



FOOD AND NUTRITION SECURITY ATLAS OF LAO PDR



World Food Programme



Federal Ministry
for Economic Cooperation
and Development

Preface and Acknowledgements

In the context of a growing body of data across multiple sectors in Lao PDR, the Food and Nutrition Security Atlas was initiated with the aim of providing an up-to-date synthesis of available information on the food and nutrition security situation in the country. The Atlas summarizes the key issues affecting rural households, including social, economic, and political context, rural livelihood assets and strategies, food access, caring practices, water and sanitation, nutrition outcomes, and household vulnerability. Easily understandable thematic maps accompany the analysis to geographically situation the most vulnerable.

The Atlas was prepared under the overall coordination of Siemon Hollema, Sr. Regional Programme Advisor, VAM/WFP Bangkok and Paul Howe, former Deputy Country Director, WFP Lao PDR. The process was initiated and supported in the early stages by Michael Sheinkman, former Sr. Regional Programme Advisor, VAM/WFP Bangkok and Elliot Vhurumuku, former Regional Programme Advisor, VAM/WFP Bangkok. The literature review, analysis and writing was conducted by Emily Mitchard Turano, Food Security and Nutrition Consultant, VAM/WFP Lao PDR. Baas Brimer, Programme Officer, VAM/WFP Lao PDR, Vilon Viphongxay, Programme Officer, VAM/WFP Lao PDR and Soo Mee Baumann, Programme Officer, VAM/WFP Bangkok provided meticulous review and valuable contributions to the report. Touleelor Sotoukee, former GIS specialist, VAM/WFP Lao PDR and Ruangdech Pongprom, Sr. Programme Assistant, VAM/WFP Bangkok prepared the maps presented in the Atlas. Funds for the report were provided by the German Quality Improvement Grant.

It is hoped that this report will serve as a valuable resource for government and development actors throughout Laos by improving availability of updated information on food and nutrition security.

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Map Designations Used:

The depictions and use of boundaries, geographic names and related data shown on maps and included in the tables throughout the document are not warranted to be error-free, nor do they necessarily imply official endorsement or acceptance by the World Food Programme.

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LIST OF ACRONYMS

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Centre
ASEAN	Association of Southeast Asian Nations
CFSAM	Crop and Food Security Assessment Mission
CFSVA	Comprehensive Food Security and Vulnerability Analysis
EFSA	Emergency Food Security Assessment
FAO	Food and Agriculture Organization of the United Nations
GHI	Global Hunger Index
GNI	Gross National Income
HDI	Human Development Index
IFPRI	International Food Policy Research Institute
IYCF	Infant and Young Child Feeding
LECS	Laos Expenditure and Consumption Survey
LSB	Laos Statistical Bureau
LSIS	Laos Social Indicator Survey
MAF	Ministry of Agriculture and Forestry
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal, Neonatal and Child Health
MoH	Ministry of Health
MPI	Ministry of Planning and Investment
NAFRI	National Agriculture and Forestry Research Institute
NDMO	National Disaster Management Office
NNS	National Nutrition Survey
NSEDP	National Socio-Economic Development Plan
NTFP	Non-Timber Forest Product
RDPE	Rural Development and Poverty Eradication plan
U5MR	Under-five Mortality Rate
UNDP	United Nations Development Programme
UXO	Unexploded Ordinance
VAM	Vulnerability Analysis and Mapping
WFP	World Food Programme of the United Nations
WHO	World Health Organization

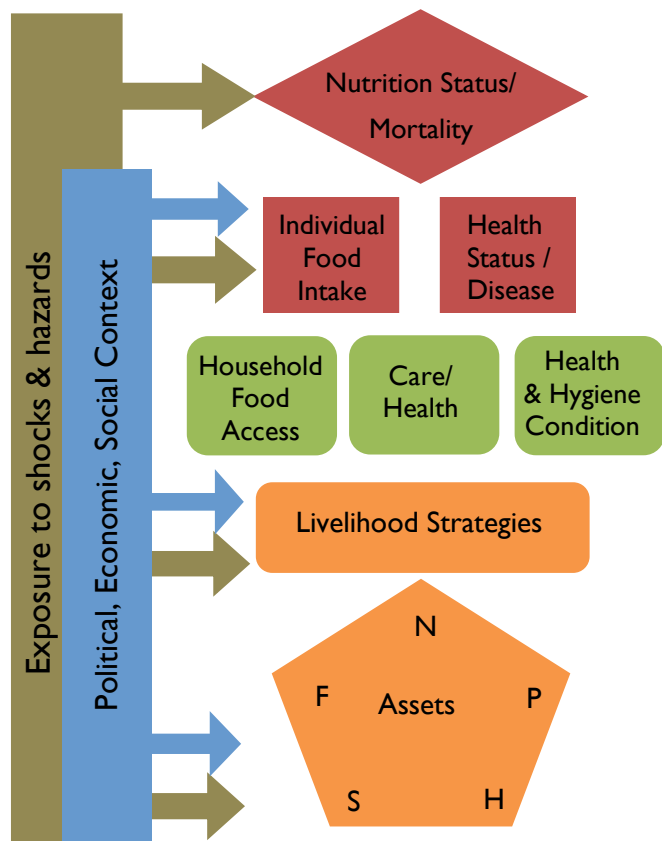
Overview

Lao People’s Democratic Republic is a small landlocked country in Southeast Asia bordered by Cambodia, China, Myanmar, Thailand, and Vietnam. Despite steady economic growth in the 21st century, the country remains a least developed and a low-income food-deficit country, ranking 138th out of 187 countries on the 2011 Human Development Index and 57th of 78 countries on the 2012 Global Hunger Index.^[1, 2] Approximately one-quarter of the population lives in poverty, mostly in rural and remote areas. Malnutrition is a critical concern for the country as it struggles with stubbornly high rates of stunting (44 percent) and underweight (27 percent). Of 11 countries in the Southeast Asian region, Lao PDR has some of the highest levels of stunting and underweight for children less than five years of age. According to the FAO State of Food Insecurity in the World (SOFI) 2012, the proportion of the population in a condition of undernourishment was still prevalent in Lao PDR at 27.8 percent.^[3] From 2005 to 2010, It is estimated that the equivalent of US \$166 billion in productivity was lost as the result of undernutrition.^[4]

Food Security Conceptual Framework

The Atlas on Food and Nutrition Security in Lao PDR is based on a conceptual framework developed by WFP/VAM. The framework allows for a comprehensive analysis of food and nutrition security by taking into account household livelihood assets and strategies, contextual factors, shocks and hazards. The Atlas is structured along the components of the framework:

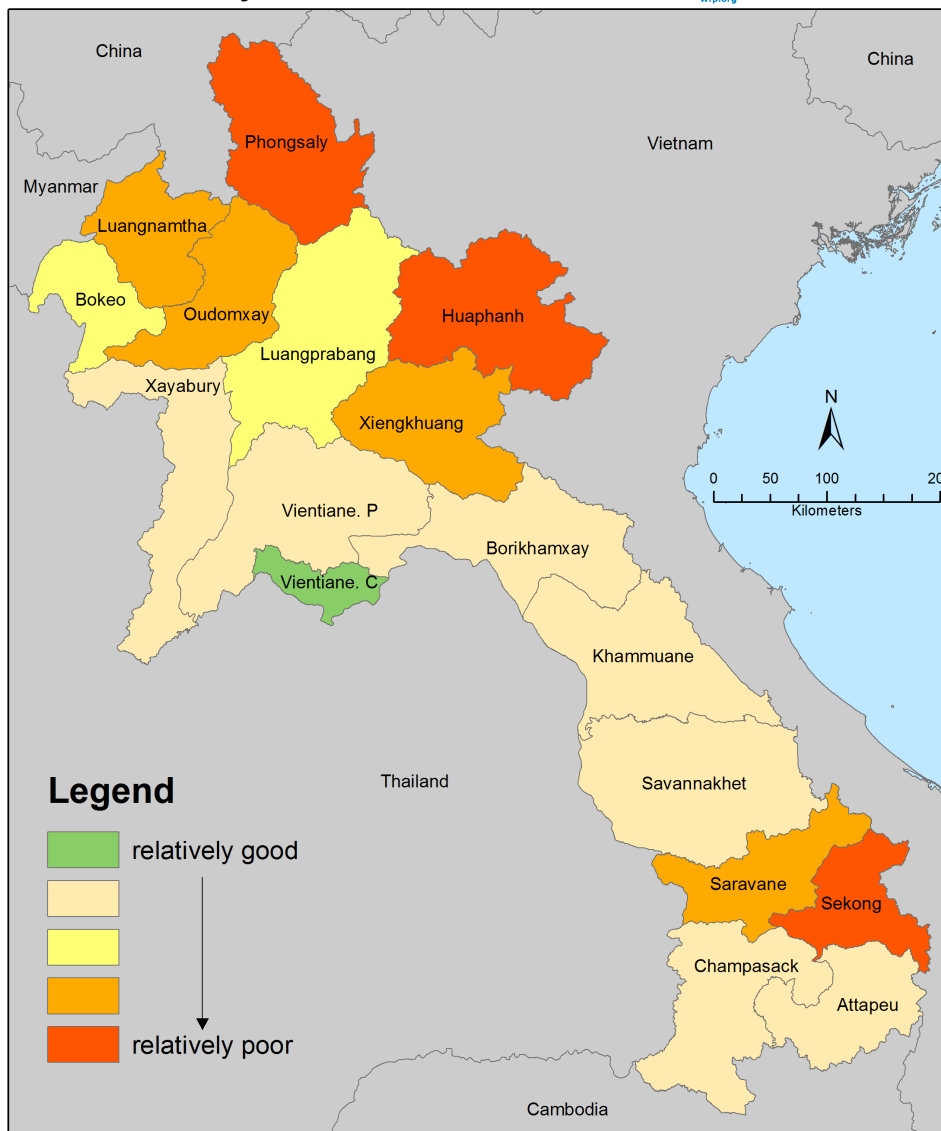
- 1) **Context:** The social, economic and political factors that affect household food security;
- 2) **Livelihood assets & strategies:** The natural, human, social, physical, and financial assets available to households that inform livelihoods and welfare outcomes;
- 3) **Food security & health/caring practices:** The household’s ability to access food, its health/hygiene environment, and knowledge of and access to adequate care;
- 4) **Individual outcomes:** the outcomes at the individual level (nutrition status and mortality) that are a direct result of individual food intake and disease status; and
- 5) **Vulnerability:** exposure to shocks and hazards that, when intersecting with each level, can increase household vulnerability to food and nutrition insecurity.



Thematic maps supplement the analysis where applicable, disaggregated at provincial level as a result of data availability. Relevant food security and nutrition data that is available at other levels of disaggregation such as agro-ecological zones (see annex 2 for a description of the six agro-ecological zones in Lao PDR) is presented in the accompanying text.

The following map showing relative food and nutrition security status by province is based on a composite index of three indicators: population living below the national poverty line (LECS 2007/08), percent of households with poor or borderline food consumption (RVS 2012/13), and prevalence of stunting amongst children less than 5 years of age (LSIS 2011/12).^[3,5,6] The national poverty line in Lao PDR is based on the international \$1.25 poverty line adjusted to account for differences in cost of living between geographic areas and between years of data collection. Poverty is a fundamental factor underscoring household economic access to nutritious foods. Household food consumption, measured by the food consumption score, is a key proxy indicator of household access to food and stunting is a primary indicator for long-term nutritional deficiency. The indicators were normalized, combined using equal weight and categorized into quintiles according to natural breaks.

Relative Status of Food and Nutrition Security in Lao PDR



FOOD AND NUTRITION SECURITY AT A GLANCE

Malnutrition is a major challenge in Lao PDR. According to recent data, the country remains 'seriously off-track' for achieving the hunger-related millennium development goals. For MDG1 (halve the prevalence of underweight by 2015) the target for Laos is 18.2 percent underweight. Yet as of 2012, prevalence remained at 26.6 percent underweight. In addition, 44.2 percent of children less than five years was stunted and another 5.9 percent was wasted as of 2012.^[5] For 13 out of 17 provinces, stunting levels are above the World Health Organization's (WHO) critical threshold of 40 percent. The prevalence of stunting and underweight is closely associated with poverty and geography. Malnutrition rises steeply amongst the poorest quintiles compared to the wealthiest, and children in rural areas without road access are twice as likely to be malnourished than urban children. Micronutrient deficiencies are also suspected to be a critical problem in Lao PDR, particularly for iron, vitamin A, iodine, and zinc.

Food insecurity on the surface appears to be less critical than malnutrition. Between 1990 and 2012, hunger as measured by IFPRI's hunger index declined from 28.6 to 19.7 points.^[1] Undernourishment as presented in the SOFI 2012 declined from 44.6 percent to 27.8 percent over the same time period. The latest extensive assessment of food insecurity, the Risk and Vulnerability Survey (RVS) conducted in 2012/13, indicated that food consumption was acceptable for over 80 percent of the population.^[6]

According to the RVS 2012/13, households with poor or borderline food consumption tend to have lower educational attainment, smaller plots of land and fewer vegetable plots, and engage in more cash crop production as a key source of income. In addition, they tend to have diets heavily based in rice consumption with substantially lower intake of animal protein.^[6] Additional characteristics can be drawn from the CFSVA 2006 as much of the profile remains relevant today. According to the CFSVA 2006, the food insecure populations in Lao PDR tend to be households engaged in shifting cultivation in upland areas on steep sloping fragile land, smallholders and unskilled labourers. They are asset-poor households, with little or no access to infrastructure, and subject to poor sanitary conditions. They are frequently from non-Lao-Tai ethnicities.^[7] While food and nutrition security involves a complex web of factors, the Atlas seeks to highlight those key factors that underscore high rates of malnutrition and household vulnerability to food insecurity.

LIVELIHOOD ASSETS

Assets are more limited and households are less resilient to shocks in the mountainous regions of the north, eastern border and south. Inhabitants of these regions tend to be of minority ethnicities, Mon-Khmer, Chinese-Tibetan, and Hmong-Mien, and farm mostly fragile upland plots. The rugged terrain limits the ability to irrigate and use tractors, reflected in lower statistics of use compared to the lowlands along the Mekong flood plains. Access to year-round driveable roads is also limited in mountainous terrain, thereby reducing access to health and education facilities, as well as to markets. As a result, literacy, educational attainment, and reproductive health indicators tend to be worse in the mountainous provinces and amongst the minority ethnic populations than in the lowland Lao-Tai population.

LIVELIHOOD STRATEGIES

Despite increasing market orientation for many farmers, subsistence farming remains widespread. Approximately 90 percent of rural households grow rice, with more than one-third of households reporting growing additional crops, cash and/or food crops.^[6] Raising a small number of livestock is common, with cattle production becoming increasingly market-oriented in the central provinces. Fishing, hunting and gathering of wild foods is central to food procurement and increasingly cash generation for a large number of households, particularly in the northern uplands.

FOOD SECURITY, CARE AND HEALTH ENVIRONMENT

Access to food: The ability to purchase food depends on market access, household income poverty and competing demands for use of limited income. Access to markets is not consistent for a large proportion of rural households. On average, one in three villages has a food produce market in the village, but less than 2 percent have a permanent market. Access to permanent markets in the district and provincial centers is dependent on road infrastructure and the quality of roads. During the rainy season, approximately one in three villages loses access to roads and therefore to permanent markets. Market access is particularly low in rural upland villages. Food purchasing patterns have shifted in recent years. While expenditure on food has increased in real terms, the share of household food that is purchased has declined relative to food from own production reflecting in part the increase in basic food prices.

Water and sanitation: Provision of clean drinking water has improved across Lao PDR, although gaps still exist in remote upland rural villages. Access to sanitation facilities, on the other hand, is not evenly distributed and has lagged behind that of improved water. In the southern provinces, use of improved sanitation facilities is particularly low. The general environment of poor hygiene and sanitation contributes to the poor nutrition status of children in rural areas: Simultaneous action to improve dietary intake and sanitation is needed to tackle malnutrition rates.^[6]

INDIVIDUAL OUTCOMES

Food intake: In Lao PDR, the typical diet is simultaneously noted for its extensive diversity of food items and for its nutritional imbalance.^[6,8] Rice dominates the diet with an average daily intake of 491 grams per person accounting for 77 percent daily energy needs.^[8] At the same time, intake of fat and protein is strikingly low. Wild meat is the primary source for fat and protein in the diet and availability and ability of households to access wild meat is increasingly threatened. Improving women's diets and infant and young child feeding practices (covering the first 1000 days of life from inception to two years of age) is critical to breaking intergenerational cycles of malnutrition. In Lao PDR, dietary restrictions post pregnancy are common, affecting the health and nutrition of the woman and her infant. Exclusive breastfeeding is low across the country and evidence of widespread inappropriate practices of complementary feeding are suspected to be a driving factor in child malnutrition.

Health Status: Diarrhea, pneumonia, malaria, and parasitic infections are common childhood afflictions that contribute directly to undernutrition. WHO estimates that pneumonia and diarrhea together underscore 30 percent of deaths amongst children under the age of five years. Levels of infection tend to be higher in the northern provinces compared to the southern and central provinces.

VULNERABILITY

Natural disasters such as flooding, mild drought, and storms are common in Laos. As climate change progresses, the country is expected to face more extreme events including erratic rainfall, increased risk of flooding and irregular periods of drought, increasing risk for the vast majority of households that rely on crop production for livelihoods and food. UXOs remain a major challenge, disproportionately distributed in the poorest districts and further limiting agricultural potential. Sweeping changes in agriculture and the expansion of mining and hydropower are changing the face of the landscape and affecting not only livelihoods and food security for rural households but impacting broader ecosystems.

THE FOOD SECURITY CONTEXT

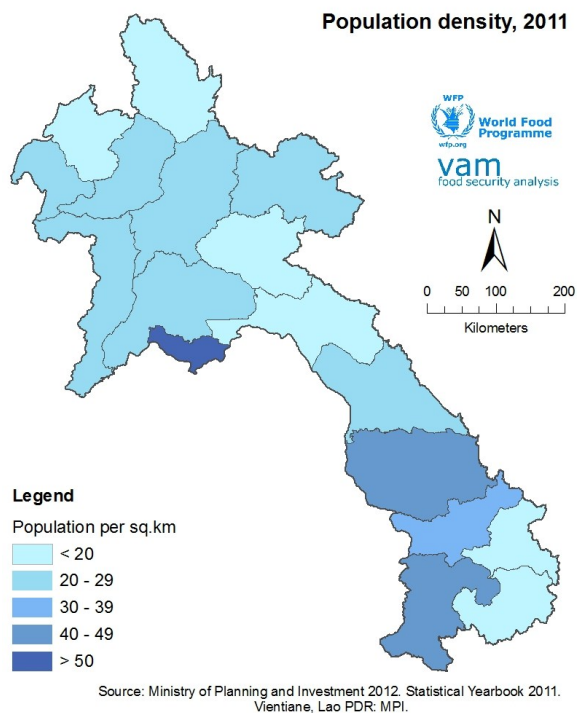
Social Context

Population

With a population of 6.5 million in 2012, Lao PDR has grown at an average of 2 percent/year over the past decade. However, the country remains one of the least densely populated countries in the region with an average density of 27 people per square kilometer.^[9,10]

Population density is greatest in the six central provinces and along the Mekong Corridor where half of the total population live. The northern seven provinces are home to one-third of the population and are the most sparsely populated. The remaining one-fifth of the population live in the southern four provinces.^[9] Urbanization has proceeded at a slower pace than in neighboring countries: In 2011, 33 percent of Laotians lived in urban areas compared to 49 percent on average in South-east Asian developing countries.^[8,9]

Progress in poverty reduction has been on-going, declining from 45 to 28 percent below the national poverty line between 1992 and 2008. Disparity in poverty incidence exists and is closely associated with geography and terrain: 2 in 5 households live below the poverty line in remote rural areas without access to roads, in upland areas, and in areas with steep slopes respectively.^[3,12] Poverty in the more remote rural areas is largely driven by a lack of market access and limited access to flat land for farming, according to an influential study on poverty in Laos.^[12] Indeed, poverty rates have declined faster in mostly lowland areas compared to upland areas. Yet while the incidence of poverty in upland areas is double that of the lowlands, the density of poor people is higher in the Mekong Corridor and the absolute number of poor remains evenly distributed.^[3]



		Poverty headcount		Number of poor	
		2003	2008	2003	2008
District slope	Mostly flat	27.4	18.9	750,619	508,042
	Somewhat steep	37.1	31.9	243,975	437,608
	Mostly steep	40.4	38.8	857,513	600,880
Village altitude	Lowland	28.2	20.4	895,057	644,097
	Midland	36.5	29.1	352,109	301,960
	Upland	43.9	42.6	605,398	600,691

Source: Ministry of Planning and Investment 2010. *Poverty in Lao PDR 2008*. Vientiane, Lao PDR: MoPI/LSB

Gender

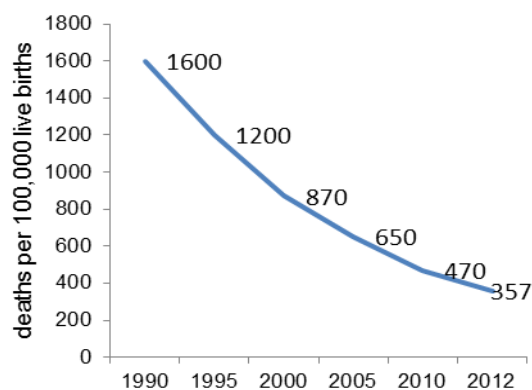
Gender equality in Lao PDR has made slow progress: In 2011, Laos ranked 107th out of 146 countries on the Gender Inequality Index.^[2] Inequity is closely linked to poverty, ethnicity and geography with wider gaps in health and education indicators seen in rural upland minority communities.^[13]

Trends in reproductive health show mixed results: Maternal mortality has declined by about 6 percent per year since 1990, but maternal deaths remain nearly double the regional average (357 maternal deaths per 100,000 live births compared to 184 in the region in 2012). Adolescent birth rate has declined minimally in the past 7 years, from 110 births per 1,000 adolescent women to 94 births in 2012. Adolescent birth rates are higher in the north (120) compared to the center (79) and south (90) and higher in rural areas (114) compared to urban (44).^[5]

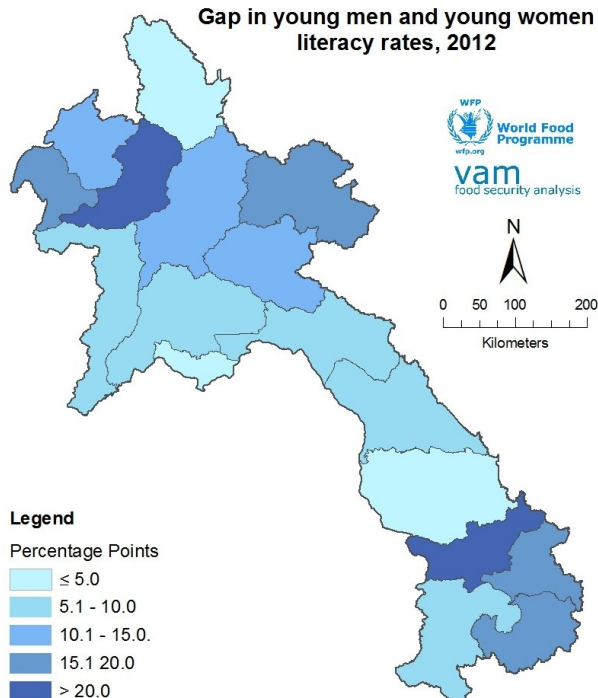
While net enrollment of girls in primary education was equal to that of boys in 2012, only 23 percent of adult women went on to secondary education compared to 37 percent of adult men.^[2,11] National literacy rates for young women (15 to 24 years) still lag behind that of men, 68.7 percent compared to 77.4 percent.^[5] The male-female literacy gap is widest amongst the poor and minorities. Less than half of the minority women on average are literate compared to over 80 percent of Lao-Tai women.^[5]

Female political representation has shown some improvement: In 2012, women held 25 percent of parliamentary seats, up from 6.3 percent in 1990. Female participation in the labor force is about equal to that of males,^[2] but data on gender-based division of labor is limited and there are concerns about the impact on gender equality of transitions to market-oriented household economies.^[13]

Maternal Mortality Ratio, 1990-2012



Gap in young men and young women literacy rates, 2012



Source: Ministry of Health and Lao Statistic Bureau, 2013, Laos Social Indicator Survey 2011-2012, Final Report, Vientiane, Lao PDR: MoH/LSB

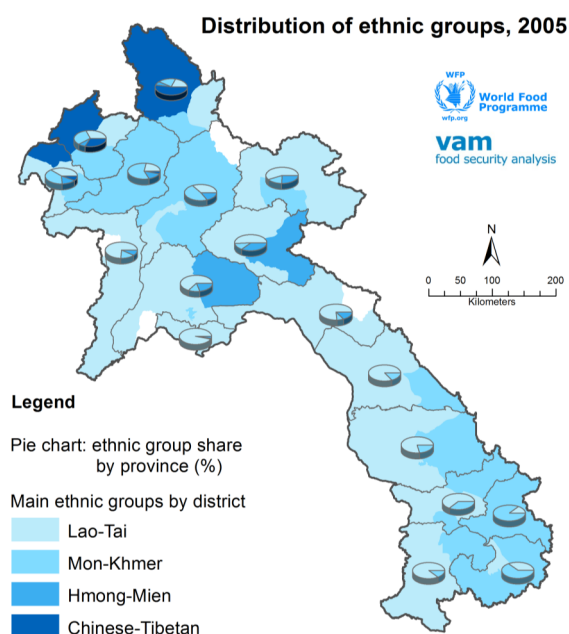
*NB: In Phongsaly, the literacy gap is -1.6 indicating a greater proportion of literate women.

THE FOOD SECURITY CONTEXT

Ethnicity

Ethnic and cultural diversity is a distinguishing feature of Lao PDR, with 49 primary ethnic groups and over 250 sub-groups aggregated into four ethno-linguistic categories: the Lao-Tai, Mon-Khmer, Hmong-Mien and Chinese-Tibetan.^[14] The Lao-Tai populations account for about two-thirds of the population, reside in the lowland areas along the Mekong Corridor and dominate socially, economically and politically. The Mon-Khmer (also known as the Austro-Asiatic linguistic family) constitute 21 percent of the population and tend to live in the midland/plateau areas of the north and south. The Hmong-Mien (8 percent) and Chinese-Tibetan (3 percent) populations are mostly found in the highly sloped, remote mountainous areas in the northern regions of the country.^[14,15]

Health, social and economic indicators tend to diverge along ethnic lines, mostly reflexive of the geographic isolation of minority populations. Poverty incidence (percentage of the population living under the poverty line) is highest among minority populations living in remote areas of the country, however due to the low population density in these regions, the majority of poor people in Laos are actually living in the Mekong River Valley and are of Lao-Tai ethnicity.^[12]



Source: Department of Statistics 2005. Lao PDR Population Census 2005. Vientiane, Lao PDR: NSC.

Selected Social and Economic Indicators									
	Poverty Head Count*	Number of poor*	Ownership of tractor*	Primary School attend-	Literate young women**	Use improved water**	Use improved sanitation**	Stunted**	Underweight**
Lao-Tai	18.4	680,522	35	91.8	81.6	72.4	73.6	33.4	21.5
Mon-Khmer	47.3	570,895	21	75.0	45.3	62.0	29.9	55.5	36.7
Hmong-Mien	43.7	214,532	21	82.8	48.6	68.7	46.4	60.5	21.3
Chinese-Tibetan	42.2	73,494	7	73.1	30.1	82.6	30.0	60.9	42.8

*data from LECS IV 2007/08; **data from LSIS 2011/12

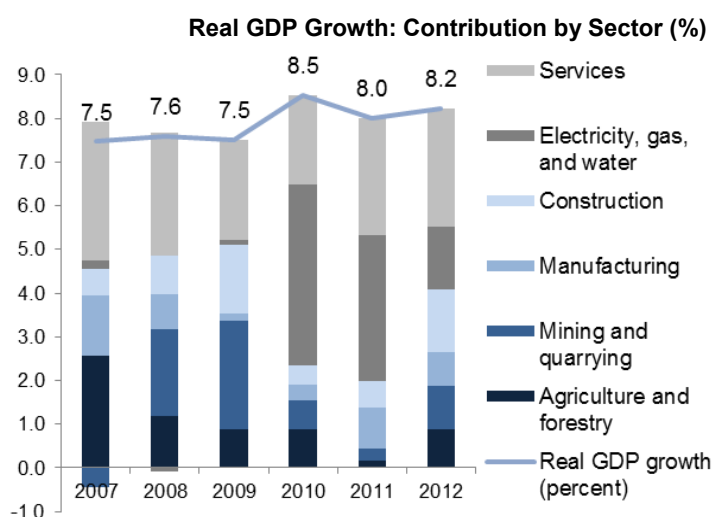
Economic Context

Economy & Employment

Laos has experienced steady economic growth of 7 to 8 percent/year over the past decade.^[10] In 2012, the service industry contributed 2.7 percent to real GDP growth as a result of increasing tourism. Exploitation of abundant natural resources, particularly through hydropower and mining, contributed 1.4 and 1.0 percent respectively to growth in 2012.^[16] With high global prices for copper and gold, mining also contributes substantially to government revenue.^[16]

Despite the small contribution of agriculture to GDP (<1 percent), Lao PDR remains a predominantly agricultural society, with the sector employing 76 percent of working persons in 2011.^[17] The majority of those employed in the sector work on their own land as “unpaid” or “own account” workers.^[17] While recent data on non-agricultural employment is limited, data from 2008 suggests that trade, manufacturing and services dominate (23.4 percent total).^[18] It is yet to be seen if expectations of improved job opportunities will materialize as a result of industrial growth and continued expansion of hydropower and mining.^[19]

Minerals, electricity, and agricultural commodities are core internationally-traded products for Lao PDR. Intra-ASEAN trade accounted for 74 percent of the total export value and 86 percent of the total import value in 2010.^[9] The primary agricultural exports include coffee, wood, and cereals (maize), while key imports include processed items (beverages, foodstuffs, etc.), cereals (rice), and fodder. In 2010, the country imported 43,000 tonnes of rice at a value of 16 million USD.^[20]



Source: World Bank 2012. *Lao PDR Economic Monitor November 2012*
Update. Vientiane, Lao PDR: World Bank.

Mining & Hydropower Sectors

Beyond employment, growth in mining and hydropower sectors directly impacts rural livelihoods and food security as geographic areas of interest frequently overlap. Concessions for mining and hydropower can disrupt local ecosystems on which households rely and reduce access to agricultural land and forests.^[21] As of 2012, operational mines covered 548,756 hectares and an additional 1,027,873 hectares were leased for exploration. Of operational mines, zinc/tin mines cover the greatest land area (35 percent), followed by copper (16 percent), iron (11 percent) and gold mines (9 percent).^[22] Mining projects are predominantly located in the northern and central regions of the country.^[22]

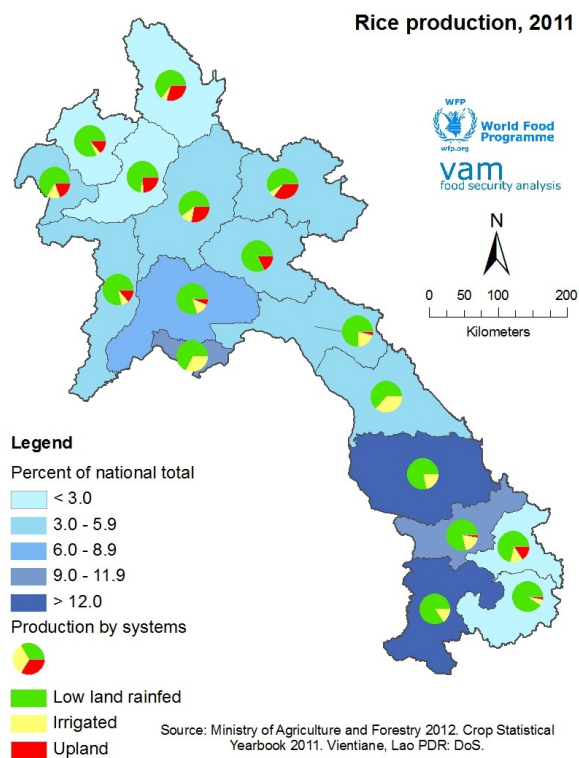
THE FOOD SECURITY CONTEXT

Extensive plans exist for expansion of hydropower in the Mekong river basin and particularly in Laos. In addition to the 10 operational hydropower plants, 12 plants are nearing completion by 2015, and 31 more projects are in the pipeline.^[19] The resulting increase in dams and reservoirs may very well result in the relocation of more villages and may threaten the survival of some aquatic species. As noted in UNDP's 2012 Country Analysis Report, unregulated development in mining and hydropower, as well as in commercial agriculture, "may degrade beyond recovery the rich ecosystem, upon which the vast majority of the rural population so depend for fuel, food and fibre."^[19]

Agriculture Sector

Rice production dominates the sector and, in line with the national strategy for rice self-sufficiency, total production has steadily increased from 1.3 million tons in 1993 to 3.07 in 2011.^[9,23] The increase is attributed in large part to the expansion of irrigation in the lowlands and adoption of improved seeds.^[23] Most of the rice production originates from lowland rain-fed paddy systems, with only 17 percent from irrigated systems and 6.6 percent from upland.^[24] Five provinces in the centre and south account for 62 percent of total rice production (lowland rain-fed and irrigated),^[24] with one province, Savannakhet, contributing 20 percent. By contrast, the 7 northern provinces together provide only 22 percent from lowland rain-fed, irrigated, and upland combined.

Other important crops in Lao PDR include maize, vegetables, starchy roots, sugarcane, bananas and increasingly rubber. In plateau areas, coffee, tea and cardamom are also important. Maize, grown mostly for livestock feed, is planted by approximately 24 percent of households, second only to rice. Vegetable are grown for household consumption as well as for sale: 2 in 5 households maintain small vegetable plots.^[17] While national output of vegetables and starchy roots has increased substantially in recent years, it is mostly geared for export markets.^[25] Sugarcane and rubber are fast-growing cash crop industries: rubber production has jumped from none in 1999 to 66,500 hectares in 2011, and sugar cane production has doubled from 3,100 to 6,400 hectares in the same time period.^[17] The shift to



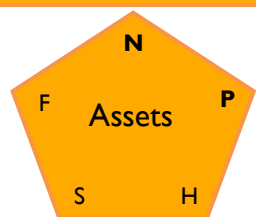
cash crop production is occurring most prominently in the north, with important implications for food security: As household replace food crops with cash crops, they can become increasingly reliant on market purchases for household food supply and therefore vulnerable to fluctuations in prices and access.

Political Context

Food security and nutrition have gained increasing prominence in the national discourse in recent years, appearing centrally in such strategic documents as the 2020 Strategy for Agriculture Development and the first ever five-year National Nutrition Strategy and Plan of Action. The 2015 National Socio-Economic Development Plan (NSEDP) and 2015 Rural Development and Poverty Eradication (RDPE) Plan outline ambitious strategies to reduce poverty, integrate the most remote villages and sustainably industrialize and modernize while preserving natural resources and protecting the environment. However, it is in this nexus that Lao PDR faces the challenge of accelerating economic growth through expansion of such sectors as mining, hydro-power and foreign direct investment, while simultaneously protecting biodiversity, ensuring sustainable livelihoods and improving food security for rural populations.

While an extensive legal and political framework for environmental protection and conservation exists, enforcement and monitoring remains a problem. Ambiguity in land ownership and rights introduces an additional layer of complexity to appropriate management of resources and protection of rural livelihoods.^[19] As a result, the 2015 NSEDP aims to create detailed land management plans and continue issuing over one million land titles.^[26]

Improving livelihood opportunities in the remote upland areas is also a major challenge. To reduce shifting cultivation, the practice in which farmers slash and burn primary forest often on steeply sloping land in order to gain access to agricultural land, remains a political focus due to the association with deforestation. At present it is estimated that 3,000 households in Lao PDR still practice shifting cultivation, mostly concentrated in the northern region.^[23] Resettlement, as part of government rural development plans (e.g. the village, or Kumban, cluster strategy), linked to stabilization of shifting cultivation policies, opium eradication efforts, and/or to make way for public and private development projects, has been ongoing since the early 1990s, impacting a large number of rural villages particularly in the northern and southern provinces.^[27] While a primary goal of government policies have been to improve rural welfare and food security (e.g. the Kumban strategy encourages villages to cluster together in order to improve access to a variety of services while the shifting cultivation stabilization policy aims to improve food security by encouraging a transition to sedentary market-oriented farming), available research suggests that the impact of resettlement has been overwhelmingly negative in terms of health, food security and nutrition outcomes.^[27]



Natural Capital

Forests and Rivers

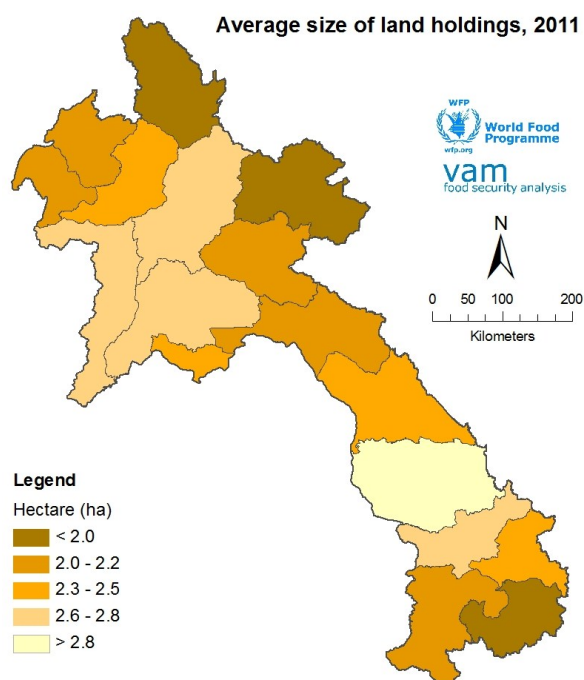
Natural resources such as forests and rivers play a central role in household livelihood strategies and food and nutrition security. While mineral deposits are an abundant and lucrative natural resource for the country, they play a greater role in affecting household vulnerability than in contributing to livelihood strategies and therefore are discussed under the section “Vulnerability”.

Forests provide a wide range of plant and animal products known collectively as non-timber forest products. NTFPs contribute directly to household diet and incomes, most prominently in upland areas.^[6,29-31] Deforestation is a major concern as forest cover has declined from over 70 percent in the 1970s to 40 percent in recent years.^[33] Mountains cover roughly 70 percent of total land area, mostly in the northern region and along the central/south border with Vietnam. Steeply sloping terrain limits agricultural potential and makes the provision of basic infrastructure difficult.^[7]

Water ecosystems crisscross large portions of Lao PDR and play a central role in the food security profile of many households: Two thirds of farm households engage in at least one form of capture fishery that provides fish and other aquatic animals for household consumption or sale, and over 80 percent consume fish at least once a week.^[6,17] While only 20 percent of land was irrigated in 2011, the extensive river basin system offers the potential for the expansion of irrigation infrastructure.^[17] The increasing exploitation of the river basin for its hydropower potential carries implications for availability of fish, a key source of protein in the diet of rural households.

Productive Land

Given the centrality of agricultural production to livelihoods in Lao PDR, access to productive land is a critical household asset. In 2011, only seven percent of total land in Lao PDR was under agricultural production.^[17] The most productive land is located in the lowland and plateau areas. The lowlands, concentrated along the Mekong floodplains and the banks of its tributaries, are used mostly for rain-fed and irrigated paddy production. Plateaus in the mountain ranges of the north and south are also highly fertile and particularly well suited to the production of industrial crops (e.g. coffee). The uplands refer to fragile, steeply sloping terrain mostly concentrated in the northern provinces:



Source: Agriculture Census Office 2012. Lao Census of Agriculture 2010/11. Vientiane, LaoPDR: MAF/LSB

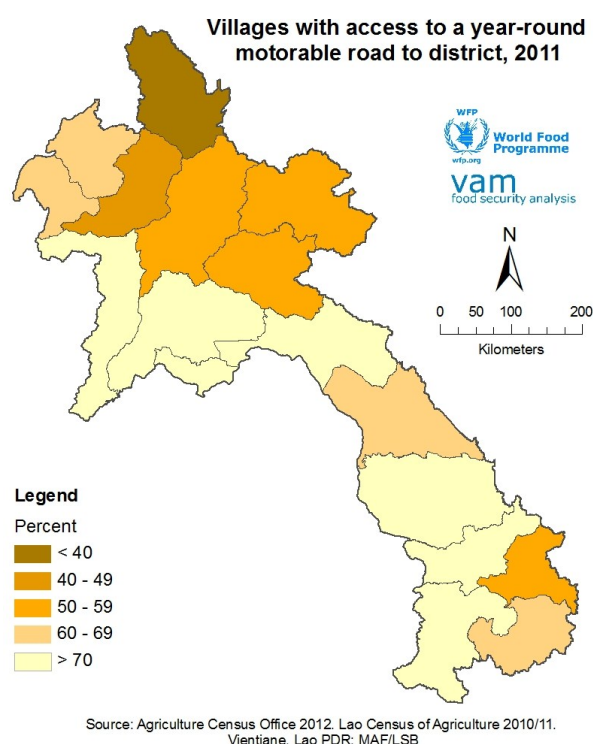
75 to 85 percent of land in Huaphanh, Luang Prabang, Phongsaly, Luangnamtha, Oudomxay, and Xiengkhuang is considered fragile.^[7] Upland rice production has limited yields and thus lower output, directly impacting household food security in upland areas.

The average land holding in Lao PDR as reported in the Census of Agriculture 2010/11 is 2.4 hectares, although 23 percent reported farming less than 1 hectare and 54 percent less than 2 hectares.^[17] Land holdings are often fragmented, with 65 percent of land holdings consisting of 2 or 3 parcels. Fragmentation is more common in the north with one-third of households farming more four or more parcels of land than in the center and south (15 percent each).^[17]

Physical Capital

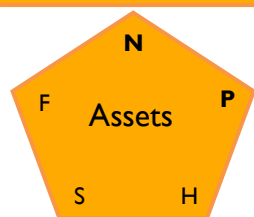
Roads

Access to roads, by providing access to markets, schools and health facilities located in larger centres, is closely associated with reduced incidence of poverty.^[12, 34] In 2011, the road network in Lao PDR was limited, with 41,029 km of roads and only 16 percent paved.^[9] Villages with gravel or dirt roads face greater risk of losing access to commercial centres during the rainy season (May to September), amounting to roughly one in three villages.^[7, 17, 35] An additional 9 percent of villages had no road access at all, mostly in the northern provinces.^[17] A greater proportion of lowland and midland villages (90 percent) have year-round road access compared to upland villages (68 percent).^[3]



Electricity

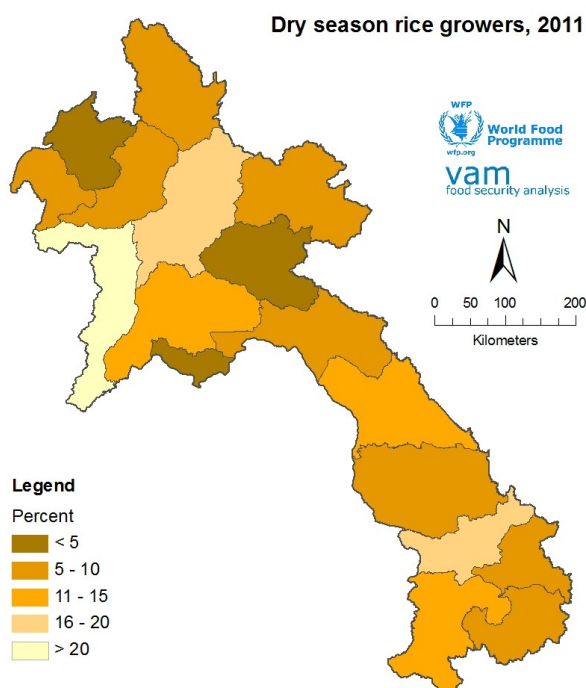
Electricity has expanded rapidly from 16 percent of households in 1995 to over 70 percent in 2010. The majority of households are connected via the national electrical grid, with some support for off-grid mechanisms in the more remote areas. By 2020, the government aims to provide electricity to 90 percent or more of the population. Despite this progress, rural electrification has not translated into growth of small rural businesses (through refrigeration, improved processing technologies, etc) largely as a result of unreliable and inconsistent supply.^[36] At present, electricity is mainly used for domestic lighting.^[36]



Productive Assets

Irrigation enables farmers to engage in dry season production and smooth wet season production which can improve household food security. At present, irrigation use is far below potential, with only 15 percent of the country’s paddy irrigated (mainly in the central provinces) despite almost half of villages nationwide reporting access to irrigation facilities.^[17,25] The 2020 Strategy for Agriculture Development outlines plans to upgrade and expand irrigation facilities to improve resilience to climate change and assist livelihood diversification.^[23,37]

Use of productive inputs such as fertilizers and pesticides can also improve food security by improving output potential. While the use of fertilizers has increased over the past decade, it’s higher in the centre and south than in the north. Pesticide use, on the other hand, remains low everywhere (17 percent).^[17] As commercial agriculture and mechanisms such as contract farming expand, the use of agricultural inputs and technologies is likely to increase.^[38] While data is limited, assets for processing are estimated to be quite low. For example, rice is often taken across international borders for milling indicating limited capacity in Lao PDR.^[25]



Source: Agriculture Census Office 2012. Lao Census of Agriculture 2010/11. Vientiane, Lao PDR: MAF/LSB

Use of Productive Inputs by Region				
	North	Center	South	Lao PDR
Two-wheel Tractor Use	43	80	54	61
Fertilizer Use*	25	72	74	57
Improved Rice Seed	14.5	49	58	38

*Fertilizer use = chemical and organic fertilizers.

Source: Agricultural Census Office 2012. Lao Census of Agriculture 2010/11. Vientiane, Lao PDR: MAF/LSB.

Human Capital

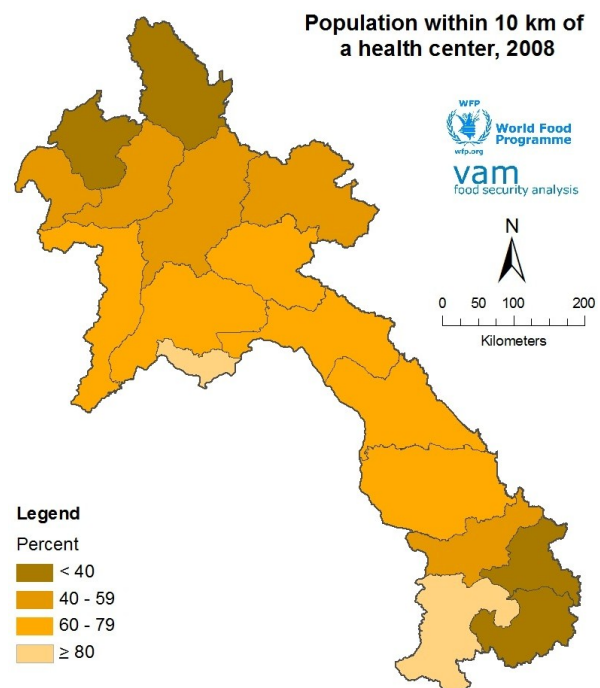
Family Size

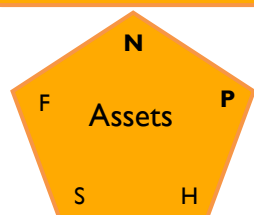
Human capital refers to the skills, knowledge, good health and ability of individuals to work. In Lao PDR, large families are valued for labour in rural areas, reflected in higher fertility rates. The national fertility rate in 2011 was 3.2 children per women, compared to 2.5 in Cambodia, 2.0 in Myanmar, 1.8 in Vietnam, and 1.6 in Thailand.^[10] In rural areas without road access and with road access, the fertility rates were 4.8 and 3.4 respectively, compared to 2.2 in urban areas.^[5] According to the Census of Agriculture 2010/11, over half (48 percent) of farm households are large (>6 persons), and 70 percent of the employed farm population over 10 years are working for the household.^[17] The life expectancy in Lao PDR is 62 and 64 years of age for men and women respectively.

Health

Physical and financial access to and use of health facilities are key challenges in Lao PDR. The health care system is primarily government-owned and vertically structured, with facilities at central, regional, provincial, district and community levels. Private facilities are increasingly available but largely limited to urban centres.^[39] Maternal, Neonatal and Child Health (MNCH) and nutrition are priority themes at all levels of service provision. At the community level, public services include outreach (immunization and supplementation programs, MNCH interventions), dispensaries, and drug kits in those villages at least a two-hour walk from a dispensary. In 2011, 70 percent of villages reported a pharmacy or drug kit in the village and 62 percent reported a dispensary or hospital within a two-hour walk.^[17] Physical access varies considerably by road access and altitude: only 33 percent of villages without road access and 46 percent of upland villages are within a two-hour walk of a dispensary or hospital.^[17] Throughout Lao PDR, a wide network of traditional providers continues to play a central role in primary health care.^[39]

Key challenges to providing public health care in Lao PDR include low government expenditure (4.1 percent of GDP), critical shortage of health staff (2.17 health workers per 1,000 population), poor quality of services and a resulting low use of services.^[39] In addition, high user fees and out-of-pocket payments mean that the poor are less likely to seek timely (or any) care.^[39]





According to the WHO health profile for Lao PDR, communicable diseases are a major cause of morbidity and mortality (particularly related to water and sanitation, malnutrition, and poor hygiene, see section “Individual Outcomes”), although non-communicable diseases and injuries are on the rise (tobacco-, illicit drug-, and traffic-related).^[40] Despite progress in detection and treatment, tuber-

culosis (TB) continues to be of concern in much of Lao PDR, particularly as drug-resistance spreads. According to 2009 estimates, Laos remains a high-burden TB country with a prevalence of 151 per 100,000 people.^[38] The burden of disease related to malaria has declined considerably since the 1990s, largely due to the increased use of mosquito nets.^[33] The prevalence of HIV/AIDS is currently fairly low in Lao PDR, estimated at 0.2 percent among 15 to 49 year olds in 2009.^[41] However, the country’s location in a high-prevalence region is cause for concern, particularly given signs of a low level of knowledge on HIV prevention. In 2012, only 24 percent of women and 28 percent of men aged 15 to 24 had comprehensive knowledge about HIV prevention.^[5] While important progress has been made in reducing the rates of sexually transmitted infections (STIs) amongst the high risk population of female sex workers (FSW), the challenge remains to improve HIV education and prevention amongst FSWs as well as for other high risk groups such as men who have sex with men (MSM) and injectable drug users (IDUs).^[41]

Individuals afflicted with major illnesses such as malaria, tuberculosis, HIV/AIDS and STIs are often unable to work to their maximum potential and draw heavily on scarce household resources, human and financial, that could otherwise be used for activities related to food and income generation. In addition, household members with disabilities, such as injuries resulting from UXO detonation, are often unable to contribute to their maximum potential. Recent data on disabilities in Lao PDR, however, is limited. The burden on households is substantially greater in regions with limited access, physically and financially, to health facilities and with less recourse to preventive and remedial care, increasing their vulnerability to food and nutrition insecurity.

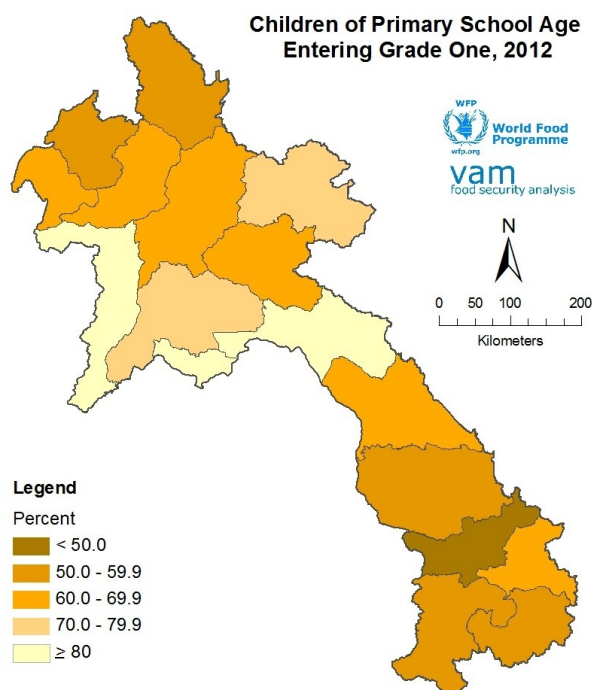
Snapshot: Public Health Care System, 2010	
Community drug kits	5,000
Health Centres	894
District Hospitals	130
Provincial Hospitals	12
Regional Hospitals	4
Central Hospitals	4
Specialized Care Centres	3

Education

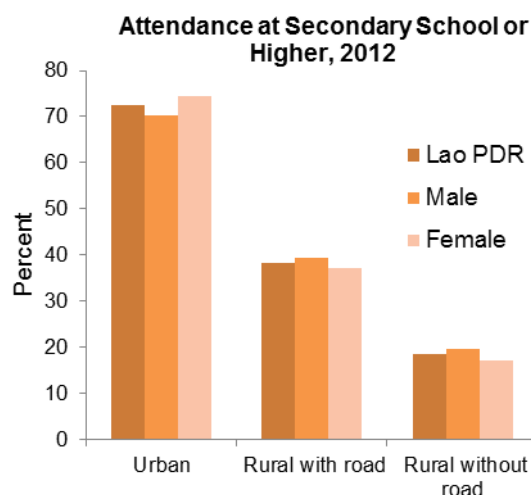
Educational achievement is an important aspect of human capital. Between 1991 and 2005, the percentage of children of primary school age (6 years) enrolled in grade one increased from 58 to 84 percent. However, in 2012 the enrolment rate dropped to 64 percent, with variation between urban (81.2 percent) and rural populations (60 percent).^[5] In rural areas without road access, less than half of six-year olds entered grade one, mostly reflexive of the limited number of primary schools in these remote villages: only 48 percent of rural villages without road access have primary schools compared to 66 percent of rural villages with roads.^[5,17] Variations in enrolment were also seen along income and ethnic lines: Less than half of primary school age children from the poorest quintile enrolled compared to over three quarters in top two wealthiest quintiles respectively, while enrolment rates amongst non-Lao-Tai children ranged from 42 to 57 percent compared to 74 percent of Lao-Tai children.

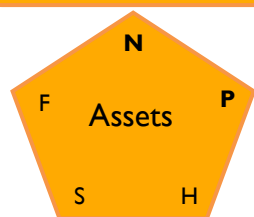
The rate of primary school completion, by contrast, improved substantially between 1991 and 2012 from 48 percent to 95 percent of pupils. While most students that completed primary school transitioned to secondary schools (91 percent), attendance rates in secondary school fell to 45 percent, with variation between urban and rural locations.^[5,33]

Between 2005 and 2012, young adult literacy rates (ages 15 to 24 years) fell from 89 to 77 percent among young men and from 79 to 69 among young women.^[5,42] Rates varied widely by location of residence, with over 90 percent in urban areas compared to 41 and 56 percent for young women and young men respectively in rural areas without road access.^[5] Rates also vary by ethnic group, with higher percentages of literate young people of Lao-Tai ethno-linguistic background compared to other minority groups.



Source: Ministry of Planning and Investment 2008, Lao Expenditure and Consumption Survey 2007/08, Vientiane, Lao PDR: LSB.





Social Capital

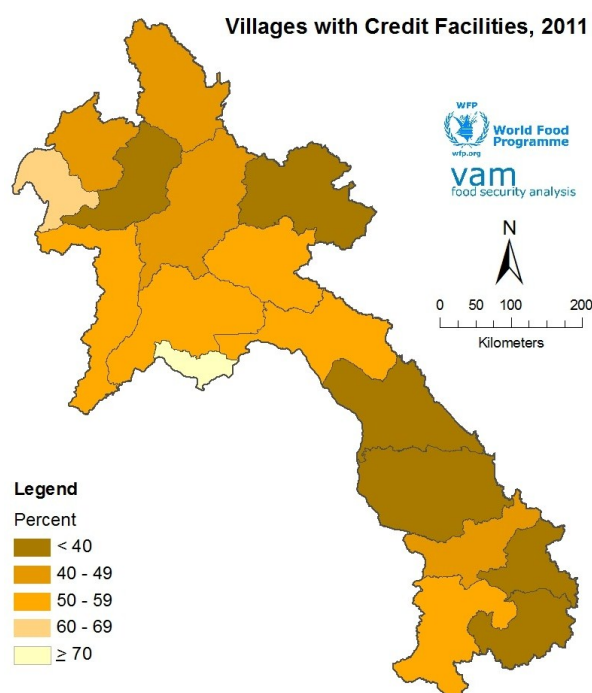
Social capital encompasses all social resources (groups, associations, networks, agreements) upon which people draw in pursuit of their livelihood objectives. In Lao PDR, social assets range from ethnic, community and family support systems, memberships in community and economic associations such as cooperatives, village development funds or trade groups, to vertical connectedness through mechanisms such as contract farming.

In Lao PDR, villages tend to be ethnically homogenous, with the non-Lao-Tai minorities living in more remote and isolated areas. While ethnic and kinship ties at the village level may enhance social capital, linguistic differences and in particular an inability to speak Lao language may be limiting social capital at provincial and national levels. Politically, ethnic minorities are under-represented in parliament and political organizations. Economically, linguistic barriers may limit participation in associations, groups or arrangements that could improve resilience to food insecurity.

Arrangements such as contract farming are another form of social capital that may hold the potential to improve household resilience to food insecurity, if regulated appropriately. Participating farmers receive agricultural inputs to increase production and improve market access, which can generate greater economic returns for the farmers. However, achieving these benefits is heavily dependent on the nature of the contract and reduction of risks for both the farmer and the investor. Contract farming currently is spreading much more rapidly in the northern provinces of Lao PDR and while studies show controversial findings, some suggest improved economic outcomes in terms of income. The full impact on food security and well-being has yet to be seen.^[17,43]

Financial Capital

Financial assets refer to the availability of cash equivalents that enable people to adopt different livelihood strategies. Access to cash income in rural areas is closely linked to sale of agricultural products. While wage labour opportunities are growing, they are still relatively limited in rural areas. According to the 2007/08 LECS, the percent of households engaged in wage labour increased from 10 to 14 percent overall, but the increase was attributed to urban opportunities.^[44] Such high dependence on agricultural production for both income and food amongst rural households can translate into in-



Source: Agriculture Census Office 2012, Lao Census of Agriculture 2010/11. Vientiane, Lao PDR: MAF/LSB.

creased vulnerability to food insecurity, particularly in the wake of a shock or hazard.

In addition, access to credit is relatively low in rural areas of Lao PDR: according to the Census of Agriculture 2010/11, 31 and 47 percent of villages in rural areas without road access and with road access respectively had credit facilities in the village, but only 13 percent of rural households held any credit at the time of the survey.^[17] Borrowing from friends and relatives has been noted as a more common coping strategy for households as bank loans are difficult to access.^[45]

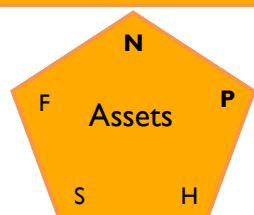
Remittances are not a major source of income for households in Lao PDR. Official data suggests migration across borders particularly to Thailand occurs at a rate of 2.5 per 1,000 people, although informal migration is not captured in these figures.^[11] Remittances in 2010 were estimated at approximately US \$1 million, compared to a net inflow of US \$0.2 billion from foreign direct investment (FDI) and US \$0.5 billion from official development assistance. For other countries in the region, remittances in 2010 are much greater, amounting to US \$364 million in Cambodia, US \$7.2 billion in Vietnam, and US \$21.3 billion in the Philippines.^[46]

Livelihood Strategies

For rural populations in Laos, the dominant livelihood profile is that of agricultural production for own consumption supplemented by hunting, fishing and gathering of wild products for food and/or for sale.^[17] The RVS 2012/13 identified three broad profiles of villages, which, while not exhaustive, provide a snapshot of livelihoods in rural Laos: (1) market-oriented farming villages characterized by greater opportunities for irrigated and high-value crop production; (2) part-time farming villages, reliant on both farm and non-farm income sources; and (3) rice-based conservation upland farming with an emphasis on subsistence farming.^[6] For market-oriented and part-time farming villages found mostly in the lowlands and along the Mekong Corridor, cash-generating activities such as unskilled labour, cash crop production, and sale of agricultural and wild products are increasingly important to livelihood profiles. According to the Census, 70 percent of farm households reported selling some agricultural produce: one in three farm households sold some rice, and two in five reported selling other crops or livestock products.^[17] Several studies have noted the increasing importance of the sale of non-timber forest products (NTFPs) to livelihood strategies particularly in the uplands, with the income used to buy cheaper food in the market.^[7,25,29,30] The sale of wild-caught fish, on the other hand, remains relatively low: in 2011, 77 percent of fishing households did not sell any of their fish catch.

Percent of Households Engaged in Select Livelihood Activities^[17]

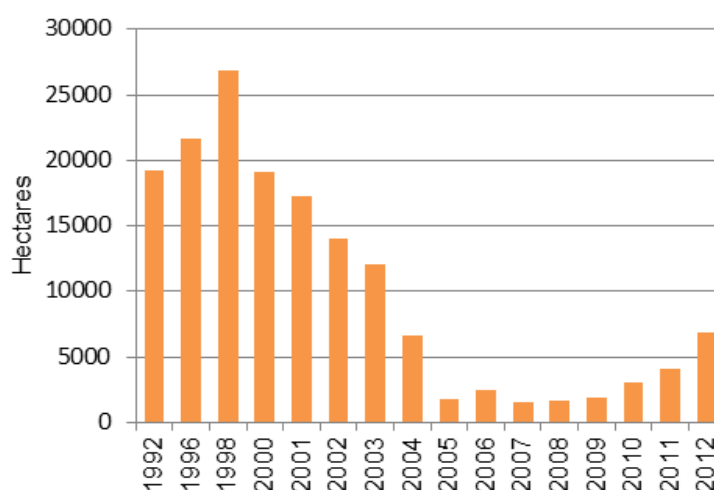
Crop production		Livestock ownership			Wild Products	
Rice	Vegetable garden	Chickens	Pigs	Cattle	Engaged in Fishing	Exploit Public forests
93	41	62	39	38	67	69



In rural Laos, the growth in unskilled labour opportunities is closely related to the expansion of commercial agriculture. In the north where contract farming is prevalent, individuals can engage in wage labour either on their own land (investor pays their wages in addition to providing inputs and managing the market) or on other households' contracted land.^[47] In the south and centre, concession arrangements are more common and wage labour is typical on commercial plantations. The level of household engagement in wage labour can vary widely, reflecting the seasonal nature of opportunities (demand at its peak during land clearing, planting and harvesting seasons) and the household's ownership of own land.^[17,19,47-49] According to the Census of Agriculture, approximately 46,000 farm households (a three-fold increase since 1999) are currently landless and reliant on wage labour as their primary livelihood.^[17] The sole dependence on casual labour for income and food increases household vulnerability to food insecurity due to inconsistent availability of opportunities as well as greater dependence on market access and price stability.

In the north in particular, livelihood strategies are undergoing rapid change that may increase household vulnerability food insecurity. These changes include: pressure to reduce shifting cultivation; expansion of commercial agriculture (e.g. maize, rubber) through contract arrangements, which may affect availability and access to important food crops and increase household dependence on purchases; declining biodiversity and access to NTFPs resulting from removal of primary forest and overharvesting; escalation of hydropower and mining operations that may reduce household access to natural resources, particularly for poor and upland farmers; and resettlement linked to rural development policies and public and private sector development projects. In addition, poppy production appears to be making a comeback in the region: In 2012, opium production was estimated to have returned to 2004 levels, originating primarily from six provinces (Phongsaly, Luang Namtha, Huaphanh, Xiangkuang, Oudomxay, and Luang Prabang).^[28] The increase in production reflects rising demand, high prices, and the lack of alternative sustainable livelihood activities for upland farmers.

Estimated area under poppy cultivation in Lao PDR (Ha), 1992-2012



Source: UNODC 2012. *South-east Asian Opium survey 2012: Lao PDR and Myanmar*. UNODC.

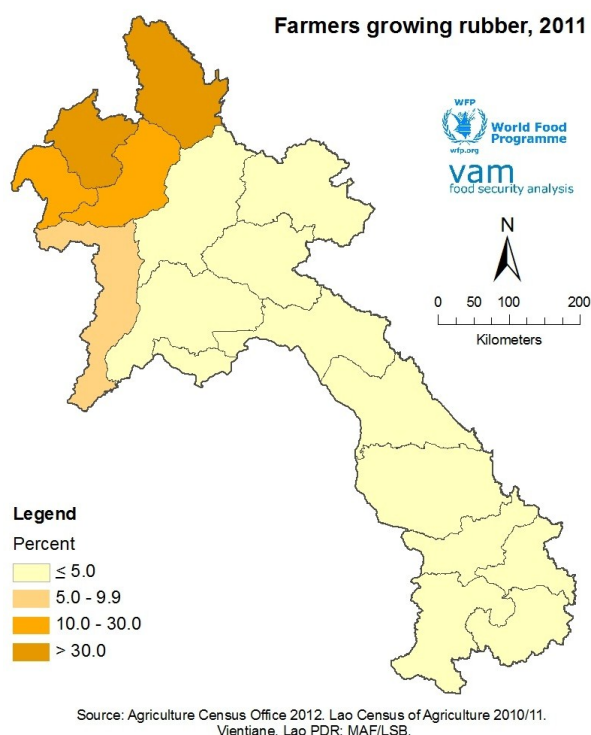
Crop Production

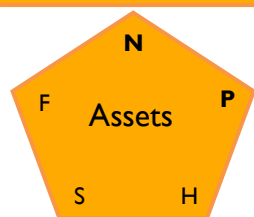
Rice production remains the primary crop grown by most farm households, although rice yields and output vary widely by production system. In lowland systems, land holdings are typically larger (> 2 ha), irrigation is more accessible, and the average yields under rain-fed lowland and irrigated systems reach approximately 3.88 and 4.82 t/ha respectively.^[17, 24] By contrast, upland systems are typically comprised of several small steeply sloping plots and have an average yield of 1.90 t/ha.^[17, 24] This geographic inequity in rice production has direct implications for household food security: In 2008, villages in the north and south reported insufficient rice for 2.6 months per year on average compared to 2.4 months per year in the centre.^[3]

Secondary crops are widely grown by households for own consumption and/or sale. Differences in the types of crops grown can also be seen by agriculture production system. In lowland systems, vegetable production is more common followed by maize, while in the uplands, maize production is increasingly important, with cassava and job's tear also grown.^[6, 17, 25] Two in five northern farmers are growing maize, accounting for one-quarter (26 percent) of the area under temporary crops.

Rubber production is also expanding in the north as 15 percent of farmers have planted rubber trees on approximately 53,500 hectares.^[17] Much of the maize and rubber in the north is grown under contract arrangements.^[38] Production of roots such as cassava (uplands) and sweet potato and taro (lowlands) are grown more for sale than for own consumption, generally only eaten if rice is not available.^[25, 45] Fruit production is common across the country: one in four households produce mangoes, roughly evenly spread across the three regions, and bananas, tamarind, and coconut are grown by between 9 to 15 percent of farm households.^[17] Coffee, tea and cardamom are also grown largely in plateau areas.

Over the past 30 years, the overall variety and diversity of food crops produced by individual households in Lao PDR has declined.^[25] This change has important implications for food security as households replace food crops with cash crops and/or become increasingly reliant on market purchases for food.

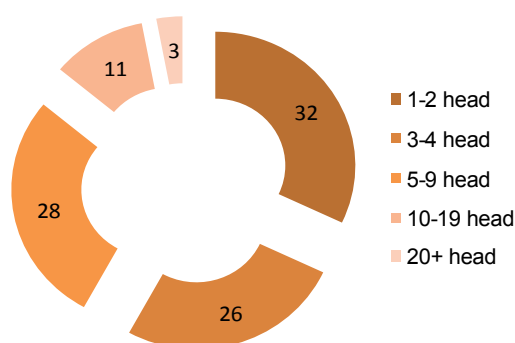




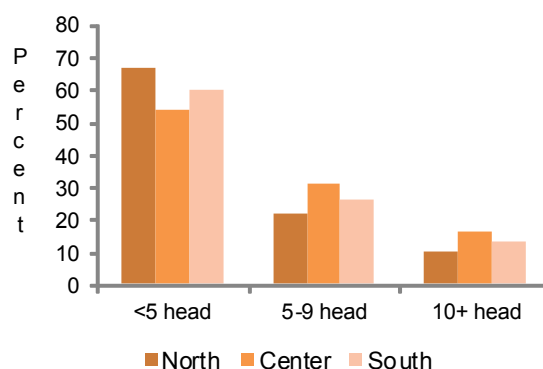
Livestock Production

The livestock industry has largely remained small and oriented for own consumption. Pigs and poultry are often raised for meat and eggs: Over 80 percent of households with pigs own between one and four pigs (average of 3 per household) and over 90 percent of households with chickens have small flocks (less than 50 chickens, with an average of 18 per household).^[17] Buffalo numbers have decreased over a 10-year period reflecting the spread of mechanization, and those that are kept are largely raised as a source of meat. The number of cattle, by contrast, has increased from 944,000 head to 1.5 million head in the past 10 years. Average herd size has also increased from 4.5 to 5.3 head of cattle, with the largest herds found in the central provinces.^[17] Overall, production of livestock is being promoted as a means of poverty reduction and improved resilience to food and nutrition insecurity by diversifying livelihoods and providing nutritional and income support, particularly for upland farmers.^[23]

Cattle Herd Sizes (%), 2011



Cattle Herd Sizes by Region, 2011



Wild Products

Wild products, including timber, wood, non-timber forest products, fish and other aquatic animals are important to livelihoods and food security for a large proportion of households in Lao PDR. Reliance on NTFPs increases for poor and upland communities as well as for some ethnic minority groups, and becomes particularly important before the peak lean season preceding the harvest period.^[6,17, 29, 50] Wild-caught animals and insects are a principal source of high quality protein in the diet: For the average rural household, an estimated 32 percent of animal protein comes from wild sources, increasing to 45 percent in the Central/Southern Highlands.^[6] Aquaculture remains a small industry, with only 8.7 percent of farm households engaged in the cultivation of fish.^[17]

While Lao PDR is noted for its wide diversity of NTFPs, research has suggested declining biodiversity and low levels of a number of different species due to unregulated hunting, illegal trade, deforestation from both shifting cultivation and illegal logging, and conversion of natural forest to cash crops and tree plantations.^[51] According to the RVS 2012/13, more than 80 percent of

households reported declining access to forest resources in the last 5 years.^[6] Given the importance of NTFPs to food supply and dietary diversity, particularly during the peak lean season, this declining availability of NTFPs has serious negative implications for the food and nutrition security profiles of farm households particularly in the northern uplands.

Seasonality

Lao PDR has two seasons, the rainy season that begins in May and lasts typically through September, and the dry season that spans October to April. The main harvest of rain-fed lowland and upland rice occurs between October and December, while the harvest of lowland irrigated rice falls largely in the month of April. The peak lean season for rice therefore usually occurs in between August and the end of October as households await the new rice harvest. A second lean season often occurs in March, prior to the harvest of irrigated rice.

NTFPs are also subject to seasonal availability. In upland areas particularly, gathered vegetables and other NTFPs become increasingly important during the peak lean season as households await the rice harvest, markets become physically inaccessible due to rain, and prices of key food items rise. Mushrooms and bamboo sprouts are most available and collected during the rainy season months. Hunting for wild mammals occurs mostly between October and December, while fishing continues year-round, either in ponds, rivers and streams or in rice paddies during the rainy season.^[52]

Lao PDR Rice Cropping Calendar												
	Dry season				Rainy season					Dry season		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Upland Rice, rainfed*	Land selection, preparation, slashing and burning				Planting	Weeding				Harvesting		
Lowland rice, rain-fed			Land prep (first year only)		Nursery	Trans-planting	Weeding			Harvesting		
Lowland rice, irrigated	Planting	Weeding		Harvesting								

*The seasonal calendar for rainfed upland rice can vary by ethnic group and micro-climates.

Sources: adapted from WFP/VAM (No date). *Food Security Calendar: Uplands, Lao PDR*. Vientiane, Lao PDR: WFP, & FAO (2007). *Lao PDR Crop Calendar*. GIEWS Country Briefs. Accessed at: www.fao.org/giews/countrybrief.

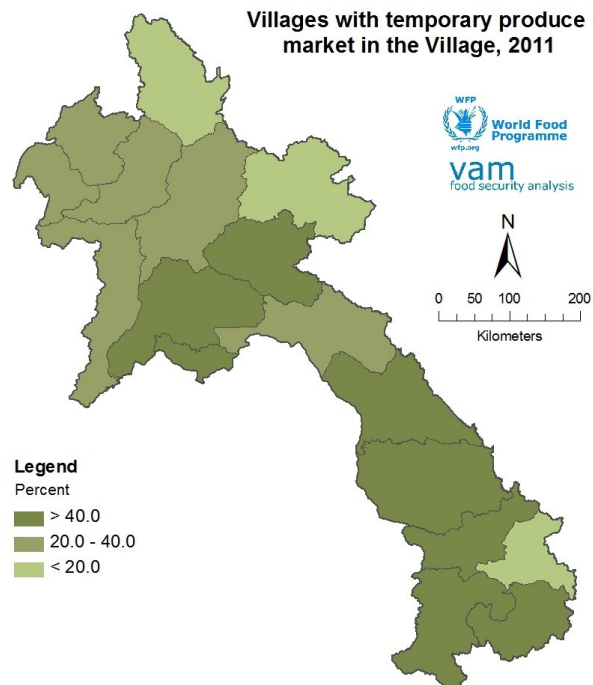
Access to Food

Market Presence

Markets are central to food and nutrition security, both as an opportunity to generate income through sale of produce and as a key source of food not grown or gathered by the household. In Lao PDR, households predominantly source oil, sugar, milk, meat and eggs from markets.^[7,25] Assuming household ability to purchase (see below), access to markets for such items could play an important role in improving protein and fat in the diet.

According to the Census of Agriculture 2010/11, only 2 percent of rural villages have a permanent market. Temporary produce markets are more common, with about 33 percent of villages nationally having a produce market. A larger proportion of villages in the central and southern provinces have a produce market located in the village than villages in the northern provinces. According to the Census of Agriculture 2010/11, agricultural produce markets are also twice as common in lowland villages compared to upland.^[17]

Access to markets outside of the village in district and provincial centres is a function of road infrastructure. As discussed in Section 2: “Assets”, good quality roads are limited in Lao PDR and one out of three villages loses access to roads seasonally. Moreover, the poor transport system inhibits movement of produce from surplus to deficit areas, reducing what is available in local markets and further driving up prices.^[25]

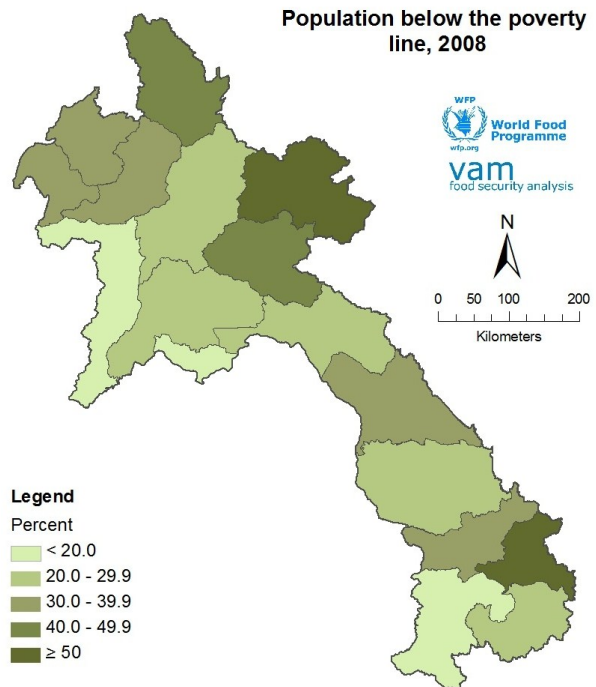


Poverty & Food Purchasing Patterns

Poverty undermines household food and nutrition security as poor households lack the necessary resources to maintain an adequately healthy and nutritious diet. While poverty in Lao PDR overall has declined by 17 percentage points in 16 years, it remains a predominantly rural phenomenon with highest rates in the more mountainous and remote provinces.

A 2012 study analyzing trends in food consumption and expenditure in Lao PDR between 2002 and 2008 provides useful insight into household purchasing patterns related to food. The study found that while expenditures on food increased nearly two-fold during the five-year pe-

riod, the share of food consumption coming from purchased foods declined relative to own produced foods.^[8] In 2003, average share of food consumption from purchased foods was 36 percent while in 2008 the share fell to 24 percent, indicating an increased reliance on own production for food. As noted by the study, this shift could be due to several factors including an increase in basic food prices (39 percent rise in the same five-year period) and/or competing demands on household incomes.^[8] The percent increase in real terms of expenditure on food from 2002 to 2008 was significantly greater in rural areas (62 percent) compared to in urban areas (26 percent).

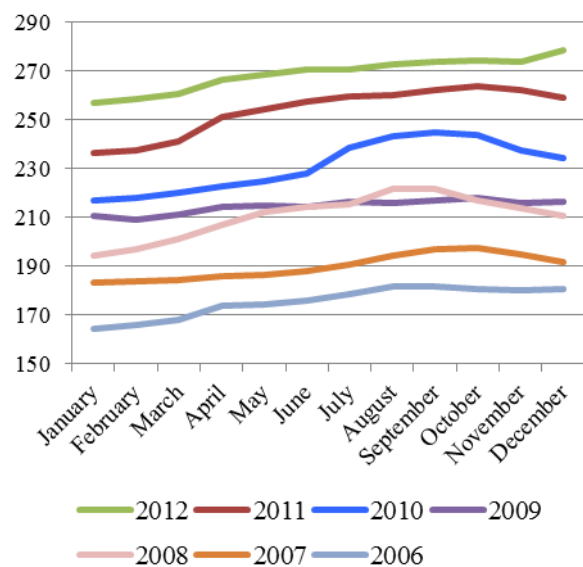


Source: Ministry of Planning and Investment 2010. Poverty in Lao PDR 2008. Vientiane, Lao PDR: MPI/LSB.

Prices

In Lao PDR, the long-term trend in food and non-alcoholic beverages consumer price index reveals a pattern of consistently rising food prices. By the end of 2012, the consumer price index had increased by more than 50 percent from the 2006 index. The prices typically peak during the peak lean season (August to October) and decline towards the end of the year as the harvest season ends.^[20] High meat prices were a main driving factor behind high consumer prices in 2011 and early 2012.^[54] The steady increase in consumer prices over the last six years raises concern for food security of poor and vulnerable households.

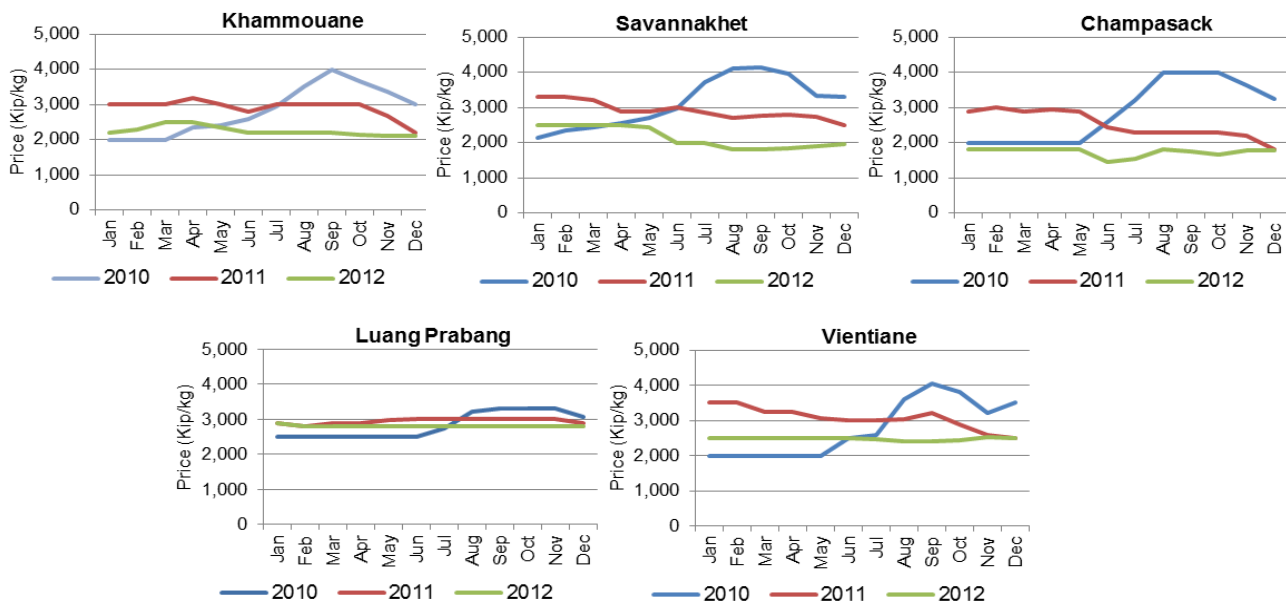
Trend in Consumer Price Index, 2006-2012



For specific food items, especially rice, prices are particularly sensitive to regional and domestic shocks and less so to global shocks. During the 2006-2008 global food crisis, prices in the country were shown to be minimally affected by global prices.^[53] More recently in 2010, large spikes in domestic glutinous rice prices reflected the combined impact of larger than normal exports to regional neighbours and prolonged domestic shocks (an unusual dry spell during the planting season that caused significant crop losses, followed in some areas by heavy rains).^[25, 53] Between the end of 2010 and October 2012, prices for glutinous rice gradually returned to pre-drought 2010 retail prices (approximately 2,000 kip/kg).

Trends in Glutinous Rice (Unmilled) Prices in Provincial Markets, 2010-2012

NB: Average annual exchange rates (2010: 1 USD = 7562 Kip; 2011: 1 USD = 9658 Kip; 2012: 1 USD = 8761 Kip)

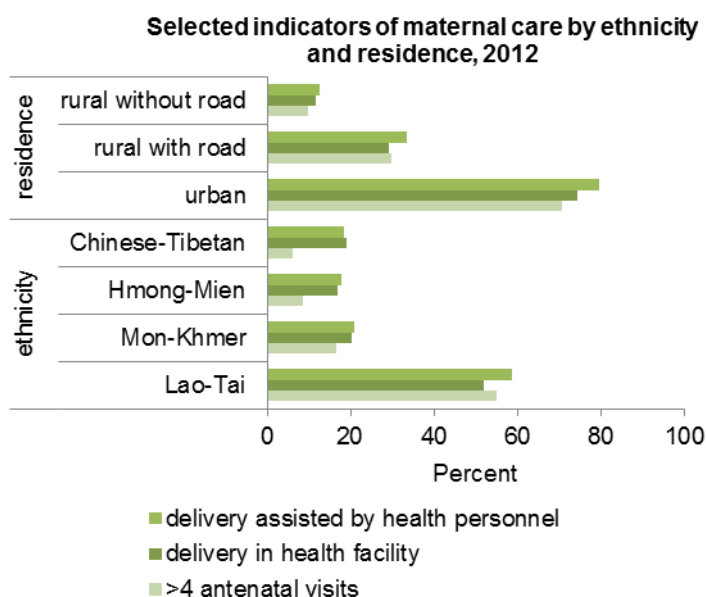


Caring Practices

Caring practices refer to the health and nutrition-related care provided for/available to household members, particularly women and children. Outcome indicators are typically used to assess maternal and child care (e.g. antenatal care and immunizations received) and serve as proxy measures of improved knowledge and access to health care. However, as is well known, a complex range of factors interact to influence behavior change, including access to education, access to health facilities and services both physically and financially, and cultural influences. Infant and young child feeding (IYCF) practices are discussed in the section “Individual Outcomes” because of the direct link between what a child under the age of two consumes and the nutritional status of that child.

Maternal Care

While the proportion of women receiving care during pregnancy has nearly doubled since 2005/06, coverage remains low in Lao PDR: only half of pregnant women receive antenatal care of which only 37 percent receive the recommended minimum of four visits and less than half give birth in the presence of a skilled attendant.^[5] Indicators of maternal care are lowest in rural areas without roads, largely reflecting the limited access to health facilities. In addition, important disparities in access to care exist according to the woman's education and by household wealth quintile: According to LSIS 2011/12, 25 percent of women with no education and from the poorest quintile respectively receive antenatal care, while 93 percent of women with post secondary or higher and 77 percent of women from the top two wealth quintiles received antenatal care.



Child Care

The Expanded Programme on Immunization, launched in 1974 in Lao PDR, has made important strides forward in improving child health. Between 1990 and 2010, the country doubled its measles immunization rate for one year old children, one of only 4 countries in the region to have done so.^[11] However, progress in provision of all childhood immunizations remains low: In 2012, only 43 percent of children age 12 to 23 months had received all the recommended vaccinations at the time of the survey, and only 34 percent had received them before their first birthday.^[5] Vaccination coverage varies by mother's education and wealth quintile: 73 percent of children with high education were fully vaccinated compared to 24 percent among children with mothers that have no education, and 61 percent of children in the highest quintile were fully vaccinated compared to 29 percent in the lowest wealth quintile.^[5]

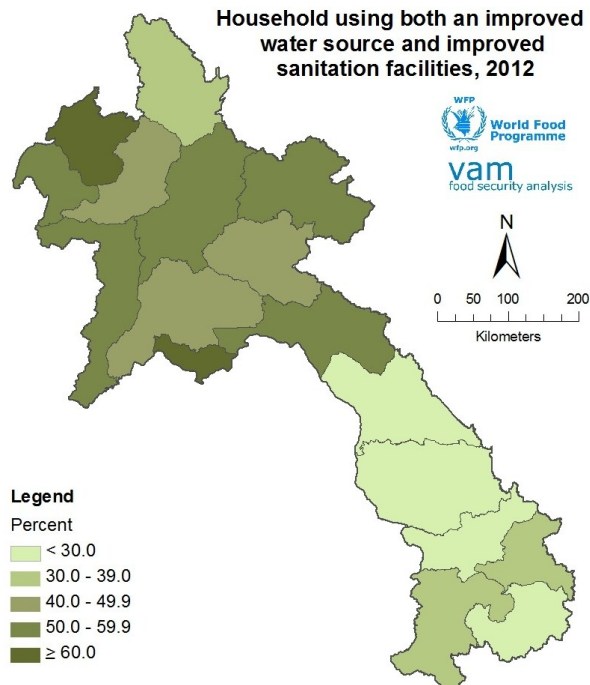
Health & Hygiene Conditions

Poor sanitary conditions, resulting from a lack of access to improved drinking water and sanitation facilities, increase the risk of childhood diseases such as diarrhoea and further exacerbate rates of malnutrition. A key finding from the RVS 2012/13 indicates that reducing malnutrition in Lao PDR will require *simultaneously* addressing the diet and improving sanitation—improving one without the other has much less of an impact in reducing malnutrition rates.^[6]

Substantial progress has been made in the provision of improved drinking water and sanitary facilities in Lao PDR over the past 15 years: In 2010, 67 percent of the population had access to safe drinking water and 63 percent to improved sanitation

facilities, compared to 39 and 17 percent respectively in 1995.^[55, 56] Estimates from 2012 indicate that the provision of improved sources of drinking water and sanitary facilities continues to expand.^[5] Despite this progress, recent estimates suggest that poor sanitation and hygiene is associated with more than three million disease episodes and over 6,000 premature deaths in Lao PDR annually.^[57]

Gaps remain wide in urban-rural provision of improved water and sanitation facilities. In 2012, less than half (42 percent) of the population in rural areas without access to road were using improved sources of drinking water and only 23 percent were using improved sanitation facilities, compared to 88 and 91 percent in urban areas.^[5] Provision of improved sanitation facilities has lagged behind that of water facilities. In the south, while the proportion of the population using of improved drinking water sources is comparable to the north and centre, use of improved sanitation is distinctly lower.^[5] Similarly, non-Lao-Tai ethnic minorities that tend to live in the more remote areas of the country have less access to improved sanitation facilities: 30 to 46 percent use improved sanitation facilities amongst Mon-Khmer, Hmong-Mien and Chinese-Tibetan compared to 74 percent of Lao-Tai households. A 2012 study of financing of hygiene and sanitation in Lao PDR identifies several factors linked to the limited progress in provision of sanitation facilities, including the high costs of scaling up and lack of financial support to households to build their own facilities.^[57]



Source: Ministry of Health and Lao Statistics Bureau 2013. Lao Social Indicator Survey 2011/12, Final Report. Vientiane, Lao PDR: MoH/LSB.

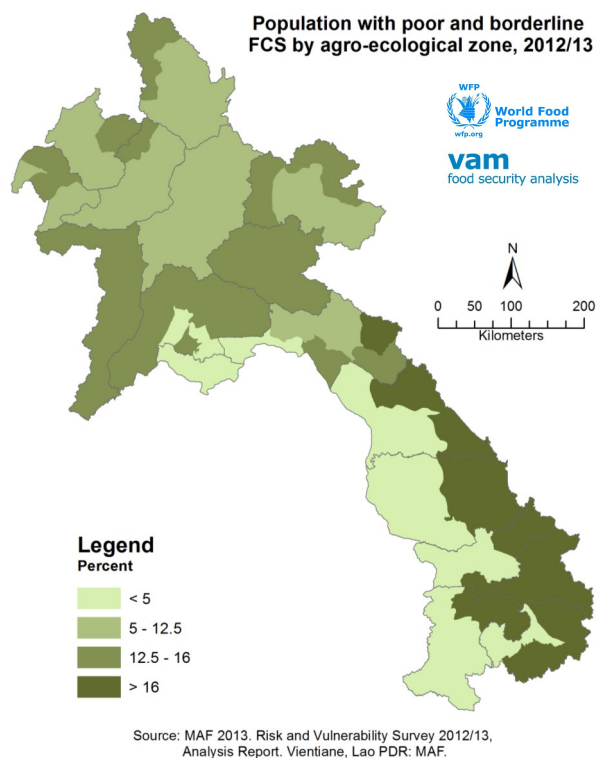
	North	Centre	South
Improved water source	79.4	64.8	67.1
Improved sanitation facility	61.3	67.8	34.8

Food Security Profile

The RVS 2012/13, as the most recent food security assessment, found acceptable food consumption patterns for 89 percent of the population, borderline for 9 percent and poor for 2 percent.^[6] Given that the assessment was conducted towards the end of the harvest period (December to January), it is anticipated that the proportion of households with borderline/poor food consumption scores (FCS) will increase during the peak lean season. By agro-ecological zone, food consumption was found to be worse in the Central/Southern Highlands, Northern Lowlands, and Northern Highlands compared to the Mekong Corridor and Vientiane Plain.

The RVS found that households with poor/borderline food consumption tended to “cultivate less land, rely more on cash crop production as a source of income, have less access to vegetable plots,” and have household heads with lower educational attainment compared to households with acceptable food consumption patterns.^[6] In addition, their diet tended to have a greater proportion of rice with distinctly less animal protein.

The CFSVA 2006 found similar consumption patterns with 87 percent consuming an acceptable diet, 11 percent borderline and 2 percent a poor diet. Overall, the CFSVA indicated that households most vulnerable to food insecurity were those living in remote areas with little access to basic infrastructure, households with low engagement in fishing and hunting or unskilled labourers, those practicing upland farming on small plots of land in fragile areas with steep slopes, and those without kitchen gardens. Non-Lao-Tai ethnic groups tend to be more food insecure than the Lao-Tai group.^[7]





INDIVIDUAL OUTCOMES

Individual
Food
Intake

Health
Status /
Disease

Health Status/Disease

The cyclical relationship between poor nutrition, increased susceptibility to infection, further worsening nutritional status as a result of the combination of inhibited bio-absorption and increased demand for nutrients, leading to more infections is well-established. Children with poor nutrition in Lao PDR are at greater risk of common childhood infections such as pneumonia, diarrhoea, respiratory tract infection, and malaria which often results in heightened malnutrition, and on again. According to LSIS 2011/12, 10 percent of children had diarrhoea in the two weeks preceding the survey, with higher prevalence in the north (15 percent) compared to the centre and south (7.4 and 7.9 percent).^[5] This is similar to data from 2006, which found 12 percent incidence of diarrhoea.^[62] Diarrhoeal incidence of 20 percent or more amongst children less than 5 years of age is considered a serious health problem.^[63] In 2010, diarrhoea was estimated to be responsible for 10 percent of deaths among children less than five years of age.^[64] Childhood fever (used as a proxy for malaria) was reported at 14.2 percent, mostly concentrated in the northern and central regions (16 percent respectively), while the south had lower rates of fever (5.9 percent).^[5] While 87 percent of children slept under a mosquito net, only 43 percent slept under an insecticide-treated net. Suspected pneumonia was lower, at 3.3 percent of children under 5 years of age, however WHO 2012 estimates suggest that pneumonia is responsible for 20 percent of the burden of deaths among children less than five, second only to deaths caused by prematurity.^[64]

Parasitic infections also increase the risk of malnutrition. The MICS-NNS 2006 found that among children 24 to 59 months of age, 54 percent had at least one parasite. Levels of parasitic infection tended to be higher among children living in the north (71 percent) compared to children in the central region (39 percent), higher among children from poorest two quintiles (66 and 65 percent) compared to the richest (21 percent), and higher among Khmou (93 percent), Hmong (68 percent) and households speaking other languages (65 percent) compared to households speaking Lao (39 percent).^[62] According to the REACH 2009 stocktaking assessment, the prevalence of parasitic infections among children under five was estimated at 54 percent, identified as a “serious problem requiring urgent action”.^[63]

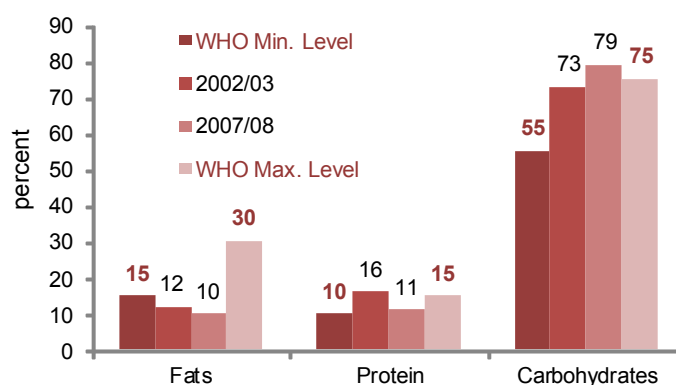
Individual Food Intake

Food Consumption Patterns

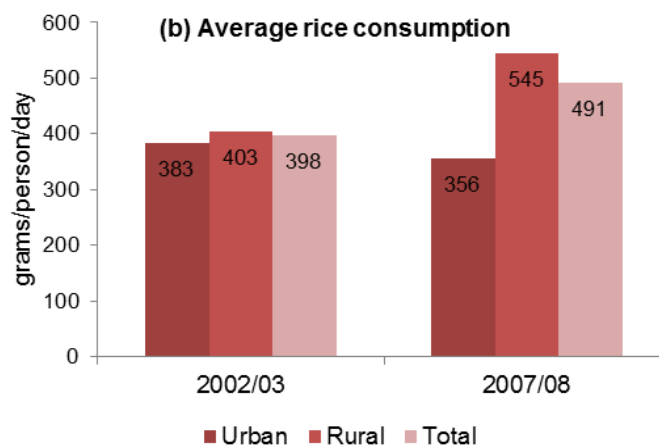
Diets in Lao PDR has long been noted as exceptionally diverse. However, this diversity does not necessarily translate into nutritional balance given such hard-to-measure variables as quantity of food consumed, nutrient bioavailability, and factors affecting bio-absorption of nutrients. In general, available food consumption data from the CFSVA 2006, the CFSAM 2011, RVS 2013, localized Emergency Food Security Assessments (EFSAs) conducted by WFP, and several smaller case studies conducted around the country, have all corroborated data indicating low consumption of fats and protein.^[6,7,25,29-31,45,49,51,58,59] The primary sources of protein and fats in Lao PDR are wild-caught meat and fish, and as such consumption depends on availability of and

access to these wild products. Little oil is added to the diet — According to the CFSVA 2006, only 14 percent of households reported adding any oil to their food.^[7] The recent study on trends in food consumption and expenditure in Lao PDR found that in 2008 fat intake accounted for 10 percent of daily energy consumption, below the minimum internationally recommended level of 15 percent, while average protein intake, at 11 percent, fell at the low end of the recommended range (10 to 15 percent).^[8] At the same time, trends in rice consumption between 2003 and 2008 indicate that rice intake is increasing, possibly at the expense of other foods in the diet, including roots and tubers.^[8,25] In 2008, average rice consumption was estimated at 491 grams per person per day, an increase of 93 grams over the average amount of rice consumed per person per day in 2003. In addition, rice alone was found to be contributing 79 percent to the total daily energy needs, greater than the international recommendation of 55 to 75 percent contribution from all carbohydrates.^[8] Rice consumption was found to be much higher in rural areas (545 g/person/day) compared to urban areas (356.4 g/person/day).

(a) Contribution of Macronutrients to total DEC, based on WHO recommendations



(b) Average rice consumption



Source: Lao Statistics Bureau 2012. *Food Security in Lao PDR: A Trend Analysis*. Vientiane, Lao PDR: EC-FAO.

Women’s Consumption Patterns

Amongst many of the ethnic groups in Lao PDR, cultural beliefs influence consumption by women during pregnancy and after giving birth. Restricting food items during pregnancy and while breastfeeding can impact the health and nutrition of both the mother and her child, particularly as both are already nutritionally vulnerable. According to MICS-NNS 2006, 81 percent of women restricted their diet after their last delivery, with more women in rural areas re-



INDIVIDUAL OUTCOMES

stricting their diet (83 percent) compared to women in urban areas (75 percent).^[60] Commonly restricted foods include meat (74 percent), eggs (38 percent) and fish (28 percent), likely exacerbating iron deficiency for already anaemic women (36 percent of women of reproductive age were found to be anaemic).^[60] Over half of the women (58 percent) restricted multiple foods at the same time. The typical length of time that women restrict their diets is between 2 and 4 months (66 percent), with 30 percent extending the restrictions beyond four months. Those that restrict their diet beyond four months tend to be from higher wealth quintiles and from urban areas, suggesting an association with socio-economic status.^[60] More recent small case studies have indicated that food restrictions continue to be an issue for women and children’s health.^[61]

Infant and Young Child Feeding Practices

Infant and young child feeding (IYCF) practices refer to the age-appropriate practices of breastfeeding and introduction of complementary foods and are critical in the nutrition status of children in Lao PDR. Together with maternal nutrition and health during pregnancy, these first 1000 days of the child’s life, from inception to 23 months of age, are viewed as an important ‘window of opportunity’ to improve nutrition outcomes. According to the findings from LSIS 2011/12, breastfeeding and complementary feeding are not being practiced according to international recommendations for the majority of children in Lao PDR.

Breastfeeding: Less than half of women initiate breastfeeding within one hour of birth (39 percent) and less than half exclusively breastfeed infants through 5 months of age (40 percent). The proportion of one year old infants still breastfeeding is fairly high (73 percent), declining to 40 percent of children by the second year.^[5] While differentials were not large, appropriate breastfeeding practices was found to be higher in rural areas compared to urban and among the poorest wealth quintiles compared to the wealthiest.

Complementary feeding: According to international recommendations, safe and appropriate

(a) Select IYCF Indicators, 2012			
	Exclusive breastfeeding (<6 mo)	Receiving solid, semi-solid or soft foods (6-23 mo, breastfeeding)	Minimum meal frequency (6-23 mo, breastfeeding and not breastfeeding)
Lao PDR	40.4	35.4	43.0
Residence			
Urban	38.2	26.7	52.9
Rural with road	42.4	38.8	40.9
Rural without road	30.1	33.1	32.6
Wealth Index Quintile			
Poorest	46.6	38.7	29.8
Second	39.7	41.3	37.7
Middle	41.8	36.9	41.7
Fourth	36.8	29.0	53.8
Richest	34.1	27.5	61.5

complementary foods should be introduced at 6 months. However, only half (52 percent) of infants 6 to 8 months of age in Lao PDR receive solid, semi-solid or soft foods according to the LSIS 2011/12. Of children aged 6 to 23 months, only 43 percent were fed solid, semi-solid or soft foods the minimum recommended number of times during the day. In urban areas and amongst the wealthier quintiles, a greater proportion of children 6 to 23 months of age received meals with the minimum recommended frequency.^[5]

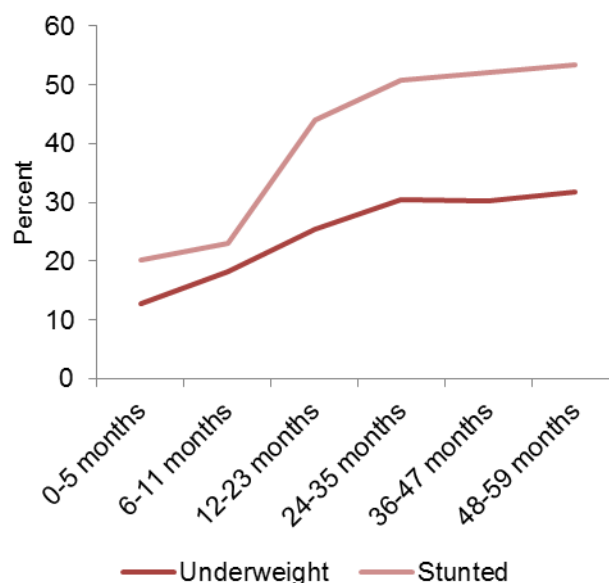
The introduction of complementary foods at 6 months is a particularly risky time for children from a nutritional perspective: inappropriate feeding practices and/or poor quality foods combined with increased exposure to unsanitary conditions and heightened risk of infection, pose a serious threat to the child's nutritional status. The impact of these multiple factors is reflected in the rapid increase in the prevalence of undernutrition in Lao PDR between the ages of 6 and 23 months.^[5]

The RVS 2012/13 provides the most up-to-date window into dietary diversity for children less than two years of age in Lao PDR. While the survey was conducted in December and January when food availability is presumed to be better, the survey still found sub-optimal diets (3 food groups or less consumed in the previous 24 hours) for more than half (55.2 percent) of the children less than 5 years of age.^[6] An assessment conducted by UNICEF in 2010 found similarly high levels of poor dietary diversity, revealing also that children rarely receive specially prepared meals, instead eating together with the household from the family pot.^[59]

Nutrition Status

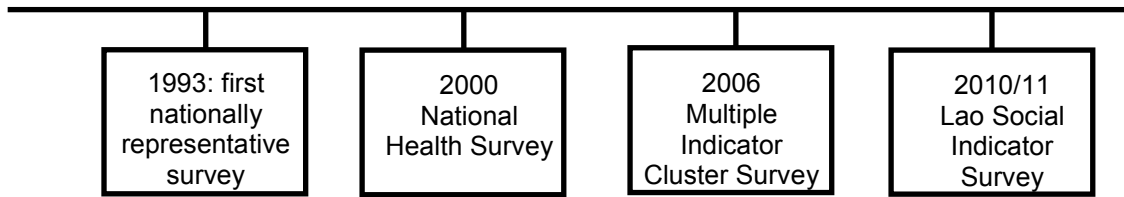
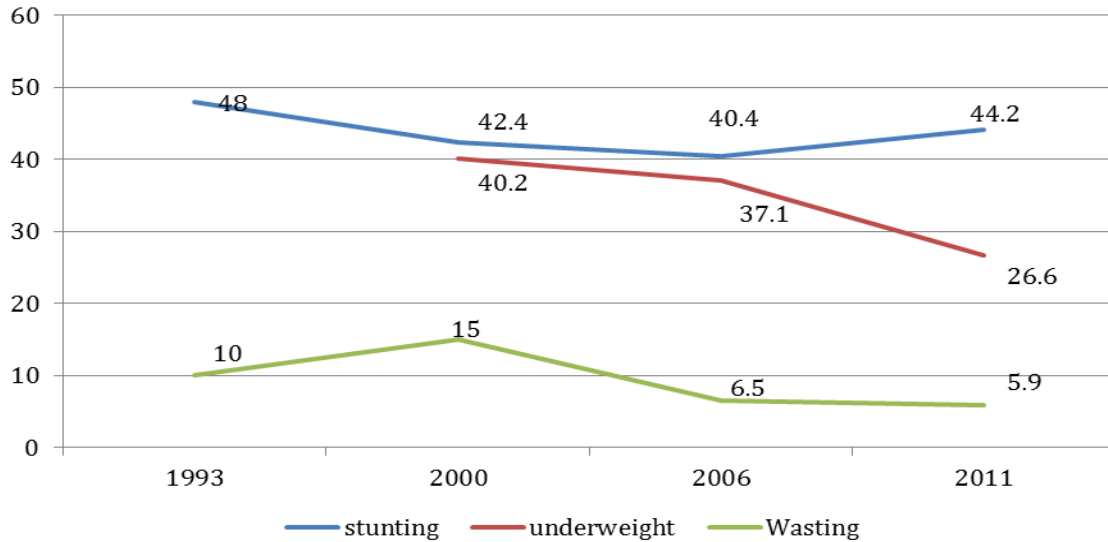
It is well established that nearly one-third of all child deaths is attributable to malnutrition. Over the past two decades, child malnutrition in Lao PDR has seen very little improvement. Since the first nationally representative survey conducted in 1993, stunting rates have fluctuated within a range of 10 percentage points, remaining at roughly half the children less than five years of age. Underweight appears to be declining steadily, albeit slowly, but remains far from the MDGI target of 18.2 percent by 2015.

(b) Underweight and Stunting by age group under five years, 2012



Source: Ministry of Health and Lao Statistics Bureau 2012. *Lao Social Indicator Survey 2011-12, Final Report*. Vientiane, Lao PDR: MoH/LSB.

Trends in Malnutrition in Lao PDR, 1993 to 2012



NB: The CFSVA and Nutritional Assessment surveys are not nationally representative—the CFSVA sample included rural households only and Nutrition Assessment included 9 flood - and typhoon-affected provinces

Distinct patterns of malnutrition can be seen amongst children less than five years of age in Lao PDR. A child has a greater risk of being malnourished if s/he:

- Lives in a rural area
- Lives in a province in the north or south
- Is born to a mother with a lower level of education
- Is born in a household from the poorer income quintiles
- Is born in a non-Lao speaking household.

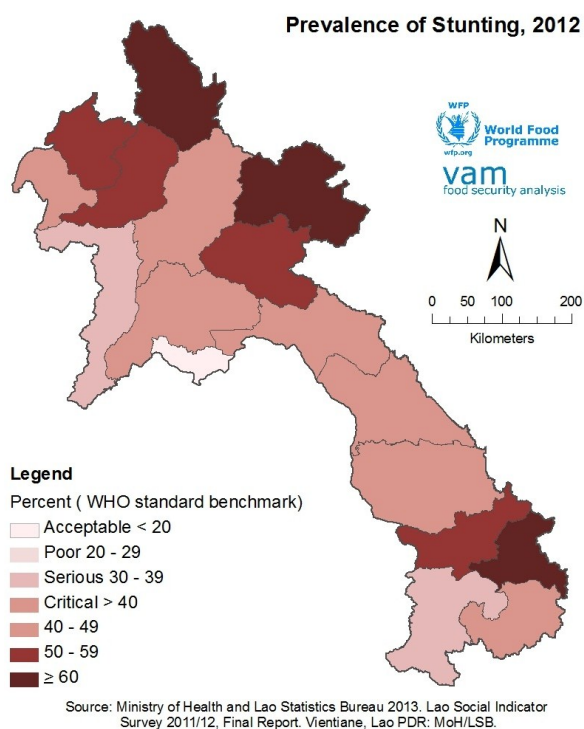
Region	Stunting (%)	Underweight (%)	Wasting (%)
Lao PDR	44.2	26.6	5.9
Region			
North	51.4	26.2	5.3
Center	38.1	23.1	5.4
South	46.6	34.7	7.9
Residence			
Urban	27.4	16.1	5.4
Rural	48.6	29.3	6.1
Rural w/ Road	47.8	29.0	6.1
Rural w/o Road	53.8	31.6	5.7

Stunting

Stunting (low height-for-age) for children less than five years is a measure of chronic malnutrition and is the result of prolonged lack of adequate nutrition, repeated infections, or both. Stunting in Lao PDR is of particular concern with a national average of 44 percent in 2011/12.^[5]

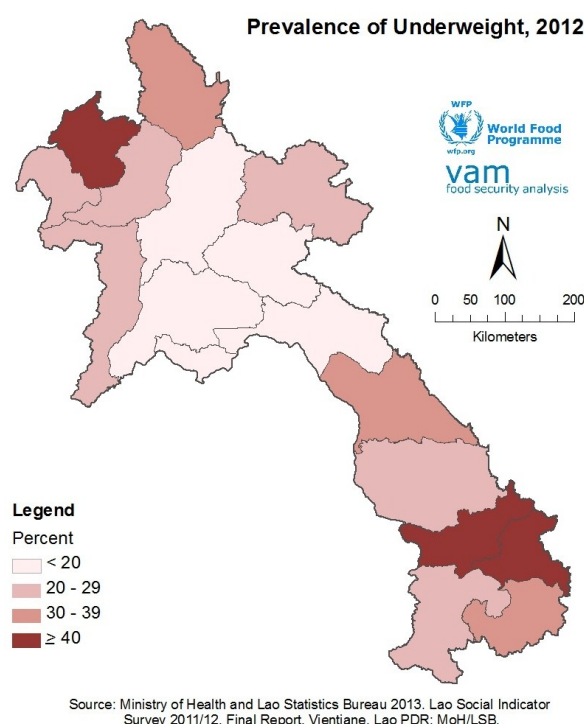
Clear disparities in stunting exist by geography and socio-economic factors. A child in rural Laos is 1.75 times more likely to be stunted than a child in urban Laos. Prevalence of stunting in the north and south is 51 and 47 percent respectively, compared to 38 percent in the center.

The geographic disparities in stunting parallel disparities seen by maternal education and wealth index, reflecting the limited access to infrastructure and higher rates of poverty found in the more mountainous and isolated regions of the country. Ethnic disparities in stunting likewise show similar results with non-Lao-Tai ethnic groups having higher rates of stunting (56 to 61 percent) than Lao-Tai (33 percent).^[5]



Underweight

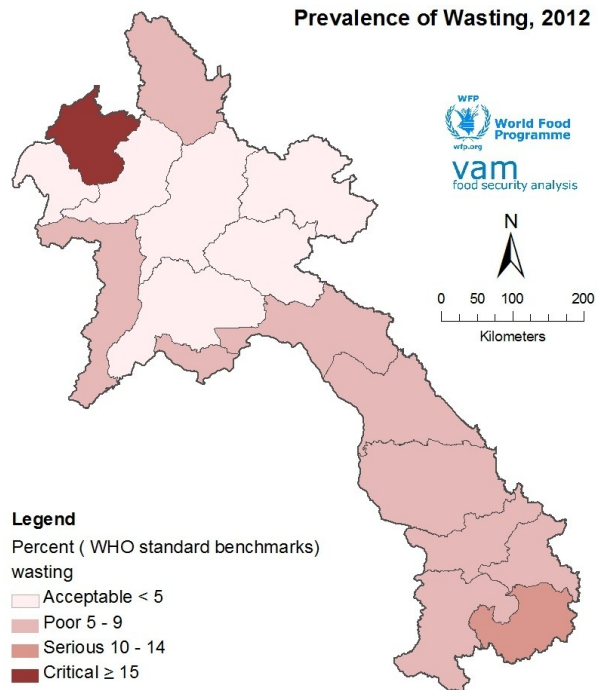
Underweight (low weight-for-age) is an indicator of chronic and acute malnutrition that measures a child's shortness or thinness compared to a reference population of healthy children. Overall, the prevalence of underweight in children less than 5 is 27 percent. As seen with stunting, prevalence varies by geographic, social and ethnic factors. In the north and south, the prevalence is 26 and 35 percent respectively compared to 23 percent in the central region. Underweight is nearly half in urban areas compared to rural.^[5] The prevalence declines steadily as maternal education and household wealth improve. Children from Mon-Khmer and Chinese-Tibetan ethnic groups have higher prevalence rates (37 and 43 percent respectively) compared to 21 percent among children from both Lao-Tai and Hmong-Mien ethnic groups.^[5]



Wasting

Wasting (low weight-for-height) is an indicator of acute malnutrition that occurs after severe food deprivation, severe infections, or both. The prevalence of wasting is sensitive to seasonality and occurrence of major shocks. The most recent national prevalence of wasting was 6 percent in 2012, but data was collected in the harvest season (October 2011-February 2012) and does not capture seasonal variation.^[5]

Regional disparities do exist, with higher rates found in the Southern provinces (between 7 and 11 percent) compared to the northern and central provinces, with a few exceptions.^[5] LSIS 2011/12 recorded two populations with unusually high levels of wasting: children in Luangnamtha province (21.2 percent) and Chinese-Tibetan children (13 percent). While the Chinese-Tibetan population is large in Luangnamtha, rates are not unusually high in provinces also home to a large Chinese-Tibetan population (e.g. Phongsaly) and the two should not be conflated. More analysis will be required to interpret these data.

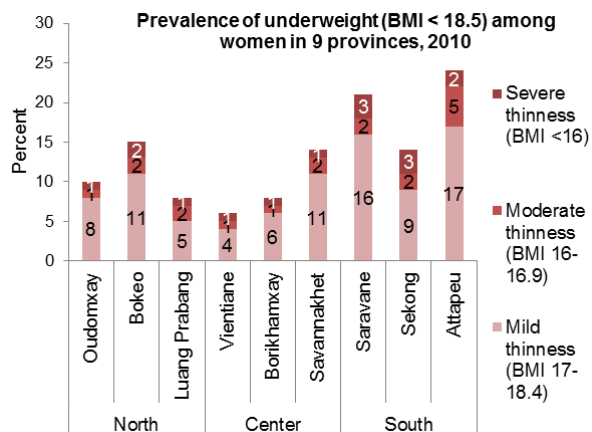


Source: Ministry of Health and Lao Statistics Bureau 2013. Lao Social Indicator Survey 2011/12, Final Report. Vientiane, Lao PDR: MoH/LSB.

Women’s Nutrition Status

The nutritional status of women is important both for her own physical development and health and that of her baby, Low Body Mass Index (BMI <18.5) is an indicator of underweight for adults. While recent nationally representative data on adults’ BMI is lacking, MICS-NNS 2006 reported 15 percent underweight amongst women of reproductive age. Prevalence was highest in the south (21 percent) and lowest in the north (10 percent). Differences were also seen by urban/rural locale: 12 percent underweight in urban areas compared to 15 and 18 in rural with road access and rural without road access respectively.^[62]

A 2010 Nutritional Assessment of 9 flood and typhoon-affected provinces reported 14 percent of women underweight, with higher rates in the two southern provinces of Attapeu (24 percent) and Saravane (21 percent), compared to the central provinces (6 to 14 percent) and the northern provinces (8 to 15 percent).^[59]



Micronutrient Deficiencies

Deficiency in micronutrients, known as the “Hidden Hunger”, can impair mental and physical development. Micronutrient deficiencies are the result of an incomplete diet and/or physical inability to absorb nutrients, often linked to illness. While data is limited, deficiencies in key micronutrients (vitamin A, iron, iodine, and zinc) are suspected to be a major problem in Laos.

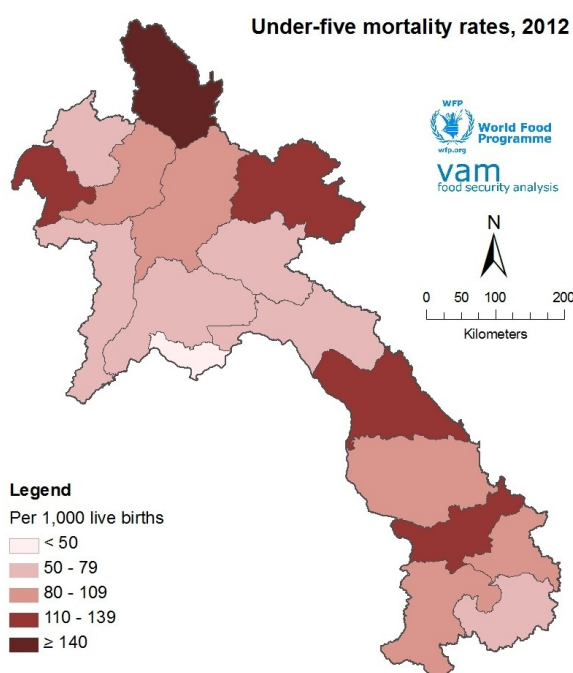
MICS-NNS 2006 represents the last nationally representative estimates of iron deficiency (anaemia), vitamin A deficiency, and iodine deficiency measured through blood and urine samples. The results indicated that 42 percent of children less than five and 23 percent of women aged 12 to 49 years were deficient in Vitamin A and 36.2 percent of non-pregnant women of reproductive age and over 40 percent of children under five were anaemic. Amongst children, anaemia was higher in children less than 2, with 59 percent of children 6 to 12 months of age and 68 percent of children 12 to 24 months of age anaemic. Iodine deficiency was less of a concern, with 60 percent of households reportedly using salt with adequate iodine (more than 20 parts per million) and greater than 86 percent of non-pregnant women of reproductive age having adequate levels of urinary iodine.^[60]

The 2010 Nutritional Assessment found that 38 percent of children less than five were anaemic, a serious public health concern in all surveyed provinces. In three provinces, Attapeu, Saravane, and Savannakhet, levels exceeded the threshold for severe public health significance.^[59]

Mortality

Prior to LSIS 2011/12, Lao PDR was estimated to be one of the few countries in Asia Pacific region on track to achieve MDG4 (reduce under-five mortality by two-thirds of its 1990 values by 2015). According to UNICEF estimates, Lao PDR had achieved a reduction of 63 percent in 2010. The most recent estimate from LSIS, however, suggests a reversal with an U5MR of 89, one of the highest amongst its immediate neighbours in Southeast Asia.^[5]

In 2012, children in the north and south are 1.4 times more likely to die before their fifth birthday than children in the central provinces. Indeed, children in the northern province of Phongsaly are 4.7 times more likely to die by age of 5 years than children in Vientiane Capital. Chinese-Tibetan and Mon-Khmer ethnic groups also have higher U5MRs (160 and 108 respectively) compared to Hmong-Mien and Lao-Tai (74 and 76 respectively).^[5]



Source: Ministry of Health and Lao Statistics Bureau 2013. Lao Social Indicator Survey 2011/12, Final Report. Vientiane, Lao PDR: MoH/LSB.

VULNERABILITY

Vulnerability refers to “those characteristics and circumstances of a community [or] system that make it susceptible to the damaging effects of a hazard.”^[65] A household’s vulnerability to food and nutrition insecurity is a function of (1) its exposure to the hazard or shock and (2) its ability to cope with the exposure. Its ability to cope is determined by the degree of diversification of its livelihood strategies and its asset base. Coping ability improves with a greater diversification of livelihood strategies and a wider asset base. For example, subsistence farming households are more vulnerable to climate risks (flooding, drought) than farming households that also rely on skilled labour or petty trade for added income.

Hazards are classified as natural and non-natural, although in reality the distinction is blurred as impacts of natural hazards are frequently mitigated for better or for worse by human actions. More often than not, households are exposed to multiple hazards at once.

Natural Hazards

The main natural hazards include floods, landslides, droughts, storms, rodent infestations, and animal and human epidemics. While the overall risk profile is generally lower than that of other countries in the Southeast Asian region, climate change is anticipated to increase the risk of natural hazards.

In 2010, the National Disaster Management Office (NDMO) with support from the Asian Disaster Preparedness Centre (ADPC) developed a National Risk Profile that mapped hazard-prone areas and assessed the risk to households at the provincial and district levels.^[66] The multiple hazard analysis found that most of the provinces are at risk for more than one hazard. Four provinces (Vientiane, Saravane, Luang Prabang, and Khammuane) were at risk for more than 5 hazards.

Floods

Eight rivers and river basins have been deemed at higher risk: the Nam Ngiap, Nam Xan, Nam Ou, Se Bangfai, Xe Banghiang, Xe Kong, Nam Ngum and Xe Don rivers. Only one of the eight river basins is located in the north, affecting the provinces of Phongsaly and Luang Prabang. Five are found in the central region and two in the southern region. Floods in the region rarely lead to loss of human life, but can cause major infrastructural damage and loss of/damage to

Hazards and affected population, 1960-2012^[66]

Hazard	# of events 1960- 2012*	Tot affected population
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

Source: WHO collaborating Centre for Research on the Epidemiology of Disasters (CRED) 2012. *EM-DAT: Emergency Events Database*. Available from www.emdat.be.

household assets.^[35] Roads are often washed out during floods thereby limiting access to markets and increasing vulnerability to food insecurity. In addition, deteriorating sanitation and the spread of diarrheal diseases become major concerns in the aftermath of a flood, which increases the risk of severe malnutrition.

Drought

Mild and moderate droughts are common occurrences in Lao PDR, although extreme drought is rare. In the past 40 years there have been five major droughts. However, small localized droughts occur with more regularity and can seriously affect crop production and increase household vulnerability to food insecurity: One estimate suggests that 188,000 households are at risk of food insecurity as a result of drought, located primarily in Savannakhet, Khammuane, Saravane, Champasack, Xayabury and Vientiane provinces.^[68] According to the Census of Agriculture 2010/11, villagers perceived conditions to be drier now than 10 years ago and the rainy season started later.^[17]

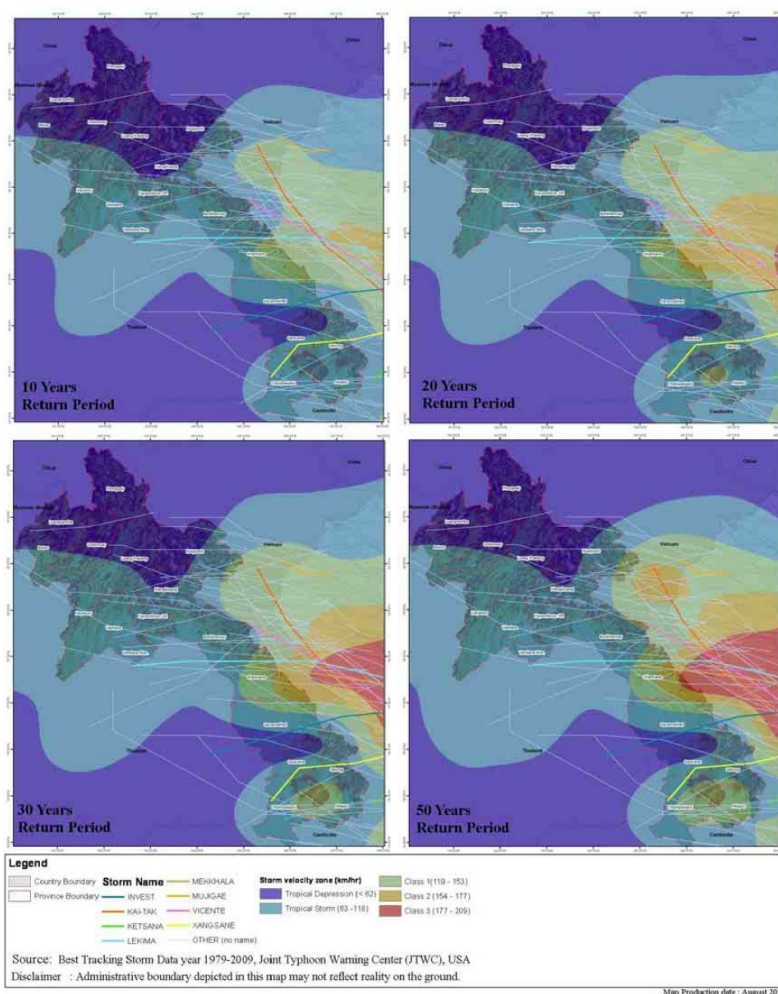
Storm

Based on available storm tracking data from 1979 to 2009, Khammuane province is considered the most vulnerable to storms, with other provinces in the central and southern region, Savannakhet, Champasack and Attapeu, also increasingly vulnerable to storms.^[35]

Epidemics

Trend analysis of human epidemics indicates that the risk of acute bloody diarrhoea, acute watery diarrhea, and acute respiratory tract infections is increasing in Lao PDR while the risk of malaria is decreasing. Dengue fever is also on the rise.^[35]

Storm Patterns for different time periods in Lao PDR



Source: ADPC & NDMO 2010. *Developing a National Risk Profile of Lao PDR*. Vientiane, Lao PDR: GoLUN.

VULNERABILITY

Landslides & Earthquakes

The risk of landslides is low in Lao PDR: only 5.5 percent of land located in the south-east and central regions is considered highly susceptible to landslide.^[35] On-going deforestation may add to the risk of landslides. One-quarter of Laos can be classified as at high risk for earthquakes. The main risk area for earthquakes is in the northern provinces of Xayabury, Bokeo, Oudomxay, Luangnamtha, and Phongsaly.^[35]

Agricultural Pests

Agricultural pests are a major concern for farmers mostly in upland areas. Over the past several years in the north, rodents were responsible for widespread crop damage and production losses.^[69]

Climate Change

With climate change, the frequency and severity of natural hazards worldwide are anticipated to increase. While there are several climate models and regional differences within the models, a widely reference prediction for Lao PDR projects:

- Temperature increases of 1.4 to 4.3 degrees by the 21st century, with more rapid warming likely in the south;
- Rainfall increases of 10 to 30 percent in the southern and eastern regions, annual precipitation increases of 4.2 percent in the north; and
- Increase in intensity and frequency of extreme events, runoff and dry season precipitation in the Mekong delta.^[68]

In 2009, the Lao Government developed a National Adaptation Programme of Action (NAPA) to Climate Change with the main objective of establishing a cross-cutting program for addressing the impact of climate change across four key sectors: agriculture, forestry, water and water resources, and human health.^[37] Adaptation to climate change has already been embedded in key strategic documents including the National Environmental Strategy/National Environmental Action Plan (NES/NEAP), the National Biodiversity Strategy and Action Plan (NBSAP), the National Growth Poverty Eradication Strategy (NGPES), National Forestry Strategy and Integrated Agriculture Development Strategy, and the NSEDP.^[37] Following the establishment of a National Risk Profile for Lao PDR, the Lao Government released the draft National Disaster Management Plan for 2012-15, which shifted the focus from disaster response to disaster preparedness and improving the resilience of communities to cope with hazards.^[66] The NDMP 2012-15 includes resilience to both natural and non-natural hazards.

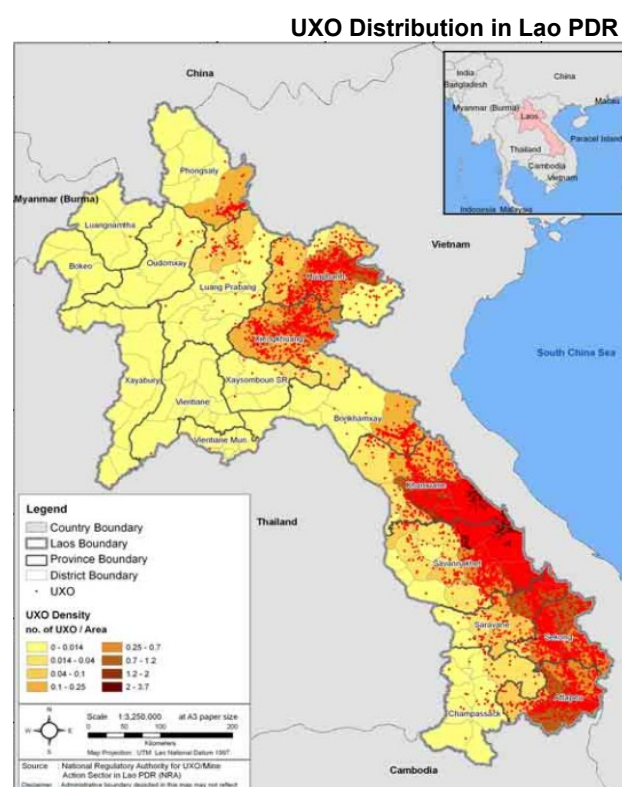
Non-Natural Hazards

Non-natural hazards that affect household vulnerability include unexploded ordinances (UXOs) and competition for land and natural resources arising in part from growth in industrial and commercial agriculture sectors. Additional shocks include international and domestic price fluctuations, particularly as households become more market-oriented. These shocks are discussed under “Food Access” in Section 3: Livelihood Assets & Strategies.

Unexploded Ordinances

UXOs not only pose a high risk for human safety, but they also seriously impinge on agricultural productivity and increase household vulnerability to food insecurity by limiting household access to productive agricultural land. According to recent estimates, 78 million anti-personnel submunitions are still at large in rural areas, most densely located along the south/central border with Vietnam as well as in the Northern provinces of Huaphanh and Xiengkhuang.^[19]

According to UNDP’s 2012 Country Analysis Report for Lao PDR, five out of seven of the chronically poor provinces in the country have significant UXO contamination.^[19]



Source: ADPC & NDMO 2010. *Developing a National Risk Profile of Lao PDR*. Vientiane, Lao PDR: ADPC/NDMO.

Competition for Land and Natural Resources

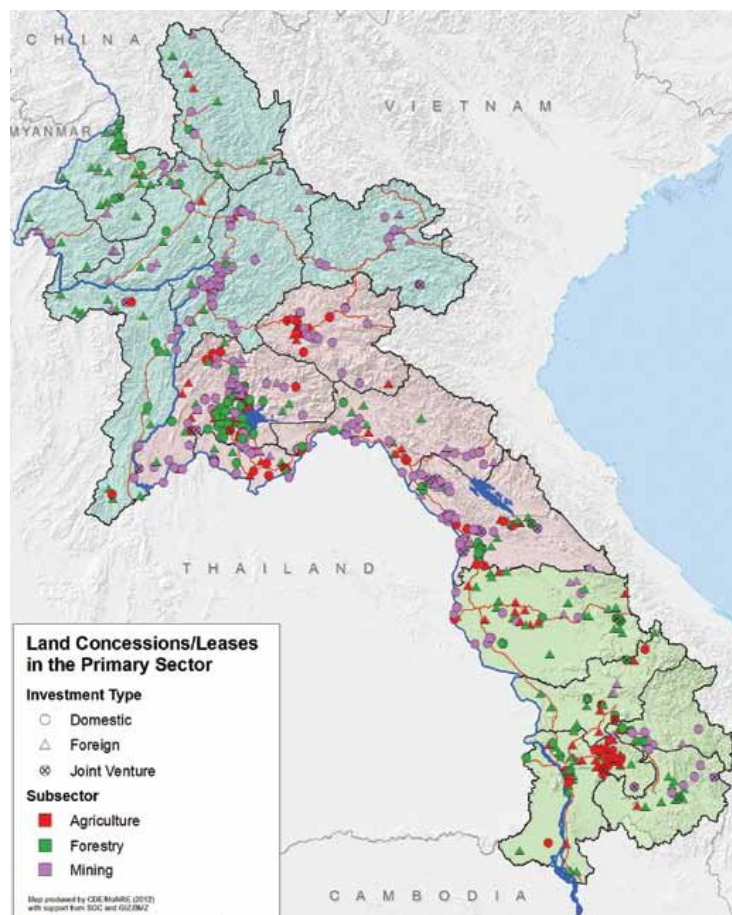
Land and natural resources are key assets at both national and household levels. Competing uses of land and natural resources, including for public and private development projects as well as for conservation, have been associated with resettlement of rural populations with overwhelming negative outcomes and increased vulnerability through disruption of livelihoods leading to greater food insecurity, worsened housing and sanitation conditions contributing to higher morbidity rates, and reduced social cohesion.^[27] As the country continues to undergo rapid transitions related to economic growth, the increasing competition for use of natural resources is expected to adversely impact household livelihoods and food security not only for resettled populations, but also for populations that remain through mechanisms such as loss of access to land, forests and waterways and environmental degradation.

VULNERABILITY

Nationally, the economic potential from hydropower and mining projects is substantial. However, growth in the two sub-sectors carries with it serious risks for rural populations as forests and natural resources are degraded, populations are resettled, and/or household access to natural resources is reduced to make way for public and private projects.^[21] According to Fenton and Lendelow (2010), the households most affected by project developments are among the poorest households, typically minority ethnic groups living in remote upland regions.^[21] As noted earlier, the impact on households of growth in industrial sectors may vary depending on if and to what extent economic and employment opportunities arise.

Deforestation as a result of industrial projects, timber harvesting or conversion of land to agricultural production (including shifting cultivation) is also expected to rise as pressure for land and natural resources continues. Deforestation is a contributing factor in the threatened survival of many forest species, flora and fauna, that are central to food security profiles of these same poor, remote upland households.^[51] Reducing shifting cultivation through stabilization policies (often involving resettlement) and establishing National Biodiversity Conservation Areas have been other government means to address deforestation associated with swidden agriculture and to protect forests. However, while these policies have been intended to improve rural food security and protect biodiversity, the result for resettled populations has often been reduced access to NTFPs and increased vulnerability to food insecurity.^[27]

Commercial agriculture is another player in the competition over land and resources. As with industrial growth, the expansion of commercial agriculture is also likely to have mixed implications for vulnerability of rural households. In Lao PDR, commercial agricul-



Source: Schwonweger et al. 2012. *Concessions and Leases in Lao PDR: Taking Stock of Land Investments*. CDE, University of Bern, Bern & Vientiane: Geographica Bernensia

ture is progressing in mainly two forms, through contract farming and through agricultural concessions and leases.^[22,38] Both may offer economic opportunities for rural households, contract farming more so than concessions, but both also wield the potential to negatively impact household food security. According to the State Land Leases and Concessions Inventory, concessions and leases accounted for 9 percent of total land area in Lao PDR in 2012 (2.1 million hectares).^[22]

The vast majority of land under investment falls in the primary sector, either in mining (50 percent), forestry (28 percent) or agriculture (13 percent). The products that account for the largest land use include zinc/tin (189,900 ha) and copper mines (86,888 ha), rubber plantations (129,614 ha) and eucalyptus cultivation (95,978 ha). While the majority of deals are with domestic investors (65 percent), the vast majority of land area is under foreign investment (72 percent), mostly Thai, Vietnamese and Chinese companies.^[22] Overall, most of the land deals are located in forested areas and impact household access to land and forests, important assets in food security profiles. According to the CFSVA 2006, one in 4 rural households were vulnerable to becoming food insecure as a result of the loss of access to forest area, a figure that has likely increased given the rapid change in landscape.^[7] In addition, planting of tree crops such as rubber and eucalyptus have changed the landscape from multifunction to monoculture with inherent impacts not only on livelihoods but on the ecosystem at large.^[22]

Coping Strategies

Household coping mechanisms are informed by the livelihood orientation and asset wealth of households. For example, asset-rich households may rely on selling assets to cope with a shock while asset-poor households may turn to social networks for support. Repeated assessments of coping strategies reveals that the most common coping mechanisms tend to be short-term consumption-easing mechanisms as opposed to distress mechanisms.^[7,25,45,48] These short-term mechanisms include reducing or changing food consumption, borrowing or other help from relatives and friends, consuming wild foods, and using credit. As previously discussed, the decline in access to and availability of wild foods has serious implications for household ability to cope, as well as for overall food and nutrition security.

A return to opium production is a potential early indicator of stress on rural livelihoods and a lack of alternative means to make a living. According to the 2012 survey conducted by UNODC in conjunction with the Ministry of Defense in Lao PDR, opium production was confirmed in 4 of 6 surveyed provinces in the North and is suspected to be produced in 10 of the northern provinces on an estimated 6,800 hectares.^[28] The report estimates that as many as 38,400 households may be involved in opium production. With government-led eradication efforts on-going (707 hectares eradicated in 2012), participating rural households may be at increased risk of food insecurity from the loss of a central livelihood strategy without sustainable alternatives and/or being resettled.^[27,28]

ANNEX I: PROVINCIAL PROFILES

NORTHERN PROVINCES (Green)

Phongsaly	45
Luangnamtha	47
Oudomxay	49
Bokeo	51
Luang Prabang.....	53
Huaphanh	55
Xayabury	57

CENTRAL PROVINCES (Blue)

Xiengkhuang	59
Vientiane P.	61
Borikhamxay	63
Khammuane	65
Savannakhet	67

SOUTHERN PROVINCES (Red)

Saravane	69
Sekong.....	71
Champasack.....	73
Attapeu.....	75

DATA SOURCES FOR PROVINCIAL PROFILES

Population Size & Density: MPI 2012. *Statistical Yearbook 2011*. Vientiane, Lao PDR: MPI/LSB.

Urban Population: ACO 2012. *Census of Agriculture, Highlights 2010/11*. Vientiane, Lao PDR: MAF/LSB.

Poverty headcounts: MPI 2010. *Poverty in Lao PDR 2008*. Vientiane, Lao PDR: MoPI/LSB

Nat. & Physical Assets: ACO 2012. *Census of Agriculture, Highlights 2010/11*. Vientiane, Lao PDR: MAF/LSB.

Education (primary school completion rate*, secondary attendance, literacy rates): MoH & LSB 2013. *Lao Social Indicator Survey 2011-12, Final Report*. Vientiane, Lao PDR: MoH/LSB

Health Facility within 2 hours walk, Access to credit facilities, Livelihood strategies: ACO 2012. *Census of Agriculture, Highlights 2010/11*. Vientiane, Lao PDR: MAF/LSB.

Rice Production. MAF 2012. *Crop Statistical Yearbook 2011*. Vientiane, Lao PDR: Department of Agriculture.

Market Access: ACO 2012. *Census of Agriculture, Highlights 2010/11*. Vientiane, Lao PDR: MAF/LSB.

FCS: WFP 2007. *Comprehensive Food Security and Vulnerability Analysis, Lao PDR*. Rome: WFP.

Care Practices, Water & Sanitation, IYCF practices, micronutrients, nutrition and mortality indicators: MoH & LSB 2013. *Lao Social Indicator Survey 2011-12, Final Report*. Vientiane, Lao PDR: MoH/LSB

Natural Hazards, Non-Natural Hazards (UXOs): Asia Disaster Preparedness Center & National Disaster Management Office 2010. *Developing a national risk profile of Lao PDR*. Vientiane, Lao PDR: ADPC/NDMO.

Non-Natural Hazards (Concessions): Schonweger, O., et al. 2012. *Concessions and Leases in the Lao PDR: Taking Stock of Land Investments*. Centre for Development and Environment (CDE), University of Bern, Bern and Vientiane: Geographica Bernensia.

Non-Natural Hazards (Opium Production): UNODC 2012. *South-East Asia Opium Survey 2012: Lao PDR and Myanmar*. UNODC.

Non-Natural Hazards (Resettlement): ACO 2012. *Census of Agriculture, Highlights 2010/11*. Vientiane, Lao PDR: MAF/LSB.

*Primary School completion rate is the percentage of students completing the last year of primary school, calculated by taking the total number of students in the last grade of primary school divided by the total number of children of official graduation age. If the number of repeaters in that grade are not subtracted from the total number of students in the last grade, then this percentage may be greater than 100.



Food Security at a Glance: Phongsaly Province

OVERVIEW

Total Land (km ²)	16,270	Farm Households (%)	96
Population, 2011 est.	178,006	Poverty headcount (%)	46
Density, 2011 est. (pop/sq. km)	11	Urban/rural poverty (%)	5.6/50.1

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	20
Villages with irrigation facilities (%)	58
Households growing dry season rice (% of rice producers)	2.8
Households using fertilizer (%)	31
Households using 2-wheel tractor (%)	25

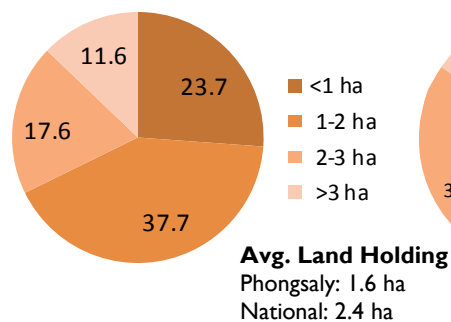
Human, Social and Financial Assets

Primary School Completion Rate	86.1
Secondary School Attendance (F:M) (%)	32:36
Literacy Rate (F:M) (%)	53:51
Villages with health facility within 2 hrs (%)	35
Villages with access to credit facilities (%)	47

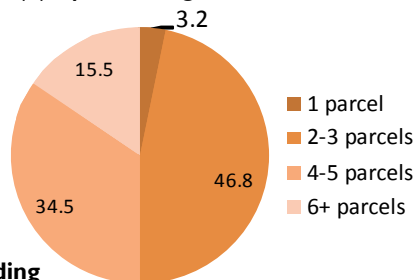
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

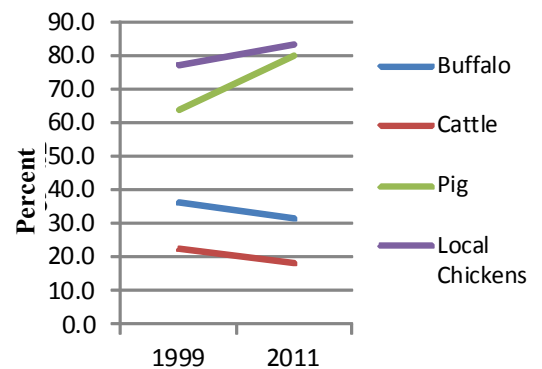
(a) by size of land holdings



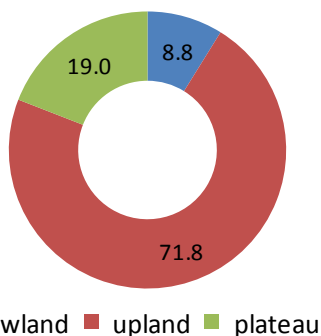
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



Total Rice Production 2011: 45,940 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	15,900	56
Rubber	8,900	31
Cardamom	8,800	31
Cassava	5,500	19
Tea	4,500	16
Opium	NA	NA

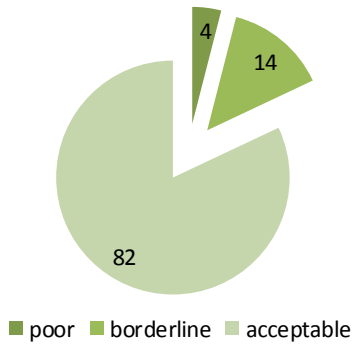
LIVELIHOOD OUTCOMES

Access to Food

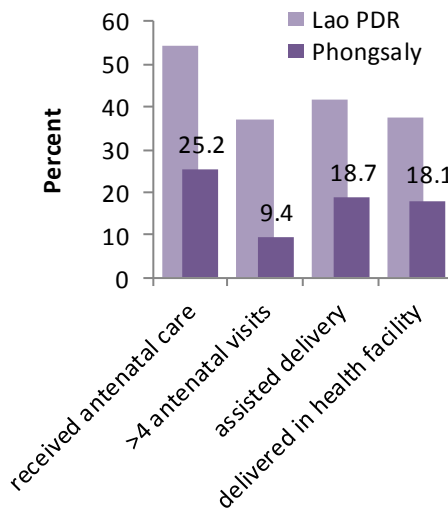
Market Access

Villages with year-round road access to district **34**

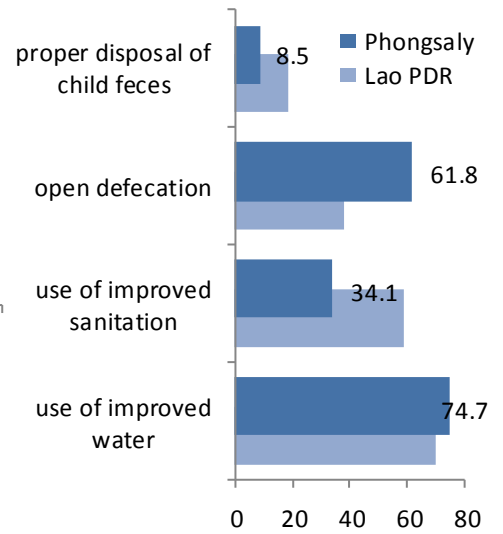
Food Consumption Score



Care Practices

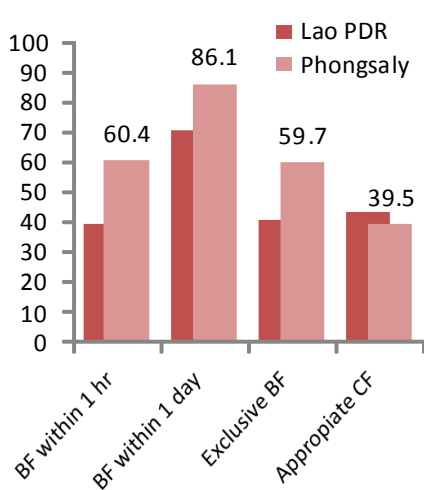


Water & Sanitation

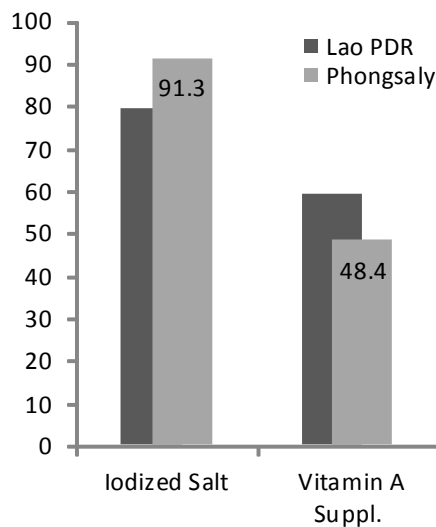


NUTRITION & MORTALITY

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Phongsaly	Lao PDR
Stunting	61.1	44.2
Underweight	34.1	26.6
Wasting	5.1	5.9
U5MR	151	89
Infant MR	120	76

VULNERABILITY

Natural Hazards

Earthquake	High risk — 97.6% of province in high risk zone
Landslide	Medium/high risk—medium susceptibility in 60% of land area, high susceptibility in 6%
Drought	Low risk of moderate to extreme drought in most of the province year round.
Flood	At risk — Nam Ou River (2 districts, Mai & Khoa, at high risk)
Storm	Not at risk

Non-Natural Hazards

UXO	Medium density in southern districts
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Confirmed poppy prod. (2012 survey) 2012 reported eradication: 245 ha Prevalence of opium use: 1.44%
Resettlement	21% of villages resettled in past 10 years; 7% planned for resettlement



Food Security at a Glance:

Luangnamtha Province

OVERVIEW

Total Land (km ²)	9,325	Farm Households (%)	90
Population, 2011 est.	168,140	Poverty headcount (%)	30.5
Density, 2011 est. (pop/sq. km)	18	Urban/rural poverty (%)	7.8/35.7

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	8.6
Villages with irrigation facilities (%)	63
Households growing dry season rice (% of rice producers)	6.5
Households using fertilizer (%)	34
Households using 2-wheel tractor (%)	47

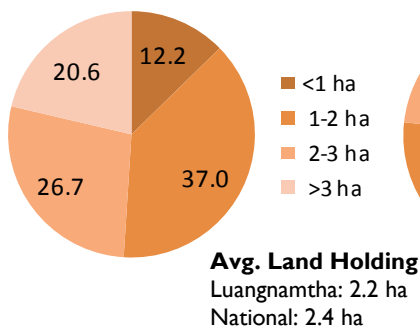
Human, Social and Financial Assets

Primary School Completion Rate	129.3
Secondary School Attendance (F:M) (%)	40:44
Literacy Rate (F:M) %	58:70
Villages with Health Facility within 2 hrs (%)	66
Villages with access to credit facilities (%)	47

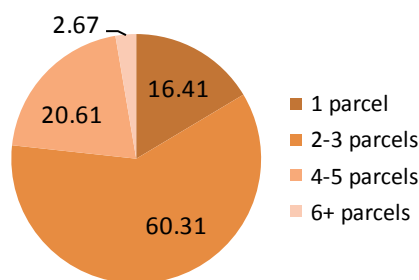
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

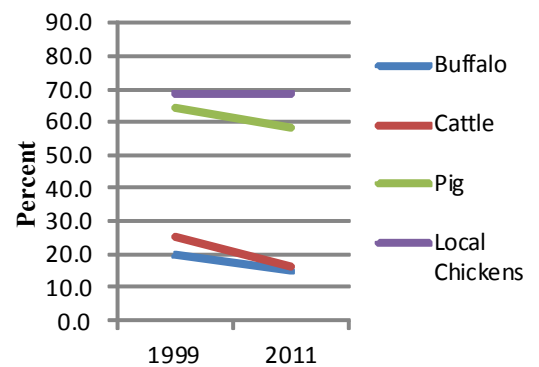
(a) by size of land holdings



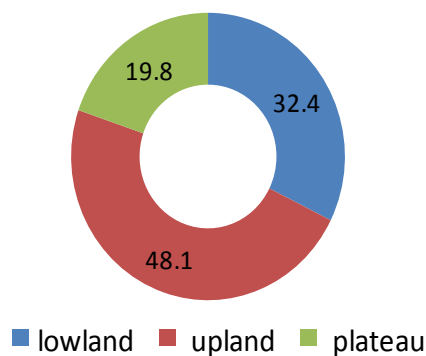
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



Total Rice Production 2011: 64,010 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Rubber	15,000	57
Maize	5,600	21
Sugar cane	2,100	8
Groundnut	1,300	5
Opium	N/A	N/A

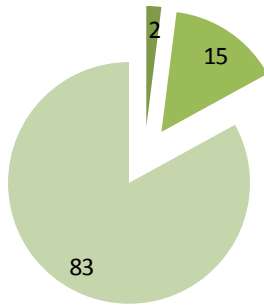
LIVELIHOOD OUTCOMES

Access to Food

Market Access

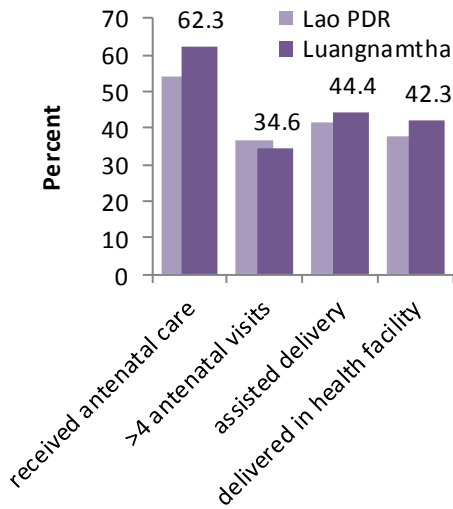
Villages with year-round road access to district **68**

Food Consumption Score

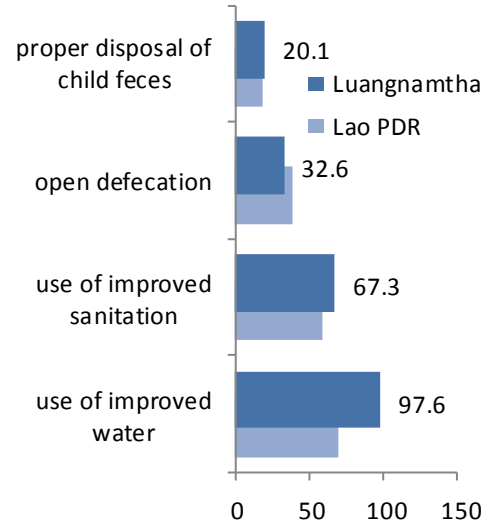


■ poor ■ borderline ■ acceptable

Care Practices

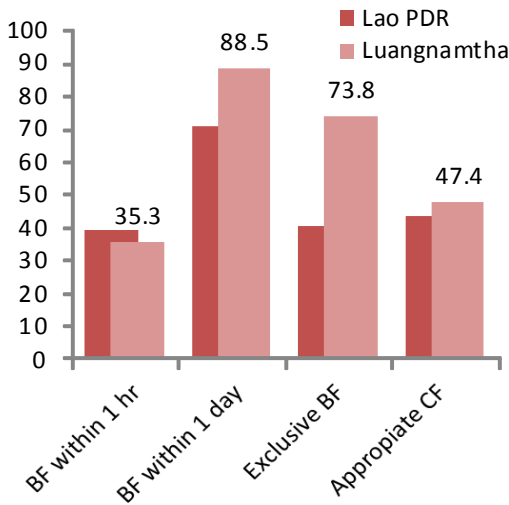


Water & Sanitation

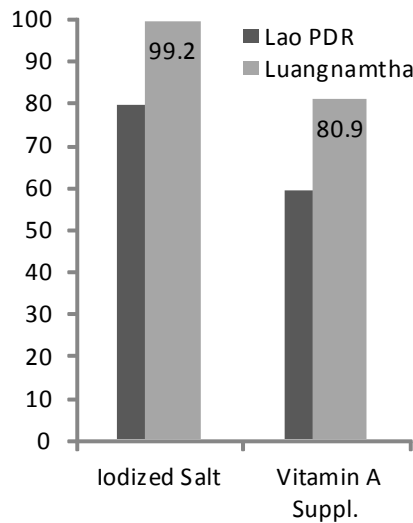


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Luangnamtha	Lao PDR
Stunting	53.2	44.2
Underweight	40.4	26.6
Wasting	21.2	5.9
U5MR		89
Infant MR		76

VULNERABILITY

Natural Hazards

Earthquake	High risk — 100% of province in high risk zone
Landslide	Medium risk—medium susceptibility in 44% of land area, high susceptibility in 1%
Drought	Low risk of moderate to extreme drought in southern parts in dry season and in northern parts June-Sept
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	Low risk
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Confirmed poppy prod. (2012 survey) 2012 reported eradication: 96 ha Prevalence of opium use: 1.04%
Resettle-ment	16% of villages resettled in past 10 years; 1% planned to resettle



Food Security at a Glance: Oudomxay Province

OVERVIEW

Total Land (km ²)	15,370	Farm Households (%)	92
Population, 2011 est.	307,065	Poverty headcount (%)	33.7
Density, 2011 est. (pop/sq. km)	20	Urban/rural poverty (%)	13/38.6

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	16.4
Villages with irrigation facilities (%)	61
Households growing dry season rice (% of rice producers)	3.4
Households using fertilizer (%)	9
Households using 2-wheel tractor (%)	36

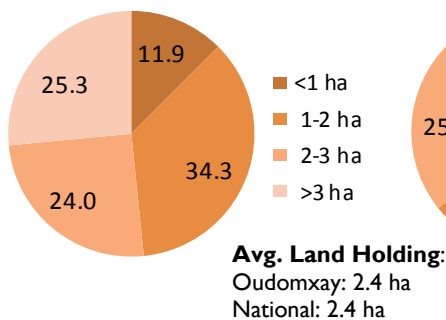
Human, Social and Financial Assets

Primary School Completion Rate	81
Secondary School Attendance (F:M) (%)	33:38
Literacy Rate (F:M) %	51:76
Villages with Health Facility within 2 hrs (%)	51
Villages with access to credit facilities (%)	37

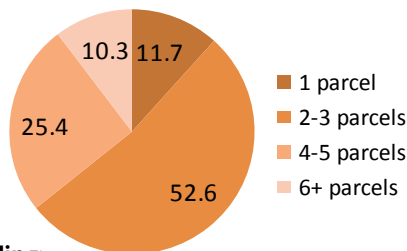
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

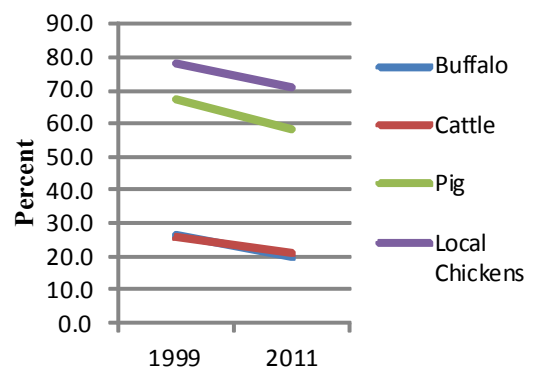
(a) by size of land holdings



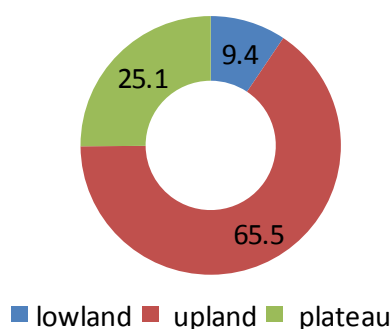
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	23,500	53.0
Rubber	8,200	18.4
Sesame	3,200	7.2
Opium	NA	NA

Total Rice Production 2011 : 84,365 Tons

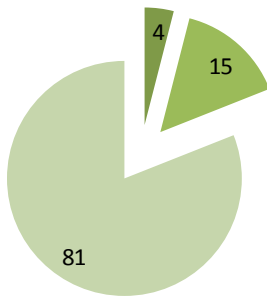
LIVELIHOOD OUTCOMES

Access to Food

Market Access

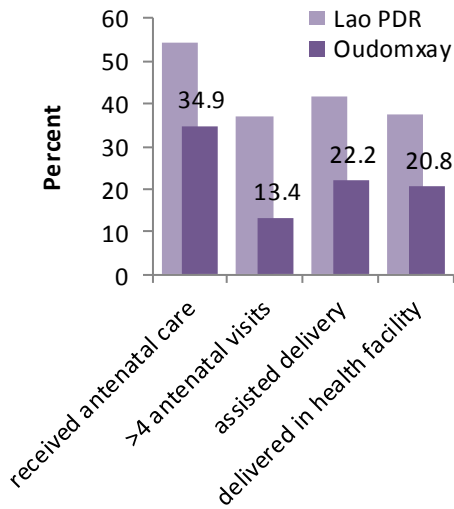
Villages with year-round road access to district (%) **48**

Food Consumption Score

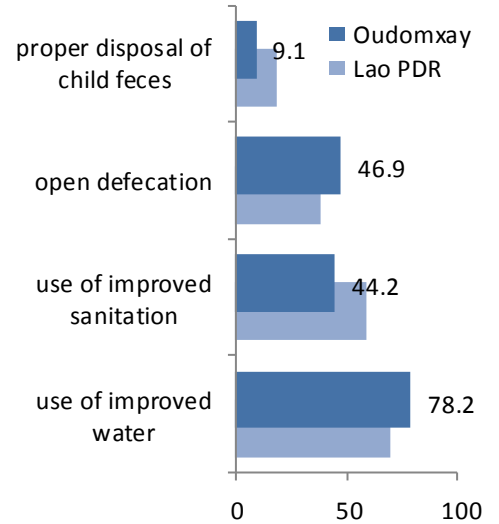


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Care Practices

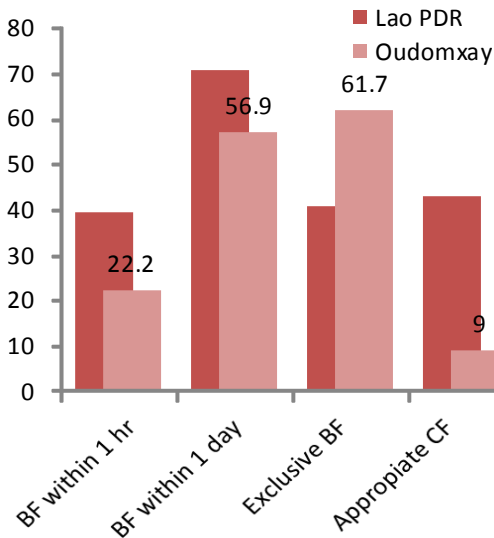


Water & Sanitation

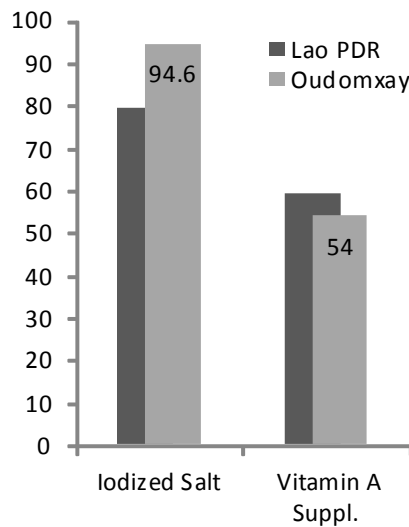


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Oudomxay	Lao PDR
Stunting	54.9	44.2
Underweight	28.7	26.6
Wasting	4.6	5.9
U5MR	100	89
Infant MR	87	76

VULNERABILITY

Natural Hazards

Earthquake	High risk — 100% of province in high risk zone
Landslide	Medium/high risk—medium susceptibility in 50% of land area, high susceptibility in 2%
Drought	Low risk of mod. to extreme drought in most of the province in dry & wet seasons; some parts at low risk March-April; Some parts at higher risk in dry season
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	Low risk
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Suspected poppy prod. (not confirmed); 2012 reported 11 ha eradicated Prevalence of opium use: 0.19%
Resettlement	26% of villages resettled in past 10 years; 3% planned to resettled



Food Security at a Glance:

Bokeo Province

OVERVIEW

Total Land (km ²)	6,196	Farm Households (%)	87
Population, 2011 est.	169,807	Poverty headcount (%)	32.6
Density, 2011 est. (pop/sq. km)	27	Urban/rural poverty (%)	17.9/35.3

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	6.3
Villages with irrigation facilities (%)	64
Households growing dry season rice (% of rice producers)	9.6
Households using fertilizer (%)	25
Households using 2-wheel tractor (%)	61

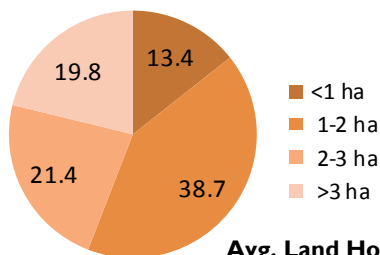
Human, Social and Financial Assets

Primary School Completion Rate	87.7
Secondary School Attendance (F:M) (%)	37:45
Literacy Rate (F:M) %	62:82
Villages with Health Facility within 2 hrs (%)	62
Villages with access to credit facilities (%)	60

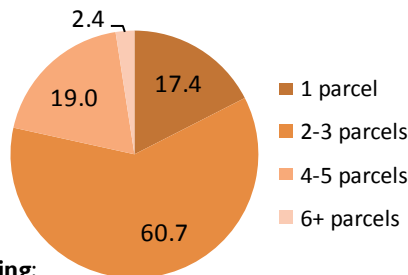
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

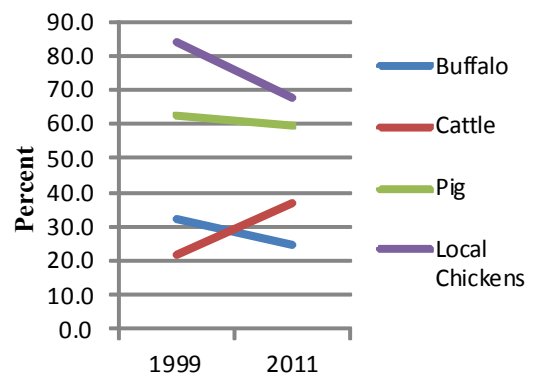


(b) by land fragmentation

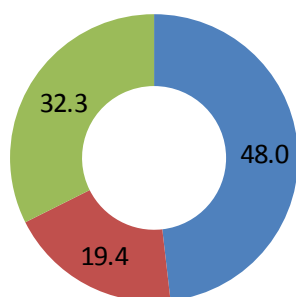


Avg. Land Holding:
Bokeo: 2.1 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Rubber	5,900	24
Maize	5,800	24
Sesame	1,400	5.7
Opium		

Total Rice Production 2011: 95,085 Tons

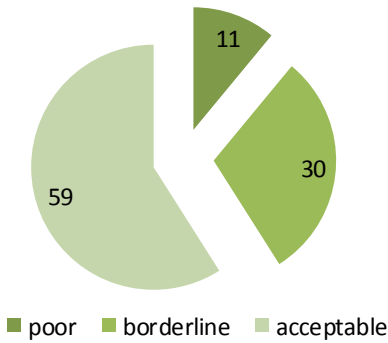
LIVELIHOOD OUTCOMES

Access to Food

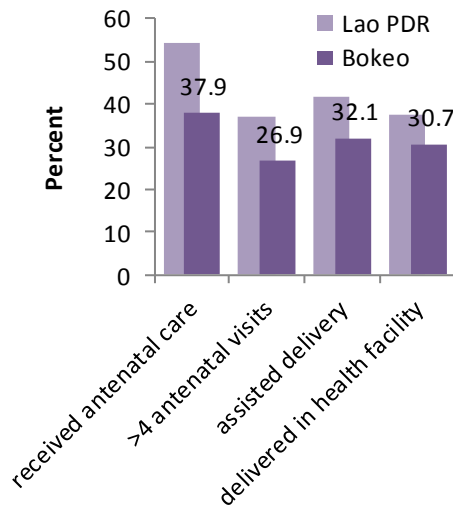
Market Access

Villages with year-round road access to district (%) **67**

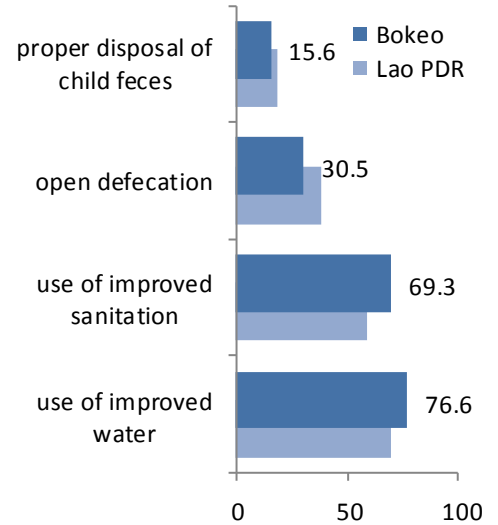
Food Consumption Score



Care Practices

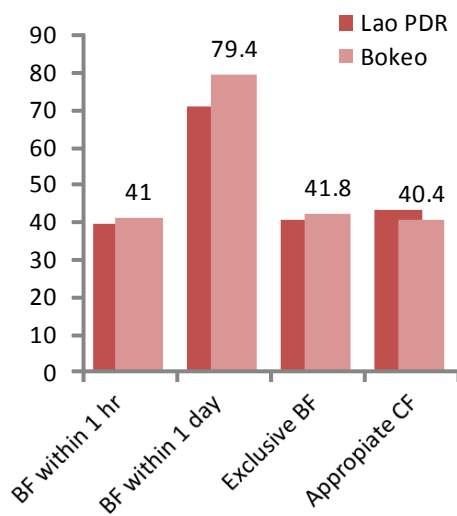


Water & Sanitation

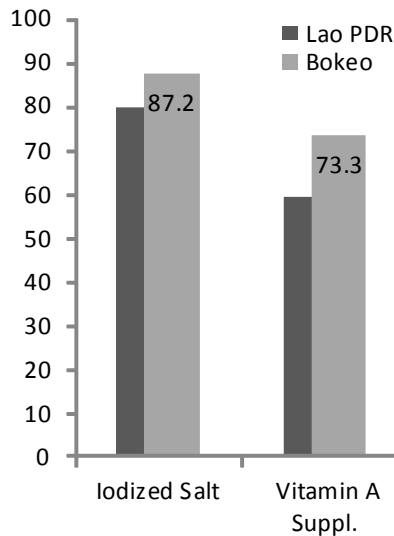


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Bokeo	Lao PDR
Stunting	46	44.2
Underweight	23.7	26.6
Wasting	4.7	5.9
U5MR	92	89
Infant MR	110	76

VULNERABILITY

Natural Hazards

Earthquake	High risk — 95% of province in high risk zone
Landslide	Low risk—medium susceptibility in 24% of land area, high susceptibility in 0.3%
Drought	Low risk of moderate to extreme drought in southern parts in the dry season
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	Low risk
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Suspected poppy production (not confirmed) 2012 reported eradication: 22 ha Prevalence of opium use: 0.35%
Resettlement	9% of villages resettled in past 10 years; 10% planned to resettle



Food Security at a Glance:

Luang Prabang Province

OVERVIEW

Total Land (km ²)	16,875	Farm Households (%)	81
Population, 2011 est.	455,532	Poverty headcount (%)	27.2
Density, 2011 est. (pop/sq. km)	27	Urban/rural poverty (%)	13.5/30.8

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	18.7
Villages with irrigation facilities (%)	37
Households growing dry season rice (% of rice producers)	5.9
Households using fertilizer (%)	15
Households using 2-wheel tractor (%)	18

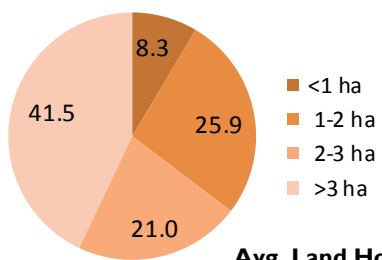
Human, Social and Financial Assets

Primary School Completion Rate	112.7
Secondary School Attendance (F:M) (%)	38:47
Literacy Rate (F:M) %	70:83
Villages with Health Facility within 2 hrs (%)	60
Villages with access to credit facilities (%)	49

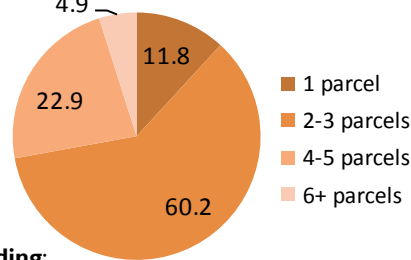
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

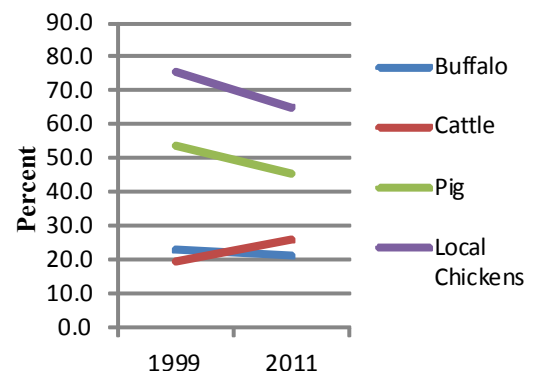


(b) by land fragmentation

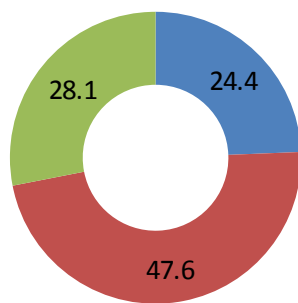


Avg. Land Holding:
Luang Prabang: 2.8 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

Total Rice Production 2011: 96,220 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	17,300	29
Sesame	10,500	18
Mango	8,600	14.5
Cassava	5,700	9.6
Rubber	2,300	4
Opium		

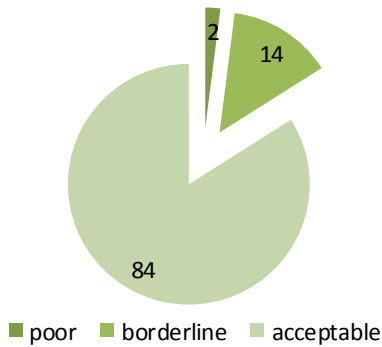
LIVELIHOOD OUTCOMES

Access to Food

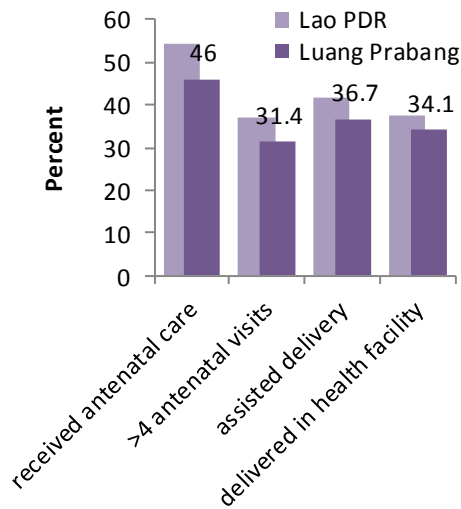
Market Access

Villages with year-round road access to district (%) 52

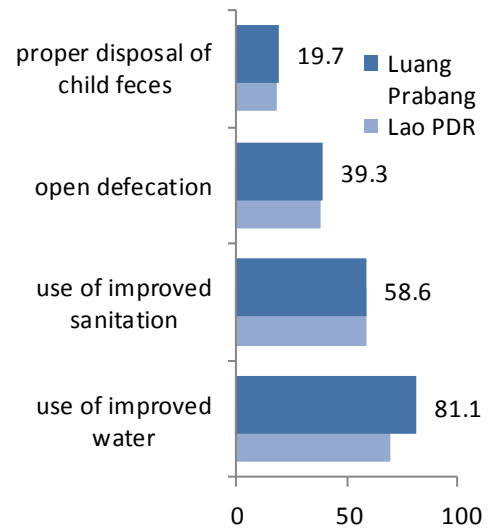
Food Consumption Score



Care Practices

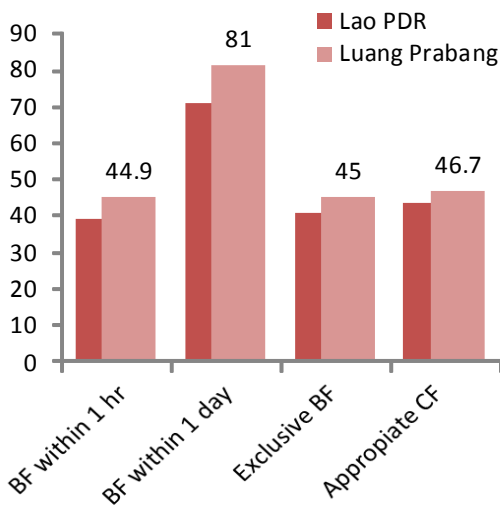


Water & Sanitation

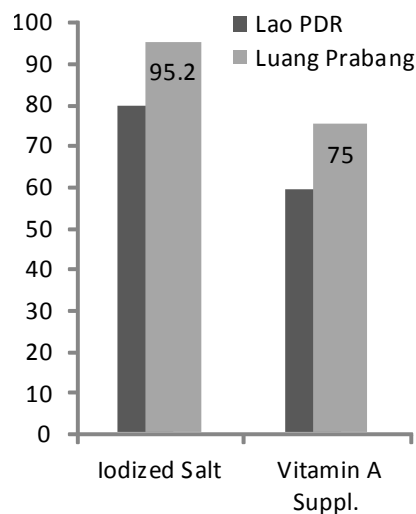


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Luang Prabang	Lao PDR
Stunting	45.6	44.2
Underweight	19.8	26.6
Wasting	3.1	5.9
U5MR	107	89
Infant MR	84	76

VULNERABILITY

Natural Hazards

Earthquake	Mod. risk — 57% of prov. in moderate risk zone
Landslide	Medium/high risk—medium susceptibility in 50% of land area, high susceptibility in 4%
Drought	Low risk of moderate to extreme drought in western parts in the dry season; most parts of the province at low risk in wet season
Flood	At risk — Nam Ou river (4 districts, Ngoy, Nambak, Pakxeng, Pak Ou, at risk)
Storm	Not at risk

Non-Natural Hazards

UXO	Low density in northern districts
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Confirmed poppy prod. (2012 survey) 2012 reported eradication: 69 ha Prevalence of opium use: 0.2%
Resettle-ment	13% of villages resettled in past 10 years; 5% planned to resettle



Food Security at a Glance:

Huaphanh Province

OVERVIEW

Total Land (km ²)	16,500	Farm Households (%)	93
Population, 2011 est.	325,757	Poverty headcount (%)	50.5
Density, 2011 est. (pop/sq. km)	20	Urban/rural poverty (%)	28.6/52.7

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	5
Villages with irrigation facilities (%)	67
Households growing dry season rice (% of rice producers)	15.6
Households using fertilizer (%)	25
Households using 2-wheel tractor (%)	47

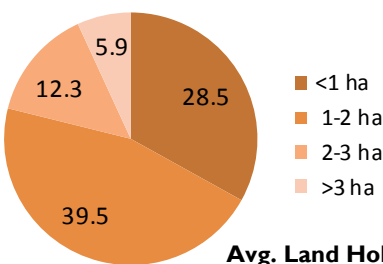
Human, Social and Financial Assets

Primary School Completion Rate	119
Secondary School Attendance (F:M) (%)	48:43
Literacy Rate (F:M) %	67:87
Villages with Health Facility within 2 hrs (%)	54
Villages with access to credit facilities (%)	28

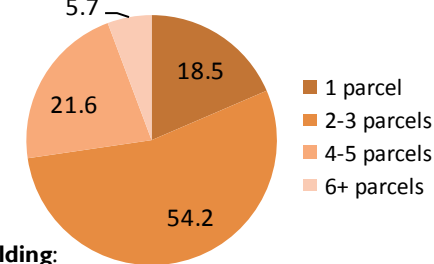
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

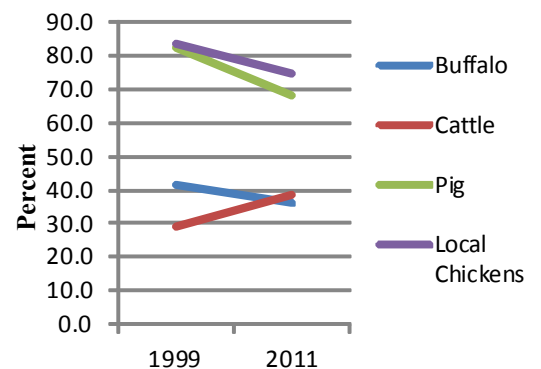


(b) by land fragmentation

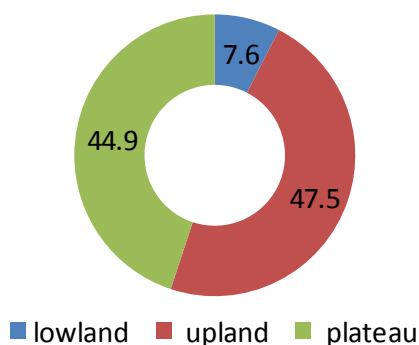


Avg. Land Holding:
Huaphanh: 1.3 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	23,300	55
Mango	9,100	21.6
Cassava	5,400	13
Opium		

Total Rice Production 2011: 94,190 Tons

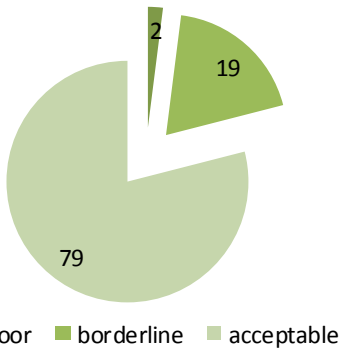
LIVELIHOOD OUTCOMES

Access to Food

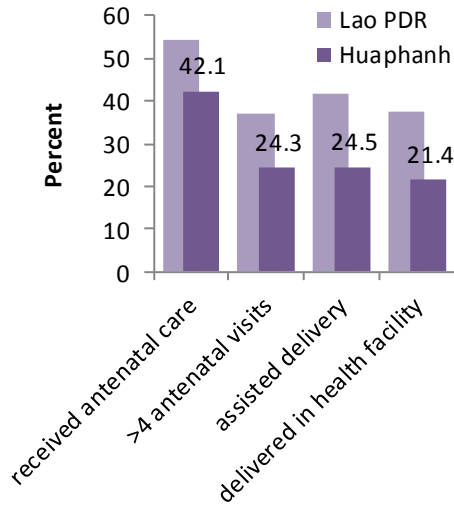
Market Access

Villages with year-round road access to district (%) **54**

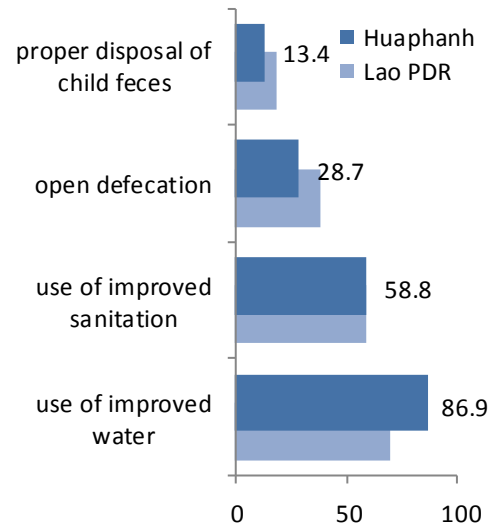
Food Consumption Score



Care Practices

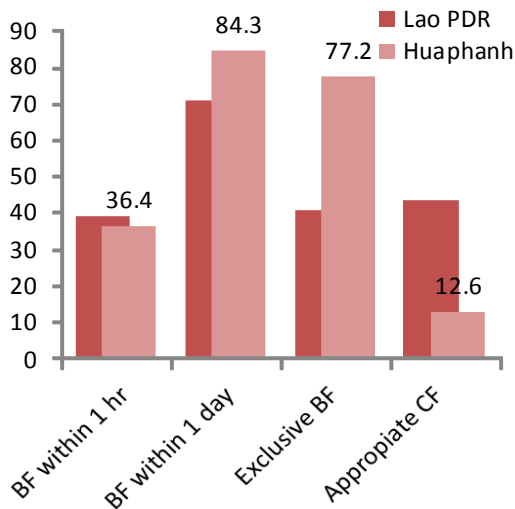


Water & Sanitation

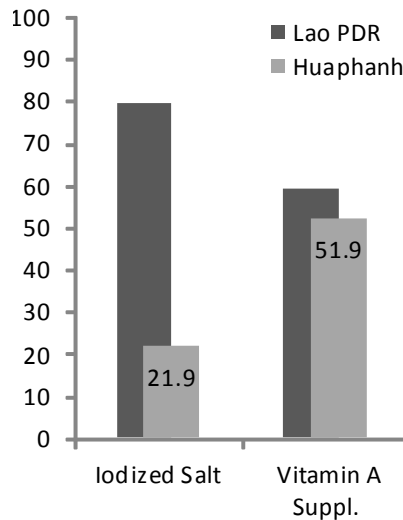


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Huaphanh	Lao PDR
Stunting	61.1	44.2
Underweight	23.5	26.6
Wasting	1.9	5.9
U5MR	118	89
Infant MR	100	76

VULNERABILITY

Natural Hazards

Earthquake	Mod. risk — 100% of prov. in moderate risk zone
Landslide	Medium risk—medium susceptibility in 51% of land area, high susceptibility in 2%
Drought	Low risk of mod. to extreme drought in most of the province in the dry & wet seasons, and March-April; high risk in most parts June-September
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	High density of UXOs in many districts
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Confirmed poppy prod. (2012 survey) 2012 reported eradication: 226 ha Prevalence of opium use: 1.06%
Resettlement	14% of villages resettled in past 10 years; 2% planned to resettle



Food Security at a Glance:

Xayabury Province

OVERVIEW

Total Land (km ²)	16,389	Farm Households (%)	92
Population, 2011 est.	381,908	Poverty headcount (%)	15.7
Density, 2011 est. (pop/sq. km)	23	Urban/rural poverty (%)	15.3/15.8

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	3.8
Villages with irrigation facilities (%)	74
Households growing dry season rice (% of rice producers)	7.6
Households using fertilizer (%)	38
Households using 2-wheel tractor (%)	69

Human, Social and Financial Assets

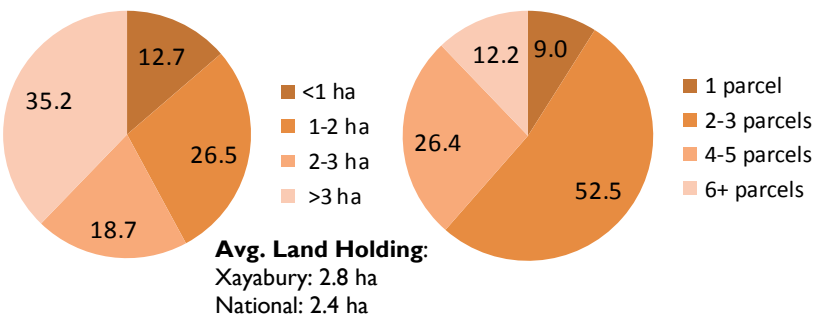
Primary School Completion Rate	102.9
Secondary School Attendance (F:M) (%)	50:53
Literacy Rate (F:M) %	84:89
Villages with Health Facility within 2 hrs (%)	79
Villages with access to credit facilities (%)	59

AGRICULTURAL LIVELIHOOD STRATEGIES

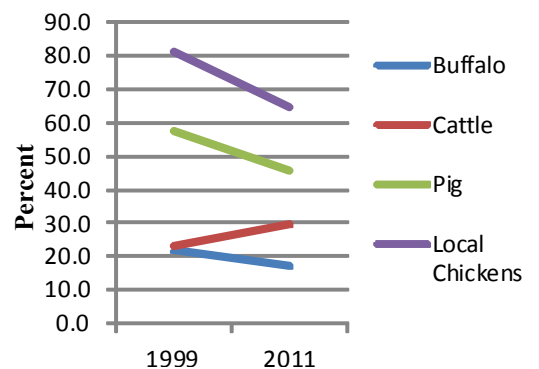
Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

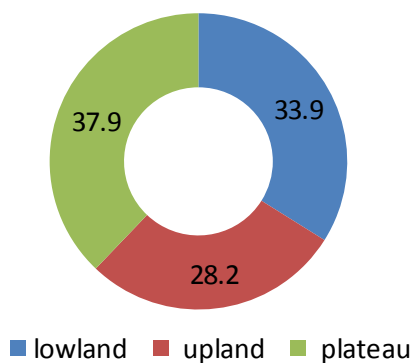
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



Total Rice Production 2011: 173,610 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	27,200	44
Mango	19,800	32
Coconut	13,600	22
Tamarind	8,500	13.6
Rubber	3,100	5

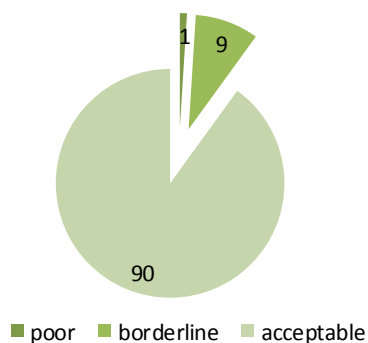
LIVELIHOOD OUTCOMES

Access to Food

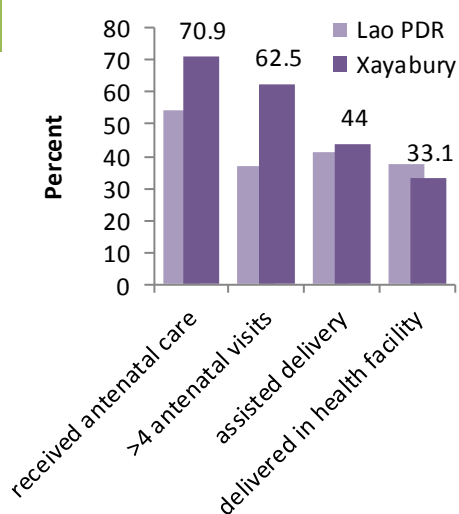
Market Access

Villages with year-round road access to district (%) 84

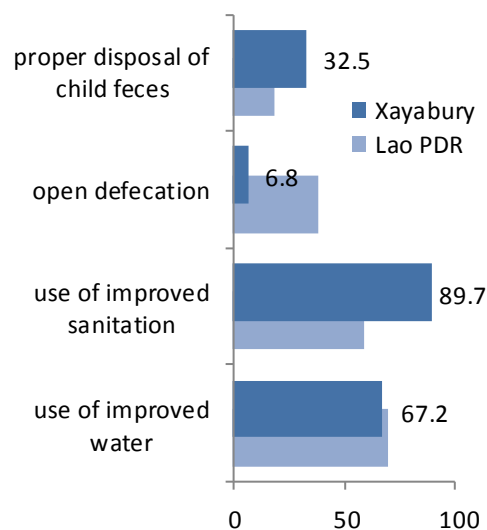
Food Consumption Score



Care Practices

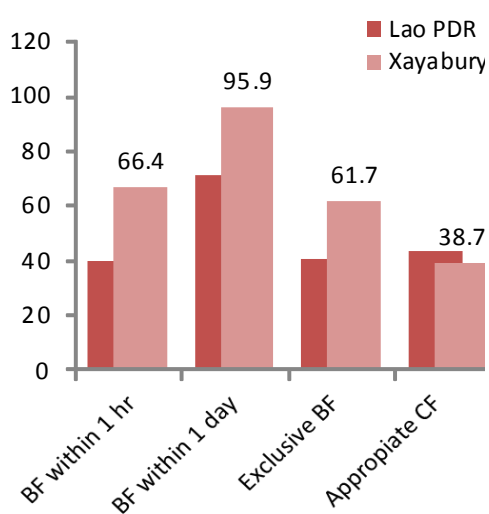


Water & Sanitation

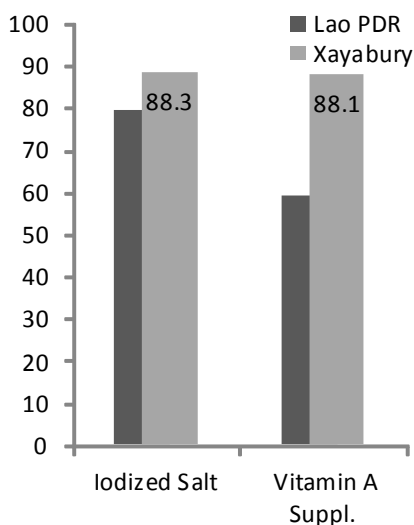


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Xayabury	Lao PDR
Stunting	39	44.2
Underweight	23.2	26.6
Wasting	5.5	5.9
U5MR	65	89
Infant MR	59	76

VULNERABILITY

Natural Hazards

Earthquake	High risk — 57% of province in high risk zone
Landslide	Low risk—medium susceptibility in 37% of land area, high susceptibility in 0.7%
Drought	Low risk of moderate to extreme drought in all parts of the province in wet and dry season
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	Low risk
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Suspected poppy prod. (not confirmed) 2012 reported eradication: 0 ha Prevalence of opium use: 0.02%
Resettle-ment	5% of villages resettled in last 10 years; 3% planned to resettle



Food Security at a Glance: Xiangkhuan Province

OVERVIEW

Total Land (km ²)	16,358	Farm Households (%)	90
Population, 2011 est.	276,242	Poverty headcount (%)	42
Density, 2011 est. (pop/sq. km)	17	Urban/rural poverty (%)	16.6/48.1

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	5
Villages with irrigation facilities (%)	46
Households growing dry season rice (% of rice producers)	8.5
Households using fertilizer (%)	66
Households using 2-wheel tractor (%)	64

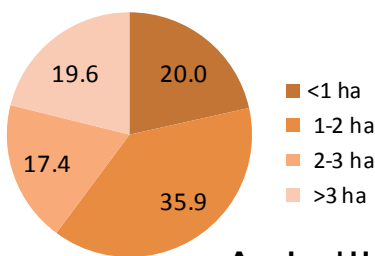
Human, Social and Financial Assets

Primary School Completion Rate	111
Secondary School Attendance (F:M) (%)	57:60
Literacy Rate (F:M) %	78:88
Villages with Health Facility within 2 hrs (%)	68
Villages with access to credit facilities (%)	50

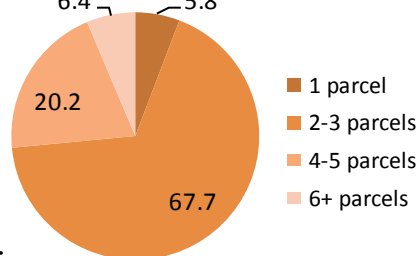
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

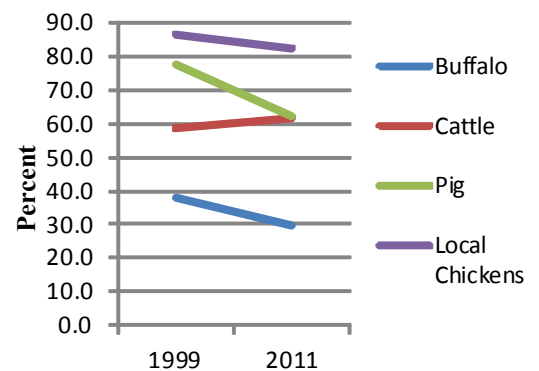


(b) by land fragmentation

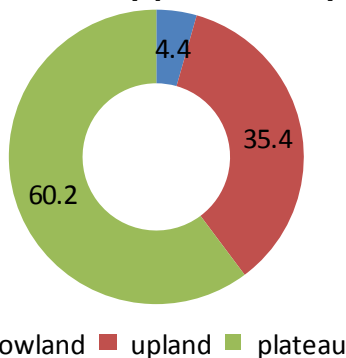


Avg. Land Holding:
Xiangkhuan: 2.0 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Maize	19,600	54
Mango	12,800	35
Cassava	4,300	12

Total Rice Production 2011: 100,960 Tons

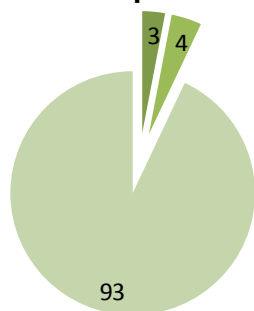
LIVELIHOOD OUTCOMES

Access to Food

Market Access

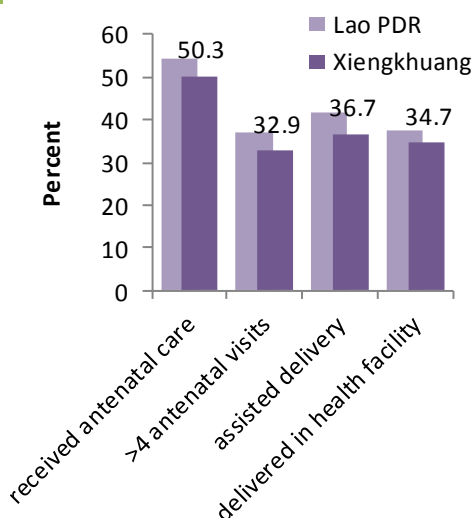
Villages with year-round road access to district (%) **56**

Food Consumption Score

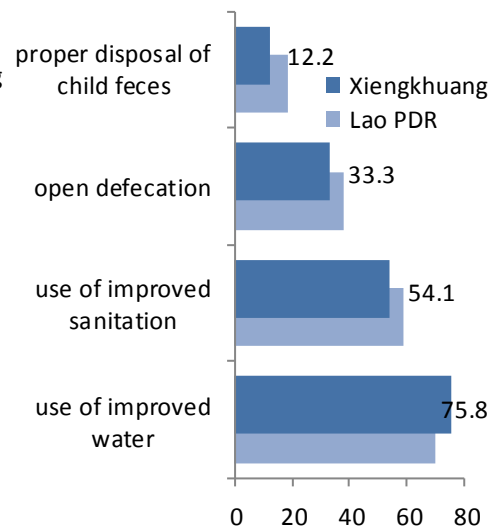


■ poor ■ borderline ■ acceptable

Care Practices

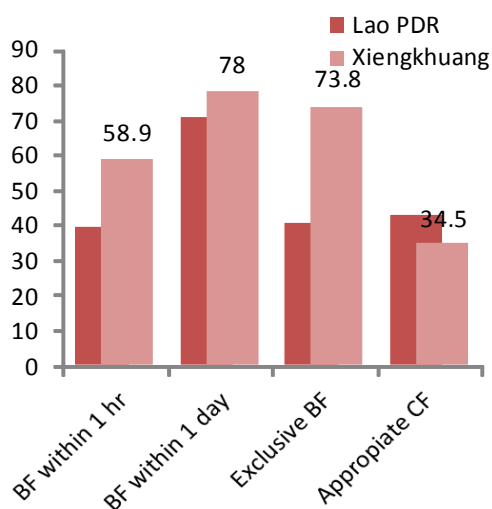


Water & Sanitation

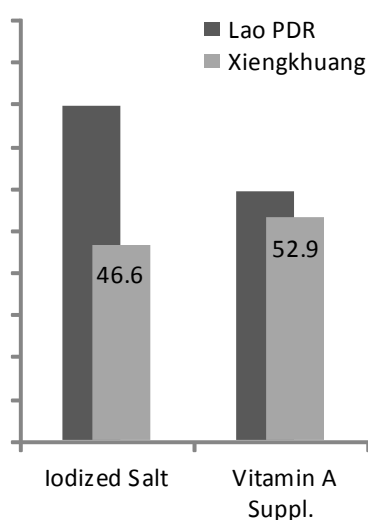


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Xiengkhuang	Lao PDR
Stunting	52.9	44.2
Underweight	19.9	26.6
Wasting	2	5.9
U5MR	67	89
Infant MR	53	76

VULNERABILITY

Natural Hazards

Earthquake	Mod. risk — 96% of province in moderate risk zone
Landslide	Medium/high risk—medium susceptibility in 47% of land area, high susceptibility in 4%
Drought	high risk of mod. to extreme drought in all parts of the province in wet season, June-September, and
Flood	Not at risk
Storm	Not at risk

Non-Natural Hazards

UXO	High density of UXOs in many districts
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	Low risk
Opium	Suspected poppy prod. (not confirmed) 2012 reported eradication: 21 ha Prevalence of opium use: 0.58%
Resettlement	12% of villages resettled in past 10 years; 4% planned to resettle



Food Security at a Glance:

Vientiane Province

OVERVIEW

Total Land (km ²)	22,554	Farm Households (%)	77
Population, 2011 est.	493,593	Poverty headcount (%)	28
Density, 2011 est. (pop/sq. km)	22	Urban/rural poverty (%)	14.9/31.7

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	3.2
Villages with irrigation facilities (%)	64
Households growing dry season rice (% of rice producers)	12.2
Households using fertilizer (%)	60
Households using 2-wheel tractor (%)	82

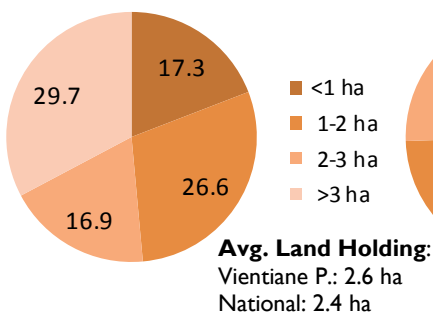
Human, Social and Financial Assets

Primary School Completion Rate	114.5
Secondary School Attendance (F:M) (%)	57:61
Literacy Rate (F:M) %	84:90
Villages with Health Facility within 2 hrs (%)	68
Villages with access to credit facilities (%)	53

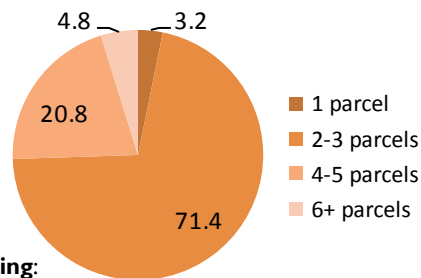
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

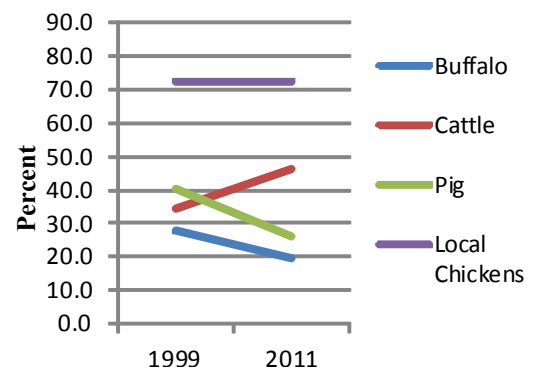
(a) by size of land holdings



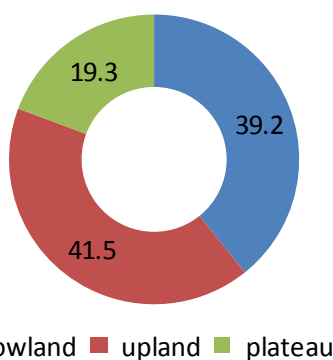
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



Total Rice Production 2011: 267,910 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	21,200	34
Coconut	16,700	27
Tamarind	5,700	9.1
Maize	5,200	8.3
Rubber	2,100	3.4

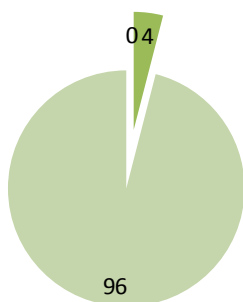
LIVELIHOOD OUTCOMES

Access to Food

Market Access

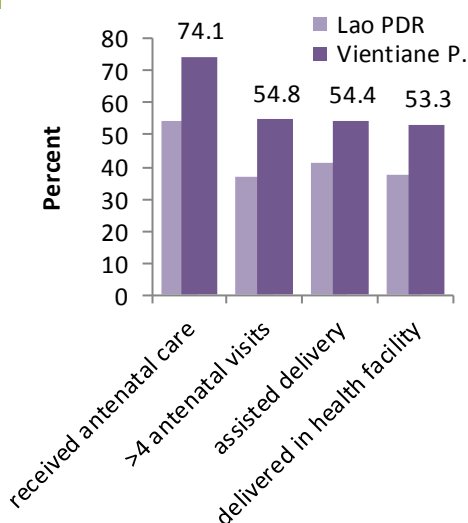
Villages with year-round road access to district (%) **89**

Food Consumption Score

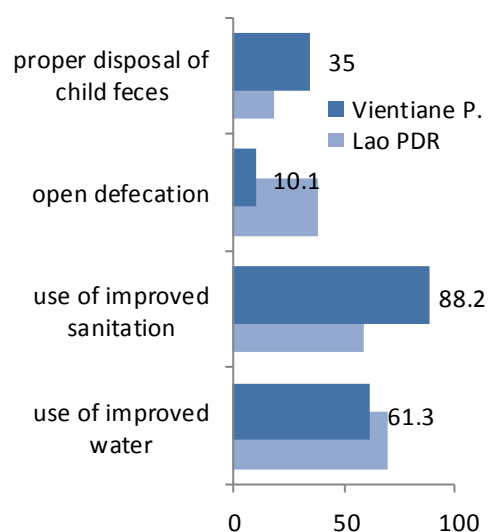


■ poor ■ borderline ■ acceptable

Care Practices

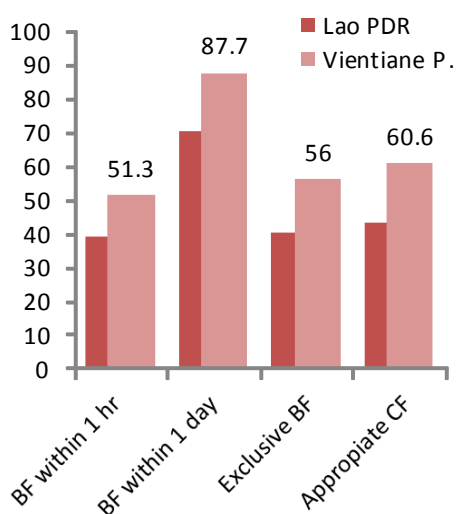


Water & Sanitation

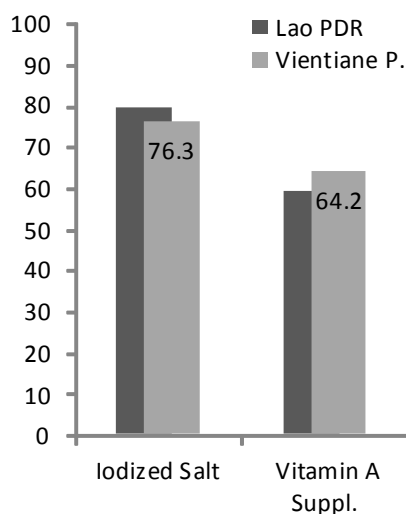


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Vientiane P.	Lao PDR
Stunting	42.6	44.2
Underweight	18.9	26.6
Wasting	4.6	5.9
U5MR	37	89
Infant MR	31	76

VULNERABILITY

Natural Hazards

Earthquake	Mod. risk — 90% of province in moderate risk zone
Landslide	Medium risk—medium susceptibility in 37% of land area, high susceptibility in 4%
Drought	Low risk of mod. to extreme drought in all parts of the province in dry & wet seasons and June-Sept.
Flood	At risk — Nam Ngum River (Pak Ngum district)
Storm	Not at risk

Non-Natural Hazards

UXO	Low risk
NTFPs	Low risk
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Suspected poppy prod. (not confirmed) 2012 reported eradication: 5 ha Prevalence of opium use: 0.13%
Resettlement	7% of villages resettled in past 10 years; 2% planned to resettle



Food Security at a Glance:

Borikhamxay Province

OVERVIEW

Total Land (km ²)	14,863	Farm Households (%)	81
Population, 2011 est.	272,794	Poverty headcount (%)	21.5
Density, 2011 est. (pop/sq. km)	18	Urban/rural poverty (%)	18.1/22.4

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	3.2
Villages with irrigation facilities (%)	46
Households growing dry season rice (% of rice producers)	9.3
Households using fertilizer (%)	40
Households using 2-wheel tractor (%)	77

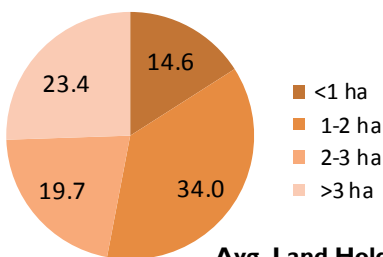
Human, Social and Financial Assets

Primary School Completion Rate	112.4
Secondary School Attendance (F:M) (%)	50:56
Literacy Rate (F:M) %	79:88
Villages with Health Facility within 2 hrs (%)	65
Villages with access to credit facilities (%)	56

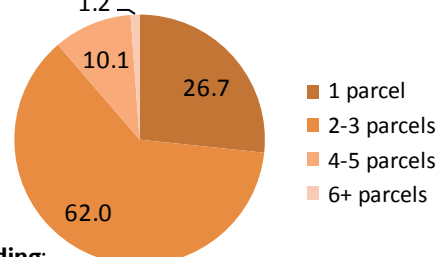
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

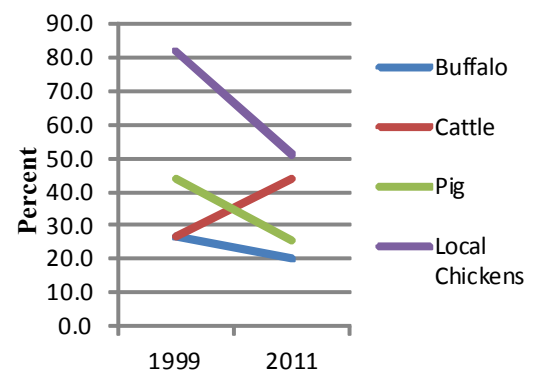


(b) by land fragmentation

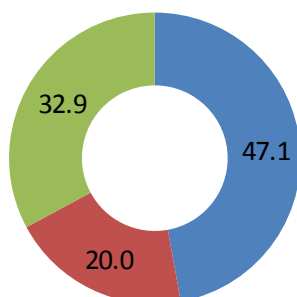


Avg. Land Holding:
Borikhamxay: 2.2 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

Total Rice Production 2011: 121,785 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Cassava	5,200	15
Maize	2,300	6.7
Rubber	1,200	3.5
Tobacco	900	2.6

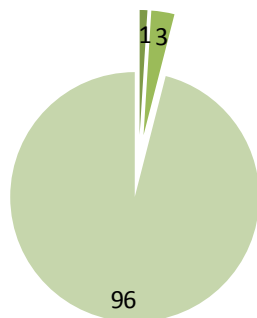
LIVELIHOOD OUTCOMES

Access to Food

Market Access

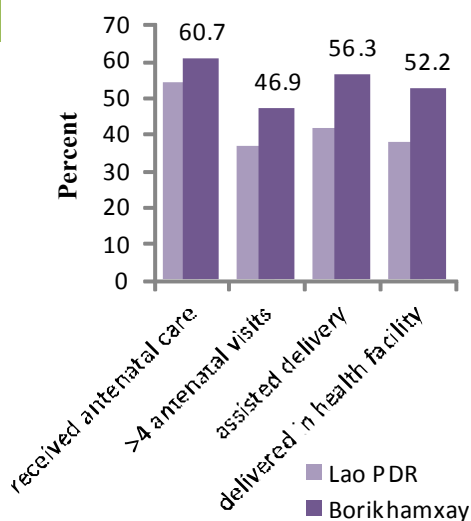
Villages with year-round road access to district (%) **81**

Food Consumption Score

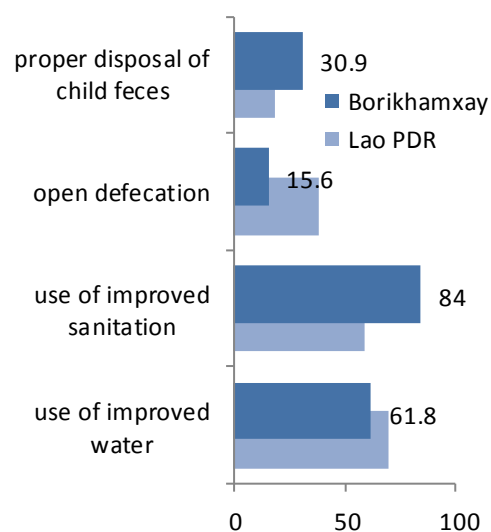


■ poor ■ borderline ■ acceptable

Care Practices

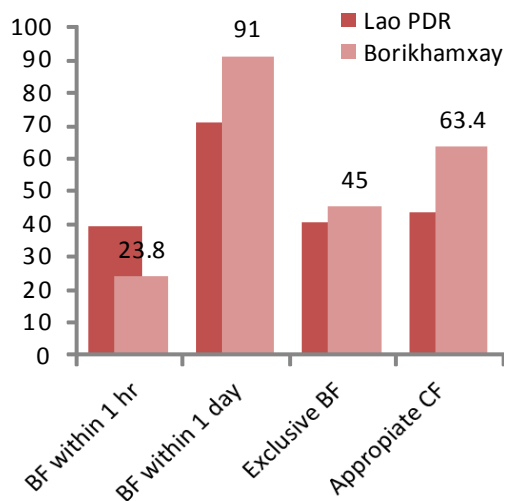


Water & Sanitation

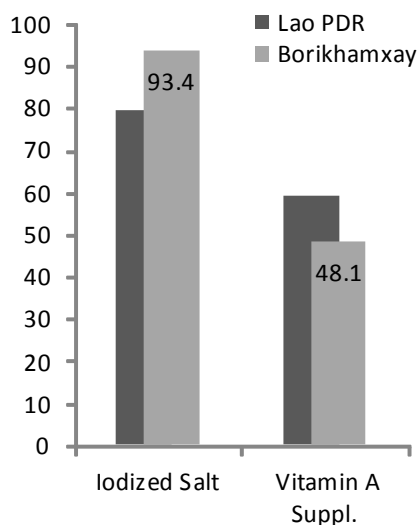


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Borikhamxay	Lao PDR
Stunting	40.8	44.2
Underweight	19.8	26.6
Wasting	6.2	5.9
U5MR	52	89
Infant MR	45	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Medium/high risk—medium susceptibility in 50% of land area, high susceptibility in 11% (mainly in conservation areas)
Drought	Low risk of moderate to extreme drought in most parts of the province; high risk in some parts in dry & wet season, and June-September
Flood	At risk — Nam Ngiap, Nam Xan, and Nam Ngum rivers (2 districts, Borikhan & Pakxan, at high risk)
Storm	Not at risk

Non-Natural Hazards

UXO	Low density in south western districts
NTFPs	Low risk
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Suspected poppy prod. (not confirmed) 2012 reported eradication: 22 ha Prevalence of opium use: 0.35%
Resettlement	10% of villages resettled in past 10 years; 6% planned to resettle



Food Security at a Glance: Khammuane Province

OVERVIEW

Total Land (km ²)	16,315	Farm Households (%)	78
Population, 2011 est.	383,099	Poverty headcount (%)	31.4
Density, 2011 est. (pop/sq. km)	23	Urban/rural poverty (%)	37.2/29.8

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	12
Villages with irrigation facilities (%)	24
Households growing dry season rice (% of rice producers)	15.3
Households using fertilizer (%)	75
Households using 2-wheel tractor (%)	87

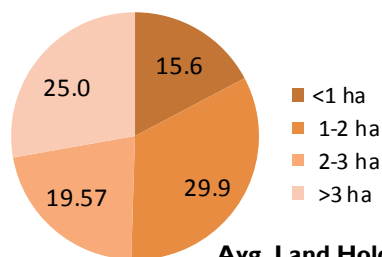
Human, Social and Financial Assets

Primary School Completion Rate	84.4
Secondary School Attendance (F:M) (%)	37:39
Literacy Rate (F:M) %	68:74
Villages with Health Facility within 2 hrs (%)	66
Villages with access to credit facilities (%)	38

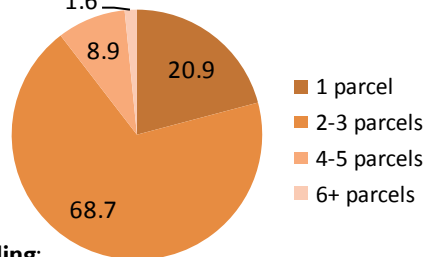
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

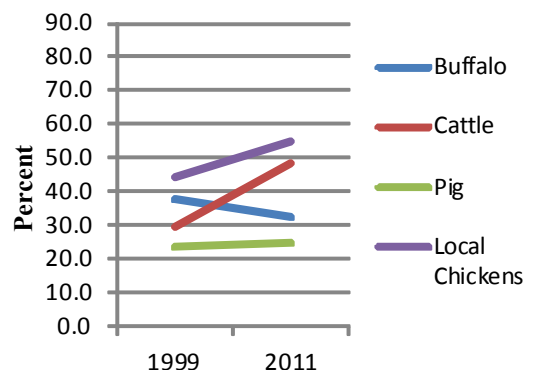


(b) by land fragmentation

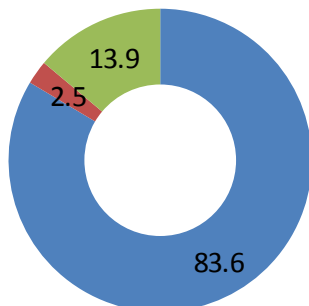


Avg. Land Holding:
Khammuane: 2.3 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

Total Rice Production 2011: 153,945 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	14,300	28
Coconut	8,400	17
Maize	7,600	15
Tamarind	5,000	10
Tobacco	2,100	4
Rubber	1,100	2.2

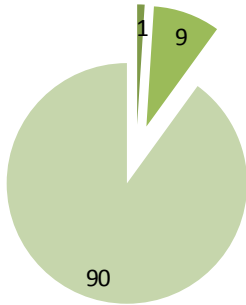
LIVELIHOOD OUTCOMES

Access to Food

Market Access

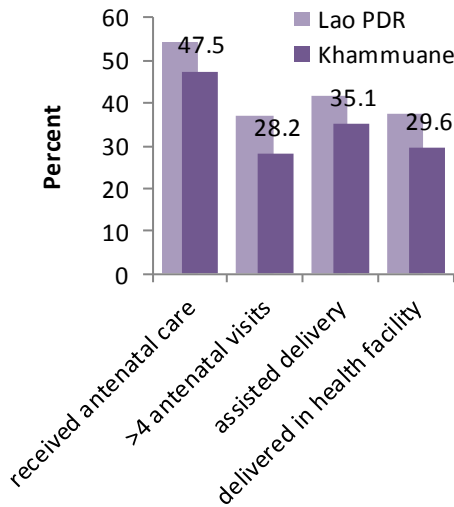
Villages with year-round road access to district (%) **65**

Food Consumption Score

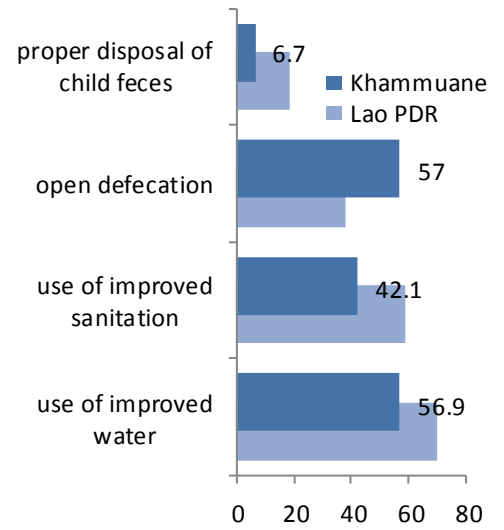


■ poor ■ borderline ■ acceptable

Care Practices

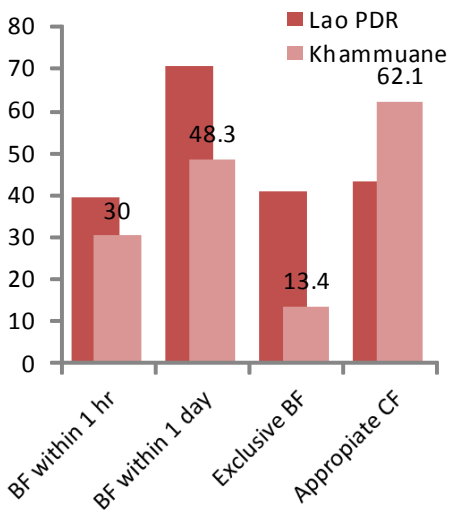


Water & Sanitation

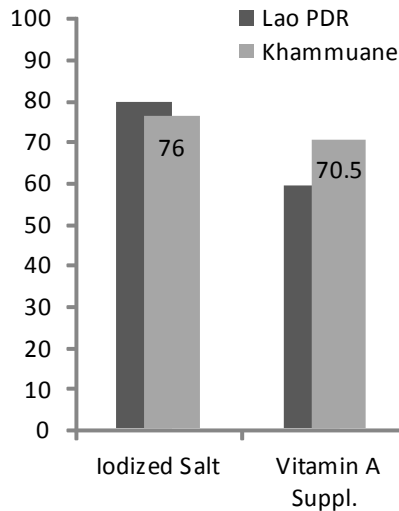


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Khammuane	Lao PDR
Stunting	40.8	44.2
Underweight	29.4	26.6
Wasting	7.1	5.9
U5MR	138	89
Infant MR	131	76

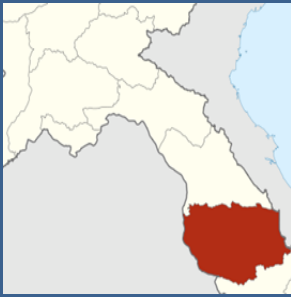
VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Medium/high risk—medium susceptibility in 37% of land area, high susceptibility in 9%
Drought	High risk of mod. to extreme drought in most parts of the province, particularly in the south & in the dry season
Flood	At risk — Se Bangfai river (3 districts, Mahaxai, Xebangfai & Nongbok)
Storm	High risk—parts of province at high risk of major storm

Non-Natural Hazards

UXO	V. high density of UXOs in some districts, e.g Bualapha, Xaibouathong, & Mahaxai)
NTFPs	Low risk
Concessions	At risk (loss of access to land, impact on environment, etc)
Opium	Not at risk
Resettlement	6% of villages resettled in past 10 years; 4% planned to resettle



Food Security at a Glance: Savannakhet Province

OVERVIEW

Total Land (km ²)	21,774	Farm Households (%)	79
Population, 2011 est.	922,210	Poverty headcount (%)	28.5
Density, 2011 est. (pop/sq. km)	42	Urban/rural poverty (%)	22.2/34.6

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	7
Villages with irrigation facilities (%)	27
Households growing dry season rice (% of rice producers)	9.4
Households using fertilizer (%)	84
Households using 2-wheel tractor (%)	81

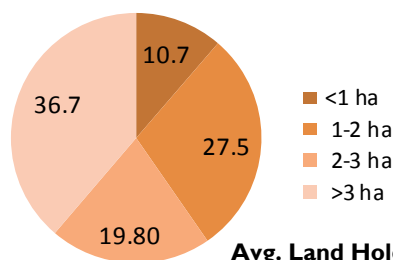
Human, Social and Financial Assets

Primary School Completion Rate	83.8
Secondary School Attendance (F:M) (%)	38:28
Literacy Rate (F:M) %	59:59
Villages with Health Facility within 2 hrs (%)	62
Villages with access to credit facilities (%)	27

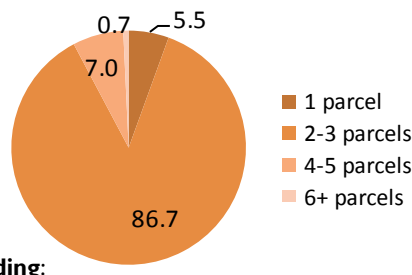
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

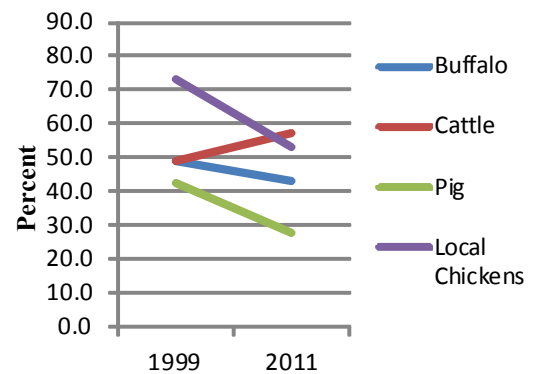


(b) by land fragmentation

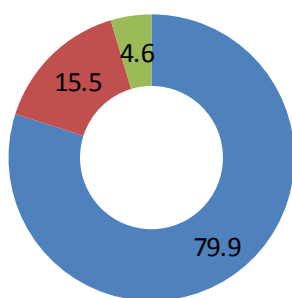


Avg. Land Holding:
Savannakhet: 3.1 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	35,400	33
Coconut	23,500	22
Tamarind	18,700	17
Maize	11,500	11
Sugarcane	500	4.6

Total Rice Production 2011: 613,735 Tons

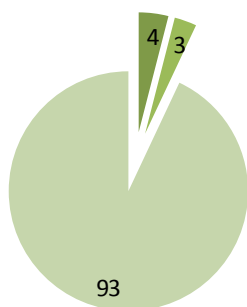
LIVELIHOOD OUTCOMES

Access to Food

Market Access

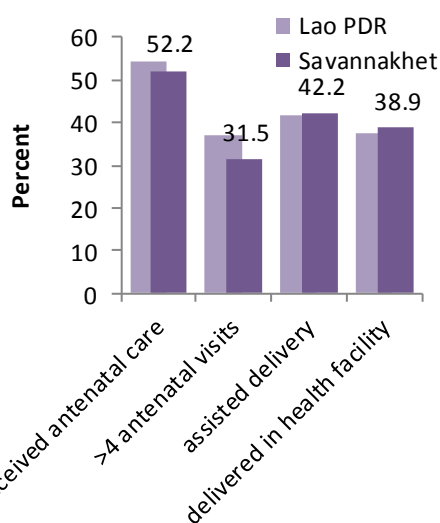
Villages with year-round road access to district (%) **73**

Food Consumption Score

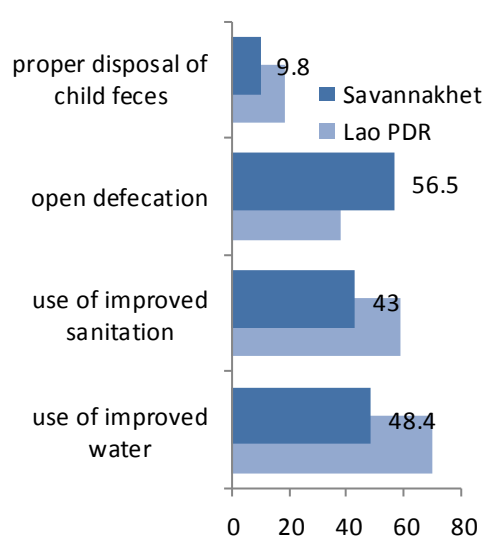


■ poor ■ borderline ■ acceptable

Care Practices

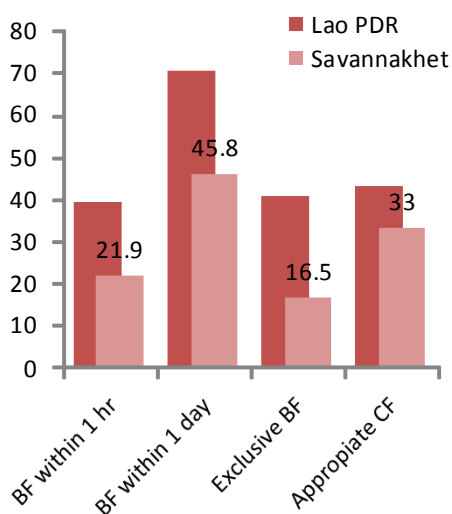


Water & Sanitation

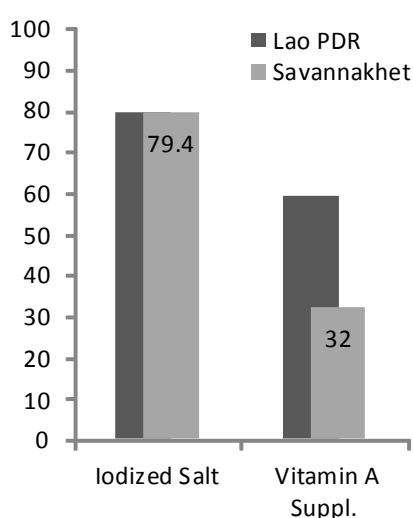


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Savannakhet	Lao PDR
Stunting	40.8	44.2
Underweight	28.2	26.6
Wasting	5.0	5.9
U5MR	94	89
Infant MR	81	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Low risk—medium susceptibility in 21% of land area, high susceptibility in 1%
Drought	Low/high risk — low risk of mod. to extreme drought in central parts June-Sept; high risk in eastern parts June-Sept
Flood	At risk — Xe Banghiang, Se Bangfai rivers (7 districts at risk of Xe Banghing, 2 districts at risk of Se Bangfai floods)
Storm	At risk—parts of Savannakhet at risk of major storm

Non-Natural Hazards

UXO	Very high density in some districts, e.g. Vilabouri, Xepon, Nong
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Not at risk
Resettlement	4% of villages resettled in past 10 years; 1% of villages planned to resettle



Food Security at a Glance: Saravane Province

OVERVIEW

Total Land (km ²)	10,691	Farm Households (%)	90
Population, 2011 est.	375,517	Poverty headcount (%)	36.3
Density, 2011 est. (pop/sq. km)	35	Urban/rural poverty (%)	3.1/38.7

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	3
Villages with irrigation facilities (%)	29
Households growing dry season rice (% of rice producers)	17.8
Households using fertilizer (%)	70
Households using 2-wheel tractor (%)	64

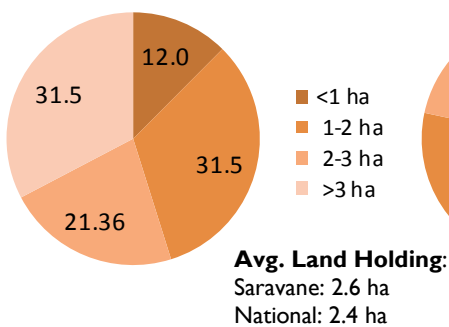
Human, Social and Financial Assets

Primary School Completion Rate	58.6
Secondary School Attendance (F:M) (%)	20:25
Literacy Rate (F:M) %	39:63
Villages with Health Facility within 2 hrs (%)	62
Villages with access to credit facilities (%)	41

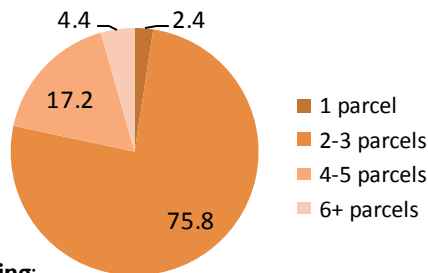
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

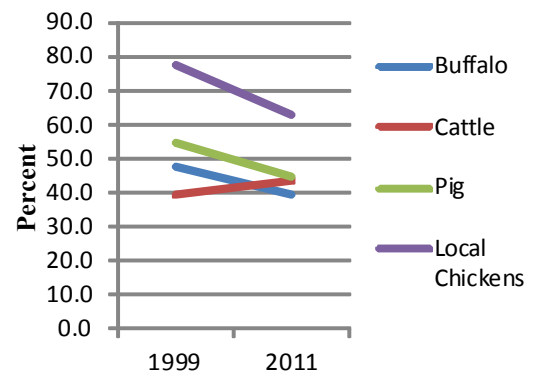
(a) by size of land holdings



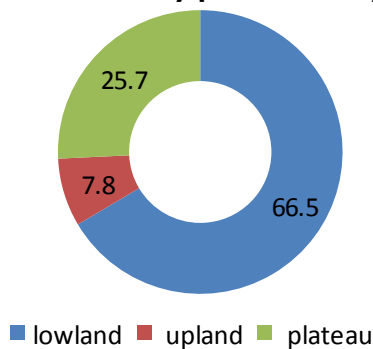
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	16,300	33
Coconut	10,600	21
Maize	10,200	20
Tamarind	10,000	20
Coffee	6,200	12

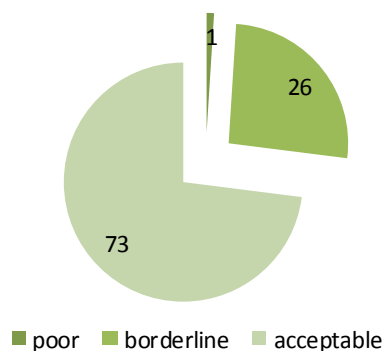
Total Rice Production 2011: 317,700 Tons

LIVELIHOOD OUTCOMES

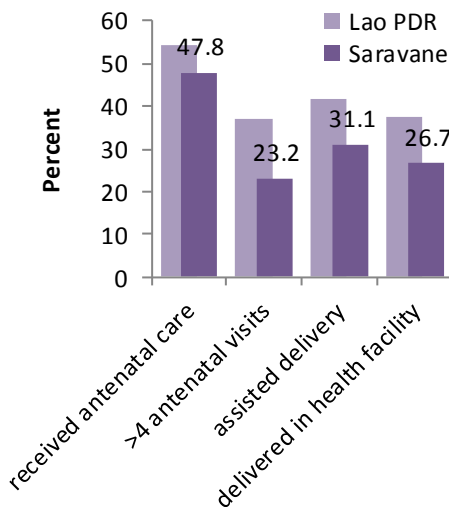
Access to Food

Market Access
Villages with year-round road access to district (%) **74**

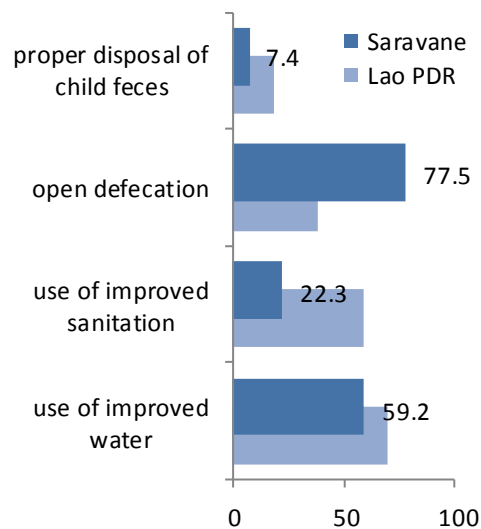
Food Consumption Score



Care Practices

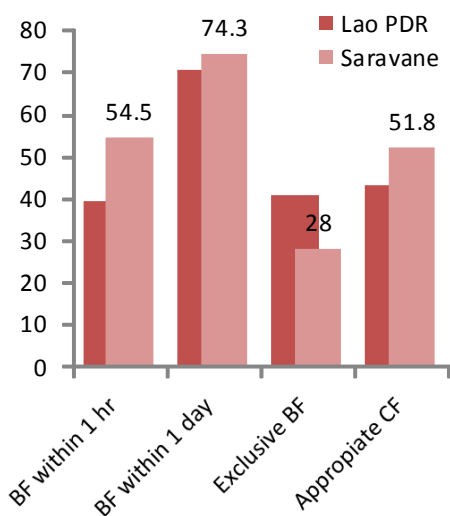


Water & Sanitation

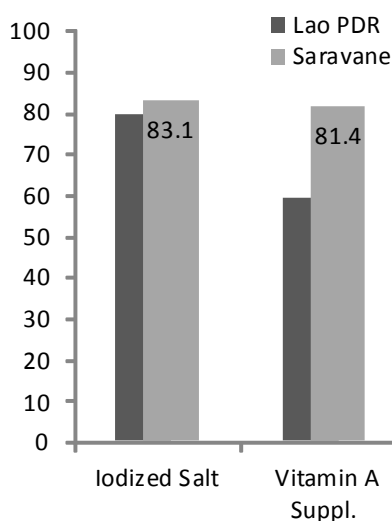


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Saravane	Lao PDR
Stunting	54.4	44.2
Underweight	41.2	26.6
Wasting	8.6	5.9
U5MR	113	89
Infant MR	98	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Medium/high risk—medium susceptibility in 42% of land area, high susceptibility in 7%
Drought	High risk of moderate to extreme drought in northern and southeastern parts in the June-September, low risk during the rest of year
Flood	At risk — Xe Don river (5 districts with 1 district, Khongxedon, most at risk)
Storm	At risk

Non-Natural Hazards

UXO	High density in some districts in the west
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Not at risk
Resettlement	6% of villages resettled in past 10 years; 3% planned to resettle



Food Security at a Glance:

Sekong Province

OVERVIEW

Total Land (km ²)	7,665	Farm Households (%)	86
Population, 2011 est.	100,595	Poverty headcount (%)	51.8
Density, 2011 est. (pop/sq. km)	13	Urban/rural poverty (%)	19.5/59.3

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	15.3
Villages with irrigation facilities (%)	50
Households growing dry season rice (% of rice producers)	6.7
Households using fertilizer (%)	41
Households using 2-wheel tractor (%)	30

Human, Social and Financial Assets

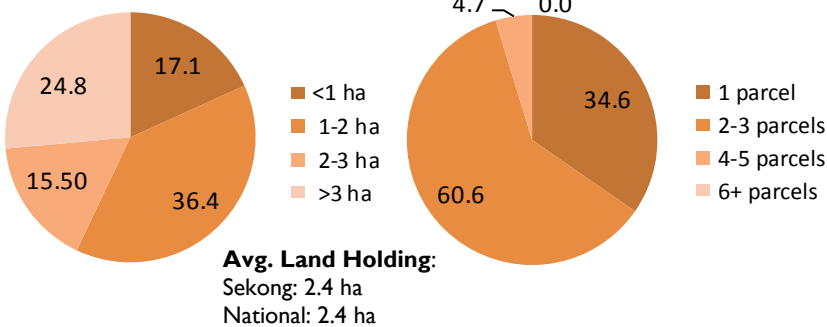
Primary School Completion Rate	95.2
Secondary School Attendance (F:M) (%)	36:37
Literacy Rate (F:M) %	61:76
Villages with Health Facility within 2 hrs (%)	46
Villages with access to credit facilities (%)	30

AGRICULTURAL LIVELIHOOD STRATEGIES

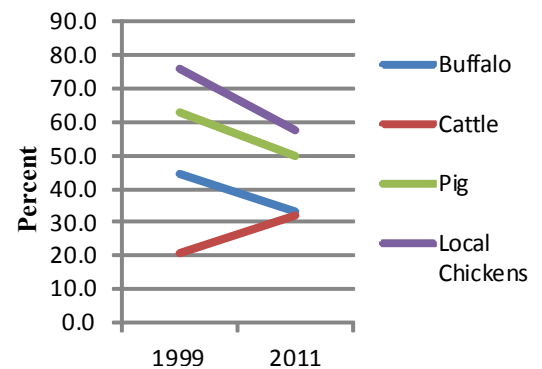
Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

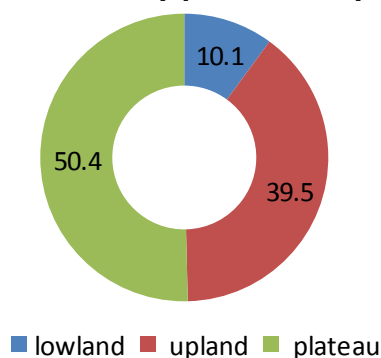
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



Total Rice Production 2011: 27,865 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Coffee	4,800	38
Maize	4,600	36
Cassava	3,300	26
Tobacco	1,900	15
Mango	1,900	15

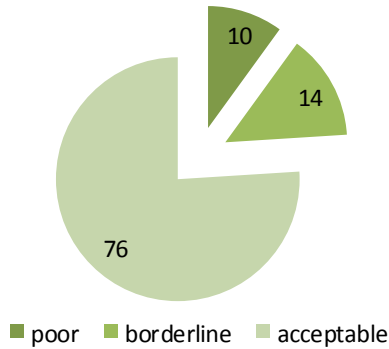
LIVELIHOOD OUTCOMES

Access to Food

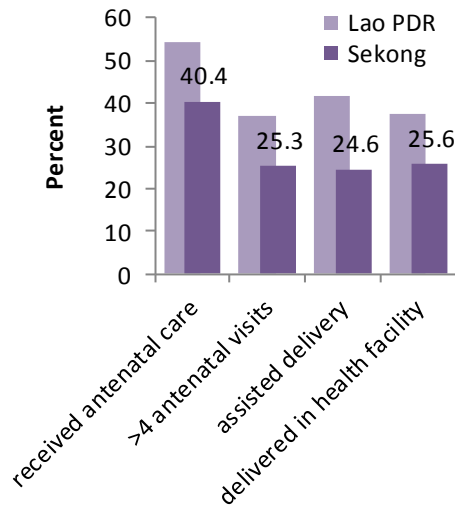
Market Access

Villages with year-round road access to district (%) **54**

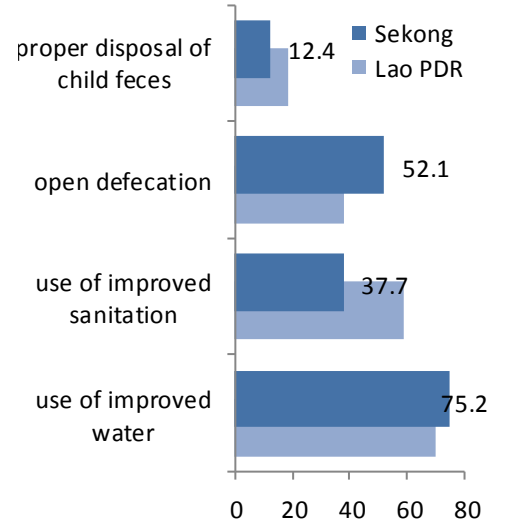
Food Consumption Score



Care Practices

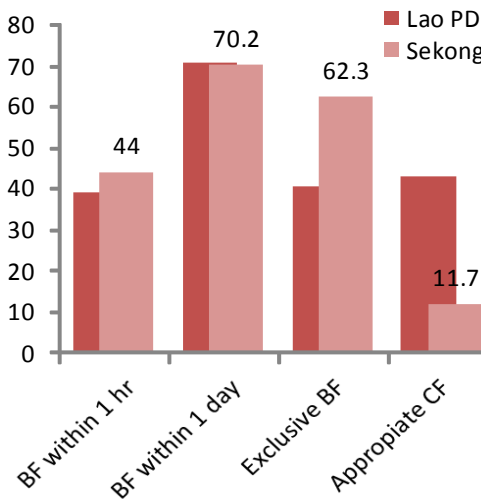


Water & Sanitation

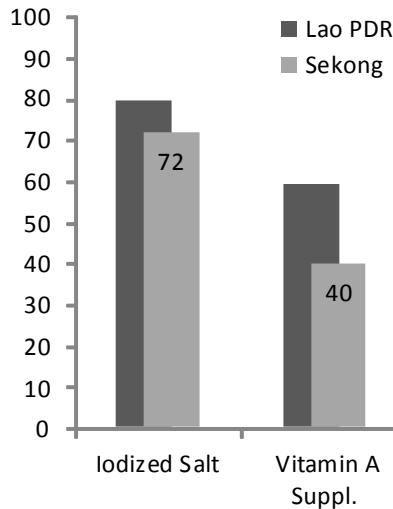


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Sekong	Lao PDR
Stunting	62.7	44.2
Underweight	46	26.6
Wasting	7.3	5.9
U5MR	93	89
Infant MR	71	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Medium/high risk—medium susceptibility in 58% of land area, high susceptibility in 24%
Drought	Low risk of moderate to extreme drought in northern parts in the dry season, and in most of the rest of the province in June-September
Flood	At risk — Xe Kong River (2 districts, Karum & Lamam)
Storm	At risk

Non-Natural Hazards

UXO	High density in many districts
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	At risk (loss of access to land, impact on the environment, etc.)
Opium	Not at risk
Resettlement	20% of villages resettled in past 10 years; 9% planned to resettle



Food Security at a Glance: Chamapasack Province

OVERVIEW

Total Land (km ²)	15,415	Farm Households (%)	71
Population, 2011 est.	661,358	Poverty headcount (%)	10
Density, 2011 est. (pop/sq. km)	43	Urban/rural poverty (%)	12/9.3

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	17.4
Villages with irrigation facilities (%)	46
Households growing dry season rice (% of rice producers)	13.9
Households using fertilizer (%)	81
Households using 2-wheel tractor (%)	52

Human, Social and Financial Assets

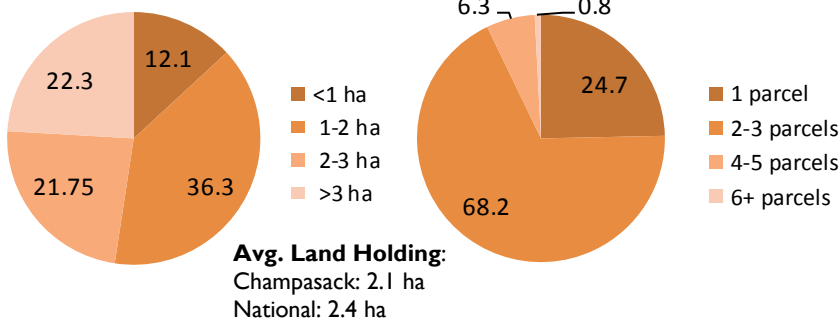
Primary School Completion Rate	73.6
Secondary School Attendance (F:M) (%)	43:37
Literacy Rate (F:M) %	65:71
Villages with Health Facility within 2 hrs (%)	61
Villages with access to credit facilities (%)	54

AGRICULTURAL LIVELIHOOD STRATEGIES

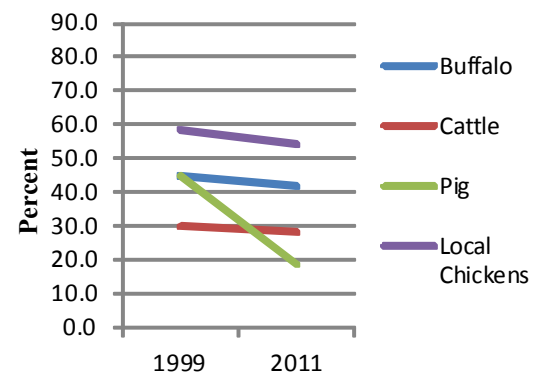
Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

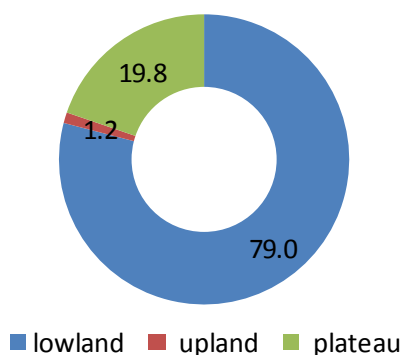
(b) by land fragmentation



Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



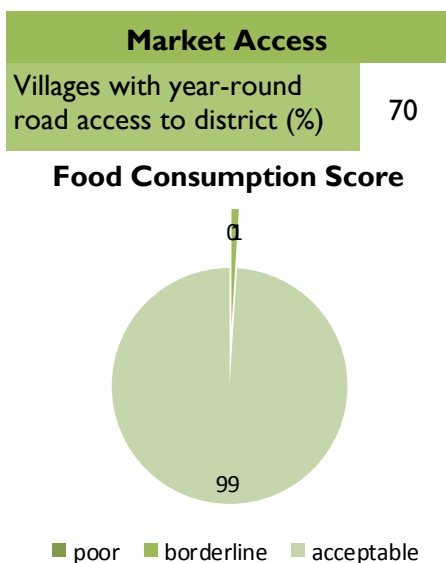
HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	18,100	24
Coconut	15,800	21
Coffee	12,700	17
Tamarind	8,800	12

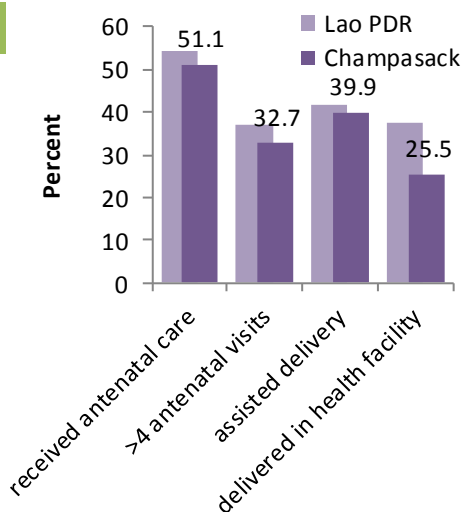
Total Rice Production 2011: 419,085 Tons

LIVELIHOOD OUTCOMES

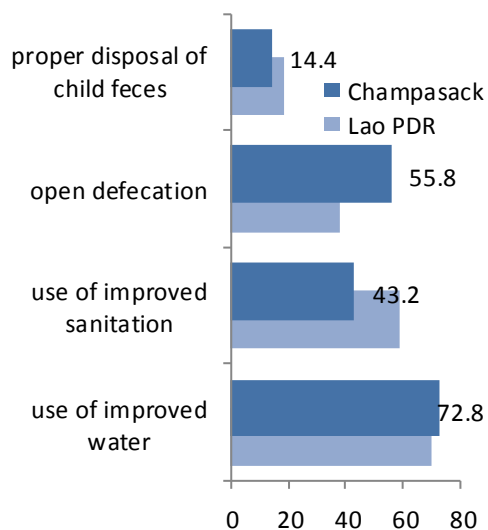
Access to Food



Care Practices

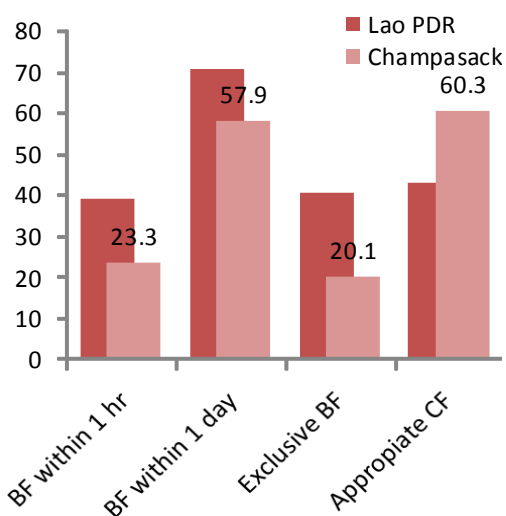


Water & Sanitation

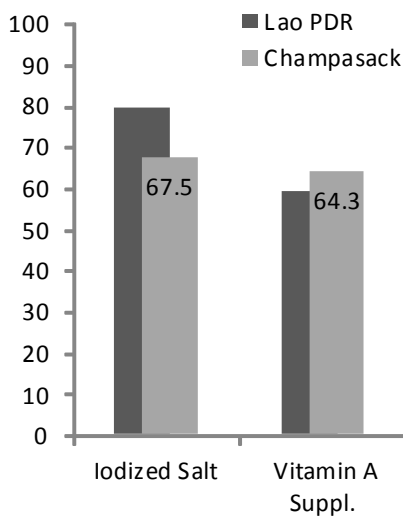


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Champasack	Lao PDR
Stunting	36.7	44.2
Underweight	26.3	26.6
Wasting	6.8	5.9
U5MR	97	89
Infant MR	89	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Medium risk — medium susceptibility in 33% of land area, high susceptibility in 2%
Drought	Low risk of mod. to extreme drought in most parts in the dry season and in some parts in March-April
Flood	At risk—Xe Don River (3 districts at risk)
Storm	At risk

Non-Natural Hazards

UXO	Low risk
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Not at risk
Resettlement	2% of villages resettled in past 10 years; 2% planned to resettle



Food Security at a Glance: Attapeu Province

OVERVIEW

Total Land (km ²)	10,320	Farm Households (%)	84
Population, 2011 est.	130,402	Poverty headcount (%)	24.6
Density, 2011 est. (pop/sq. km)	13	Urban/rural poverty (%)	9/28.9

SELECTED ASSETS

Natural and Physical Assets

Villages with no road access (%)	12
Villages with irrigation facilities (%)	15
Households growing dry season rice (% of rice producers)	6.1
Households using fertilizer (%)	79
Households using 2-wheel tractor (%)	49

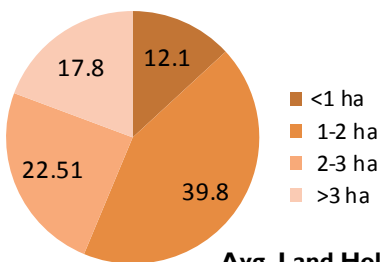
Human, Social and Financial Assets

Primary School Completion Rate	87.6
Secondary School Attendance (F:M) (%)	32:36
Literacy Rate (F:M) %	68:84
Villages with Health Facility within 2 hrs (%)	67
Villages with access to credit facilities (%)	33

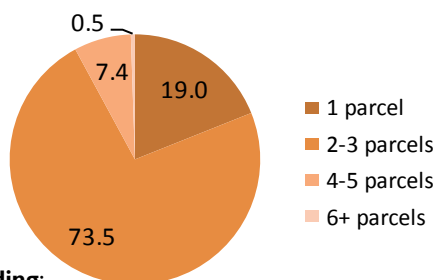
AGRICULTURAL LIVELIHOOD STRATEGIES

Land Holding Characteristics (% of HHs), 2011

(a) by size of land holdings

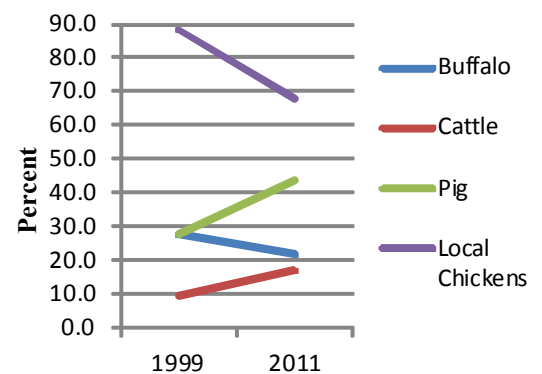


(b) by land fragmentation

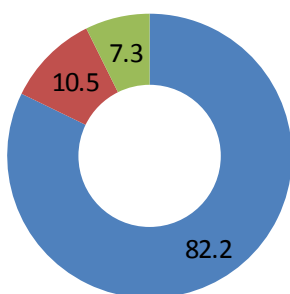


Avg. Land Holding:
Attapeu: 1.9 ha
National: 2.4 ha

Livestock Ownership Trends (% of HHs)



HH Distribution by production system, 2011



■ lowland ■ upland ■ plateau

Total Rice Production 2011: 70,790 Tons

HHs growing select secondary crops, 2011

Secondary Crop	# of growers	% of Farm HHs
Mango	7,300	39
Coconut	5,700	30
Tamarind	5,000	26
Maize	4,000	21
Cassava	2,300	12

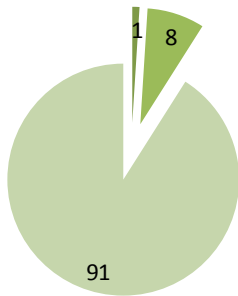
LIVELIHOOD OUTCOMES

Access to Food

Market Access

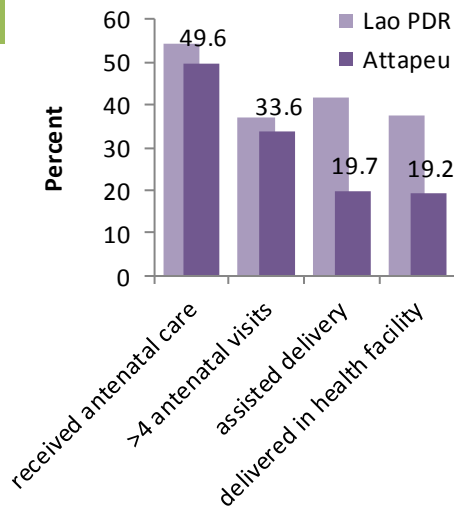
Villages with year-round road access to district (%) **69**

Food Consumption Score

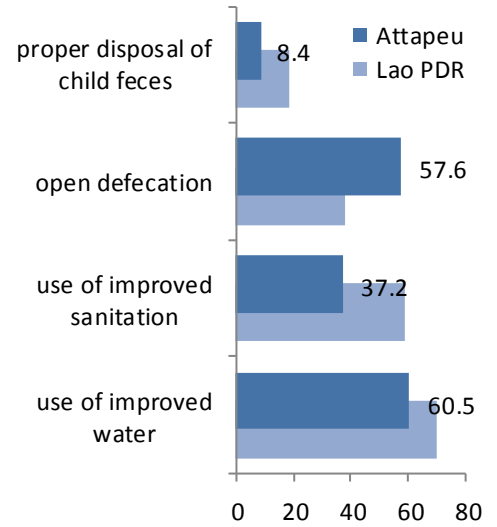


■ poor ■ borderline ■ acceptable

Care Practices

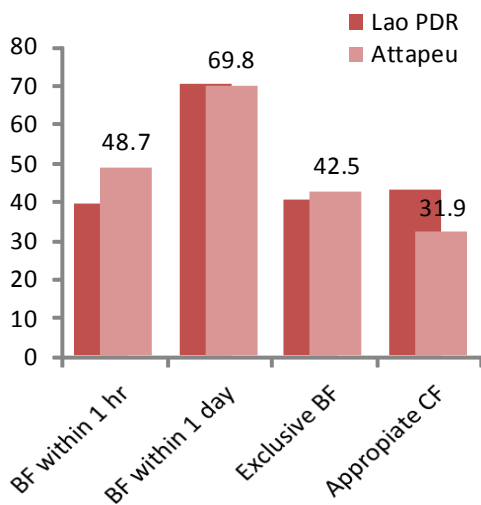


Water & Sanitation

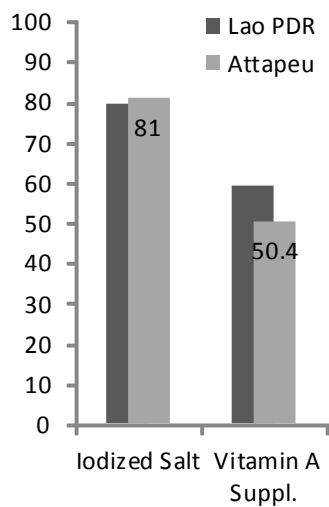


NUTRITION

IYCF Practices



Micronutrients



Nutrition & Mortality Figures

	Attapeu	Lao PDR
Stunting	39.7	44.2
Underweight	32	26.6
Wasting	10.6	5.9
U5MR	77	89
Infant MR	58	76

VULNERABILITY

Natural Hazards

Earthquake	Not at risk
Landslide	Moderate/high risk—medium susceptibility in 67% of land area, high susceptibility in 14%
Drought	Low risk of moderate to extreme drought in western parts in the dry season
Flood	At risk—Xe Kong river (7 districts, Thateng, Pakxong, Sanxai, Samamxai, Samakhixa, Phou-vong, & Xaisettha)
Storm	At risk

Non-Natural Hazards

UXO	High density in many provinces
NTFPs	At risk (Declining availability & access, multiple causal factors)
Concessions	At risk (loss of access to land, impact on the environment, etc)
Opium	Not at risk
Resettle-ment	17% of villages resettled in past 10 years; 10% planned to resettle

ANNEX 2: AGRO-ECOLOGICAL ZONES OF LAO PDR

Vientiane Plain:

This area extends over parts of Vientiane, Bolikhamxay and Khammuane 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 growing 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 and illegal logging. Upland rice cultivation is one of the main agricultural activities but animal husbandry is also of some importance. The region is characterized by medium to low population density with poverty concentrated in the semi-urban areas.

Northern Lowland areas:

This area comprises parts of Luangprabang, Phongsaly, Oudomxay and Xayabury. 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, rapid expansion of cash cropping (particularly maize) and livestock grazing. The population density is higher than in the Northern Highlands and poverty incidence is declining. While the transition to commercial agriculture appears to be bringing marked improvements in farmers' livelihoods, there is concern about the sustainability of the farming systems (severe erosion).

Northern Highland areas:

This zone covers the mountain areas of Phongsaly, Luangnamtha and Bokeo in the extreme northwest, parts of Huaphanh and Xiengkhuang 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. Upland livelihoods and farming systems are undergoing a rapid transition from subsistence-based systems to ones more geared towards the market. Natural forests have been largely removed by shifting cultivation and commercial or smallholder rubber plantations. Overall, population density is relatively low and poverty incidence is medium to high.

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 millimeters, 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 to make way for intensive crop production, particularly of lowland rain-fed rice, irrigated rice, and cash crops in the sloped areas. The region is the most densely populated area in the Lao PDR.

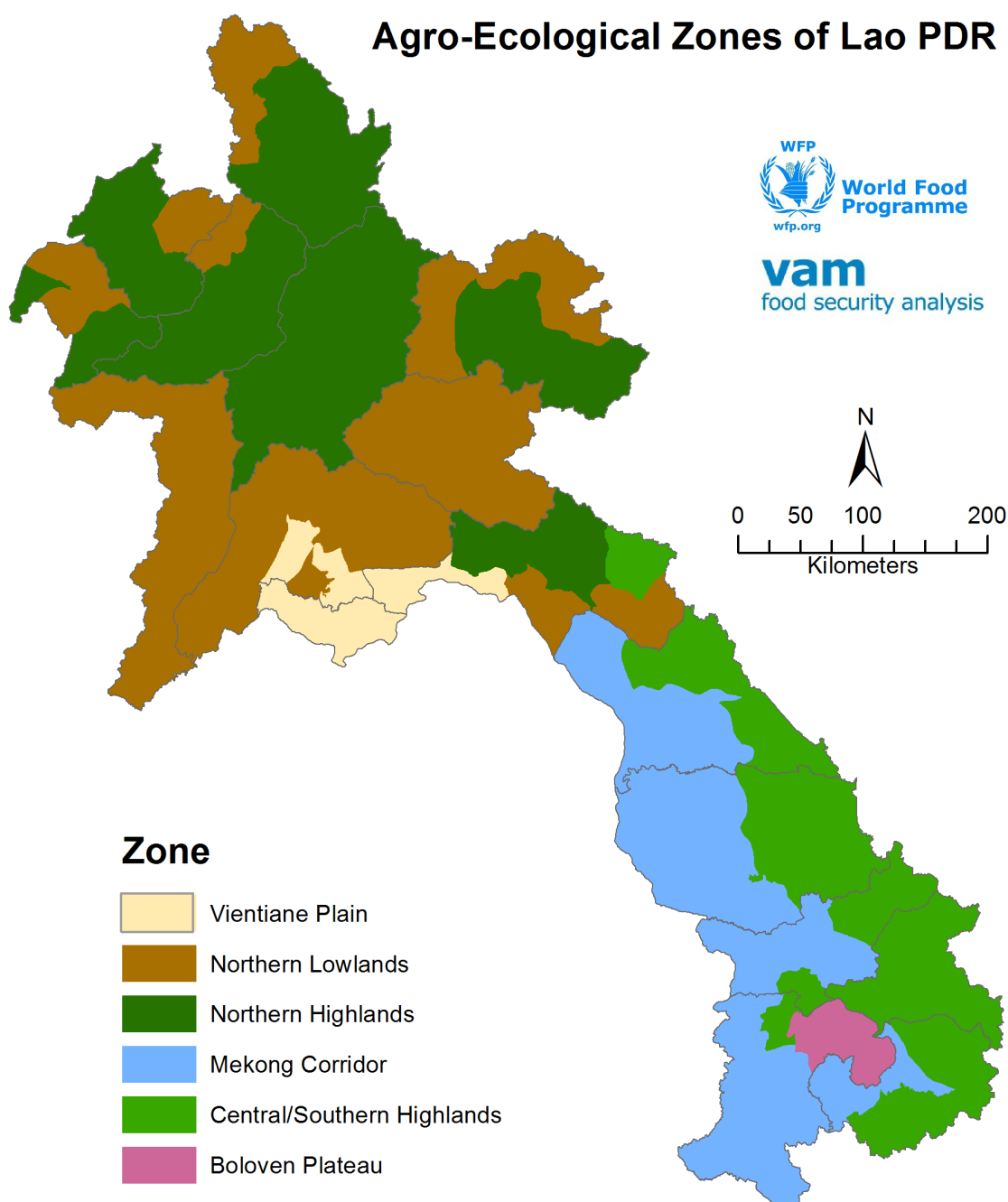
Central-Southern Highlands & Boloven Plateau:

The Central-Southern Highlands includes parts of Khammouane, Savannakhet, Saravane, 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. 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 density is low and poverty incidence is one of the highest.

The region has also faced considerable increase in cross-border investments in mining and rubber plantations, as well as improvement in transportation, that are impacting the local rural population with little significant poverty reduction.

Most of the Boloven Plateau is located within Paxkong district in Champasack province in the south of the country, though the edges of the plateau are also located in neighbouring Sekong and Attapeu provinces. Altitude varies from 800-1,500 meters and rainfall ranges from 2,500-3,000 mm. The 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. In recent years, medium to large scale agriculture concessions have increased in size and importance.

Agro-Ecological Zones of Lao PDR



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