rural population is 3 days per week.

As discussed earlier, FCS does not reflect quantities of food items consumed. As such, supporting secondary data from the LECS series can help to explore the trends in consumption by food category in more detail and will be discussed within each food group below.

Foods by Category

Staples:

Over the seven-day FCS recall period, 98 percent of household reported consuming rice every day. Consumption of other staples appears to be increasing overall since 2006: in those households reporting consumption, other staples (maize/corn, cassava, other roots/tubers) are eaten only on one or two days in the past 7 days.

TABLE 18: PERCENT OF HOUSEHOLD REPORTING CONSUMPTION OF STAPLES AT LEAST ONCE IN THE PAST 7 DAYS, 2006-2013

Staple	CFSVA 2006	RVS 2013
Maize/corn	15	27.9
Cassava	24	35.3
other roots/tubers	31	44.7

Looking more closely at consumption patterns of staples, maize or corn consumption appears highest amongst the Lao-Tai population (38.6 percent of households reporting consuming it at least once in the past 7 days), while consumption of cassava and other roots and tubers is more common in Mon-Khmer and Chinese-Tibetan households (Table 19).

TABLE 19: PERCENT OF HOUSEHOLDS REPORTING CONSUMPTION OF STAPLES AT LEAST ONCE IN THE PAST 7 DAYS BY ETHNICITY (RVS 2013)

Staple	Ethnic Group			
	Lao-Tai	Mon-Khmer	Hmong-Mien	Chinese-Tibetan
Maize/corn	38.6	14.7	9.5	24.9
Cassava	29.9	45.6	26.3	57.1
other roots/tubers	42.9	49.6	31.4	68.2

Some indication of consumption in terms of quantity can be derived from the RVS data on rice consumption measured as grams per capita per day (g/p/d). Rural households on average consumed 470 g/p/d in December 2012. This data is broadly consistent with that contained in the LECS IV Food Security Trends analysis, which, using 2007/8 data, found national daily rice consumption per capita at 491 g/p/d, with rates rising in rural areas to 545 g/p/d. In 2003/04, total rice consumption was found to be 398 g/p/d, rising to 403 in rural areas.¹⁵ Differences in rice consumption may vary across seasons, with greater consumption after the harvest season and dropping in the lean season. Additional research is necessary, however, to understand the potential impact of increased rice consumption on the consumption of other food items, particularly more nutrient dense foods (such as proteins, vegetables or oils/fats), which may be diminished or excluded in diets high in carbohydrate energy.

TABLE 20: DAILY PER CAPITA RICE CONSUMPTION (RVS 2013)

Agro-ecological zone	Rice (g/p/d)
Vientiane Plain	382.89
Northern Lowlands	559.62
Northern Highlands	527.12
Mekong Corridor	417.6
Central/Southern Highlands	378.75
TOTAL	470.09

As rice represents the cornerstone of the Lao diet, it is worth reflecting on the variation between AEZ presented in Table 20. At the low end of the scale, Vientiane Plain, and the Central/Southern Highlands consume 382 and 378 g/p/d, whereas in the north consumption in both AEZ is 527 and 559 g/p/d respectively. It is possible that this data capture the total availability of rice in the household per month rather than actual intake, which is more difficult to measure. The data may also be time sensitive, as data was collected at the months immediately following the harvest, such that this may represent a high point for rice availability. Finally, it is worth noting that the highest rice consumption per capita occurs

¹⁵ As LECS4 data was not disaggregated by AEZ, further director comparison is not possible between the datasets, although some consistency between AEZ with larger urban populations (such as the Vientiane Plain and Mekong Corridor) do echo the LECS4 findings of lower consumption in urban areas.

in the same AEZ with the highest rates of stunting. High consumption of carbohydrate rich cereals may be occurring at the expense of nutrient-dense foods, including proteins, fats and micronutrients, and may thus be indicative of negative nutritional outcomes.

Sources of Protein:

Some 80 percent of households reported consuming fish and over half reported consuming other aquatic animals at least one day per week. Consumption of fish was highest amongst Lao-Tai populations, with almost a quarter of Lao-Tai households reporting daily consumption of fish. Fish consumption was lowest amongst Hmong-Mien populations (only 40 percent reported eating any fish in the last 7 days). Likewise, only 20 percent of Hmong-Mien households reported eating any other aquatic animals, while between 60 and 70 percent of households in other ethnicities reported limited consumption (mostly one to three days) of other aquatic animals (OAA). In geographic terms, this translates to high consumption of fish and OAA in Vientiane Plain and the Mekong Corridor compared to other AEZs. Some 31 percent in the Vientiane Plain and 25 percent of households in the Mekong Corridor reported eating fish every day of the week.

TABLE 21: PERCENT OF HOUSEHOLDS REPORTING CONSUMPTION OF MEAT, FISH OR OAA AT LEAST ONCE IN THE PAST 7 DAYS, 2006-2013

Protein food item	CFSVA 2006	RVS 2012
Fish	81	80.2
OAA	55	56.7
Poultry	41	54.2
Pork	41	51.9
Red meat	42	44.8
Large wild meat	6	6.2
Small wild meat	26	32.2
Eggs		60.5

Domestic meat (poultry, pork, red meat) was reportedly consumed by about half of households at least one day in the week. Since 2006, the consumption of domestically produced meat appears to have increased, particularly for pork and poultry, and consumption appears most frequent in Vientiane Plain as well as in the northern highlands (Table 22).

TABLE 22: PERCENT OF HOUSEHOLDS REPORTING CONSUMPTION OF DOMESTIC MEAT AT LEAST ONCE IN THE PAST 7 DAYS (RVS 2013)

Domestic meat	Agro-Ecological Zones					Total
	Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/Southern Highlands	
Poultry	71.9	51.5	56.4	56	36.2	54.2
Pork	77.3	49.6	61.9	46.4	33.6	51.9
Red meat	59.3	32.9	38.8	55.4	41	44.8

In terms of wild meats, 58 percent of households in the northern highlands reported consuming small wild meat at least one day in past 7 days followed by households in the northern lowlands at 34 percent. A lower proportion of households reported eating small wild meat in the past 7 days in the Central and Southern Highlands (27.1 percent) and the Mekong Corridor (20.3 percent), possibly reflecting more limited access to forests in southern Lao PDR. From the qualitative component, household interviews indicated that an estimated 41 percent of protein consumed in the household was derived from the forest including wild pig, bamboo rats, fish, monkeys, birds and deer, but also some vegetables with protein content such as mushrooms.

Egg consumption appears quite high – 60 percent of households reported consuming eggs at least one day in the past seven days. Most of these households are in Vientiane Plain, Northern Lowlands and Mekong corridor. Egg consumption is lower in the highlands and particularly in the central and southern highlands where only 41.3 percent of households reported any egg consumption.

Vegetables

Vegetable consumption is common and widespread in Lao PDR. Overall, 90 percent of interviewed households reported consuming vegetables, of which over 40 percent consumed vegetables every day. Consumption of bamboo shoots and mushrooms, typically gathered in the forests, was reported by 36.8 percent of households.

Fats and oils

As indicated in the desk review, adequate fat consumption is a serious concern in Lao PDR. The LECS IV Food Security Trend Analysis indicated fats contributed 10 percent to overall daily energy consumption, below WHO minimum recommended threshold of 15 percent. While 62.2 percent of households overall reported consuming oil in the 7-day recall, only 10 percent consumed oil every day and about one in three households (35.6 percent) reported consuming oil between one to three days in the past week. The differences are wide by ethnic group and by AEZ. For example, amongst the Hmong-Mien, not only 75 percent of household consume oil in the past 7 days, but about 30 percent reported consuming oil/fat every day in the past 7 days. This in contrast to Mon-Khmer households, amongst whom less than 50 percent consumed in the past 7 days and only 4 percent consumed oil/fat daily. Tables 23 illustrates findings.

TABLE 23: PERCENT OF HOUSEHOLDS REPORTING CONSUMPTION OF MEAT, FISH OR OAA AT LEAST ONCE IN THE PAST 7 DAYS, 2006-2013

	Ethno-Linguistic Group			
	Lao-Tai	Mon-Khmer	Hmong-Mien	Chinese-Tibetan
At least one day	68.2	45.5	75.6	87
Daily	10.4	3.7	33.3	17.3

TABLE 24: PERCENT OF HOUSEHOLDS REPORTING CONSUMPTION OF OILS OR FATS IN 7 DAY RECALL BY AEZ (RVS 2013)

	Agro-Ecological Zones				
	Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/ Southern Highlands
At least one day	83.1	69.9	65.2	57.4	35.5
Daily	13.9	19.1	11	4.9	3.7

Profile of Households with Poor or Borderline Food consumption patterns:

This data focuses on those populations with poor or borderline food consumption patterns. The educational attainment of the household head in poor or borderline households tends to be lower, with only 9 percent reaching secondary or tertiary education compared to 22 percent of household heads in households with acceptable food consumption. Poor or borderline households tend to cultivate less land, rely more on cash crop production as a source of income, have less access to vegetable plots, eat a greater amount of rice, and consume less animal protein. On average, households with poor or borderline consumption farm 1.6 hectares of land compared to 1.9 hectares amongst households with acceptable consumption. While an equal proportion of households with poor or borderline consumption report rice production as their primary livelihood, cash crop production is reported as a primary or secondary livelihood strategy by more households with poor/borderline consumption (46 percent) than by households with acceptable consumption (31 percent). By contrast, casual labour is reported as primary or secondary livelihood strategy by a greater proportion of households with acceptable consumption patterns (30 percent) compared to households with poor or borderline consumption (22 percent).

About half (53.3 percent) have access to a vegetable plot, compared to almost three-quarters (72.7) percent of households with acceptable consumption. Per capita rice consumption is slightly higher (488 g/p/d) amongst households with poor or borderline consumption compared to an average of 468 g/p/d amongst households with acceptable diets. In addition, protein consumption drops considerably to 1.8 days per week amongst households with poor or borderline consumption when compared to daily consumption of animal protein foods amongst households with acceptable consumption patterns (Fig 21). Of all sources of protein, fish is most consistently consumed across all FCS categories (Table 25). While consumption drops from 85.9 percent among acceptable households to 65 percent among poor and borderline, all other forms of proteins drop by 50 percent or more. This goes to indicate that fish is the single most important source of protein in the Lao diet by a considerable measure. In addition, fat/oil consumption is very low for poor and borderline FCS households, consumed only one day a week compared to 2 days per week in households with acceptable consumption.

FIGURE 21: AVERAGE NUMBER OF DAYS A FOOD ITEM WAS CONSUMED IN HOUSEHOLDS WITH POOR/BORDERLINE FCS (RVS 2013)

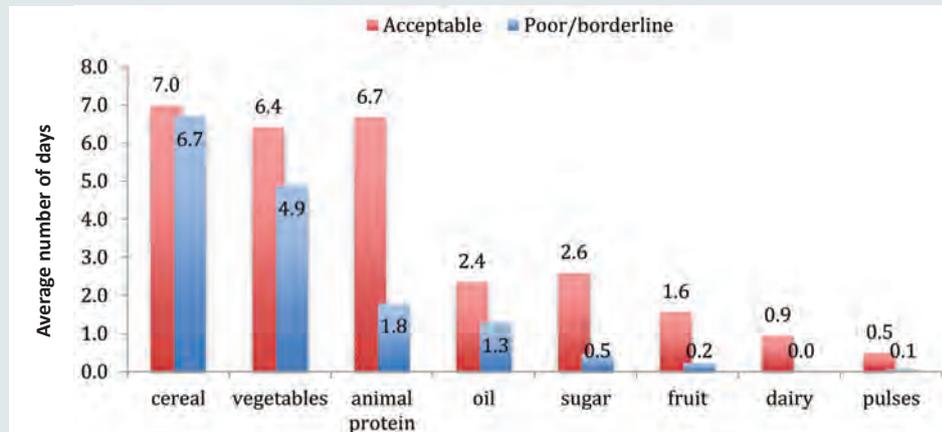


TABLE 25: PERCENT OF HHS REPORTING CONSUMPTION OF MEAT AT LEAST ONE DAY IN 7 DAY RECALL (RVS 2013)

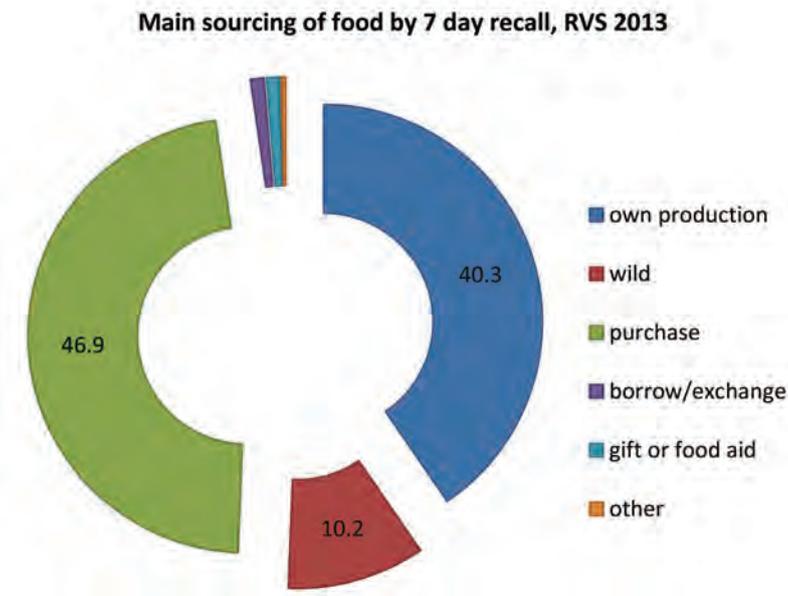
	Poor/borderline	Acceptable
Fish	65.7	85.9
OAA	16	61.8
Poultry	15.2	59.1
Pork	14.3	56.6
Red meat	7.5	49.4
Large wild meat	1.6	6.7
Small wild meat	13.9	34.5
Eggs	11.4	66.7

Sources of Food

Weighted by frequency of consumption, the following graphs show the relative importance of different sourcing strategies to the average diet, as well as the sourcing strategies by food group. At national level, own production still accounts for a significant proportion of the food consumed in the average weekly diet, although purchasing accounts for slightly more. Sourcing from the wild accounts for 10 percent to the weekly diet.

In terms of vulnerability, particular attention is paid in the data that follow to wild sourcing and purchases, as there are more likely to be subject to external factors, which may reduce food access. In the case of wild sourcing, declining access to forests may reduce the viability of sourcing from the wild, whereas purchasing is contingent on market price fluctuations and household income.

FIGURE 22: SOURCING OF TOTAL FOOD (%) ACCORDING TO 7 DAY RECALL (RVS 2013)



Analysing this data further can provide an indication of the relative importance of difference sources for specific foods groups. For instance, for cereals consumed in the past seven days, own production was the main source, followed by purchases. By contrast, at the national level, purchasing was the primary source for animal protein (fish, OAA, pork, poultry, wild meat, eggs), with a substantial proportion (32 percent) from wild sources. Based on findings from the qualitative survey, cultural practice dictates that wild meats are shared among the village, suggesting that the higher the proportion of wild sourced meat, the greater availability there is at the village level. Vegetables are mostly sourced through own production, but purchasing and wild sourcing are important as well. In contrast to most other types of food, the limited amount of oil in the diet is sourced almost entirely from market purchases.

FIGURE 23: SOURCING OF TOTAL FOOD (%) BY AEZ (RVS 2013)

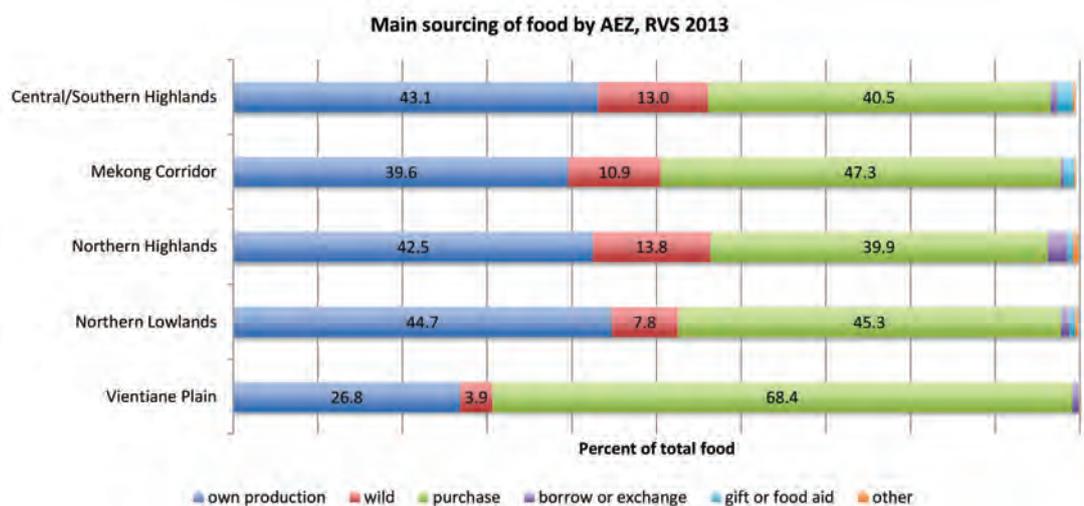
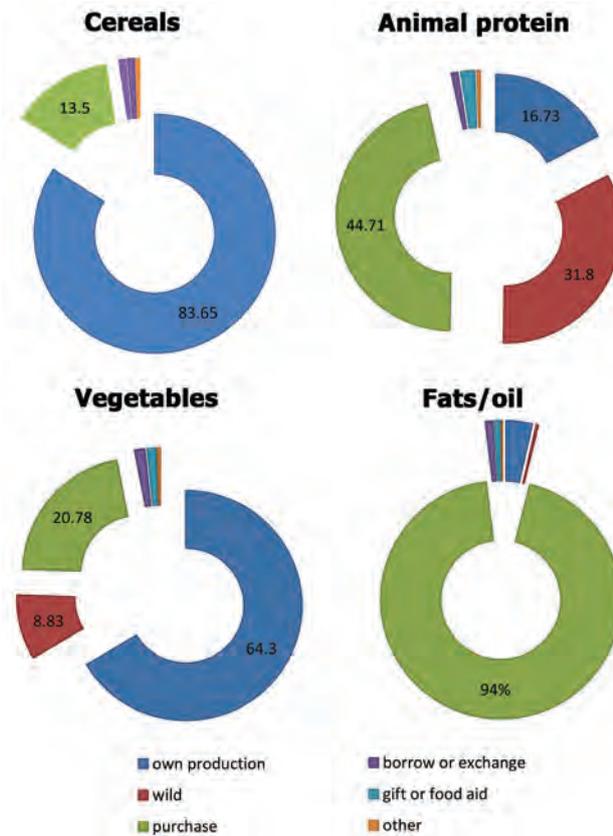
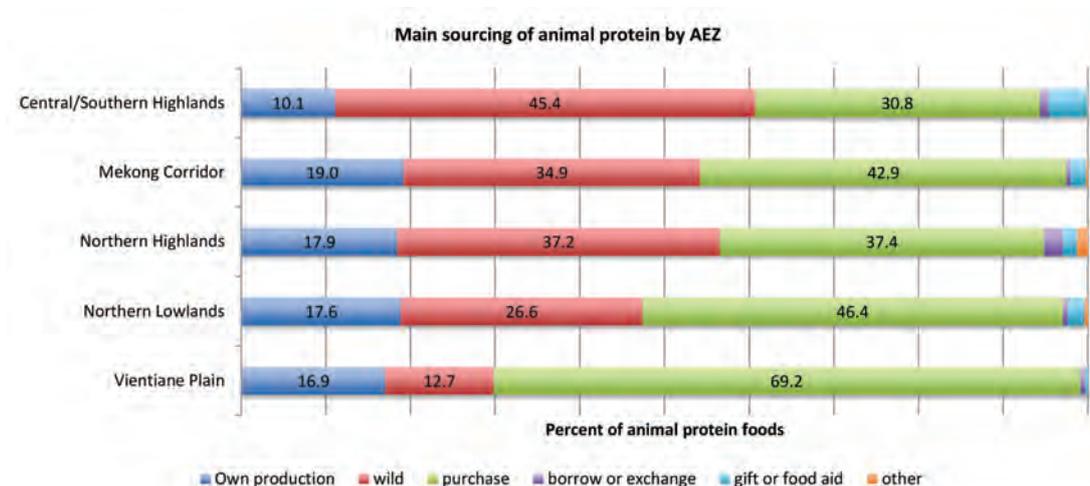


FIGURE 24: SOURCING OF FOOD (%) ACCORDING TO FOOD GROUPS (RVS 2013)



Disaggregating the sourcing of animal protein foods by AEZ helps to reveal the regional importance of wild sources. For example, primary sources of animal protein vary by AEZ, with purchasing particularly important in Vientiane Plain, followed by Northern lowlands. By contrast, the animal protein sourced from the wild contributes more than animal protein sourced from purchases in the central and southern highlands. These data were corroborated by the qualitative research findings, which showed similar proportions of own production, wild sourcing and purchasing for cereals, protein and vegetables. Although the quantitative component did not address micronutrients, the qualitative indicated that some 70 percent of calcium in the diet came from wild sourced foods.

FIGURE 25: SOURCING OF ANIMAL PROTEIN FOODS BY AEZ (RVS 2013)



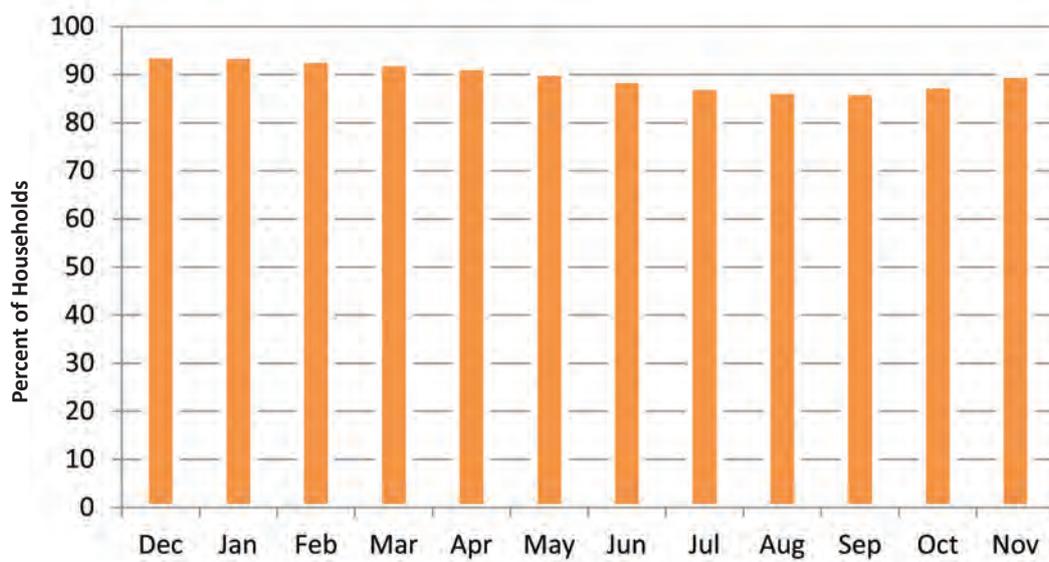
Perceptions of Cereal Sufficiency

Given the cultural and historical importance of rice in the Lao context, rice supply is widely presumed to be a proxy for caloric intake of household's in rural Lao PDR. Further, rice availability tends to be an index of own production, rather than market purchases, thus indicating the extent to which households are reliant on own production to meet their basic caloric needs.

Households were asked a number of questions which were used to establish whether households had access to or consumed sufficient cereals. The questions included quantity of rice consumed a month prior the survey, rice and maize production and a direct question on whether had sufficient cereals for the entire month each month, throughout 2012.

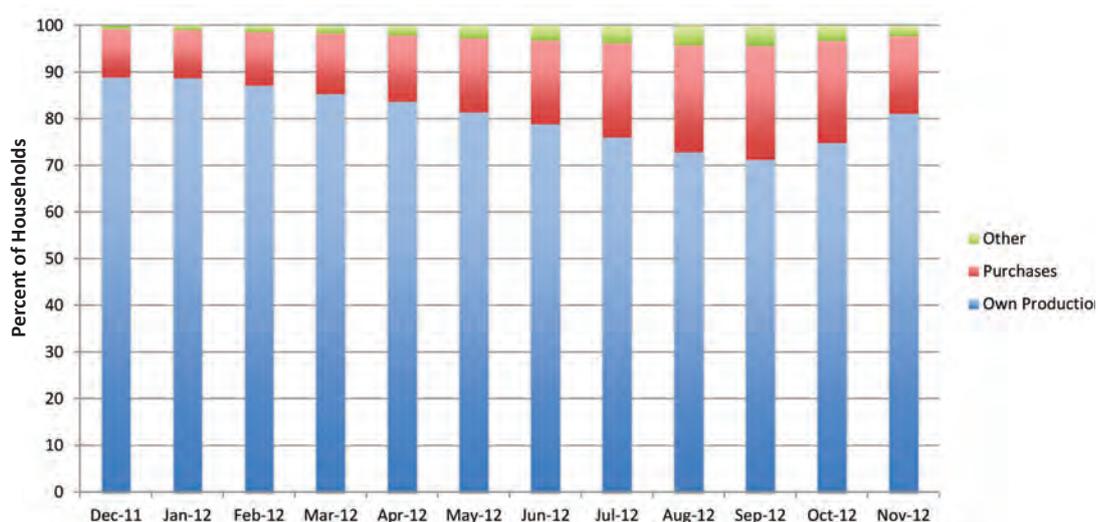
As an average for the entire year, 90 percent stated they had enough cereals. However, the proportion of households stating they had enough cereals for the month declined during the traditional lean season, with up to 15 percent of households not having an adequate supply of rice to meet household needs.

FIGURE 26: PERCENTAGE OF HOUSEHOLDS MEETING THEIR BASIC CEREALS NEEDS, PER MONTH (RVS 2013)



Further to this, during those lean months when own production is unable to meet household requirements, an increasing proportion of household report that purchasing is their primary mechanisms for meeting household cereal needs (Figure 27). This suggests the seasonal vulnerability particularly relative to food prices or a lack of purchasing power.

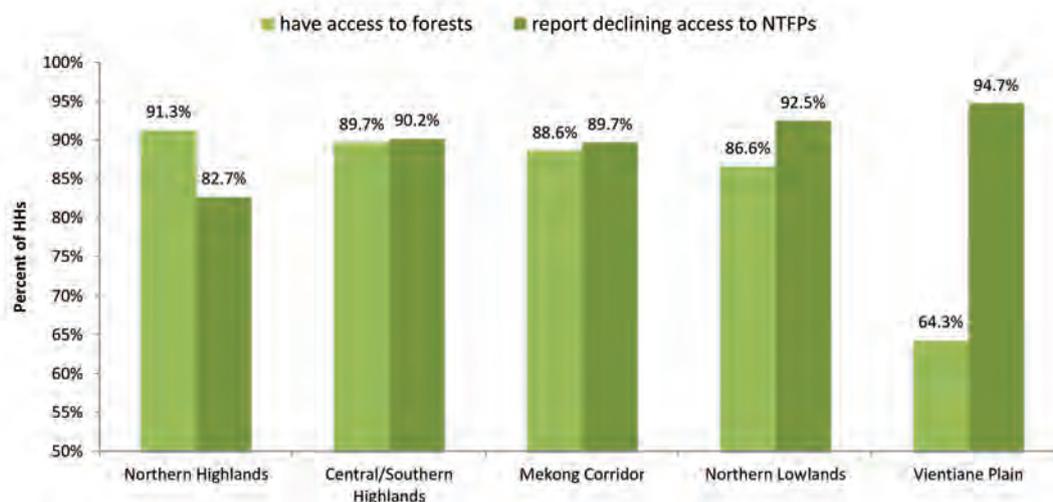
FIGURE 27: PRIMARY SOURCE OF CEREALS BY MONTH (RVS 2013)



Forest (and river) access

While the majority of households reported currently having access to forests (average 87 percent), households overwhelmingly perceived access to (NTFPs) to be declining compared to five years ago. From the quantitative village component, the primary reasons stated for this decline in access to forest resources include decreasing access to land, increasing rubber plantations, deforestation and issues related to excess pesticide and/or fertilizer use. For fishing resources, the main factors reported as relating to decline included a lack of conservation areas, illegal fishing, competing interests between fishing and irrigation, and population pressure. This decline is perhaps most accentuated on the Vientiane Plain, where access to NTFPs is lowest (64 percent of HHs state they have access to forests), and perceptions of declining access are highest at 95 percent. Even so, the qualitative survey noted that selling wild foods and other NTFPs is still a significant income source in some villages, particularly in the subsistence-based upland villages. For villages with seasonal road access, travelling merchants come to purchase forest products from villagers, making this a preferred option for households unable to afford transport.

FIGURE 28: ACCESS TO FORESTS AND NTFPS (RVS 2013)



Household Food Insecurity Access Score (HFIAS): Perceptions of Food Access

Developed by the USAID FANTA project, HFIAS is a series of nine questions, designed to determine the extent to which households experienced concern over or actual inability to secure the food they need to meet their household's needs.

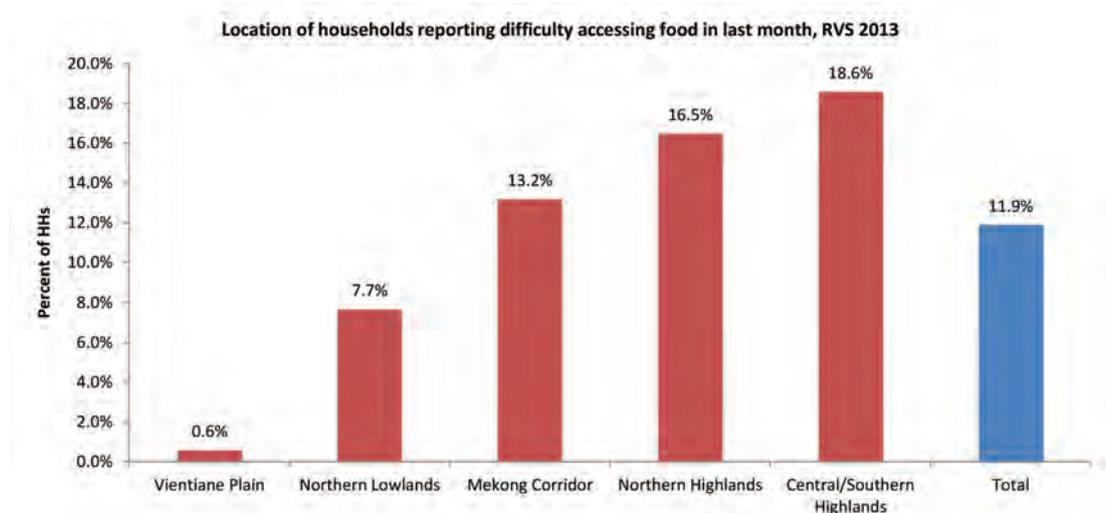
The Household Food Insecurity Access Scale (HFIAS) assesses whether households have experienced problems in food access in the preceding 30 days by measuring the severity of food insecurity for that period, as reported by the households themselves. The HFIAS captures food access dimensions of food security.

- Feelings of uncertainty and anxiety
- Perceptions that food is of insufficient **quantity**
- Perceptions that food is of insufficient **quality**
- Reductions in food intake.

While it does not assess availability or utilization, HFIAS is nevertheless a useful indicator of feelings of uncertainty and anxiety of food, perceptions that food is of insufficient quantity, perceptions that food is of insufficient quality and reported reductions in food intake. In sum, HFIAS provides a synopsis of access: the extent to which the household is failing (or succeeding) to get sufficient food.

For the RVS, households were asked first if in the last 30 days they failed to obtain sufficient food for one or more days. If yes, the households responded to subsequent nine questions of the HFIAS. Accordingly, only 11 percent of total rural households responded that they failed to get sufficient food for a day or more in the last 30 days. Of these 11 percent, most were located in the Central and Southern highlands and northern highlands.

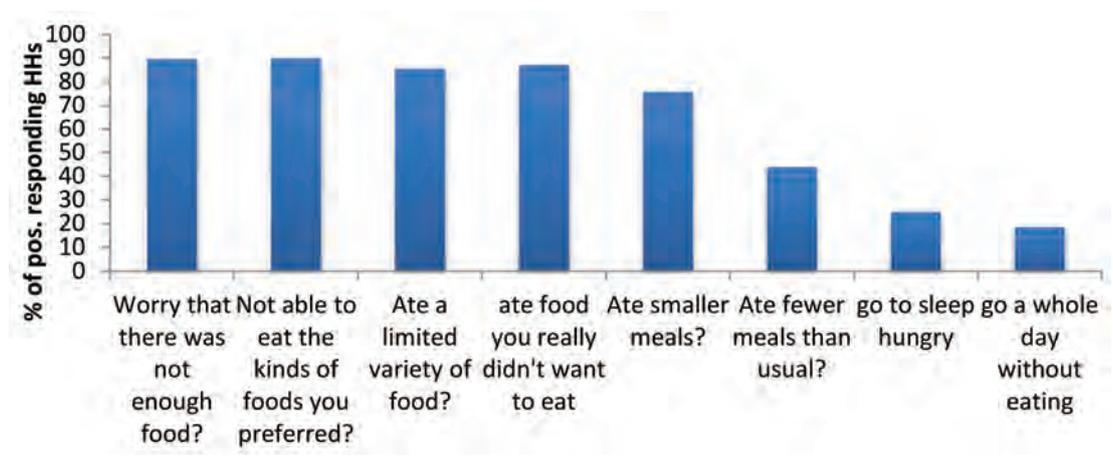
FIGURE 29: HOUSEHOLDS UNABLE TO SECURE ADEQUATE FOOD >1 DAY OVER THE LAST 30 DAYS, RVS 2013



Amongst the 11 percent that had a problem with food in the past month, most responded that they had worried about not having enough food, had eaten foods they did not prefer, had eaten a limited variety of food, and/or had eaten food they really did not want to eat. About 76 percent responded that they ate smaller meals than usual. A much smaller

proportion went to bed hungry or went a whole day without eating, viewed as much more severe experiences of hunger.¹⁶

FIGURE 30: HFIAS question responses amongst the 11 percent that had issues with food (RVS 2013)



Remittances

Overall, 15.6 percent of rural households reported someone migrating for the purpose of finding work. The highest proportion of households reporting a member migrating were found in the Mekong corridor and in Vientiane plain, where 26.8 percent and 18.7 percent of households respectively reported someone migrating respectively. Of all households that reported someone migrating, three out of four also reported receiving remittances from them. While over half of households in each zone reported receipt of some remittances, upwards of 86 and 80 percent of households with migrants in Mekong corridor and Vientiane Plain respectively reported receiving remittances from migrants.

Nutrition and Food Utilization

Key Terms used in this Section

Malnutrition (malnourishment): Refers to all deviations from adequate nutrition, including undernutrition and over-nutrition, resulting from inadequacy (or excess) of food and/or disease. Categories of undernutrition are as follows:

Acute Malnutrition (Wasting): Acute malnutrition results in low weight in relation to height and/or the presence of oedema. It is often the result of a severe shortages of food and/or severe infections.

Chronic Malnutrition (Stunting): Chronic malnutrition is measured as a low height relative to age. It is due to on-going or temporary nutritional deficiencies during critical times (energy and/or micronutrients), and/or it also can be

¹⁶ Due to a translation error in the Lao questionnaire, the question asking if there was ever a time that there was no food at all to eat in the household was discarded in the analysis.

the result of repeated exposure to infections or even to generally poor living conditions. It is often poverty related.

Growth retardation (Underweight): A combination of stunting and wasting, this indicator measures the prevalence of children that have a low weight in relation to other children of their age.

Prevalence of malnutrition

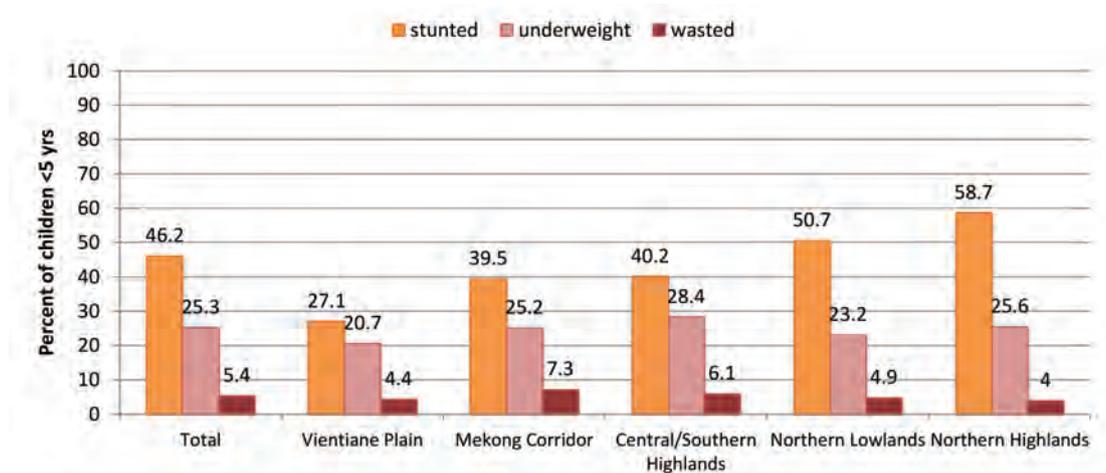
On the whole, malnutrition rates identified in the RVS are highly consistent with those of the LSIS (Table 26). This both supports the credibility of the LSIS findings, and suggests strong possibilities for meta-analyses of findings across both datasets. However, LSIS remains the source of national prevalence estimates for malnutrition, with RVS providing prevalence rates for rural populations valid for the agro-ecological zone only.

TABLE 26: PREVALENCE OF MALNUTRITION IN CHILDREN UNDER 5 YEARS, LSIS 2011 AND RVS 2013

	LSIS 2011/12			RVS 2013			% of children under 2 (Total)
	Total	Male	Female	Total	Male	Female	
Stunting	44.2	45.7	42.6	46.2	45.9	46.5	41.1
Underweight	26.6	26.7	26.4	25.3	26	24.5	21
Wasting	5.9	6.4	5.4	5.4	5.9	4.7	5.1

Disaggregated by agro-ecological zones, malnutrition in Lao PDR is found to be worse in the northern regions, with stunting rate at 50 and 58 percent in the northern lowlands and northern highlands respectively. These rates represent more than double the prevalence level in Vientiane Plain. Underweight shows a much more consistent prevalence across AEZs, with a slightly higher rate in the central and southern highlands.

FIGURE 31: PREVALENCE OF MALNUTRITION BY AEZ (RVS 2013)

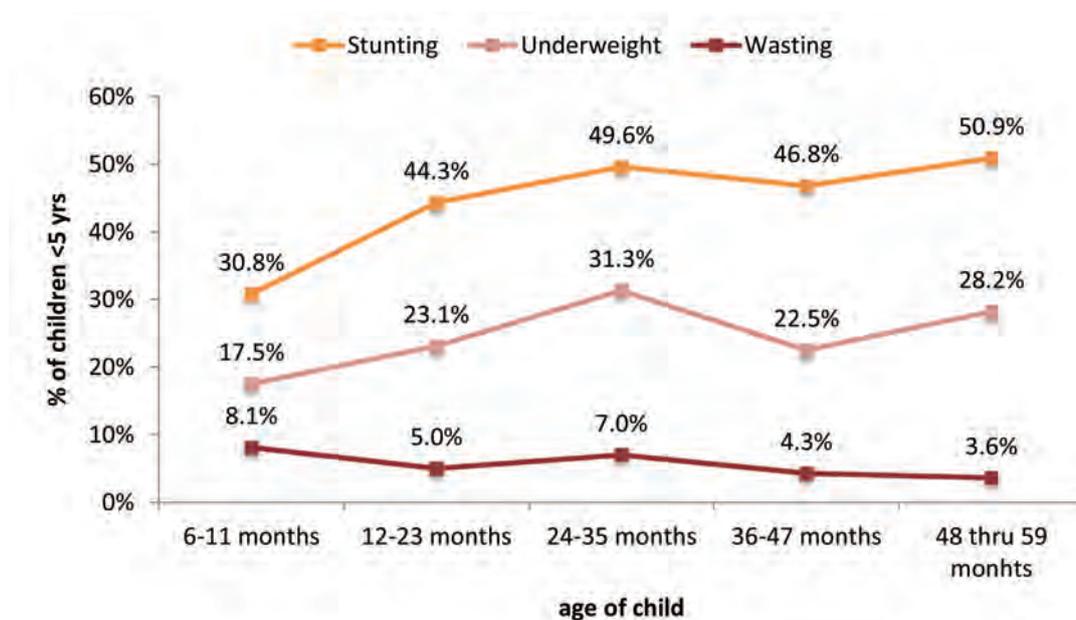


Malnutrition among different age groups

It is widely acknowledged that the period from pregnancy through early childhood (the first 1000 days) presents a critical window of opportunity for improving child nutrition outcomes, and in particular, for preventing or reducing stunting. In global data and likewise reflected in both the LSIS and RVS data, the prevalence of stunting and underweight follows a pattern of sharply increasing rates before the age of two years, after which point prevalence rates begin to plateau amongst children three to five years of age.

Of equal importance is the high initial rate of malnutrition seen amongst 6 to 11 month olds (30 percent stunted, 18 percent underweight) in the RVS data, indicating that the process of deteriorating nutritional status is already underway by the time an infant reaches 6 months. Further to this, LSIS data indicates that 10 percent of children aged 0 to 5 months were already stunted. This points again to the importance of maternal health and nutrition pre-, during, and post-pregnancy and of proper infant and young child feeding (IYCF) practices as key determinants of malnutrition.

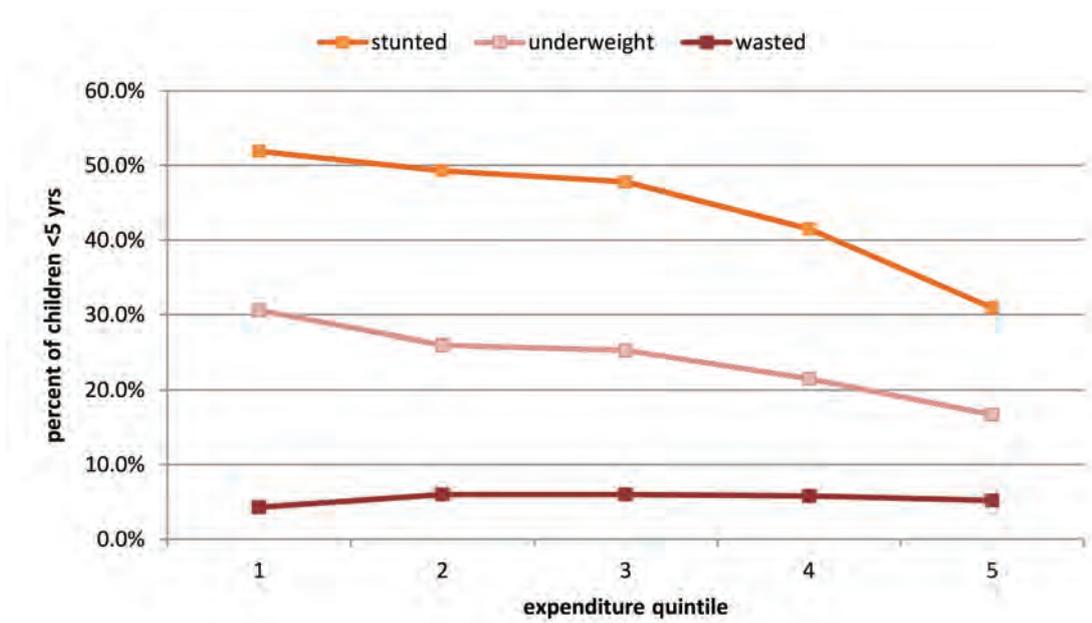
FIGURE 32: PREVALENCE OF MALNUTRITION BY AGE GROUP (RVS 2013)



Malnutrition and Poverty

As seen with key indicators of food consumption, the prevalence of malnutrition (stunting and underweight) decline as household wealth improves. Amongst the lowest two quintiles, the prevalence of stunting is approximately 50 percent and that of underweight is approximately 28 percent. This represents a 20 percentage point difference in the prevalence of stunting compared with the wealthiest quintile (31 percent) and nearly twice the prevalence rate of underweight in the highest quintile (17 percent). However, the fact that prevalence rates are still high in the wealthiest quintile suggests that while lower household income may contribute to malnutrition, malnutrition is not only a function of poverty.

FIGURE 33: PREVALENCE OF MALNUTRITION BY EXPENDITURE QUINTILE (RVS 2013)

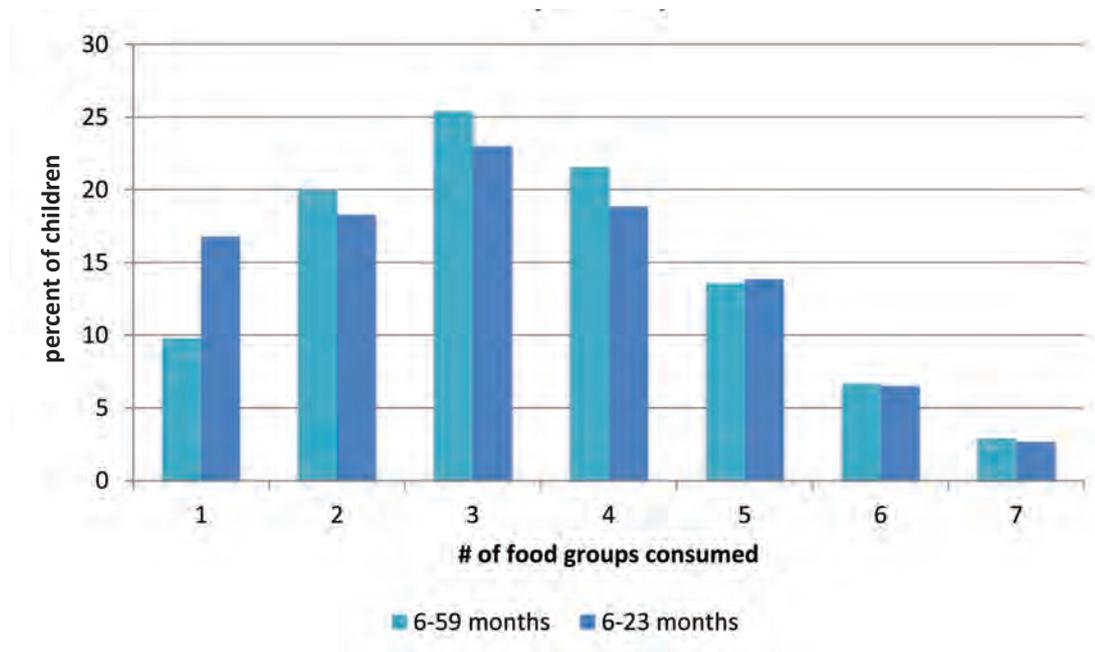


Dietary diversity

Food intake is directly linked to an individual’s nutrition status. The RVS survey measured child consumption through a 24-hour recall of food items aggregated into 7 internationally standardized, child-specific food groups: (1) grains, roots and tubers; (2) legumes and nuts; (3) dairy products (4) flesh foods (meat, fish, poultry, and liver/organ meats); (5) eggs; (6) vitamin A rich fruits and vegetables; and (7) other fruits and vegetables. From the resulting diversity score, ranging from 0 to 7, children were classified as having an acceptable diet (≥ 4 food groups) or a sub-optimal diet of less than 4 food groups (WHO/FANTA guidelines).

Overall, more than half of children under the age of 5 years (55.2 percent) consumed a sub-optimal diet of 3 or fewer food groups. In children under two years of age, 58.1 percent consumed a sub-optimal diet. This is stark contrast to the widespread reports of acceptable dietary diversity at household level, suggesting a key disconnect between the foods available and accessible to households and child consumption. The assumption should not, however, be that food is withheld from children – in fact, data from the qualitative component strongly indicates that children are prioritized for food consumption according to the reports of both men and women. Rather these findings suggest that there is potentially a lack of knowledge on optimal feeding practices and appropriate nutrient dense foods for children.

FIGURE 34: DIETARY DIVERSITY FOR CHILDREN UNDER 5 YEARS OF AGE AND UNDER 2 YEARS OF AGE (RVS 2013)



Of children under two, nearly all (89 percent) ate grains in the day preceding the survey. Some 60 percent consumed flesh foods (fish being the driving item in this category with 41 percent of children consuming it), and about half (51 percent) consumed other fruits and vegetables, with only 22 percent consuming vitamin A rich fruits and vegetables. One in three children less than two years reportedly consumed eggs (34 percent) and 30 percent consumed some form of dairy product. The relatively low consumption of foods rich in minerals and vitamins is of concern. However, as with the household level dietary diversity measurements, little can be inferred about the quantities of food consumed.

While not included in the standardized food groups, the RVS survey asked about child consumption of packaged foods such as crackers, chips, biscuits or instant noodles. The interest was in exploring the potential nutrition impacts of rapid shifts in available and affordable foods. About 53 percent of children under 5 and 45 percent of children under 2 received a packaged food product in the day preceding the survey. In addition, the survey asked about oil/fat consumption and found that only 30 percent of children less than 5 years and 20 percent of children less than two years of age consumed oil or fat.

Dietary diversity at AEZ

At agro-ecological zone level, the dietary diversity for children is notably worse in the southern and central highlands, which may be reflected in the higher levels of underweight seen in the region as immediate food intake relates more closely to underweight than to stunting. Rates are also poor in Northern highlands where malnutrition is a serious concern.

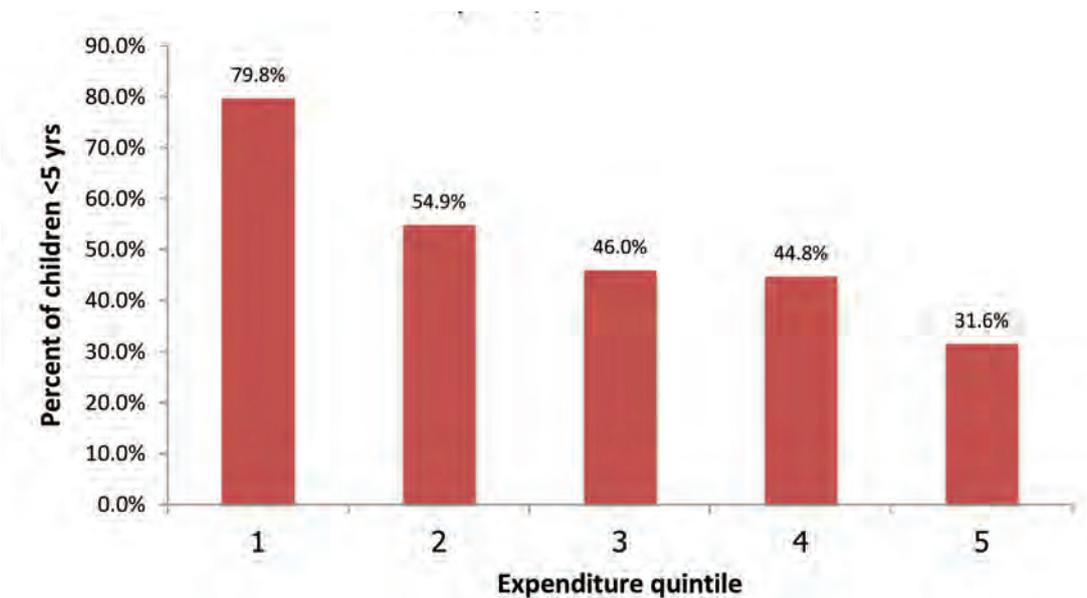
TABLE 27: CHILDREN WITH SUB-OPTIMAL DIETARY DIVERSITY BY AEZ (RVS 2013)

Age group	Agro-ecological zones					Total
	Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/Southern Highlands	
< 5 yrs	19.7%	42.9%	59.2%	50.7%	76.8%	55.2%
< 2 yrs	25.0%	45.3%	67.0%	50.0%	79.6%	58.1%

Dietary Diversity and Poverty

Consistent with the data presented above for the prevalence of malnutrition and expenditure quintiles, analysis of children’s dietary diversity indicates that child’s diets are significantly worse among the poorest quintile compared to the wealthiest. In the poorest quintile, some 80 percent of children have sub-optimal diets compared to 30 percent in the wealthiest. Again, however, it is notable that even in the wealthiest quintile, nearly one in three children are fed inappropriately.

FIGURE 35: PROPORTION OF CHILDREN WITH SUB-OPTIMAL DIETS BY AEZ (RVS 2013)



Additional IYCF indicators

In addition to minimum dietary diversity, the RVS collected data on several standardized IYCF indicators for children less than two years: (1) the minimum meal frequency; (2) introduction of solid, semi-solid, or soft foods; and (3) continued breastfeeding at one year. Overall, about 68 percent of children less than 2 years of age are currently being breastfed.

Minimum meal frequency is a measure of the appropriate frequency of consumption of solid, semi-solid and soft foods for specific age groups taking into consideration the child’s breastfeeding status. Overall, the RVS found that less than half (48 percent) of children under

2 years were found to be reaching the minimum meal frequency. This is consistent with LSIS data, which found 43 percent reaching the minimum meal frequency.

Among children 6 to 8 months, just over half (53.7 percent) were fed solid, semi-solid, or soft foods, suggesting a low practice of timely introduction to complementary foods. Again, the data strongly supports that seen through LSIS of 52.3 percent being fed solid, semi-solid, or soft foods. Continued breastfeeding at one year, measured as those children between 12 and 15 months of age still breastfeeding, is slightly higher at 64.6 percent.

Through focus group discussions and household interviews, the qualitative survey further informs the quantitative findings of widespread inappropriate IYCF practices. In all locations visited by the qualitative survey teams, it was noted that weaning practices are heavily influenced by local tradition. Babies in some households are fed mashed or pre-masticated sticky rice from birth and nutritionally appropriate weaning practices are not commonly practiced at all. Weaning foods mentioned by women include for example rice soup with meat, salt and MSG, as well as steamed mashed bananas. In many villages, vegetables are not seen as suitable for weaning babies. A woman in Phongsaly stated:

I have just started to prepare meals for my six month old son by mixing boiled rice with salt. I have learnt this from my mother, who told me that this would avoid sickness and food poisoning, which would arise from him eating yellow coloured vegetables such as pumpkin.

Once the child is older (above the age of five), there was found to be little variation between adults and children's meal composition: rice, vegetable and chillies were the common elements for all household members above the age of five.

Women's health, nutrition and education

The qualitative study also observed that the absence of specialized feeding practices for young children appeared to be related not only to a lack of knowledge and awareness about nutrition, but also to a lack of time. Mothers in all villages reported that they were expected to continue their existing responsibilities as well as care for themselves, their other children and their new child immediately after delivering.¹⁷ The only exceptions are afforded to women with young daughters, who can take over their mothers' responsibilities for a time.

Post partum Taboos

Although food taboos during pregnancy are relatively limited, postpartum taboos are common. In villages in Phongsaly and Khammouan, women stated that their only diet for the first 15-30 days after delivery was sticky rice with salt and galangal, although there appears to be an economic dimension to this practice: this diet can be continued for up to three months in poor families. Meat is slowly reintroduced into the diet, but only if the household can afford meat.

¹⁷ There was one exception for middle-income women in the market-oriented village Vakneua, Sekong, who reported that they would rest approximately one month after delivery.

On the whole, meat and yellow or red vegetables tend to be carefully regulated. In Phongsaly and Khammouan, various forms of meat are avoided, such as white buffalo, meat from chicken with white feathers, cattle, and all kinds of wild meats. Pumpkins, pumpkin leaves, papaya, chilli, and bamboo shoots were also mentioned as taboo for post partum consumption. Taboos tend to hold for the first year after birth, exceptions occur: some forms of protein, such as pork and fish, may be reintroduced after six months. Taboo patterns are locally specific and contingent: in Sekong, no specific taboos were identified for post partum women. For Akha people in Phongsaly, special soups made from duck and chicken meat are specialty meals specifically for breastfeeding women, prepared by husbands for their wives. This suggests that not all traditional practices are uniformly adverse- the latter example would serve to improve the nutritional content of the mother’s breast milk, and goes to underscore the context-specific nature of traditional practices.

Women’s education

The education of the women in the household is widely accepted to be positively associated with both household-level food consumption outcomes as well as food consumption and nutrition outcomes for children. In a study by Smith et al (2003), data from more than 63 countries indicated that women’s education contributed more to the reduction of undernutrition than food availability. In Lao PDR, according to the RVS sample, only 20 percent of women older than 17 years of age have secondary or higher education. The proportion of women with no formal education is highest in the highland regions.

TABLE 28: PERCENT OF WOMEN > 17 YEARS OF AGE WITH NO FORMAL EDUCATION COMPARED TO SECONDARY OR TERTIARY EDUCATION BY AEZ (RVS 2013)

Level of Education	Total	Agro-ecological zone				
		Vientiane Plain	Northern Lowlands	Northern Highlands	Mekong Corridor	Central/Southern Highlands
No formal education	35.7	20.7	28.4	46.3	24.9	57.0
Secondary or tertiary education	20.3	38.0	22.4	12.9	25.7	8.0

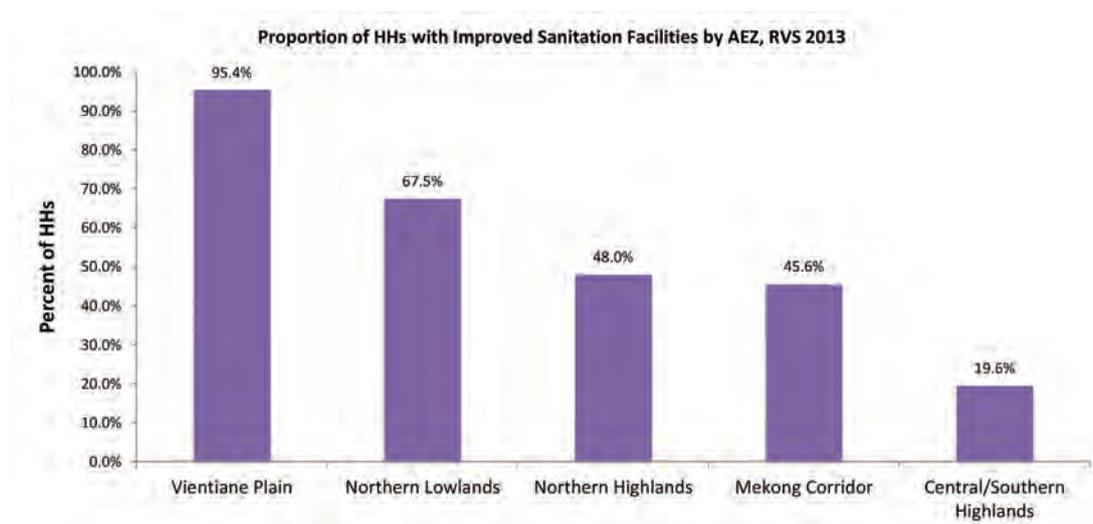
Water and Sanitation

The RVS asked households what their main source of water was from the following list of options: (1) public tap/piped water; (2) borehole or pump; (3) protected dug well or spring; (4) unprotected well or spring; (5) rain water; (6) pond, lake, river or stream; (7) tanker/trucker; (8) cart with small tank/drum; or (9) other. Of all households, approximately 37 percent reported that their primary source was ‘other’. The largest proportion of households reporting ‘other’ were found in the in the northern provinces, with over 80 percent of households in some of these northern provinces reporting ‘other’. It is suspected that a great many of these households access their water from gravity flow systems in which water is piped from the mountain springs into the village. However, time did not permit the extensive revisiting and revision of questionnaires that would be necessary to recode the ‘other’ responses accurately, and therefore source of water was regrettably excluded from the analysis.

Improved Sanitation Facilities

For the RVS, improved sanitation was considered as having access to a flush toilet or a hygienic pit latrine with slab, while unimproved was considered as an unhygienic pit latrine, or open defecation, defecation into a bucket, etc. According to RVS data, about half (53.5 percent) of rural households have access to improved sanitation facilities. However, sharp disparities exist by AEZ. In the central and southern highlands, only 19.6 percent of households had access to improved facilities while in Vientiane plain, almost all (95.4 percent) reported improved sanitation facilities.

FIGURE 36: PROPORTION OF HOUSEHOLD WITH IMPROVED SANITATION FACILITIES BY AEZ, RVS 2013

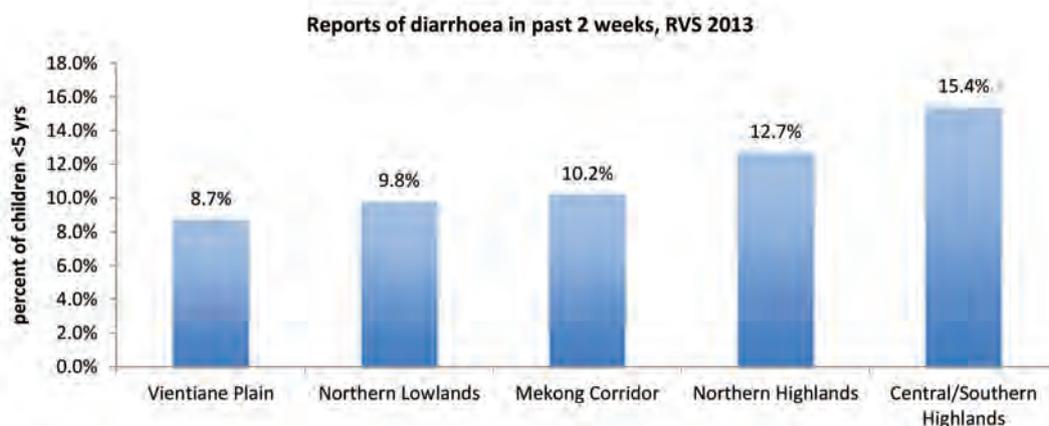


Disease and health seeking practices

The relationship between morbidity and nutritional status is cyclical. Poor nutritional status depletes the body's ability to fight off disease, and repeated, severe and/or prolonged infections in turn result in poor nutritional uptake. In particular, diarrheal diseases are strongly associated with worsening nutrition status. According to RVS data, the overall incidence of diarrhoea is 11.9 percent with higher rates in the highlands (15.4 and 12.7 percent in the central/southern highlands and northern highlands respectively)¹⁸. As indicated in figure x, this likely reflects the more limited access to improved water and sanitation at higher altitudes, as compared to lowland and river basin areas.

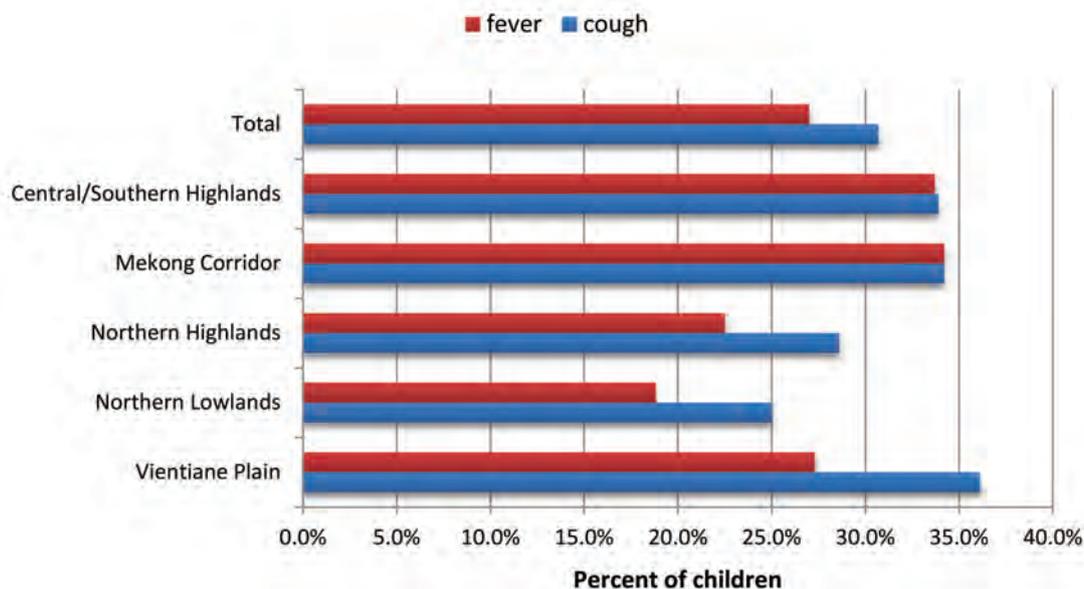
¹⁸ According to WHO standards, diarrhea incidence of 20 percent or more is considered a serious public health concern.

FIGURE 37: PERCENT OF CHILDREN WITH DIARRHOEA IN PAST 2 WEEKS BY AEZ (RVS 2013)



RVS also asked mothers if the child had experienced any coughing or fever in the last two weeks. The question did not distinguish based on severity, but the data can nonetheless provide some indication of regional differences in infection prevalence. Incidence of fever was reportedly higher in the central and southern highlands and the Mekong Corridor, while incidence of cough was highest in Vientiane Plain. Overall, 27 percent of children were reported as having a fever in the past two weeks while 30 percent were reported as having a cough.

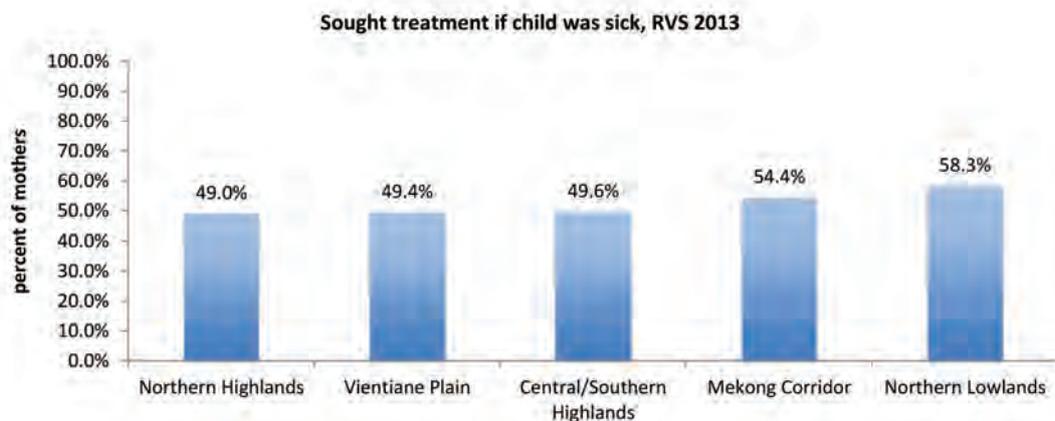
FIGURE 38: PERCENT OF CHILDREN WITH FEVER OR COUGH BY AEZ (RVS 2013)



Morbidity and health seeking behaviours

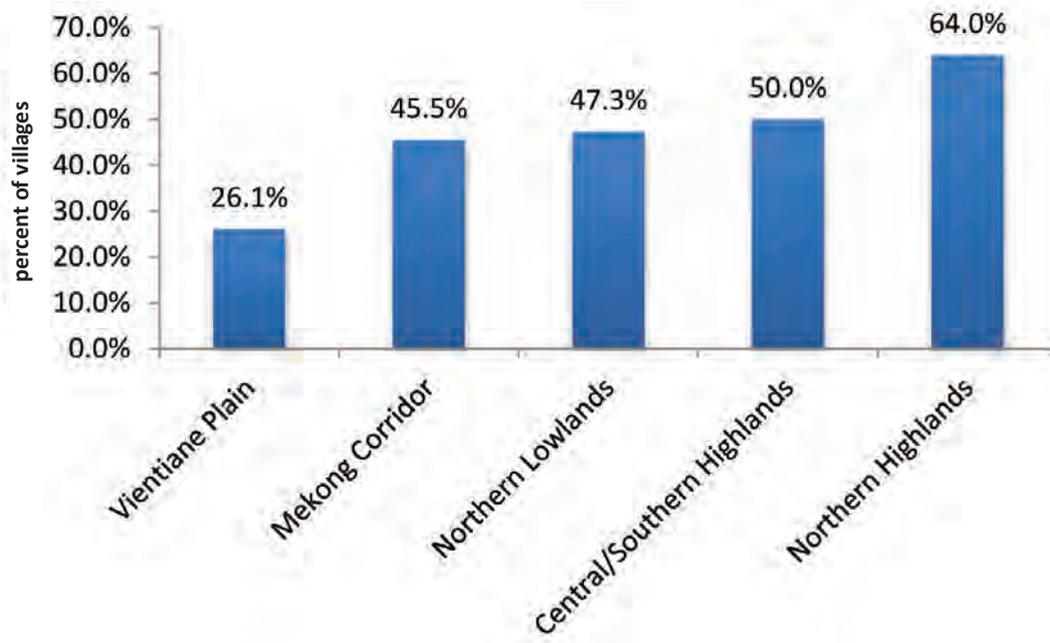
The RVS survey asked mothers that having a sick child in the past two weeks if they sought any treatment for the child. Overall, just over half (52.3 percent) of mothers reported seeking treatment for their child. The difference by agro-ecological zones was not significant, although slightly higher percentage of women sought treatment for their child in the northern lowlands and Mekong corridor compared to the other AEZs.

FIGURE 39: PERCENT OF MOTHERS WHO SOUGHT TREATMENT IF THEIR CHILD WAS SICK (RVS 2013)



The decision to seek care is determined by a number of factors, including perceived severity of illness, knowledge of warning signs, level of health education, cultural influences, as well as access to health facilities. In the highlands, access to facilities is much more challenging than in the lowlands, Mekong corridor, and Vientiane plain. For 64 and 50 percent of villages respectively in the northern and central/southern highlands, health facilities were more than 2 hours distance from the village.

FIGURE 40: PERCENT OF RVS VILLAGES WITH A DISPENSARY OR HOSPITAL > 2 HOURS DISTANCE AWAY BY AEZ (LCA 2010/11)



Hazards & Vulnerability

Natural disasters are a frequent and recurrent factor across rural Lao PDR, including floods, droughts, storms, livestock disease outbreak and pest infestation. The impact of such events is felt most profoundly among vulnerable populations at the community level, such as children, the elderly, pregnant women and women headed-households.

The rainy season runs from June to October, with variation to this widely noted. Rains can occur as early as March or April, and last through November. At one village visited in the qualitative exercise in Khammouan, floods have been recorded every year since 1981 with the exception of 2012. In 2011, flood waters rose to a height of 4.30 metres, cutting the village off for 19 days. During the dry season, drought and forest fires are major risks, compromising both crop production and availability and access to NTFPs.

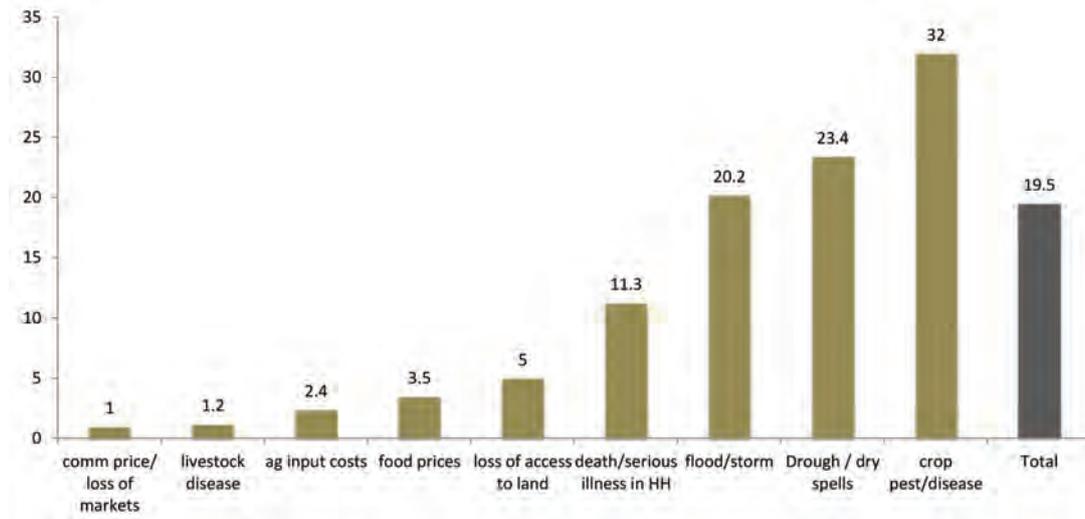
In terms of chronic vulnerabilities, July to October is the traditional lean season for rice, with both food and employment opportunities in short supply. Within that lean season, two periods of differing forms of shortage can be noted. During the later months of the dry season, when foraging becomes most difficult, and water most scarce, access to NTFP diminishes. Second, in the early months of the rainy season, heavy field work leaves little time to forage, and heavy rains or flooding make access to natural resources difficult, and limit road access to markets.

Over the medium to long term, land tenure, access to productive land, irrigation and soil quality concerns also contribute to vulnerability and elevated risks. In the qualitative survey, deforestation was highlighted as a particular concern, as it results in degradation of a key food and fuel source, increased soil degradation and water loss.

When looking towards the future, qualitative survey respondents expressed concern, with changes in the environment were rated negatively across the board: fewer fish, rice shortages due to flooding, hotter weather, irregular and unpredictable rainfall, lack of land, limited forest access due to deforestation were all cited as present and future risks, contributing to greater difficulty in hunting/gathering and lower agricultural productivity.

According to the RVS data, approximately 20 percent of rural households reported experiencing a shock in 2012. Of these households, most (32 percent) indicated the shock to be unusually high crop pest/disease, followed by 23 and 20 percent reporting drought/dry spell or floods.

FIGURE 41: HAZARDS REPORTED BY HOUSEHOLDS



Part 5: Linkages between Food Security and Malnutrition

The RVS data suggests that in general, household food consumption is good in Lao PDR, with 12 percent showing poor and borderline food consumption and only 11 percent reporting that they had problems with food in the last month (HFIAS). Meanwhile, malnutrition remains high, with more than 40 percent stunted and one in four underweight, and key indicators of child feeding suggest that food is not being given to children in an appropriate or optimal manner. A central question for the RVS was then to investigate further these linkages between food consumption patterns (at household and child level) and malnutrition in the context of other household level factors.

To ensure comparable sample sizes as multiple variables are entered into the analysis, the food consumption indicators (FCS and HDDS) were converted from categorical variables into binary variables. Accordingly, households are compared on the basis of having a low food consumption score (<50) or a high food consumption score (≥ 50), and as having a low dietary diversity score (<6 food groups) or a high dietary diversity score (≥ 6 food groups). The following analysis presents first the independent relationships between malnutrition and food factors, followed by malnutrition and non-food factors, namely sanitation. It then explores the relationship between sanitation and dietary intake and their additive impact on malnutrition, particularly on stunting. Given limitations of time, it was not possible to conduct a regression analysis.

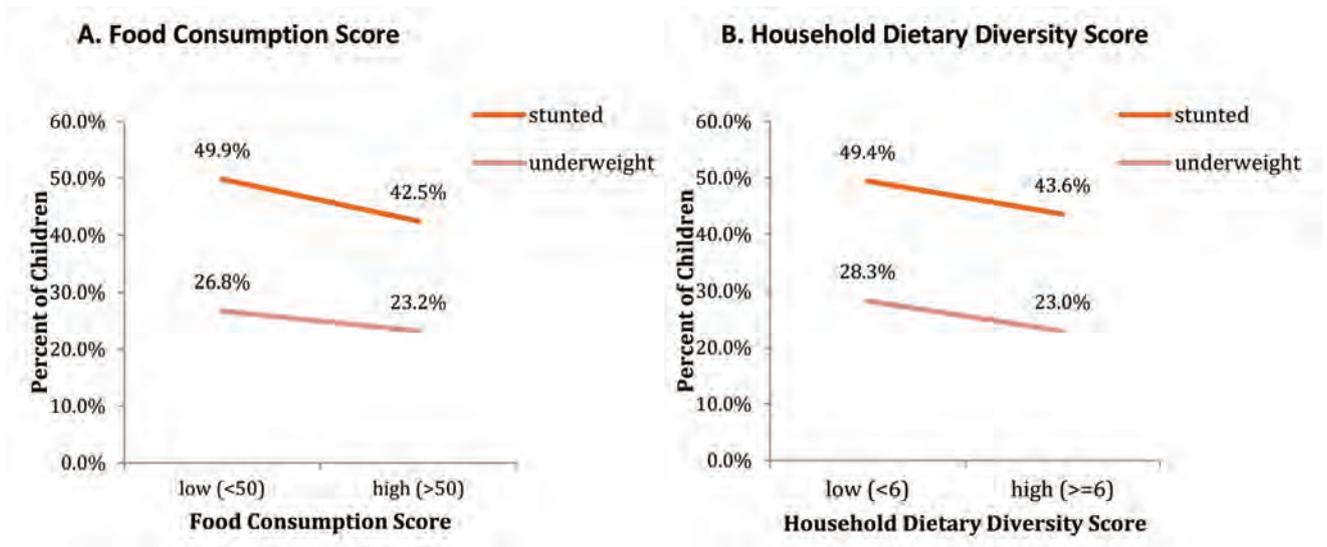
Overall, the RVS found that while there are important independent relationships between malnutrition and food consumption as well as between malnutrition and access to sanitation, there was an even greater effect when the variables were analysed together. In other words, when sanitation AND dietary intake are simultaneously improved, there is a larger reduction in the prevalence of malnutrition, particularly for stunting, compared to if one is done without improvements to the other.

Child Malnutrition and Food Factors

Household level

As indicated in figures 42, there is a weak but significant relationship between household level food consumption and malnutrition. As household consumption patterns improve, malnutrition rates decline. In terms of food consumption scores, the prevalence rates of stunting and underweight declined by 7.4 percent and 3.5 percent respectively from households with low consumption to households with high consumption scores (Fig 42.A). Looking at the household dietary diversity score (Fig 42.B) the difference in prevalence between households with high diversity and low diversity is 5.9 and 5.3 percent respectively.

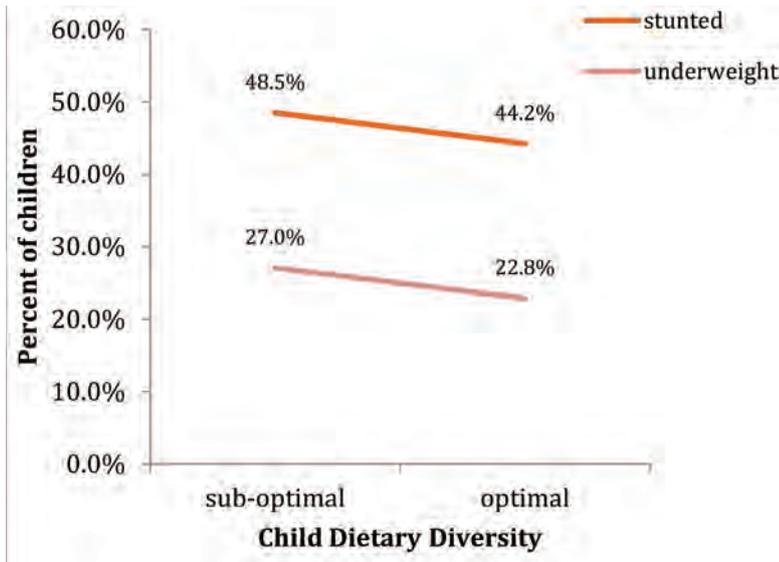
FIGURE 42: MALNUTRITION BY FOOD CONSUMPTION PATTERNS (RVS 2013)



Child Level

As would be expected, RVS data showed that child nutrition status improves as the diet improves, indicating the importance of child food intake to reducing malnutrition. The prevalence of stunting and underweight both declined by about 4 percent between those that consumed sub-optimal diet (< 4 food groups) and those that consumed an optimal diet (>= 4 food groups).

FIGURE 43: MALNUTRITION AND CHILD DIETARY DIVERSITY



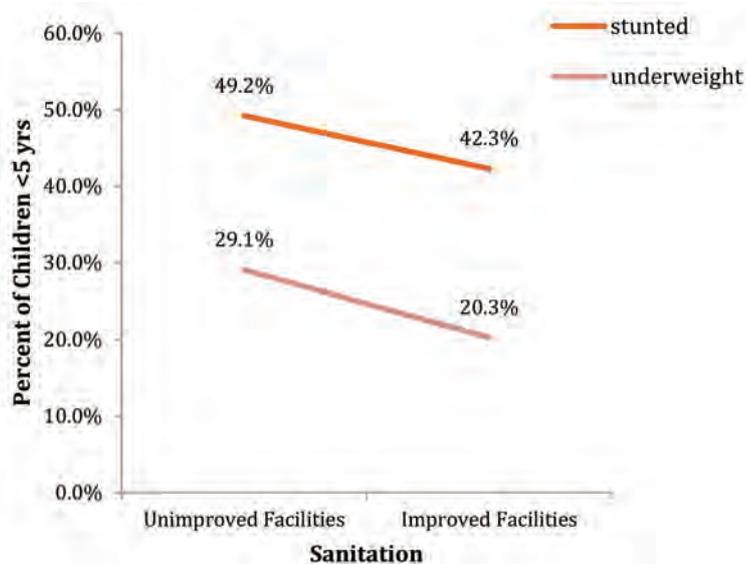
Child Malnutrition and Non-food factors

A great number of non-food factors can impact child malnutrition, many of them related to overall poverty level of the household. As seen in the nutrition section above, malnutrition declines as wealth improves (stunting declines from 52 percent in the lowest quintile to 31 percent in the highest quintile, and malnutrition declines from 31 to 17 percent). Comparing households in which the household head has no formal or primary education with ones in which the household head has secondary or tertiary education, the prevalence of stunting was found to decline from 48 to 39 percent and underweight declined from 26 to 22 percent. While a full analysis of non-food was not possible at this time, this nonetheless suggests that improving factors related to poverty status can have positive implications for reducing malnutrition.

Malnutrition and Improved Sanitation

A key non-food factor influencing malnutrition is access to improved sanitation. RVS data indicates a strong relationship between household access to improved sanitation and prevalence of malnutrition. As indicated in Figure 44, the prevalence of stunting declines by approximately 7 percentage points in household with improved sanitation, and the prevalence of underweight declines by 9 percentage points.

FIGURE 44: MALNUTRITION AND SANITATION (RVS 2013)



Interaction between Food and Sanitation

Analysis with multiple variables allows for greater understanding of the relative role of food and non-food factors. The following analysis presents the effect on malnutrition of improvements in (1) household dietary diversity, and (2) child dietary diversity after controlling for sanitation.

Interaction of Sanitation and Household-level dietary diversity

After controlling for sanitation, there is a significant difference in the prevalence of malnutrition, particularly for stunting, in household with better food consumption patterns as compared to those with poorer consumption patterns. In households with improved sanitation (blue lines), the prevalence of stunting declines by 12.1 percentage points when food consumption score improves (figure 45.A). Likewise, the prevalence of stunting declines by 8.4 percentage points in households with improved sanitation when dietary diversity (HDDS) improves from low to high (figure 46.A). By contrast, in households with unimproved sanitation (red lines), the improvement in food consumption has no discernible impact on levels of stunting, suggesting that improving household access to food has a limited role in reducing malnutrition if sanitation is not also improved.

FIGURE 45: PREVALENCE OF MALNUTRITION BY SANITATION AND FOOD CONSUMPTION SCORE (RVS 2013)

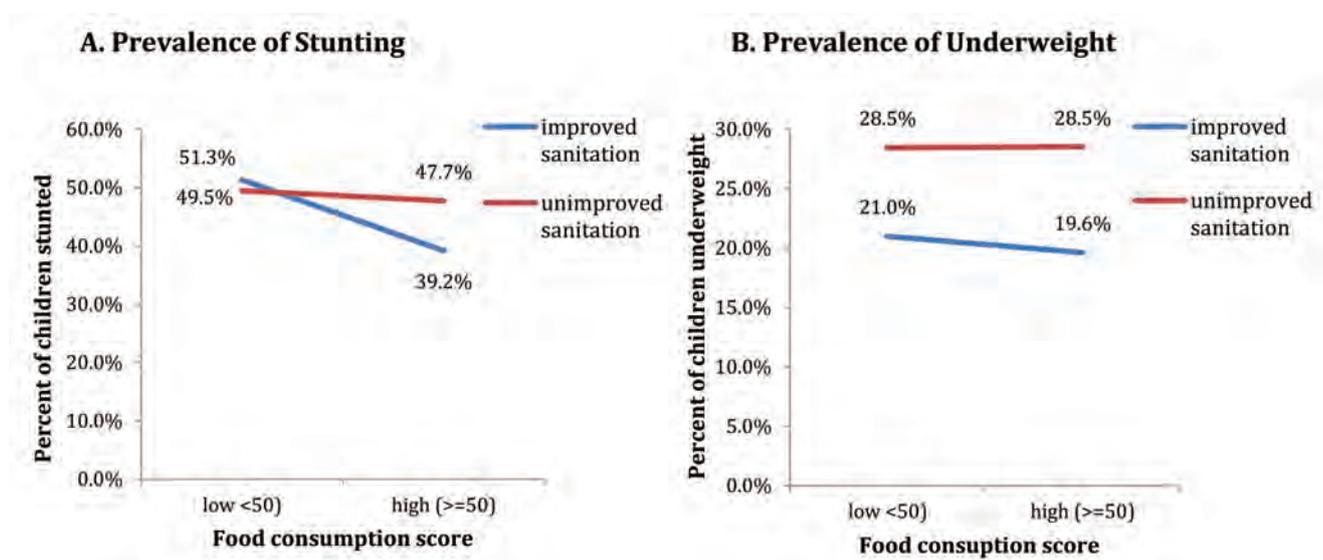
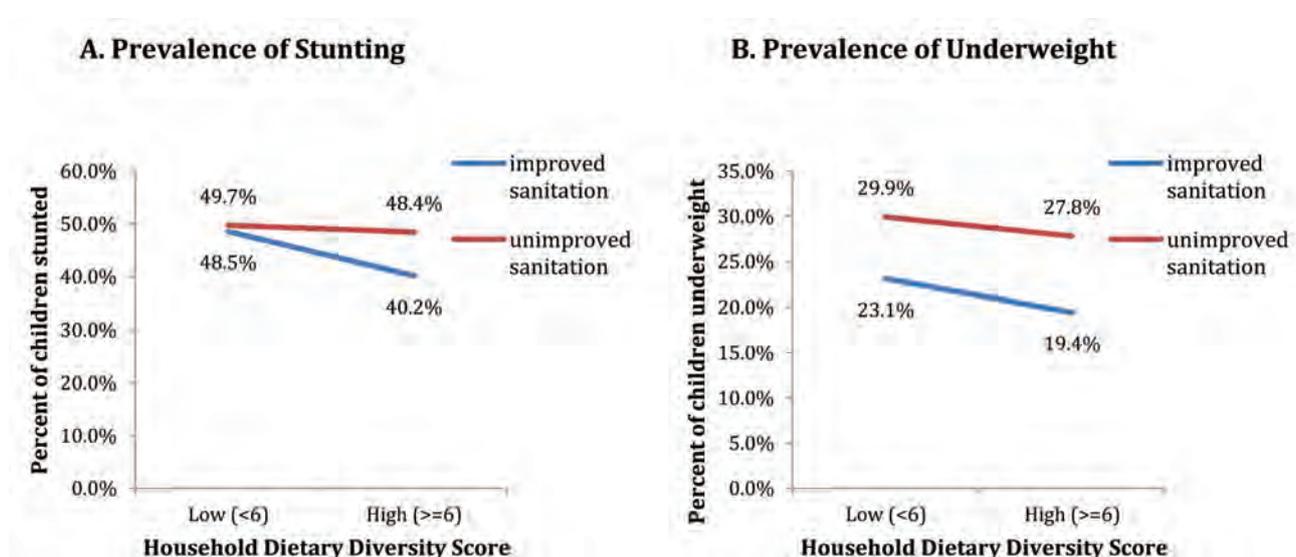


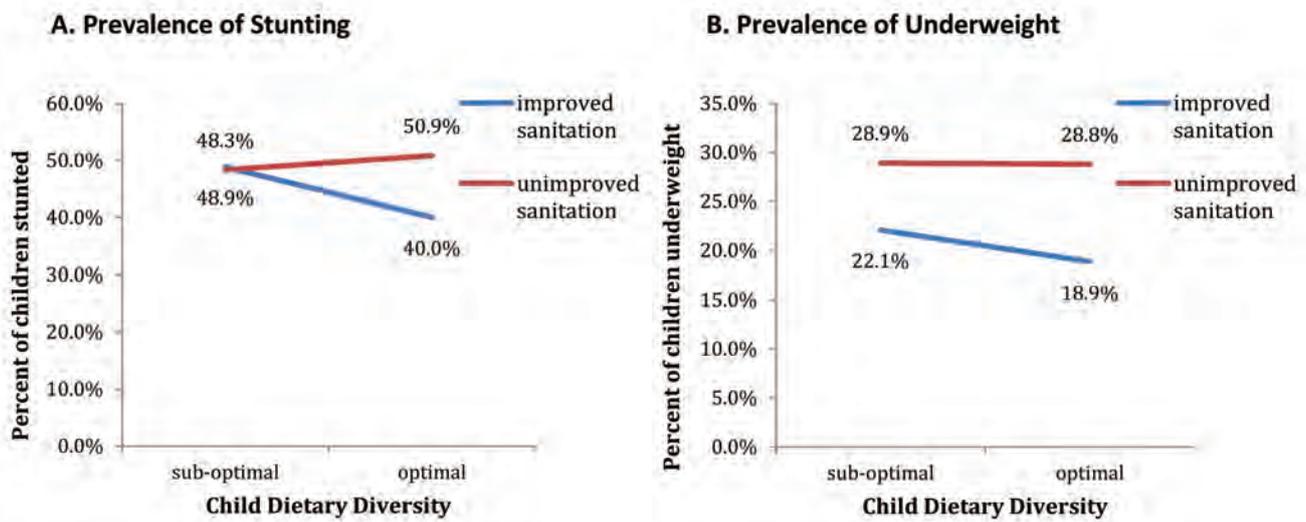
FIGURE 46: PREVALENCE OF MALNUTRITION BY SANITATION AND HOUSEHOLD DIETARY DIVERSITY SCORE (RVS 2013)



Interaction of Sanitation and Child-level dietary diversity

Similar additive effects can be seen between improved sanitation and improved child dietary diversity. After controlling for sanitation, there is a significant difference in the prevalence of malnutrition amongst children with optimal dietary diversity as compared to those with sub-optimal dietary diversity. In households with improved sanitation facilities (blue lines), the prevalence of stunting and underweight declined by 8.9 and 3.2 percentage points respectively when the child's diet was improved from sub-optimal to optimal. This is in contrast to relatively no change seen in the prevalence of stunting and underweight in households with unimproved sanitation facilities when the child's diet was improved (Figure 47). Again, the implication of this analysis is that without simultaneous improvements in sanitation, the role of improved diet has a limited function in reducing malnutrition.

FIGURE 47: PREVALENCE OF MALNUTRITION BY SANITATION AND CHILD DIETARY DIVERSITY (RVS 2013)



Summary

Overall, this analysis of linkages between food intake and sanitation strongly indicate the need for a multi-sectoral approach that simultaneously addresses sanitation, hygiene, nutrition education and child feeding practices. While analysis could not be conducted on the impact of access to safe water, the relationship with improved sanitation and of both to nutritional status is well-understood globally, and therefore improving access to safe water should also be addressed in tandem with those factors discussed above.

Part 6: Key Observations And Recommendations

Key Observations

In elaborating these observations, it is worth recalling that the focus of this survey was on the exploration of the connections between food security and nutrition. The overall survey approach focused on food-related aspects of nutrition, but as the IPC framework indicates, malnutrition has both food and non-food contributing factors. While some of the most important findings of this report indicate the importance of non-food related factors in understanding the malnutrition profile of Lao PDR, a full analysis of the multitude of non-food factors nevertheless fell beyond the remit of this survey. It is therefore essential that these findings be contextualized within the framework of the 2012 LSIS data, which is the most authoritative data source on malnutrition in Lao PDR.

Recognizing that the RVS was designed to operate as a supporting exercise for the LCA, a similar point can be made regarding all agricultural sector data. Where possible, the agricultural data in the RVS has been crosschecked against the LCA, and when applicable, the LCA data has been applied directly. These two larger surveys highlight the need for the RVS to be understood within that wider research context, and the extent to which its findings are reliant on data from those exercises.

Finally, it is noted that the coverage of this survey is not exhaustive; other factors which influence food security such as social exclusion, land access and tenure, and increased commercial exploitation of natural resources, are not easily captured in a survey format. Readers searching for more information on these aspects of the food and nutrition security context of Lao PDR are encouraged to explore other sources of information on these topics, such as the 2012 MONRE/CDE report on concession and leases in Lao PDR (available [here](#)¹⁹).
Malnutrition:

Reiterating the findings of the LSIS, the RVS found very high levels of stunting in all areas surveyed, with a very high degree of comparability with the larger LSIS dataset. Those data are re-presented here, to indicate the overall prevalence at the national level. In geographic terms, stunting is highest in the northern lowlands and highlands, at 50 and 58 percent respectively.

19 http://www.decide.la/MoNRE_Book/Download_NR.html

TABLE 29: PREVALENCE OF MALNUTRITION IN CHILDREN UNDER 5 YEARS, LSIS 2011 AND RVS 2013

	LSIS 2011/12			RVS 2013			% of children under 2
	Total	Male	Female	Total	Male	Female	(Total)
Stunting	44.2	45.7	42.6	46.2	45.9	46.5	41.1
Underweight	26.6	26.7	26.4	25.3	26	24.5	21
Wasting	5.9	6.4	5.4	5.4	5.9	4.7	5.1

Furthermore, RVS data are consistent with nutrition data recorded since the 2000 MICS and successive exercises thereafter, indicating high and stable levels of stunting, some reductions in underweight (31 to 26.6 percent since MICS 2006), and generally low and stable rates of wasting.

With this in mind, and with agricultural production data, GDP growth and major improvements in infrastructure, it is clear that chronic malnutrition represents one of the prevailing food and nutrition security concerns for Lao PDR.

The RVS offers indication that malnutrition must be addressed from both a food perspective as well as a sanitation perspective. The data indicate that while household dietary diversity is high, that diversity is not proportionately shared within the household. In every region except Vientiane Plain, among household with sub-optimum dietary diversity, children under five have significantly less diversity than adults, ranging from 43 percent in the northern lowlands to 76 percent in the central and southern highlands. Data on page 61 (Table 33) indicate that even among the richest quintile, children’s diets are still inadequate in 30 percent of households. This suggests that stunting may be a function of inadequate diversity in the diets of children under five. In line with global observations and recommendations, RVS also found that poor practices of timely introduction of complementary foods for infants, poor dietary diversity and poor frequency of feeding for children under two. In combination with the observation of high starting prevalence of malnutrition already at 6 months of age, the data strongly points toward the importance of maternal nutrition, health, and care pre-, during, and post-pregnancy.

Based on analysis of various measures of food access, including food consumption score, and dietary diversity, there appears to be weak relationships between food consumption and malnutrition. At the child level, analysis of the child dietary intake reveals high levels of sub-optimal diversity even within households with access to a wide range of food. Data on intra-household consumption patterns from the qualitative survey suggest that children tend to eat first, and that there is no cultural barrier to prioritizing children’s nutrition, therefore the issue would appear to be a function of a lack of knowledge on the need for young children to eat a diverse diet.

Analysis of data on access to sanitation and stunting indicate that children in households with no access to improved sanitation facilities are more likely to be stunted than in household with access. Additional multivariate analysis indicates a clear relationship between improved sanitation, improved child dietary diversity and reduced levels of malnutrition. This again underscores the need to explore in greater depth the linkages between non-food and food

factors and the need for a multi-sectoral approach, a point that will be taken up further in the Recommendations section.

In terms of the food consumption measurement tools used, it is clear that some standard tools such as food consumption score and dietary diversity need to be tailored to the specifics of the Lao context if they are to have useful applicability to on-going monitoring of food and nutrition security. The WFP has done some important work on developing FCS for the Lao context already, and these efforts should be renewed with support from all stakeholders. In addition, the lack of information on quantities of food from these tools limits the extent of understanding about volume of food consumed in malnutrition. Further information on quantities of each food group would greatly inform the data on dietary diversity.

Macronutrient Consumption:

Corroborating the findings of the LECS4 Food Insecurity Trend Analysis, protein and fats consumption are lower than WHO recommended levels, with animal/fish proteins consumed on 1.8 days of the week among borderline and poor FCS households, and oils/fats consumed only one day a week. Consumption of eggs is increasing, but pulses and milk remain virtually non-existent in the Lao diet. With the exception of eggs, wild-source proteins, especially fish and OAA, remain an important source in most AEZ.

Declining Access to NTFPs:

Hunting and gathering of foods from wild sources remain a key source of income and a means of sourcing food across all livelihood groups, as the data on page 56 show. Among the key findings of the RVS was the consistency of responses around questions of perceptions of access to NTFPs. Some 82 percent of all respondents stated that their access to forest resources had diminished over the past five years. While the volume and diversity of items collected may be diminishing, the role of NTFPs as a source of income is increasingly important. One respondent in the qualitative component of the RVS noted “Earlier, there was lots of food in the forests. But now it is all vanishing. Everything goes to the market. Everyone needs money.” Bearing in mind the importance of NTFPs as a food source, this is an important finding that will be discussed further in the Recommendations section.

Poor Hygiene and Sanitation Knowledge:

Malnutrition and nutrition related issues continue to be commonly perceived by rural populations as a function of rice intake, with limited nutritional knowledge in evidence among survey respondents. Understanding of sanitary, hygienic practice in food preparation was also noted to be lacking, underscoring the weak understanding of the linkages between sanitation, food, disease and malnutrition amongst rural populations.

Hazards and Vulnerability:

Floods, droughts, infestations and other hazard events are common and widespread phenomena in Lao PDR, although there are significant issues of scale, with some occurring at the level of a village, while others affecting multiple provinces at once. While the RVS does not add extensive detail to the existing information on natural disasters, it is noted that extreme events at the village, district and provincial level are more common in the northern AEZ, but that vulnerability is lower as coping responses are well evolved. In the Mekong

corridor, central and southern highlands, extreme events tend to be more infrequent, but can result in higher levels of damage as a result of increased event severity.

Although based only on the qualitative sample, there was no explicit linkage between resettlement *per se* and vulnerability. Vulnerability was more a function of good communication, (including access to mobile phones), all year road access, access to markets, village health volunteers or traditional midwives, Toilets/latrines and sufficient water supply, and electricity.

In all locations, improvements in major infrastructure, including roads, electricity, water systems, markets and communications networks were noted and well appreciated. This was indicated as an importance factor in disaster resilience and recovery by survey participants, and is an encouraging trend. However, similar improvements were not noted in educational systems. Given the importance of schools as a venue for food, agricultural and nutrition-based learning, plus the fact that income generating potential and nutritional knowledge was both demonstrated to be connected to educational status of women, in particular, this is cause for concern and renewed effort.

Recommendations

Based on feedback from the participants at the Analysis Workshop in April 2013, these recommendations are grouped by food security component, with additional recommendation pertaining to gender and further study required. As noted in Part 3 of this report, aspects of food security are necessarily cross cutting, and may not be limited to one sector or the other. The recommendation around seasonality is a case in point-this could be included in various sections. It is therefore suggested these recommendations be considered in full, rather than individually. Equally, differing modes and rates of development in different parts of the country mean that there is no 'one size fits all' recommendation, and locally specific solutions at the district and village level will need to be identified to address the specifics of the local context.

Where possible, examples of ongoing programming have been included, so as to indicate ways in which these recommendations can be easily actionable.

General:

With stunting the prevailing food and nutrition security priority for Lao PDR, an interdisciplinary, multi-stakeholder approach is needed to address this issue. This must therefore be a first-order priority for policy and programming across relevant sectors, including agriculture, public health, water/sanitation and trade. It is noted that through its efforts to attain the MDGs, its commitment to the SUN initiative, as well as the National Nutrition Plan of Action and Nutrition Strategy, the Government of Lao PDR is well aware of this issue and that comprehensive approaches to address this issue are already in place. It is recommended that the relevant stakeholders including Government, development partners and the donor community consider ways in which to renew collective commitments to address stunting.

With this as general recommendation, potential areas for programming to be addressed within the food security context include, *inter alia*: improving research on nutrition among pregnant mothers, improved nutrition for pregnant mothers, weaning practice for CU2 (especially as pertains to dietary diversity), nutrition awareness and knowledge, household food expenditure patterns, changing access to wild foods (including fish and NTFPs), and the role of women in rural Lao PDR. On the non-food side, renewed focus on water and sanitation infrastructure and hygienic practice is also of significant importance.

Availability:

Seasonality is still a strong factor in food insecurity in Lao PDR, influencing dietary diversity, consumption patterns, livelihoods and vulnerability. While more research is required into the role of seasonal variations in overall vulnerability, it is recommended that additional efforts be made to mitigate that variability for rural households. This can be achieved through a) providing more consistent food supplies over the course of the year, b) mitigating the impact of severe weather on rural households, c) developing off-farm income opportunities (in non-weather contingent livelihoods)

Some potential programmatic interventions are suggested as follows:

- In terms of developing crops which support nutrition at the community level, it is noted that overall rice availability in Lao PDR is more than adequate to meet per

capita demand, and that there is relatively little variation at the provincial level in this regard. However, supply of nutrition-rich foods such as leafy greens, legumes, seeds and nuts, as well as protein sources from livestock are more varied and contingent on access to wild sourcing. Renewed commitment to developing self-sufficiency at the community level should be supported, encouraging households to develop foods with nutritive value, through house gardens, improved availability of affordable agricultural inputs, and livestock/poultry inputs and medical coverage. As access to wild foods is reduced, there is a need to support increased replacement of those foodstuffs through own-production, and that should be supported at the household and village level.

- Post harvest losses and post harvest technology can be improved to reduce the quantities of foods lost prior to consumption. In the first instance, an expansion of milling infrastructure for rice at the district and village level would improve overall recovery rates for rice, thereby making more rice available at the local level. Improved storage facilities would also further reduce losses. The SNV funded [BIIE project](#)²⁰ in Khammouan and Savannakhet provinces offer one possible model to be expanded.
- While there are viable food preservation methods practiced in Lao PDR (including salting, drying, fermenting, pickling, etc), they tend not to be applied on more than an *ad hoc* basis, and could be more viably expanded to provide more consistent availability of preserved foods during the lean season. Additional efforts can be expended to expand awareness of food preservation techniques in areas where they are less practiced, notably the northern highlands.
- Participating households noted that forward planning over the course of the coming year is a challenge, with the result that future events which may have bearing on a household's livelihoods are not always well anticipated. Supporting household level financial and livelihood planning will contribute to informed decision-making at the household level- examples of how this can be fostered can be found in [the LANN approach](#)²¹.

Access:

As noted below in the section on Utilization, protein in the Lao diet is sourced from a variety of places, not least of which is wild meat and fish. While market purchases of some protein rich food such as eggs are on the increase, it is likely that wild-sourced protein will continue to play an important part in the Lao diet. This should serve as reminder that there is a need for sustainable stewardship and management of wild food sources, in both rivers and forests, as the cost of replacing wild caught protein with market purchases may be beyond poorer rural populations.

It is noted that NTFPs and wild foods including meat, fish and OAA continue to play a

20 <http://www.snvworld.org/en/countries/laos/our-work/projects/rice-building-income-independence-and-empowerment-for-farmers-biie>

21 http://www.alliance2015.org/fileadmin/Texte__Pdf/Text_Documents/Round_Table_Dublin_Docs_and_Photos/Alliance2015_Roundtable_Laos_presentation.pdf

valuable role in the Lao diet. However, their role should not be overestimated. As access to wild resources changes, there is a need for a balanced approach to NTFPs. It is therefore recommended that a twofold approach to supporting sustainable NTFP use and fishing practice be developed, to support to expanded agricultural activities at the household level to replace NTFP inputs in those areas where NTFP access is more difficult, but equally to support sustainable conservation-based use of Lao PDR's biodiversity. The applicability of each approach will vary from place to place, based on local circumstances.

Utilization:

This study has attempted to limit its field of reference to food related issues and how they may pertain to food and nutrition security. However, simple analysis of incidence of malnutrition and access to sanitation suggest there may be important links between these two fields. This is further borne out by the larger LSIS exercise. In short, it would appear that stunting is strongly linked to access to improved water and sanitation facilities. Improving rural access to potable water and sanitary toilets is highlighted here as a key strategy in improving rates of stunting in Lao PDR.

Nutrition knowledge and understanding of safe and hygienic food preparation practice was noted to be incomplete and inaccurate. Among survey respondents, malnutrition was broadly understood to be a function of rice intake. There is a need to ameliorate nutrition and food safety education through formal educational channels and development programming. Good templates for this exist, such as [the LANN approach²²](#), which should be explored further as a means towards improving rural populations' understanding of linkages between food security (including agriculture) nutrition and health.

Echoing the recommendations of the [LECS4 Food Security Trend Analysis²³](#), the Lao diet continues to be lower than WHO recommended thresholds for protein and oil/fats. While rice consumption remains the cornerstone of the Lao diet, there is a need to rebalance the share of macronutrients, such that rice consumption does not contribute to inadequate protein and oil/fat intake.

RVS data indicates that dietary diversity in CU5 is an important consideration in the continued levels of stunting found in Lao PDR. However, the sample size for the CU2 population was inadequate to support extensive analysis. Recognizing once again the importance of the first 1000 days, further research into both the dietary diversity and quantities consumed among CU2 represents a key issue in better understanding malnutrition in Lao PDR. It is recommended that further discussion on this point between Government and development partners take place in the immediate future.

Gender Issues:

- While data on children and infant feeding in Lao PDR is increasingly robust, information on food and nutrition security among pregnant women is less well extensive, and was not covered in the LSIS. Recognizing that the first 1,000 days approach starts from the onset of pregnancy, it is recommended that additional funding, research,

22 http://www.alliance2015.org/fileadmin/Texte__Pdfs/Text_Documents/Round_Table_Dublin_Docs_and_Photos/Alliance2015_Roundtable_Laos_presentation.pdf

23 http://www.maf.gov.la/swgard/download/LECS_4_FSSM_Report_v5.pdf

and programming be oriented to quantify and address the needs of this population. Data from the qualitative element of this survey suggest that there are fewer taboos and traditional norms associated with pregnancy than there are with weaning, which suggests this may be a practical point of programmatic entry.

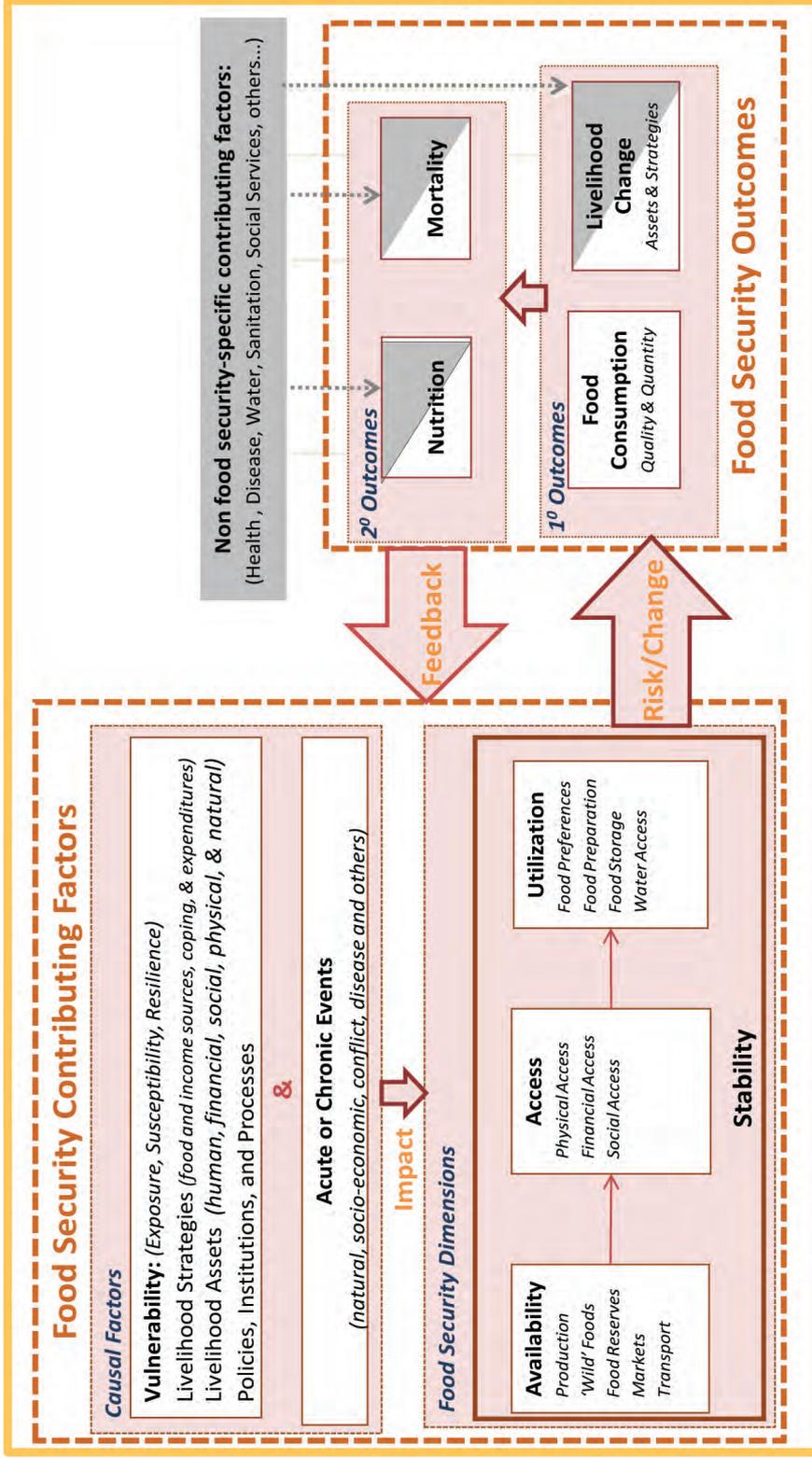
- Women's educational development, access to information, and income generating opportunities are all seen to have important implications for food and nutrition security. Further research is needed into the importance of mothers' general education levels as it correlated to child nutrition, as well as specific maternal knowledge on infant and young child feeding. The present research would suggest that while the correlations between stunting and household food consumption may be weak, there may be stronger linkages to maternal education. Improving access to information and education must also necessarily involve the adaptation of traditional gender roles in the rural context, which must involve husbands, fathers and sons as well as mothers, wives and daughters.

Statistics and Methodology

- While the RVS collected extensive data on diversity of food consumption, it did not provide additional detail on food quantities. Based on the information in the RVS, among dietary factors contributing to stunting, it seems plausible that overall dietary composition- specifically, overall volume of food consumed- is a contributing factor to malnutrition. It is therefore recommended that further research be conducted into the quantities of food consumed at the intra-household level, with a focus on children's consumption. With LECS5 fieldwork completed, it is hoped that expenditure and consumption data may be analyzed to fill this gap in the data.
- Given the high levels of dietary diversity common in the Lao context, global standards and thresholds applied on tools such as FCS and DDS may not be applicable in Lao PDR: people consuming less than adequate diets may yet appear adequately diverse. Continuing the adjustment of FCS to the Lao context has already been started by WFP, and it is recommended that this be continued, such that more meaningful thresholds are developed for the Lao context. The same holds true for DDS- while the RVS has set thresholds for the purposes of this exercise, there is a need for renewed discussion and consensus on what appropriate thresholds should be set.
- With pilot testing of the IPC approach for chronically food insecure populations now complete in Nepal and Philippines, there is renewed interest and commitment from food security stakeholders to exploring its more complete application in the Lao context. It is recommended that MAF and FAO pursue this with relevant counterparts at the regional level within the course of the next six months.

Annex I: IPC Food Security analytical Framework

Annexes



Annex II: Agro-ecological Zones of Lao PDR²⁴

Mekong Corridor: The Mekong Corridor includes the banks and floodplains of the Mekong River and the lower alluvial valleys of its tributaries. Altitudes range from 100-200 meters, annual rainfall is between 1,500-2,000 millimetres, and the agricultural growth period ranges from 180-200 days. The landscape consists mainly of plain to modestly sloping areas. The original lowland forest cover has long been removed for intensive farming as the area is well suited for a wide range of crops, particularly lowland rice. The total rural population in the Mekong Corridor is about 1.5 million people making it the most densely populated area in Laos.

Central-Southern Highlands: This zone includes parts of Khammouan, Savannakhet, Saravan, Sekong and Attapeu provinces and extends parallel to the Mekong covering the upper valleys of its tributaries and upland areas. Altitude range varies from 200-500 meters. Rainfall ranges from 2,000-3,000 mm and the length of growth period is between 210-240 days. Population density is low with less than 300,000 people. The zone is generally characterized by poor acid soils with little potential for productive agriculture. In addition, the high risk of unexploded ordnance (UXO) prevents the cultivation of a large portion of the available land. The rural population is estimated at around 15 people per square kilometre.

Vientiane Plain: The Vientiane Plain extends over parts of Vientiane, Bolikhamxay and Khammouan provinces and covers the higher plains and lower slopes in the areas. Altitude ranges from 500-1000 meters and annual rainfall from 2,500-3,000 mm. The growth period is 240-270 days. The landform is dominated by rolling topography and middle mountain areas. Natural forests still exist but have been affected by shifting cultivation. Upland rice cultivation is one of the main agricultural activities but animal husbandry is also of some importance. The total rural population is approximately 300,000 people with low to medium population density.

Bolaven Plateau: This zone includes parts of Saravan, Sekong, and Attapeu provinces in the south of the country. Altitude varies from 500-1,500 meters and rainfall ranges from 2,500-3,000 mm. Today's natural vegetation mainly consists of savannah, forest and grassland formations. Land is primarily used for cultivation of tree crops (coffee, tea and cardamom) but some shifting cultivation for upland rice production occurs as well. Livestock production is of major importance in this area. The total rural population is estimated to be around 60,000 people.

Northern Highland Areas: This zone covers the mountain areas of Phongsaly, Luang Namtha and Bokeo in the extreme northwest, parts of Houaphan and Xiengkhouang and eastern parts of Bolikhamxay. Altitude varies from 1,500-2,500 meters and annual rainfall ranges from 1,300-2,500 mm. The zone is characterized by remoteness, inaccessibility and high erosion risk due to the steep mountainous topography. However, soils are well suited for farming and there is good potential for animal husbandry. Natural forests have been largely removed and shifting cultivation is the predominant land use. The total rural population is approximately 1,000,000 people, however, overall population density is still low.

24 Source: Lao PDR: Rural and Agriculture Sector Issues Paper, World Bank 2006 (available: <http://lad.nafri.org.la/fulltext/LAD010320071391.pdf>)

Northern Lowlands: This area comprises parts of Luang Prabang, Phongsaly, Oudomxai and Sayabouli. Altitude ranges from 500-1,500 meters and annual rainfall ranges from 1,500-2,000 mm. The landforms in this zone are predominantly mountainous and similar to those in the Northern Highlands. The original natural forests have been removed and remaining forests are largely shaped by shifting cultivation and livestock grazing. The total rural population in this zone is estimated at about 1,000,000 but population density is higher than in the Northern Highlands.

Annex III: Key Tables at Provincial Level

Mean Hectares cultivated in 2012		
Province	Vientiane.C	1.9
	Phongsaly	1.8
	Luangnamtha	1.5
	Oudomxay	1.9
	Bokeo	2.1
	Luangprabang	1.4
	Huaphanh	1.3
	Xayabury	2.0
	Xiengkhuang	2.4
	Vientiane	1.9
	Borikhamxay	1.9
	Khammuane	1.6
	Savannakhet	2.0
	Saravan	1.8
	Sekong	2.0
	Champasack	2.1
	Attapeu	1.5
Total		1.8

Percent of HHs with access to vegetable plots		
Province	Vientiane.C	72.2%
	Phongsaly	88.8%
	Luangnamtha	52.4%
	Oudomxay	78.2%
	Bokeo	71.8%
	Luangprabang	44.7%
	Huaphanh	70.0%
	Xayabury	69.5%
	Xiengkhuang	65.6%
	Vientiane	69.1%
	Borikhamxay	94.0%
	Khammuane	68.2%
	Savannakhet	71.9%
	Saravan	67.6%
	Sekong	55.2%
	Champasack	80.3%
	Attapeu	68.7%
Total		70.5%

Percent of Households growing selected crops in 2012						
		rice	maize	cassava	sugarcane	rubber
Province	Vientiane.C	93.6%	4.8%	2.6%	0.5%	1.3%
	Phongsaly	94.3%	47.5%	14.8%	17.0%	2.5%
	Luangnamtha	95.2%	7.1%	0.0%	15.6%	15.9%
	Oudomxay	87.7%	47.1%	2.7%	2.1%	2.8%
	Bokeo	100.0%	11.3%	2.5%	0.0%	18.1%
	Luangprabang	93.1%	32.7%	5.3%	0.0%	1.5%
	Huaphanh	96.2%	38.0%	4.6%	0.0%	3.5%
	Xayabury	88.9%	38.1%	0.8%	0.0%	0.7%
	Xiengkhuang	98.8%	65.8%	4.9%	1.0%	0.7%
	Vientiane	94.9%	6.5%	3.2%	1.0%	1.3%
	Borikhamxay	98.3%	0.4%	30.6%	0.7%	3.5%
	Khammuane	98.9%	1.6%	0.4%	0.9%	1.0%
	Savannakhet	98.0%	1.3%	1.3%	0.0%	1.5%
	Saravan	89.5%	2.7%	13.3%	0.0%	0.5%
	Sekong	91.1%	0.0%	19.0%	0.0%	1.5%
	Champasack	85.9%	2.9%	0.7%	0.0%	0.4%
	Attapeu	99.0%	0.0%	0.0%	0.4%	0.0%
Total		93.9%	15.9%	4.9%	1.5%	2.5%

Percent of Households owning at least one of the animal species					
		Own cattle	Own buffalo	Own pigs	Own poultry
Province	Vientiane.C	34.1%	10.7%	3.0%	78.3%
	Phongsaly	18.3%	20.1%	79.9%	84.4%
	Luangnamtha	11.8%	24.6%	76.6%	83.3%
	Oudomxay	18.1%	21.8%	77.3%	85.9%
	Bokeo	57.9%	21.7%	79.8%	90.6%
	Luangprabang	19.1%	18.8%	58.7%	77.8%
	Huaphanh	52.7%	33.0%	67.0%	84.9%
	Xayabury	32.6%	21.3%	51.6%	74.6%
	Xiengkhuang	63.8%	17.9%	82.9%	88.6%
	Vientiane	35.4%	12.9%	26.4%	81.2%
	Borikhamxay	40.9%	19.5%	44.8%	77.2%
	Khammuane	46.7%	30.0%	37.9%	80.8%
	Savannakhet	58.7%	26.3%	46.5%	74.7%
	Saravan	51.5%	34.4%	63.4%	81.9%
	Sekong	24.6%	29.0%	72.7%	54.4%
	Champasack	21.7%	41.7%	35.4%	80.5%
	Attapeu	6.2%	52.2%	58.0%	69.3%
Total		37.8%	25.7%	51.0%	79.6%

Percent of Households by size of livestock herd													
Province	Pig herd sizes					Poultry flocks							
	No pigs	1-2 pigs	3-4 pigs	>4 pigs	No poultry	1-5 poultry	6-10 poultry	11-20 poultry	>20 poultry	No poultry	1-5 poultry	6-10 poultry	>20 poultry
Vientiane.C	97.0%	1.8%	0.6%	0.6%	21.7%	11.3%	15.3%	29.1%	22.6%				
Phongsaly	20.1%	47.9%	20.0%	12.0%	15.6%	37.5%	26.1%	13.0%	7.8%				
Luangnamtha	23.4%	38.4%	20.1%	18.1%	16.7%	24.5%	28.6%	19.5%	10.7%				
Oudomxay	22.7%	61.3%	10.8%	5.2%	14.1%	46.4%	10.8%	8.8%	19.9%				
Bokeo	20.2%	45.7%	17.1%	17.0%	9.4%	20.1%	27.7%	21.0%	21.7%				
Luangprabang	41.3%	25.6%	11.6%	21.5%	22.2%	19.0%	16.5%	18.6%	23.7%				
Huaphanh	33.0%	31.8%	15.9%	19.3%	15.1%	24.1%	23.8%	23.1%	13.9%				
Xayabury	48.4%	33.0%	10.7%	7.9%	25.4%	13.4%	14.0%	20.5%	26.7%				
Xiengkhuang	17.1%	49.8%	18.6%	14.6%	11.4%	20.2%	13.4%	25.3%	29.6%				
Vientiane	73.6%	10.3%	6.0%	10.1%	18.8%	10.6%	11.2%	21.6%	37.8%				
Borikhamxay	55.2%	25.3%	8.6%	10.9%	22.8%	5.5%	27.4%	23.3%	21.0%				
Khammuane	62.1%	20.4%	7.9%	9.6%	19.2%	21.3%	19.2%	21.9%	18.5%				
Savannakhet	53.5%	35.2%	6.4%	4.8%	25.3%	21.3%	24.0%	21.1%	8.2%				
Saravan	36.6%	43.9%	11.7%	7.8%	18.1%	27.7%	15.6%	21.7%	16.8%				
Sekong	27.3%	48.9%	11.9%	11.9%	45.6%	21.7%	18.5%	9.9%	4.3%				
Champasack	64.6%	31.1%	2.9%	1.3%	19.5%	15.4%	17.6%	24.8%	22.8%				
Attapeu	42.0%	45.4%	9.4%	3.2%	30.7%	22.0%	19.5%	17.8%	10.1%				
Total	49.0%	32.4%	9.6%	9.1%	20.4%	20.4%	18.8%	20.9%	19.4%				

Percent of Households by size of livestock herd		cattle ownership					buffalo ownership						
		No cattle	1-2 cows	3-4 cows	>4 cows	No buffalo	1-2 buffalo	3-4 buffalo	>4 buffalo	No buffalo	1-2 buffalo	3-4 buffalo	>4 buffalo
Province	Vientiane.C	65.9%	6.5%	6.5%	21.0%	89.3%	2.4%	2.1%	6.3%	89.3%	2.4%	2.1%	6.3%
	Phongsaly	81.7%	13.8%	2.2%	2.3%	79.9%	14.3%	3.8%	2.0%	79.9%	14.3%	3.8%	2.0%
	Luangnamtha	88.2%	6.6%	3.8%	1.5%	75.4%	13.2%	7.6%	3.8%	75.4%	13.2%	7.6%	3.8%
	Oudomxay	81.9%	11.4%	4.6%	2.1%	78.2%	17.7%	1.9%	2.3%	78.2%	17.7%	1.9%	2.3%
	Bokeo	42.1%	26.7%	9.8%	21.3%	78.3%	12.7%	4.9%	4.0%	78.3%	12.7%	4.9%	4.0%
	Luangprabang	80.9%	8.6%	5.0%	5.4%	81.2%	9.5%	5.1%	4.2%	81.2%	9.5%	5.1%	4.2%
	Huaphanh	47.3%	23.2%	13.2%	16.2%	67.0%	15.3%	9.7%	8.0%	67.0%	15.3%	9.7%	8.0%
	Xayabury	67.4%	11.7%	8.4%	12.6%	78.7%	13.1%	3.5%	4.8%	78.7%	13.1%	3.5%	4.8%
	Xiengkhuang	36.2%	12.1%	11.5%	40.2%	82.1%	8.2%	6.8%	2.9%	82.1%	8.2%	6.8%	2.9%
	Vientiane	64.6%	9.1%	8.2%	18.1%	87.1%	4.1%	4.1%	4.7%	87.1%	4.1%	4.1%	4.7%
	Borikhamxay	59.1%	11.6%	12.2%	17.1%	80.5%	7.5%	7.6%	4.4%	80.5%	7.5%	7.6%	4.4%
	Khammuane	53.3%	25.6%	11.4%	9.7%	70.0%	17.0%	7.6%	5.5%	70.0%	17.0%	7.6%	5.5%
	Savannakhet	41.3%	23.7%	15.0%	20.0%	73.7%	15.5%	6.9%	3.8%	73.7%	15.5%	6.9%	3.8%
	Saravan	48.5%	14.4%	14.4%	22.7%	65.6%	19.3%	9.3%	5.8%	65.6%	19.3%	9.3%	5.8%
	Sekong	75.4%	6.8%	9.3%	8.5%	71.0%	14.1%	10.8%	4.1%	71.0%	14.1%	10.8%	4.1%
	Champasack	78.3%	7.6%	5.1%	9.0%	58.3%	21.3%	13.4%	7.0%	58.3%	21.3%	13.4%	7.0%
	Attapeu	93.8%	1.2%	0.4%	4.7%	47.8%	19.6%	17.4%	15.2%	47.8%	19.6%	17.4%	15.2%
Total		62.2%	14.1%	9.2%	14.6%	74.3%	13.5%	7.1%	5.1%	74.3%	13.5%	7.1%	5.1%

Distribution of households according to food consumption patterns									
Province	Food Consumption Groups					HH Dietary Diversity Ranges			
	Poor	Borderline	Acceptable	<5	5 to 8	>8			
Vientiane.C	0.0%	3.4%	96.6%	3.7%	59.0%	37.4%			
Phongsaly	0.0%	2.5%	97.5%	7.4%	82.5%	10.1%			
Luangnamtha	1.1%	2.6%	96.3%	7.0%	61.1%	31.8%			
Oudomxay	0.9%	4.7%	94.4%	18.5%	69.3%	12.2%			
Bokeo	0.0%	22.1%	77.9%	7.7%	67.8%	24.5%			
Luangprabang	3.8%	11.4%	84.8%	51.7%	44.2%	4.1%			
Huaphanh	5.7%	27.6%	66.7%	41.3%	54.8%	3.8%			
Xayabury	3.3%	6.4%	90.3%	11.7%	72.7%	15.6%			
Xiengkhuang	10.2%	32.9%	56.9%	34.1%	50.3%	15.7%			
Vientiane	1.1%	3.5%	95.3%	5.4%	64.9%	29.7%			
Borikhamxay	0.8%	1.2%	98.1%	7.1%	53.8%	39.1%			
Khammuane	0.0%	4.0%	96.0%	19.3%	69.1%	11.6%			
Savannakhet	0.4%	2.3%	97.3%	14.4%	68.2%	17.4%			
Saravan	2.9%	18.6%	78.5%	26.8%	66.3%	6.9%			
Sekong	22.6%	40.4%	37.0%	70.8%	29.2%	0.0%			
Champasack	1.3%	2.7%	96.0%	5.1%	69.7%	25.1%			
Attapeu	3.8%	11.4%	84.8%	55.9%	41.4%	2.8%			
Total	2.3%	8.9%	88.8%	19.0%	63.2%	17.9%			

Percent of HHs with improved sanitation		
Province	Vientiane.C	97.8%
	Phongsaly	28.1%
	Luangnamtha	49.9%
	Oudomxay	53.1%
	Bokeo	70.1%
	Luangprabang	40.4%
	Huaphanh	55.3%
	Xayabury	80.1%
	Xiengkhuang	39.1%
	Vientiane	81.2%
	Borikhamxay	85.2%
	Khammuane	48.1%
	Savannakhet	54.1%
	Saravan	18.7%
	Sekong	6.1%
	Champasack	35.7%
	Attapeu	23.5%
Total		53.5%

Annex IV: HHold questionnaire

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire

1. To be completed by Enumerator

Please complete before the Interview

	Name	Code
0.1	Enumerator	
0.2	Province	
0.3	District	
0.4	Village	
0.5	Household	
0.6	Ethnic Group	
Province Codes		
01	Vientiane.C	06 LuangPrabang
02	Phongsaly	07 Huaphanh
03	LuangNamtha	08 Xayabury
04	Oudomxay	09 Xiengkhuang
05	Bokeo	10 Vientiane
16	Champasack	17 Attapeu
		11 Borikhamxay
		12 Khammuane
		13 Savannakhet
		14 Saravane
		15 Sekong

My name is We are conducting a survey of the livelihoods of people in rural areas of LAO PDR . Government and its development partners use the information from this survey for their planning and programming. Your household is part of many randomly selected households to represent your neighborhood. The interview will take about 35 to 45 minutes to complete. Any information that you provide will be kept strictly confidential and will not be disclosed to other people. Your participation is voluntary. However we hope that you will participate since your views are important. Would you like to participate in this National Survey by answering questions about your household?

Yes []

No []

Signature of Interviewer: _____ Date: _____

2. To be completed by Team Leader

0.7	Questionnaire Number	
0.8	Date	
Day/Month/Year		
0.9	Name of Supervisor	
0.10	Remarks:	
Signature of Supervisor		

3. To be completed by Data Entry Clerk

0.12	Date	
Day/Month/Year		
0.13	Data Entry Clerk Code	
0.14	Remarks:	
Signature of Data Entry Clerk		

Unless specified otherwise, do not read the answer and circle only one answer per question. Where writing is required, please write as clearly as possible.

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire

Section 1: Demographics				
1.1 Please give me the first name of each household member, starting with the Head of the Household <i>Line 1 must be completed. If there is no spouse, leave line 2 blank and continue with line 3</i>	1.2 Is [Name] male or female? 1 = Male 2 = Female	1.3 How old is [name]? <i>Give age in years. If less than 1 year old, write "0"</i>	For all members of the HH 1.4 What is the main activity that [Name] does to earn income or food? 1= Formal (regular) 2= Informal (irregular) 3 = Hunting and gathering 4 = HH agricultural activities 5 = None	For those members of the HH over 17 years of age 1.5 What is the highest level of schooling that [Name] has attended? <i>See Codes below</i>
				1.6 Is [Name] currently attending school? 1 = Yes 2 = No <i>If yes, go to 1.8</i>
				1.7 If [Name] is NOT attending school, What is the main reason for not attending school this year? <i>See codes below</i>
1. HH HEAD:				
2. SPOUSE:				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
1.8 How many people aged between 15 - 59 are chronically ill? (<i>Chronically ill being those that spend more than 3 months out of an year unable to work because of the disease.</i>)				
Codes for Education Level (for question 1.5)				
0 = No formal schooling	1 = Primary	2 = Secondary	3= Tertiary	4 = Other Specify
Codes for reason not attending school (for question 1.7)				
1 = Illness	2 = Hunger	3 = Work for food /money	4 = Help in the household	5 = School not important
6 = School is too far	7 = Expensive no money	8 = Not interested in school	9 = Migrated here too late to start	10 = Early Marriage
11 = Unwanted Pregnancy	12 = Other Specify			

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire

Section 1: Demographics (EXTRA PAGE)

	1.1 Please give me the first name of each household member, starting with the Head of the Household <i>Line 1 must be completed. If there is no spouse, leave line 2 blank and continue with line 3</i>	1.2 Is [Name] male or female? 1 = Male 2 = Female	1.3 How old is [name]? <i>Give age in years. If less than 1 year old, write "0"</i>	For all members of HH 1.4 What is the main activity that [Name] does to earn income or food? 1= Formal (regular) 2= Informal (irregular) 3 = Hunting and gathering 4 = HH agricultural activities 5 = None	For those members of HH over 17 years of age 1.5 What is the highest level of schooling that [Name] has attended? <i>See Codes below</i>	For those members of HH between 6 and 17 years of age 1.6 Is [Name] currently attending school? <i>1 = Yes 2 = No If yes, go to 1.8</i>	1.7 If [Name] is NOT attending school, What is the main reason for not attending school this year? <i>See codes below</i>
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
20.							
21.							
22.							

Codes for Education Level (for question 1.5)

0 = No formal schooling	1 = Primary	2 = Secondary	3 = Tertiary	4 = Other Specify
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Codes for reason not attending school (for question 1.7)

1 = Illness	2 = Hunger	3 = Work for food /money	4 = Help in the household	5 = School not important
6 = School is too far	7 = Expensive no money	8 = Not interested in school	9 = Migrated here too late to start	10 = Early Marriage.
11 = Unwanted Pregnancy	12 = Other Specify			

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire Number []

Section 2: Household Characteristics							
For questions 2.1 through 2.2 observe (do not ask) the best material used to construct the roof and walls of the main house in the homestead. Then ask the respondent question 2.3 through 2.5.							
2.1	What is the main material used to construct the walls of the house? <i>(Circle only one code)</i>	1 = Shelter (no walls) 7 = Dirt/rudimentary walls	2 = Plywood 8 = Finished walls/ cement	3 = Cement Blocks 9 = Bamboo (mud, lat-tice, dry leaf, mud)	4 = Cane/palm/trunks 10 = Bricks/stone 4 = Grass/leaves	5 = Reused wood/cardboard 11 = other (specify) 5 = Bamboo	6 = Wood planks, shingles 6 = Other
2.2	What is the main material used to construct the roof of the house? <i>(Circle only one code)</i>	1 = Tile/Sipax	2 = Wood	3 = Corrugated iron	4 = Grass/leaves	5 = Bamboo	6 = Other
2.3	What is the Tenure arrangements of your house? <i>(Circle only one code)</i>	1 = Own	2 = Rent	3 = Provided by Relatives	4 = Provided by employer	5 = Other (specify)	
2.4	How many rooms does your household occupy?						
2.5	During the last month, what fuel did you use most often for cooking? <i>(Circle only one code)</i>	1 = Gas	2 = Electricity	3 = Wood	4 = Charcoal	5 = Dung, maize	6 = Other
Section 3: Water and Sanitation							
3.1	What kind of toilet facility does your household use? <i>Do not read the options, circle only one.</i>	1 = Pit latrine with slab	2 = Pit latrine without slab (open pit, no walls)	3 = Flush latrine	4 = None		
3.2	What is the main source of drinking water for your household during the wet season?	1 = Public tap/piped water 6 = pond, lake, river or stream	2 = Borehole with pump 7 = tanker/trucker	3 = Protected dug well or spring 8 = cart with small tank/drum	4 = unprotected well or spring 9 = other	5 = rain water	
3.3	What is the main source of drinking water for your household during the dry season?	1 = Public tap/piped water 6 = pond, lake, river or stream	2 = Borehole with pump 7 = tanker/trucker	3 = Protected dug well or spring 8 = cart with small tank/drum	4 = unprotected well or spring 9 = other	5 = rain water	
3.4	Do you treat your drinking water in the wet season to make it safer to drink?	1 = yes 2 = no	3.5 Do you treat your drinking water in the dry season to make it safer to drink?		1 = yes 2 = no		
3.5	If you treat for drinking water in either season, what do you do to make it safer to drink?	1 = Boil 5 = Solar Disinfectant	2 = Add Chlorine/ Bleach	3 = Strain through a cloth	4 = Use a water filter (ceramic, compost, sand)	6 = Let it stand and settle 7 = Other (specify)	88 = Don't know

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire Number []

Section 4: Assets

4.1 How many of [Animal Type] does your household own? (Please insert number in appropriate box)

4.2 Does your household own any of the following assets? Read each asset and mark "1" next to the asset if the household own and 0 if the household does not own the asset.

1	Cattle	8	Shovel/Spade	16	Weaving tool	23	Bed
2	Buffalo	9	Sickle	17	Water pump	24	Mosquito Net
3	Sheep	10	Fish net	18	Rice mill (fuel)	25	Radio
4	Goats	11	Bicycle	19	Rice mill (electricity)	26	Television
5	Pigs	12	Truck	20	Motorcycle	27	Stove (Gas/fuel)
6	Poultry (chicken, ducks)	13	Boat/Canoe	21	Animal-drawn cart	28	Refrigerator
7	Horses/ donkeys	14	Four-wheeled tractor	22	Plough	29	Generator
		15	Two-wheeled tractor			30	Cell phone

Section 5: Livelihoods

5. During the past 12 months, what were the three most important sources of income and food for the household? DO NOT read the list. Enter code from list provided in the appropriate space

		Income	Food	Livelihood Codes				
				1 = Rice Food crop production/sale	2 = Production of cash crops (Tea, Coffee, Cotton)	3 = Production/sales of other food crops (Cassava, Maize etc)	4 = Production/sales of fruits/vegetables	5 = Livestock production/sale
5.1	During the past 12 months, what was the most important sources of income and food for the household?			6 = Fishing	7 = Hunting/gathering	8 = On Farm Casual labour	9 = Off Farm Casual Labour	10 = Formal employment
5.2	During the past 12 months, what was the second most important sources of income and food for the household?			11 = Own Business	12 = Remittances	13 = Sale of charcoal/wood	14 = Crafts	15 = Pension
5.3	During the past 12 months, what was the third most important sources of income and food for the household?			17 = Other Specify				

LAO PDR Risk and Vulnerability Survey 2012—Household Questionnaire Number []

Section 6: Access to Credit								
6.1	Have you or any household member taken a loan in the last 12 months? <i>If No, go to 7.1</i>	1 = Yes	2 = No					
6.2	From whom did you borrow money? <i>Circle all that apply</i>	1 = Bank	2 = Contracting companies	3 = Informal Savings and Loans	4 = Family / Friends	5 = NGOs		
6.3	What was the main use of the <i>largest loan</i> taken in the last year? <i>Circle only one</i>	6 = Shopkeepers/traders	7 = local money lender	8 = associations	9 = Other (specify)			
		1 = Home Improvement	2 = Land purchase / rent	3 = Bride price/wedding	4 = Business investment	5 = Purchase of crop and animal inputs		
		6 = purchase of food	7 = health emergency	8 = pay funeral costs	9 = Other (specify)			
Section 7: External Assistance/ Remittances								
7.1	During the last 12 months, did your household get any support or participate in any programs or services provided by external sources such as government, NGOs, family or friends? <i>Probe by giving examples including cash, food, non-food items, and/or services such as health equity programs, extension agent services</i> <i>If no, go to 7.3</i>	1 = Yes	2 = No					
7.2	If you received support and/or participated in programs, who provided the support and/or programs? <i>(Circle all that apply. In cases of multiple sources please rank in terms of importance, 1 being the most important)</i>	1 = Government	2 = UN/NGOs	3 = Relatives in rural areas	4 = Relatives in Urban areas	5 = Relative outside of Lao PDR	6 = Friends / Neighbors	7 = Other (specify)
7.3	In the last 12 months, have any household or extended family members migrated in search of work? <i>If no, go to 8.1</i>	1 = Yes	2 = No					
7.4	If any member of the household or extended family has migrated in search of work, where has he/she/they gone to work? <i>(Circle all that apply)</i>	1 = This province	2 = Other province (specify)	3 = Thailand	4 = Burma			
7.5	If yes, how many household or extended family members migrated	5 = Vietnam	6 = Cambodia	7 = China	8 = Other (specify)			
7.6	Did you receive money, food or non food items during the last year from the migrant/s?	1 = Yes	2 = No					

Section 8: Land, irrigation, and forests			
8.1	Does your household have access to any agricultural land? <i>If no, go to 8.6</i>	1 = Yes	2 = No
8.2	How much land (in hectares) does your household own or rent in?		
8.3	How much of your land (in hectares) is irrigated?		
8.4	What is the main type of tillage that you used to prepare your land last season? <i>Do not read list, circle only one</i>	1 = Tractor	2 = Cattle/buffalo 3 = Zero Tillage/digging by hoe 4 = Other (specify)
8.5	Do you have a household vegetable plot or garden?	1 = Yes	2 = No
8.6	Do you have access to forested land?	1 = Yes	2 = No
8.7	Compared to the last 5 years, has your access to non-timber forest products increased, decreased, or stayed the same? <i>Circle only one</i>	1 = Increased	2 = Decreased 3 = Stayed the same

Section 9: Crop Production			
9.1	Which crops did your household grow last season? <i>See crop codes below. Record one code per line. Record all crops mentioned</i>	9.2 What is the total area planted (Ha)	9.3 What is the total quantity harvested in 2012?
		9.4 What is the unit of measure? <i>See codes for units" below. Record one code per line.</i>	9.5 Is the quantity harvested given in 9.3 processed or unprocessed. 1 = Non-processed (Cob/shell) 2 = Processed (Grain/peeled)
		9.6 If everything is used for own consumption, how long (in months) do you think the harvest will last? <i>Record number of months, or 888 = Not Applicable 999 = Don't Know</i>	Crop Codes 1 = Rice 2 = Maize 3 = Cassava 4 = Sugar-cane 5 = fruit 6 = Tobacco 7 = Coffee 8 = Tea 9 = Cotton 10 = Rubber 11 = Other (specify)
			Unit Codes 1 = Kgs 2 = 50 kg bag 3 = 90 kg bag 4 = Tonnes 5 = 20 Litre bucket 6 = Bale 7 = Other (specify)
9.7	Which crops did the household grow under contract? <i>Record code from "crop codes" and record up to 4 crops (0 for None)</i>		

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Section 10: Household Expenditure							
10.1 How much did your household spend on the following items in last calendar MONTH?							
Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)
1 Vegetables (leafy, egg-plant, onions, etc)	5	Sugar and other sugar products (honey)	9	Milk (including condensed, powdered & formula)	13	Milling costs	
2 Rice	6	Cooking oil, butter and margarine	10	Eggs	14	Hygiene and cleaning products (soap, lotion, toothpaste, etc)	
3 Noodles	7	Meat	11	Household utensils	15	Cooking fuel (karosene, gel, firewood, etc)	
4 Bread, Wheat flour/ grain	8	Fish excluding fish powder	12	Drinks & Alcohol	16	Cellphones & airtime	
10.2 How much did your household spend on the following items in the last 6 calendar MONTHS?							
Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)	Expenditure Item	Amount (Kip)
1 Agriculture Input (Seed, Fertilisers and chemicals), Veterinary chemicals and drugs, Agricultural tools (include spare parts and maintenance), Fuel for agricultural purposes				6 Social occasions (funeral, weddings, parties)			
2 Agricultural labour				7 Loan repayment			
3 Education cost (School fees and levies, School uniforms ,Stationary education costs, Other education costs				8 Construction costs (including maintenance) and household assets			
4 Clothes/shoes (excluding school uniforms)				9 Remittances (out)			
5 Health/medical costs				10 Taxes (livestock/household)			
Section 11: Food Stocks and Food Consumption							
11.1	How much rice do you currently have in stock (kg)?						
11.2	How much rice did your household consume last month (kg)?						
11.3	YESTERDAY, how many meals did adults (over 18 yrs of age) in this household eat?						
11.4	Is the number of meals you ate yesterday normal, more, or less than used to consume (circle one.)						
			1 = Normal		2 = More		3 = Less

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Section 11: Food Stocks and Food Consumption, continued					
Food Item	11.5 YESTERDAY, was [name of food] eaten in household? If consumed, mark "1" if not, mark "0"	11.6 In the last 7 days, how many DAYS was [name of food] eaten? <i>Record the # of days the food was eaten from 0 to 7</i>	What was the main source for [name of food] for the last 7 days?	Food Sources	
				1 = Own Production	6 = Exchange labor for food.
				2 = Hunting/ Fishing	7 = Exchange items for food.
				3 = Gathering	8 = Gift (food) from family/relatives
				4 = Borrowed	9 = Food Aid
				5 = Purchased	10 = other (specify)
1 Rice (Glutinous or non-glutinous)					
2 Maize/corn					
3 Cassava					
4 Other roots/ tubers (sweet potatoes, yam)					
5 fish (excluding fish powder)					
6 Other aquatic animals (crabs, snails, shrimps, frogs, etc)					
7 Chicken, duck					
8 Pork					
9 Red meat (goat, sheep, beef, buffalo)					
10 Large wild meat (wild pig, deer...)					
11 Small wild meat (squirrels, birds, rodents)					
12 Eggs					
13 Milk/milk products (milk, yoghurt, cheese)					
14 Pulses (lentils, tofu, bean curd, soy milk)					
15 Vegetables (eggplant, pumpkin, long beans, carrots, onions, cucumbers)					
16 Green, leafy vegetables					
17 Bamboo shoots/mushrooms					
18 Fresh fruits					
19 Oil/butter/fats					
20 Sugar					
21 Condiments (salt, pepper, other spices, fish powder, or other items used to give flavor to the food: chili, etc)					

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Section 14: Household Food Insecurity Access Tool						
14.1	During the past 4 weeks (30 days), did your household FAIL to get sufficient food for a day or more. <i>If "No", go to section 15.</i>	1 = Yes			2 = No	
		Never	Rarely (1-2 times in past 4 weeks)	Sometimes (3-10 times in past 4 weeks)	Often (> 10 times in past 4 weeks)	
14.1.1	If your household failed to get sufficient food for a day or more in the past 4 weeks (30 days), how frequently did your household resort to using one or more of the following strategies in order to have access to food?	1	2	3	4	
14.1.2	During the past 4 weeks (30 days), did you worry that your household would not have enough food because of lack of money or other resources to get food?	1	2	3	4	
14.1.3	During the past 4 weeks (30 days), did your household run out of food because of lack of money or other resources to get food?	1	2	3	4	
14.1.4	During the past 4 weeks (30 days), were you or any household member not able to eat the kinds of foods you preferred because lack of money or other resources?	1	2	3	4	
14.1.5	During the past 4 weeks (30 days), did you or any household member have to eat a limited variety of foods due to lack of money or other resources?	1	2	3	4	
14.1.6	During the past 4 weeks (30 days), did you or any household member have to eat some foods that you really did not want to eat because lack of money or other resources to obtain other types of food?	1	2	3	4	
14.1.7	During the past 4 weeks (30 days), did you or any household member have to eat a smaller meal than you felt you needed because lack of money or other resources?	1	2	3	4	
14.1.8	During the past 4 weeks (30 days), did you or any household member have to eat fewer meals in a day because lack of money or other resources?	1	2	3	4	
14.1.9	During the past 4 weeks (30 days), was there ever no food to eat of any kind in your house because lack of money or other resources?	1	2	3	4	
14.1.10	During the past 4 weeks (30 days), did you or any household member go to sleep at night hungry because there was not enough food?	1	2	3	4	
14.1.11	During the past 4 weeks (30 days), did you or any household member go a whole day and night without eating anything because lack of money or other resources?	1	2	3	4	

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Section 15: Shocks and Hazards	
<p>15.1 During 2012 did your household experience any problems that affected your household's ability to feed itself in the manner you are accustomed to? If no, Skip to section 16. See "codes for shocks/hazards" below. Do not read options. Record only one code per line - Probe: «Did you experience any other problems?»</p>	<p>15.2 What measures did the household take to reduce the impact of the hazard? (Up to 4 measures) See "codes for coping strategies" below. Do not read options. Record up to 4 codes, only one code per box - Probe: «Did you do anything else?»</p>
1.	
2.	
3.	
4.	
<p>Codes for Shocks and Hazards</p> <p>1 = Floods & Storms 2 = Unusually high levels of crop pests and disease 3 = Unusually high prices of food 4 = Drought/ dry spells 5 = Unusually high levels of live-stock disease 6 = Unusually high costs of agriculture inputs 7 = Loss of access to agricultural land 8 = Death or serious illness of a productive member of HH 9 = Loss of access to forests 10 = Low commodity price and/or loss of markets</p> <p>Codes for Coping Strategies</p> <p>1 = resorted to longer than normal migration 2 = Reduced expenditure on education or school materials 3 = Withdrew children from school to work to bring additional income 4 = Increased casual labour activities 5 = Borrowed food/money from friends or relatives 6 = Sold more livestock than usual 7 = Avoided seeking medical attention when a household member was ill to save money 8 = other (specify)</p>	

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Section 16: Maternal Information					
Information from Column 1 and 2 in Section 1 (page 2)		16.3 Are you married, living together but not married, living apart but not divorced, widowed, or never married? 1 = married 2 = partner 3 = divorced 4 = living apart not divorced 5 = widow 6 = never married	16.4 Are you currently pregnant? 1 = yes 2 = no	16.5 Mother's weight (kg) (If pregnant do not measure)	16.6 Mother's height (cm) (If pregnant do not measure)
16.1 Name of the mother/primary caretaker of the children <5 selected to participate in the interview	16.2 Record the Individual number of the mother or primary caretaker				
1					
2					
3					

Section 17: Basic Child Information							
17.1 What is the Name of Child? (<5 years of age)	17.2 Is [name] a boy or girl? 1 = Male 2 = Female	17.3 Are you the mother or are you the primary caretaker of [name]? 1 = mother 2 = Not mother, but primary Care-taker	17.4 Record the Individual number of the mother or primary care-taker from 16.1	Ask to see the family history book		17.8 Is [name] currently being breast fed? 1 = Yes 2 = No	17.9 Yesterday, how many times did [name] eat food (solid, semi-solid, or soft foods) other than liquids? If the child did not eat food, go to 18.14
				17.5 On what date was [name] born? DD/MM/YYYY	17.6 What is [name]'s age in months?		
				17.7 The age was recorded from: 1 = history book 2 = birth certificate 3 = yellow health card 4 = Recall			
1							
2							
3							

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Section 18: Child Dietary Diversity

		18.1 Yesterday, what did [name] eat in the morning, during the daytime, and in the evening? Did he/she eat any snacks throughout the day? Mark "1" in the corresponding box if the child consumed any of the food items per food group and '0' if he/she not. For any food items/groups the mother does not initially mention, ask again to confirm that the child did not consume any food item for that food group yesterday.													18.16 If [name] consumed any milk or milk products (NOT including soy milk), what		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Name of Child (Should be the same names in lines 1, 2, and 3 as section 17)		Cereals Rice, Maize, Corn, Noodles Pre- chewed rice	Packaged Foods Crackers Chips Biscuits Instant noodles	Roots Cassava Pota- toes White yams Other edible roots	Fish Including eel (Not including fish powder or fish used as a condi- ment/ for fla- vor(ing))	Other aquatic animals: Snails Shrimp Frogs	Flesh meat: Beef Pork Goat Poultry Wild game	Organ meat: Liver Kidney Heart	Eggs	Pulses: Lentils Tofu Bean curd Soy milk	Dark leafy green vegeta- bles	Orange & yellow fruits & vegeta- bles: Carrot Orange yam Papaya Pineap- ple Oranges	Other fruits & vegeta- bles	Oil & Fats: Including if foods were cooked in oil or fat	Liquids: Plain Water Sweetened water Soda juice Jello drink	Milk & Milk products: Fresh milk Boxed milk Yoghurt	
1																	
2																	
3																	

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Section 19: Child Illness					
	19.1 In the past 2 weeks, has [name] had diarrhea? (Diarrhea is defined as 3 or more loose or watery stools per day)	19.2 In the past 2 weeks, has [name] had a cough or had difficulty breathing?	19.3 In the past 2 weeks has [name] had a fever? (Fever is defined as a raised temperature, the child is hot to the touch and is thirsty)	19.4 If [name] had diarrhea, cough or fever in the past 2 weeks, did you seek treatment in a health facility for him/her? If no, go to 20.1	19.5 If you sought treatment, did you receive or purchase any medication for [name]?
	1 = Yes 2 = No 3 = Don't know/ Forget	1 = Yes 2 = No 3 = Don't know/ Forget	1 = Yes 2 = No 3 = Don't know/ Forget	1 = Yes 2 = No 3 = Don't know/ Forget	1 = Yes 2 = No 3 = Don't know/ Forget
Name of child (Should be the same names in lines 1, 2, and 3 as section 17)					
1					
2					
3					
Section 20: Nutrition Status					
	20.1 Child weight (kg):	20.2 Child height (cm):	20.3 Presence of oedema		
			1 = Yes 2 = No		
Name of child (Should be the same names in lines 1, 2, and 3 as section 17)					
1			1 = Yes 2 = No		
2			1 = Yes 2 = No		
3			1 = Yes 2 = No		

Annex V: Glossary of key terms

Access:

The degree to which available food can be sourced through markets, own production, or other means. Households or individuals' ability to secure adequate resources for acquiring appropriate foods (in terms of macronutrients, micro nutrients and cultural acceptability) for a nutritious diet.

Acute Malnutrition:

Acute malnutrition is the manifestation of low weight in relation to the height of children and/or the presence of oedema. The key indicator for acute malnutrition is the proportion of children under-five with weight less than two standard deviations below the median. In its most severe form (> 3 standard deviations) is known as wasting.

Agriculture:

All activities pertaining to the cultivation of natural resources to produce crops for human consumption, animal consumption, commercial and/or industrial uses. Agriculture often includes livestock rearing. Agriculture practiced at the household level is referred to as small-scale or subsistence agriculture, compared with industrial or commercial agriculture involving large land holdings.

Agricultural Household:

Any household for which the primary livelihood activity, and/or the largest source of income is derived from agriculturally based activity.

Agricultural Production:

The sum total of all agricultural outputs, expressed in tonnages or economic values. Usually measured in terms of unprocessed raw commodities, aggregated at the district, province or national level.

Availability:

Adequate quantities of food, supplied through domestic production, stocks, imports and food aid to ensure that the minimum nutritional requirements of the population can be met. Food availability addresses the "supply side" of food security.

Body Mass Index (BMI):

Body Mass Index (BMI) is an index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m²).

Chronic Food Insecurity:

A long-term or persistent inability to meet minimum food requirements. Poverty and chronic food insecurity often go hand-in-hand.

Chronic Malnutrition:

Chronic malnutrition (also known as 'stunting') is the result of prolonged or temporary nutritional deficiencies (macro and/or micronutrients) during critical periods of cognitive and

physical development. It can also be the result of repeated exposure to infections, generally poor living conditions, or a combination of these factors. The result is substandard physical and cognitive growth. It is measured by height for age, with a score below 1, 2 or 3 Standard Deviations from the reference population representing mild, moderate and severe stunting respectively.

Climate change:

The combination of geographic, environmental and socio-economic factors which result in greater variability in weather patterns, noted in terms of temperature fluctuations (referred to as 'global warming'), irregular rainfall, increased frequency of extreme weather events, and less predictability in weather patterns. Responses to climate change include adaptation, mitigation, and reducing emissions.

Commodity:

In general economics, refers to any good or service which has monetary value. In agriculture, refers to any crops which are internationally traded on spot, or derivatives markets. Important commodities grown across the SE Asia region include rice, maize, soybeans, edible oil, and coffee.

Food Access:

The ability of individual households to acquire food, either by producing it themselves, hunting, fishing or gathering from wild sources, through purchase, exchanges or as gifts. Purchasing power is a key determinant of access in most settings. Food access depends on household purchasing power, which varies in relation to market integration, market access, price policies, and local economies (in terms of employment and livelihoods)

Food and Nutrition Security:

Food and nutrition security exists when all people, at all times, have physical, social and economic access to food which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life (Committee for World Food Security, July 2012)

Food Insecurity:

Food insecurity exists when people are at risk of, or actually are consuming food of inadequate quality, quantity (or both) to meet their nutritional requirements. This may be a result of the physical unavailability of food, a lack of social or economic access to adequate food, inadequate food utilization or a combination thereof. Food insecurity may be chronic, or acute, transitory, or cyclical. It may characterise individuals, households, groups, areas or an entire country.

Food Poverty:

The inability of an individual or household to obtain the food it requires for basic health and nutrition as a result of poor availability, access or utilization.

Food Poverty Line:

The cost of purchasing a combination of foods that are adequate to meet minimum daily nutritional requirements. This varies from country to country, based on consumption patterns, market prices and methodologies applied to determining the overall poverty line.

Food Security:

A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (SOFI, 2001). However, direct measurement of food security is complex and problematic. Food security is most frequently based upon the *absence* of food insecurity.

Food Stock:

All foods held in reserve at the household, community, regional, or national level. An important component of food balance sheet calculations.

Food Utilization:

- 1) A household’s use of the food to which they have access. Includes all food handling, preparation and consumption methods, hygiene and sanitation, and waste disposal. It includes how food is distributed within a household.
- 2) Individuals’ ability to absorb and metabolize the nutrients – the conversion efficiency of food by the body. This often depends on the health of the individual.

Household Food Insecurity:

A household’s inability to meet all of the food needs of all of its members at all times.

Household Food Security:

Year-round access to an adequate supply of nutritious and safe food to meet the needs of all household members.

Hunger:

Nutritionists have estimated the amount of dietary energy that people of different ages and sex with different activity levels in different cultures require to maintain a healthy and active life. When people do not have access to the amount of dietary energy needed for their normal level of activity, they feel hungry. If the situation persists over a longer time, it leads to undernutrition. Chronic energy deficiency can lead to a reduction in physical activity, weight loss or both. In severe forms, chronic energy deficiency can lead to wasting and eventually death. Hunger is not synonymous with malnutrition or undernutrition, but there are overlaps between these two. (CFS 2012)

Hygiene:

Any and all practices related to limiting the spread of disease from any source. In a food security context, this is especially pertinent to food handling, preparation, consumption and disposal practices. It is also interlinked with issues around personal hygiene (i.e. hand washing), public health and disease prevalence.

Indicators:

A specific variable, or combination of variables, that gives insight into a particular aspect of the situation. A value that can be used to evaluate or assess different types of impact.

Kilocalorie (Kcal):

In scientific terms, refers to the amount of energy required to raise the temperature of one kilogram of water by one degree Celsius. In food terms, refers to the dietary energy contained

within a particular food. For example, non-glutinous rice contains 360 Kcal per 100 grammes. As a general rule, adults require 2,100 Kcal per day in order to have the energy required for a sedentary lifestyle: more physically active livelihoods require higher Kcal intake.

Livelihood:

The capabilities, assets (natural, human, physical, social and financial) and activities required for present-day survival and future well-being.

Livelihood Group:

A group of people or households who share common livelihood systems and strategies, access similar resources, and share similar social and cultural practices. As a function of shared and common practice, livelihood groups are generally vulnerable to similar risks. It is common to see more than one livelihood group in a specific geographical area. Livelihood Groups may undertake more than one livelihood activity in the course of a year (i.e. rice planting, casual labour, fishing, etc).

Macronutrient:

Critical nutrients required in substantial amounts for humans to maintain their physical and cognitive growth and development. Refers to carbohydrates, proteins and fats, and are measured in kilocalories or grams. Macronutrients alone are inadequate for a balanced diet, and are complemented by micronutrients, which are required in much smaller quantities. Shortages of macronutrients generally lead to hunger and undernourishment.

Malnutrition (malnourishment):

Refers to all deviations from adequate nutrition, including undernutrition and over-nutrition, resulting from inadequacy of food (or excess food) relative to need and or disease. Categories of malnutrition are as follows:

- 1. Acute Malnutrition (Wasting):** Acute malnutrition results in low weight in relation to height/length and/or the presence of oedema. It is often the result of a crisis or food emergency.
- 2. Chronic Malnutrition (Stunting):** Food consumption is inadequate to support normal growth. Reflected by growth retardation, meaning a height-for-age score below one, two or three Standard Deviations from the reference population (mild, moderate and severe stunting respectively). It is due to chronic or temporary nutritional deficiencies during critical times (energy and/or micronutrients), and/or it also can be the result of repeated exposure to infections or even to generally poor living conditions. It is often poverty related.
- 3. Growth retardation (Underweight):** A combination of stunting and wasting, this indicator measures the prevalence of children that have a low weight in relation to other children of their age. The same metric, the Z-score and cut-points -1, -2 and -3 are used to define mild, moderate and severe underweight status are used.
- 4. Micronutrient Deficiencies:** Inadequate intake of critical micronutrients (minerals and vitamins) as a result of poor diet or food utilization. Micronutrient deficiencies increase risks of infectious diseases and weaken immune systems.
- 5. Overnutrition:** Excessive consumption of macronutrients, resulting in excess body weight and/or poor physical and metabolic function. Obesity refers to an advanced form of Overnutrition. Causes include dietary, economic, social and lifestyle related factors.

Micronutrients:

Includes all vitamins and minerals required by humans for normal physical and cognitive development. Vitamins are either water soluble, such as B-complex vitamins and vitamin C and generally not stored by the body, or fat-soluble (e.g., vitamins A and D), which can be stored by the body.

Micronutrient deficiencies:

Inadequate intake of critical micronutrients (most often including Vitamin A, D, iron, iodine, zinc) as a result of poor diet or food utilization. Micronutrient deficiencies increase risks of infectious diseases and weaken immune systems.

Multi Indicator Cluster Survey (MICS):

A UNICEF-supported process which furthers national collection and analysis of household level data for the purposes of the monitoring the situation of children and women. The MICS process produces statistically sound and internationally comparable estimates of a range of indicators in the areas of health, education, nutrition, child protection and HIV/AIDS.

Non Timber Forest Products (NTFPs):

A broad category which refers to all food, fuel, fibre and medicinal products sourced from commonly held natural resources. This may include bamboo, birds, vegetables, animals, mushrooms, insects, honey and more. For rural populations in SE Asia, this can constitute a vital source of dietary diversity.

Nutrition:

The provision of food and its utilization, with the purpose of supporting growth, maintenance and general wellbeing of the body. Nutritional status has demonstrable links with health status, and thus health and nutrition are often linked. Other important linkages include relationships between nutrition and: (1) physical activity, development and work capacity; (2) mental activity, development and educational performance; (3) social behaviour and cultural practices, etc.

Nutrition Security:

Nutrition security exists when all people at all times consume food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education and care.(FAO/AGN 2012)

Nutritional status:

The physiological state of an individual that results from the relationship between nutrient intake and requirements and from the body's ability to digest, absorb and use these nutrients. A summary of key nutritional status issues for children and adults is as follows:

Children:

- Prevalence of underweight in children under five years: The proportion of children under-five with weight less than that of 2 standard deviations below the median of **weight-for-age** of the reference population as adopted by the World Health Organization.

- Prevalence of stunting in children under five years: The proportion of children under-five with height or stature less than that of 2 standard deviations below the median of **height or stature-for-age** of the reference population as adopted by the World Health Organization.
- Prevalence of wasting in children under five years: The proportion of children under-five with weight below the median of **weight-for-height** or stature of the reference population as adopted by the World Health Organization.
- Prevalence of overweight in children under five years: The proportion of children under-five with weight **above the median of weight-for-height** or stature of the reference population as adopted by the World Health Organization.

Adults:

- Prevalence of underweight in adults: The proportion of underweight in adults refers to the adult population falling below 18.5 Body Mass Index (BMI).
- Prevalence of overweight in adults: The proportion of overweight in adults refers to the adult population with BMI 25 and above.
- Prevalence of obesity in adults: The proportion of obesity in adults refers to the adult population with BMI 30 and above.

Poverty:

Poverty encompasses different dimensions of deprivation that relate to human capabilities including consumption and food security, health, education, rights, voice, security, dignity and decent work. It is commonly measured by income per capita.

Sanitation:

Refers to the provision of facilities and services for the safe disposal of human waste, such as urine and feces. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on health and food security both in households and across communities. Also refers to the maintenance of hygienic conditions, through services such as garbage collection and wastewater disposal.

Self-sufficiency:

In food security, refers to domestic production adequate to meet the food requirements of the total population without recourse to imports or food aid. Calculated at the national level. Self-sufficiency in specific commodities, such as rice or fish, may also be calculated.

Stability:

The fourth pillar of food security, stability refers to the continuity of availability, access and utilization over time. It is emphasized in the World Food Summit definition of food security by the phrase 'all people, at all times'. Major factors that affect stability include climatic uncertainties, uneven income earning opportunities, crop disease, etc.

Staple Food:

Those food(s), usually carbohydrate-based, which form the basis for the culturally preferred diet within a nation or region. Across Southeast Asia, rice is the dominant staple food. In other societies, maize, wheat or root crops are important staples.

Stunting:

Height-for-age scores below the reference population median, represented as growth retardation. Evidence of chronic malnutrition.

Undernourishment:

Calculated on a per capita basis at the national level, undernourishment refers to the condition of people whose dietary energy consumption is continuously below a minimum dietary energy requirement (MDER) for maintaining a healthy life and carrying out a light physical activity. Undernourishment is a key indicator for Millennium Development Goal 1.1.

Undernutrition:

An aggregate measure of all forms of inadequate food intake at the population level, arising from the deficiency of one or more nutrients, including both macro and micronutrients, and in children is assessed anthropometrically by measuring growth failure which encompasses stunting, wasting, and underweight, or combinations thereof, and among adults is measured by weight loss.

Utilization:

The third pillar of food security. Refers to (a) physical utilization of food at the household level (including food storage, food preferences, food preparation, feeding practices, and water requirements), and (b) biological utilization of food at the individual level (health, hygiene, nutrition, sanitation).

Vulnerability:

Vulnerability is a function of exposure, susceptibility, and resilience to hazard/shock, leading to the possibility of negative outcomes. In general terms, the level of vulnerability of a household and/or individual is determined by the inadequacy of their adaptive mechanisms, coping mechanisms or accumulated capital or food stocks to meet their daily needs.

Vulnerable Group(s):

Populations who are vulnerable to similar risk factors as a result of common livelihoods, assets and coping mechanisms. Identification of key vulnerable groups is usually a main component of assessments.

Wasting:

Physical manifestation of advanced acute malnutrition, the point at which malnutrition is a medical emergency. Visible loss of subcutaneous fat and skeletal muscles. Anthropometric wasting may not be observed in cases of malnutrition related diseases where wasting is masked. Treated by therapeutic feeding programmes.

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