Socio-Economic Atlas of the Lao PDR

Patterns and Trends from 2005 to 2015

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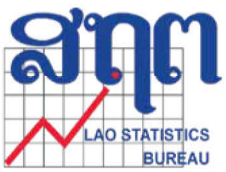

Lao Statistics Bureau (LSB), Ministry of Planning and Investment (MPI), Lao PDR, and Centre for Development and Environment (CDE), University of Bern, Switzerland, with Bern Open Publishing (BOP), 2018

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Funded by: Swiss Agency for Development and Cooperation SDC

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Layout and design: Watcharapol Isarangkul Na Ayuthaya

Printed by: Pankham Jampa Printing, Vientiane, Lao PDR

Funding: Swiss Agency for Development and Cooperation (SDC)

DOI: https://doi.org/10.7892/boris.120671

ISBN (e-print): 978-3-906813-62-2

ISBN (print): 978-3-906813-61-5

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Citation: Epprecht Michael; Bosoni Nicholas; Ehrensperger Albrecht; Nagasawa Hiroko; Lu Juliet; Studer David; Vollmar Patrizia; and Sisoulath Vilaysook (2018). *Socio-Economic Atlas of the Lao PDR. Patterns and trends from 2005 to 2015.* Bern, Switzerland and Vientiane, Lao PDR: Centre for Development and Environment, University of Bern, and Lao Statistics Bureau, Lao PDR, with Bern Open Publishing. 124 pp.

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List of abbreviations

ADB	Asian Development Bank
CDE	Centre for Development and Environment
CLTS	Community-Led Total Sanitation
EFA	Education For All
GIS	Geographic Information Systems
GMS	Greater Mekong Subregion
GoL	Government of the Lao PDR
IMF	International Monetary Found
km	Kilometre
Lao PDR	Lao People's Democratic Republic
LDC	Least developed countries
LECS	Lao Expenditure and Consumption Surveys
LPG	Liquid petroleum gas
LSB	Lao Statistical Bureau
MAF	Ministry of Agriculture and Forestry
masl	Metre above sea level
MDGs	Millennium Development Goals
MPI	Ministry of Planning and Investment
MW	Megawatt
NER	Net Enrolment Rate
NGD	National Geographic Department of the Lao PDR
NSEDP	National Socioeconomic Development Plan
OOSC	Out of school children
PHC	Population and Housing Census
SDC	Swiss Agency for Development and Cooperation
SDGs	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
UN	United Nations
UNCRPD	United Nations Convention on the Rights of Persons with Disabilities
UNFPA	United Nations Population Found
UNICEF	United Nations Children's Fund
UXO	Unexploded Ordnance
WB	World Bank
WHO	World Health Organization

Foreword

The importance of reliable statistics for well-informed planning and decision-making cannot be emphasized enough, and the Government of the Lao PDR has long recognized this. The national Population and Housing Censuses are among the most important sources of information for the monitoring and analysis of socio-economic developments, and provide a solid basis for developing strategies for the sustainable development of the country.

The 4th Population and Housing Census was conducted in March 2015 by the Lao Statistics Bureau (LSB) according to the Prime Ministerial Decree No. 89/PM, dated September 11, 2013. The results of the census provide key insights into the demographic, social, and economic conditions of all households in the Lao PDR, and are therefore a key foundation for supporting the smooth graduation from the list of Least Developed Countries (LDC), and for monitoring of progress towards the 8th National Socio-Economic Development Plan (NSEDP) and towards the Sustainable Development Goals (SDG).

This new Socio-Economic Atlas of the Lao PDR takes the statistics of the census one level further by adding a layer of geographic information that lets us visualize important trends and indicators through a large set of highly informative maps. Not only does the Atlas present the socio-economic characteristics of the Lao population as of 2015, but it also reveals the many changes society experienced in the past decade. It reveals where progress was strongest in specific areas of development, as well as locations where progress has been less pronounced.

It is my hope that this new source of insights will be used widely to inform decisions for the continued strong development of our country.

Dr. Samaychanh Boupha
Head of Lao Statistics Bureau, Vice Minister

Preface

The world has successfully fought against human ordeal such as poverty, hunger, diseases and illiteracy. Cutting world poverty to half and reducing hunger significantly between the years 2000 and 2015 are substantial achievements by the Millennium Campaign. Never before in history did the aggregate numbers that indicate development trends hit comparable marks.

The Lao PDR has been particularly effective in designing pathways out of poverty. With the majority of the economic indicators pointing steadily upwards, its goal to graduate from the LDC countries in the early 2020s comes into reach. At this moment, the Socio-Economic Atlas of the Lao PDR is a particularly timely publication, as it allows tracing different variations of possible development trajectories. The detailed analysis of a rich variety of socio-economic indicators puts the success narrative on the aggregate accomplishments into perspective.

The 131 maps highlight the dimensions that characterize the socio-economic development pathways in the Lao PDR and thus stimulate the debate about what measures will be effective in addressing persistent poverty. The Atlas illustrates, impressively, that while the development gap between the Lao PDR and other countries was reduced, the concern about within-country inequality must continue to drive political agendas. The trajectory of a country like the Lao PDR, notable as it is, needs to be reflected against the more complicated, the high-resolution and often inconvenient truth of inverse relations. The maps identify where and for whom deprivation is most entrenched, where progress was made and in what areas the obstacles appear to be insuperable and thus inviting interpretations about interlinkages between poverty dimensions. In light of Agenda 2030, these are the challenges we are facing. This is reinforced by the fact that nowadays over 70% of the world's poor live in middle-income countries. Against the background of the rapid change in socio-economic conditions, political priorities in the Lao PDR will have to draw upon a thorough analysis of these patterns. The plea to leave no one behind resonates with the commitment to dig deeper and shape policies towards actual transformation.

The present edition of the Socio-Economic Atlas of the Lao PDR offers a fascinating story of development. It is an alternative to the mainstream narrative that indeed must be told now.

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About the Atlas

Since 1985, the Government of the Lao People's Democratic Republic, through the Lao Statistical Bureau (LSB) and under the Ministry of Planning and Investment (MPI), has conducted four national Population and Housing Censuses (PHC) at ten year intervals. The 3rd and 4th PHC were conducted in March 2005 and 2015 respectively. These censuses collect basic demographics and housing data for the entire population of the Lao People's Democratic Republic (Lao PDR). Such information is essential for carrying out well-informed socio-economic analysis, monitoring, and planning at central as well as at sub-national levels. The design, implementation, and monitoring of – for instance – the National Socio-Economic Development Plans (NSEDPs), as well as the implementation of the 2030 Agenda for Sustainable Development (Agenda 2030) set by the United Nations (UN) in 2015 with its corresponding set of Sustainable Development Goals (SDG), relies heavily on detailed national statistics such as those resulting from the national censuses. The census results have proven invaluable for planning, targeting, implementing, and monitoring of a wide range of development programs promoting poverty alleviation in general, gender equality and inclusion of disadvantaged segments of the population, as well as improving infrastructure and services in the health, education, water, sanitation, and transport sectors.

Unlike national sample surveys, the PHCs are distinctive in being a complete enumeration of the entire population. The range of information collected on every individual in the country includes demographic as well as socio-economic characteristics.

This complete coverage of the entire population results in a rich statistical database. During the census implementation, each individual was counted at his or her usual place of residence, which in most cases is the village where each person was registered. By combining the statistical census database with detailed geographic information, a whole new dimension is added to the collected information, opening the doors for detailed analysis of patterns across the different areas of the country. To achieve this, the individual and household statistics were aggregated and calculated as specific indicators at village-level, then plotted on national maps, and disaggregated to the lowest administrative level possible (the village-level). This process of combination and analysis using data from the PHC 2005 resulted in the Socio-Economic Atlas of 2005 – the first of its kind in the Lao PDR, published in 2008, revealing for the first time the rich diversity in socio-economic characteristics of the population of the Lao PDR on detailed national maps (Messerli *et al.*, 2008).

This new atlas goes one important step further: using geographic information on the place of residence of each individual in each census, the data of the two latest PHCs (2005 and 2015), were linked geographically, which allowed for calculations, analysis and the mapping of changes in Lao society and its population over space and time. The resulting maps – showing both the Lao PDR in 2015, and the changes between 2005 and 2015 – reveal patterns and trends not obvious when looking at the statistics alone, and provide invaluable insights for current and future development planning.

With the exception of the maps on the topography, the accessibility times to different locations, as well as the maps on poverty and inequality, all maps were developed based on the statistical data of the PHCs of 2005 and 2015, combined with geographic village location and administrative boundary information from the Ministry of Agriculture and Forestry (MAF) and the National Geographic Department (NGD) respectively.

The geographic information on the location of each village was available in the form of coordinates for the main administrative centre of each village. For visualization purposes, the country's surface was divided into "village polygons" around each village centre point. The polygons are approximations and do not represent exact village boundaries. For a more detailed description of this, see Epprecht *et al.*, 2008).

The censuses were funded by the Government of the Lao PDR (GoL), with substantial support from the Swedish International Development Cooperation Agency (SIDA) in 2005, and the Swiss Agency for Development and Cooperation (SDC), the United Nations Population Fund (UNFPA), the Government of the People's Republic of China, the World Bank (WB), and United Nations Children's Fund (UNICEF) in 2015.

The development of this atlas was made possible thanks to the contributions and support of a range of people and institutions. The LSB provided the necessary raw data from the censuses, based on which the many different variables and indicators used in this atlas were calculated. The atlas itself was developed within the framework of the Lao DECIDE info Project, which is funded by the Government of Switzerland through SDC. We would like to express our appreciation for the continued support of SDC in Bern, and the Swiss Cooperation Office in the Mekong Region in Vientiane.

A great number of people have contributed their technical and contextual knowledge to the development to this atlas, and are listed as co-authors of this atlas.

The atlas is structured similar to the Socio-Economic Atlas of 2005, (Messerli *et al.*, 2008) which allows for easier comparisons. As this new atlas presents the spatial patterns of the situation as of 2015, along with the various changes that were observed in the 10 years between the two latest censuses, it is most valuable when consulted together with the earlier atlas. A brief introductory chapter is followed by a section on the general demographic characteristics of the population in the Lao PDR, before patterns of migration within the Lao PDR are highlighted in a subsequent chapter. The two chapters that follow first put a spotlight on education and then on insights into health issues that can be gleaned from the census data. The geographic distribution of the country's many ethnicities and religious practices is then presented, followed by descriptions of various economic characteristics of the population. The last two chapters focus on the living conditions of communities in the different parts of the country, and on the spatial distribution of the poor, as well as the dynamics of poverty in the Lao PDR.

INTRODUCTION

#	Name
Vientiane Capital	
101	Chanthabuly
102	Sikhottabong
103	Xaysetha
104	Sisattanak
105	Naxaithong
106	Xaythany
107	Hadxaifong
108	Sangthong
109	Mayparkngum
Phongsaly Province	
201	Phongsaly
202	May
203	Khua
204	Samphanh
205	Boon neua
206	Nhot ou
207	Boontai
Luang Namtha Province	
301	Namtha
302	Sing
303	Long
304	Viengphoukha
305	Nalae
Oudomxay Province	
401	Xay
402	La
403	Namor
404	Nga
405	Beng
406	Hoon
407	Pakbeng
Bokeo Province	
501	Huay xay

#	Name
502	Tonpheung
503	Meung
504	Pha oudom
505	Paktha
Luang Prabang Province	
601	Luang Prabang
602	Xieng Ngeun
603	Nan
604	Park Ou
605	Nambak
606	Ngoi
607	Pak Xeng
608	Phonxay
609	Chomphet
610	Viengkham
611	Phoukhoune
612	Phonthong
Huaphanh Province	
701	Xamneua
702	Xiengkhor
703	Huim
704	Viengxay
705	Huameuang
706	Xamtay
707	Sopbao
708	Add
709	Kuane
710	Sone
Xayabury Province	
801	Xayabury
802	Khop
803	Hongsa
804	Ngeun
805	Xienghone

#	Name
806	Phiang
807	Parklai
808	Kenethao
809	Botene
810	Thongmyxay
811	Xaysathan
Xiengkhuang Province	
901	Pek
902	Kham
903	Nonghed
904	Khoune
905	Morkmay
906	Phoukoud
907	Phaxay
Vientiane Province	
1001	Phonhong
1002	Thoulakhom
1003	Keo oudom
1004	Kasy
1005	Vangvieng
1006	Feuang
1007	Xanakharm
1008	Mad
1009	viengkham
1010	Hinherb
1013	Meun
Borikhamxay Province	
1101	Pakxanh
1102	Thaphabath
1103	Pakkading
1104	Bolikhanh
1105	Khamkeuth
1106	Viengthong
1107	Xaychamphone

#	Name
Khammuane Province	
1201	Thakhek
1202	Mahaxay
1203	Nongbok
1204	Hinboon
1205	Nhommalath
1206	Bualapha
1207	Nakai
1208	Xebangfay
1209	Xaybuathong
1210	Khounkham
Savannakhet Province	
1301	Kaysone Phomvihane
1302	Outhoomphone
1303	Atsaphangthong
1304	Phine
1305	Sepone
1306	Nong
1307	Thapangthong
1308	Songkhone
1309	Champhone
1310	Xonbuly
1311	Xaybuly
1312	Vilabuly
1313	Atsaphone
1314	Xayphoothong
1315	Phalanxay
Saravane Province	
1401	Saravane
1402	Ta oi
1403	Toomlarn
1404	Lakhonepheng
1405	Vapy
1406	Khongxedone

#	Name
1407	Lao ngarm
1408	Samuoi
Sekong Province	
1501	Lamarm
1502	Kaleum
1503	Dakcheung
1504	Thateng
Champasack Province	
1601	Pakse
1602	Sanasomboon
1603	Bachiangchaleunsook
1604	Paksxong
1605	Pathoomphone
1606	Phonthong
1607	Champasack
1608	Sukhuma
1609	Moonlapamok
1610	Khong
Attapeu Province	
1701	Xaysetha
1702	Samakkhixay
1703	Sanamxay
1704	Sanxay
1705	Phouvong
Xaysomboun Province	
1801	Anouvong
1802	Thathom
1803	Longcheng
1804	Home
1805	Longsane

Administrative division and topography

The Lao People's Democratic Republic (Lao PDR) is a landlocked country located in Southeast Asia. It is bordered by the People's Republic of China to the north, the Socialist Republic of Vietnam to the east, the Kingdom of Cambodia to the south, the Kingdom of Thailand to the west and the Republic of the Union of Myanmar to the northwest.

At the time of the latest census, the country had one city – Vientiane Capital City – and three secondary metropolitan areas – Luang Prabang, Savannakhet, and Pakxe towns – along with numerous smaller provincial and district capitals. All towns in the Lao PDR are under the administration of the respective province or district, except for Vientiane Capital City, which is equivalent to a province.

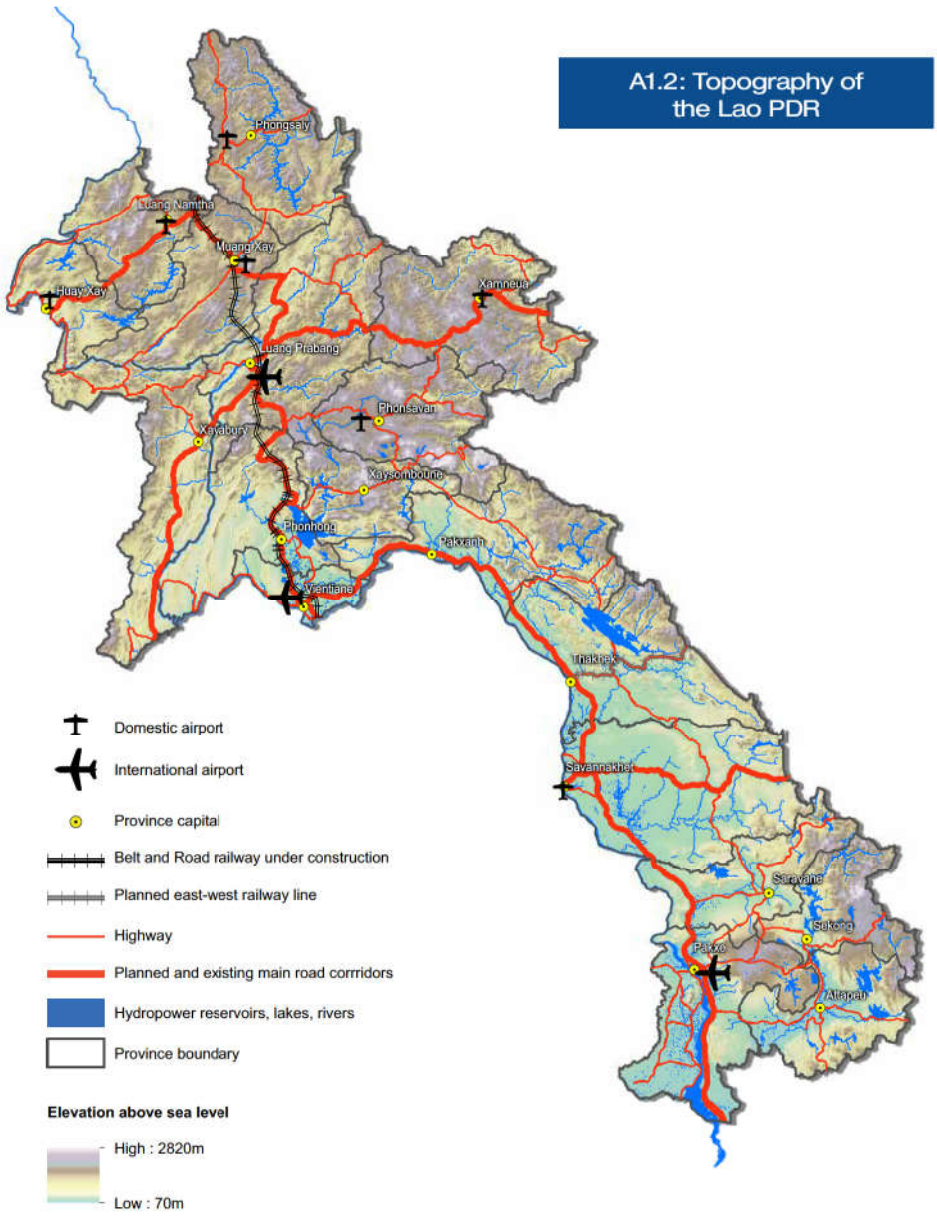
Map A1.1 shows the administrative division of the Lao PDR in 2015, including provincial and district boundaries with their respective provincial capitals. The number and delineation of the administrative divisions has been adjusted numerous times since the establishment of the Lao PDR. The changes are intended to improve local administration and public service delivery, as well as socio-economic and cultural development through strategic allocation of its limited resources.

The country is divided into 17 provinces and one prefecture, Vientiane Capital City. Provinces are further divided in 148 districts, with 9 new districts established since 2005. The smallest administrative unit is the village. The Lao PDR is composed of 8,507 villages, which has decreased from 10,052 in 2005, largely as the result of a process of administrative consolidation of physical villages.

Vientiane Capital City, once part of Vientiane Province, was formed in 1989 as a prefecture separate from Vientiane Province. In 1994, Xaysomboune Special Administrative Region was established, combining parts of Vientiane, Borikhamxay, and Xiengkhuang Provinces. Xaysomboune was under central administrative control until it was dissolved in 2006, when the respective districts were re-allocated to the initial provinces. In 2013, the area was then established as a new province.

About three quarters of the country's territory are relatively sparsely populated mountainous uplands (see Map A1.2). The highest peak is Phou Bia Mountain at 2,820 metres above sea level (masl) in Xiengkhuang Province, and the lowest point is 70 masl along the Mekong River in Champasak Province, near the Cambodian border. With 6.5 million people residing in an area of 236,800 km², the country has one of the lowest population densities in the region.

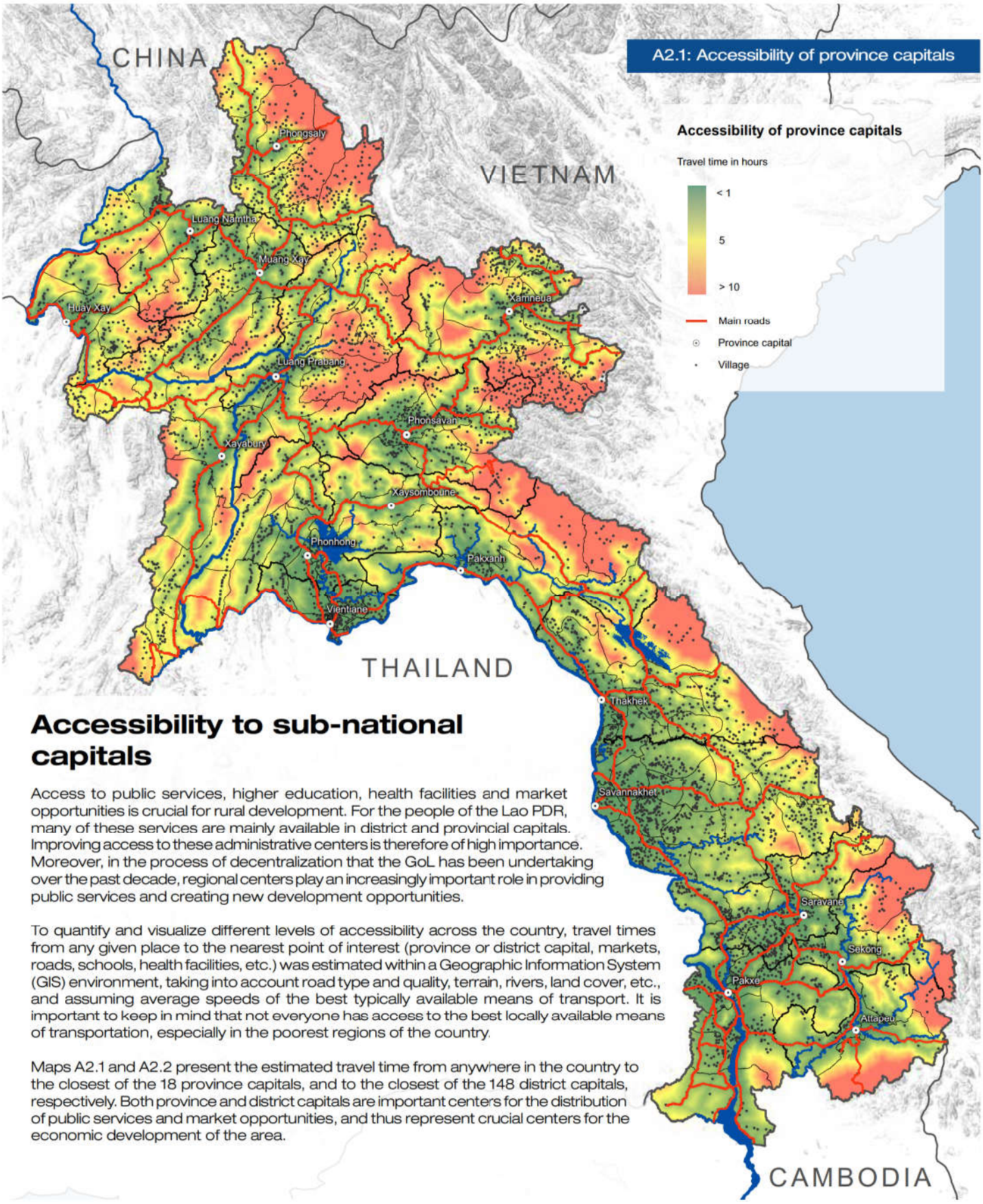
A1.2: Topography of the Lao PDR



The lowlands, where about three quarters of the country's population lives, constitute around 25% of the country's area, and stretch from the plains around Vientiane Capital City along the Mekong River to the Cambodian border, including much of Savannakhet Province.

Map A1.2 shows the main national road network, along with the planned major road and railway corridors. The Lao PDR depends greatly on road transportation for economic development. In recent years, road network expansion has been followed by a sharp increase in the number of vehicles throughout the country. Although the road network improved substantially in the last decades, many roads are still in poor condition. Waterways are another vital means of transportation, and the Mekong and Nam Ou Rivers are especially important natural channels for large-draft boat transportation. International and national airports are located on the map as well. The country has ten airports, three of which offer international flights, namely Vientiane, Luang Prabang, and Pakxe Airports.

While the mountainous terrain of the country is a challenge for the population in terms of improving transport and agricultural land use, it can also be used to the country's advantage through the construction of reservoirs and the operation of hydropower stations.



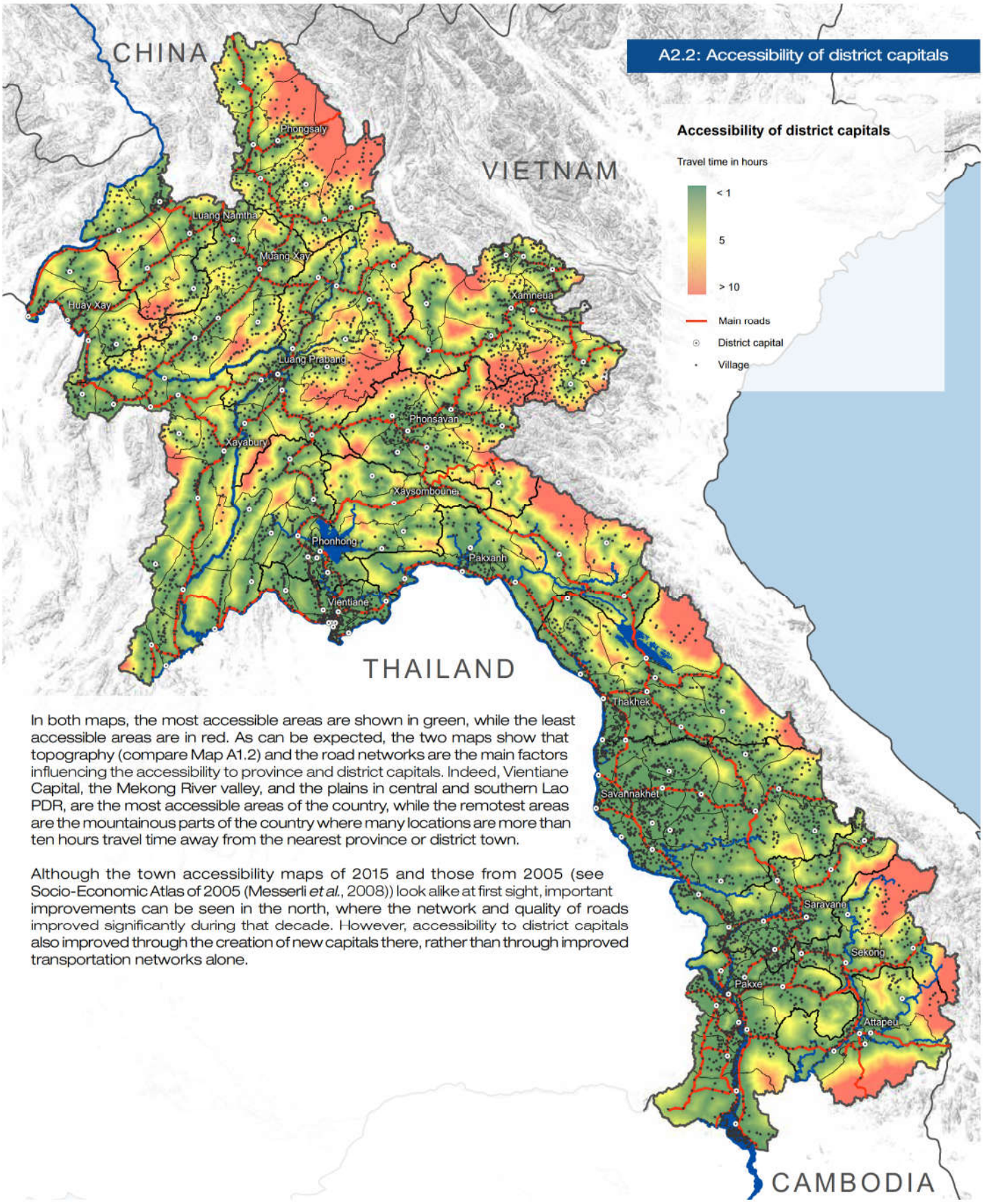
Accessibility to sub-national capitals

Access to public services, higher education, health facilities and market opportunities is crucial for rural development. For the people of the Lao PDR, many of these services are mainly available in district and provincial capitals. Improving access to these administrative centers is therefore of high importance. Moreover, in the process of decentralization that the GoL has been undertaking over the past decade, regional centers play an increasingly important role in providing public services and creating new development opportunities.

To quantify and visualize different levels of accessibility across the country, travel times from any given place to the nearest point of interest (province or district capital, markets, roads, schools, health facilities, etc.) was estimated within a Geographic Information System (GIS) environment, taking into account road type and quality, terrain, rivers, land cover, etc., and assuming average speeds of the best typically available means of transport. It is important to keep in mind that not everyone has access to the best locally available means of transportation, especially in the poorest regions of the country.

Maps A2.1 and A2.2 present the estimated travel time from anywhere in the country to the closest of the 18 province capitals, and to the closest of the 148 district capitals, respectively. Both province and district capitals are important centers for the distribution of public services and market opportunities, and thus represent crucial centers for the economic development of the area.

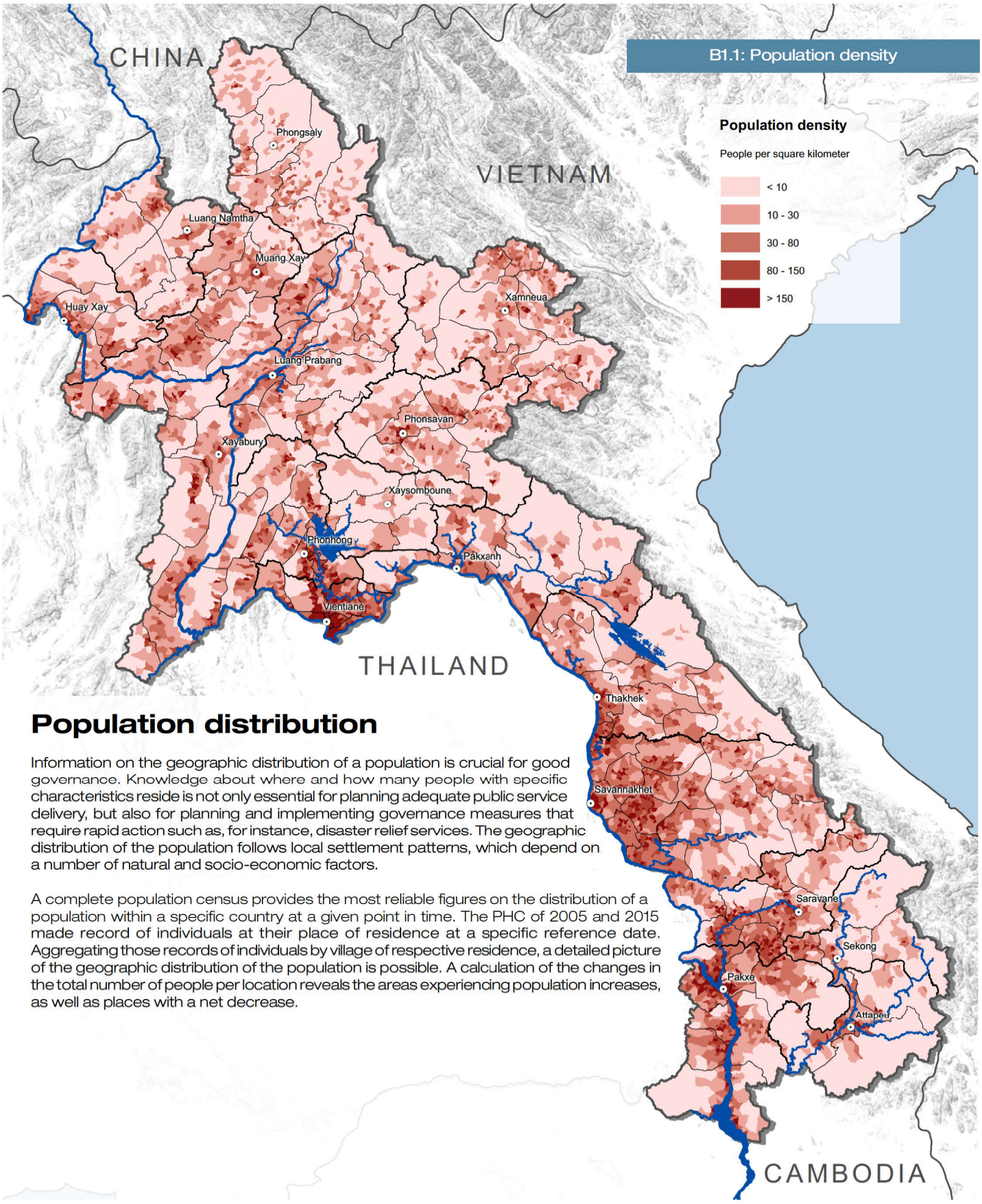
A2.2: Accessibility of district capitals



In both maps, the most accessible areas are shown in green, while the least accessible areas are in red. As can be expected, the two maps show that topography (compare Map A1.2) and the road networks are the main factors influencing the accessibility to province and district capitals. Indeed, Vientiane Capital, the Mekong River valley, and the plains in central and southern Lao PDR, are the most accessible areas of the country, while the remotest areas are the mountainous parts of the country where many locations are more than ten hours travel time away from the nearest province or district town.

Although the town accessibility maps of 2015 and those from 2005 (see Socio-Economic Atlas of 2005 (Messerli *et al.*, 2008)) look alike at first sight, important improvements can be seen in the north, where the network and quality of roads improved significantly during that decade. However, accessibility to district capitals also improved through the creation of new capitals there, rather than through improved transportation networks alone.

DEMOGRAPHY



Population distribution

Information on the geographic distribution of a population is crucial for good governance. Knowledge about where and how many people with specific characteristics reside is not only essential for planning adequate public service delivery, but also for planning and implementing governance measures that require rapid action such as, for instance, disaster relief services. The geographic distribution of the population follows local settlement patterns, which depend on a number of natural and socio-economic factors.

A complete population census provides the most reliable figures on the distribution of a population within a specific country at a given point in time. The PHC of 2005 and 2015 made record of individuals at their place of residence at a specific reference date. Aggregating those records of individuals by village of respective residence, a detailed picture of the geographic distribution of the population is possible. A calculation of the changes in the total number of people per location reveals the areas experiencing population increases, as well as places with a net decrease.

Spatial patterns in 2015

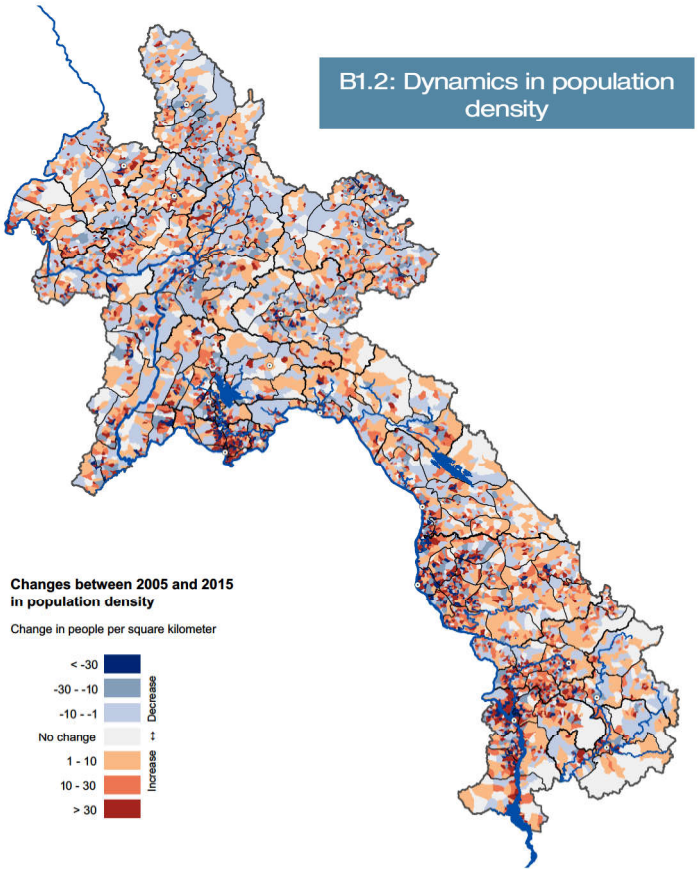
The population of 6.492 million people living in the Lao PDR in 2015 is distributed rather unevenly across the country's territory of nearly 236,800 km^2. Topography plays a significant role in determining population distribution and density: the majority of the country's land is mountainous terrain with a low population density, whereas the country's fertile flat plains support a greater density of people. The country's main lowland areas are located primarily along the Mekong River and its tributaries where Vientiane Capital City and other main provincial capitals are located. As illustrated in Map B1.1, the population is concentrated primarily in and around the country's main urban areas of Vientiane, Pakxe, and Savannakhet, followed by the rural lowland areas of Vientiane Capital City, Savannakhet Province, and Champasak Province. About one quarter of the Lao population lived in towns throughout the country and in Vientiane Capital City in 2015. The urban areas in the Lao PDR are relatively small compared to those in neighbouring countries. Vientiane Capital City, with a population of over half a million inhabitants, is by far the largest urban area in the country, followed by Savannakhet, Pakxe, and Luang Prabang towns, all with populations between 50,000 and 100,000. More than half of all provincial capitals have fewer than 20 thousand inhabitants, whereas district capitals are typically home to fewer than 5,000 people.

These main urban areas and the relatively densely populated rural areas of Savannakhet Province, Champasak Province, and Vientiane Capital City contrast sharply with the sparsely populated mountainous areas of the north and of the eastern parts of southern Lao PDR, both of which have a low population density, interspersed with somewhat higher population densities only in the valleys along the main transit routes (compare Map A1.2).

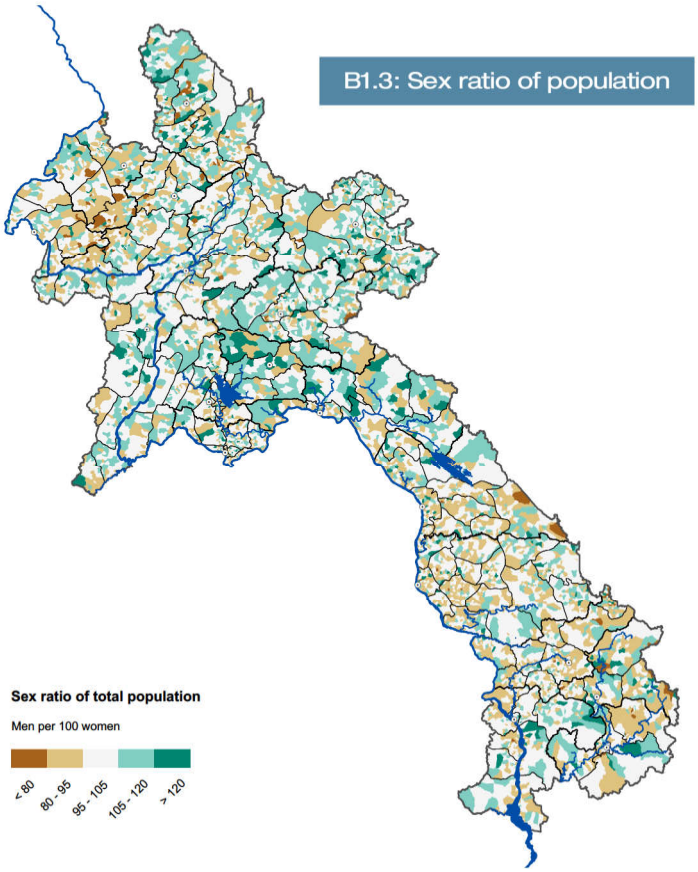
The ratio of men to women (the sex ratio) in the Lao PDR was 101 in 2015, implying just marginally more men than women. There are a number of areas in the country with more women than men (ratios below 100, shown in brown on Map B1.3), including parts of Luang Namtha and Bokeo Provinces, as well as Savannakhet Province. The age structure of the population, as well as patterns of migration, strongly influence the sex ratio of any given location (compare Maps B1.3, as well as C1.1 and C1.3), where younger populations tend to have a higher sex ratio than older populations, or where gender specific labour migration influences the gender balance for in- and out-migration areas.

Dynamics between 2005 and 2015

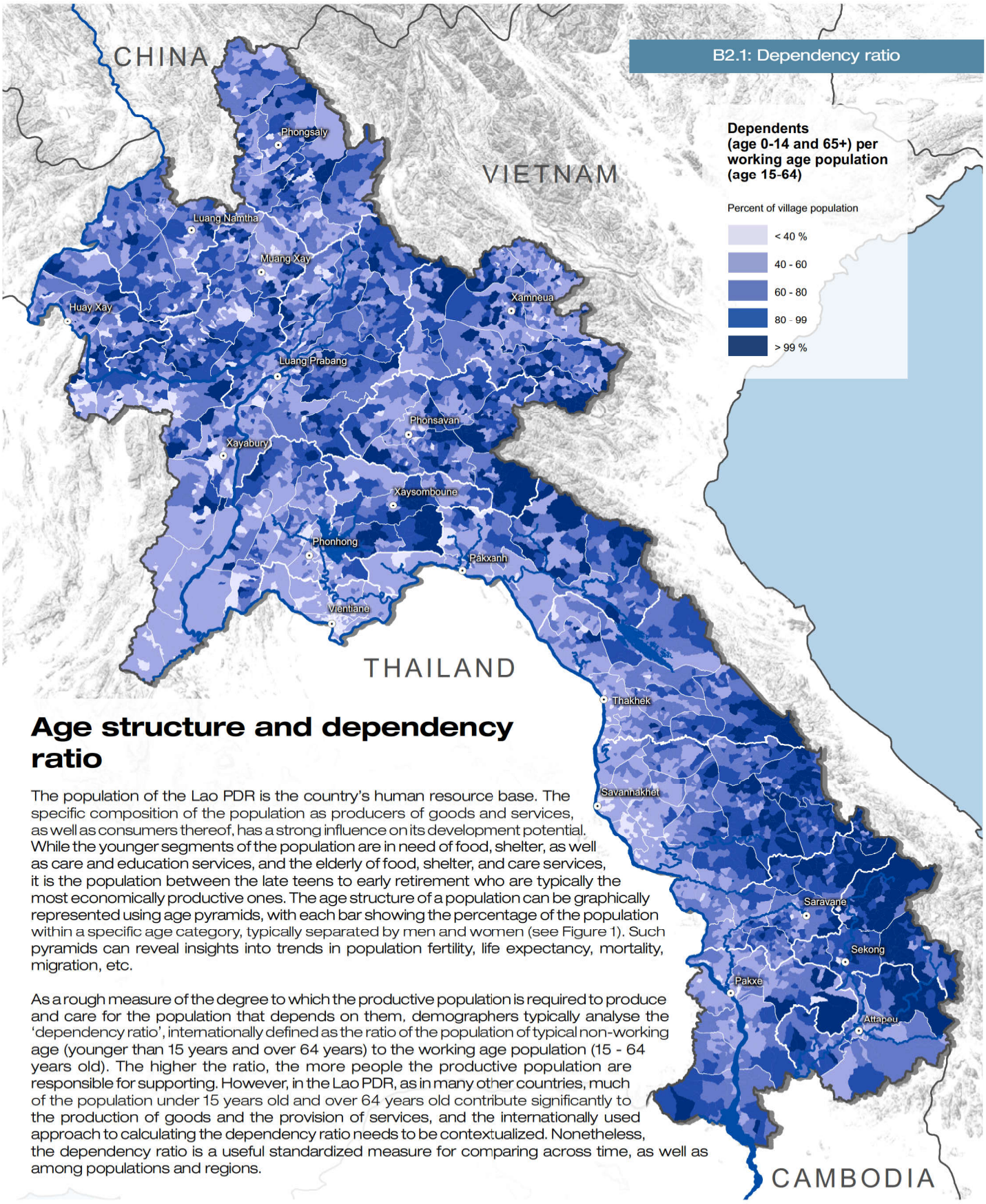
Overall, the country's population has grown at a rate of 1.45% per year between 2005 and 2015, down from an average of over 2% in the previous decade. Significant population increases have occurred primarily in and around the country's main urban areas, namely in Vientiane Capital City, followed by the areas around the province capitals of Champasak and Savannnakhet. Overall, the southern region has experienced greater population growth than the northern region, reflecting the general population density and distribution. Decreases in population are most evident in the more remote areas of the north (compare Maps A2.1 and A2.2).



B1.2: Dynamics in population density



B1.3: Sex ratio of population



Age structure and dependency ratio

The population of the Lao PDR is the country's human resource base. The specific composition of the population as producers of goods and services, as well as consumers thereof, has a strong influence on its development potential. While the younger segments of the population are in need of food, shelter, as well as care and education services, and the elderly of food, shelter, and care services, it is the population between the late teens to early retirement who are typically the most economically productive ones. The age structure of a population can be graphically represented using age pyramids, with each bar showing the percentage of the population within a specific age category, typically separated by men and women (see Figure 1). Such pyramids can reveal insights into trends in population fertility, life expectancy, mortality, migration, etc.

As a rough measure of the degree to which the productive population is required to produce and care for the population that depends on them, demographers typically analyse the 'dependency ratio', internationally defined as the ratio of the population of typical non-working age (younger than 15 years and over 64 years) to the working age population (15 - 64 years old). The higher the ratio, the more people the productive population are responsible for supporting. However, in the Lao PDR, as in many other countries, much of the population under 15 years old and over 64 years old contribute significantly to the production of goods and the provision of services, and the internationally used approach to calculating the dependency ratio needs to be contextualized. Nonetheless, the dependency ratio is a useful standardized measure for comparing across time, as well as among populations and regions.

B2.2: Dynamics in dependency ratio

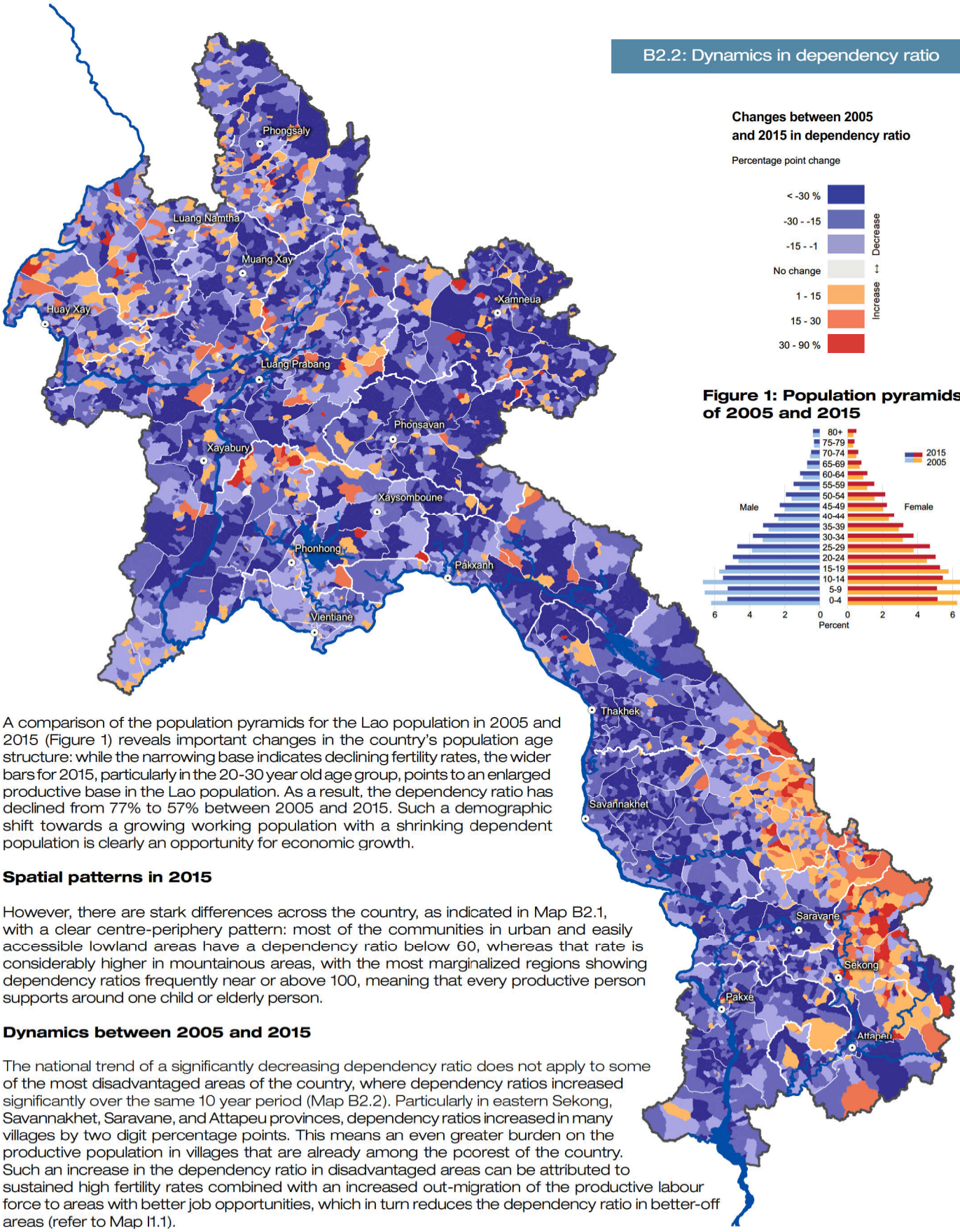


Figure 1: Population pyramids of 2005 and 2015

A comparison of the population pyramids for the Lao population in 2005 and 2015 (Figure 1) reveals important changes in the country's population age structure: while the narrowing base indicates declining fertility rates, the wider bars for 2015, particularly in the 20-30 year old age group, points to an enlarged productive base in the Lao population. As a result, the dependency ratio has declined from 77% to 57% between 2005 and 2015. Such a demographic shift towards a growing working population with a shrinking dependent population is clearly an opportunity for economic growth.

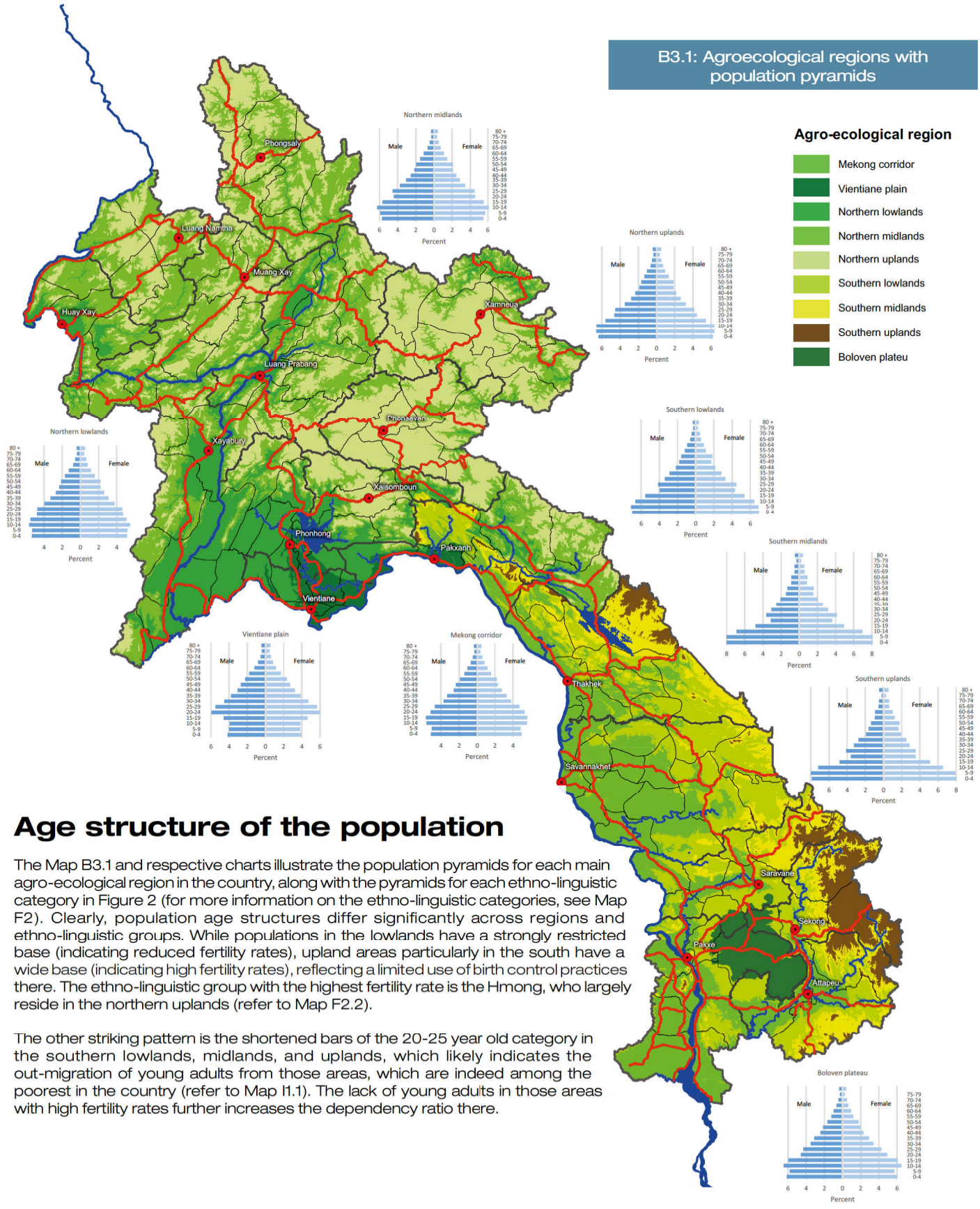
Spatial patterns in 2015

However, there are stark differences across the country, as indicated in Map B2.1, with a clear centre-periphery pattern: most of the communities in urban and easily accessible lowland areas have a dependency ratio below 60, whereas that rate is considerably higher in mountainous areas, with the most marginalized regions showing dependency ratios frequently near or above 100, meaning that every productive person supports around one child or elderly person.

Dynamics between 2005 and 2015

The national trend of a significantly decreasing dependency ratio does not apply to some of the most disadvantaged areas of the country, where dependency ratios increased significantly over the same 10 year period (Map B2.2). Particularly in eastern Sekong, Savannakhet, Saravane, and Attapeu provinces, dependency ratios increased in many villages by two digit percentage points. This means an even greater burden on the productive population in villages that are already among the poorest of the country. Such an increase in the dependency ratio in disadvantaged areas can be attributed to sustained high fertility rates combined with an increased out-migration of the productive labour force to areas with better job opportunities, which in turn reduces the dependency ratio in better-off areas (refer to Map I1.1).

B3.1: Agroecological regions with population pyramids



Age structure of the population

The Map B3.1 and respective charts illustrate the population pyramids for each main agro-ecological region in the country, along with the pyramids for each ethno-linguistic category in Figure 2 (for more information on the ethno-linguistic categories, see Map F2). Clearly, population age structures differ significantly across regions and ethno-linguistic groups. While populations in the lowlands have a strongly restricted base (indicating reduced fertility rates), upland areas particularly in the south have a wide base (indicating high fertility rates), reflecting a limited use of birth control practices there. The ethno-linguistic group with the highest fertility rate is the Hmong, who largely reside in the northern uplands (refer to Map F2.2).

The other striking pattern is the shortened bars of the 20-25 year old category in the southern lowlands, midlands, and uplands, which likely indicates the out-migration of young adults from those areas, which are indeed among the poorest in the country (refer to Map I1.1). The lack of young adults in those areas with high fertility rates further increases the dependency ratio there.

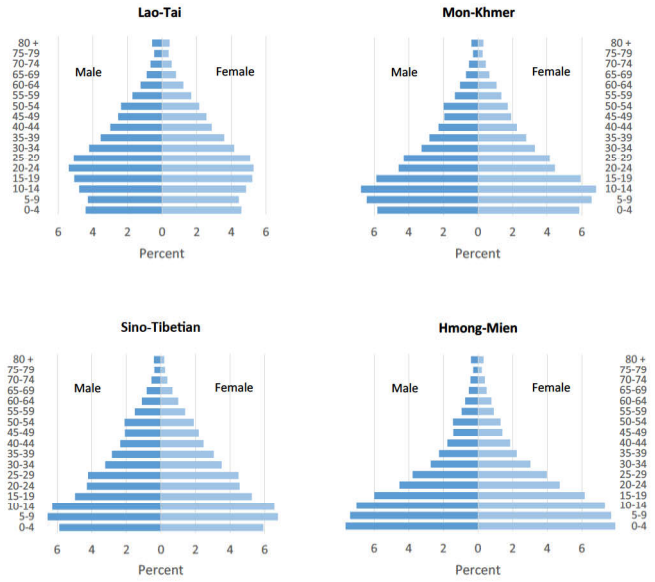
The dependency ratio presented on the previous page is a useful measure for gauging the overall productive potential of a population at a given point in time, and to compare this over time and space. A further disaggregation of the dependency pattern between the young and the elderly across space can be used to gain additional understanding of the needs and economic potential of populations in different areas.

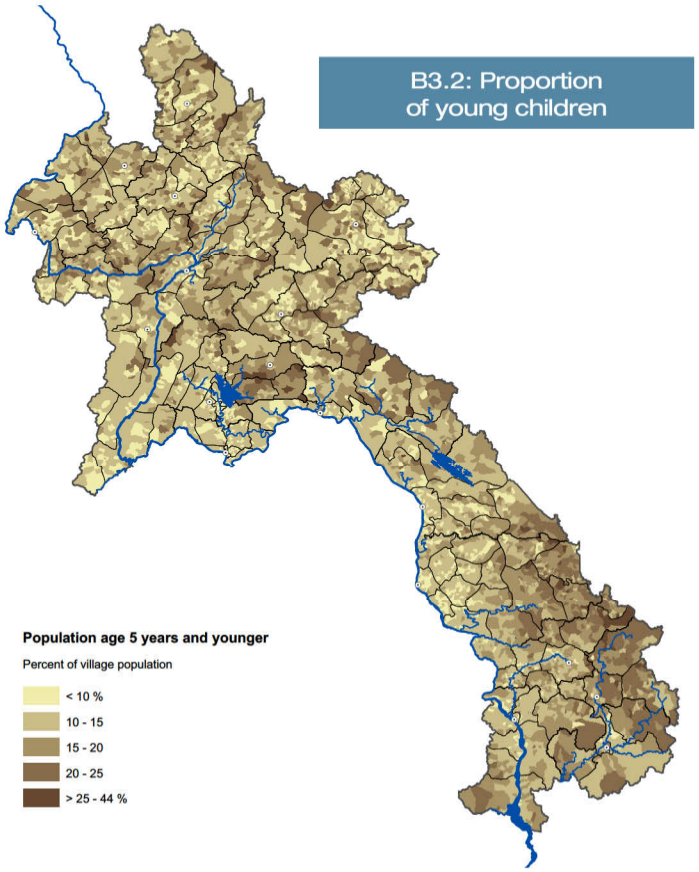
The demographic change among the youngest age groups is a key indicator of the fertility of a population. Decreases in fertility rates point to improvements in access to health services, and can indicate what the future age structure of the population will look like. On the other hand, the relative size of the elderly population is an indicator of life expectancy, which can also be linked to health care and living standards.

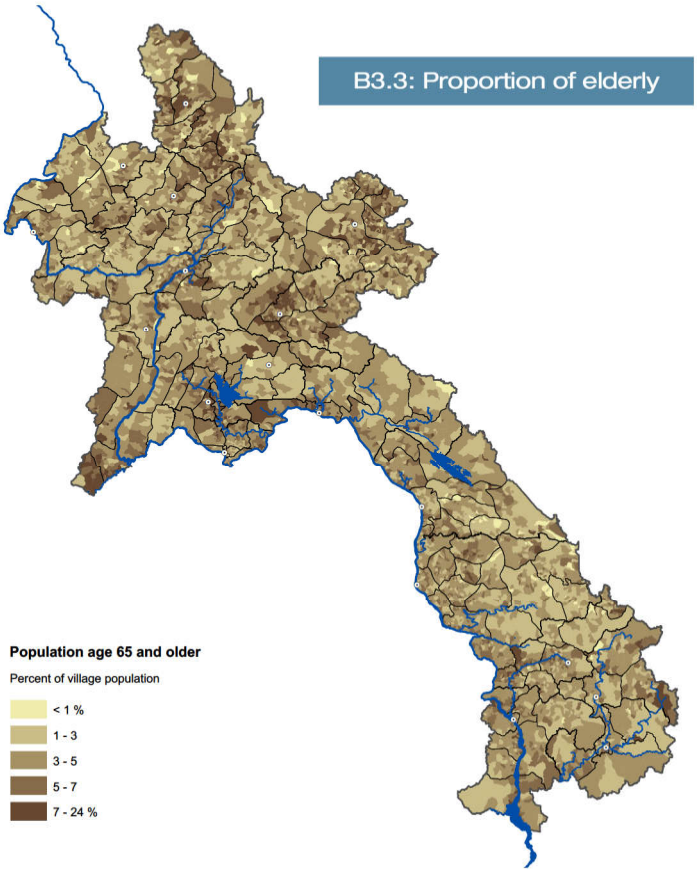
At a national level, the youth dependency ratio (i.e. the ratio of those under 15 years old to the 15-64 year olds) dropped from 70 to 50, while the old-age dependency ratio remains unchanged at 7%. At the same time, the fertility rate has declined from 4.5% in 2005 to 3.2% in 2015, which can be attributed to improvements in reproductive health and to the more widespread use of contraceptives. The elderly population, on the other hand, remained largely unchanged even though the life expectancy at birth has increased from 63 to 65 for women, and from 59 to 62 for men between the two censuses.

The patterns of the regionally disaggregated population pyramids (Map B3.1) are reflected in the geographic distribution of the share of young and elderly populations, shown in Maps B3.2 and B3.3. In the more marginal areas, dependents are predominantly children, pointing to the high fertility rates there, whereas a comparatively higher share of elderly people tends to occur in more developed lowland areas with better services and infrastructure.

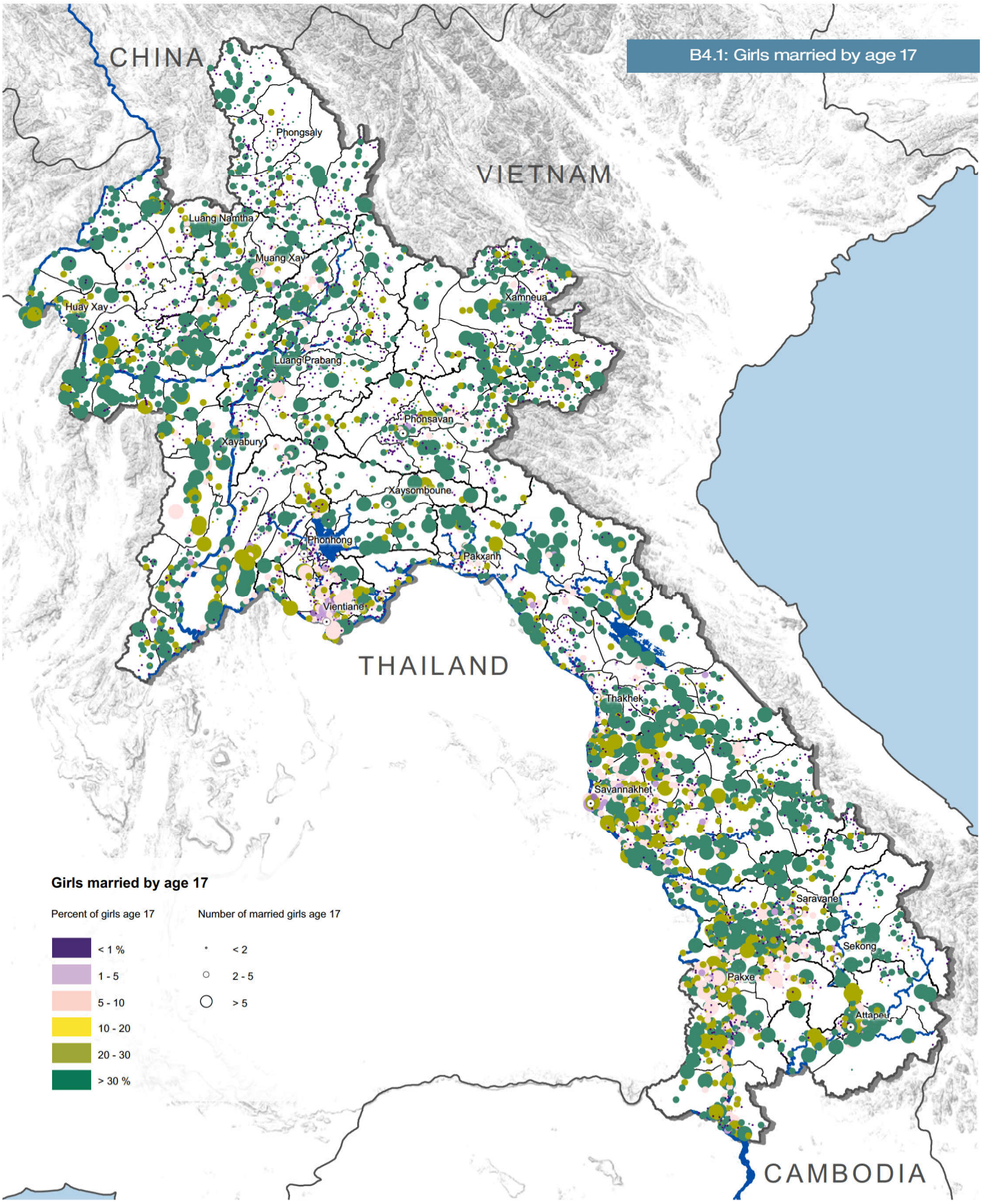
Figure 2: Population pyramids by ethno-linguistic categories







B4.1: Girls married by age 17



Early marriage

Early marriage or child marriage is defined internationally as marriage before age 18. Although early marriage is internationally considered a violation of human rights (IPU & WHO, 2016), it is particularly common in less developed countries. Early marriage applies to both boys and girls who enter into marriage before 18, but this is far more common among girls.

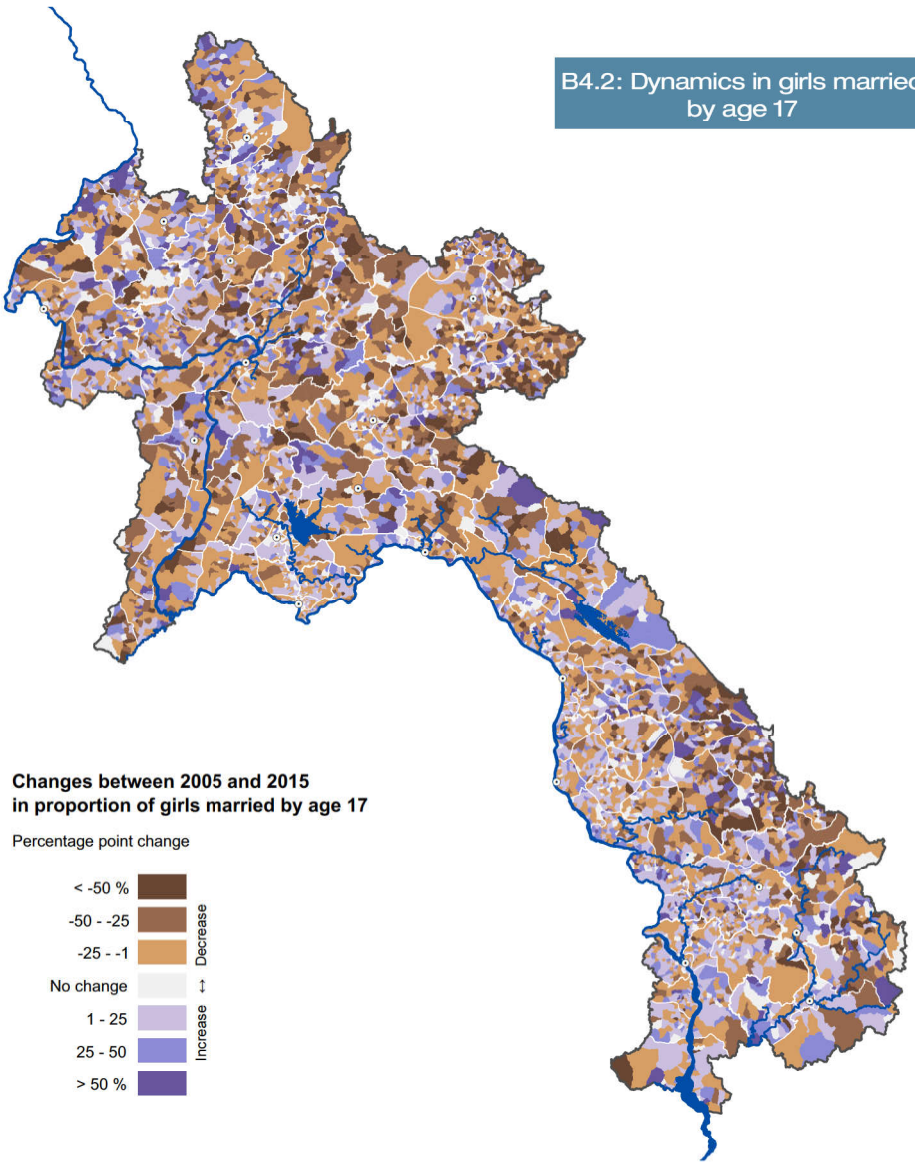
The social and personal costs of early marriage are considerable. People who marry early are more likely to drop out of school and are often less socially engaged than their unmarried peers, which impacts not only their physical and mental wellbeing but also their employment prospects and thus their future prosperity and contributions to society on the whole. Other potential consequences include health issues, as young married girls and women tend to get pregnant early. According to the World Health Organization (WHO) (2016), pregnancy and childbirth related death particularly affects girls between 15 and 19 years old in less developed countries.

Spatial patterns in 2015

Early marriage is still common in the Lao PDR, and relates to the high adolescent birth rates observed (see Map E4.1). Nationwide, over 16% of all 17 year old girls and over 5% of 17 year old boys were married in 2015. Although the legal age for marriage is 18, individuals marry at age 15 or even younger in some ethnic groups (IPU & WHO, 2016). Those who marry early tend to have low levels of education and come from poor households. Early marriage is more common in rural regions than in urban settings, and is more common among certain ethnic groups.

Map B4.1 illustrates the spatial distribution of people already married by age 17 across the country, with the number per village represented by circle size, and the share of all 17 year olds depicted with different colours. In many parts of the country, over 30% of girls are married before age 18. This appears particularly common in much of the south, as well as in many villages in Huaphanh, Xayabury, Oudomxai, and eastern Luang Prabang Provinces in the north, and also in Borikhamxay in central Lao PDR. Rates of the population who are married by age 17 are clearly much lower in and around Vientiane Capital City and Pakxe town, as well as in much of Phongsaly and western Luang Prabang provinces.

B4.2: Dynamics in girls married by age 17



Dynamics between 2005 and 2015

Map B4.2 shows few distinctive spatial patterns in the changes of early marriage rates between the 2005 and 2015 censuses. While there is an overall decrease in early marriages across the country, there are smaller areas with increases in early marriages, for instance in much of Luang Namtha province. Decreases appear particularly significant in many of the poor villages in eastern Savannakhet and Houaphan Provinces.

The overall positive trend of a decline in early marriage rates is likely related to improved access to education and improvements in living standards, although the strongest decreases in early marriage rates were observed in areas with persistently high poverty rates and thus few such improvements (compare Map I1.1). Despite these positive trends, there are still many areas with high rates of early marriage, especially in more remote rural areas.

Marital status

Marital status is a key indicator of future population development. Demographic factors such as sex and age composition and life expectancy, socioeconomic factors such as income, education, and migration, as well as cultural and social norms and practices, all play an important role in determining a person's marital status. Since these factors differ across the country, variations in the marital status within the local populations can be expected.

According to the PHC 2015, almost two thirds of the population 15 years of age and older is married, and less than one third remain single. Divorced or separated and widowed people constitute 2.5% and 4.1% of that age group respectively.

The various maps on this double page show the share of village populations above 14 years of age according to their marital status – married, unmarried, divorced, or separated – along with the changes that occurred between the 2005 and 2015 censuses.

Spatial patterns in 2015

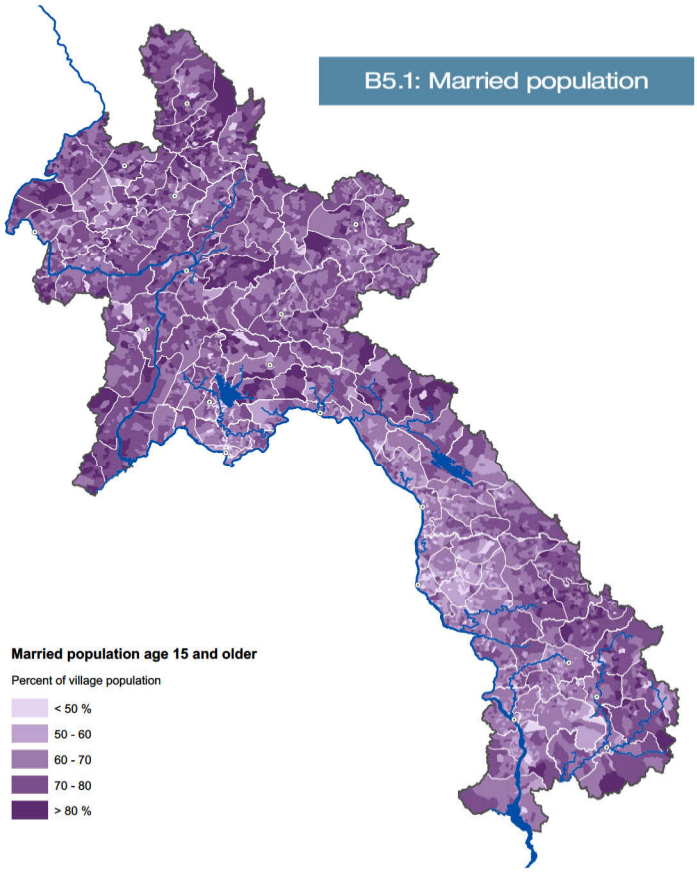
The maps illustrate that in urban, peri-urban, and more developed lowland areas, a greater share of the population is unmarried compared to in more traditional, remote, mountainous areas. People tend to get married later if they pursue higher education or other professional careers, which is more often the case in better developed areas (see Map D4.5). Smaller relative married populations are also evident in areas where there is a stronger imbalance in the local sex ratio in favour of women (compare Map B1.3), where the majority of the unmarried people are female.

Although divorce is traditionally not common in the Lao PDR, there are significant differences in the divorce rates across the country. Generally, there are higher rates of divorce in the southern part of the country compared to the north, and divorce is clearly more common in more developed, densely populated lowland areas. Indeed, high divorce rates largely correspond with areas of high population density (compare Map B1.1), but interestingly also with a larger average living space per person and household (see Map H1.1). Divorce is certainly more common in less socially conservative settings, which is the case in more densely populated areas, where social networks and societal controls tend to be less strong than in remote areas where traditional family values may dominate.

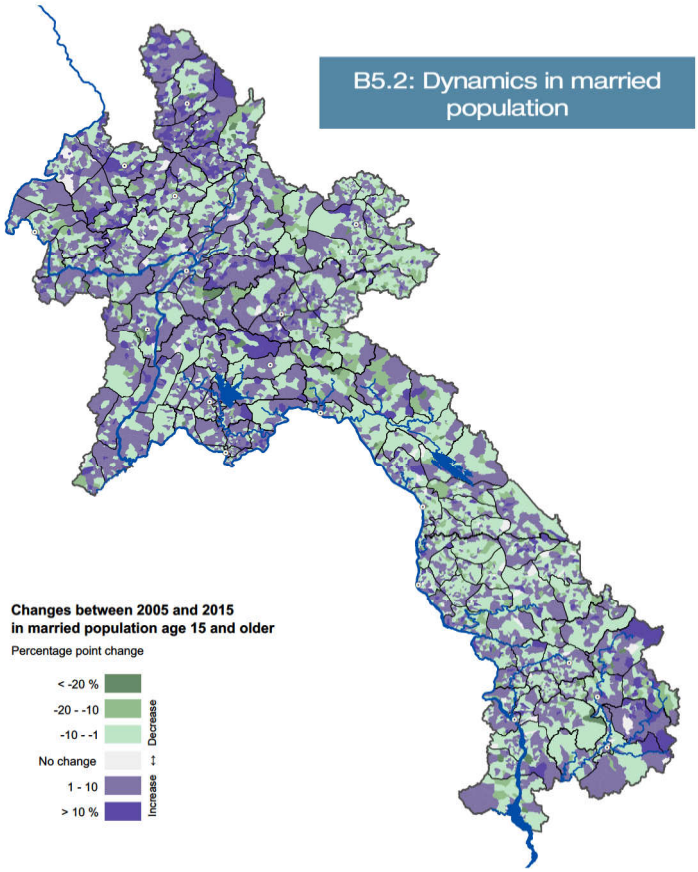
Dynamics between 2005 and 2015

The share of the population which is married increased in the north, while the inverse is true in the south. Divorce rates have increased between 2005 and 2015, particularly in the densely populated areas along the Mekong River from Xayabury southwards, and in most of the poorer areas of Savannakhet Province. In contrast, divorce rates have markedly decreased in neighbouring and more impoverished Saravane Province.

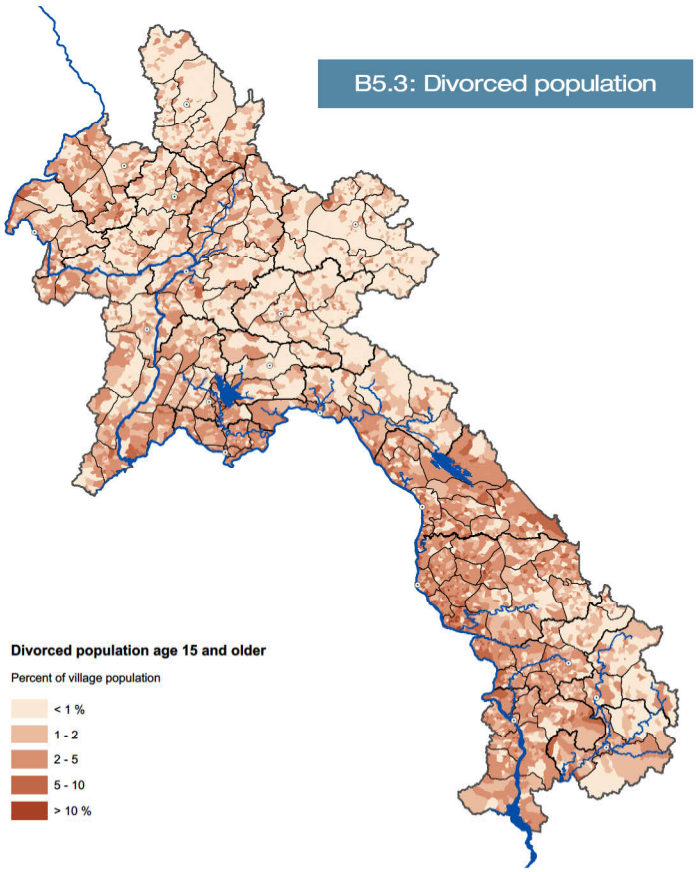
B5.1: Married population



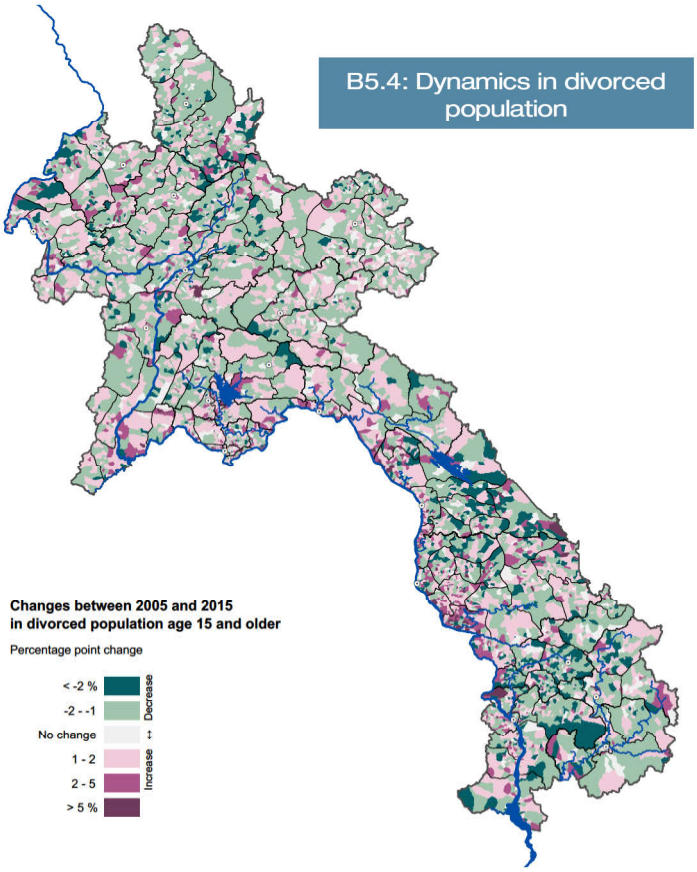
B5.2: Dynamics in married population



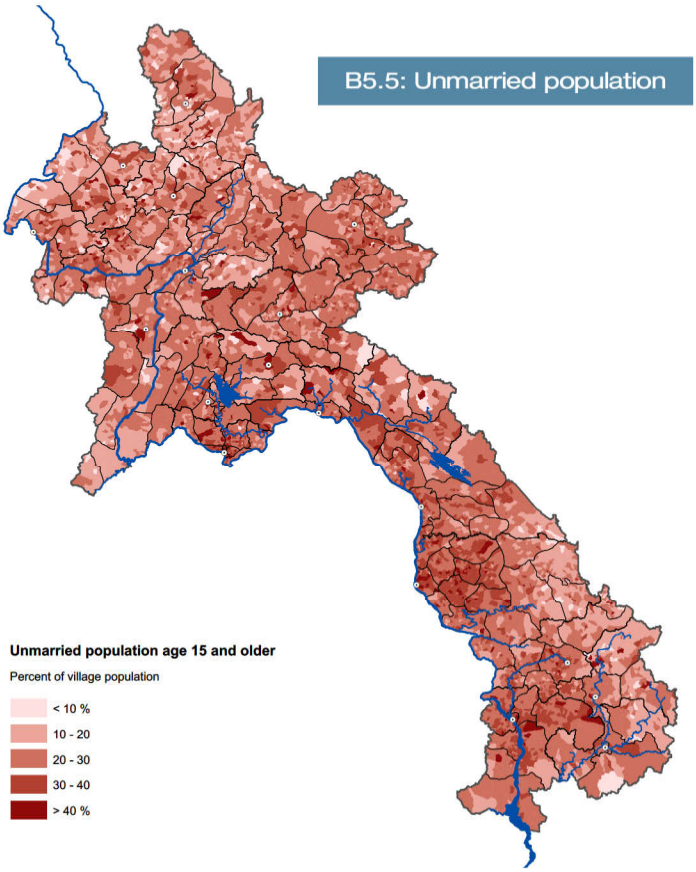
B5.3: Divorced population



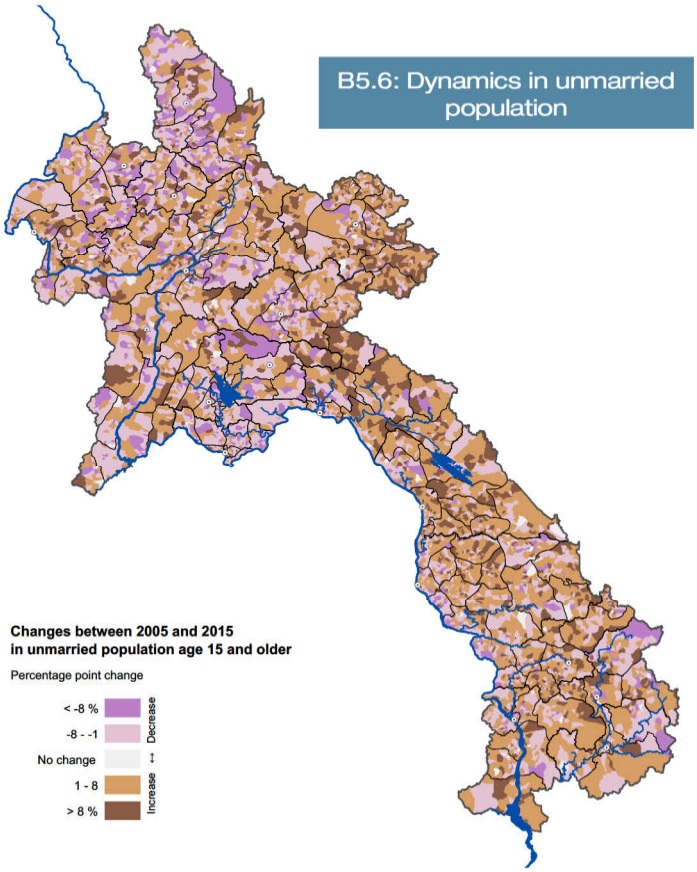
B5.4: Dynamics in divorced population

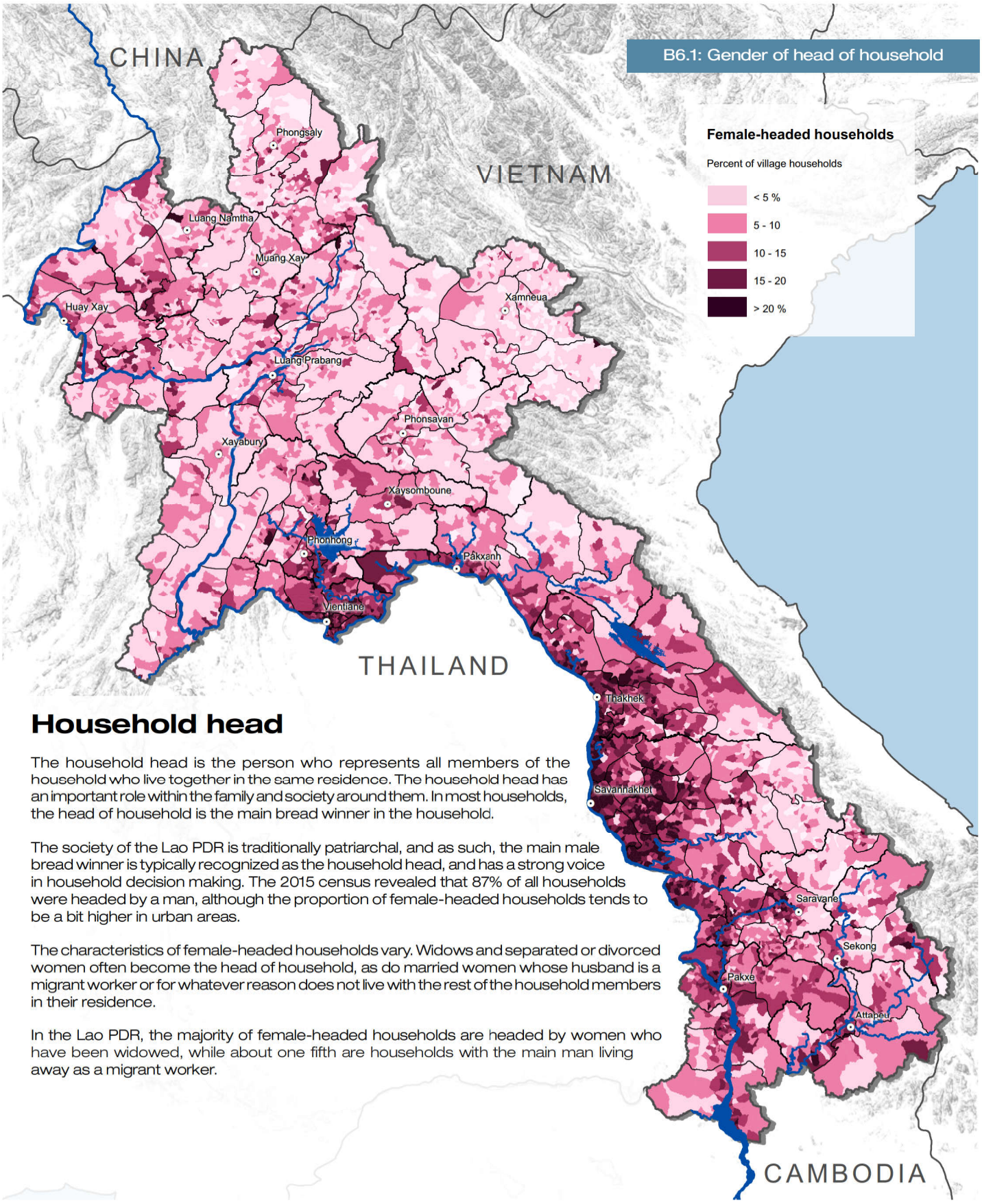


B5.5: Unmarried population



B5.6: Dynamics in unmarried population





Household head

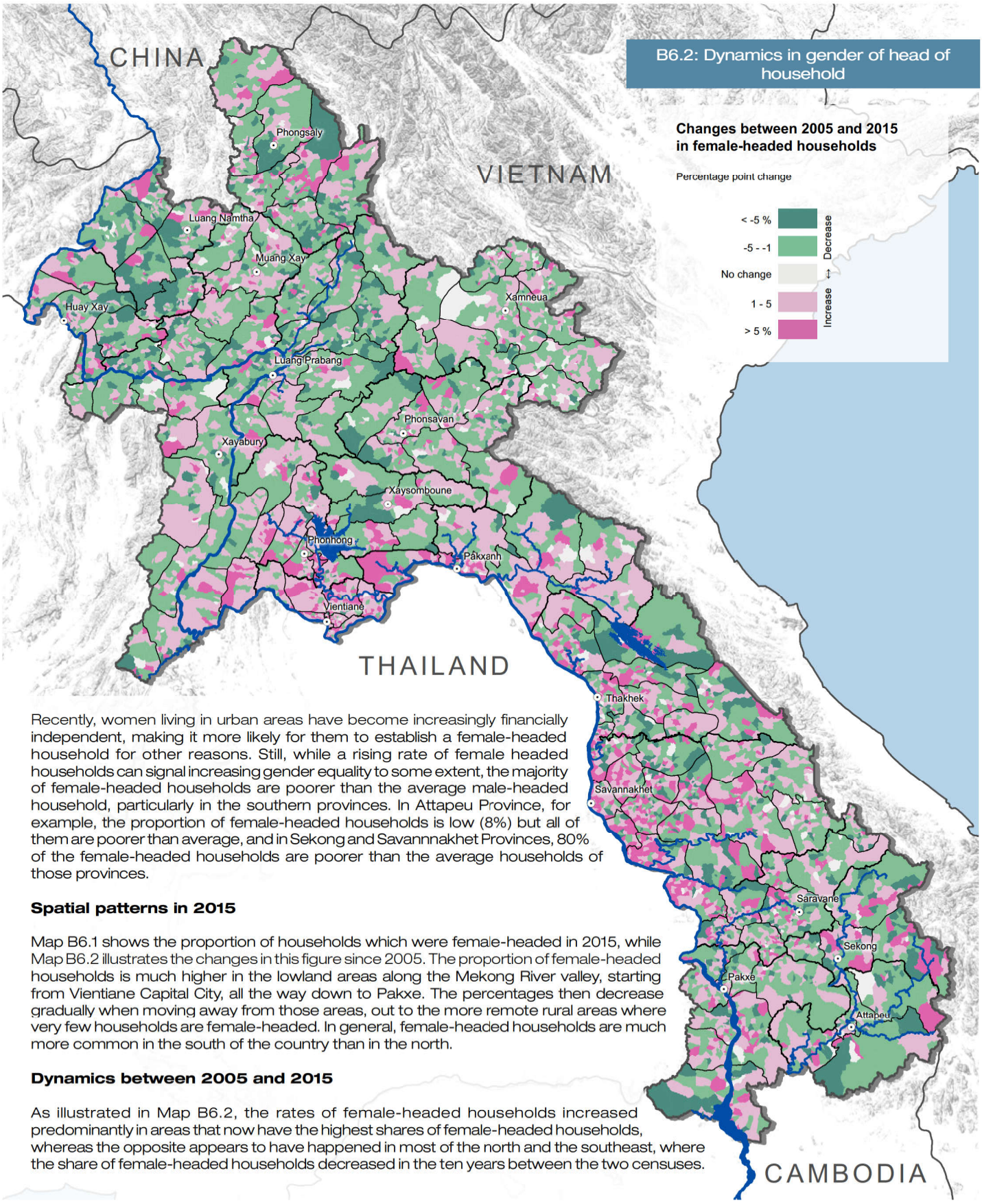
The household head is the person who represents all members of the household who live together in the same residence. The household head has an important role within the family and society around them. In most households, the head of household is the main bread winner in the household.

The society of the Lao PDR is traditionally patriarchal, and as such, the main male bread winner is typically recognized as the household head, and has a strong voice in household decision making. The 2015 census revealed that 87% of all households were headed by a man, although the proportion of female-headed households tends to be a bit higher in urban areas.

The characteristics of female-headed households vary. Widows and separated or divorced women often become the head of household, as do married women whose husband is a migrant worker or for whatever reason does not live with the rest of the household members in their residence.

In the Lao PDR, the majority of female-headed households are headed by women who have been widowed, while about one fifth are households with the main man living away as a migrant worker.

B6.2: Dynamics in gender of head of household



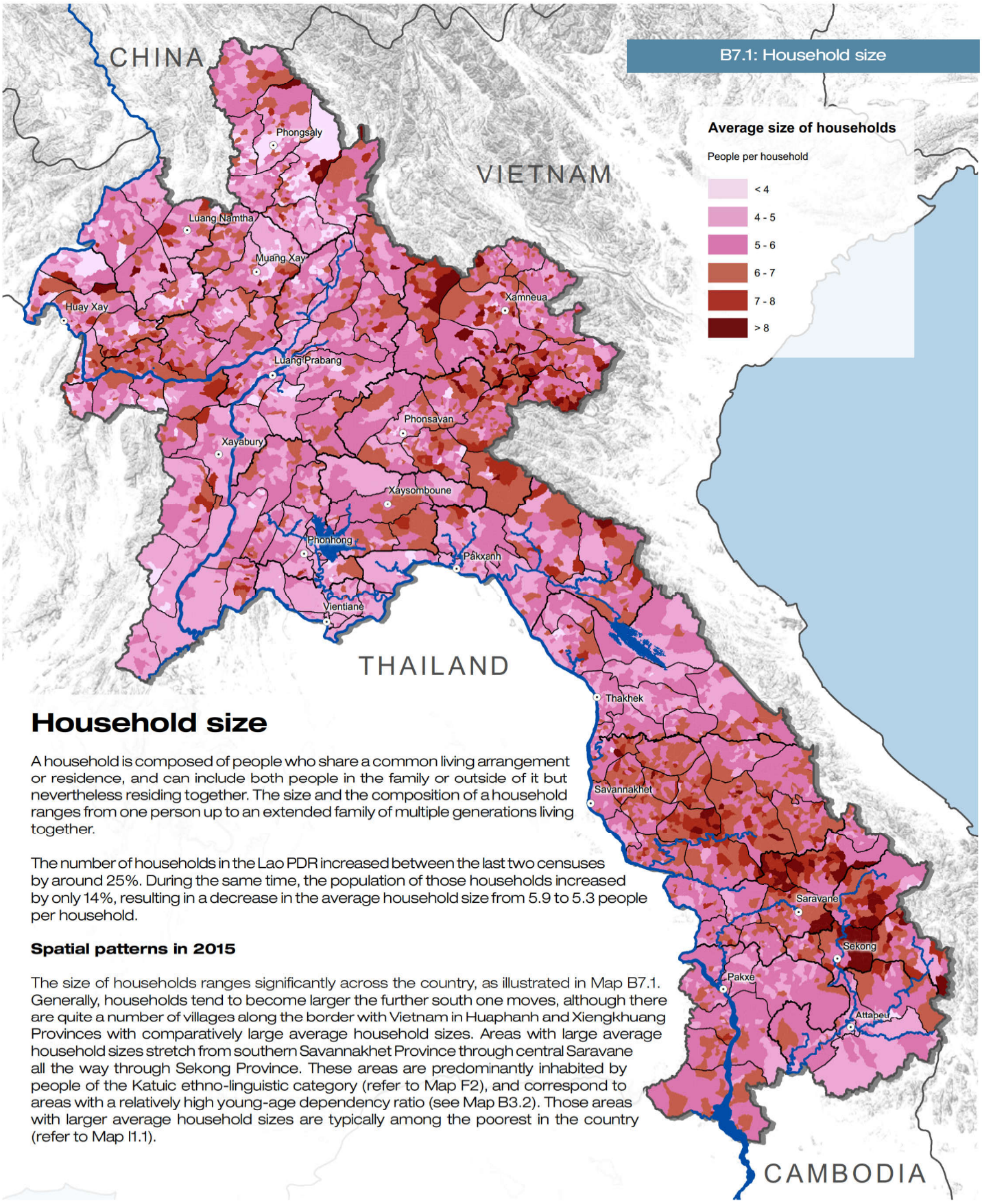
Recently, women living in urban areas have become increasingly financially independent, making it more likely for them to establish a female-headed household for other reasons. Still, while a rising rate of female headed households can signal increasing gender equality to some extent, the majority of female-headed households are poorer than the average male-headed household, particularly in the southern provinces. In Attapeu Province, for example, the proportion of female-headed households is low (8%) but all of them are poorer than average, and in Sekong and Savannnakhet Provinces, 80% of the female-headed households are poorer than the average households of those provinces.

Spatial patterns in 2015

Map B6.1 shows the proportion of households which were female-headed in 2015, while Map B6.2 illustrates the changes in this figure since 2005. The proportion of female-headed households is much higher in the lowland areas along the Mekong River valley, starting from Vientiane Capital City, all the way down to Pakxe. The percentages then decrease gradually when moving away from those areas, out to the more remote rural areas where very few households are female-headed. In general, female-headed households are much more common in the south of the country than in the north.

Dynamics between 2005 and 2015

As illustrated in Map B6.2, the rates of female-headed households increased predominantly in areas that now have the highest shares of female-headed households, whereas the opposite appears to have happened in most of the north and the southeast, where the share of female-headed households decreased in the ten years between the two censuses.



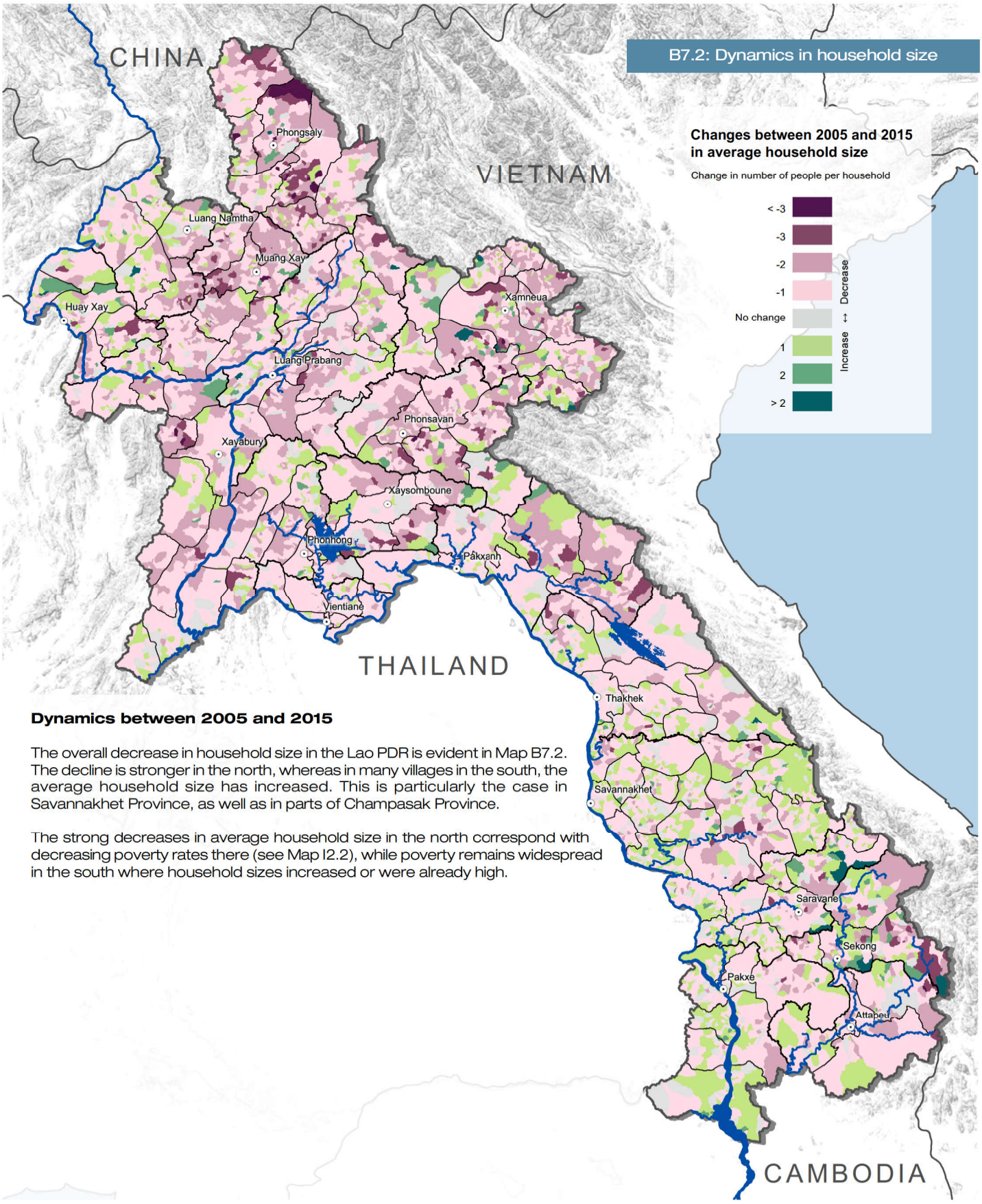
Household size

A household is composed of people who share a common living arrangement or residence, and can include both people in the family or outside of it but nevertheless residing together. The size and the composition of a household ranges from one person up to an extended family of multiple generations living together.

The number of households in the Lao PDR increased between the last two censuses by around 25%. During the same time, the population of those households increased by only 14%, resulting in a decrease in the average household size from 5.9 to 5.3 people per household.

Spatial patterns in 2015

The size of households ranges significantly across the country, as illustrated in Map B7.1. Generally, households tend to become larger the further south one moves, although there are quite a number of villages along the border with Vietnam in Huaphanh and Xiengkhuang Provinces with comparatively large average household sizes. Areas with large average household sizes stretch from southern Savannakhet Province through central Saravane all the way through Sekong Province. These areas are predominantly inhabited by people of the Katuic ethno-linguistic category (refer to Map F2), and correspond to areas with a relatively high young-age dependency ratio (see Map B3.2). Those areas with larger average household sizes are typically among the poorest in the country (refer to Map I1.1).



Dynamics between 2005 and 2015

The overall decrease in household size in the Lao PDR is evident in Map B7.2. The decline is stronger in the north, whereas in many villages in the south, the average household size has increased. This is particularly the case in Savannakhet Province, as well as in parts of Champasak Province.

The strong decreases in average household size in the north correspond with decreasing poverty rates there (see Map I2.2), while poverty remains widespread in the south where household sizes increased or were already high.

MIGRATION

In- and out-migration

Human migration is defined as the movement of people from one place to another with the intention of settling, permanently or temporarily, in a new location. Throughout its history, the Lao PDR has experienced diverse migration waves caused by wars, social and economic inequalities, and the lack of access to natural resources, education, and health facilities.

Due to the economic reforms of the 1980's and the subsequent flow of foreign investment into the country, the Lao PDR began improving its transport infrastructure and expanding economic activities throughout the 1990s. In the last two decades, the country's increasing efforts to integrate its own economy with economic activities and trade across the rest of the Greater Mekong Subregion (GMS) has bolstered the development of large transportation networks and infrastructure. This economic integration with neighbouring countries, and more generally with global markets, facilitates the movement of goods as well as people within and between countries.

With the economic development experienced by the country in the last decades, urban and peri-urban areas are becoming increasingly important centres for the Lao economy. Although migration from rural to urban areas is a common pattern within the Lao PDR, most internal migration is from rural to other rural areas. Migrants are often young adults who move to other areas in search of better jobs, health services, and educational opportunities. Some are driven by personal aspirations and interests, while others are forced by the need to remit money back to their family. While migration for educational reasons is largely to urban areas, labour migration in the Lao PDR remains mainly a rural-rural phenomenon. Rural migrants are predominantly people employed in the construction, hydropower, agribusiness, and mining sectors. Some migrant workers in these sectors also come from neighbouring countries such as China, Vietnam, or Thailand, typically employed by contractors and investors from the same country. Many rural migrants in the Lao PDR, on the other hand, migrate to pursue work opportunities in Thailand, attracted by higher wages and the relative ease of border crossing.

In the PHCs of 2005 and 2015 alike, households were asked about migration at different intervals: lifetime migration, migration since the 2005 census, and migration within the last twelve months.

The Maps C1.1 to C1.4 show in- and out-migration at village level as well as the changes in the population migrating in and out since 2005. Both in-migration and out-migration are represented as percentages of the village population. The changes between 2005 and 2015 are calculated as the difference between the percentages of in- and out-migrants in 2005 and the percentages of in- and out-migrants in 2015.

Spatial patterns in 2015

Map C1.1 represents village in-migration in the twelve months prior to the census in 2015. In some villages, the number of in-migrants exceed 10% of the village population. Xaysomboune, Oudomxai, and Attapeu in particular have experienced large numbers of in-migrants. Map C1.3 shows out-migration from villages in the same time period. Villages in the north of the country and in the southeast present higher percentages of out-migrants in relation to their population.

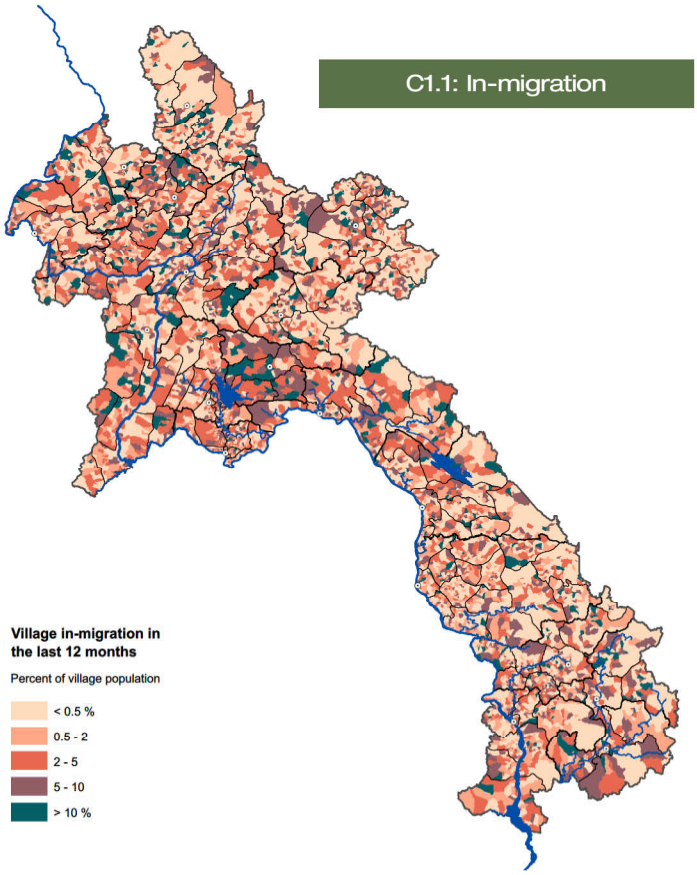
Provincial capitals and their outskirts show diverse patterns of in- and out-migration, indicating also the movements within these areas.

Interestingly, villages in Xaysomboune have high percentages of in-migrants as well as out-migrants. The high percentage of both in- and out-migration may be related to the unique history of the Province, which was established at the end of 2013. Following its establishment, many moved out, in, and within the province to work as government employees under the new administrative status of the province. Another important factor that contributes to migration in and out of the province could be the construction of the Nam San 3 B hydropower plant, which required the resettlement of multiple villages around the plant's construction site and the reservoir which the dam created.

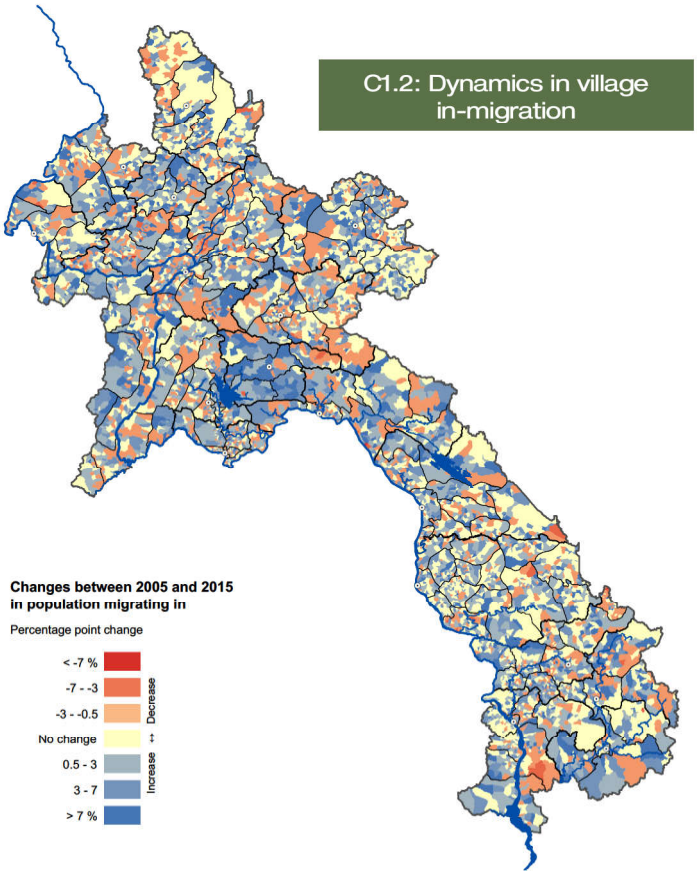
Dynamics between 2005 and 2015

Maps C1.2 and C1.4 reveal that between 2005 and 2015, the central and the northern regions saw an increase in population migrating out, while the south experienced less change. In terms of population migrating in, between 2005 and 2015, Xaysomboune and Xayabury experienced a significant increase. A significant decrease in out-migration is observed in the west of Borikhamxay. This may be due to the nearby location of the Nam Leuk Hydropower Project, a hydropower plant active since the beginning of the 2000s, which could have pushed people to migrate out of the area.

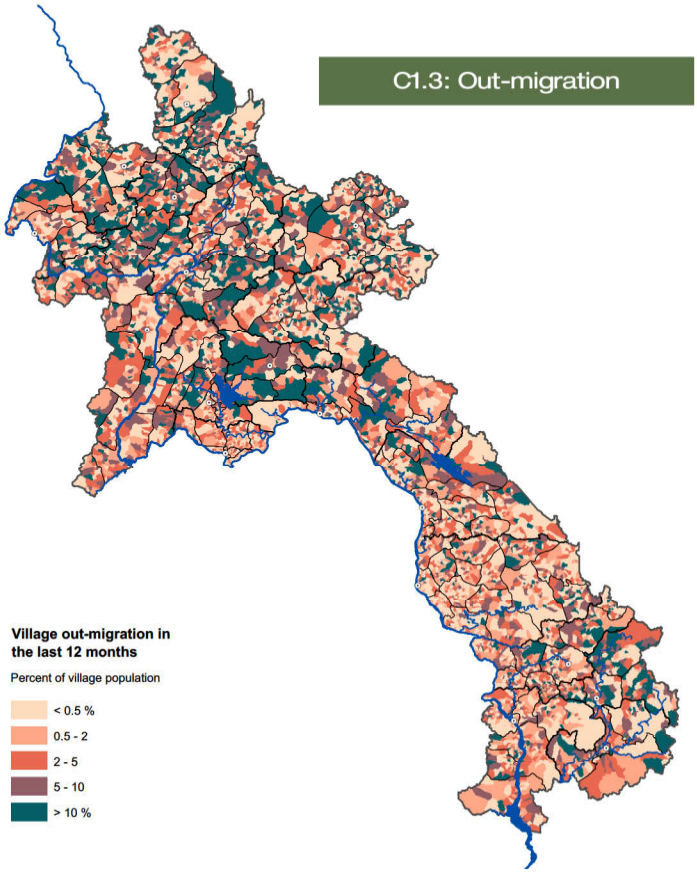
C1.1: In-migration



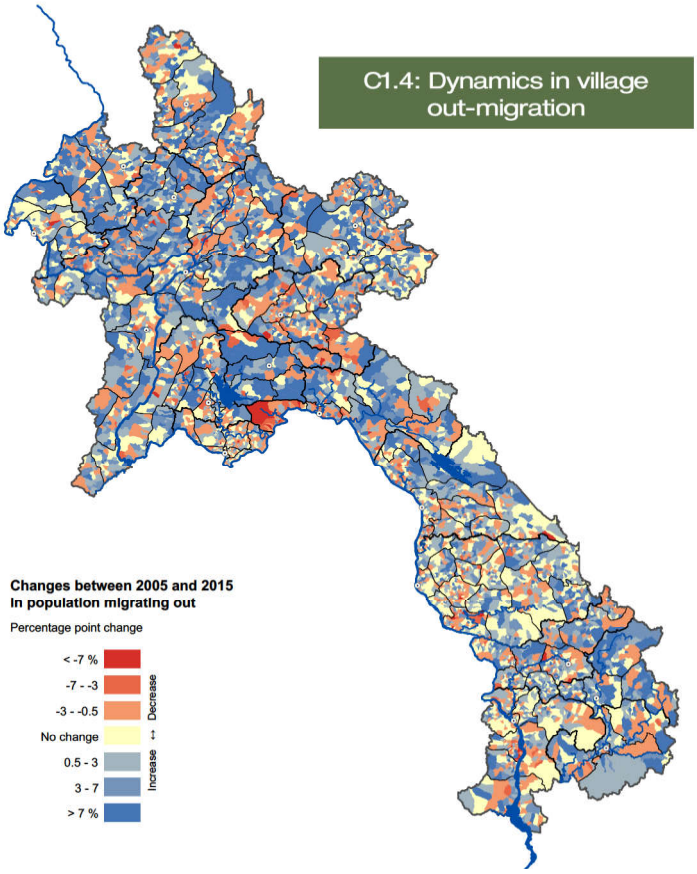
C1.2: Dynamics in village in-migration

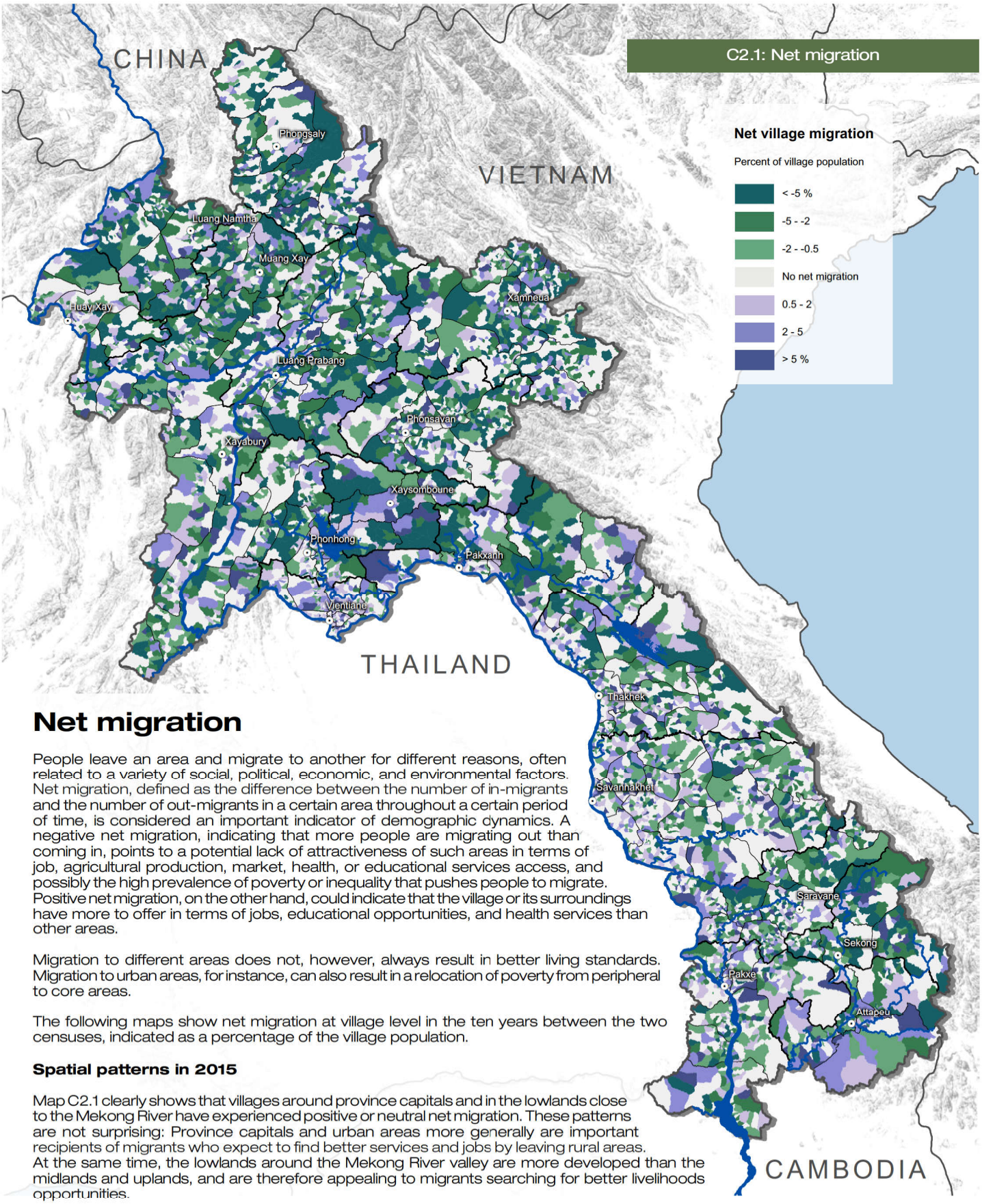


C1.3: Out-migration



C1.4: Dynamics in village out-migration





Net migration

People leave an area and migrate to another for different reasons, often related to a variety of social, political, economic, and environmental factors. Net migration, defined as the difference between the number of in-migrants and the number of out-migrants in a certain area throughout a certain period of time, is considered an important indicator of demographic dynamics. A negative net migration, indicating that more people are migrating out than coming in, points to a potential lack of attractiveness of such areas in terms of job, agricultural production, market, health, or educational services access, and possibly the high prevalence of poverty or inequality that pushes people to migrate. Positive net migration, on the other hand, could indicate that the village or its surroundings have more to offer in terms of jobs, educational opportunities, and health services than other areas.

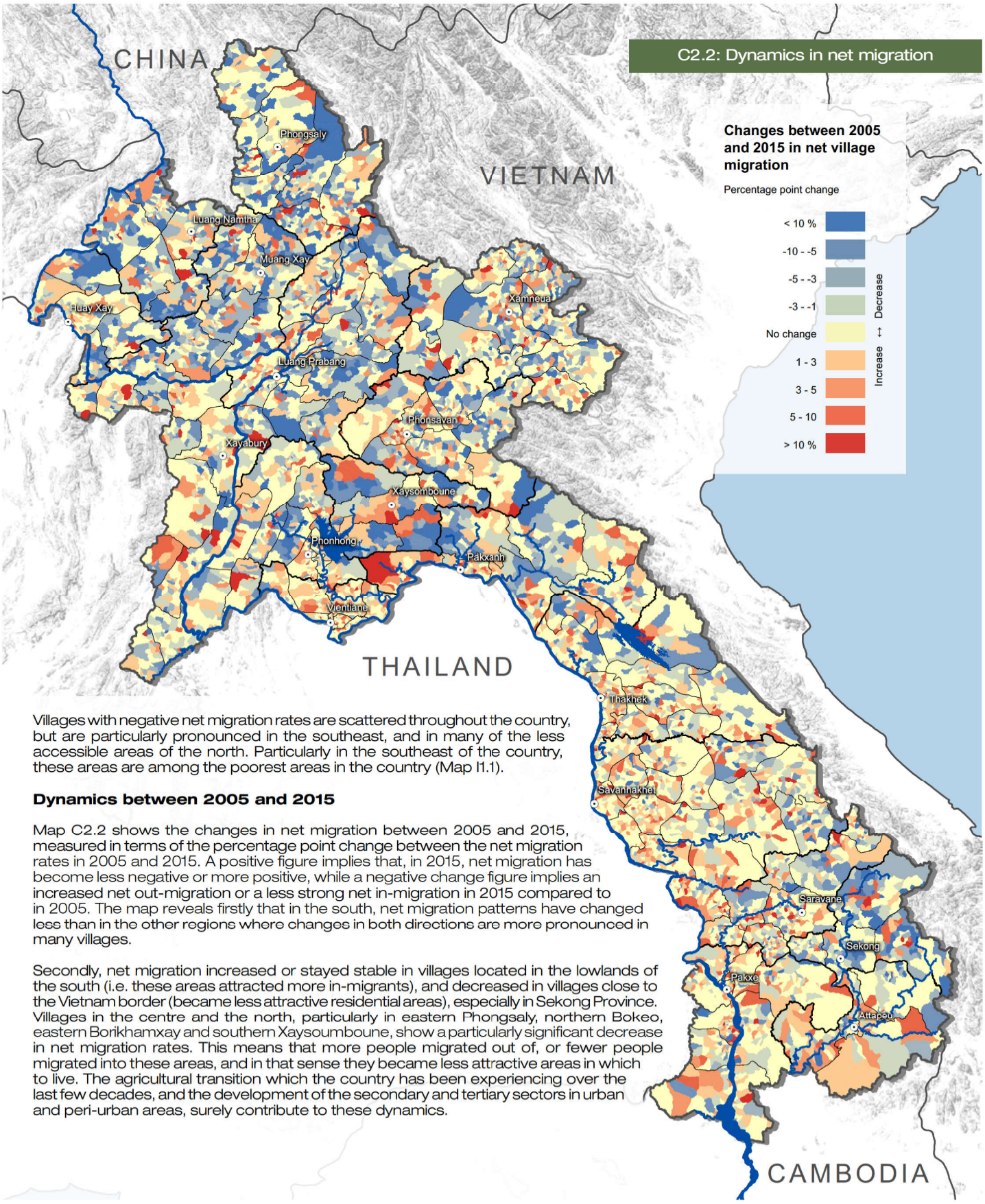
Migration to different areas does not, however, always result in better living standards. Migration to urban areas, for instance, can also result in a relocation of poverty from peripheral to core areas.

The following maps show net migration at village level in the ten years between the two censuses, indicated as a percentage of the village population.

Spatial patterns in 2015

Map C2.1 clearly shows that villages around province capitals and in the lowlands close to the Mekong River have experienced positive or neutral net migration. These patterns are not surprising: Province capitals and urban areas more generally are important recipients of migrants who expect to find better services and jobs by leaving rural areas. At the same time, the lowlands around the Mekong River valley are more developed than the midlands and uplands, and are therefore appealing to migrants searching for better livelihoods opportunities.

C2.2: Dynamics in net migration



Villages with negative net migration rates are scattered throughout the country, but are particularly pronounced in the southeast, and in many of the less accessible areas of the north. Particularly in the southeast of the country, these areas are among the poorest areas in the country (Map I1.1).

Dynamics between 2005 and 2015

Map C2.2 shows the changes in net migration between 2005 and 2015, measured in terms of the percentage point change between the net migration rates in 2005 and 2015. A positive figure implies that, in 2015, net migration has become less negative or more positive, while a negative change figure implies an increased net out-migration or a less strong net in-migration in 2015 compared to in 2005. The map reveals firstly that in the south, net migration patterns have changed less than in the other regions where changes in both directions are more pronounced in many villages.

Secondly, net migration increased or stayed stable in villages located in the lowlands of the south (i.e. these areas attracted more in-migrants), and decreased in villages close to the Vietnam border (became less attractive residential areas), especially in Sekong Province. Villages in the centre and the north, particularly in eastern Phongsaly, northern Bokeo, eastern Borikhamxay and southern Xaysoumboune, show a particularly significant decrease in net migration rates. This means that more people migrated out of, or fewer people migrated into these areas, and in that sense they became less attractive areas in which to live. The agricultural transition which the country has been experiencing over the last few decades, and the development of the secondary and tertiary sectors in urban and peri-urban areas, surely contribute to these dynamics.

LITERACY & EDUCATION

Accessibility of schools

Achieving inclusive and equitable education for all is one of the 17 globally agreed upon SDGs. Benefits from investments in education are not limited to individual returns, such as enabling individuals to increase their personal income and prosperity, but result in society-wide benefits as well. Education contributes to poverty reduction, public health improvements, as well as increased accumulated of human capital for society as a whole. Thus, education is seen as a key driver for national growth. Access to schools and basic educational opportunities is listed as a fundamental human right for children in the Universal Declaration of Human Rights in 1948, and is key to pursuing further education later in their life, while better educated individuals contribute their knowledge and skills to society as a whole.

The GoL highlights education and human resource development as a primary tool for poverty reduction and socio-economic development. The GoL has put significant efforts into improving basic education to achieve the dual goals of Education for All (EFA) and Millennium Development Goals (MDGs) in the past decades, and continues to do so as manifested in the 8th NSEDP, and as part of its commitment to the SDGs. The Lao PDR has made significant progress towards those goals. According to the censuses, the number of primary schools has increased from 3,747 in 2005 to 6,427 in 2015, which is an increase of over 70%. This goes along with an increase in the number of primary school students from 589,265 in 2005 to 814,719 in 2015, and an improvement of the net enrolment rate from 66 to 75%.

During the 2015 census, the existence and type of primary school facilities within the village was recorded. In the absence of more precise data on the location of such school facilities within a given village, the administrative centre was taken as reference. Travel time from any given location to the nearest school was estimated using GIS information on road connectivity, road type and condition, terrain, and land cover. The resulting travel time map provides an overview of the general accessibility of primary school facilities across the country.

Spatial patterns in 2015

Map D1 presents the geographical distribution of villages that accommodate a primary school facility, combined with the estimated travel time required to reach the nearest school. Primary schools are present in 76% of the villages throughout the country. This percentage does not variate significantly between urban and rural areas. Physical accessibility to schools depends on a number of factors, including the geographical location of schools in relation to the village, the quality of infrastructure for travel, such as roads, bridges, and ferries, and the local terrain. Schools are unevenly distributed across the country, and the distribution largely follows the geographical pattern of population density (see Map B1.1): Schools are most densely distributed in and around urban, more densely populated areas such as Vientiane Capital City, provincial capitals, and along main roads. This means, that children in more remote areas are likely to have to travel longer ways to school than those residing in more accessible areas, reflecting also the challenges for a government to providing equal access to schools in more remote areas. Nonetheless, overall access to schools in terms of the distribution of primary schools high, even in rural areas, and most schools can be reached within an hour.

Children in villages without a school have to commute to nearby villages where schools are available. However, as shown in Map D1, villages without a school are often located in remote areas, clustered with other villages where children have to travel further than just to the neighbouring village to attend school, thus requiring longer travel times. Figures 3 and 4 show the share of villages by average travel time to the nearest primary school. In 43% of villages, the nearest school is under 30 minutes away, ensuring relatively good school accessibility to more than 50% of the primary school students in the country. A significant 15% of all primary school students need to travel over 90 minutes to reach the nearest school, and almost 8% need to travel over 2 hours. Villages without schools are often those in more remote areas - many of them located in Phongsaly and Luang Namtha in the north, as well as in Savannakhet and to a lesser extent in Saravane and Sekong in the south. Access to schools has an important impact on school attendance, dropout rates, and late enrolments, which correspond to lower academic performance later in school life.

Figure 3: Share of villages by average travel time to the nearest primary school

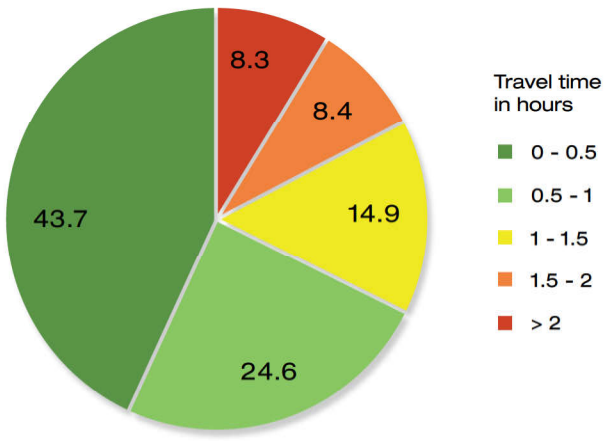
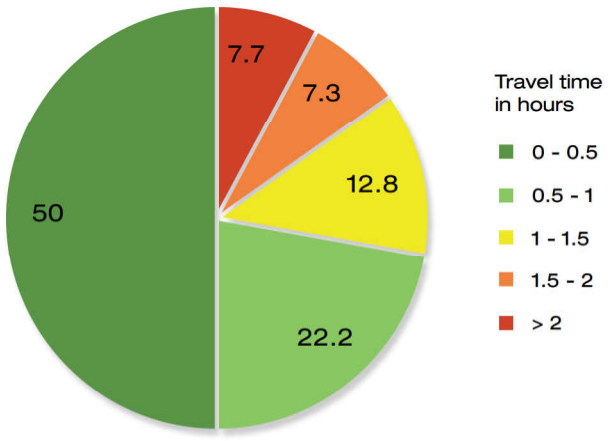
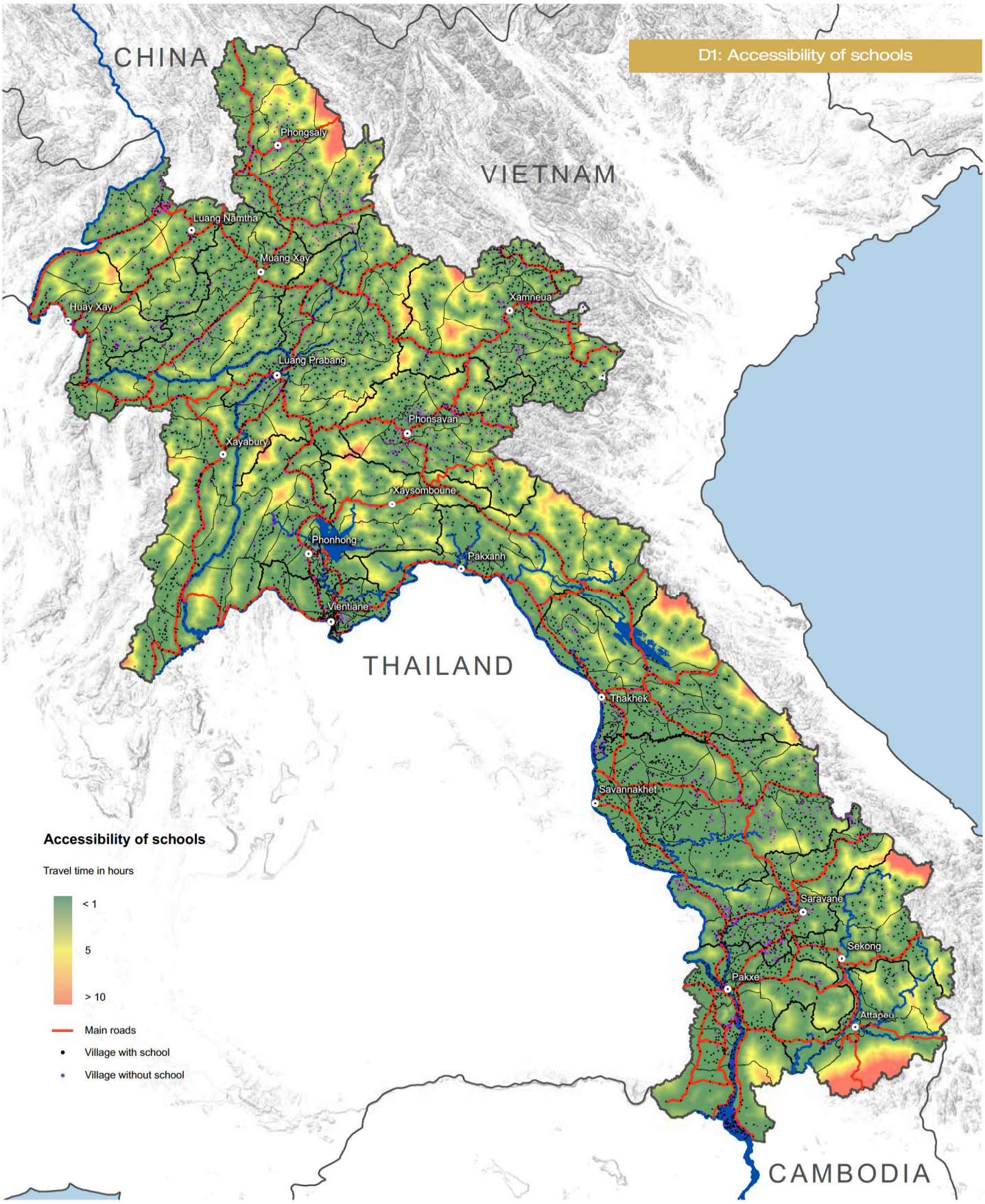
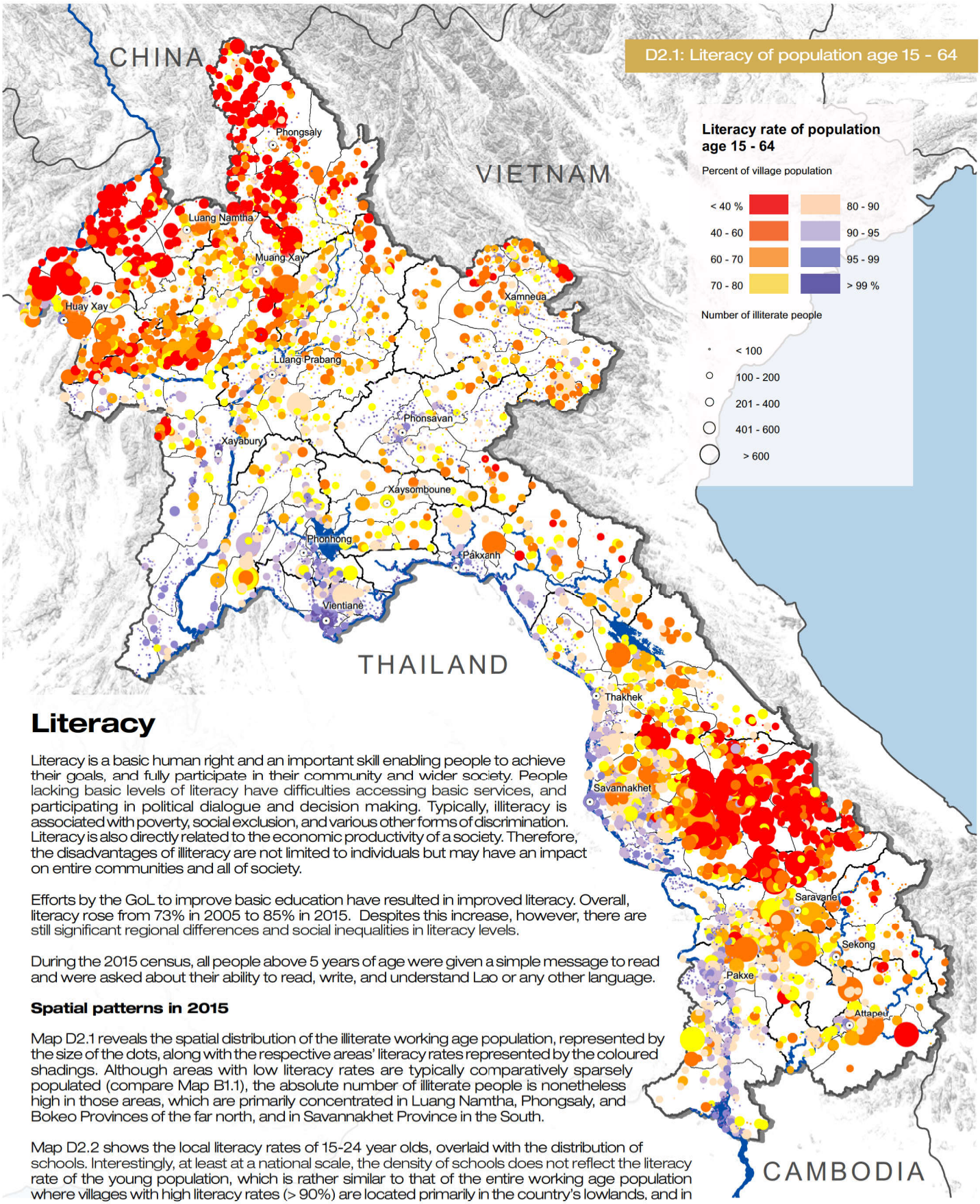


Figure 4: Share of primary school students (6-11 years old) by average travel time to the nearest primary school




D1: Accessibility of schools
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Pakxanh
Vientiane
Thakhek
Savannakhet
Saravane
Sekong
Pakxe
Attapeu
Accessibility of schools
Travel time in hours
< 1
5
> 10
Main roads
Village with school
Village without school



Literacy

Literacy is a basic human right and an important skill enabling people to achieve their goals, and fully participate in their community and wider society. People lacking basic levels of literacy have difficulties accessing basic services, and participating in political dialogue and decision making. Typically, illiteracy is associated with poverty, social exclusion, and various other forms of discrimination. Literacy is also directly related to the economic productivity of a society. Therefore, the disadvantages of illiteracy are not limited to individuals but may have an impact on entire communities and all of society.

Efforts by the GoL to improve basic education have resulted in improved literacy. Overall, literacy rose from 73% in 2005 to 85% in 2015. Despites this increase, however, there are still significant regional differences and social inequalities in literacy levels.

During the 2015 census, all people above 5 years of age were given a simple message to read and were asked about their ability to read, write, and understand Lao or any other language.

Spatial patterns in 2015

Map D2.1 reveals the spatial distribution of the illiterate working age population, represented by the size of the dots, along with the respective areas' literacy rates represented by the coloured shadings. Although areas with low literacy rates are typically comparatively sparsely populated (compare Map B1.1), the absolute number of illiterate people is nonetheless high in those areas, which are primarily concentrated in Luang Namtha, Phongsaly, and Bokeo Provinces of the far north, and in Savannakhet Province in the South.

Map D2.2 shows the local literacy rates of 15-24 year olds, overlaid with the distribution of schools. Interestingly, at least at a national scale, the density of schools does not reflect the literacy rate of the young population, which is rather similar to that of the entire working age population where villages with high literacy rates (> 90%) are located primarily in the country's lowlands, and in

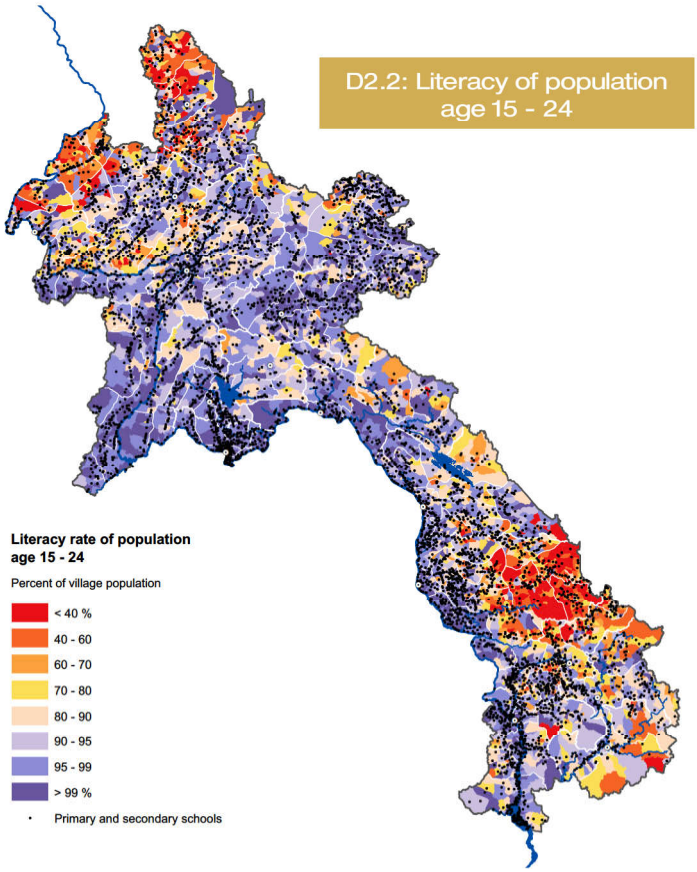
the north, including parts of the uplands there. In Huaphanh, Xiengkuang, Luang Prabang, and Xayabury Provinces, most villages have a rather high literacy rate among the youth and young adults. These regions contrast with very distinctive areas of low literacy rates, where less than half of the young population between 15 and 24 years of age can read and write. They include in particular the northern parts of Luang Namtha, Phongsaly, and part of Bokeo in the north, and the eastern two thirds of Savannakhet Province in the south – areas that are typically home to many ethnic minority people whose primary language often differs from Lao language, which is the language used and taught in schools. Indeed, literacy rates are clearly affected by the native language group of different ethno-linguistic groups. Distinctively higher literacy rates occur in areas where people primarily speak languages similar to Lao, i.e. among the Lao-Tai language group (95 % male literacy, 92% female literacy), while low literacy rates occur in rural remote areas where ethnic minority people, particularly those of Sino-Tibetan origin, reside (57% male literacy, 47% female literacy) (see Maps F1 and F2).

Literacy rates are high (above 90%) in urban areas both among men and women. In rural areas, however, the gender gap tends to be significantly wider. This is particularly true in rural areas without all-year road access, where only 62% of women can read and write, compared to 81% of men there.

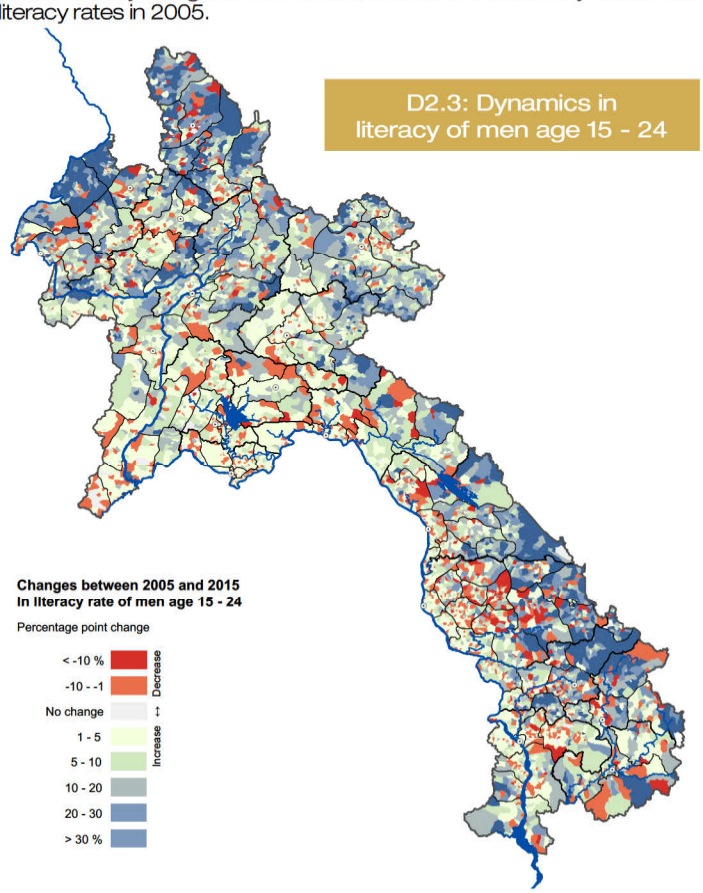
Dynamics between 2005 and 2015

The good news, however, is that there have been significant improvements between 2005 and 2015: in most of the areas with lower literacy rates, strong positive changes can be observed. While positive changes have occurred among both men and women, improvements are much stronger among women who have begun to catch up to men from the lower literacy rates exhibited in 2005, as illustrated in Maps D2.4 and D2.3 respectively.

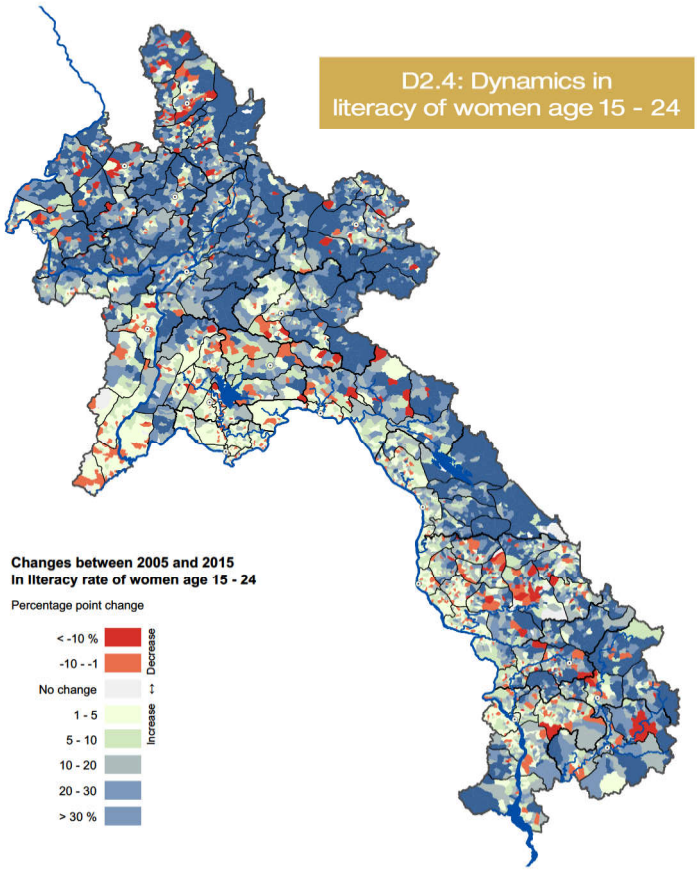
Significant improvements are seen in most parts of the country, particularly in the most disadvantaged areas, although there are clearly also areas which have experienced decreases in literacy rates. The regions which exhibit smaller degrees of change, particularly the main lowland areas of the country along the Thai border, are areas that already had better literacy rates in 2005.



D2.2: Literacy of population age 15 - 24



D2.3: Dynamics in literacy of men age 15 - 24



D2.4: Dynamics in literacy of women age 15 - 24

Sex ratio in literacy

Literacy among men in the Lao PDR (90%) remains significantly higher in 2015 than among women (80%). Literate and educated women have a great positive influence on themselves, their family, and society as a whole. Children with literate mothers tend to have better nutrition, and a better education (Alderman, 2017). The education level and literacy of women therefore plays an important role in reducing poverty.

Using information on the gender, age, and literacy of each individual five years and older from the 2015 and 2005 censuses, sex ratios for the literate population of specific age groups can be calculated, along with the respective changes that occurred between the 2005 and 2015 censuses.

Significant increases in literacy rates can be observed among both men and women between 2005 and 2015: the literacy rate among women has increased by around 16% since 2005, while the literacy among men increased by 7% in that period, implying good progress in both overall literacy and narrowing the respective gender gap significantly.

The sex ratio of the literate population, as well as the respective trends, vary significantly across different geographic locations, across different ethno-linguistic groups, and by the degree of poverty.

Spatial patterns in 2015

Map D3.1 shows the proportion of literate men to literate women aged 15 - 24 in 2015. Literacy rates are higher among men in places shaded blue, whereas shades of red indicate areas where female literacy rates exceed male literacy rates. Given the overall gender imbalance of literacy with rates higher among men, it is surprising to see that large parts of the Lao PDR actually show slightly higher literacy rates among women. However, where more pronounced imbalances exist, rates among men are much higher, particularly in the far north close to the Chinese border in Luang Namtha and Phongsaly, as well as in the south near the Vietnamese border. In these regions, more in line with global trends of less affluent families prioritizing educating boys, literacy rates are already generally low and men have much higher literacy than women. Meanwhile, in the western part of the country, especially in urban areas, there is a much less pronounced gender gap in literacy rates along with generally higher literacy rates across these urban populations.

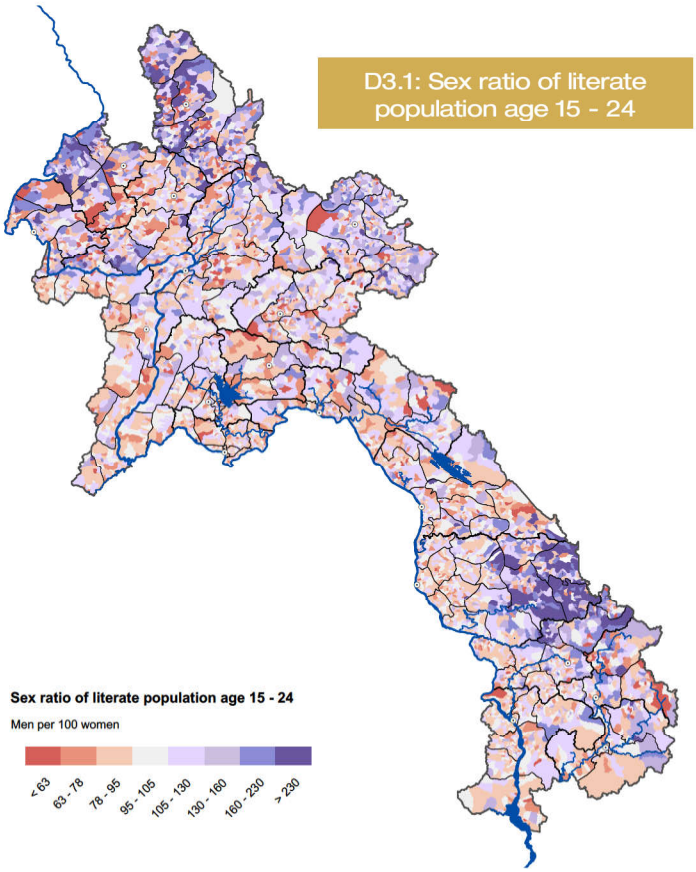
In the older age group of 25 – 64 year olds, the gender imbalance is much stronger: aside from in some urban and peri-urban areas, male literacy clearly outnumbers female literacy, indicated by the dark blue areas on Map D3.3. Again, this pattern is most pronounced in the north and south where literacy rates are already low (see Map D2.1). Progress towards narrowing the gender gap in literacy is illustrated by the clear increase in red areas on Map D3.1 compared to Map D3.3, but also clearly points to areas still lagging behind in that respect.

Dynamics between 2005 and 2015

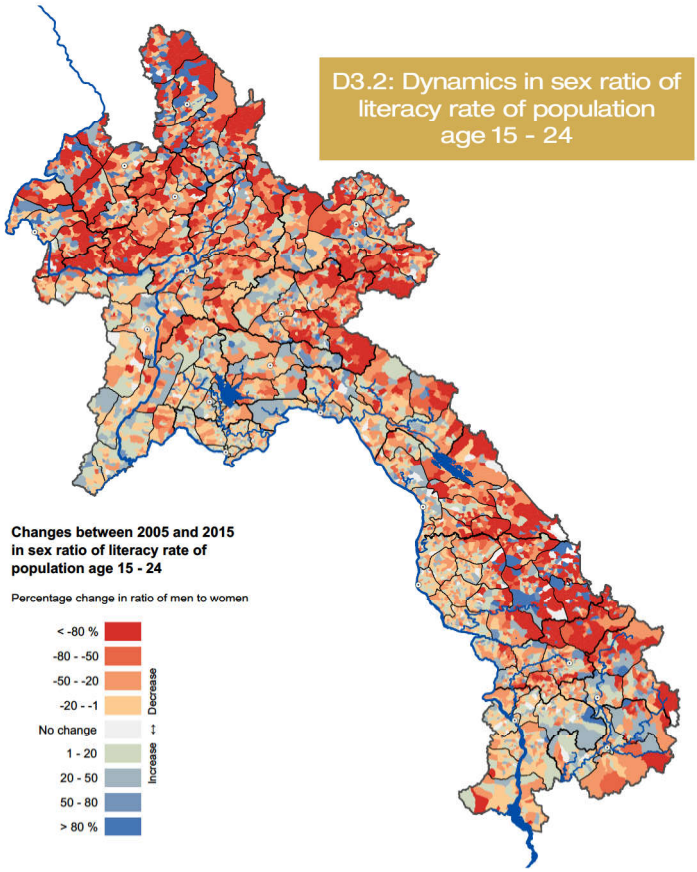
Maps D3.2 and D3.4 reveal how the gender imbalance in literacy among the population age 15-24 and among the working age population of 25 – 64 years old has changed between 2005 and 2015. As illustrated in the maps in red, the areas where male literacy is far greater than female literacy have decreased significantly across the country, but particularly in those areas that still show the greatest gender imbalances. This indicates that progress in narrowing the literacy gender gap was greatest in areas where this gap was also most pronounced.

Compared to the younger age group, the gap between higher literacy rates among men than women has decreased more significantly in the older age group. This implies that progress in narrowing the gender gap has slowed in some areas, which indeed happens to be in areas that today have a more balanced level of literacy among men and women. Nonetheless, a significant increase in the gender imbalance, illustrated in dark blue, can be identified in several villages located in the most disadvantaged regions with the lowest overall literacy rates, which certainly should be seen as a worrying trend.

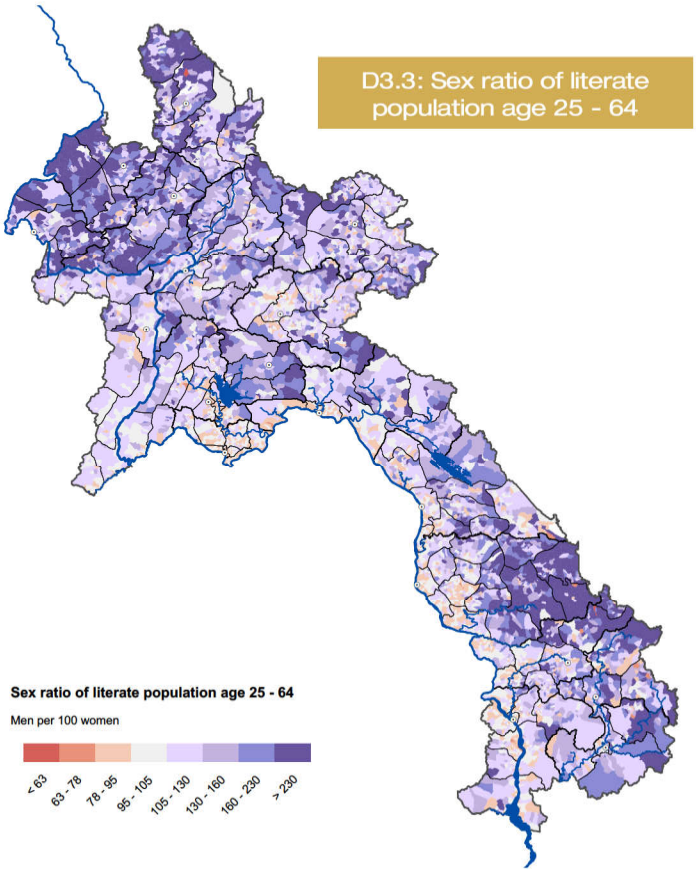
D3.1: Sex ratio of literate population age 15 - 24



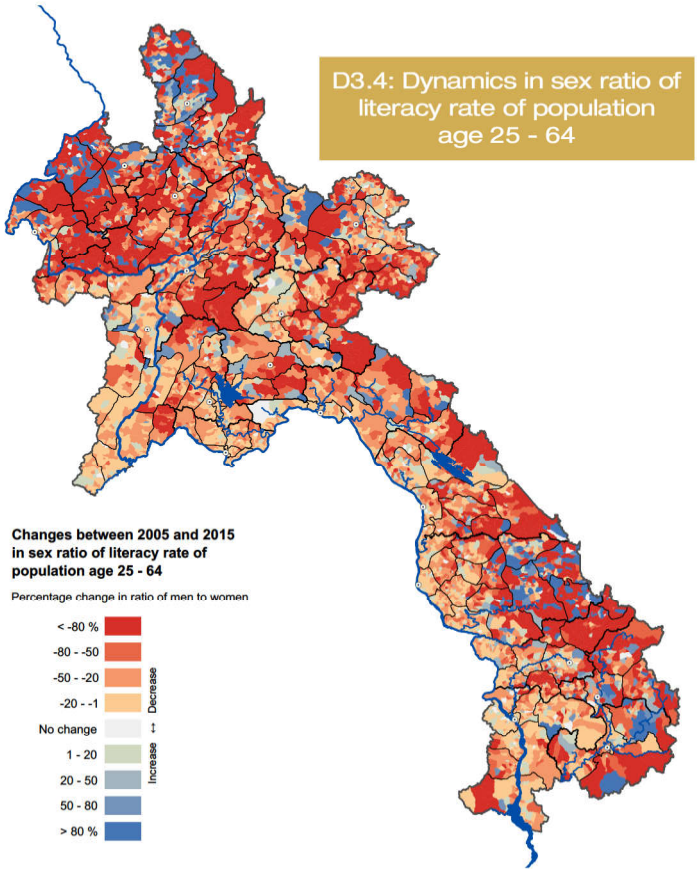
D3.2: Dynamics in sex ratio of literacy rate of population age 15 - 24

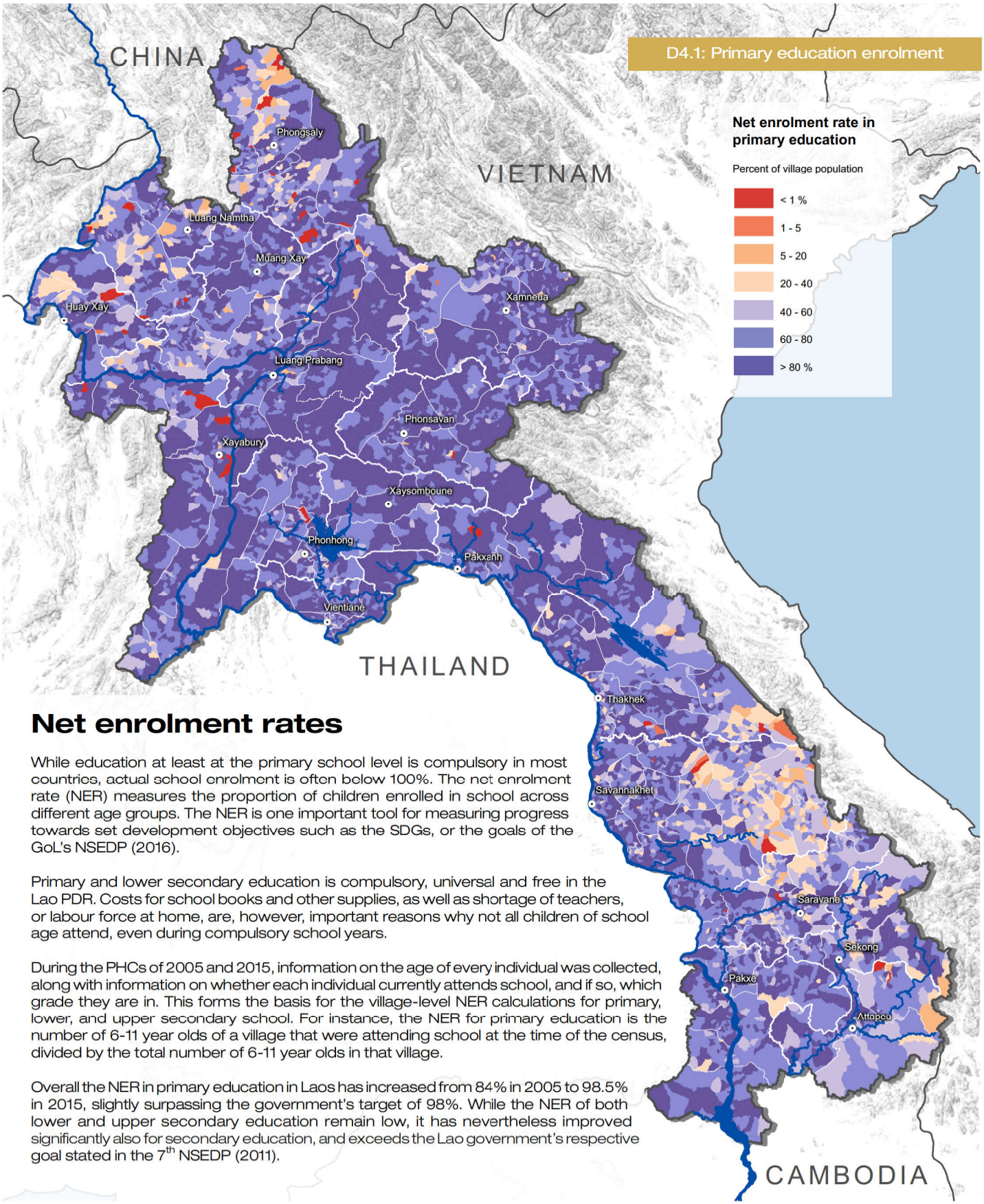


D3.3: Sex ratio of literate population age 25 - 64



D3.4: Dynamics in sex ratio of literacy rate of population age 25 - 64





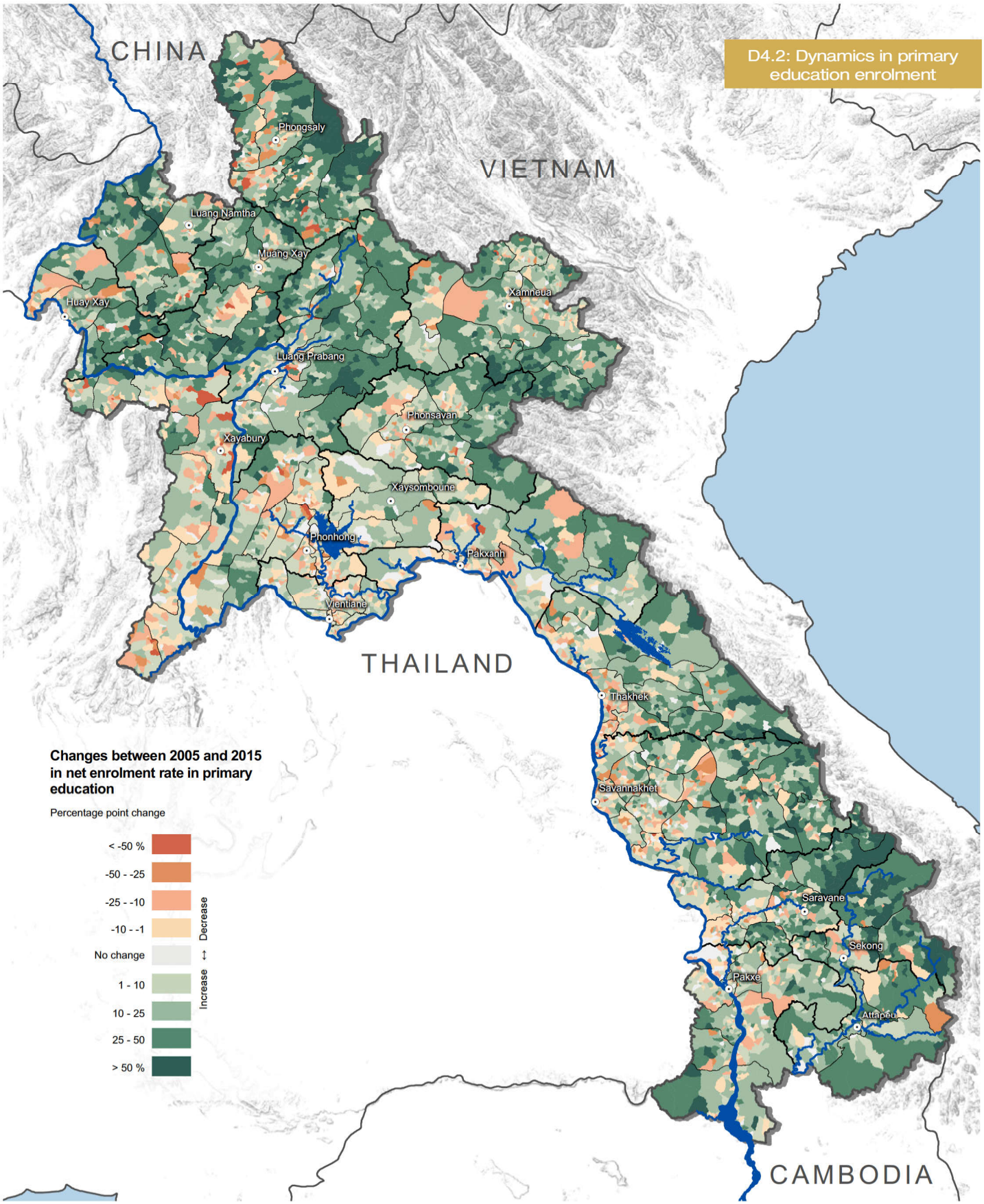
Net enrolment rates

While education at least at the primary school level is compulsory in most countries, actual school enrolment is often below 100%. The net enrolment rate (NER) measures the proportion of children enrolled in school across different age groups. The NER is one important tool for measuring progress towards set development objectives such as the SDGs, or the goals of the GoL's NSEDP (2016).

Primary and lower secondary education is compulsory, universal and free in the Lao PDR. Costs for school books and other supplies, as well as shortage of teachers, or labour force at home, are, however, important reasons why not all children of school age attend, even during compulsory school years.

During the PHCs of 2005 and 2015, information on the age of every individual was collected, along with information on whether each individual currently attends school, and if so, which grade they are in. This forms the basis for the village-level NER calculations for primary, lower, and upper secondary school. For instance, the NER for primary education is the number of 6-11 year olds of a village that were attending school at the time of the census, divided by the total number of 6-11 year olds in that village.

Overall the NER in primary education in Laos has increased from 84% in 2005 to 98.5% in 2015, slightly surpassing the government's target of 98%. While the NER of both lower and upper secondary education remain low, it has nevertheless improved significantly also for secondary education, and exceeds the Lao government's respective goal stated in the 7th NSEDP (2011).


D4.2: Dynamics in primary education enrolment
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Vientiane
Pakxanh
Thakhek
Savannakhet
Saravane
Sekong
Pakxe
Attapeu
Changes between 2005 and 2015 in net enrolment rate in primary education
Percentage point change
< -50 %
-50 - -25
-25 - -10
-10 - -1
No change
1 - 10
10 - 25
25 - 50
> 50 %
Decrease
Increase

Spatial patterns in 2015

The different maps on this double page show the net enrolment rates of 2015 in primary, lower secondary, and upper secondary education, along with the respective changes between the censuses. Not surprisingly, enrolment rates drop significantly between primary and lower secondary school, and again at the transition to upper secondary school. The spatial pattern, however, remains relatively consistent across the country: lower enrolment rates occur in the mountainous areas of the far north and the southeast, contrasting with higher enrolment rates throughout the Mekong River valley, and in more accessible areas in the north. The NERs for primary school are particularly low and concentrated in the eastern half of Savannakhet and, to a lesser extent and with less consistency, in central and northern Luang Namtha and Phongsaly Provinces (Map D4.1). Some of these area show very low NERs of less than 50% despite the fact that physical access to schools in those areas is typically quite good (see Map D1).

Enrolment in lower, and even more so in upper secondary schools (Maps D4.3 and D4.5) is very low across Luang Namtha, Bokeo, and Phongsaly Provinces in the north, and in the east along the Vietnam border, including the eastern half of Savannakhet, Saravane, Sekong and Attapeu Provinces in the south. Enrolment is also particularly low for upper secondary schools in the mountainous parts of Khammuane and Borikhamxay.

These areas contrast with comparatively high enrolment rates in most of the northern provinces of Huaphanh, Xiengkhuang, Xayabury, Luang Prabang, as well as in Vientiane Province, Vientiane Capital City, and Borikhamxay in central Lao PDR.

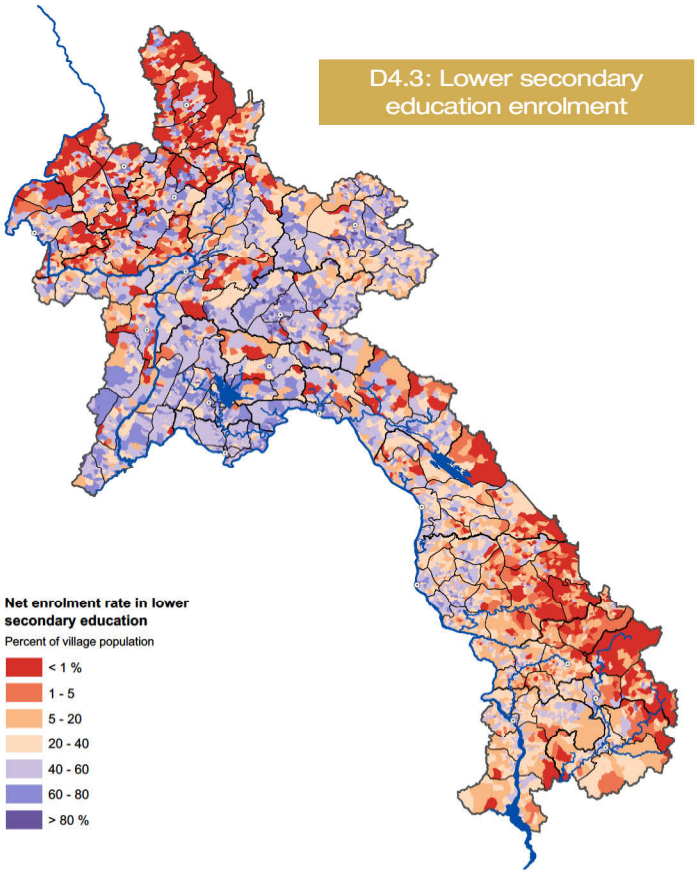
Dynamics between 2005 and 2015

The red and green coloured maps illustrate the changes in net enrolment rates between censuses: red represents a decrease in net enrolment rates, while green signifies an increase.

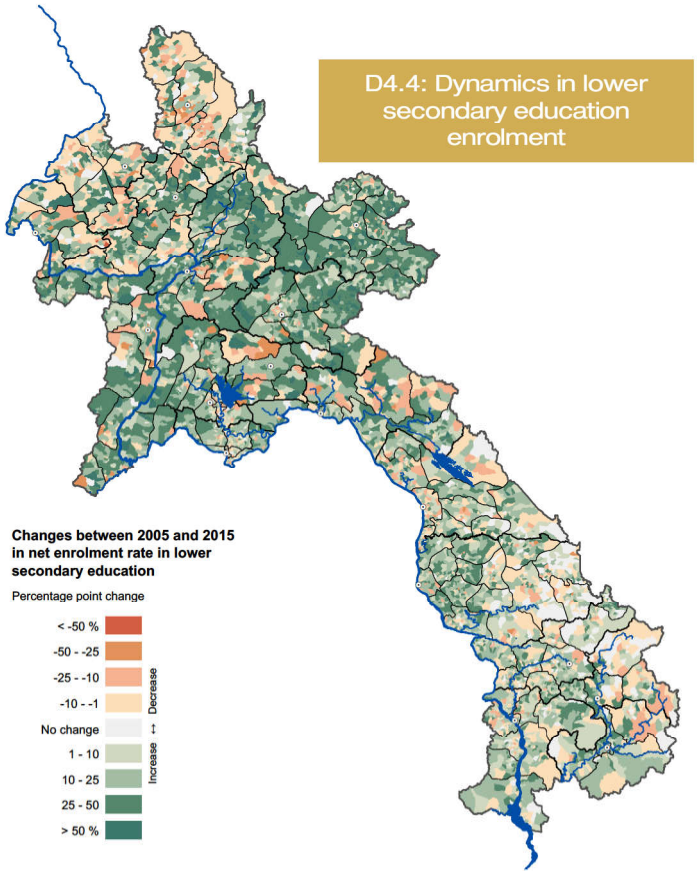
The most significant overall changes are observed in primary enrolment (Map D4.2), with strong increases in net enrolment in most of the villages in more disadvantaged, mountainous areas of the country in the north as well as in the south. The promotion of primary education in those areas has clearly resulted in positive change. In many more accessible lowland areas, on the other hand, changes were much more moderate, with slight increases as well as slight decreases in net enrolment rates. These are areas which already had rather high net enrolment rates in 2005.

A comparison of the spatial patterns of change in net enrolment rates in primary and lower secondary education (see Maps D4.2 and D4.4) reveals some interesting patterns: many of the areas that have experienced little to no change in primary school NERs experienced a strong increase in lower secondary NERs, which reflects the impact of high primary net enrolment on later improvements in secondary school enrolment.

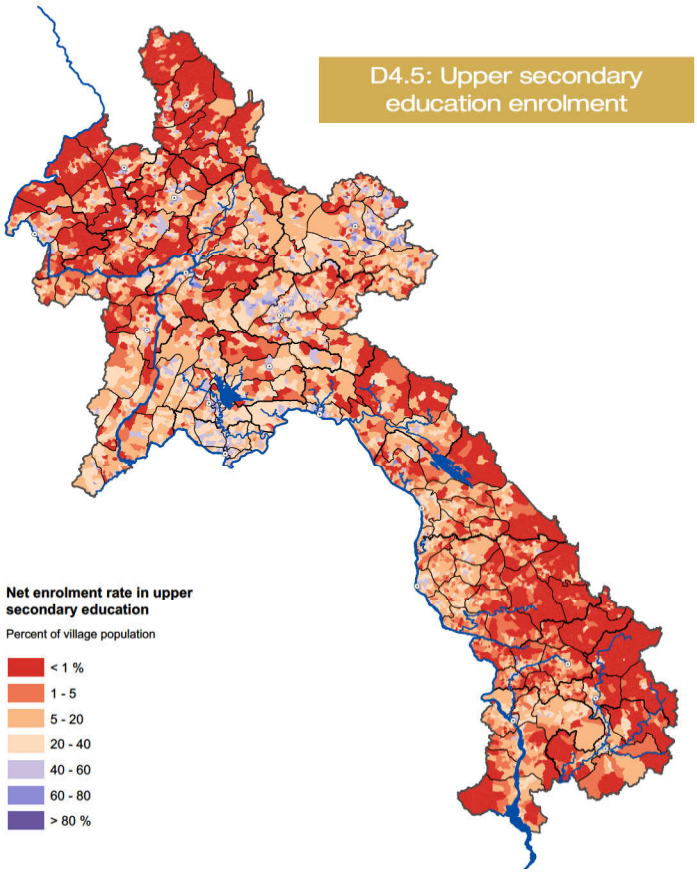
D4.3: Lower secondary education enrolment



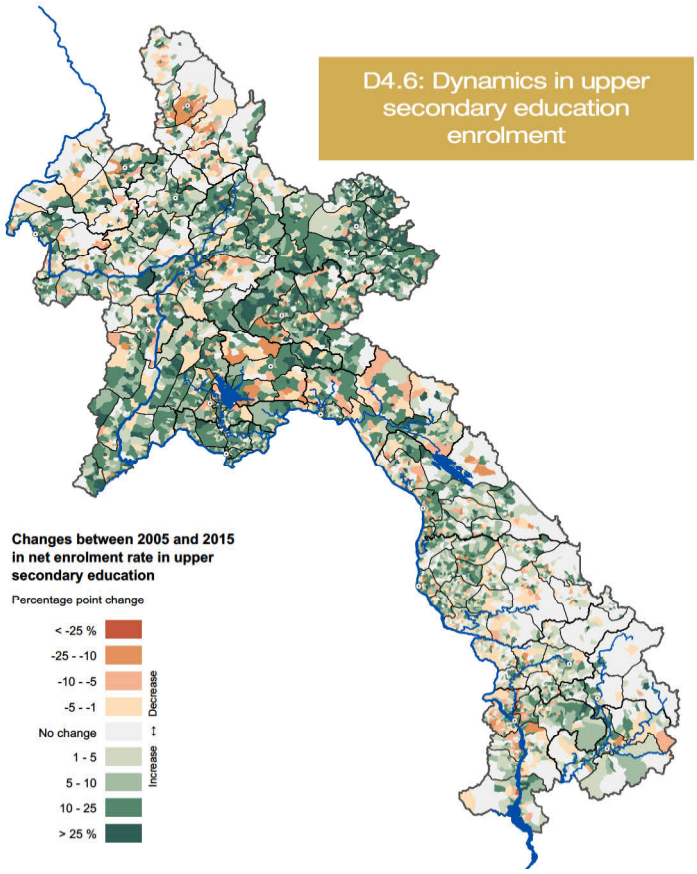
D4.4: Dynamics in lower secondary education enrolment



D4.5: Upper secondary education enrolment



D4.6: Dynamics in upper secondary education enrolment



Sex ratio in education

The global goals of the EFA (UNESCO, 2015) and SDGs (UNDP, 2015) call for equal access to education for boys and girls. Gender inequality in education is prominent where cultural norms give priority to educating boys, while traditional roles for girls include helping with domestic tasks and with raising younger siblings, often starting at young ages.

Despite significant progress in narrowing the gender gap in education in the Lao PDR, a strong imbalance remains at all levels of education, with a wider gap towards the higher levels of education.

Spatial patterns in 2015

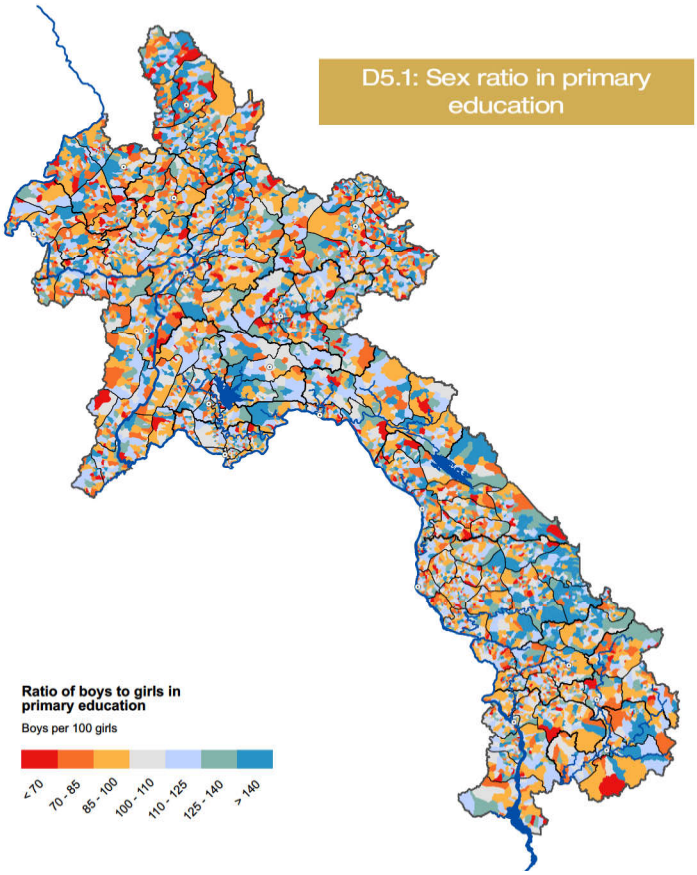
Map D5.1 illustrates the proportion of male to female students in primary education. In general, it is far more common to find a student sex ratio above 100, meaning there are more boys in schools than girls. Villages with a particularly significant gender gap are concentrated in Phongsaly and Luang Namtha Provinces near the Chinese border in the north, in Savannakhet Province particularly near the Vietnam border, and in the south.

This gender imbalance becomes more pronounced at higher education levels. In the most remote areas, very few students enter into secondary education (see the white areas in Maps D5.3 and D5.5). Moreover, the higher NER of boys than girls in secondary education is much more significant in the uplands and remote lowland areas, whereas in the more densely populated lowland and urban areas, the gender imbalance is less pronounced.

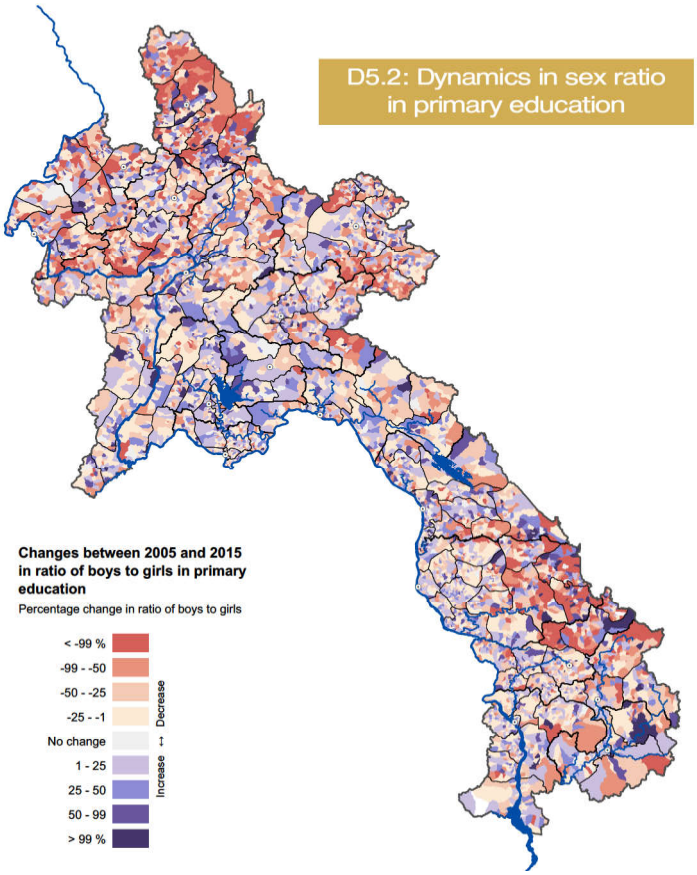
Dynamics between 2005 and 2015

Map D5.2 illustrates how the proportion of men to women in primary education changed in the past 10 years. In general, the NER of girls has increased in many parts of the country (indicated by a negative figure in the change of the sex ratio, shown in red), particularly in areas where boys have much higher NERs than girls. This illustrates that progress has been made, but that there is still ample room and need for improvement, particularly in the most disadvantaged areas of the country. Interestingly, progress in female NERs is even more pronounced in secondary education.

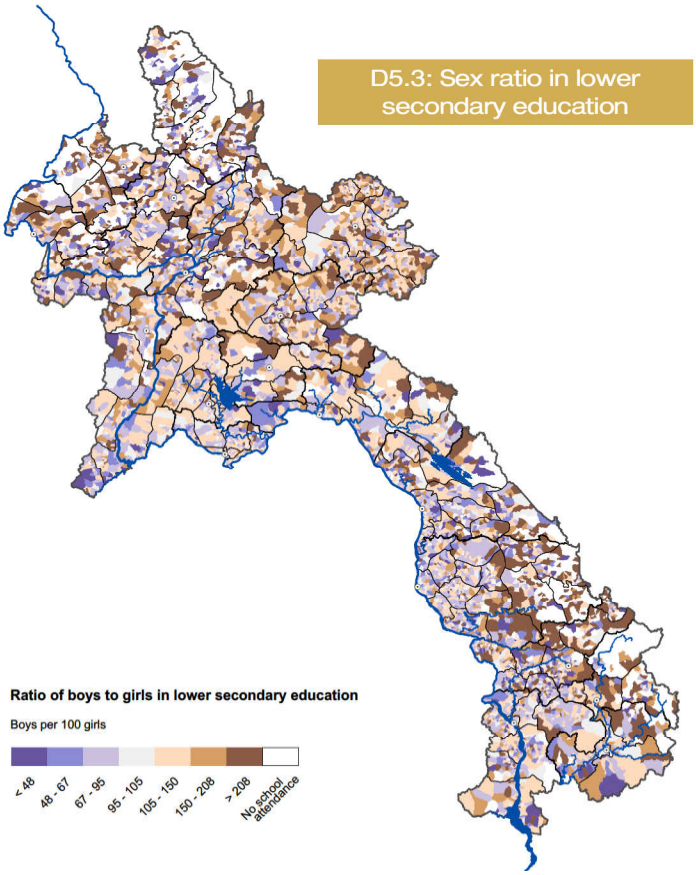
D5.1: Sex ratio in primary education



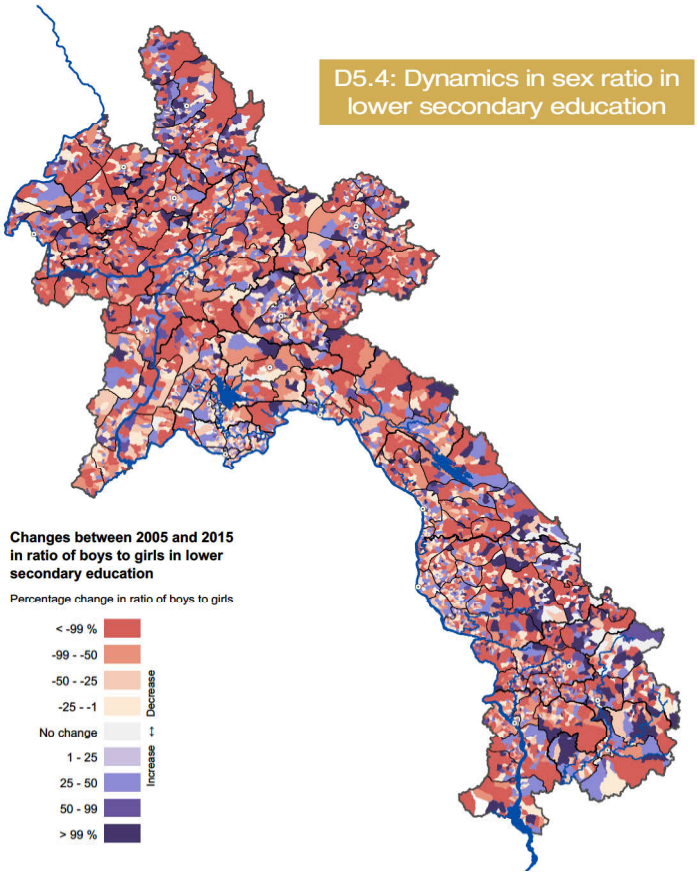
D5.2: Dynamics in sex ratio in primary education



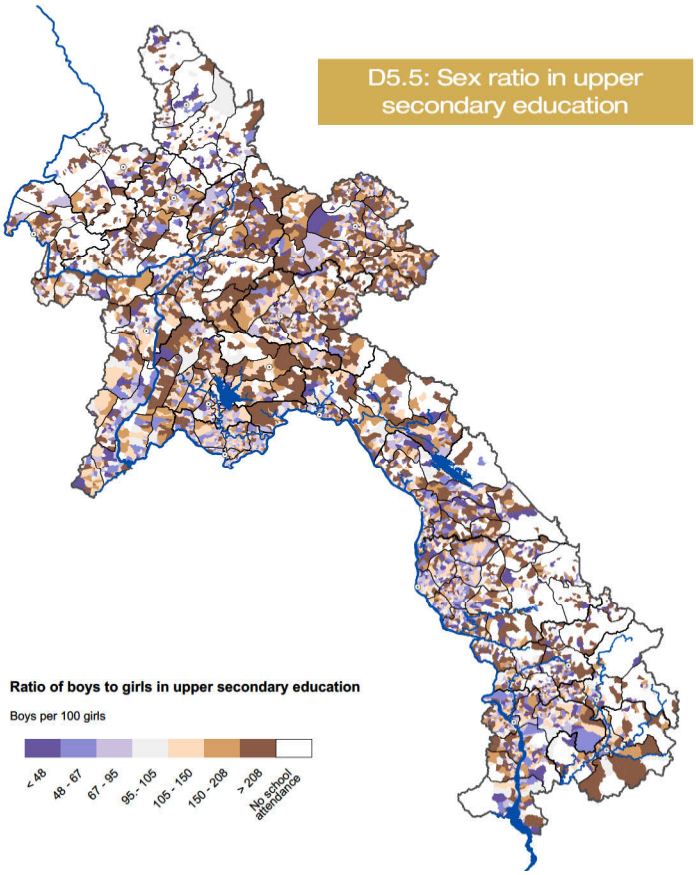
D5.3: Sex ratio in lower secondary education



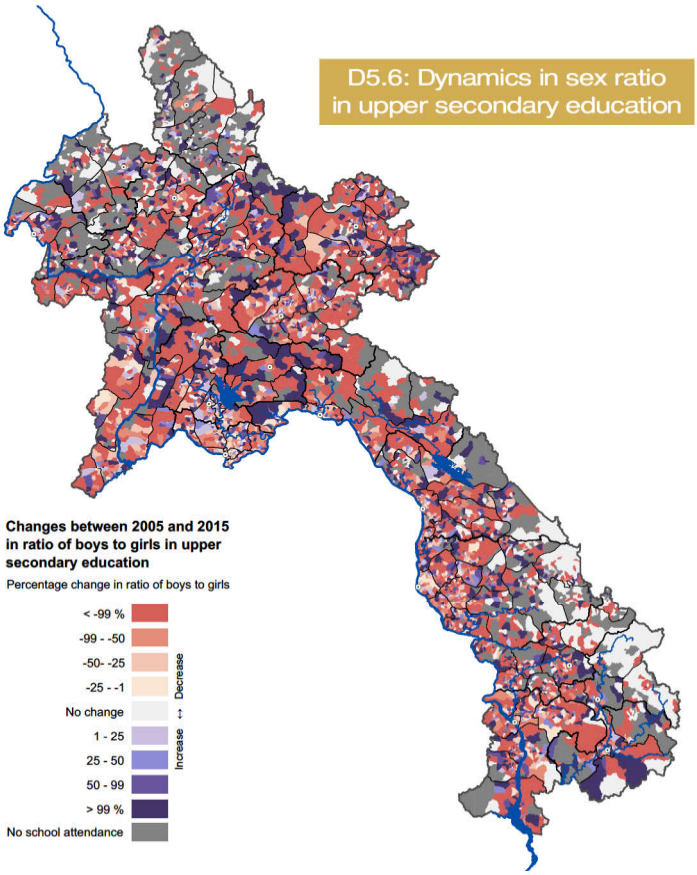
D5.4: Dynamics in sex ratio in lower secondary education



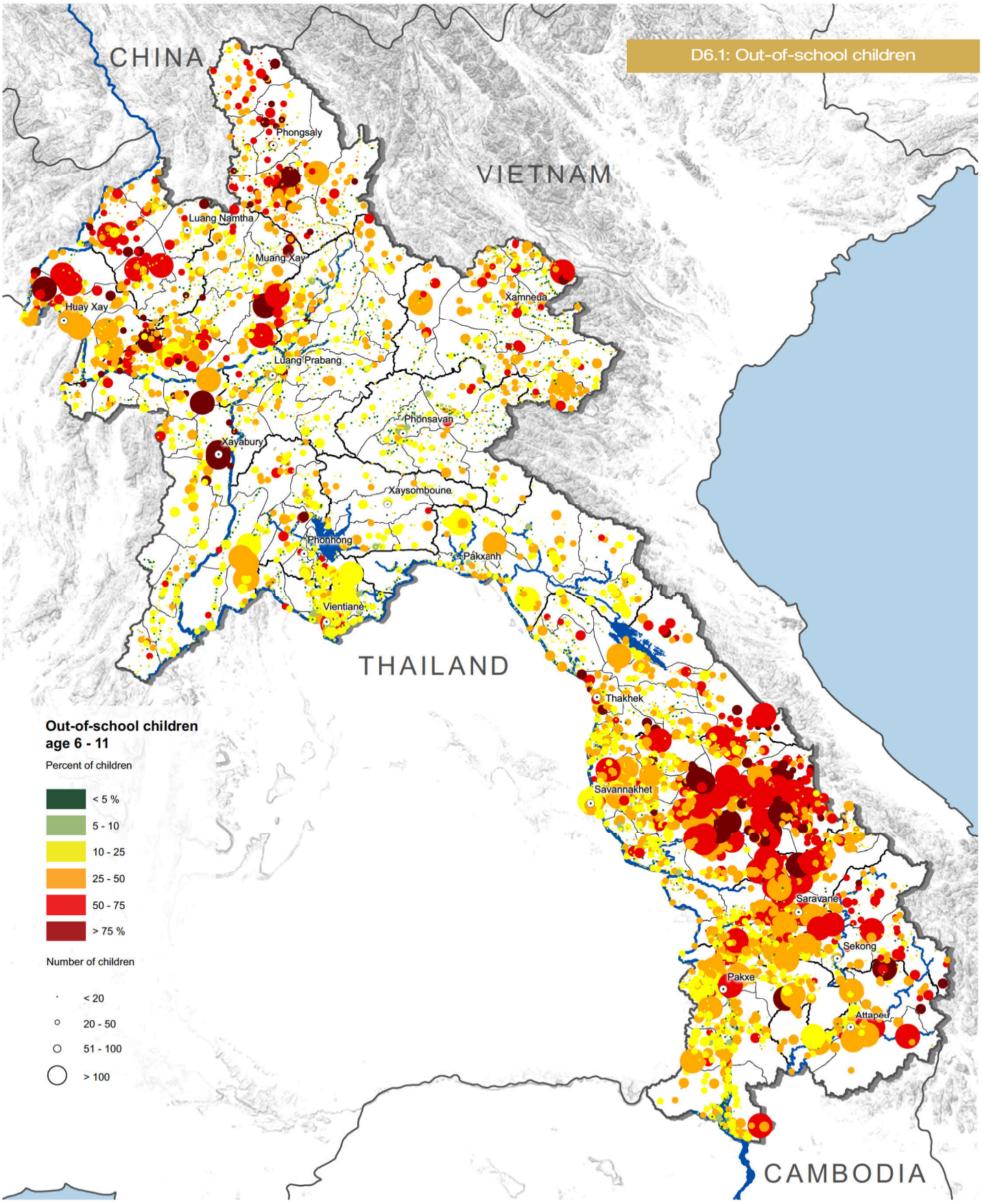
D5.5: Sex ratio in upper secondary education



D5.6: Dynamics in sex ratio in upper secondary education



D6.1: Out-of-school children



Out-of-school children

School-age children may not attend school for a variety of reasons sometimes related to the costs of attending school (direct and in terms of opportunity costs), to cultural attitudes towards education generally, and for a variety of other reasons. For example, children may have limited physical access to schools in their area, families may require children's labour, priority might be given to other duties over studying, limited school facilities or resources may discourage attendance, and a range of other obstacles may exist. Generally, so-called out of school children (OOSC) come from poor households, typically in remote rural areas, and OOSC rates are especially high among children in ethnic minority groups whose first language is not Lao, which is used and taught in school.

Spatial patterns in 2015

Although the number of schools and net enrolment rates have increased in the Lao PDR over the past decade, many children are still not attending school regularly. Map D6.1 shows the distribution of OOSC between 6 and 11 years old who are supposed to attend primary school.

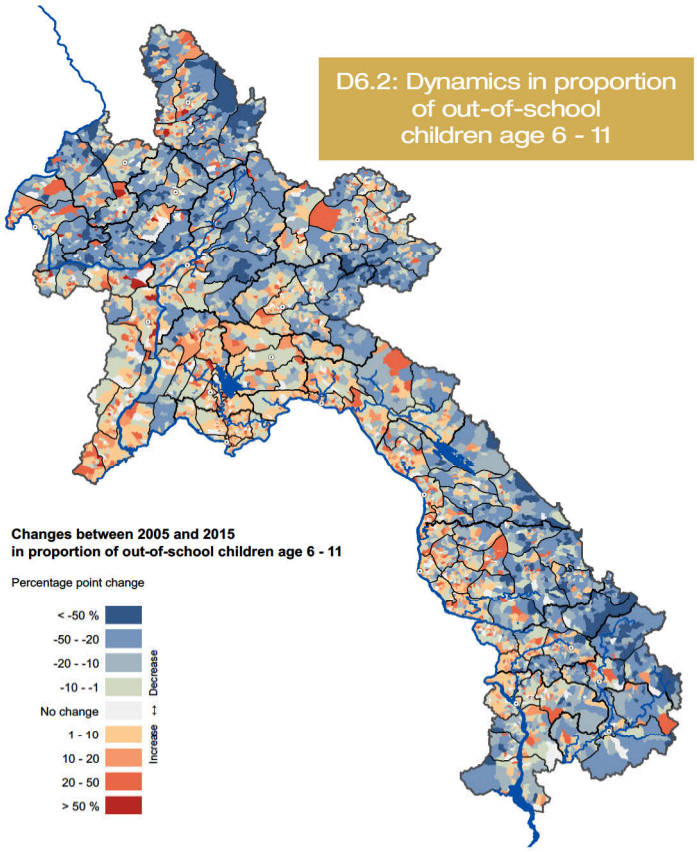
Large numbers of primary school aged children do not attend school in many villages in the northwest and the north, as well as in the eastern parts of the south, indicated with red dots on Map D6.1. These more remote rural areas are often populated with people of non-Lao ethno-linguistic groups. Among them, the Sino-Tibetan populations have the highest rates of OOSCs, followed by Mon-Khmer and Hmong-Mien populations (see Map F2). In terms of absolute numbers of OOSC, in Savannakhet, Saravane, and Champasak Provinces, many larger villages have high rates and large numbers of OOSC.

Map D6.3 reveals a gender gap among the 6 to 11 year old OOSCs, where in more accessible lowland areas a higher portion of OOSCs tend to be boys, and in the poorer areas (see Map I1.1) particularly in the southeast and the north of the Lao PDR generally more OOSCs are girls, largely reflecting the pattern of the gender gap in primary education (Map D5.1).

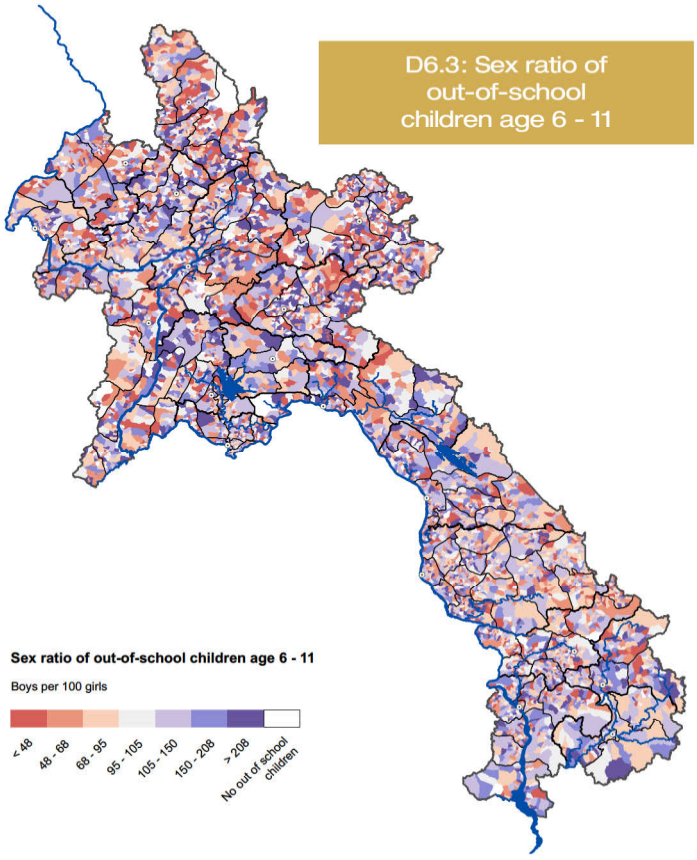
Dynamics between 2005 and 2015

Map D6.2 illustrates how the proportion of OOSCs among the 6 to 11 year olds in each village has changed over the last decade. A distinctive spatial pattern is quite clear: while the percentage of OOSCs decreased significantly throughout the uplands of the north and along the Vietnam border in southern Lao PDR, the changes are much smaller and more mixed in most of the lowland areas of the country. The areas with the strongest decreases in OOSCs in this age group are the areas that had the highest OOSC rates before, and are therefore also the areas where there was the greatest need and also the greatest scope for improvement.

D6.2: Dynamics in proportion of out-of-school children age 6 - 11



D6.3: Sex ratio of out-of-school children age 6 - 11



School attendance

School attendance is mandatory in the Lao PDR at both the primary and lower secondary school levels. All children between 6 and 16 years of age should therefore be attending school.

During the implementation of the PHC 2015, information was collected on current school attendance for all people 6 years of age and older. Overall, four fifths of all 6-16 year olds were attending school in 2015 – a significant increase from two thirds in 2005. Over half of those not attending in 2015 had attended school at some point in the past, but dropped out before completing the mandatory years of schooling.

Spatial patterns in 2015

The maps on this page show school attendance rates among 6, 10, and 15 year olds, as well as changes in these indicators since 2005. A number of distinctive patterns can be observed.

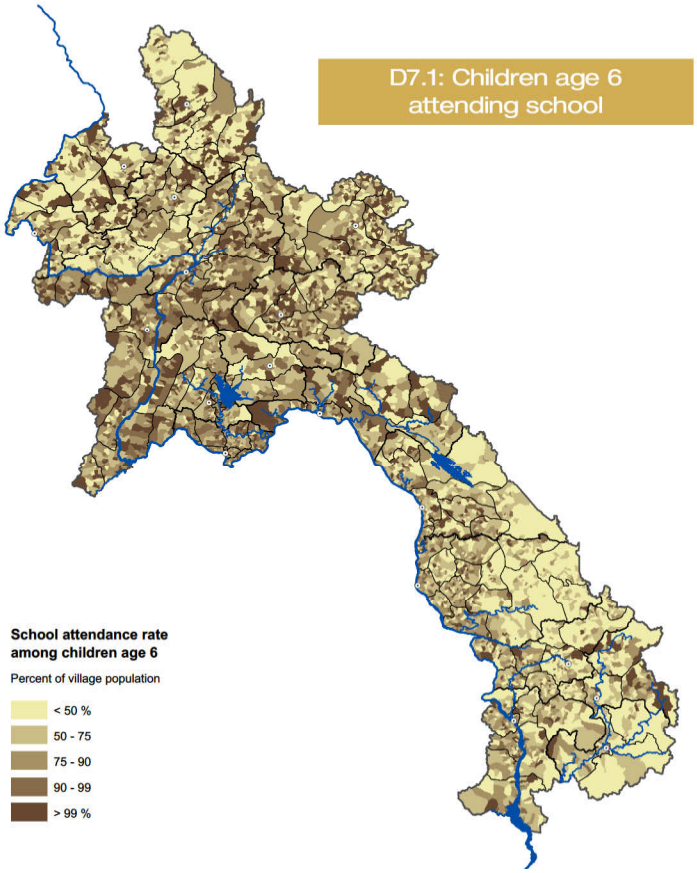
Firstly, rather than steadily declining with age, school attendance starts at a rather low level among six year olds, reaching a high attendance rate in most parts of the Lao PDR among 10 year olds, then declining again to a low attendance rate among the 15 year olds. This indicates that many children start school late, i.e. after the official start of schooling at age 6, and drop out again before completing the compulsory lower secondary schooling.

Secondly, distinctive spatial patterns are obvious: areas with late school enrolment include the far north and the northwest, as well as much of south eastern Lao PDR. Attendance at age 10 is lowest by far in eastern Savannakhet Province, which is also among one of the poorest areas in the country (see Map I1.1). School attendance among 15 year olds provides a similar picture: in areas where children tend to start school late, there is also a clear tendency for early drop-outs. All those areas are comparatively poorer and typically inhabited by members of a non-Lao ethno-linguistic groups.

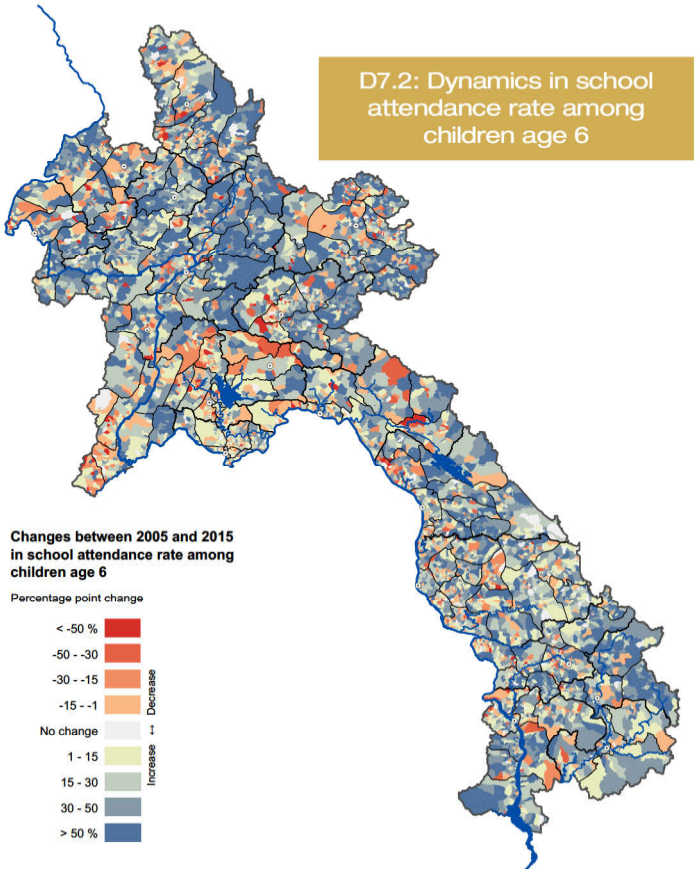
Dynamics between 2005 and 2015

Maps D7.2, D7.4 and D7.6 depict changes in the enrolment rates at the three aforementioned ages between 2005 and 2015. While there have been clear improvements in net enrolment rates in some places, there are also small pockets where rates declined. In the early years, improvements in enrolment rates were strongest in the poorer areas of the country, with some decreasing enrolment rates in certain lowland areas of the north. Among ten year olds, that pattern is even stronger, wherein the most disadvantaged areas of the country made the most progress, basically having caught up with the rest of the country, whereas enrolment rates remained at a relatively high level in most lowland areas. Patterns are again less distinctive among 15 year olds, although improvements have occurred in eastern Savannakhet Province and much of the northeast on the one hand, while decreases occurred in western Saravane and much of Sekong, as well as in many parts of the north western Lao PDR.

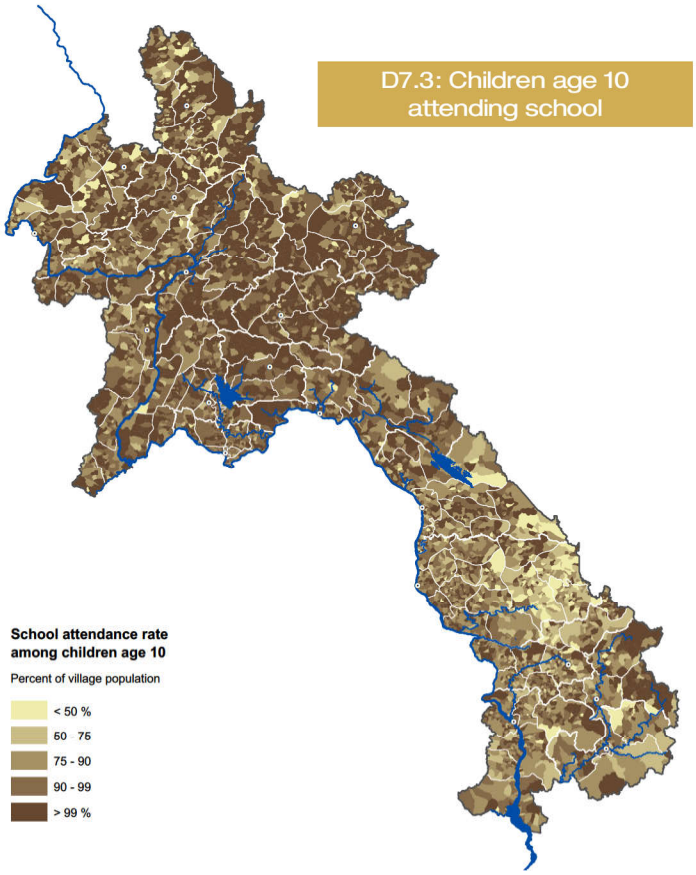
D7.1: Children age 6 attending school



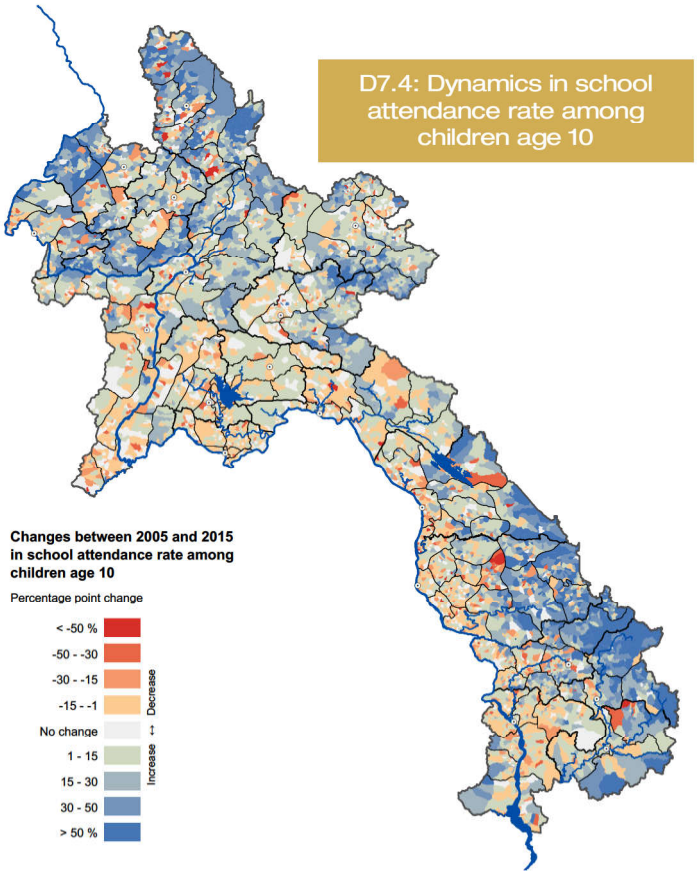
D7.2: Dynamics in school attendance rate among children age 6



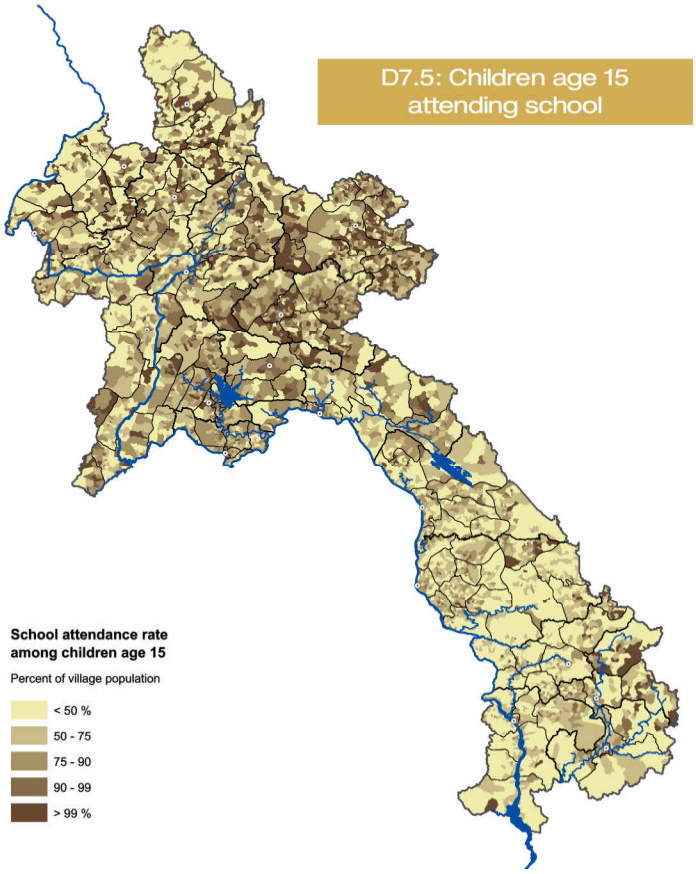
D7.3: Children age 10 attending school



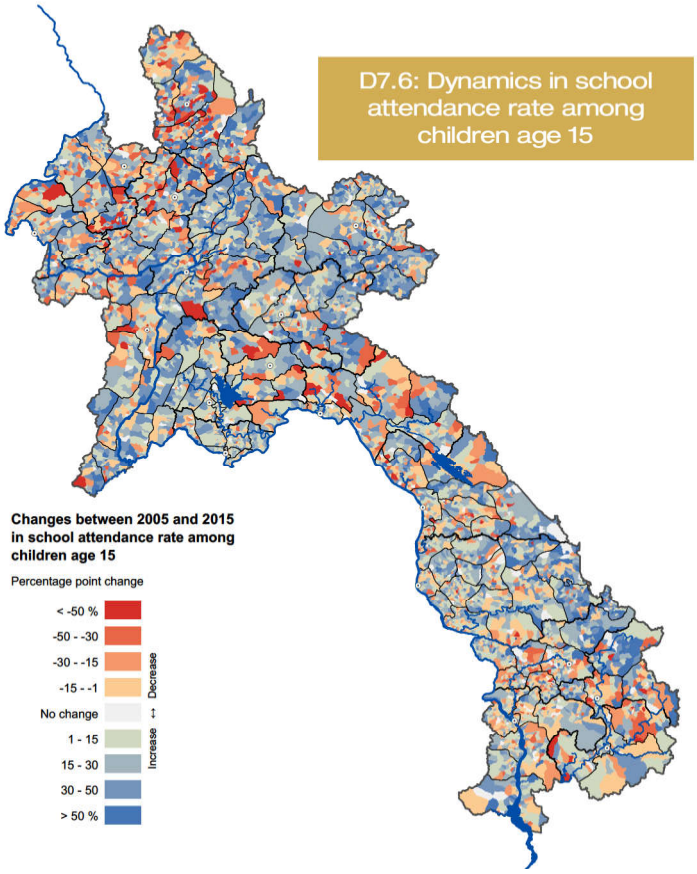
D7.4: Dynamics in school attendance rate among children age 10



D7.5: Children age 15 attending school



D7.6: Dynamics in school attendance rate among children age 15



HEALTH

Accessibility of health facilities

Access to health facilities is a major contributor to improved health and, indirectly, to rural development at large. With access to health facilities, a patient is in a better position to seek medical advice and treatment early on, before his or her condition becomes more serious and requires more serious treatment. Proximity to health facilities is of particular importance to members of a community who cannot travel due to injury, old age, or for other reasons. Thus, the strategic expansion of a functional network of health posts, dispensaries, and clinics is of great significance to a country's development.

In the 2015 census village heads were asked whether the village had a health centre or a hospital. Additional information about the quality or the state of local health facilities was not collected. Accessibility of health facilities was calculated in terms of travel time from any given point in the country to the nearest health facility in 2015.

Spatial patterns in 2015

Overall, 19% of the total population has access to a health facility within their own village. Breaking apart this category, 22% of villages considered urban have a health centre or a hospital, while only 16% of all rural villages with roads and only 12% of villages without roads have access to health facilities. Figure 5 points out that in more than one fifth of villages, the nearest health facility is more than 2 hours travel time away. Only 35% of all villages in the country have access to a health facility within half an hour travel time away, though slightly more than 50% of the country's population reside in these villages (see Figure 6).

Map E1 shows the distribution of health facilities across the Lao PDR, along with the estimated travel time to the nearest such facility. The map also reflects the main transport infrastructure, with roads displayed as red lines.

Health facilities are easily accessible in Vientiane Capital City, around the Mekong River, in the southern lowlands, and along the main roads. Health facilities are more difficult to access in mountainous areas along the Vietnam border, especially in Phongsaly and Huaphanh Provinces in the north, Borikhamxay and Khammuane Provinces in the centre and Sekong and Attapeu Provinces in the south. The east of Luang Prabang as well as the south of Attapeu are other areas where health facilities are not easily accessible. In some areas, more than 10 hours are needed to reach a health post or pharmacy.

Some of the areas with low accessibility of health facilities, such as the south of Huaphanh, eastern Borikhamxay and Khammuane, as well as eastern Sekong, are also among the country's poorer areas (see Map I1.1), suggesting a correlation between access to health facilities and poverty.

Figure 5: Share of villages by average travel time to the nearest health facility

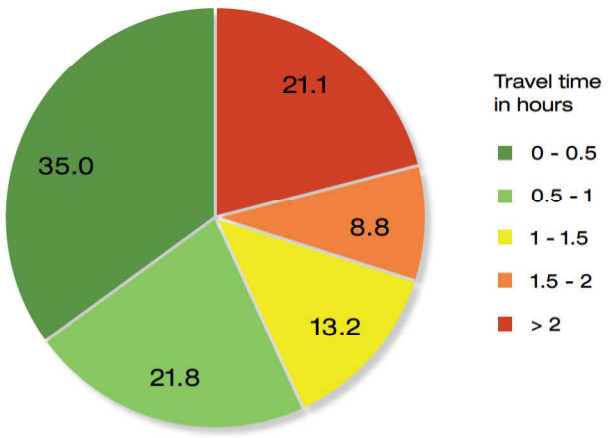
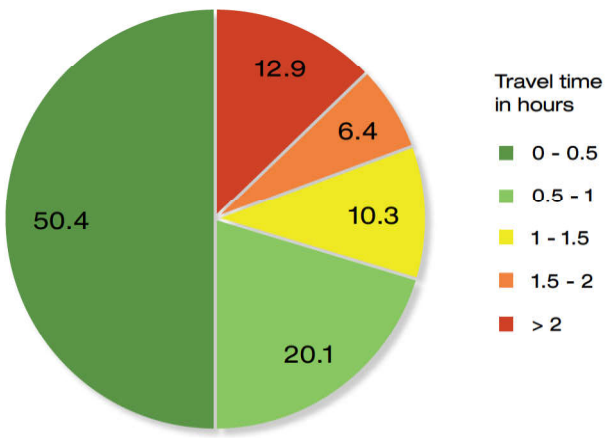
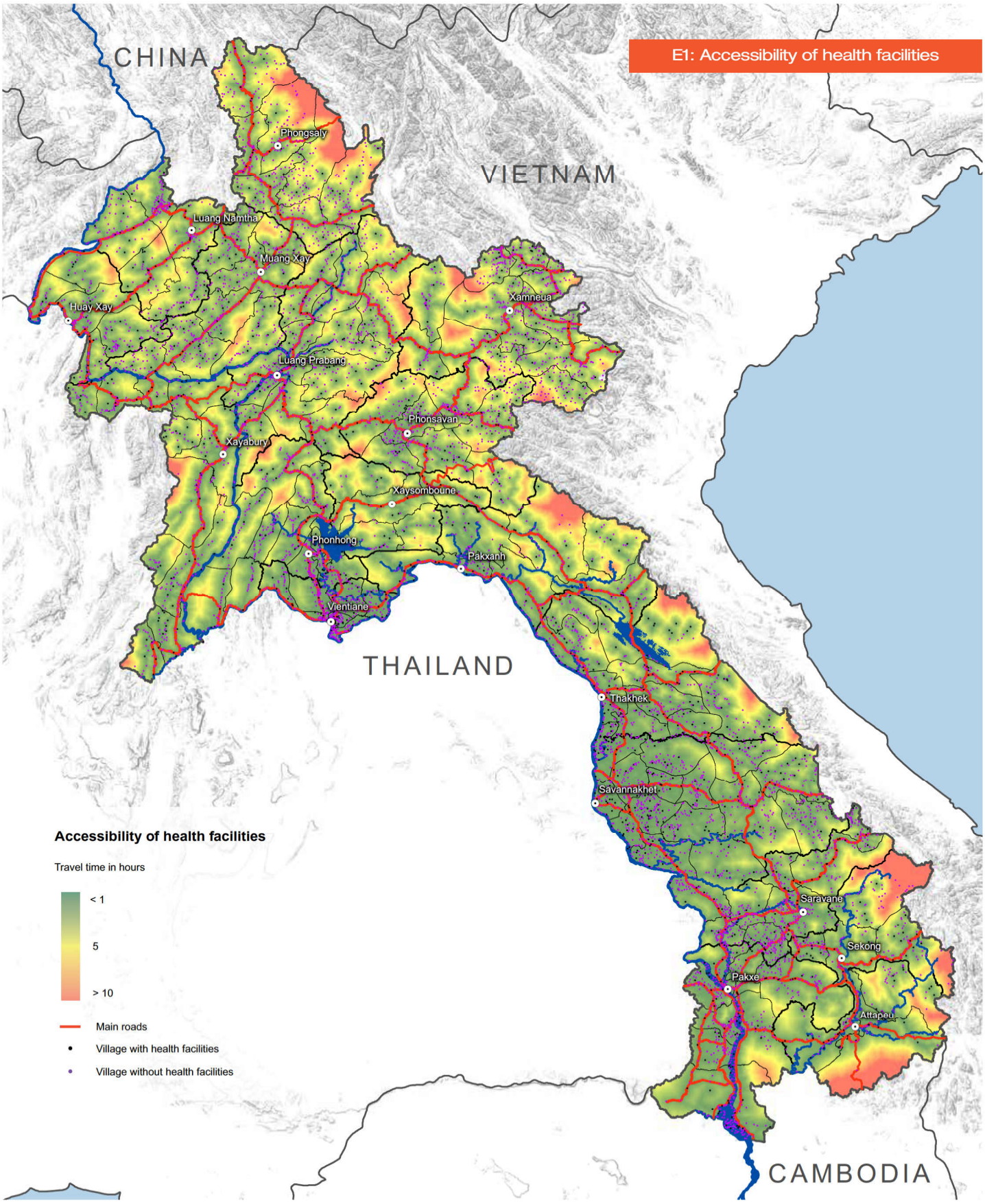
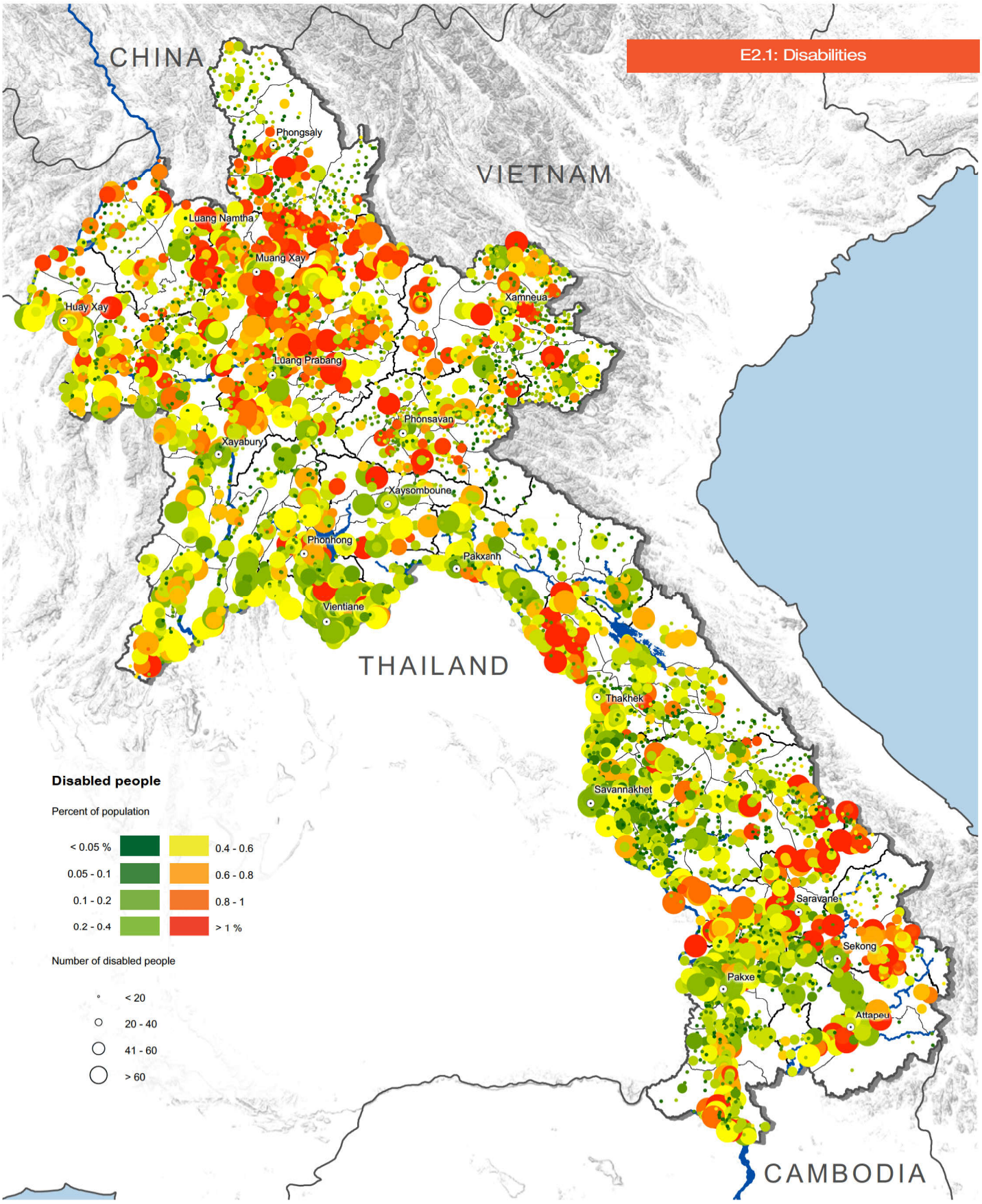


Figure 6: Share of population by average travel time to the nearest health facility




E1: Accessibility of health facilities
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Vientiane
Pakxanh
Thakhek
Savannakhet
Saravane
Sekong
Pakxe
Attapeu
Accessibility of health facilities
Travel time in hours
< 1
5
> 10
Main roads
Village with health facilities
Village without health facilities

E2.1: Disabilities



Population with disabilities

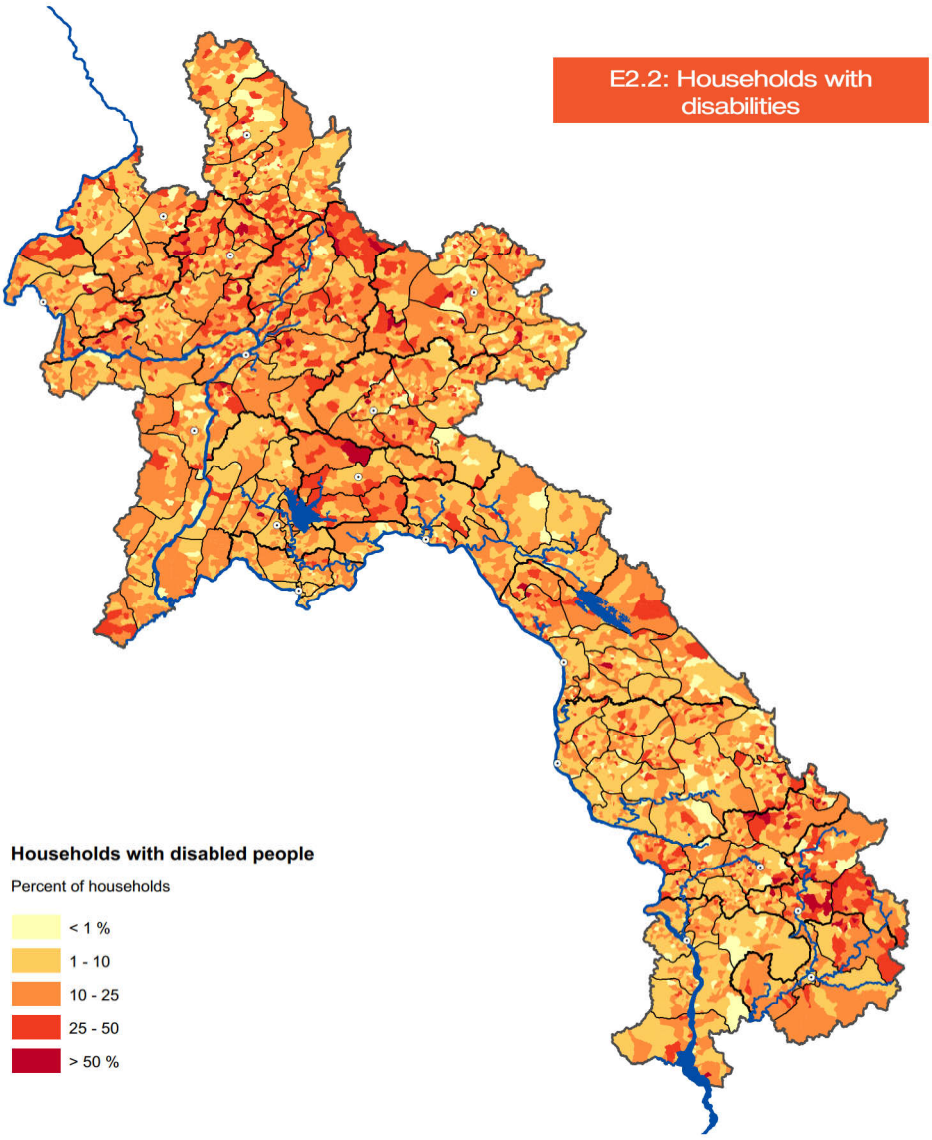
According to the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), "persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (UN, 2006). Similarly, through the Lao Disability Decree of 2014, the GoL defines people with disabilities as those "who have physical, mental or intellectual anomaly or defect including visual, hearing and speaking impairments for a long term, which hinder their daily activities and their full and effective participation in society on an equal basis with others" (Decree on Persons with Disabilities, 2014).

People with disabilities typically face greater challenges in life than people without disabilities. In countries like the Lao PDR, where poverty, low standards of transport and healthcare facilities together with a lack of inclusive education and vocational training are frequent challenges for anybody, disabled people typically face even greater challenges than in more economically developed parts of the world. On top of this, stereotypes and social stigma towards people with disabilities are rather common in the Lao PDR (Hinton and Rutherford, 2014).

Nevertheless, the GoL with support from bilateral and multilateral aid organizations, is progressing towards more inclusive policies in different sectors to guarantee basic human rights to disabled people across the country.

In the 2005 and 2015 censuses, different sets of questions about disabilities were posed to respondents. In 2005, they were simply asked whether there was a disabled person living in the household, followed by a set of questions on the kind of disability (categorized as "visually impaired", "deaf or dumb", "arm or leg handicapped", "multiple disabilities", and "other disabilities"). In the 2015 census, a set of questions explored the degree of difficulty with seeing, hearing, walking, memory or concentrating, self-care, and communicating, thus shifting the emphasis to function rather than on individual deficits. A person is considered disabled if faced with difficulty in at least one domain.

E2.2: Households with disabilities



Spatial patterns in 2015

A total of 160,881 people are disabled in the Lao PDR, constituting 2.8% of the total population. The prevalence of disabilities is 2.5% in urban areas, 2.9% in rural areas with roads and 3.3% in rural areas without road access, revealing a link between the prevalence of disabilities and general accessibility.

Map E2.1 presents the portion of disabled people in the total village population using colour gradients, along with the total number of disabled people per village, represented by the circle size. Villages in the south west and the north east, particularly in Luang Prabang, Xaysomboune, and Attapeu Provinces reveal a relatively high concentration of people with disabilities. As shown in Map E2.2, in some cases, more than 50% of households in a village reported at least one disabled person. At the province level, the prevalence of disability among the population over 5 years old is 4.2% of the total in Luang Prabang, 3.6% in Xaysomboune, and 3.6% in Attapeu. Some of these areas are also characterized by high poverty rates.

Causes of disabilities

The disabilities of the approximately 161,000 disabled people in the Lao PDR have a range of causes. During the 2015 census, respondents were asked about the cause of disabilities of members of their household. The categories of main causes are congenital, accident, illness, Unexploded Ordnances (UXO), war, and others. An important change from the census of 2005 is the inclusion of disabilities due to UXOs, which constitutes a significant cause of disability in the Lao PDR.

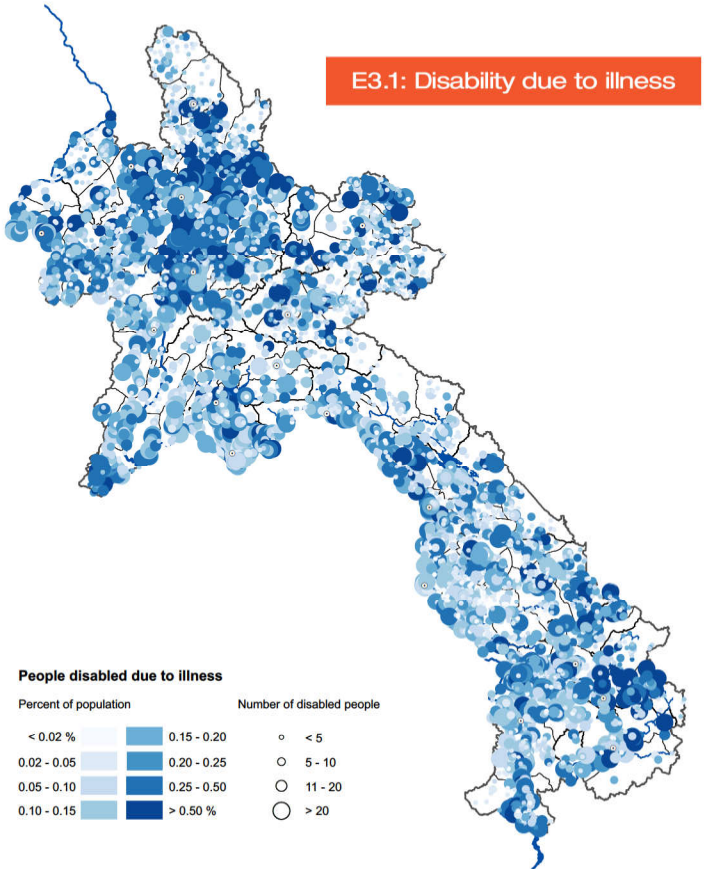
Spatial patterns in 2015

Maps E3.1 through E3.6 illustrate the distribution of disabled people in terms of the cause of their disability. Disabilities caused by accidents are more common in urban centres and more densely populated areas, and constitute the cause of disability for 5% of all disabled people in the country.

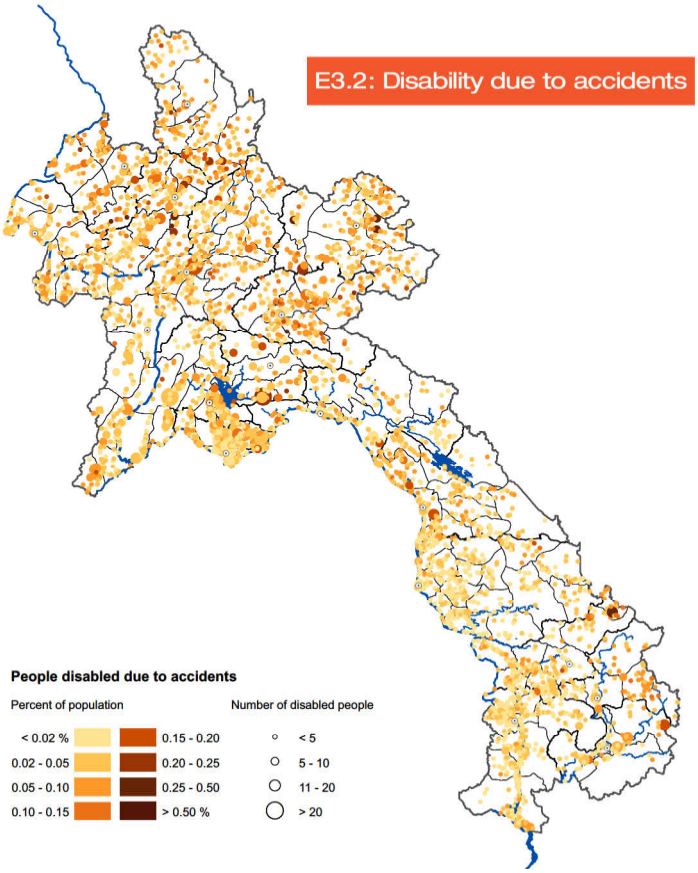
Disabilities due to congenital conditions or illness are common throughout the country, and together constitute the causes of disabilities for almost half (49.48 %) of all disabled people in the country. Illnesses caused disability for more than one third of the population in Attapeu (34.2%) and Xaysomboune (35.2%), and disabilities due to congenital conditions affect one fifth of the population in Huaphanh (24%) and Xayabury (20%) Provinces.

People with disabilities caused by UXO are present throughout the country, with a particularly high concentration in Xiengkhuang Province. Xiengkhuang was the most heavily bombed area during the American secret war, where UXO's induced disabilities constitute 2.1% of the total disabilities affecting people in the Province. Moreover, more than 7% of Xiengkhuang Province's population has disabilities due to past wars, the highest percentage among the provinces.

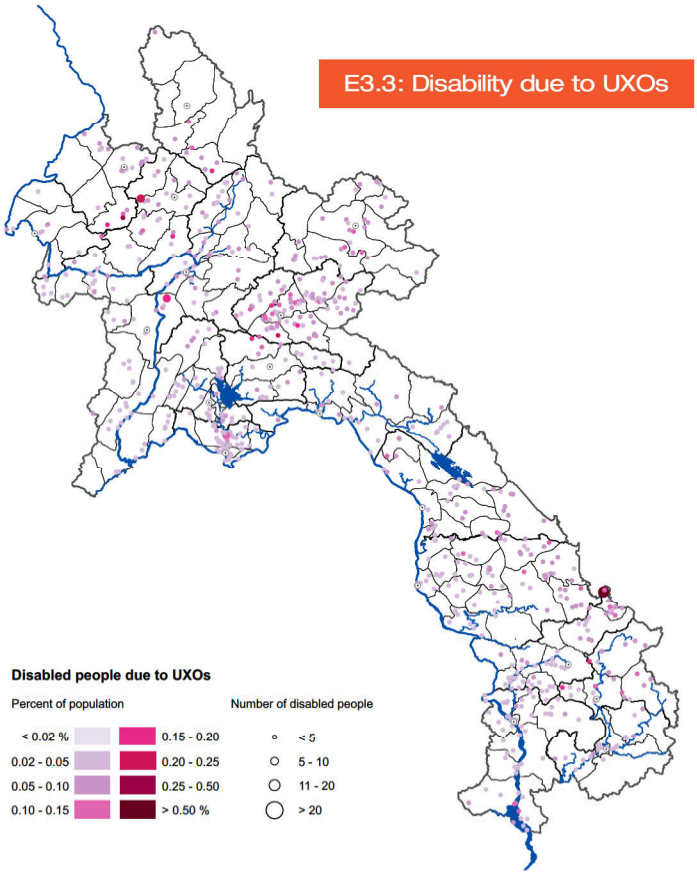
E3.1: Disability due to illness



E3.2: Disability due to accidents



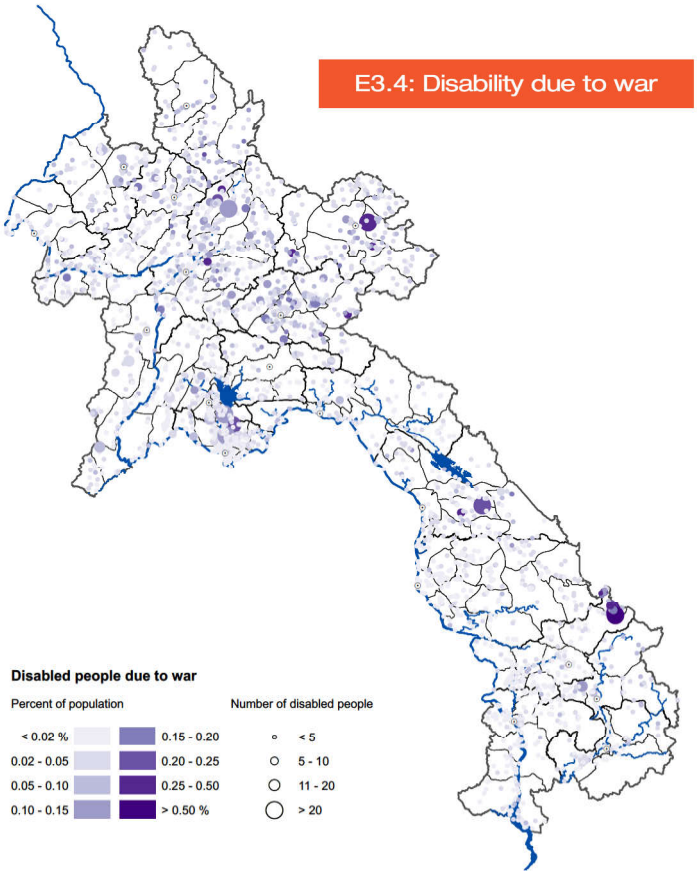
E3.3: Disability due to UXOs



Disabled people due to UXOs

Percent of population			Number of disabled people
< 0.02 %	0.15 - 0.20		< 5
0.02 - 0.05	0.20 - 0.25		5 - 10
0.05 - 0.10	0.25 - 0.50		11 - 20
0.10 - 0.15	> 0.50 %		> 20

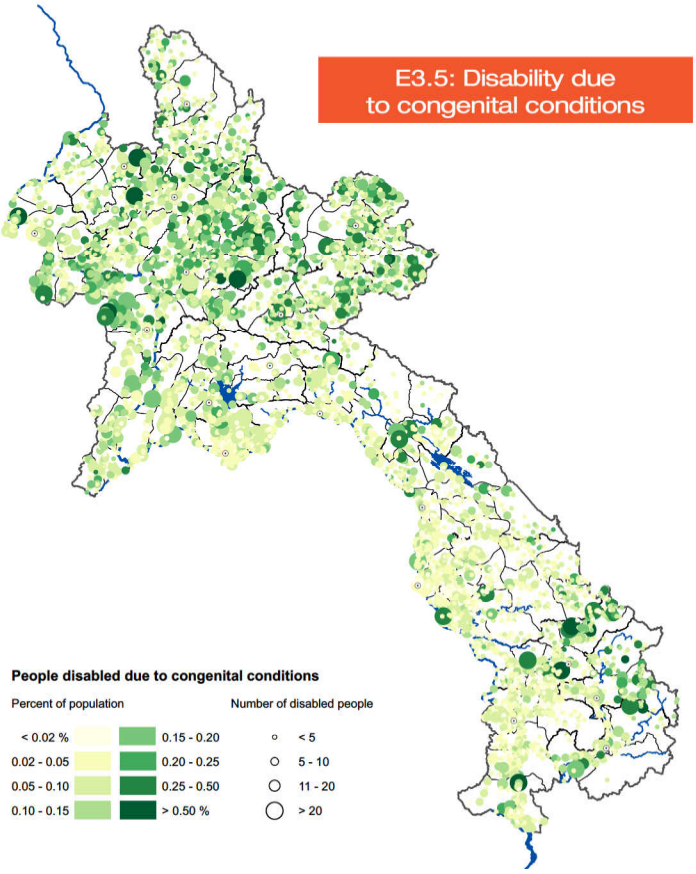
E3.4: Disability due to war



Disabled people due to war

Percent of population			Number of disabled people
< 0.02 %	0.15 - 0.20		< 5
0.02 - 0.05	0.20 - 0.25		5 - 10
0.05 - 0.10	0.25 - 0.50		11 - 20
0.10 - 0.15	> 0.50 %		> 20

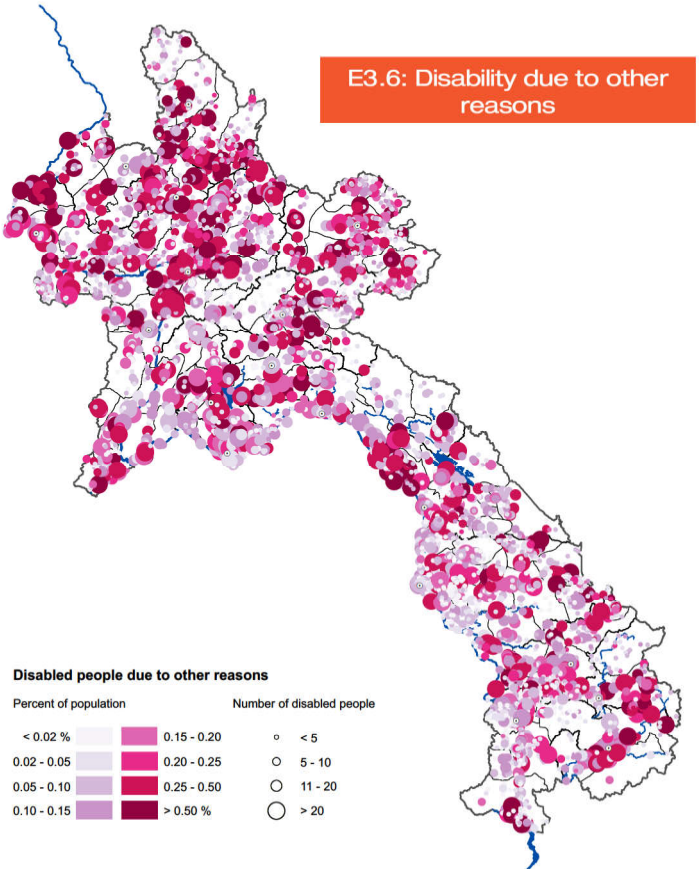
E3.5: Disability due to congenital conditions



People disabled due to congenital conditions

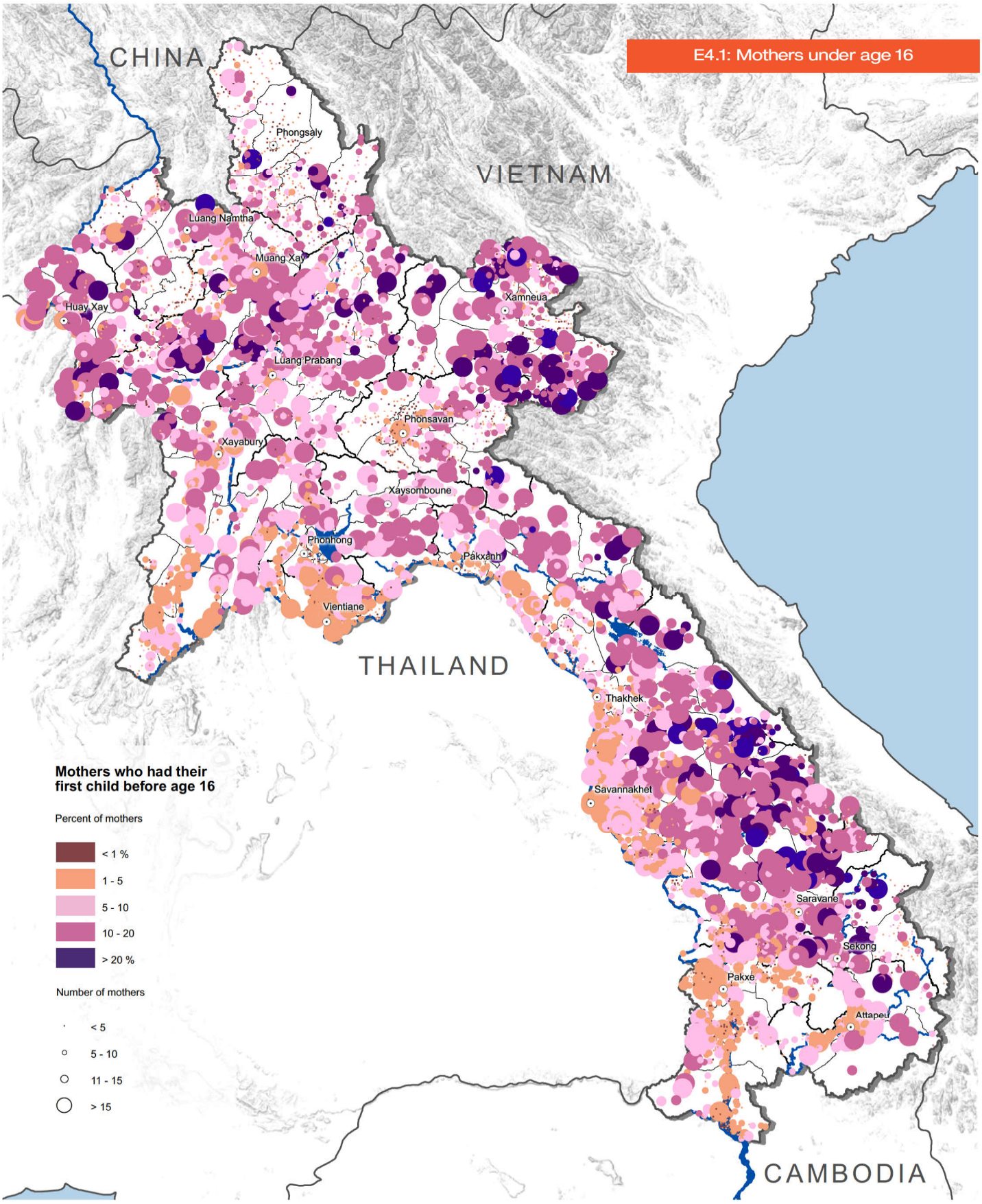
Percent of population			Number of disabled people
< 0.02 %	0.15 - 0.20		< 5
0.02 - 0.05	0.20 - 0.25		5 - 10
0.05 - 0.10	0.25 - 0.50		11 - 20
0.10 - 0.15	> 0.50 %		> 20

E3.6: Disability due to other reasons



Disabled people due to other reasons

Percent of population			Number of disabled people
< 0.02 %	0.15 - 0.20		< 5
0.02 - 0.05	0.20 - 0.25		5 - 10
0.05 - 0.10	0.25 - 0.50		11 - 20
0.10 - 0.15	> 0.50 %		> 20


E4.1: Mothers under age 16
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Pakxanh
Vientiane
Thakhek
Savannakhet
Saravane
Sekong
Pakxe
Attapeu
Mothers who had their first child before age 16
Percent of mothers
< 1 %
1 - 5
5 - 10
10 - 20
> 20 %
Number of mothers
< 5
5 - 10
11 - 15
> 15

Age of first child delivery

Giving birth at an early age is associated with risks of injury and death for both mother and child. Moreover, early maternity means a decreased mobility and ability to pursue education and skills that could lead to better livelihood opportunities for women. Therefore, the age at which a woman delivers her first child not only has a strong influence on the overall fertility rate of a country, but is also an indicator of the health and wellbeing of the mother and the child.

The Lao PDR has the highest adolescent birth rate in the East Asia and Pacific region with 76 births per 1000 women ages 15-19 according to the PHC, followed by Cambodia (57), the Philippines (57), and Thailand (51) (WHO, 2018). On average, women deliver their first child at 21 years of age, which is the lowest in the Southeast Asian region, followed by Vietnam (22.6), Cambodia (22.8), and Thailand (23.3) (Central Intelligence Agency, 2018). Additionally, despite recently recorded significant improvements such as a decrease in the under-five mortality rate from 170 per 1,000 live births in 1992 to 79 per 1,000 in 2011, the country has also one of the highest child mortality rates in Southeast Asia (UNICEF, 2018).

In the 2015 census, the age at first child delivery was recorded for all women of age 15 to 49.

Spatial patterns in 2015

Map E4.2 illustrates the average age of women at first child delivery at the village level. The age of first child delivery is higher in the lowlands around the Mekong River valley and in urban areas; villages in the central districts of Vientiane Capital City show the highest average age of women at first child delivery. This pattern is not surprising, since the lowlands and urban areas tend to be more economically developed than other parts of the country, and women are more likely in such areas to stay in school longer or invest more time in vocational education or a career, thus delaying motherhood.

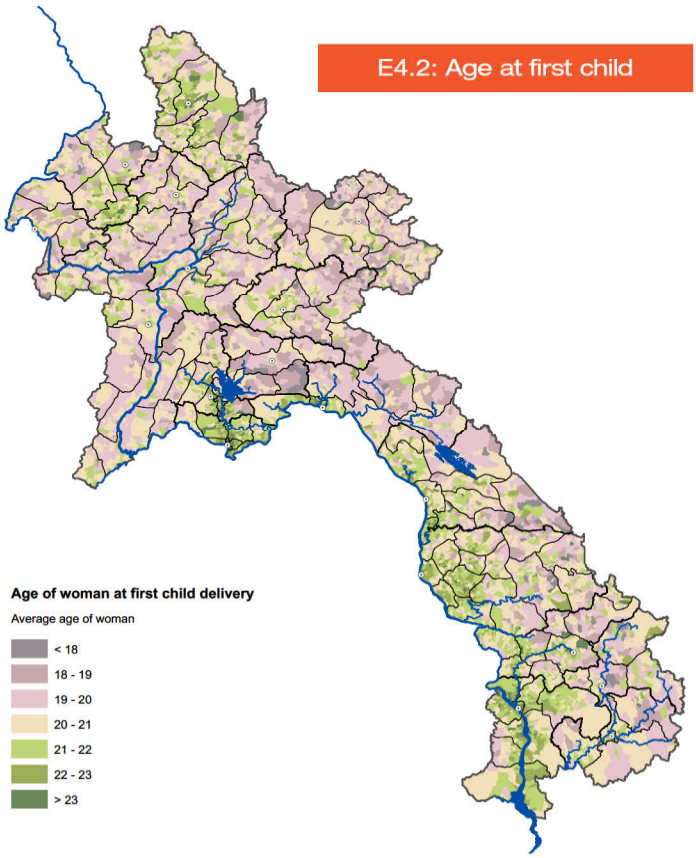
Further interesting patterns are found in Phongsaly and Luang Namtha Provinces. Even though these mountainous and less accessible regions are clearly less developed than the lowlands, some districts show a significantly higher average age of women at first child delivery.

Map E4.1 shows the spatial distribution of the number and percentage of mothers who have given birth before age 16. Villages in the mountainous areas of the north and close to the Vietnam border, as well as in many villages in Saravane and Savannakhet Provinces, have a higher percentage of mothers who had their first child before age 16. Not surprisingly, these areas tend to be the among the poorest in the country (see Map I1.1), suggesting a positive correlation between the percentage of women that give birth before 16 years of age and the general living standards in a village.

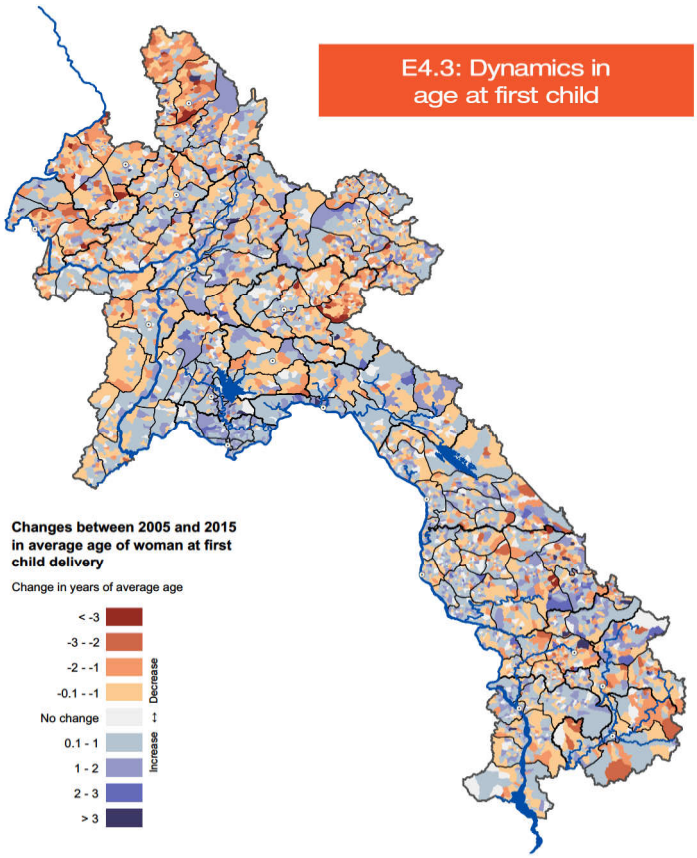
Dynamics between 2005 and 2015

Map E4.3 shows the changes between 2005 and 2015 in average age of women at first child delivery. Important increases are registered in Vientiane Capital City, which almost uniformly shows an increase in the average age of women at their first child delivery. Vientiane Capital City and Borikhamxay Province register significant increments in the age of women at first birth as well, albeit not as consistently as Vientiane Capital City. In contrast, the northern provinces of Luang Namtha, Xiengkhuang, Bokeo and Phongsaly exhibit important decreases in the average age of women at their first childbirth.

E4.2: Age at first child



E4.3: Dynamics in age at first child



ETHNICITY & RELIGION

Distribution of ethno-linguistic families

The Lao PDR is a very culturally diverse country with over fifty different ethnic groups that originated and migrated over the centuries from many different parts of the surrounding region. Today, the Lao population is composed of 49 officially recognized ethnicities. The categorization of the country's many different ethnic groups went through different phases over the past decades. In the late 1950's, the former government categorized the population into three major groups: the Lao Loum (lowlanders), Lao Theung (midlanders), and Lao Soung (highlanders). The aim of this classification was to strengthen national unity after gaining independence from France. The official use of this categorization system ceased following the adoption of the new constitution in 1991, when the Lao population was classified into four different ethno-linguistic families.

The term 'ethno-linguistic' indicates a categorization based on a common ethnicity through self-identification mainly based on language. The four ethno-linguistic families are Lao-Tai (Tai-Kadai), Mon-Khmer (Austro-asiatic), Hmong-Mien (Hmong-Yao, Miao-Yao), and Sino-Tibetan (mostly Tibeto-Burman). The Lao-Tai make up around two thirds of the total population, and predominantly reside in the agriculturally productive lowlands, the main urban areas, the Mekong River corridor and the areas around the Mekong's main tributaries. Rural Lao-Tai people cultivate lowland irrigated paddy rice in flat plains and valleys, while the non-Lao-Tai families predominantly practice subsistence oriented cultivation of upland rice on sloping lands, often intercropped with other products such as maize or cassava.

Map F1 illustrates the distribution of villages by the main ethno-linguistic family per village, represented in different colours. While dark shades indicate villages populated by only one ethno-linguistic family (more than 99% of the population), lighter shades show that the village is made up of one predominant ethno-linguistic family accounting for more than 80% of the population. Lastly, the light grey colour indicates villages where none of the four ethno-linguistic families account for more than 80%, also referred to as ethnically mixed villages.

Spatial patterns in 2015

Some distinctive spatial patterns can be recognized. Firstly, it is clearly visible that most of the villages throughout the country are inhabited mostly by people of a single ethno-linguistic family (constituting more than 80% of total village population). Secondly, the north and the south present different patterns of ethno-linguistic composition: the south is dominated by two groups, the Lao-Tai and the Mon-Khmer, while in the centre and in the north, all four ethno-linguistic families are present. Thirdly, villages with diverse ethno-linguistic compositions are mainly concentrated in the centre and the north of the country; in numerous villages in Borikhamxay Province, for instance, no ethno-linguistic family constitutes more than 80% of the village population.

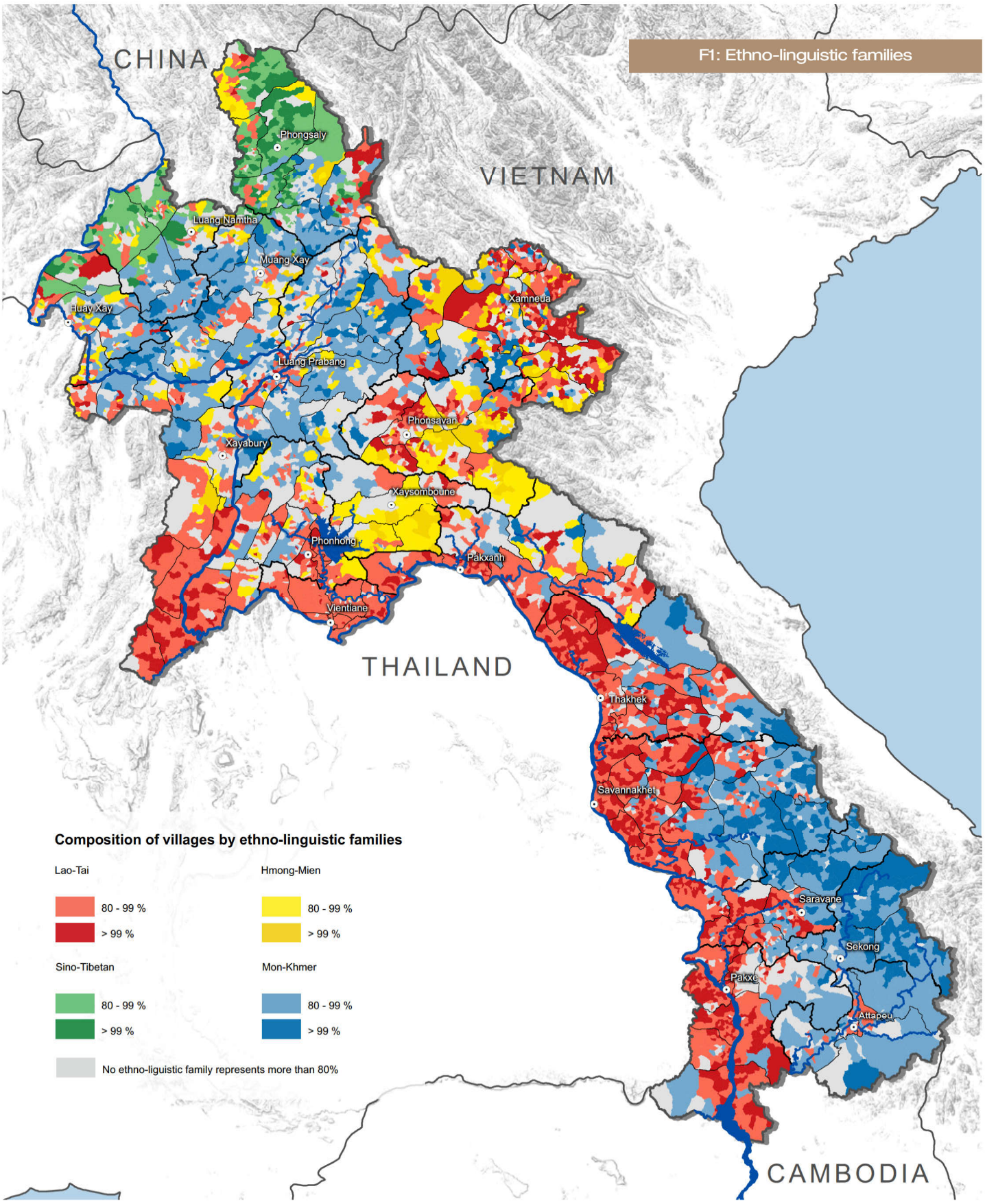
The Lao-Tai family largely dominates the lowlands and the areas in eastern Huaphanh Province; Mon-Khmer live mainly in the mid-land rural areas of the north and the south; Hmong-Mien are found predominantly in the northern uplands, while the Tibeto-Burmans mostly occupy the highlands of the most northern regions in Phongsaly, Luang Namtha and Bokeo Provinces.

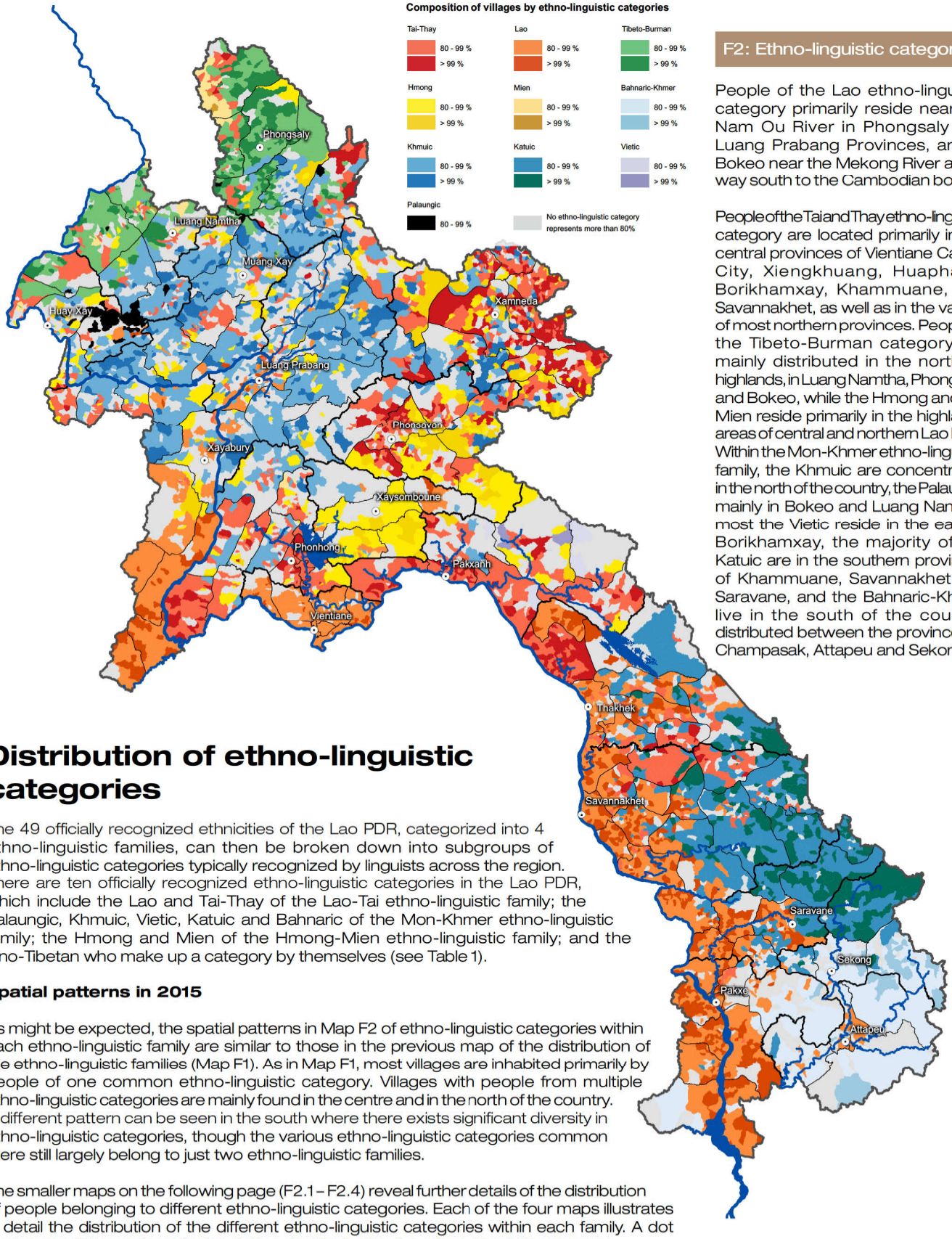
Table 1: Grouping of the ethno-linguistic families and categories

Ethno-linguistic families	Ethno-linguistic categories	Ethnic groups
Lao-Tai (Tai-Kadai)	1. Lao	Lao
	2. Tai-Thay	Phou Thay ; Tai; Nyouan; Lue; Yang; Sek; Tai Neua; Lao (in Huaphanh, Xiengkhuang, Borikhamxay, Vientiane Province, Hinboun District in Khammuane)
Mon-Khmer (Austro-asiatic)	3. Khmuic	Khmou; Pray; Ksing Moul (Sing Moun); Phong in Huaphanh, Xiengkhuang, Vientiane Province; Thène; Oe Dou; Kri (Xayabury)
	4. Palaungic	Lamet; Bit; Sam Tao
	5. Katuic	Katang; Makong; Tri;Ta Oy; Katu; Kriang; Souay; Pacoh
	6. Bahnaric-Khmer	Jrou (Laven); Triang; Yè'; Brao; Halak; Oy; Cheng; Sadang; Nya ; Heun; Lavi; Khmer
	7. Vietic	Toum; Ngouan; Meuang; Kri (except in Xayabury); Phong (except Phong assigned to Khmuic);
Sino-Tibetan	8. Tibeto- Burman	Akha; Singsily; Lahu; Sila; Hanyi; Lolo; Ho
Hmong-Mien	9. Hmong	Hmong
	10. Mien	Lu Mien

Reproduced from Messerli *et al.*, 2008

F1: Ethno-linguistic families





F2: Ethno-linguistic categories

People of the Lao ethno-linguistic category primarily reside near the Nam Ou River in Phongsaly and Luang Prabang Provinces, and in Bokeo near the Mekong River all the way south to the Cambodian border.

People of the Tai and Thay ethno-linguistic category are located primarily in the central provinces of Vientiane Capital City, Xiengkhuang, Huaphanh, Borikhamxay, Khammuane, and Savannakhet, as well as in the valleys of most northern provinces. People of the Tibeto-Burman category are mainly distributed in the northern highlands, in Luang Namtha, Phongsaly, and Bokeo, while the Hmong and the Mien reside primarily in the highlands areas of central and northern Lao PDR. Within the Mon-Khmer ethno-linguistic family, the Khmuic are concentrated in the north of the country, the Palaungic mainly in Bokeo and Luang Namtha, most the Vietic reside in the east of Borikhamxay, the majority of the Katuic are in the southern provinces of Khammuane, Savannakhet and Saravane, and the Bahnaric-Khmer live in the south of the country, distributed between the provinces of Champasak, Attapeu and Sekong.

Distribution of ethno-linguistic categories

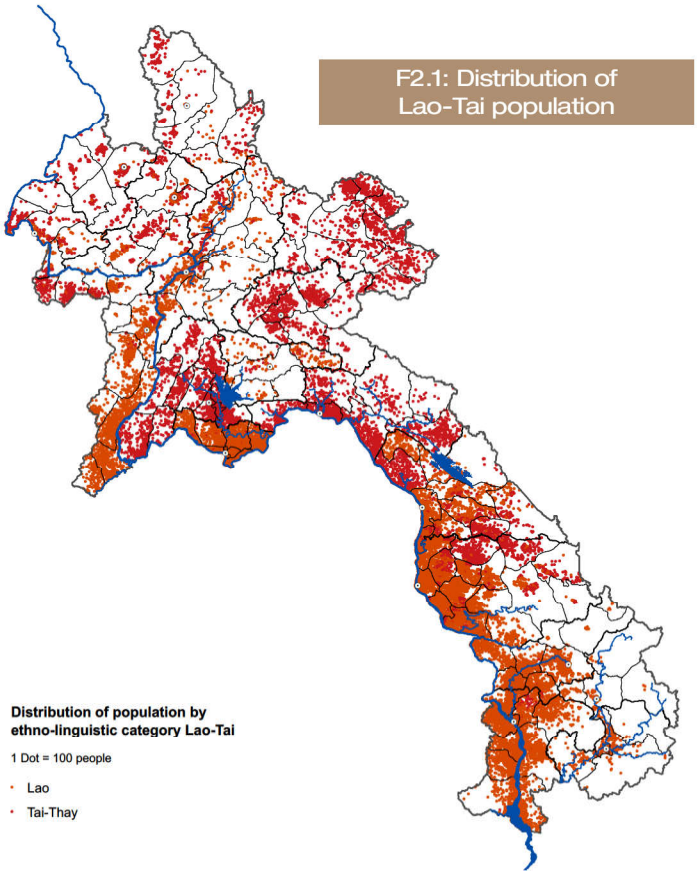
The 49 officially recognized ethnicities of the Lao PDR, categorized into 4 ethno-linguistic families, can then be broken down into subgroups of ethno-linguistic categories typically recognized by linguists across the region. There are ten officially recognized ethno-linguistic categories in the Lao PDR, which include the Lao and Tai-Thay of the Lao-Tai ethno-linguistic family; the Palaungic, Khmuic, Vietic, Katuic and Bahnaric of the Mon-Khmer ethno-linguistic family; the Hmong and Mien of the Hmong-Mien ethno-linguistic family; and the Sino-Tibetan who make up a category by themselves (see Table 1).

Spatial patterns in 2015

As might be expected, the spatial patterns in Map F2 of ethno-linguistic categories within each ethno-linguistic family are similar to those in the previous map of the distribution of the ethno-linguistic families (Map F1). As in Map F1, most villages are inhabited primarily by people of one common ethno-linguistic category. Villages with people from multiple ethno-linguistic categories are mainly found in the centre and in the north of the country. A different pattern can be seen in the south where there exists significant diversity in ethno-linguistic categories, though the various ethno-linguistic categories common there still largely belong to just two ethno-linguistic families.

The smaller maps on the following page (F2.1 – F2.4) reveal further details of the distribution of people belonging to different ethno-linguistic categories. Each of the four maps illustrates in detail the distribution of the different ethno-linguistic categories within each family. A dot represents 100 people while the dot's colour indicates the ethno-linguistic category.

F2.1: Distribution of Lao-Tai population

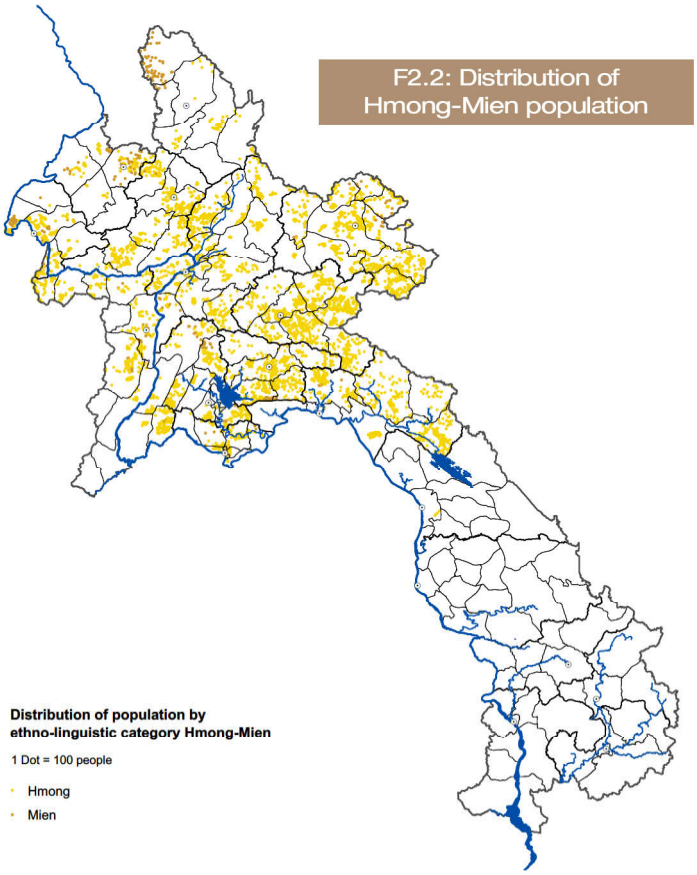


Distribution of population by ethno-linguistic category Lao-Tai

1 Dot = 100 people

- Lao
- Tai-Thay

F2.2: Distribution of Hmong-Mien population

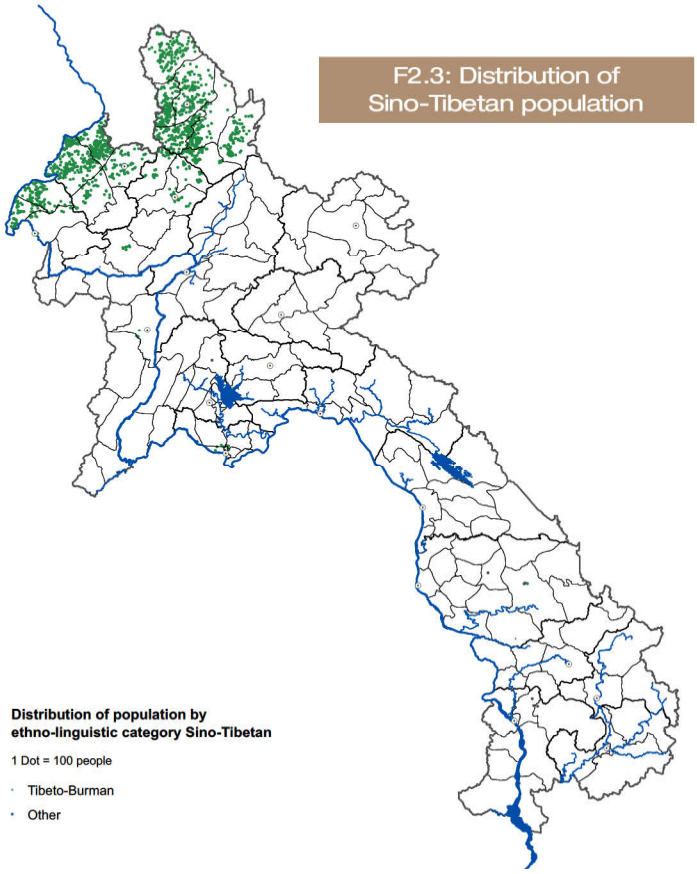


Distribution of population by ethno-linguistic category Hmong-Mien

1 Dot = 100 people

- Hmong
- Mien

F2.3: Distribution of Sino-Tibetan population

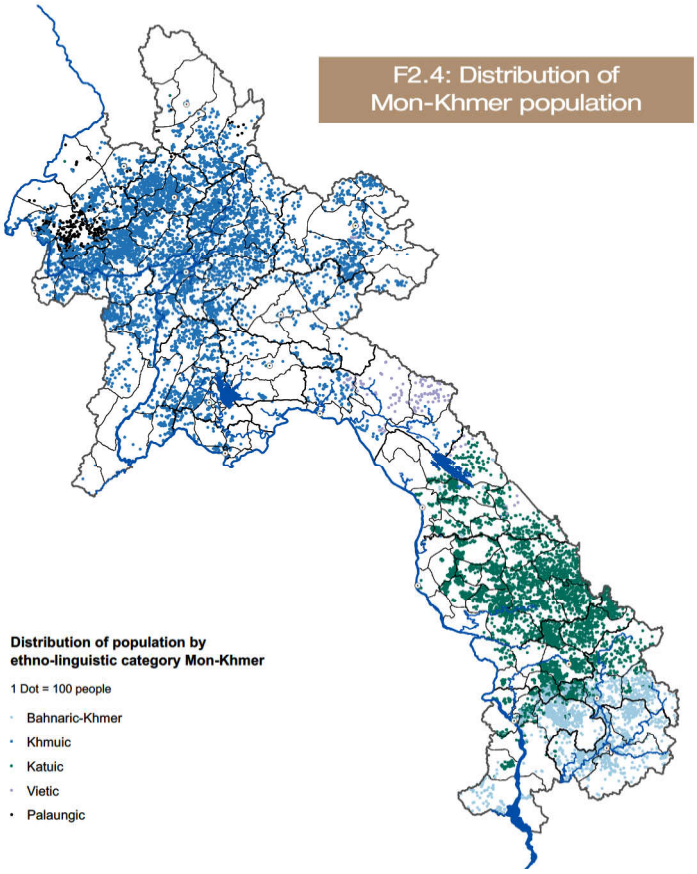


Distribution of population by ethno-linguistic category Sino-Tibetan

1 Dot = 100 people

- Tibeto-Burman
- Other

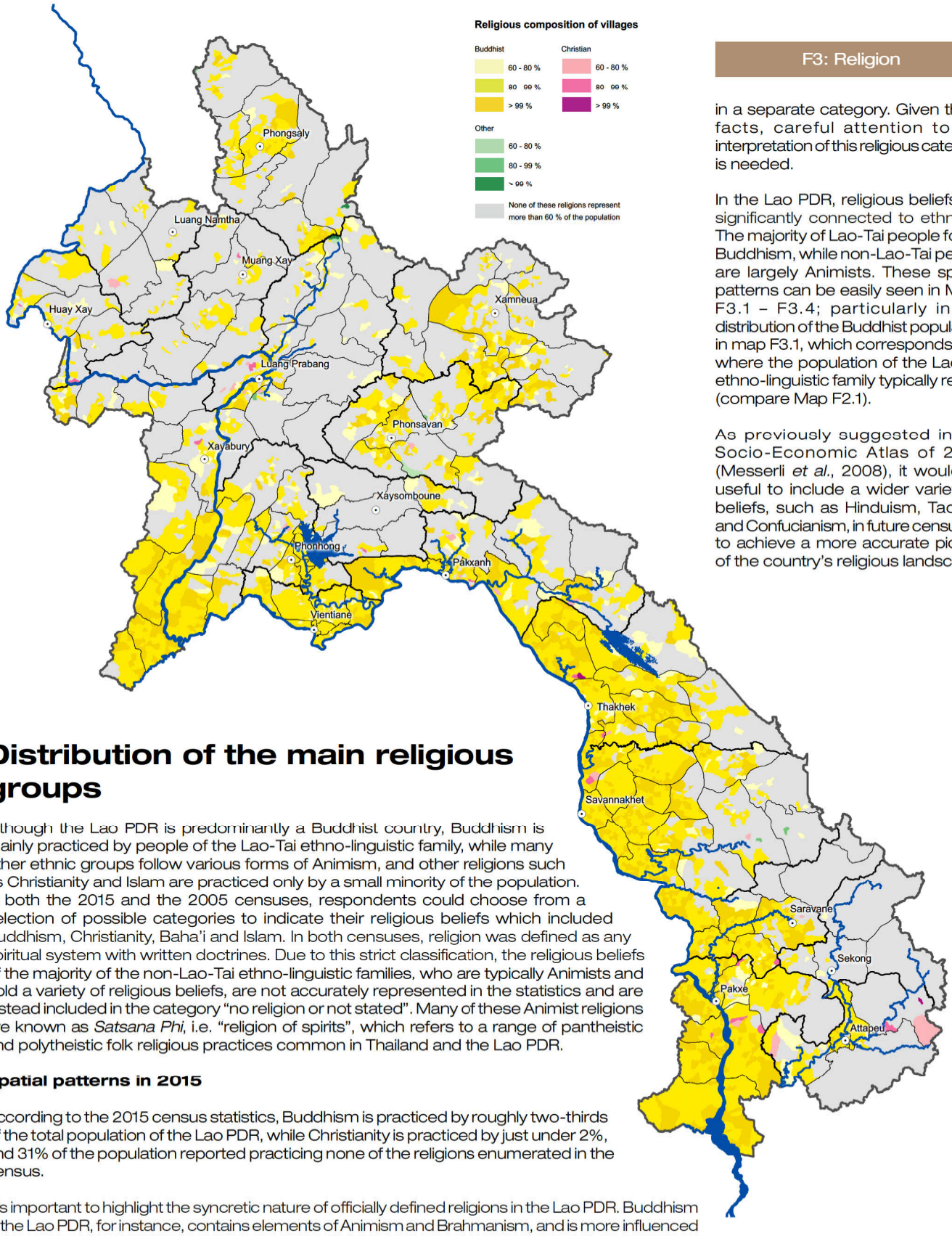
F2.4: Distribution of Mon-Khmer population



Distribution of population by ethno-linguistic category Mon-Khmer

1 Dot = 100 people

- Bahnaric-Khmer
- Khmuic
- Katuic
- Vietic
- Palaungic



F3: Religion

Distribution of the main religious groups

Although the Lao PDR is predominantly a Buddhist country, Buddhism is mainly practiced by people of the Lao-Tai ethno-linguistic family, while many other ethnic groups follow various forms of Animism, and other religions such as Christianity and Islam are practiced only by a small minority of the population. In both the 2015 and the 2005 censuses, respondents could choose from a selection of possible categories to indicate their religious beliefs which included Buddhism, Christianity, Baha'i and Islam. In both censuses, religion was defined as any spiritual system with written doctrines. Due to this strict classification, the religious beliefs of the majority of the non-Lao-Tai ethno-linguistic families, who are typically Animists and hold a variety of religious beliefs, are not accurately represented in the statistics and are instead included in the category "no religion or not stated". Many of these Animist religions are known as *Satsana Phi*, i.e. "religion of spirits", which refers to a range of pantheistic and polytheistic folk religious practices common in Thailand and the Lao PDR.

Spatial patterns in 2015

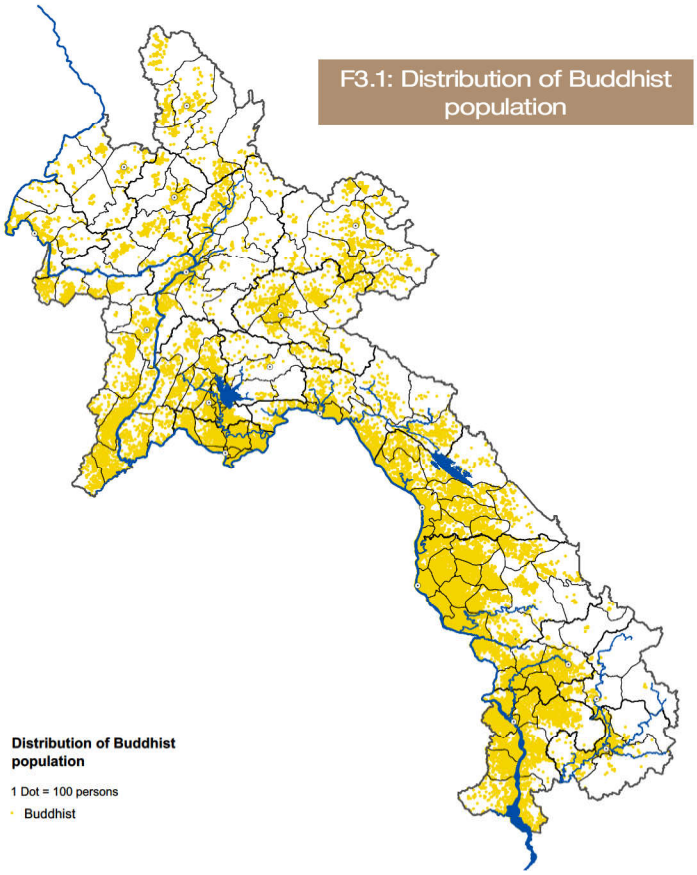
According to the 2015 census statistics, Buddhism is practiced by roughly two-thirds of the total population of the Lao PDR, while Christianity is practiced by just under 2%, and 31% of the population reported practicing none of the religions enumerated in the census.

It is important to highlight the syncretic nature of officially defined religions in the Lao PDR. Buddhism in the Lao PDR, for instance, contains elements of Animism and Brahmanism, and is more influenced by Mahayana than Theravada Buddhist doctrine. In certain areas, Catholicism has mixed with Animism, while certain forms of Animism do follow written doctrines and thus should be considered in a separate category. Given these facts, careful attention to the interpretation of this religious category is needed.

In the Lao PDR, religious beliefs are significantly connected to ethnicity. The majority of Lao-Tai people follow Buddhism, while non-Lao-Tai people are largely Animists. These spatial patterns can be easily seen in Maps F3.1 – F3.4; particularly in the distribution of the Buddhist population in map F3.1, which corresponds with where the population of the Lao-Tai ethno-linguistic family typically reside (compare Map F2.1).

As previously suggested in the Socio-Economic Atlas of 2005 (Messerli *et al.*, 2008), it would be useful to include a wider variety of beliefs, such as Hinduism, Taoism, and Confucianism, in future censuses, to achieve a more accurate picture of the country's religious landscape.

F3.1: Distribution of Buddhist population

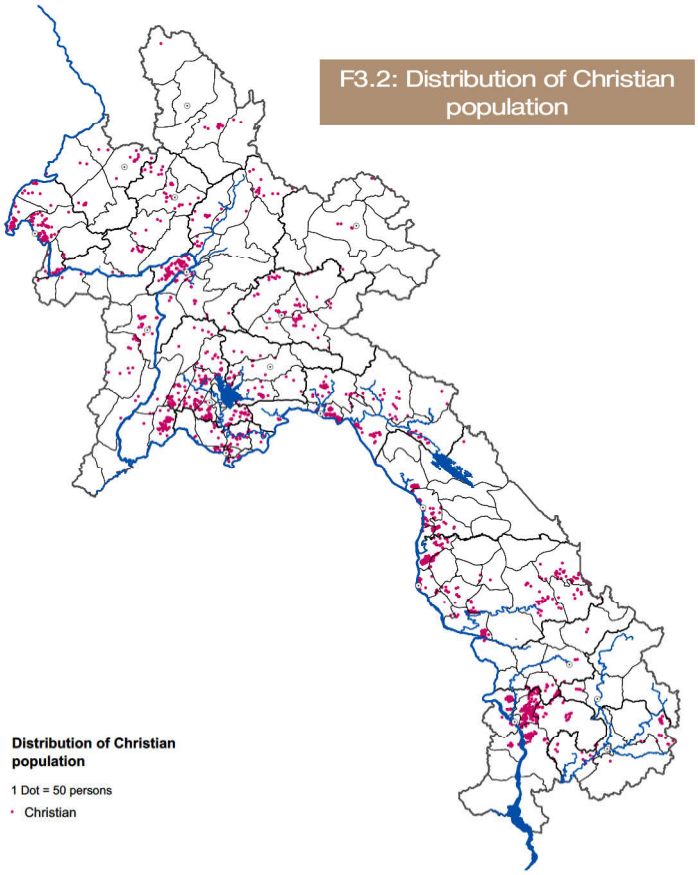


Distribution of Buddhist population

1 Dot = 100 persons

- Buddhist

F3.2: Distribution of Christian population

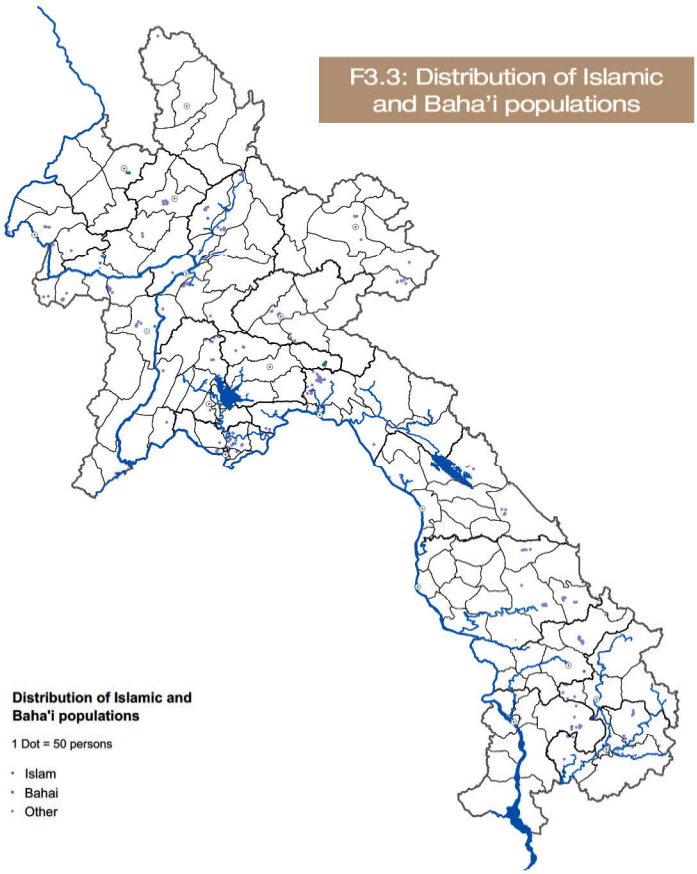


Distribution of Christian population

1 Dot = 50 persons

- Christian

F3.3: Distribution of Islamic and Baha'i populations

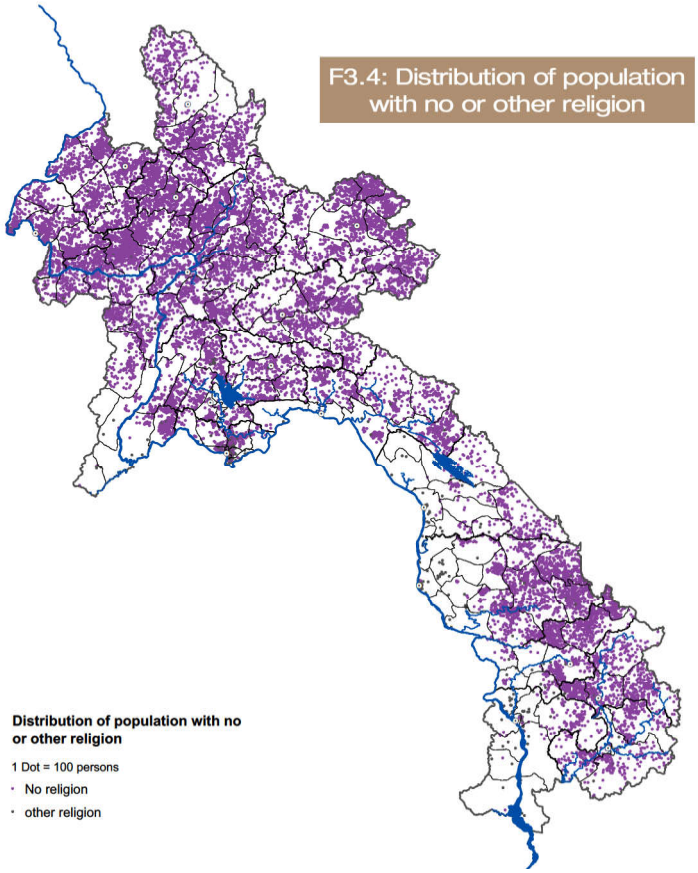


Distribution of Islamic and Baha'i populations

1 Dot = 50 persons

- Islam
- Bahai
- Other

F3.4: Distribution of population with no or other religion



Distribution of population with no or other religion

1 Dot = 100 persons

- No religion
- other religion

ECONOMIC ACTIVITIES

Accessibility of markets

As the Lao economy grows, economic activity throughout the country is geared more and more toward export markets. Agricultural production especially is becoming increasingly commercialized, and access to markets is an ever important instrument for development and change. Markets are key points of access for production inputs – fertilizers, new seed varieties, equipment – and are also points of sale for the surplus goods produced beyond what households consume. As a result, access to markets has a strongly positive association with poverty reduction and other measures of development, especially in areas which are more heavily engaged in commercial agricultural production or other economic activities tied to market access.

Access to markets varies across the Lao PDR. Not all villages in the country have their own markets, and in more remote regions with limited road access, people will transport purchases and goods for sale over great distances to reach the nearest market. As shown in Figure 7 and 8, in 54% of the villages in the country more than 2 hours are required on average to reach the closest market; these villages are home to 38% of the total population (over 10 years old). Still, as roads and forms of transport improve, access to markets steadily improves across the country too. The number of households producing crops primarily for the market increased from 6% in 1999 to 30% in 2011, and a far larger number (around 71% and rising) sell at least some part of their household output on the market (Epprecht *et al.*, 2018).

Market access is measured here by the estimated travel time to the closest market, assuming use of the best available mode of transport (see also Maps A2.1 and A2.2).

Spatial patterns in 2015

As the ease of travel is largely determined by the availability and quality of the transportation network, and even more importantly by the local terrain, the spatial patterns of accessibility to markets clearly reflect the geography of terrain and infrastructure in the Lao PDR (Map G1). As such, access to markets is significantly better for villages located near main transport networks (main roads are indicated in red on the map) and for villages located in proximity to administrative centres. It is particularly good in the lowlands along the Mekong River compared to the mountainous east and north. Larger areas with limited access to markets are located in remote areas in the east along the Vietnam border.

According to the PHC 2015, only 7% of villages have a permanent market. Permanent markets exist in only 4% of rural villages with roads, and in only 1% of rural villages without roads. It should be noted, however, that people in some border areas may be far from domestic markets, but might engage in market activities across nearby borders and therefore have better market access than these maps suggest.

Figure 7: Share of villages by average travel time to the nearest market

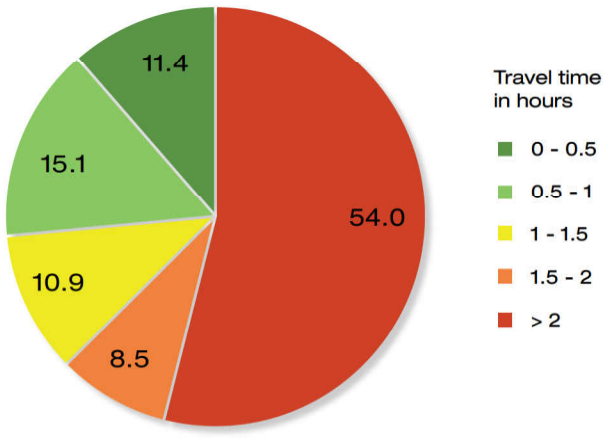
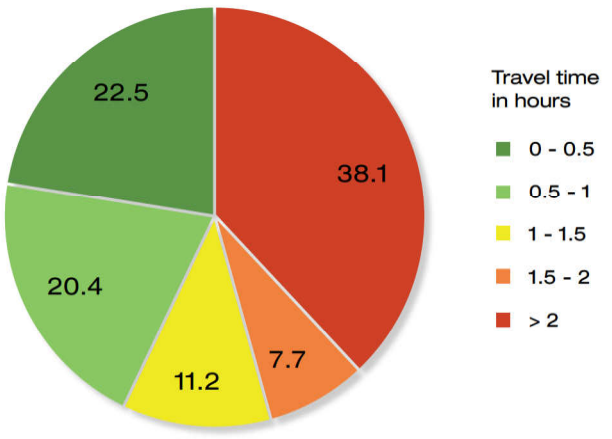
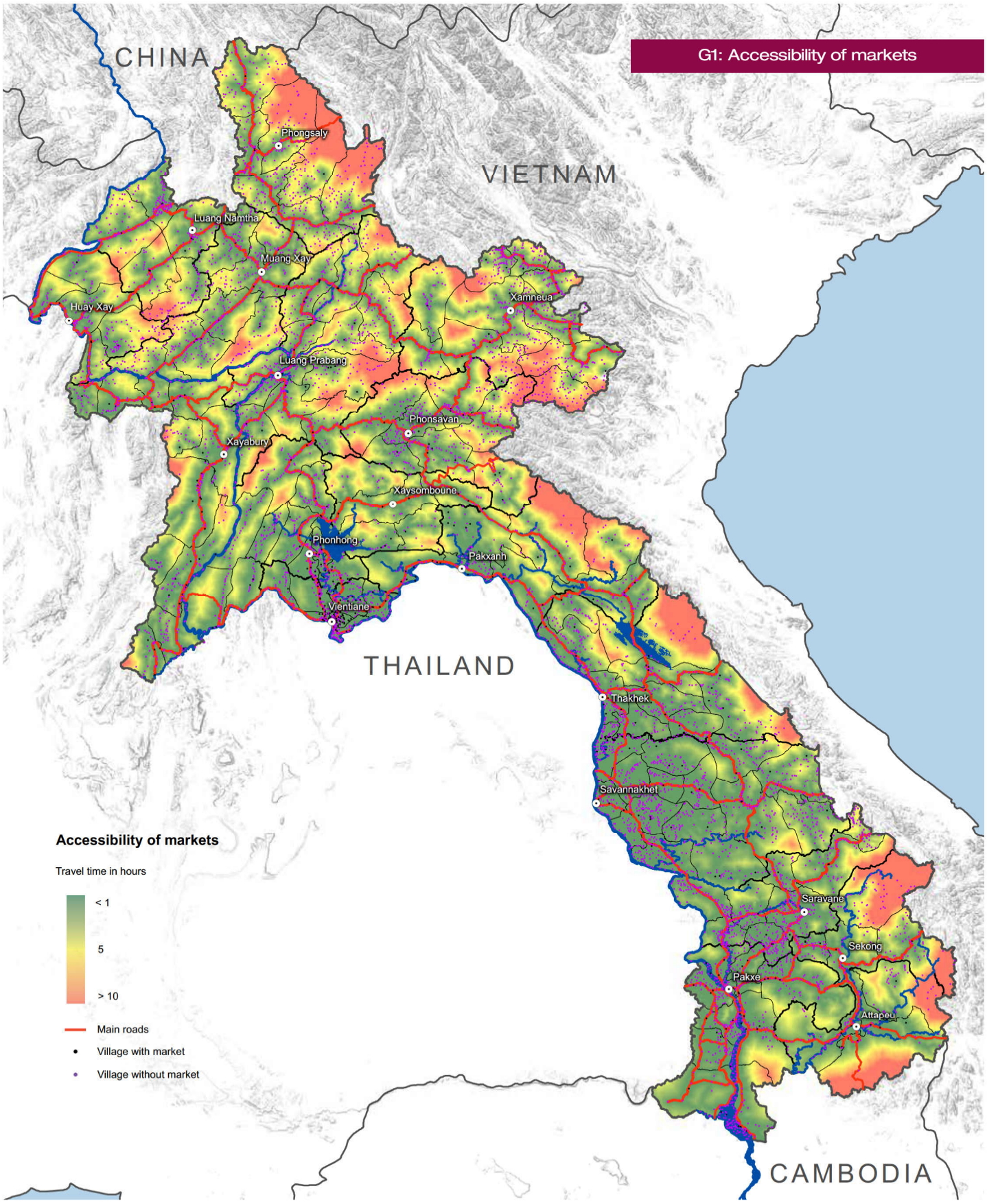
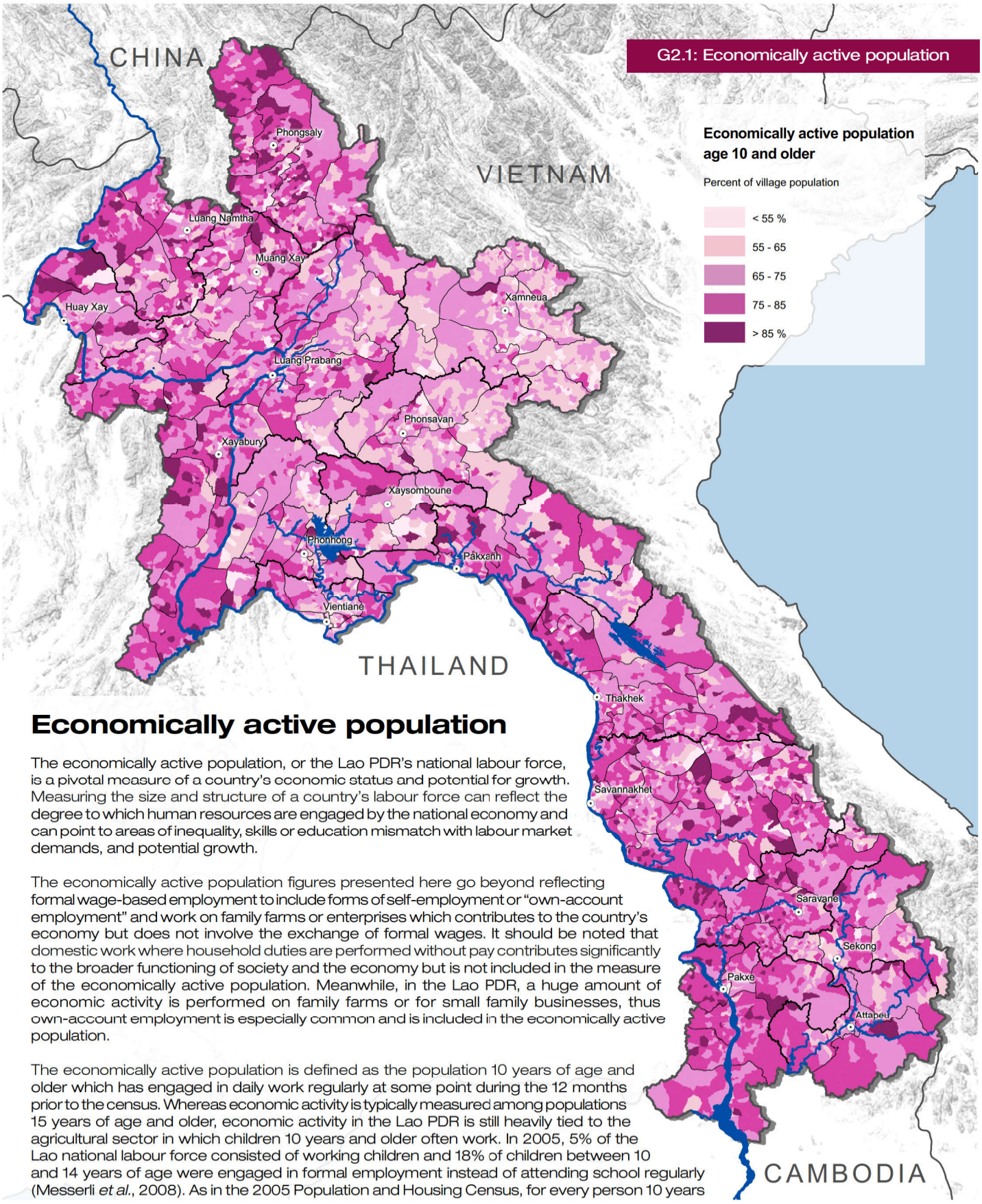


Figure 8: Share of population (over 10 years old) by average travel time to the nearest market




G1: Accessibility of markets
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Vientiane
Pakxanh
Thakhek
Savannakhet
Saravane
Sekong
Pakxe
Attapeu
Accessibility of markets
Travel time in hours
< 1
5
> 10
Main roads
Village with market
Village without market



Economically active population

The economically active population, or the Lao PDR's national labour force, is a pivotal measure of a country's economic status and potential for growth. Measuring the size and structure of a country's labour force can reflect the degree to which human resources are engaged by the national economy and can point to areas of inequality, skills or education mismatch with labour market demands, and potential growth.

The economically active population figures presented here go beyond reflecting formal wage-based employment to include forms of self-employment or "own-account employment" and work on family farms or enterprises which contributes to the country's economy but does not involve the exchange of formal wages. It should be noted that domestic work where household duties are performed without pay contributes significantly to the broader functioning of society and the economy but is not included in the measure of the economically active population. Meanwhile, in the Lao PDR, a huge amount of economic activity is performed on family farms or for small family businesses, thus own-account employment is especially common and is included in the economically active population.

The economically active population is defined as the population 10 years of age and older which has engaged in daily work regularly at some point during the 12 months prior to the census. Whereas economic activity is typically measured among populations 15 years of age and older, economic activity in the Lao PDR is still heavily tied to the agricultural sector in which children 10 years and older often work. In 2005, 5% of the Lao national labour force consisted of working children and 18% of children between 10 and 14 years of age were engaged in formal employment instead of attending school regularly (Messerli *et al.*, 2008). As in the 2005 Population and Housing Census, for every person 10 years

of age and older, the main economic activity engaged in during the 12 months prior to the 2015 census was recorded.

People were considered economically active if they had a job for either pay or profit, were working for a family business or farm, or reported themselves as unemployed but available to work. Those respondents not considered economically active include students, people engaged primarily in domestic work in their own households, and retirees (Table 2). On average across the country, 68% of the total population had been employed over the preceding 12 months, whereas only 1.4% were unemployed and the remaining 29% were outside of the labour force – mostly studying, doing household work, or retired.

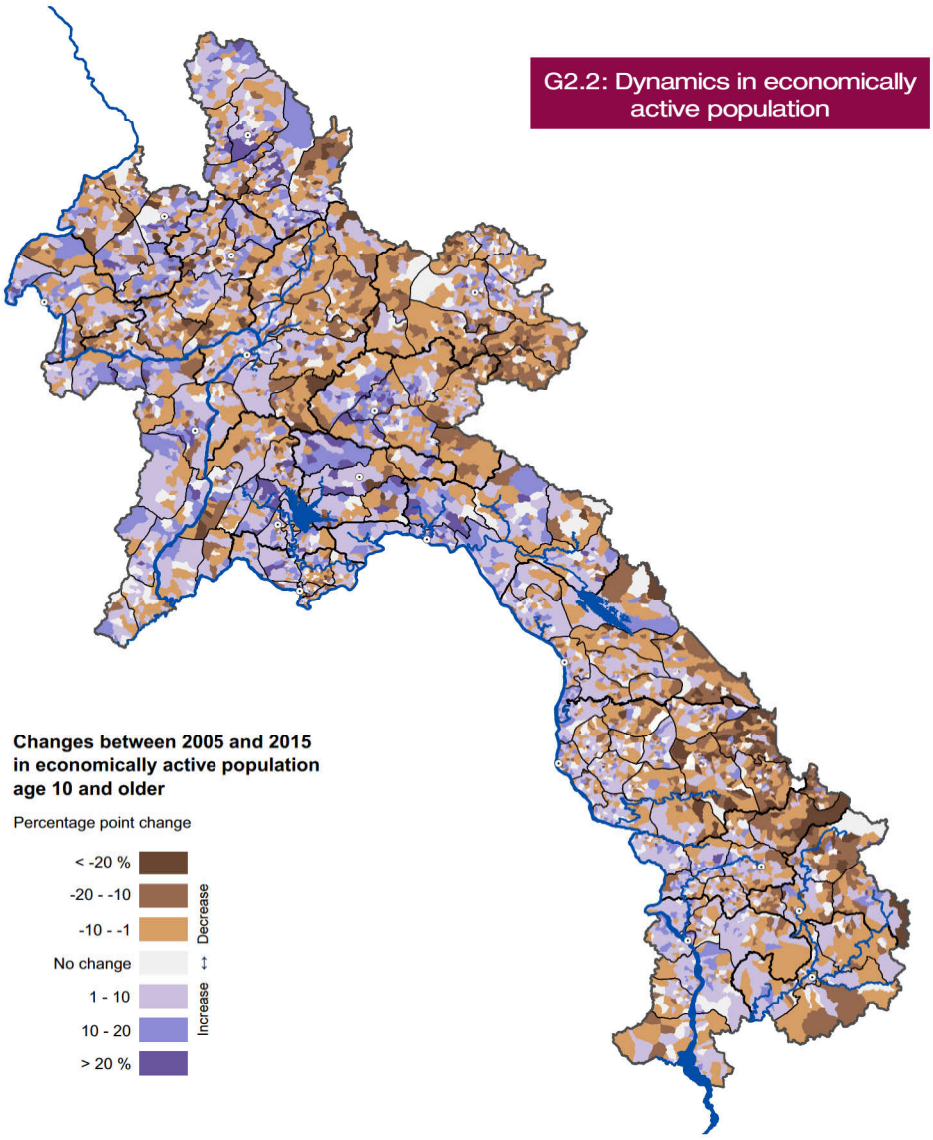
Spatial patterns in 2015

Map G2.1 shows the economically active population as a percentage of the total village population 10 years of age and older. There is significant variation in this indicator across villages and regions. Around Vientiane Capital City, a hub for higher education and one of the country's few larger urban areas, the economically active population constitutes a smaller portion of the total population (59.5%, the lowest of any province in the country), as many residents are students and it is more common in urban areas to find people who primarily engage in household work.

Urban areas exhibit a lower average rate of economically active people than rural areas. In rural areas, agriculture remains the main form of employment, and the agricultural economy absorbs less skilled, less educated workers. In urban areas, aside from in the construction business, there are fewer employment opportunities for unskilled individuals. Furthermore, seasonal construction workers in urban areas are likely to be largely underreported in the census.

On the other hand, significant areas of Huaphanh and Xiengkuang Provinces also have lower economically active populations than the country average at 62.6% and 63.9% respectively. This can be attributed to the fact that these two provinces have higher rates of elderly people, as shown in Map B3.3.

G2.2: Dynamics in economically active population



Dynamics between 2005 and 2015

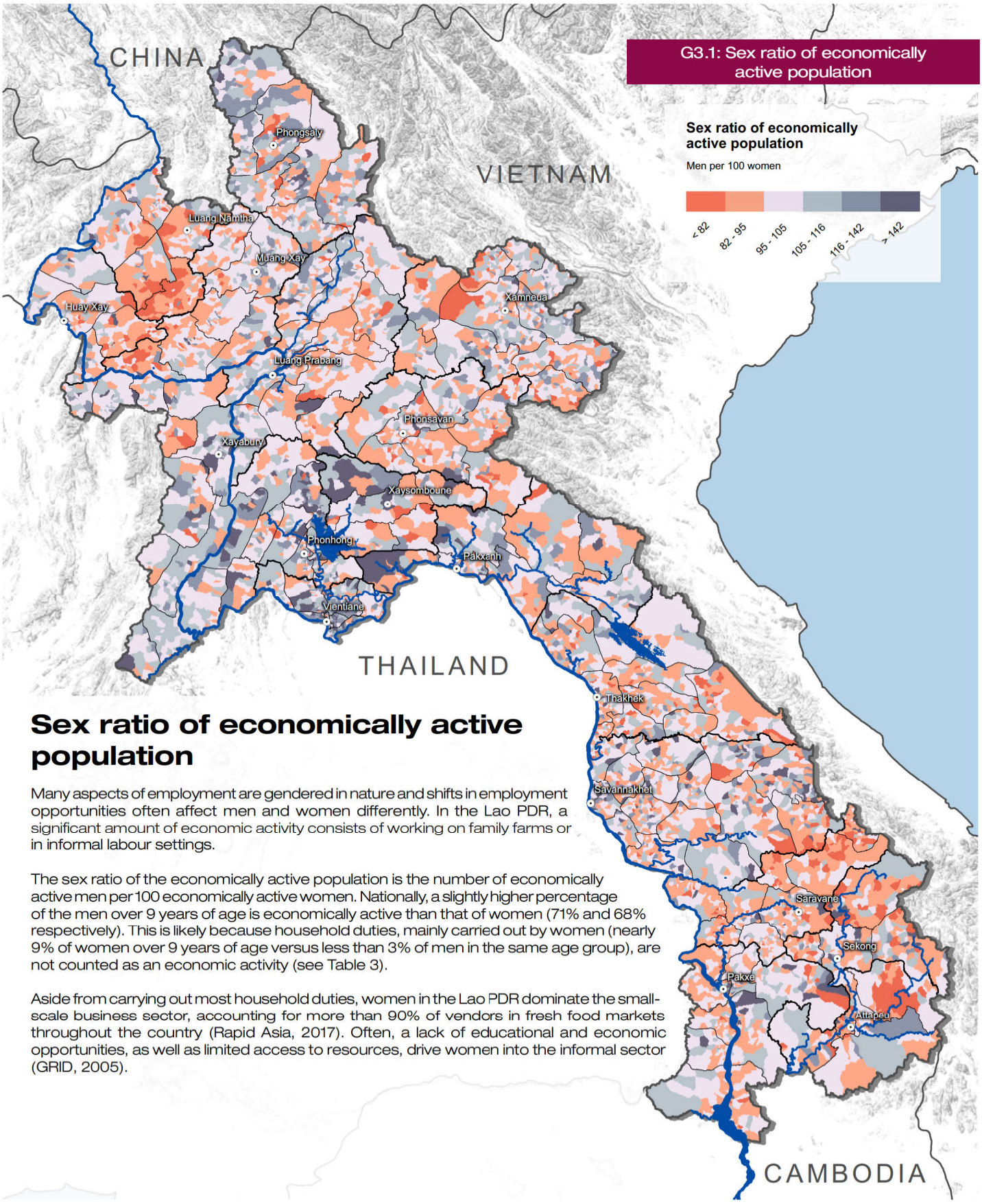
The overall portion of the total population over 9 years of age which is economically active has changed very little between 2005 and 2015 – from 67 to 69%. At the village level, however, more significant changes are apparent. Map G2.2 shows that there are many villages in the Lao PDR which experienced significant changes in the economically active population. Nationally, there are more villages which have experienced a decrease in the portion of the population which is economically active, found mainly in the less accessible and less developed eastern part of the country, whereas areas of increase are scattered across the rest of the country.

Table 2: Distribution of the population according to main activities

Total Population (+15.5%)						
Children under 10 years 21% (-4.5%)	Population 10 years and above 79% (+4.5%)					
	Economically inactive population 29% (-3.4%)			Economically active population 69.1% (+2.5%)		
	Students 70.8% (+1%)	Household duties 20% (+6.4%)	Retired, sick, too old (other) 9.2% (-7.4%)	Employed 97.9% (-0.7%)	Unemployed 2.1% (+0.7%)	Not stated 1.8% (+0.8%)

Note: The percentage always refers to the next upper entity. In parenthesis are the changes since 2005.

G3.1: Sex ratio of economically active population

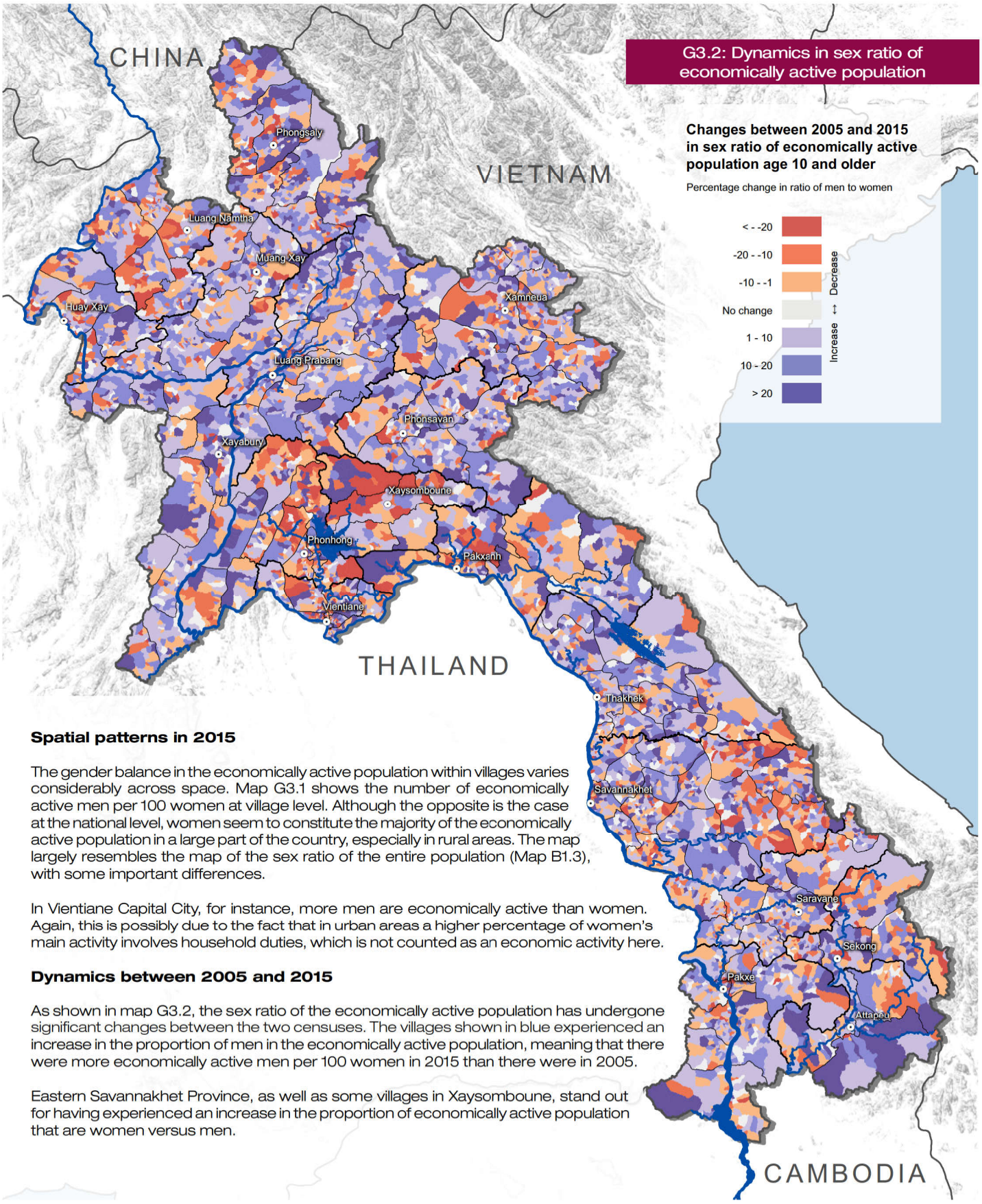


Sex ratio of economically active population

Many aspects of employment are gendered in nature and shifts in employment opportunities often affect men and women differently. In the Lao PDR, a significant amount of economic activity consists of working on family farms or in informal labour settings.

The sex ratio of the economically active population is the number of economically active men per 100 economically active women. Nationally, a slightly higher percentage of the men over 9 years of age is economically active than that of women (71% and 68% respectively). This is likely because household duties, mainly carried out by women (nearly 9% of women over 9 years of age versus less than 3% of men in the same age group), are not counted as an economic activity (see Table 3).

Aside from carrying out most household duties, women in the Lao PDR dominate the small-scale business sector, accounting for more than 90% of vendors in fresh food markets throughout the country (Rapid Asia, 2017). Often, a lack of educational and economic opportunities, as well as limited access to resources, drive women into the informal sector (GRID, 2005).



Spatial patterns in 2015

The gender balance in the economically active population within villages varies considerably across space. Map G3.1 shows the number of economically active men per 100 women at village level. Although the opposite is the case at the national level, women seem to constitute the majority of the economically active population in a large part of the country, especially in rural areas. The map largely resembles the map of the sex ratio of the entire population (Map B1.3), with some important differences.

In Vientiane Capital City, for instance, more men are economically active than women. Again, this is possibly due to the fact that in urban areas a higher percentage of women's main activity involves household duties, which is not counted as an economic activity here.

Dynamics between 2005 and 2015

As shown in map G3.2, the sex ratio of the economically active population has undergone significant changes between the two censuses. The villages shown in blue experienced an increase in the proportion of men in the economically active population, meaning that there were more economically active men per 100 women in 2015 than there were in 2005.

Eastern Savannakhet Province, as well as some villages in Xaysomboune, stand out for having experienced an increase in the proportion of economically active population that are women versus men.

Unemployment

Unemployment is defined as the situation in which an individual is actively looking for employment but is not currently employed.

The unemployment rate measures the prevalence of unemployment and is calculated as the percentage of the number of unemployed individuals out of all individuals currently in the labour force. The size of the labour force, as well as employment and unemployment rates, are crucial statistics for development and planning. High unemployment inhibits economic growth and has negative implications for the people who are unemployed, on the people economically dependent on them, and on society as a whole.

In the PHC of 2005 and 2015, the main economic activity in the twelve months before the census of each individual 10 years of age and older was recorded.

As explained in the previous chapter, in the context of the PHC 2015, a person is considered in the labour force if they hold a job which provides a salary or some kind of profit, or they work in a family farm or business without being paid but benefit in other regards (e.g. their basic needs are covered). Unemployed people who are available for work are also considered part of the labour force. The population outside the labour force includes those respondents not engaged in any kind of economic activity during the reference period and often not available to engage in work. This includes students, housekeepers working only in their own household, and retirees.

However, some limitations in the measurement must be taken into account. Firstly, under the census questionnaire approach, people self-declared being unemployed. Secondly, respondents were not asked questions meant to assess whether a self-declared unemployed person was actively searching for work. These two points must be considered while drawing conclusions from this unemployment data, especially if comparing beyond the country.

Spatial patterns in 2015

Unemployment is more pronounced in urban areas where the unemployment rate is 3.7%, versus 1.4% in rural areas with roads and 1% in rural areas without roads. As can be seen in both maps, Vientiane Capital and almost all of the villages surrounding province capitals are characterized by relatively high unemployment rates.

In urban areas, women were 3.8% more likely than men to be employed, whereas in rural areas they were 3.6% less likely to be employed than men. Gender imbalances in employment also shift by age: at young ages, women are less likely to be employed than men, suggesting that men start working younger, whereas women seem to work until they are older.

Large urban areas are also destinations for rural migrants that may find themselves with limited job opportunities once they reach urban areas. According to the World Bank's Enterprise Surveys (2016), the annual employment growth rate was negative in the Lao PDR, particularly in Vientiane Capital City, compared to 5-10% positive growth rates in the other Asian economies. This pattern is consistent with an economic model that relies heavily on natural resource exploitation in rural areas, which is not creating a significant number of jobs.

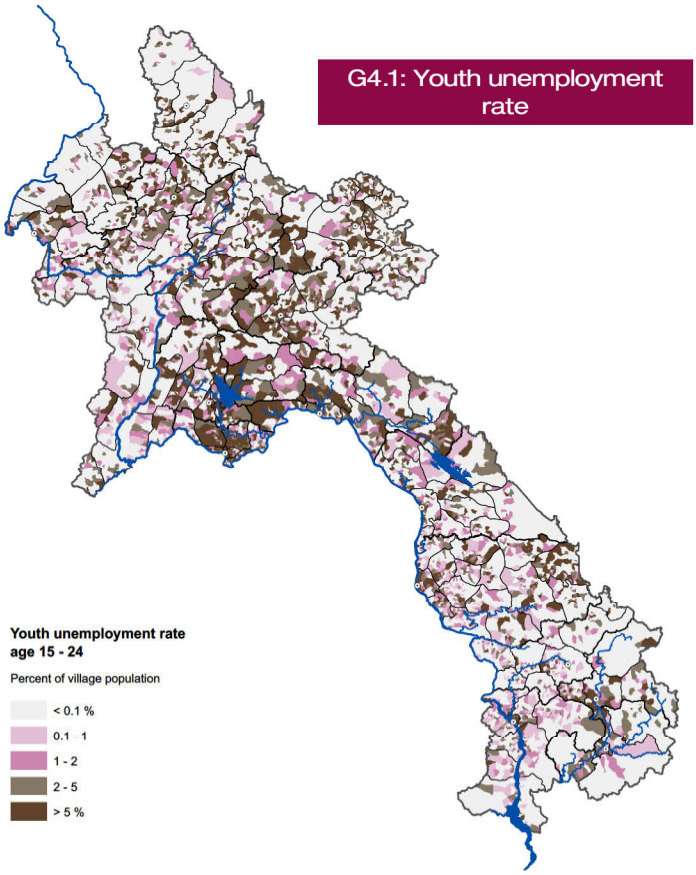
The maps display the percentage of the village population of a specific age group which is unemployed. Map G4.1 depicts youth unemployment, taking into consideration the population between 15 and 24 years old, while Map G4.3 shows the unemployment rate at village level among the individuals between 25 and 64 years old. Comparing the two maps, it is clear that youth unemployment is more pronounced than adult unemployment. Among the barriers for young people finding decent jobs are early family formation, and lack of education and training.

Generally, villages in the centre and the north of the country have higher unemployment rates than those in the south of the country. Villages with a particularly high unemployment rate are found in Vientiane Capital, Borikhamxay, Xaysomboune, Xiengkhuang, and Huaphanh Provinces.

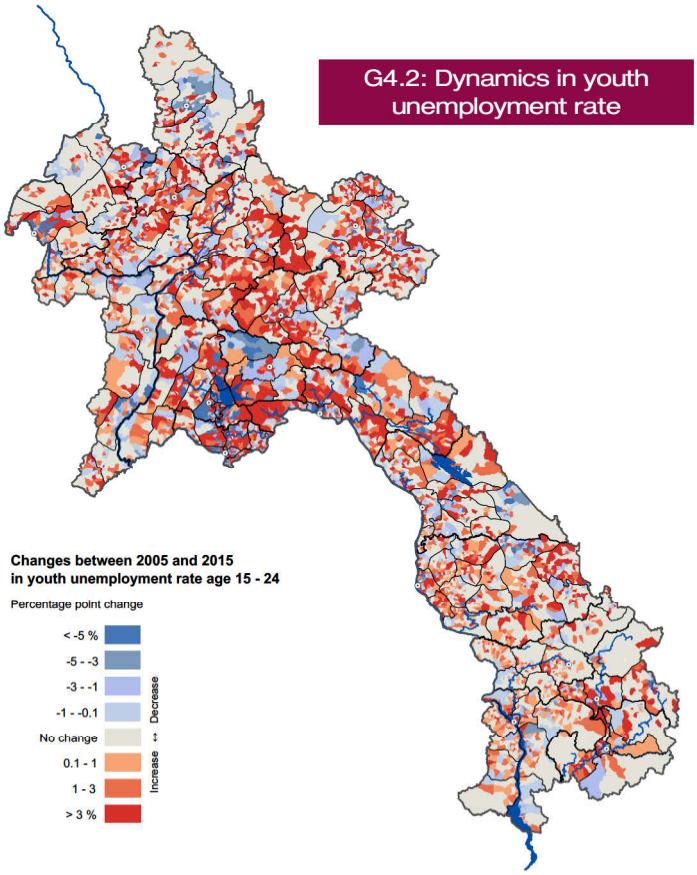
Dynamics between 2005 and 2015

The country's unemployment rate increased from 1.4% in 2005 to 2.1% in 2015. Maps G42 and G4.4 show the changes in youth and adult unemployment rates between 2005 and 2015. Youth unemployment rates have experienced a strong increase between the two censuses, especially in the central and northern provinces. On the other hand, villages that experienced important decreases in youth unemployment rates are found in Xaysomboune Province and in the east of Phongsaly. Adult unemployment rates underwent less significant changes, and do not appear to follow any clear spatial pattern throughout the country.

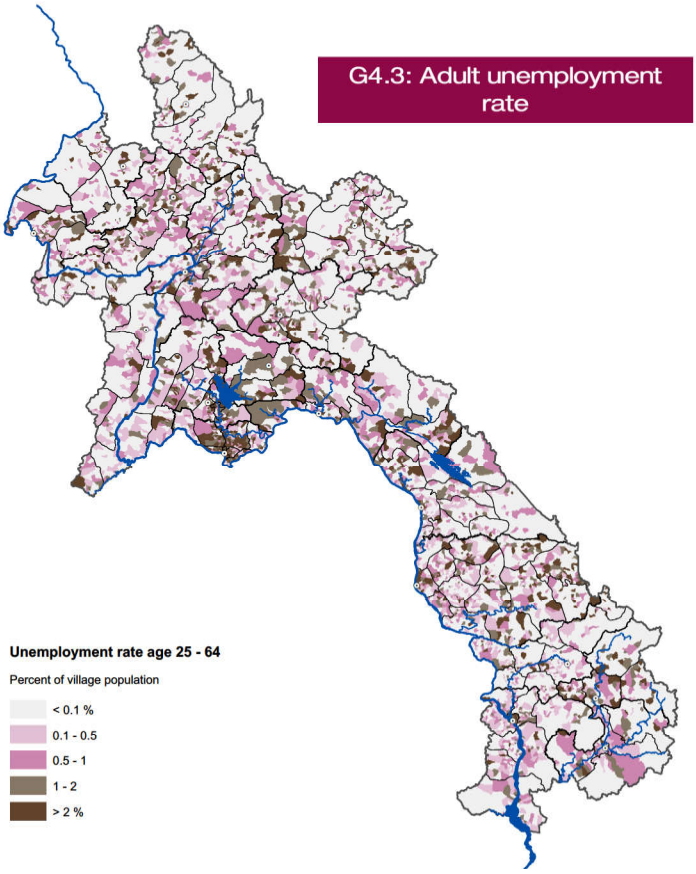
G4.1: Youth unemployment rate



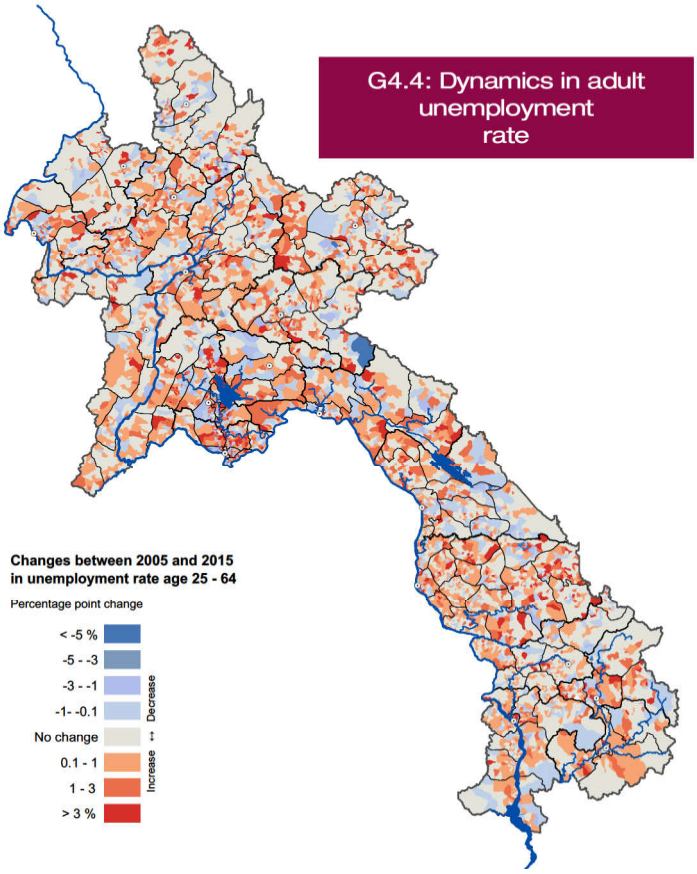
G4.2: Dynamics in youth unemployment rate



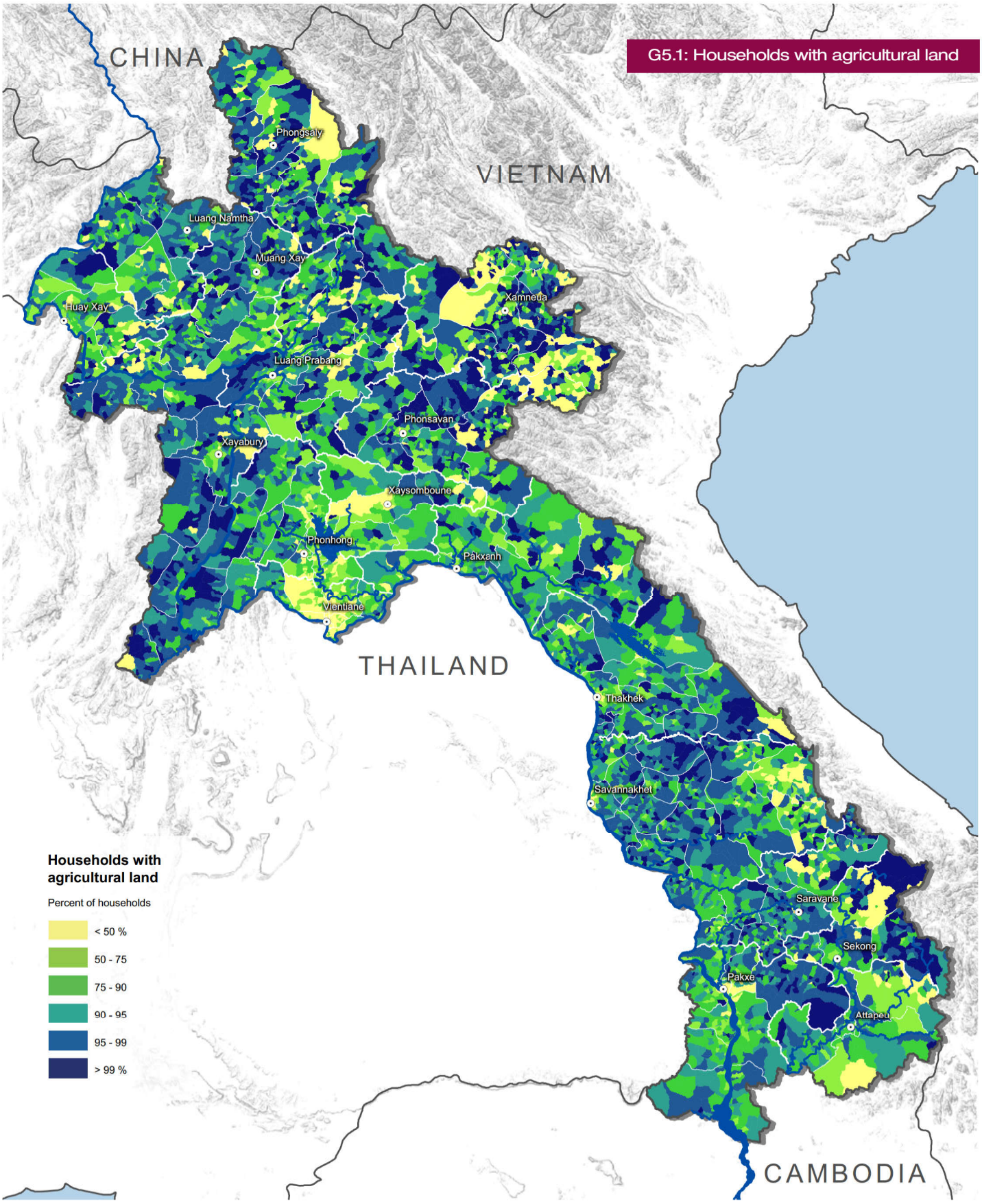
G4.3: Adult unemployment rate



G4.4: Dynamics in adult unemployment rate



G5.1: Households with agricultural land



Households with agricultural land

Agricultural land is land that is arable and used to produce annual crops, to cultivate perennial crops, or as permanent pasture. Agricultural land is an important asset which often defines the socio-economic status of a household in the Lao PDR, where agriculture continues to be the main economic sector.

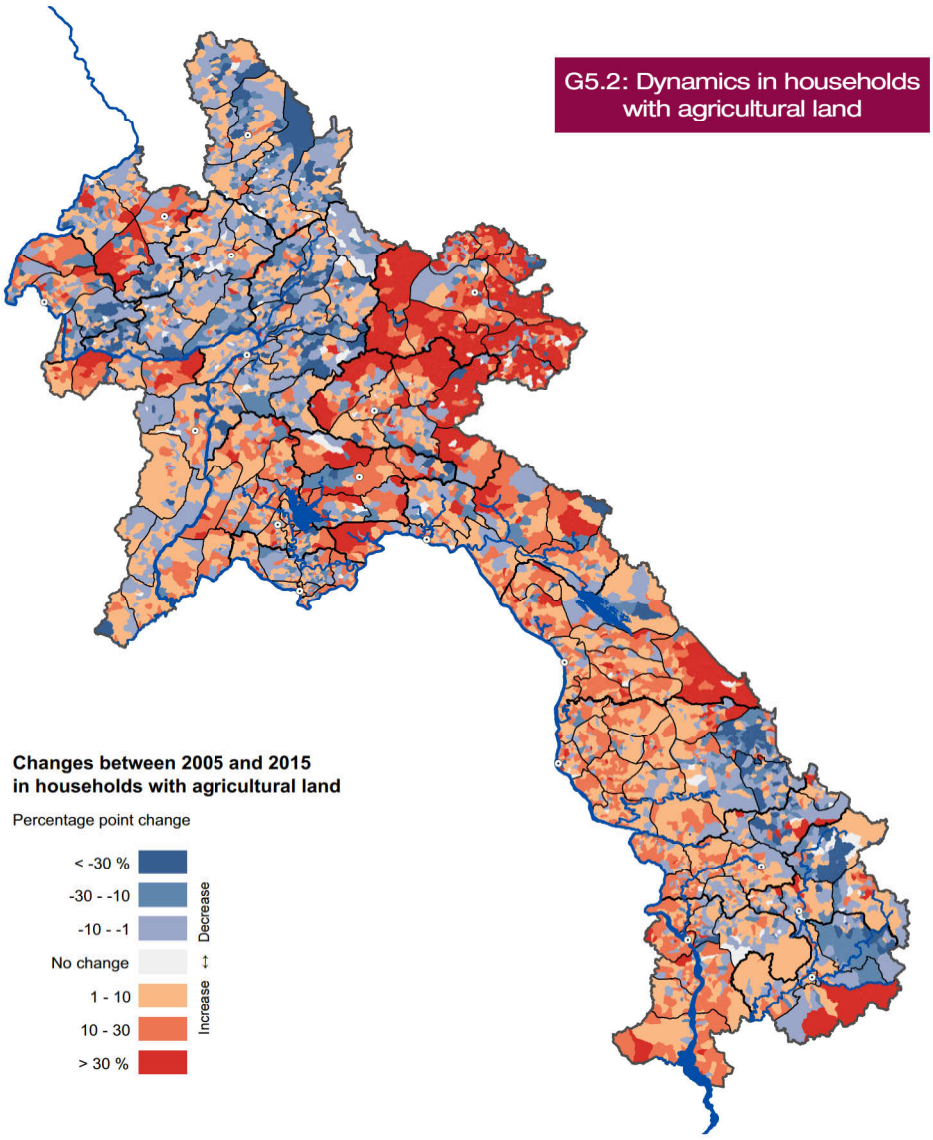
To gain a better understanding of Lao households' general living standards, all households were asked during the PHC 2015 about ownership of a range of selected assets, agricultural land being one of them.

In total, three fourths of all households (892,013 households) owned agricultural land in 2015. This percentage is clearly higher in rural areas where agricultural land ownership reaches around 86% of all households, whereas only 54% of households in urban areas own agricultural land. The relatively small difference is surprising, as urban residents' ownership of agricultural land is quite high, and rural households' rate of agricultural land ownership is relatively low considering that the vast majority of rural households are engaged in farming activities. On one hand this could be attributed to the still ambivalent system of land tenure in many parts of the country, while on the other hand it could be due to the somewhat unusual definition of urban and rural areas in the Lao census (defined by the degree of access to public infrastructure, rather than by the population's other economic characteristics, settlement characteristics, or population sizes and densities, for instance).

Spatial patterns in 2015

Map G5.1 presents the percentage of households that own any agricultural land. While the low percentage of agricultural land ownership in Vientiane Capital City comes as no surprise, since this is the country's most urbanized area, the low percentage of agricultural land ownership in the areas close to the Vietnam border in Phongsaly, Huaphanh, Savannakhet, and Sekong Provinces, as well as in the south of Attapeu Province is more surprising. In these areas, where the majority of the households depend on access to land for engaging in small-scale agriculture, land use rights are often still customary with few households holding official land titles, and the land considered communally rather than individually owned.

G5.2: Dynamics in households with agricultural land



Dynamics between 2005 and 2015

Important changes have occurred between 2005 and 2015. Land ownership increased from 67 to 75%, and agricultural land ownership in urban areas went up from 40% of all urban households in 2005 to 54% in 2015. As many villages formerly classified as urban were classified as rural in 2015 and vice versa, this surprising pattern is likely a reflection of improved access to public infrastructure (a primary criteria for the classification of villages as urban) in agricultural villages, and an increase in populations across peri-urban areas that outpaced infrastructural developments, resulting in a relative average decrease in access to public infrastructure there.

Map G5.2 reveals the dramatic increase in agricultural land ownership in Huaphanh, where land ownership increased by more than 30% in most of the villages in the province. Huaphanh had the lowest land ownership of all rural provinces in 2005 (see Socio-economic Atlas of 2005 (Messerli *et al.*, 2008)). Households in south eastern Khammuane, southern Attapeu, and western Luang Namtha have experienced important increases in the ownership of agricultural land as well.

In the last decade, these areas experienced an important shift towards commercial agriculture. This may have led to reductions in the area of collective land resulting in an increase in land ownership.

Self-employed workers

Self-employed workers are individuals who engage in economic activities not as employees, usually in a family enterprise or on their family farm. They constitute a significant portion of the economically active population of the Lao PDR.

The PHC 2015 classifies a person as employed if they fall into one of the following categories: "employee", which includes individuals working for the government, private sector, state enterprises, or non-governmental organizations, "employer", "own account worker", and "unpaid family worker". Self-employed workers include the latter three categories combined.

Table 3 illustrates the percentages of the population above 9 years of age engaged in different categories of employment. 55.2% of the total population over nine years of age is self-employed. Within this group, 53% of the total male population and 58% of the total female population above 9 years old are self-employed. The gender gap becomes wider if we consider the share of self-employed men and women throughout the economically active population: 76% of all economically active men and 87% of all economically active women are self-employed. The portion of self-employed women is particularly high because it includes unpaid family work, which is one of the most common forms of economic activity women engage in in the Lao PDR (40% of the economically active women over 9 years of age compared to 18% for men).

Spatial patterns in 2015

Self-employed workers are most common in rural areas where they account for virtually all of the total working population in many villages. Self-employed workers account for 90.3% of the total working population in rural villages with roads, and 95.2% in rural villages without road access. In more urbanized areas, self-employed workers account for a smaller share of the total workforce (60.3%) due to the wider range of job opportunities that urban areas can offer.

Maps G6.2 and G6.4 show self-employed male and female workers as a percentage of total male and female employment. Both maps clearly show that self-employed workers are the main category of employed individuals, particularly in rural areas. Urban areas such as Vientiane Capital City and areas surrounding province capitals show a significantly lower percentage of self-employed workers – both male and female.

Table 3: Distribution of the population 10 years and older according to employment category by gender

Employment category			Male (%)	Female (%)	Total (%)
Economically active	Employed	Government employee	9.28	4.31	6.8
		Private employee	6.31	3.88	5.1
		State enterprise employee	0.86	0.38	0.6
		International or NGO	0.14	0.08	0.1
	Self-employed	Employer	0.54	0.28	0.4
		Self-employed	34.14	17.14	25.6
		Unpaid family worker	18.16	40.18	29.1
	Unemployed		1.47	1.39	1.4
Economically inactive	Student		21.25	19.05	20.5
	Household duties		2.74	8.88	5.8
Other			2.79	2.37	2.7
Not stated			2.34	2.07	1.8
TOTAL			100.00	100.00	100.00

A comparison between the two maps makes clear that the percentage of self-employed men out of the total population of employed men is lower than that of self-employed women across the country, again likely due to engagement in unpaid family work by women. Indeed, more than 60% of the employed female population are unpaid family workers, while male unpaid family workers constitute only 26% of employed men.

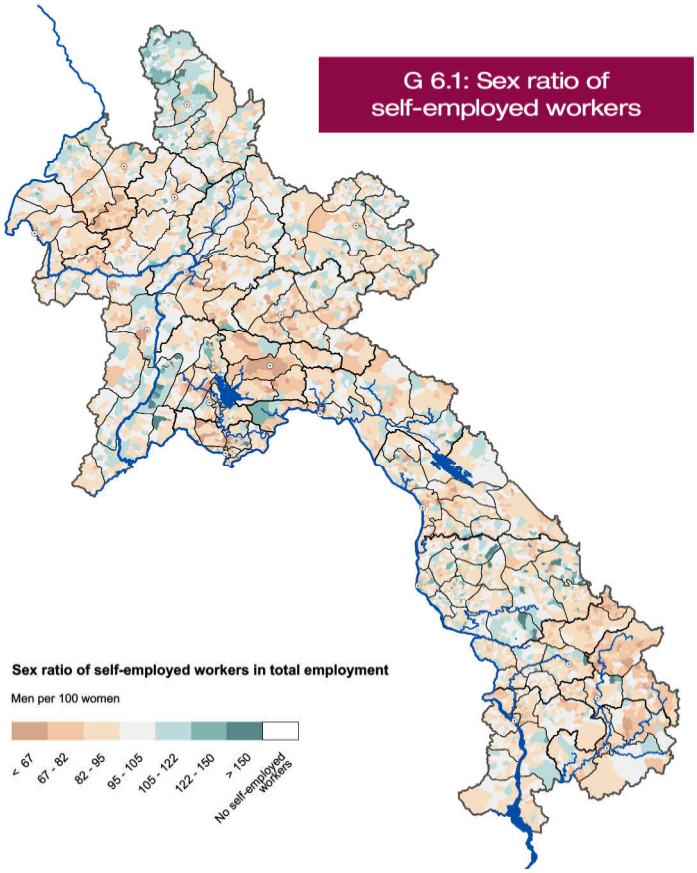
Map G6.1 shows the sex ratio of self-employed workers. The map depicts the number of self-employed men per 100 women at village level. Throughout the country, the number of self-employed women exceeds that of self-employed men in most villages, except in northwest Phongsaly, northern Luang Namtha, as well as along the Nam Ou and Mekong Rivers stretching from northern Luang Prabang to the Thai border in Xayabury.

These patterns point to important gender imbalances and indicate that women contribute to most of the unpaid household duties and are thus less likely to be formally employed than men.

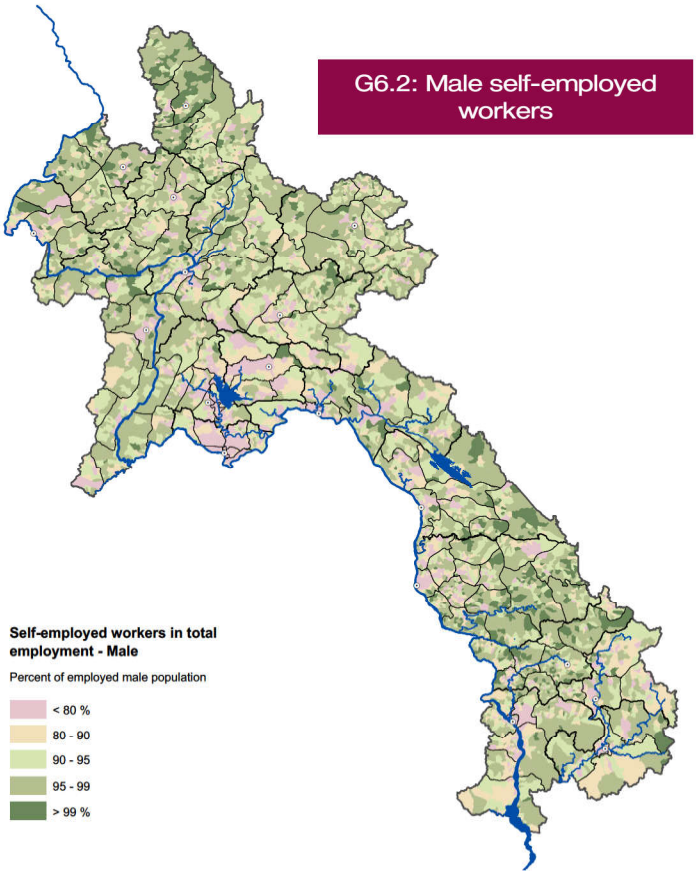
Dynamics between 2005 and 2015

Maps G6.3 and G6.5 depict changes in the share of all employed men and women who are self-employed. Obviously, the portion of self-employed workers decreased significantly for both men and women in the last decade, although there was clearly a stronger decrease among men. The decreases are strongest in and around the main towns and in the lowlands along the Mekong River. This decrease is linked to the expansion of the secondary and tertiary sectors of the economy that happened mostly in and around towns and in the more densely populated lowland areas. As a consequence, new employment opportunities offered by these sectors have led to a reduction in the number of self-employed workers there.

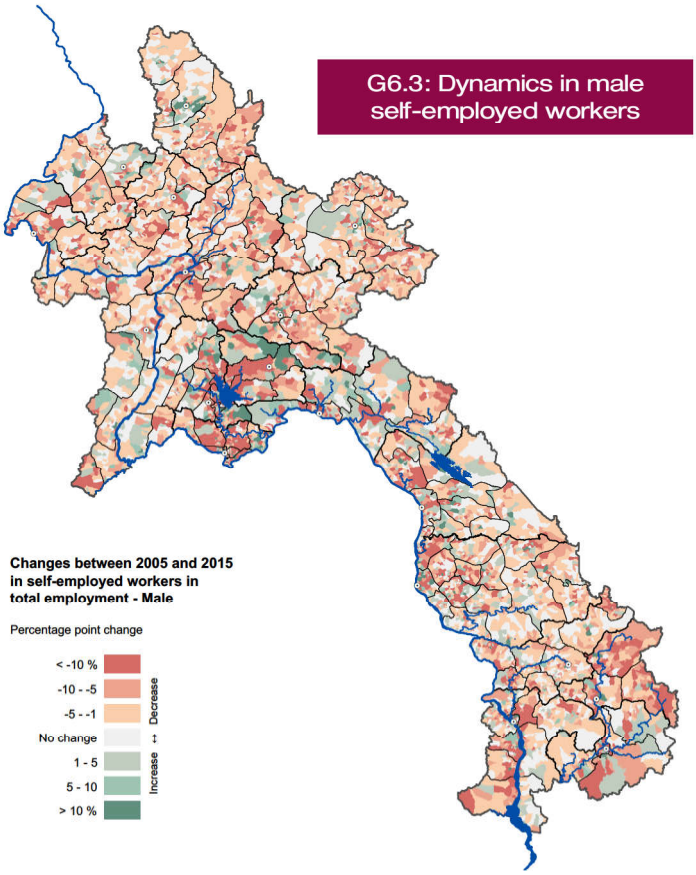
G 6.1: Sex ratio of self-employed workers



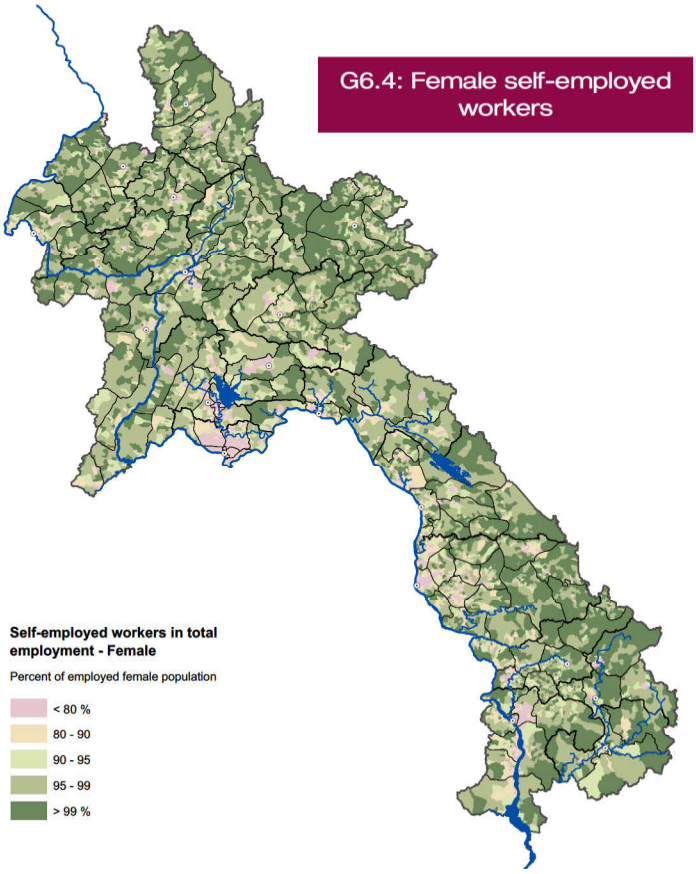
G6.2: Male self-employed workers



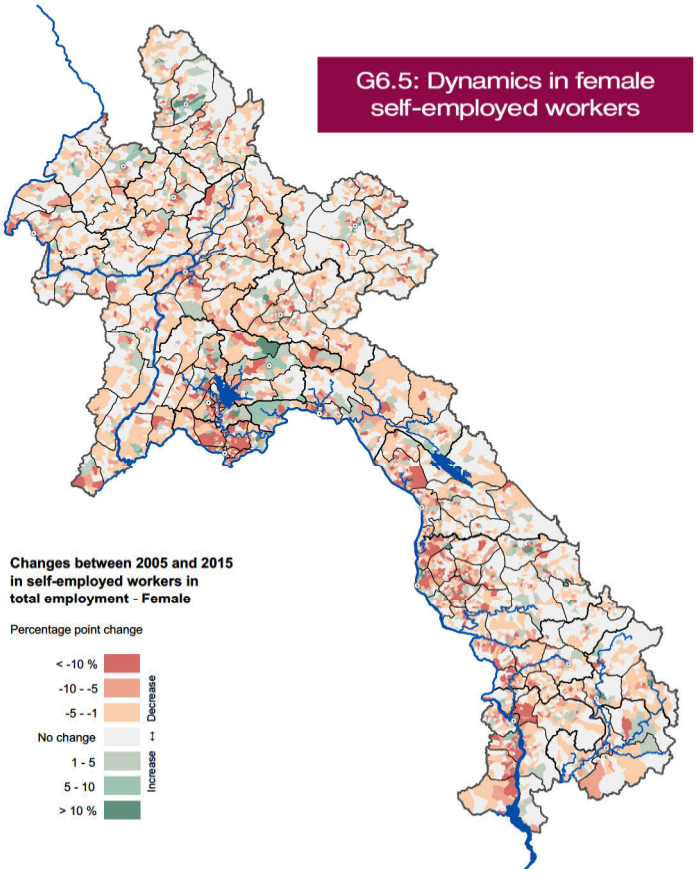
G6.3: Dynamics in male self-employed workers

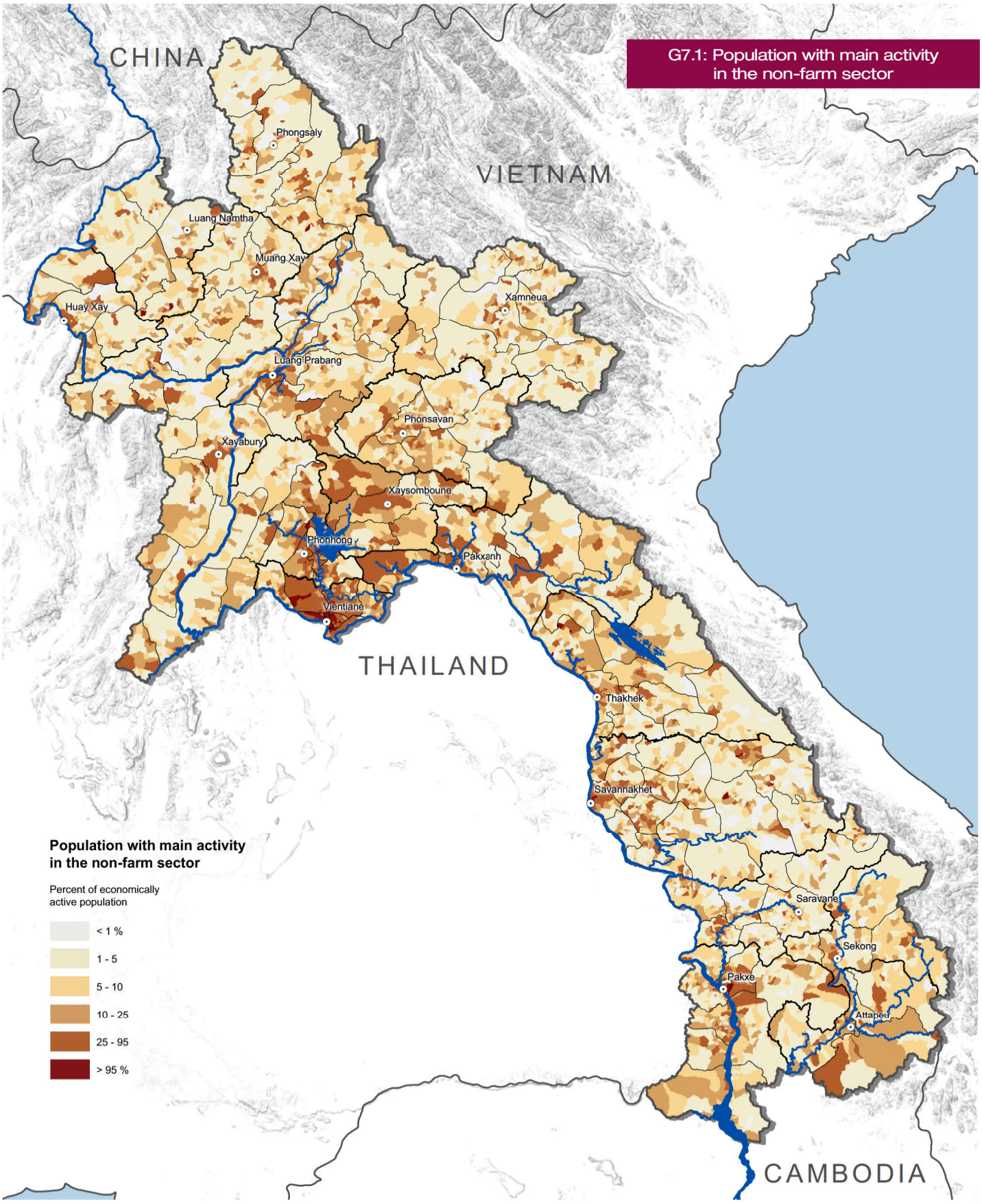


G6.4: Female self-employed workers



G6.5: Dynamics in female self-employed workers




G7.1: Population with main activity in the non-farm sector
CHINA
VIETNAM
THAILAND
CAMBODIA
Phongsaly
Luang Namtha
Muang Xay
Huay Xay
Xamneua
Luang Prabang
Phonsavan
Xayabury
Xaysomboune
Phonhong
Pakxanh
Vientiane
Thakhek
Savannakhet
Saravane
Sekong
Pakxé
Attapeu
Population with main activity in the non-farm sector
Percent of economically active population
< 1 %
1 - 5
5 - 10
10 - 25
25 - 95
> 95 %

Population active in non-farm sectors

To understand the state of an economy, its strengths, weaknesses and potentials for growth, it is necessary to know in which industry sector the economically active population is engaged.

In the 2015 PHC, for each economically active person, the main sector in which they have worked in the last 12 months was recorded. Not surprisingly, the agricultural sector employs the majority (70%) of the economically active population, a decrease of 6% since 2005. Agriculture also accounts for virtually all primary sector employment in the country (mining and quarrying only employ 0.2% of the economically active population). All the other sectors account for less than 10% of the employed population, among these, the most important are public administration and defense (6%), wholesale and retail trade which includes motor vehicle and motorcycle repair (5%), and manufacturing (3.5%). Table 4 illustrates the labour force distribution over the three main sectors of the economy, disaggregated by gender. Interestingly, only 42% of workers in the tertiary sector are women. This discrepancy is mainly due the transportation and storage sector (91% men), electricity, gas and air-conditioning supply (82% men), and public administration and defence (78% men).

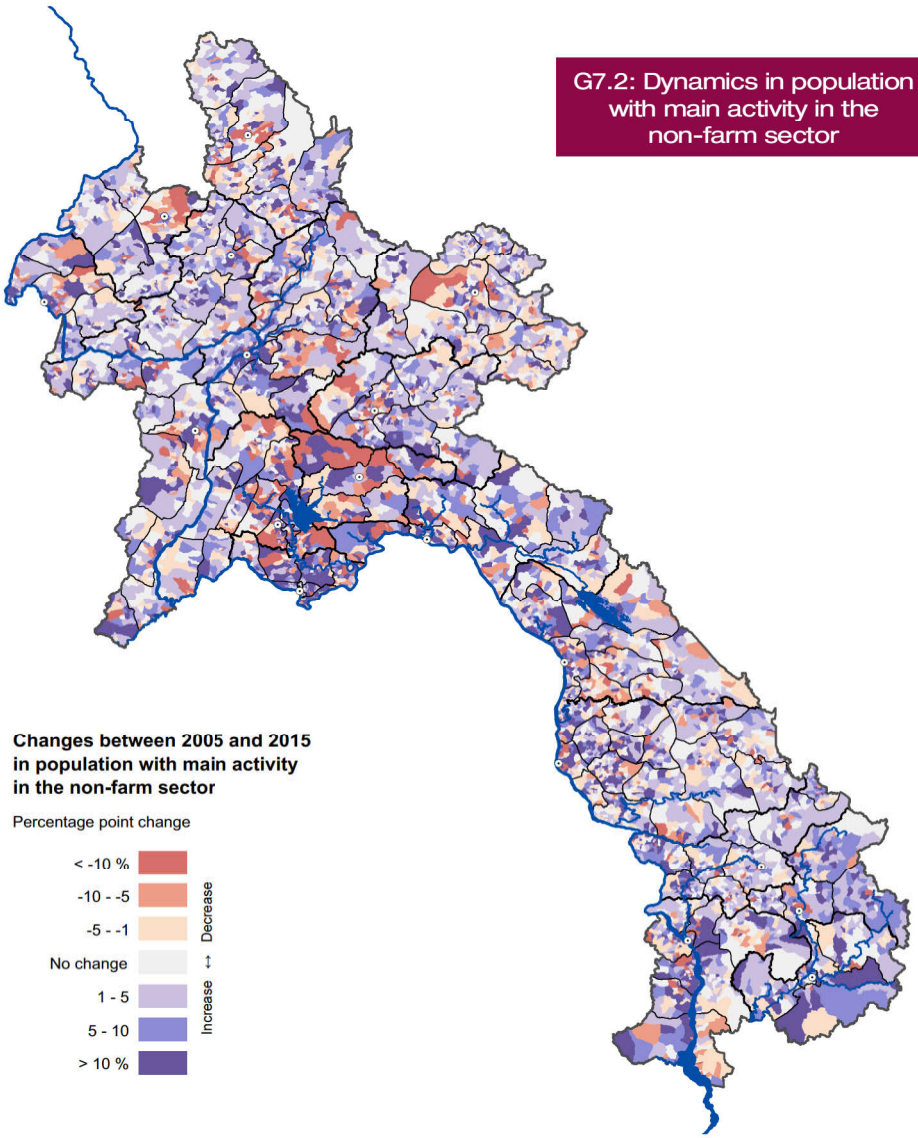
Spatial patterns in 2015

Map G7.1 shows the percentage of the population at village level whose main economic activity is in a non-farm sector. Vientiane Capital City shows a particularly high percentage of the population engaged in the non-farm sector, but particularly in the core districts where a significant industry and service sector is developing. The towns of Luang Prabang, Savannakhet and Pakxe show a similar although less pronounced pattern. Other important areas with a high share of the population active in the non-farm sector are found in Xaysomboune and Borikhamxay Provinces. One explanation for this is the presence of multiple mining and hydropower projects developed in the two provinces, which employ a significant workforce.

Dynamics between 2005 and 2015

In the last ten years, the development of the secondary and tertiary sectors, along with many areas undergoing a continuing transition from subsistence to commercial agriculture, have generated more capacity for non-farm activities in the country, thus the number of people engaged in non-farm sectors has increased.

G7.2: Dynamics in population with main activity in the non-farm sector

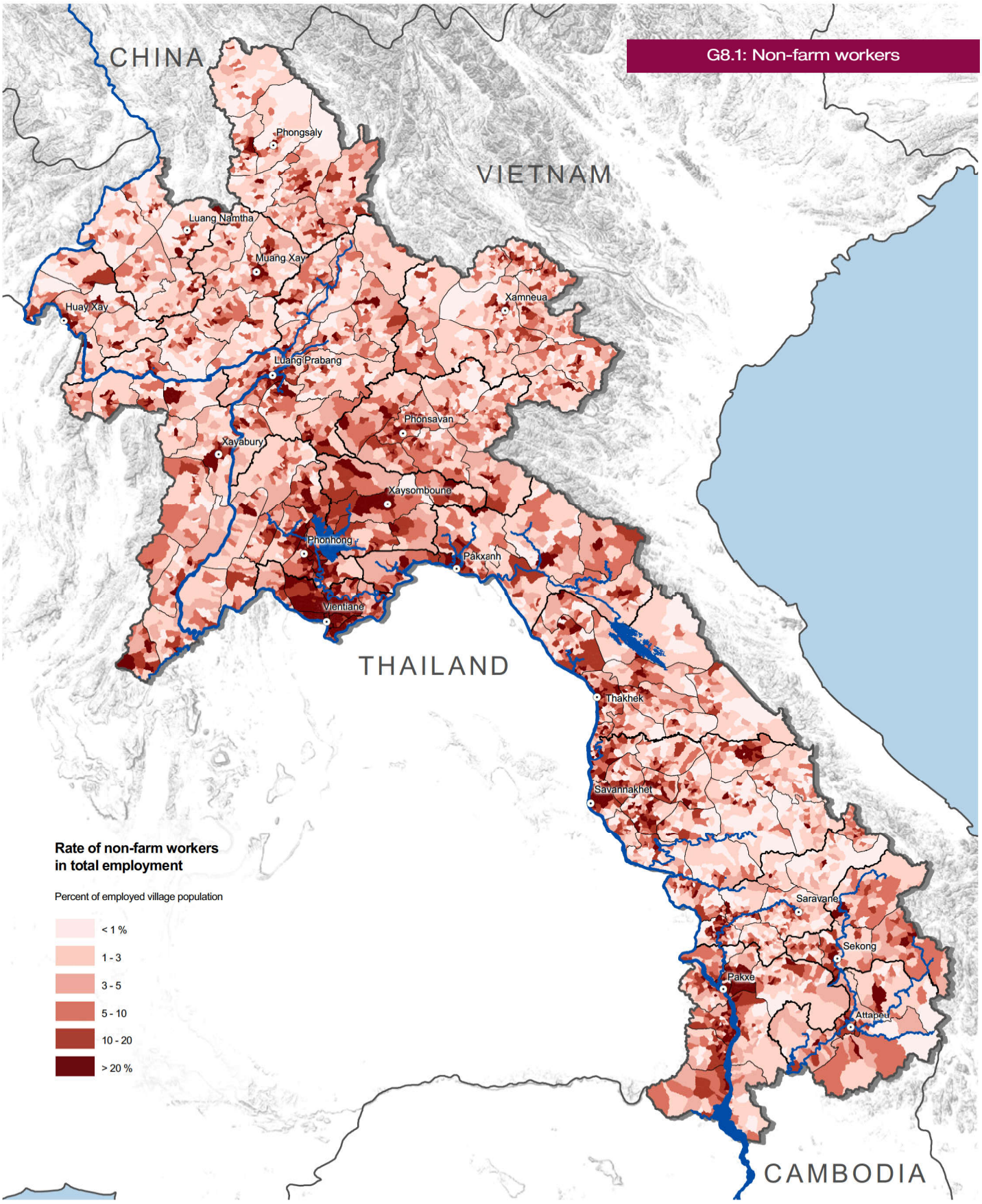


Map G7.2 reveals the dynamics between 2005 and 2015, showing interesting patterns in larger urban centres where the rates in core areas of cities did not increase as much as in the outskirts. This could be because a significant share of the population living in these towns was already active in the non-farm sector in 2005. In several areas, non-farm activities decreased by more than 10%, particularly in the north of Xaysomboune and Vientiane Provinces. This could be again due to in-migration of people engaged in the agricultural sector, as well as the development of the mining and hydropower projects there.

Table 4: Distribution of the usually employed population 10 years and older over the three main economic sectors by gender

Primary		Secondary		Tertiary		TOTAL	
2,514,662		409,701		664,676		3,589,039	
70.1%		11.4%		18.5%		100%	
Male	Female	Male	Female	Male	Female	Male	Female
1,225,944	1,288,718	201,595	208,106	380,026	284,650	1,807,565	1,781,474
48.8%	51.2%	49.2%	50.8%	57.2%	42.8%	50.4%	49.6%

G8.1: Non-farm workers



Employment in the non-farm sector

The majority of the Lao labour force works in the agricultural sector as self-employed. Those employed in non-farm sectors account for 97.5% of the total employed population of 2015, of which 55% are government employees, 40% are private sector employees, and 5% are employees of state cooperatives.

The labour force of the Lao PDR is roughly equally represented by both genders, with men accounting for 51.1% and women for 48.9% of the total. This reflects patterns in the agricultural sector, whereas most of the other sectors (which employ 28% of the economically active population) are far from gender balanced. In the transportation and storage sector, for instance, only 9% of employees are women, in electricity, gas and air conditioning supply 18%, and in public administration, defence, and compulsory social security, 22%. On the other hand, in the accommodation and food service sector, as well as in human health and social work, women account for 67 and 60% of the workforce respectively.

Spatial patterns in 2015

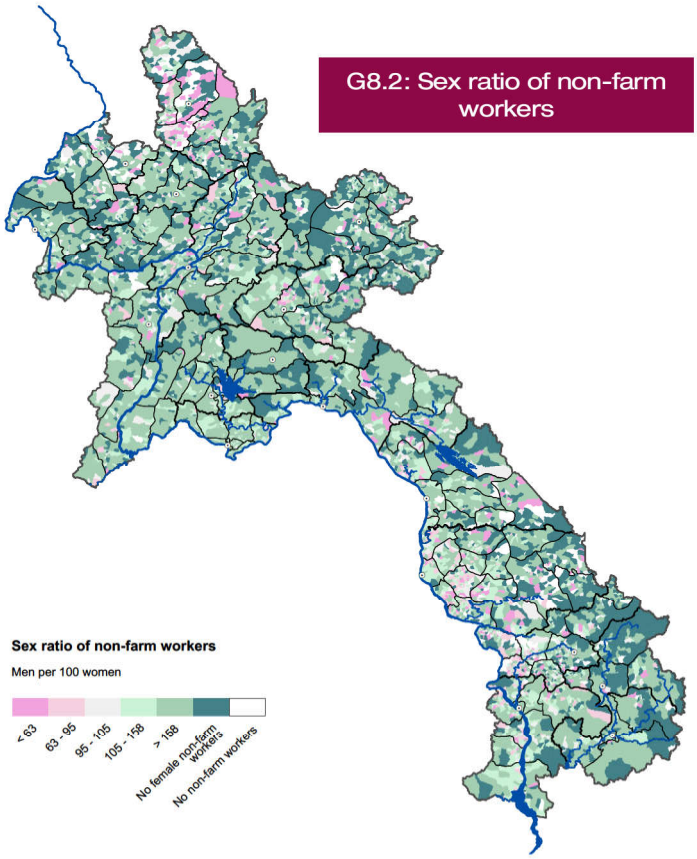
Map G8.1 resembles Map G7.1, showing a high percentage of non-farm workers concentrated in urban areas and in the province of Xaysomboune. In the majority of the villages in Vientiane Capital City, non-farm workers exceed 20% of the total employed population. Other hotspots include the areas in and around the towns of Luang Prabang, Thakhek, Savannakhet, and Pakxe.

Sex disaggregated data collected for the census allow for visualizing gender differences in employment down to the village level. Map G8.2 shows the sex ratio of non-farm workers in total employment at the village level, revealing how women working outside the agricultural sector are in the minority in most parts of the country. Exceptions include villages in parts of Phongsaly Province, along with a few in the southern lowlands.

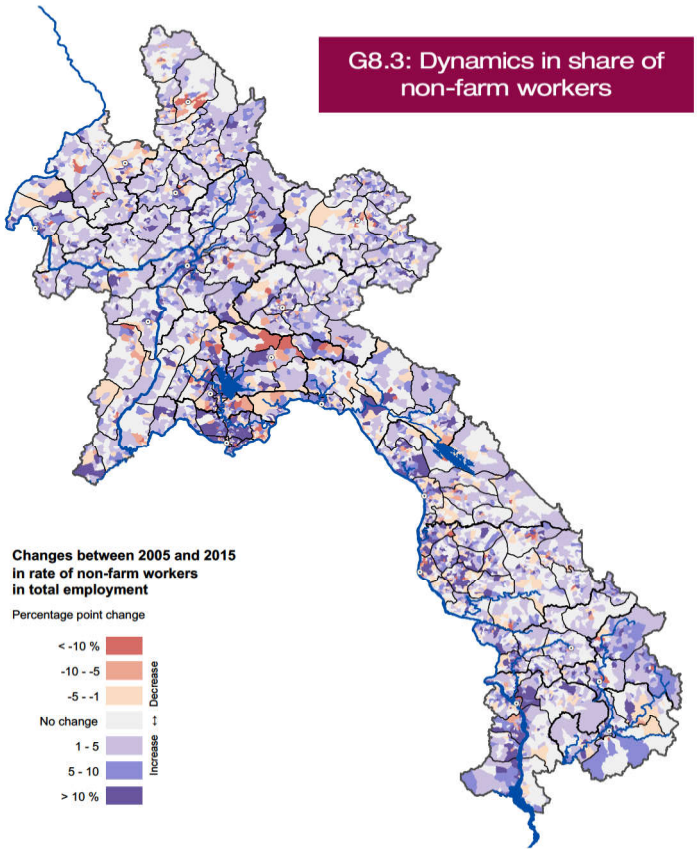
Dynamics between 2005 and 2015

Map G8.3 shows the changes in the percentage of non-farm workers between the two censuses. Overall, the rate has increased throughout almost the entire country. The areas around the country's largest urban centres experienced significant increases in the share of non-farm workers. Interestingly, Phongsaly, Xamneua, and Phonsavan towns experienced a decrease in the percentage of non-farm workers. This pattern may be due to the in-migration of people still linked to the agricultural sector that lowered the share of non-farm workers. Another area where the proportion of non-farm workers decreased significantly was in the north of Xaysomboune, which might be due to the termination of a number of mining projects in the area that employed a significant workforce in 2005.

G8.2: Sex ratio of non-farm workers



G8.3: Dynamics in share of non-farm workers



LIVING CONDITIONS

Building materials and living area of housing

Shelter is a basic human requirement. It protects from the cold and rain, offers refuge, and provides privacy and comfort to a household. Therefore, and not surprisingly, access to adequate, safe and affordable housing was added as a target to the 2030 Agenda (Target 11.1 of SDG 11 "Sustainable Cities and Communities"). The type of building materials used in the construction of homes is an indicator of the resilience and sustainability of settlements. The 2030 Agenda also includes a target related to the importance of using local building materials (Target 11.c).

In the Lao PDR, modern building materials, especially roofing materials, are rapidly replacing traditionally used local materials. While the use of corrugated iron sheets has decreased slightly since 2005 (from 54% to 50%), the use of tiles has increased massively (from 13% to 42%). Thus, the use of other materials such as grass, wood and bamboo dropped sharply from 28% to less than 10%. There were fewer changes in the flooring materials used since 2005, but the observed shifts are still significant, with wood decreasing from 55 to 40% and bamboo from 15 to 5%, while concrete increased from 17 to 24% and tile from 8 to 25%. Interestingly, the share of houses with walls made of wood remained constant since 2005 (43%). Meanwhile, the use of bamboo for walls has decreased sharply (from 36 to 14%) and was replaced by brick and cement (from 18 to 41%). The shift from more traditional, locally sourced, and typically cheaper building materials such as bamboo, grass, and to some degree also wood, to locally produced or imported (and typically more expensive) industrial building materials such as tiles and concrete reflects a general improvement in living standards in the Lao PDR.

During the implementation of the PHC 2005 and 2015, the main building materials of each household's roof, walls, and floors were recorded. Spatial patterns in 2015 and changes since 2005

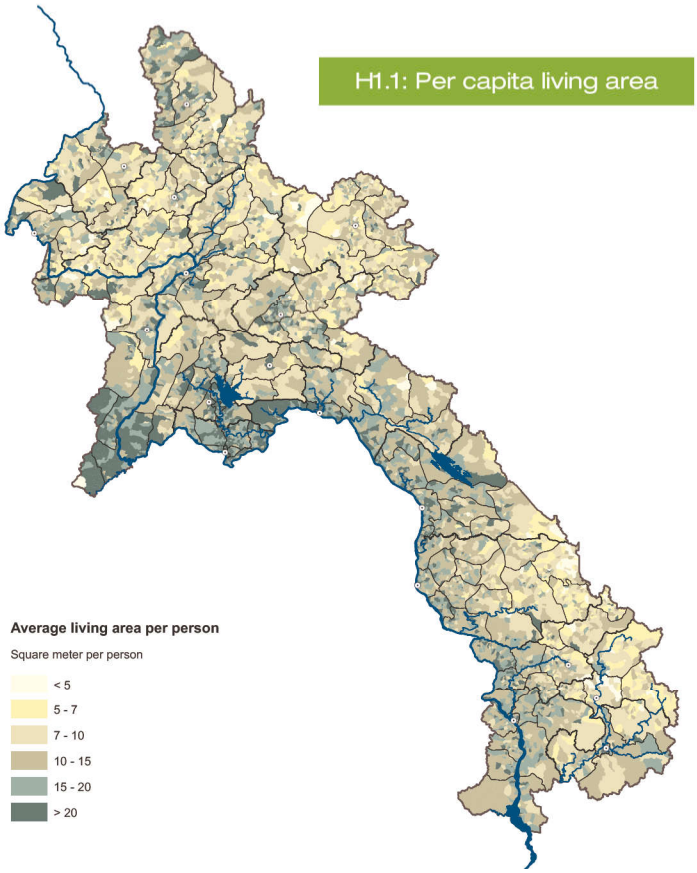
Size of houses: In 2015, around 96% of households in the Lao PDR owned the house in which they lived, whereas 2% were renting and another 2% were living in houses or apartments owned by the government. Slightly more than half of the population lives in moderately sized houses of 26 to 75 m^2. Map H1.1 shows that the average living area per person is higher in the more accessible areas around Vientiane Capital City and along the Mekong River running south. In the north and southeast, the living area per person is significantly lower, usually below 10 m^2 per person.

The living area per person increased across the country between 2005 and 2015, especially in urban areas, in the southwest, and in the south along the Mekong River (see Map H1.2). Most probably, the increase in living space per person is a result of increased living standards which means that people can afford to build and own larger houses, as well as due to the decrease in household sizes during the same period. In 2005, the average household size in the country was 5.9 people, whereas in 2015 it had dropped to 5.3.

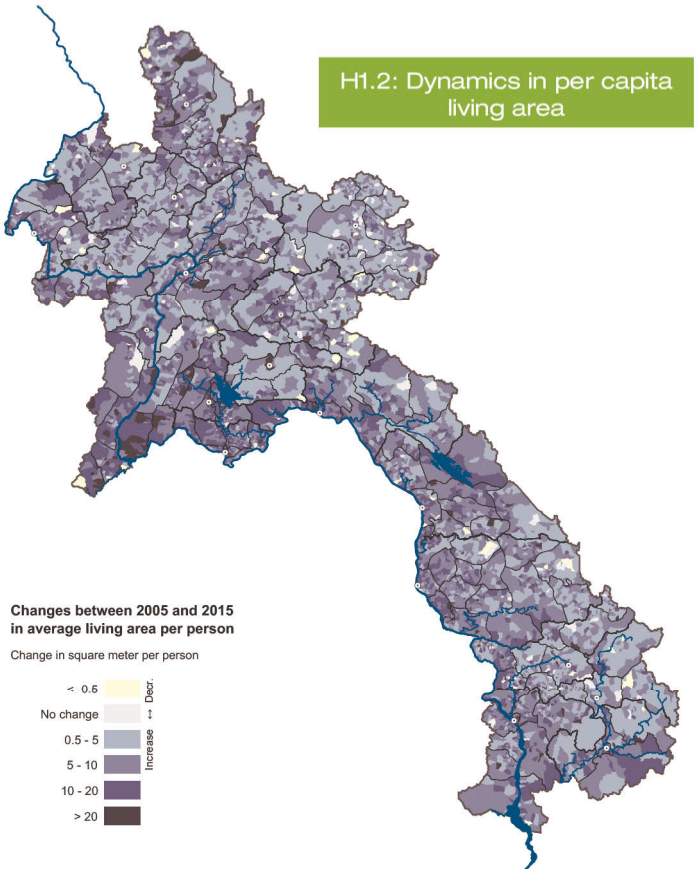
Roofing material (Map H1.3): Corrugated iron sheets have conquered most of the country in terms of becoming the main roofing material (50% of all households), closely followed by the more expensive tiles (42%). Only small areas, mainly in the northwest and the southeast of the country, have a dominance of either bamboo or grass used as roofing materials. Interestingly, tile seems to be less popular in the south of the country, where the more economical corrugated iron sheets are clearly dominant (for example, more than three quarters of the houses in Attapeu Province use corrugated iron), whereas the typically more expensive tiles are dominant around Vientiane (69% in Vientiane Province) and from there towards the northeast, reflecting the local dynamics in living standards (see e.g. Map I2.2).

Walls (Map H1.4): Wood is also the preferred material for building walls (43% of all households), especially in the south and northeast where it is clearly dominant. The highest proportion is found in Xiengkhuang,

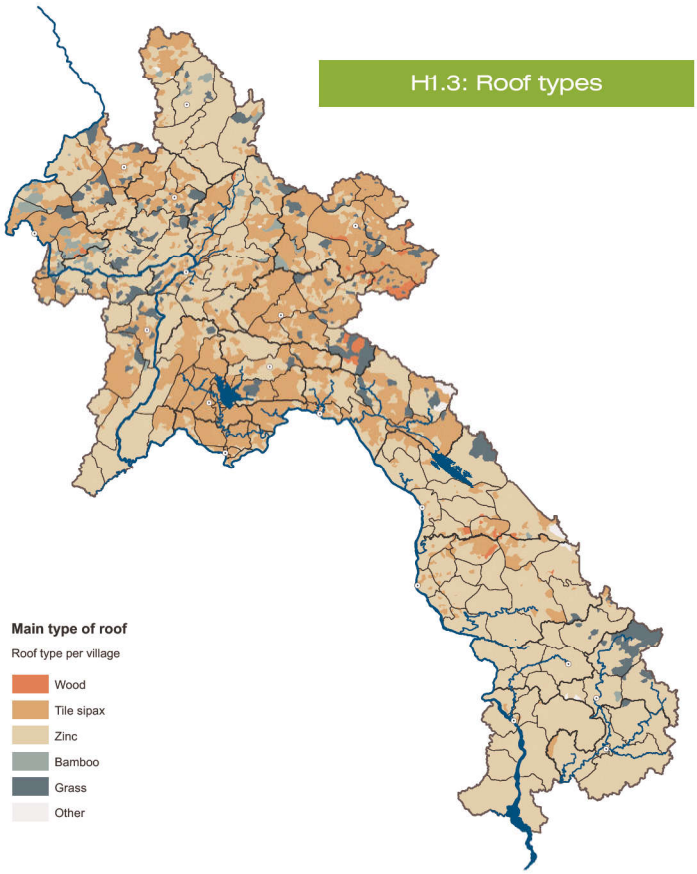
H1.1: Per capita living area



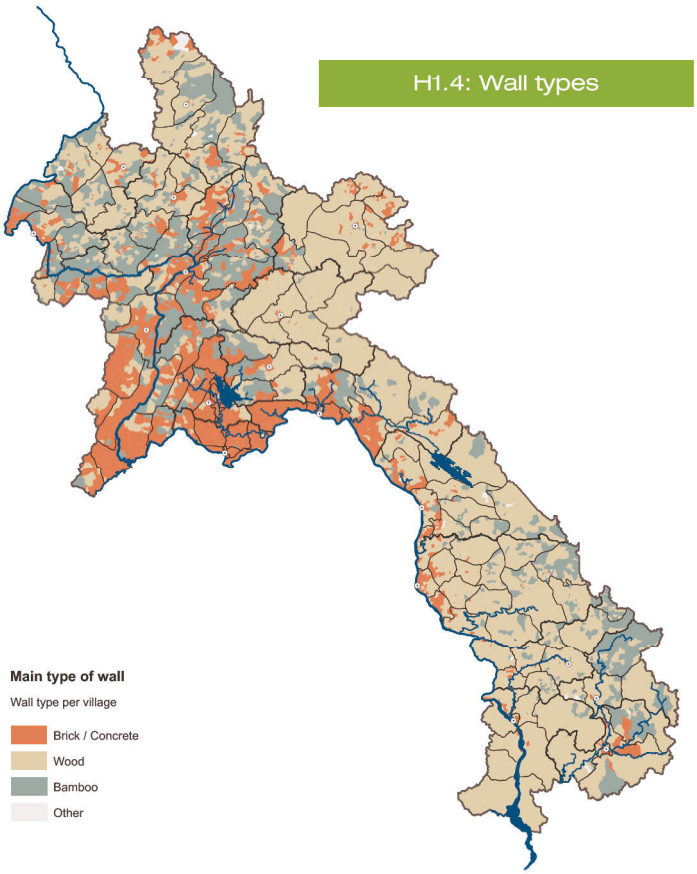
H1.2: Dynamics in per capita living area



H1.3: Roof types



H1.4: Wall types

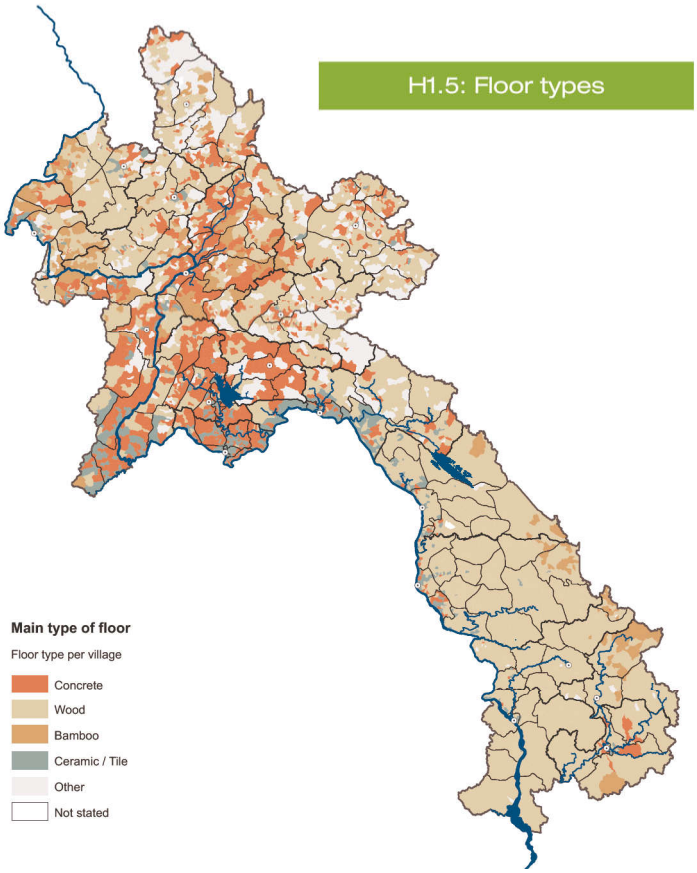


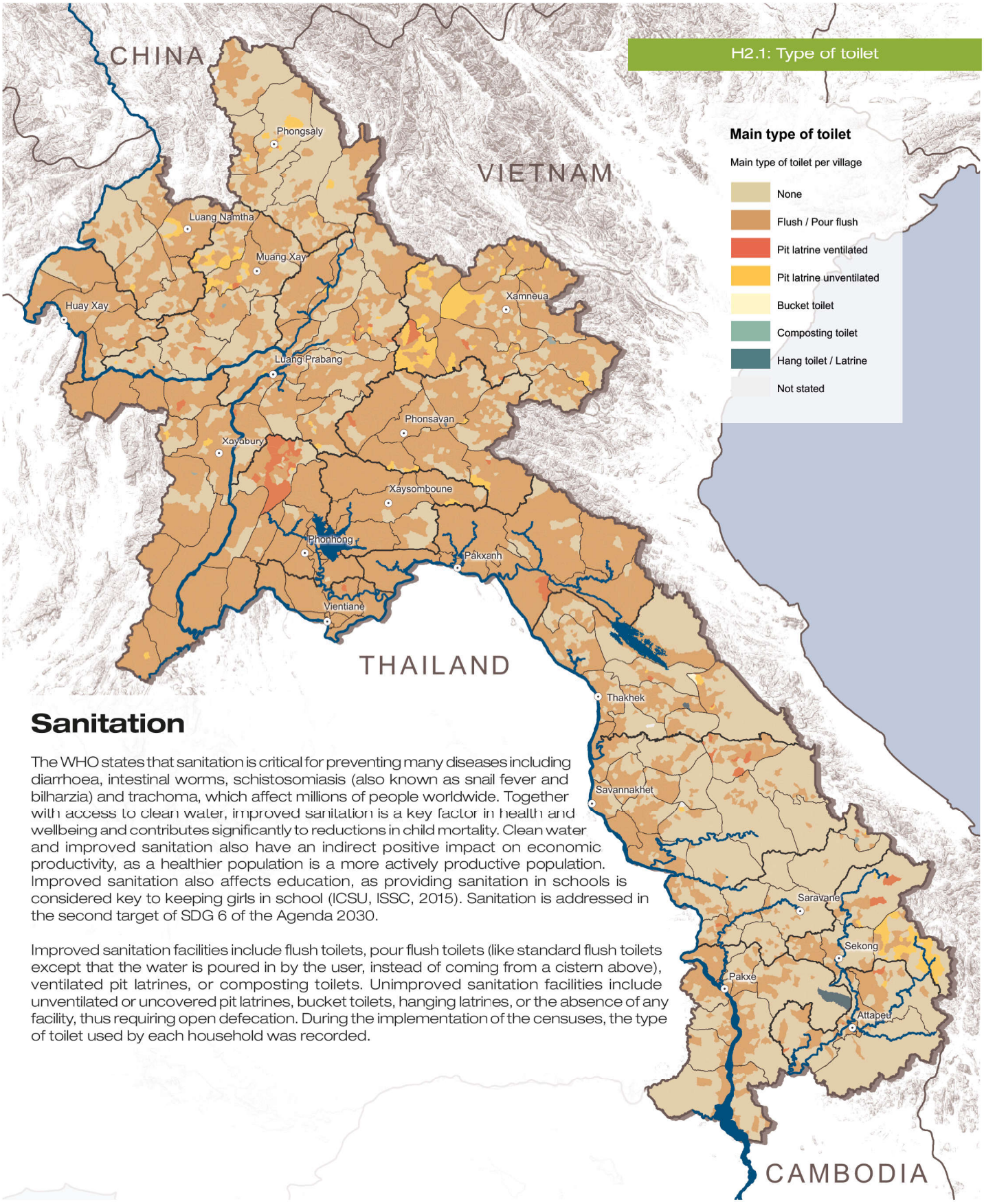
where three quarters of households use wood to build the walls of their houses. Champasak and Huaphanh follow with slightly over two thirds of houses built with wood walls. Bamboo is also still popular, especially in mountainous areas, for example in Luang Prabang, Phongsaly, Bokeo, Luang Namtha, and Oudomxai Provinces (which all range between 20% and 30%), as well as in the southeast in Savannakhet, Saravane, Sekong and Attapeu Provinces.

Floors (Map H1.5): Wood remains the preferred material for floors (40% of all households), especially in the south (for example, close to three quarters of households in Sekong and Saravane Provinces). The use of bamboo is restricted to smaller, mainly mountainous areas around Luang Prabang, Bokeo, northern Xayabury and western Luang Namtha, and in the southeast. In Vientiane, Xayabury, and Luang Prabang, especially along major roads and in more urbanized areas, concrete and ceramic floors are widespread, showing a trend towards the use of more sturdy building materials.

Even though it seems that Lao people are attached to the use of wood for the construction of walls and floors, there is a clear trend towards the use of more modern, sturdier materials for house construction. The replacement of traditional roofing materials such as bamboo and grass with corrugated iron sheets and tiles is an almost countrywide phenomenon that seems to herald the disappearance of traditional thatched roofs and their respective building skills. Similarly, tiles or cement floors are replacing wood and bamboo flooring which are less and less common, especially in urban areas and nearby. These changes, which are particularly fast in urban and other highly accessible areas, are a reflection of increased purchasing power of residents in these areas, but also a result of changed habits and standards in the population at large.

H1.5: Floor types





Sanitation

The WHO states that sanitation is critical for preventing many diseases including diarrhoea, intestinal worms, schistosomiasis (also known as snail fever and bilharzia) and trachoma, which affect millions of people worldwide. Together with access to clean water, improved sanitation is a key factor in health and wellbeing and contributes significantly to reductions in child mortality. Clean water and improved sanitation also have an indirect positive impact on economic productivity, as a healthier population is a more actively productive population. Improved sanitation also affects education, as providing sanitation in schools is considered key to keeping girls in school (ICSU, ISSC, 2015). Sanitation is addressed in the second target of SDG 6 of the Agenda 2030.

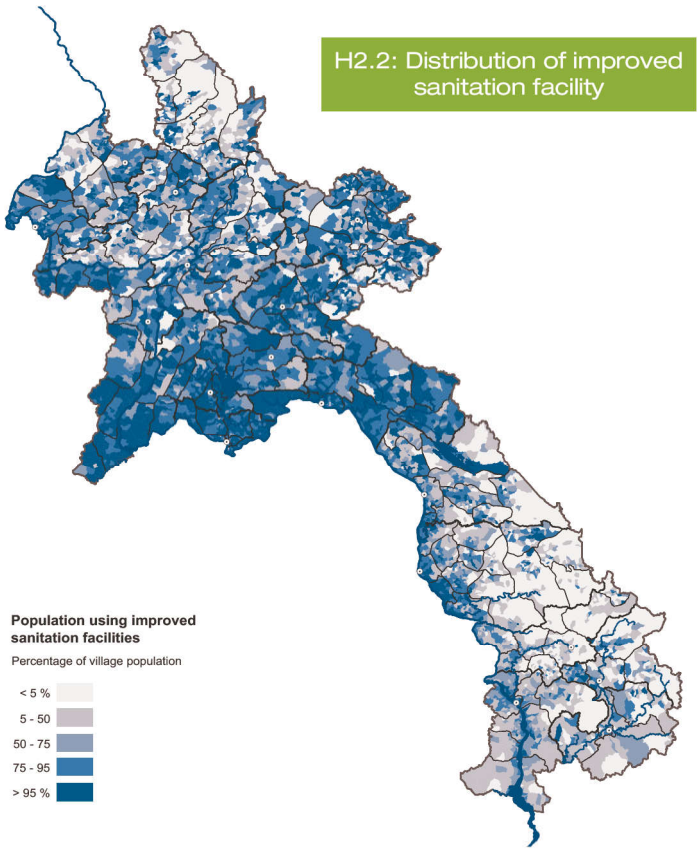
Improved sanitation facilities include flush toilets, pour flush toilets (like standard flush toilets except that the water is poured in by the user, instead of coming from a cistern above), ventilated pit latrines, or composting toilets. Unimproved sanitation facilities include unventilated or uncovered pit latrines, bucket toilets, hanging latrines, or the absence of any facility, thus requiring open defecation. During the implementation of the censuses, the type of toilet used by each household was recorded.

Spatial patterns in 2015

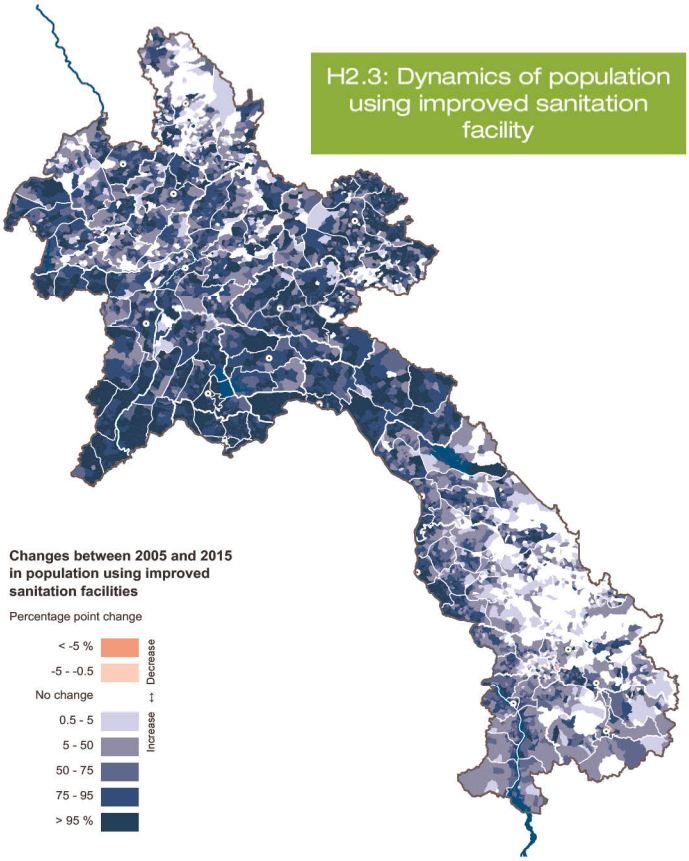
In the Lao PDR, close to three quarters (73.2%) of the population used improved sanitation facilities in 2015. According to the WHO and UNICEF, of the remaining 26.8% that are using unimproved facilities, 22.1% engage in open defecation. The share of people using improved sanitation facilities is above 90% in Vientiane Capital City and Vientiane, Xayabury, and Borikhamxay Provinces. It is particularly low in Saravane (36.8%) and Phongsaly (43.9%).

Map H2.1 shows that flush and pour flush toilets are widespread in the central part of the country in Xayabury, Vientiane, Xiengkhuang, and Borikhamxay Provinces. In large parts of the south, as well as in the far north, most households have no toilet at all.

H2.2: Distribution of improved sanitation facility



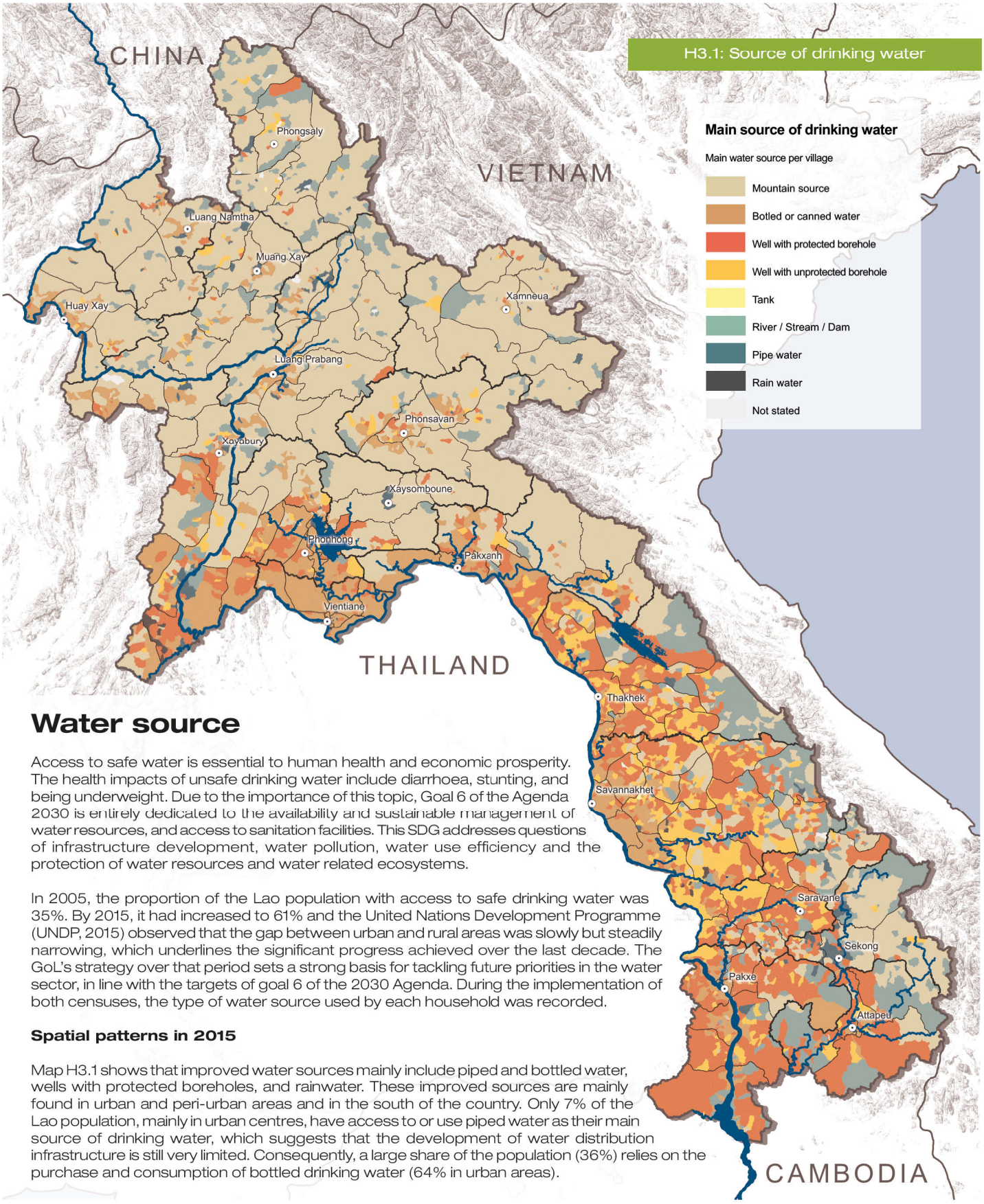
H2.3: Dynamics of population using improved sanitation facility



Dynamics between 2005 and 2015

Map H2.3 shows that between 2005 and 2015, access to improved sanitation facilities has increased in large parts across the country and no areas have experienced a decrease in sanitation facility quality. The progress is most significant in central and much of northern Lao PDR (including in Vientiane Capital City and Vientiane, Xayabury and Borikhamxay Provinces) where access for most places increased by more than 75%. In the southeast (Savannakhet, Saravane, and Sekong), as well as in Phongsaly, access to improved sanitation facilities has remained more or less stagnant and at a very low level (compare Map H2.2), with slight improvements in a limited number of villages only.

The World Bank attributes the Lao PDR's rapid progress in access to improved sanitation facilities to the GoL's adoption of the Community-Led Total Sanitation (CLTS) approach. This approach was integrated into teaching curriculums and 469 provincial and district level Government staff were trained on sanitation topics (World Bank, 2016). Despite these substantial efforts, the Lao PDR still has the second-highest level of open defecation in the region, after Cambodia.



Water source

Access to safe water is essential to human health and economic prosperity. The health impacts of unsafe drinking water include diarrhoea, stunting, and being underweight. Due to the importance of this topic, Goal 6 of the Agenda 2030 is entirely dedicated to the availability and sustainable management of water resources, and access to sanitation facilities. This SDG addresses questions of infrastructure development, water pollution, water use efficiency and the protection of water resources and water related ecosystems.

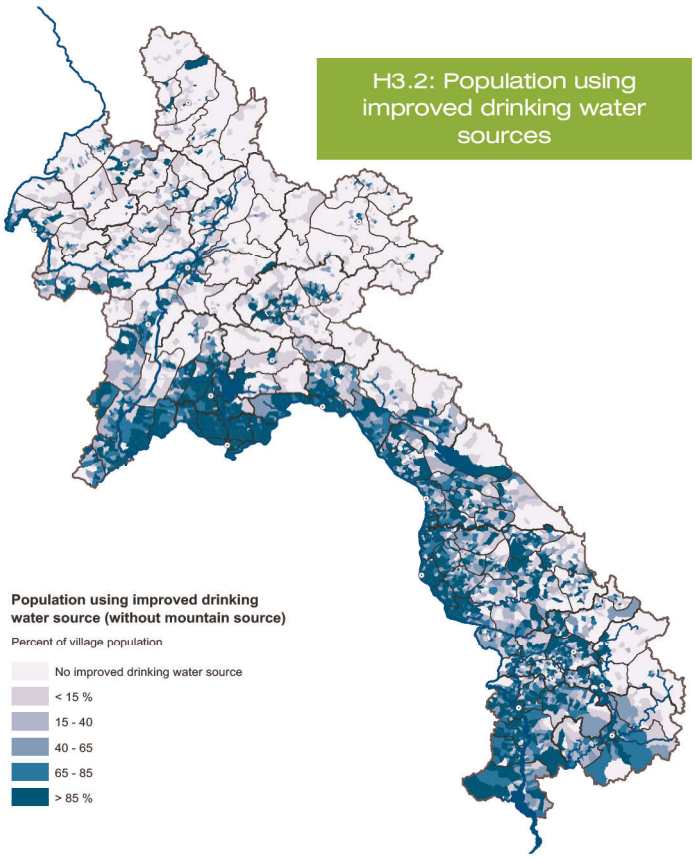
In 2005, the proportion of the Lao population with access to safe drinking water was 35%. By 2015, it had increased to 61% and the United Nations Development Programme (UNDP, 2015) observed that the gap between urban and rural areas was slowly but steadily narrowing, which underlines the significant progress achieved over the last decade. The GoL's strategy over that period sets a strong basis for tackling future priorities in the water sector, in line with the targets of goal 6 of the 2030 Agenda. During the implementation of both censuses, the type of water source used by each household was recorded.

Spatial patterns in 2015

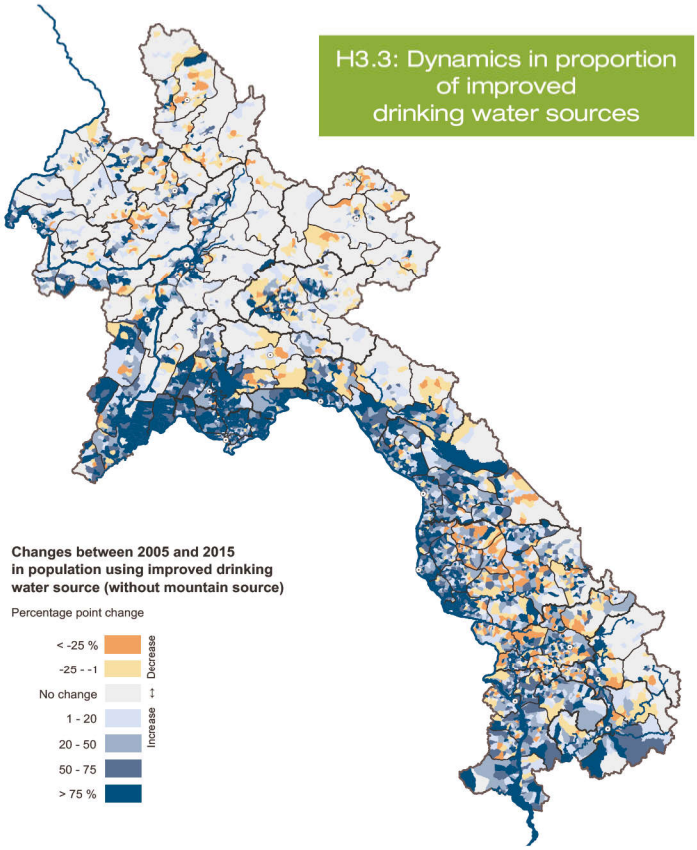
Map H3.1 shows that improved water sources mainly include piped and bottled water, wells with protected boreholes, and rainwater. These improved sources are mainly found in urban and peri-urban areas and in the south of the country. Only 7% of the Lao population, mainly in urban centres, have access to or use piped water as their main source of drinking water, which suggests that the development of water distribution infrastructure is still very limited. Consequently, a large share of the population (36%) relies on the purchase and consumption of bottled drinking water (64% in urban areas).

Unimproved water sources include mountain sources, wells with unprotected boreholes, and rivers or streams. Mountain sources are, by far, the most widespread source of water in the north of the country. One quarter of the overall population of the Lao PDR get their drinking water from mountain sources. Despite being categorized as unimproved, the quality of water from mountain sources is often good and its consumption is not a major public health concern. Waterborne diseases are more frequently contracted from unprotected wells, which are used by around 8% of the country's population. In the southeast, people often use water from rivers and streams. Overall, 6% of the population uses surface water bodies (rivers, streams and reservoirs) as a source for drinking water.

Around two thirds of the population of the Lao PDR use improved water sources. In urban areas, the share is as high as 90%, whereas in rural and remote areas it drops to 13%, mainly due to the very widespread use of mountain sources (Map H3.2). Thus, disparities in access to improved water sources are still quite significant. Apart from the various types of water sources, the distances between these sources and the households that depend on them are also a critical aspect in the assessment of access to water. For example, 94% of the households relying on piped water have water piped to their place of residence, but 2% of households have to travel more than 1 km to access it. In the case of rivers, streams, and bottled water, 5% of households have to travel more than 1 km to access these sources, and in the case of unprotected wells and boreholes, 7.5% have to travel this distance for water.



H3.2: Population using improved drinking water sources

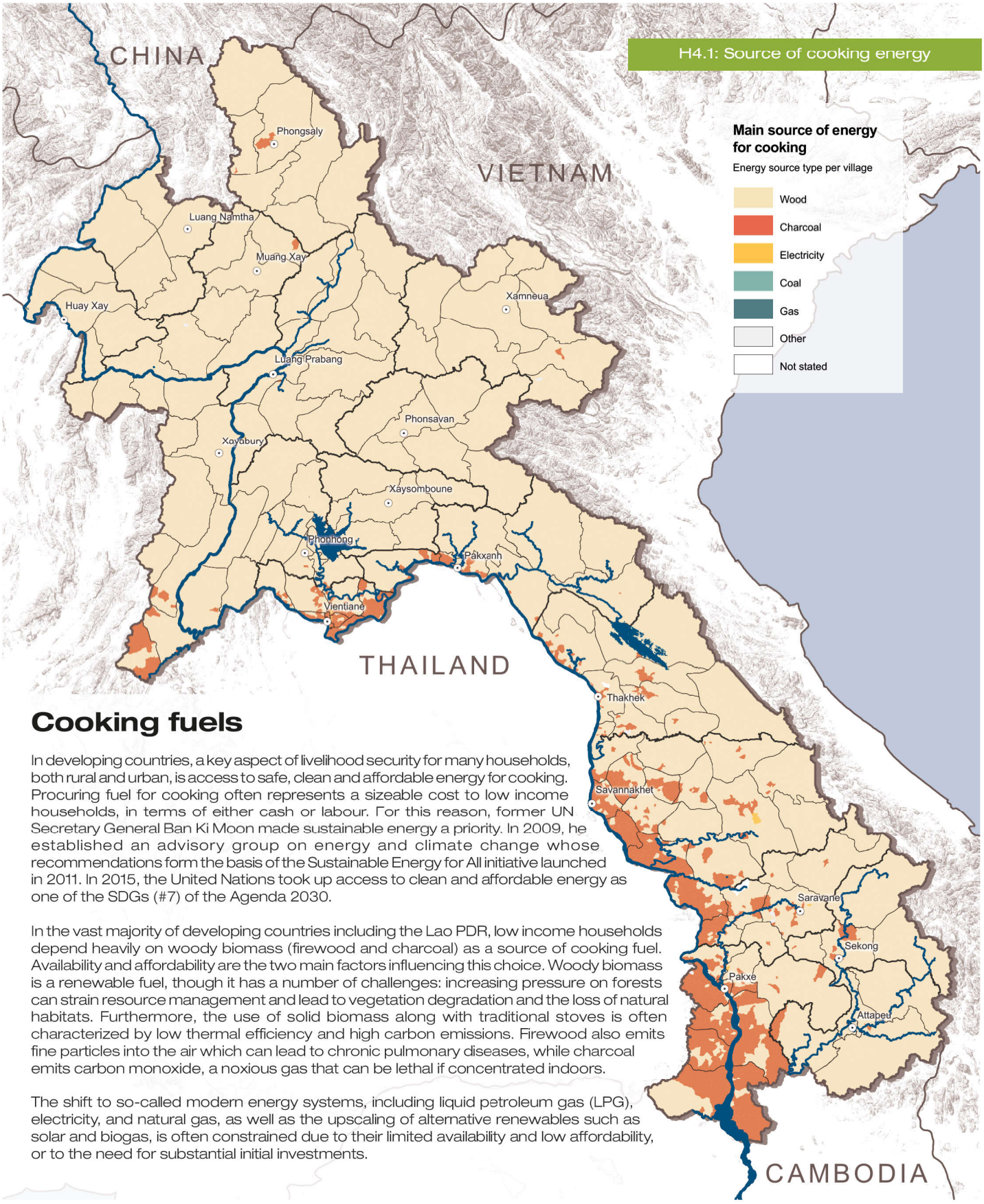


H3.3: Dynamics in proportion of improved drinking water sources

Dynamics between 2005 and 2015

Map H3.3 shows that between 2005 and 2015, the use of improved water sources increased significantly in Vientiane Capital City, in the south and west of Vientiane Province, in southern Xayabury Province, and in the Mekong River valley of central Lao PDR and Savannakhet. In remote and mountainous areas, the proportion of the population using improved water sources did not change much, especially in the north, where mountain sources still play a very dominant role in terms of water supply, and will probably continue to do so in the future. Thus, the future improvement of drinking water safety in these areas will mainly consist of protecting mountain springs and installing distribution systems from the springs to villages that prevent any contamination along the way. Map H3.3 also shows that there has been been degradation of the access to improved water sources in a number of villages scattered across the northern uplands and also in many parts of the south.

The observed improved situation in access to safe water is associated with relevant reductions in the time required to meet basic water needs. These benefits have subsequently led to an increase in the labour supply and therefore the productive potential of the economy (Boualapha and Philavong, 2011).



Cooking fuels

In developing countries, a key aspect of livelihood security for many households, both rural and urban, is access to safe, clean and affordable energy for cooking. Procuring fuel for cooking often represents a sizeable cost to low income households, in terms of either cash or labour. For this reason, former UN Secretary General Ban Ki Moon made sustainable energy a priority. In 2009, he established an advisory group on energy and climate change whose recommendations form the basis of the Sustainable Energy for All initiative launched in 2011. In 2015, the United Nations took up access to clean and affordable energy as one of the SDGs (#7) of the Agenda 2030.

In the vast majority of developing countries including the Lao PDR, low income households depend heavily on woody biomass (firewood and charcoal) as a source of cooking fuel. Availability and affordability are the two main factors influencing this choice. Woody biomass is a renewable fuel, though it has a number of challenges: increasing pressure on forests can strain resource management and lead to vegetation degradation and the loss of natural habitats. Furthermore, the use of solid biomass along with traditional stoves is often characterized by low thermal efficiency and high carbon emissions. Firewood also emits fine particles into the air which can lead to chronic pulmonary diseases, while charcoal emits carbon monoxide, a noxious gas that can be lethal if concentrated indoors.

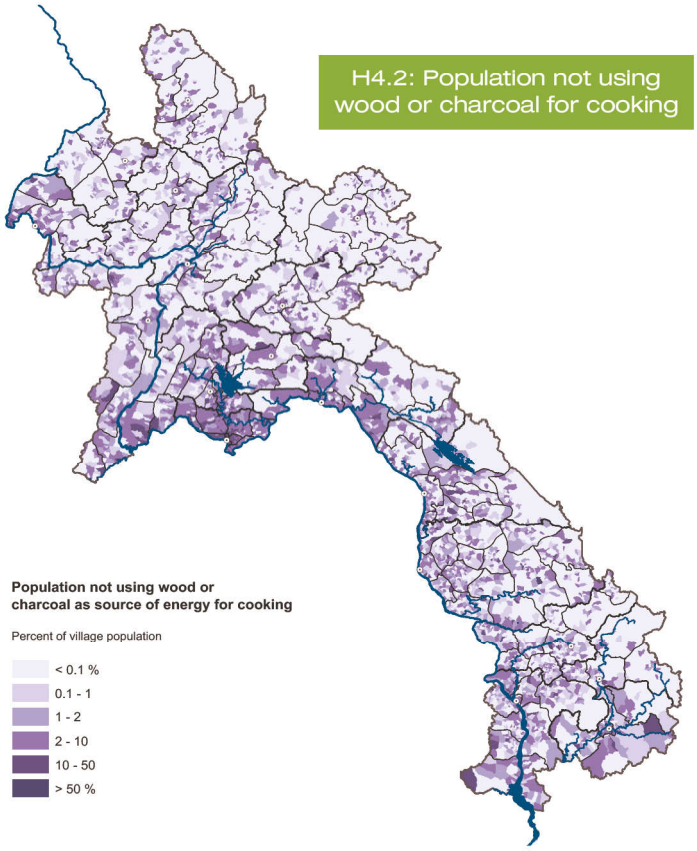
The shift to so-called modern energy systems, including liquid petroleum gas (LPG), electricity, and natural gas, as well as the upscaling of alternative renewables such as solar and biogas, is often constrained due to their limited availability and low affordability, or to the need for substantial initial investments.

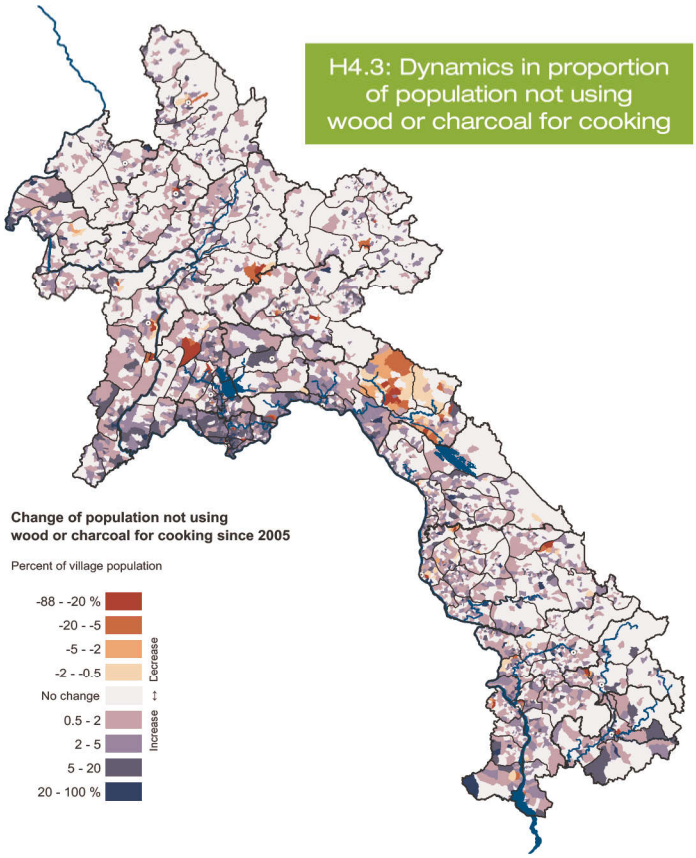
During the implementation of the censuses, the main type of energy source used for cooking in each household was recorded using the following categories: electricity, paraffin, wood, coal, charcoal, sawdust, gas, or other.

Spatial patterns in 2015

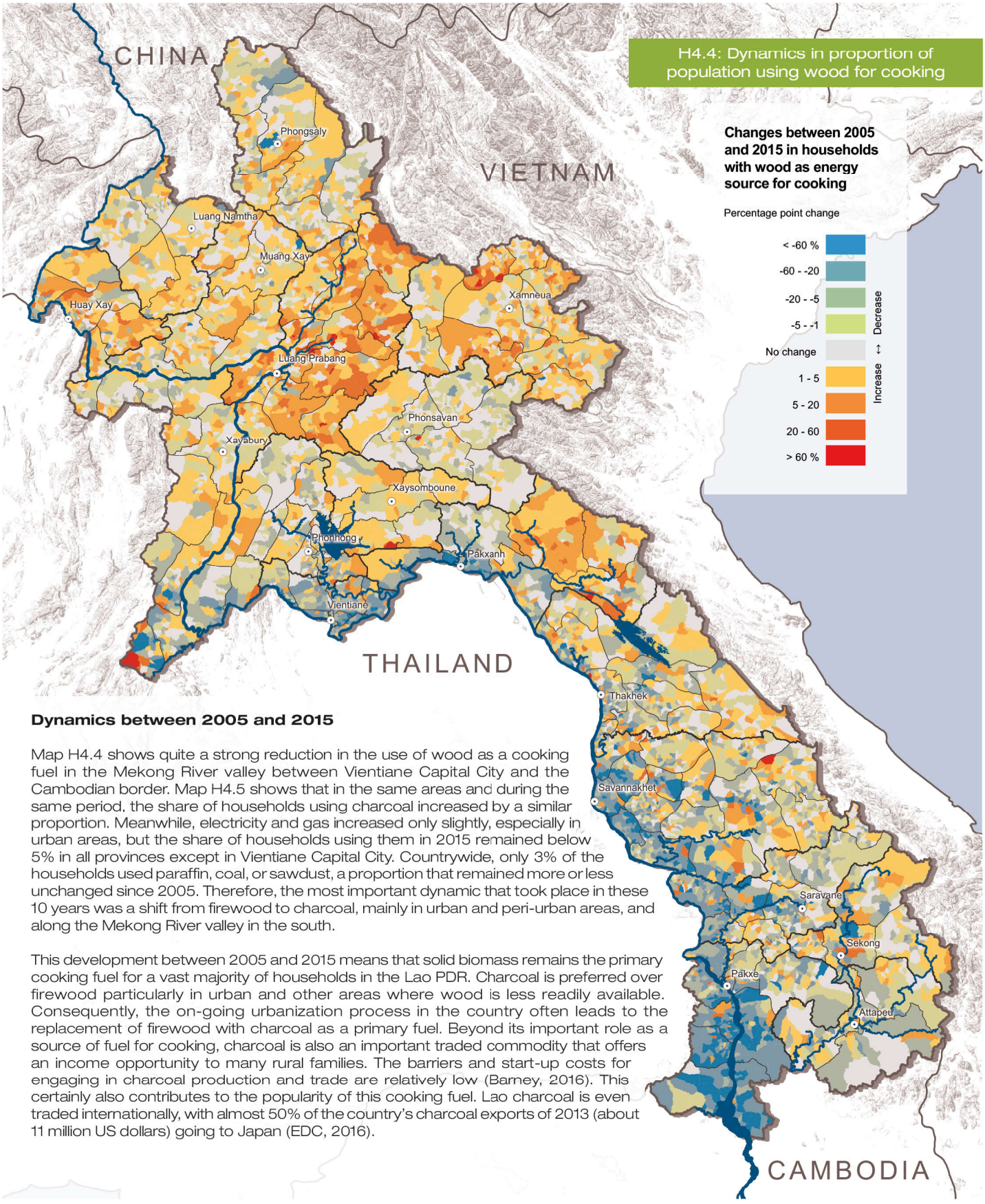
Woody biomass, typically in the form of firewood and charcoal, is by far the most dominant source of cooking fuel in the Lao PDR, as illustrated in Map H4.1. In total, 67% of all households use firewood for cooking and around one quarter use charcoal. Firewood is the primary source of energy, especially in rural areas where 88% of households use it. In provinces dominated by forested mountain areas, such as Phongsaly, Xaysomboune, and Oudomxai, more than 90% of households use firewood as their primary source of energy. Firewood is a very popular fuel source in these areas because it is readily available at low or no cost.

Charcoal is preferred in more densely populated places, in and around urban centres, for example in Vientiane Capital City and along the Mekong River in the south. In urban areas, 36% of the households use charcoal as their primary fuel for cooking. There are two main reasons for the dominance of charcoal in urban areas. First, it is lighter and easier to transport and its energy content per weight is thus higher than firewood. Second, the combustion of charcoal produces less smoke than wood, making it more convenient for use in towns. Only a small minority of the households in the Lao PDR mainly use gas or electricity to cook, which is more frequently used only in urban areas (for example, 8 and 17% of the households in Vientiane Capital City use gas and electricity respectively). In some places, households often use electricity, coal, gas and other fuels as secondary sources of energy to supplement wood and charcoal.





The current dependence of households in the Lao PDR on firewood and charcoal is mainly due to the availability and affordability of these two sources, which make them more attractive than so-called modern energy systems, especially for low-income households. Traditions and habits also partially explain the dominance of these two fuels. The popularity particularly of wood, but also charcoal, can be seen by the trends presented on Map H4.2, which shows that, especially in rural areas, the share of households not using wood or charcoal is extremely low (below 1% in most areas), and that even in more urbanized areas, it rarely exceeds 50%.

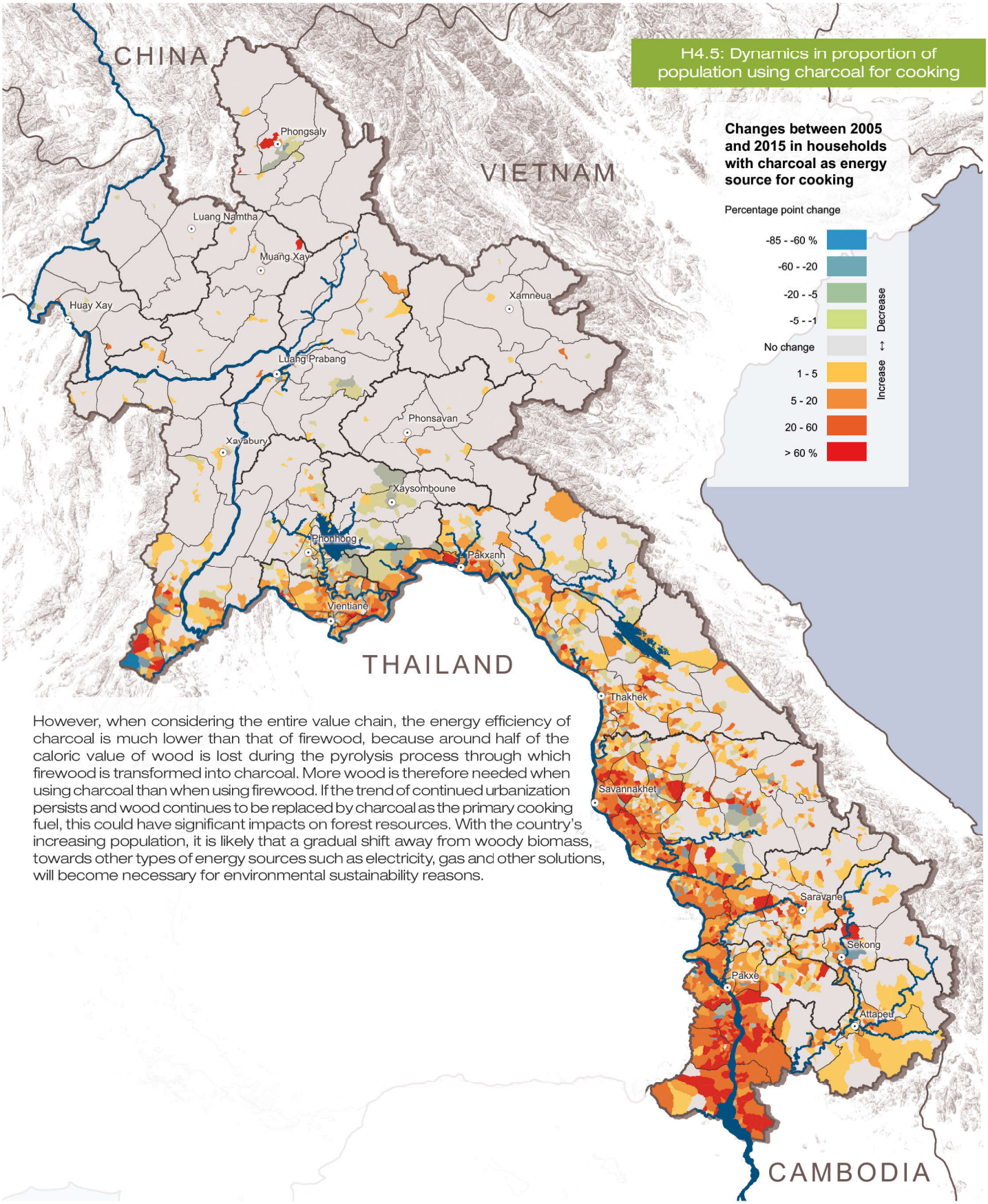


H4.4: Dynamics in proportion of population using wood for cooking

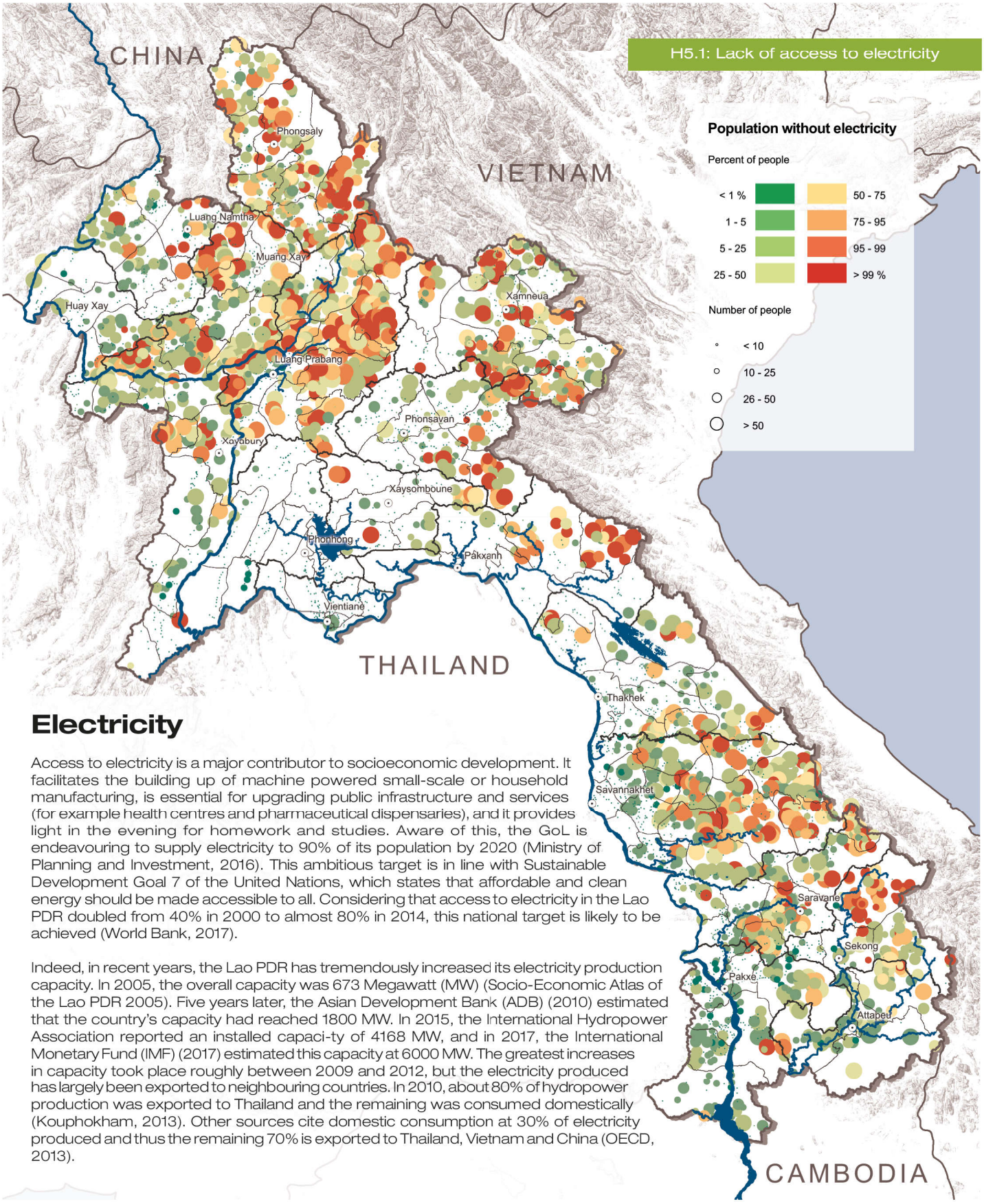
Dynamics between 2005 and 2015

Map H4.4 shows quite a strong reduction in the use of wood as a cooking fuel in the Mekong River valley between Vientiane Capital City and the Cambodian border. Map H4.5 shows that in the same areas and during the same period, the share of households using charcoal increased by a similar proportion. Meanwhile, electricity and gas increased only slightly, especially in urban areas, but the share of households using them in 2015 remained below 5% in all provinces except in Vientiane Capital City. Countrywide, only 3% of the households used paraffin, coal, or sawdust, a proportion that remained more or less unchanged since 2005. Therefore, the most important dynamic that took place in these 10 years was a shift from firewood to charcoal, mainly in urban and peri-urban areas, and along the Mekong River valley in the south.

This development between 2005 and 2015 means that solid biomass remains the primary cooking fuel for a vast majority of households in the Lao PDR. Charcoal is preferred over firewood particularly in urban and other areas where wood is less readily available. Consequently, the on-going urbanization process in the country often leads to the replacement of firewood with charcoal as a primary fuel. Beyond its important role as a source of fuel for cooking, charcoal is also an important traded commodity that offers an income opportunity to many rural families. The barriers and start-up costs for engaging in charcoal production and trade are relatively low (Barney, 2016). This certainly also contributes to the popularity of this cooking fuel. Lao charcoal is even traded internationally, with almost 50% of the country's charcoal exports of 2013 (about 11 million US dollars) going to Japan (EDC, 2016).



However, when considering the entire value chain, the energy efficiency of charcoal is much lower than that of firewood, because around half of the caloric value of wood is lost during the pyrolysis process through which firewood is transformed into charcoal. More wood is therefore needed when using charcoal than when using firewood. If the trend of continued urbanization persists and wood continues to be replaced by charcoal as the primary cooking fuel, this could have significant impacts on forest resources. With the country's increasing population, it is likely that a gradual shift away from woody biomass, towards other types of energy sources such as electricity, gas and other solutions, will become necessary for environmental sustainability reasons.



Electricity

Access to electricity is a major contributor to socioeconomic development. It facilitates the building up of machine powered small-scale or household manufacturing, is essential for upgrading public infrastructure and services (for example health centres and pharmaceutical dispensaries), and it provides light in the evening for homework and studies. Aware of this, the GoL is endeavouring to supply electricity to 90% of its population by 2020 (Ministry of Planning and Investment, 2016). This ambitious target is in line with Sustainable Development Goal 7 of the United Nations, which states that affordable and clean energy should be made accessible to all. Considering that access to electricity in the Lao PDR doubled from 40% in 2000 to almost 80% in 2014, this national target is likely to be achieved (World Bank, 2017).

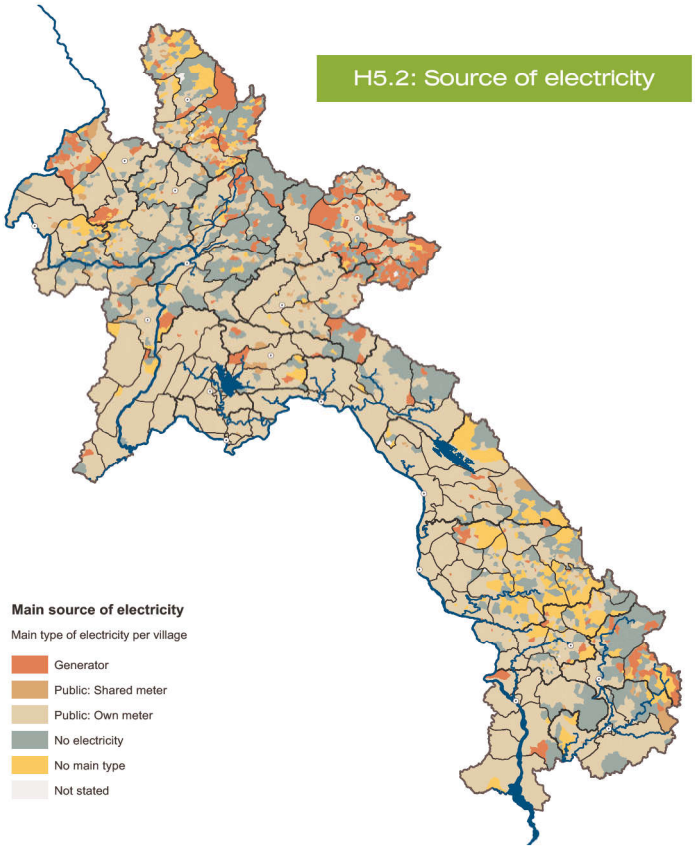
Indeed, in recent years, the Lao PDR has tremendously increased its electricity production capacity. In 2005, the overall capacity was 673 Megawatt (MW) (Socio-Economic Atlas of the Lao PDR 2005). Five years later, the Asian Development Bank (ADB) (2010) estimated that the country's capacity had reached 1800 MW. In 2015, the International Hydropower Association reported an installed capaci-ty of 4168 MW, and in 2017, the International Monetary Fund (IMF) (2017) estimated this capacity at 6000 MW. The greatest increases in capacity took place roughly between 2009 and 2012, but the electricity produced has largely been exported to neighbouring countries. In 2010, about 80% of hydropower production was exported to Thailand and the remaining was consumed domestically (Kouphokham, 2013). Other sources cite domestic consumption at 30% of electricity produced and thus the remaining 70% is exported to Thailand, Vietnam and China (OECD, 2013).

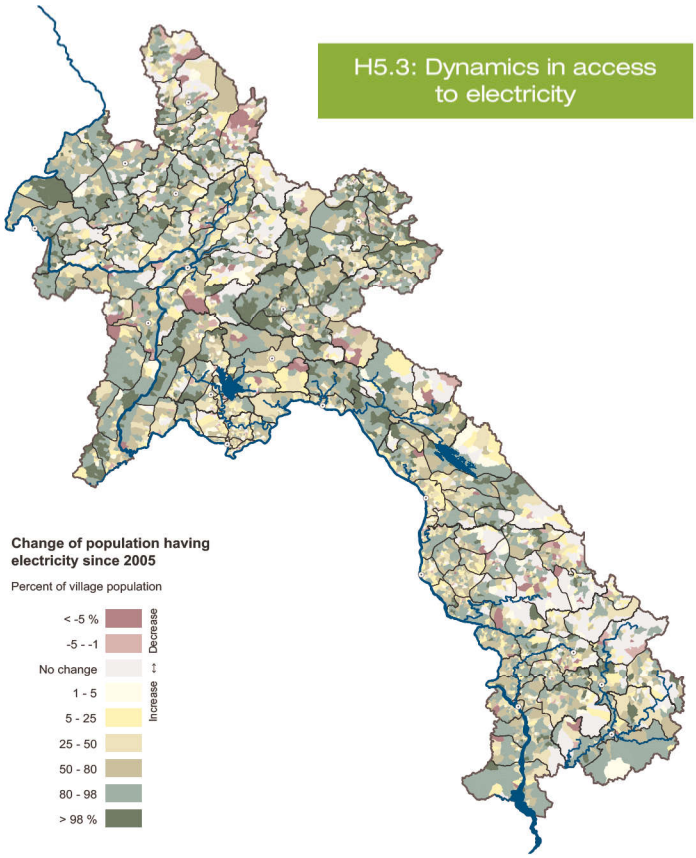
During the implementation of both censuses, each household was asked whether they have access to electricity, and whether it was from a public grid or a private generator or battery.

Spatial patterns in 2015

Almost all inhabitants of Vientiane Capital City and the country's provincial capitals throughout the country had access to electricity. However, access to electricity is far lower in rural areas, both in the north and south of the country, whereas access in urban areas is comparatively high (97%). Around 84% of the population in the Lao PDR has access to electricity through a public grid system. Map H5.1 presents the absolute number of people without access to electricity using circles of different sizes, and the share of the village population with access to electricity in green and red shades. Access is better near roads (82%) and drops sharply in remote areas without road access (37%) (see Maps H5.1 and A2.1). Map H5.1 reveals that many of these areas are not densely populated, and yet large numbers of rural people are still without access to electricity. This illustrates a sharp divide in terms of public infrastructure between more accessible and remote rural areas in the country. It also highlights the difficulty of connecting areas for which network expansion is costly – for example, due to the rugged terrain of such areas (see Map A1.2) – yet the number of potential subscribers (refer to Map B1.1) and therefore the return on investment are low.

In such areas, other sources of electricity could play an important role by substituting the national grid. Map H5.2 shows that the use of generators seems to be the only realistic alternative to electricity supplied by the public grid in use. Generators are used especially in peripheral regions in the north and south of the country which are not easily accessible and that are not connected to the national grid. It is important to note that Map H5.2 only shows the main source of electricity used in each village. Thus, it is possible that secondary





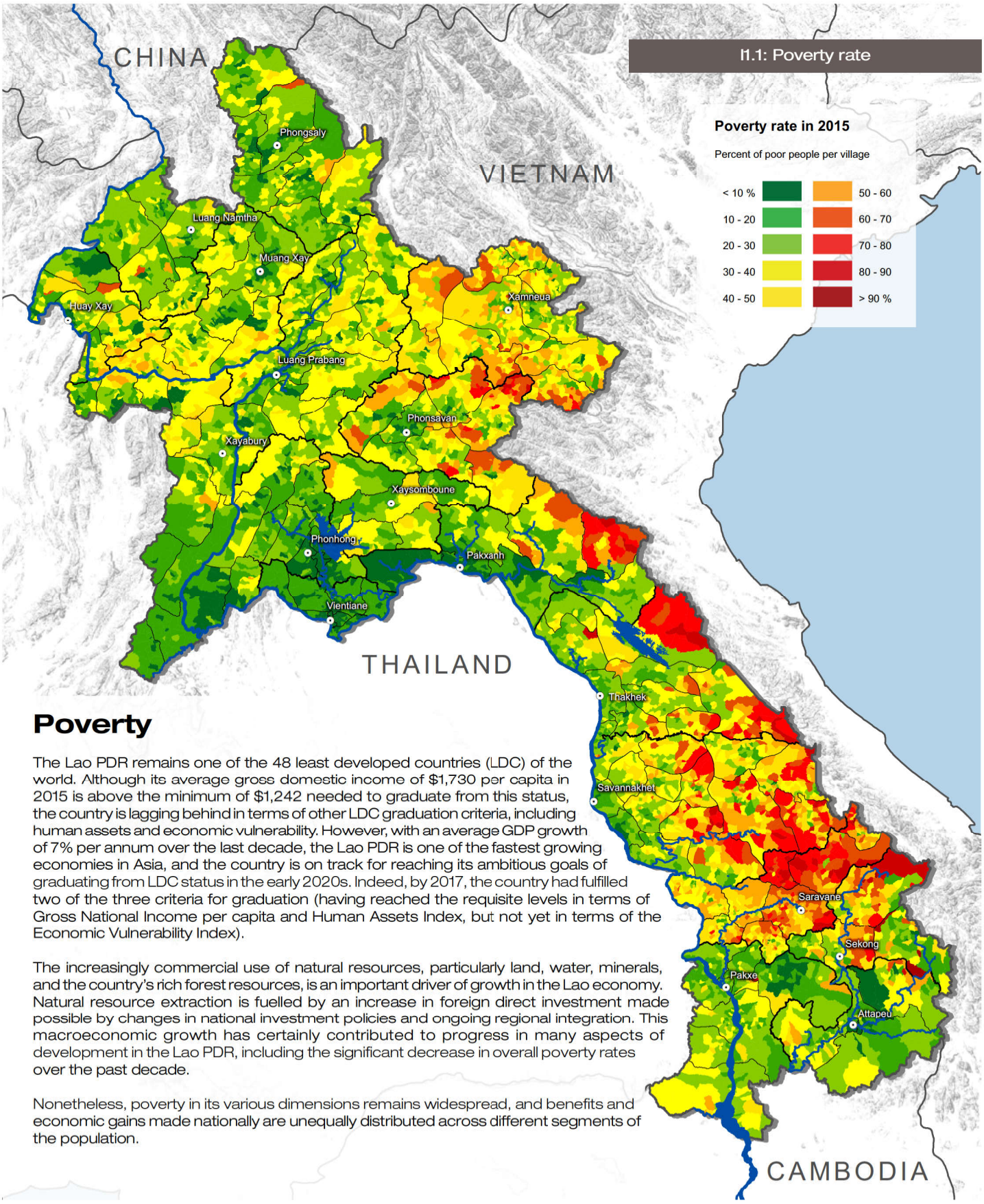
sources of electricity, such as solar power, are present in many parts of the country but not reflected in the map. Countrywide, around 9% of households use "other" sources of electricity, among which solar power is likely to be the most widely represented. Indeed, in 2013, the GoL issued the "Draft Decree on Solar Energy Development" and supplied home solar systems to around 13,000 households, mostly in remote areas.

Dynamics between 2005 and 2015

Between 2005 and 2015, access to electricity improved almost everywhere in the country, except in some areas where not much change was recorded (Map H5.3). The areas that have remained more or less stable in terms of electricity access include parts of Luang Prabang, Phongsaly, Oudomxay, and Luang Namtha in the north, as well as major portions of Savannakhet, Saravane and Sekong in the south. There are isolated cases in which the share of the population with access to electricity decreased. It is likely, that this decrease is only a reflection of population increase coupled with slow or no infrastructure development.

One can also note that the increase in access to electricity during this time period was greater in rural and remote areas, for example in Huaphanh and Xiengkhuang Provinces, than in urban centres where most people already had access to electricity back in 2005.

POVERTY & INEQUALITY

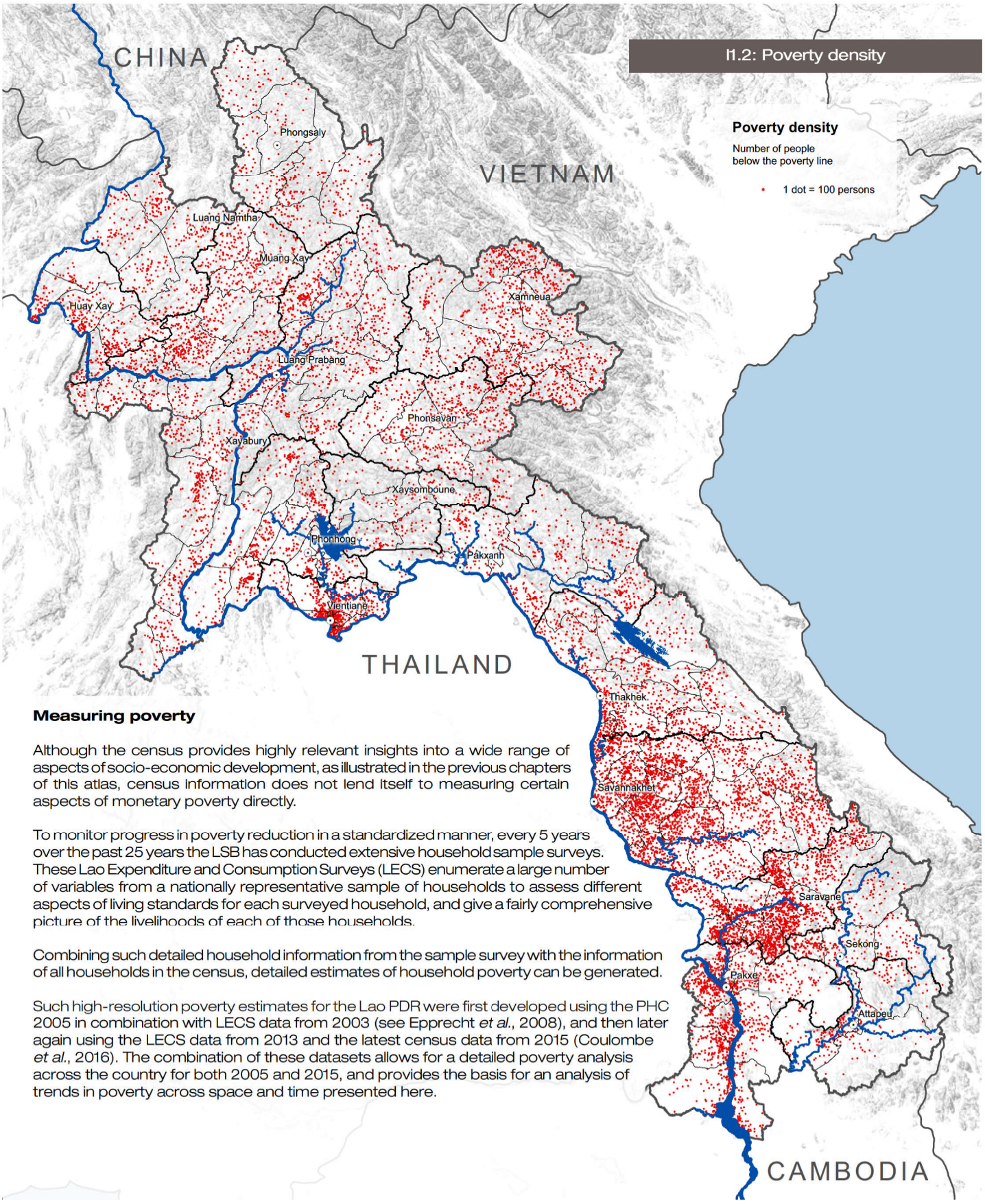


Poverty

The Lao PDR remains one of the 48 least developed countries (LDC) of the world. Although its average gross domestic income of $1,730 per capita in 2015 is above the minimum of $1,242 needed to graduate from this status, the country is lagging behind in terms of other LDC graduation criteria, including human assets and economic vulnerability. However, with an average GDP growth of 7% per annum over the last decade, the Lao PDR is one of the fastest growing economies in Asia, and the country is on track for reaching its ambitious goals of graduating from LDC status in the early 2020s. Indeed, by 2017, the country had fulfilled two of the three criteria for graduation (having reached the requisite levels in terms of Gross National Income per capita and Human Assets Index, but not yet in terms of the Economic Vulnerability Index).

The increasingly commercial use of natural resources, particularly land, water, minerals, and the country's rich forest resources, is an important driver of growth in the Lao economy. Natural resource extraction is fuelled by an increase in foreign direct investment made possible by changes in national investment policies and ongoing regional integration. This macroeconomic growth has certainly contributed to progress in many aspects of development in the Lao PDR, including the significant decrease in overall poverty rates over the past decade.

Nonetheless, poverty in its various dimensions remains widespread, and benefits and economic gains made nationally are unequally distributed across different segments of the population.



I1.2: Poverty density

Poverty density

Number of people below the poverty line

1 dot = 100 persons

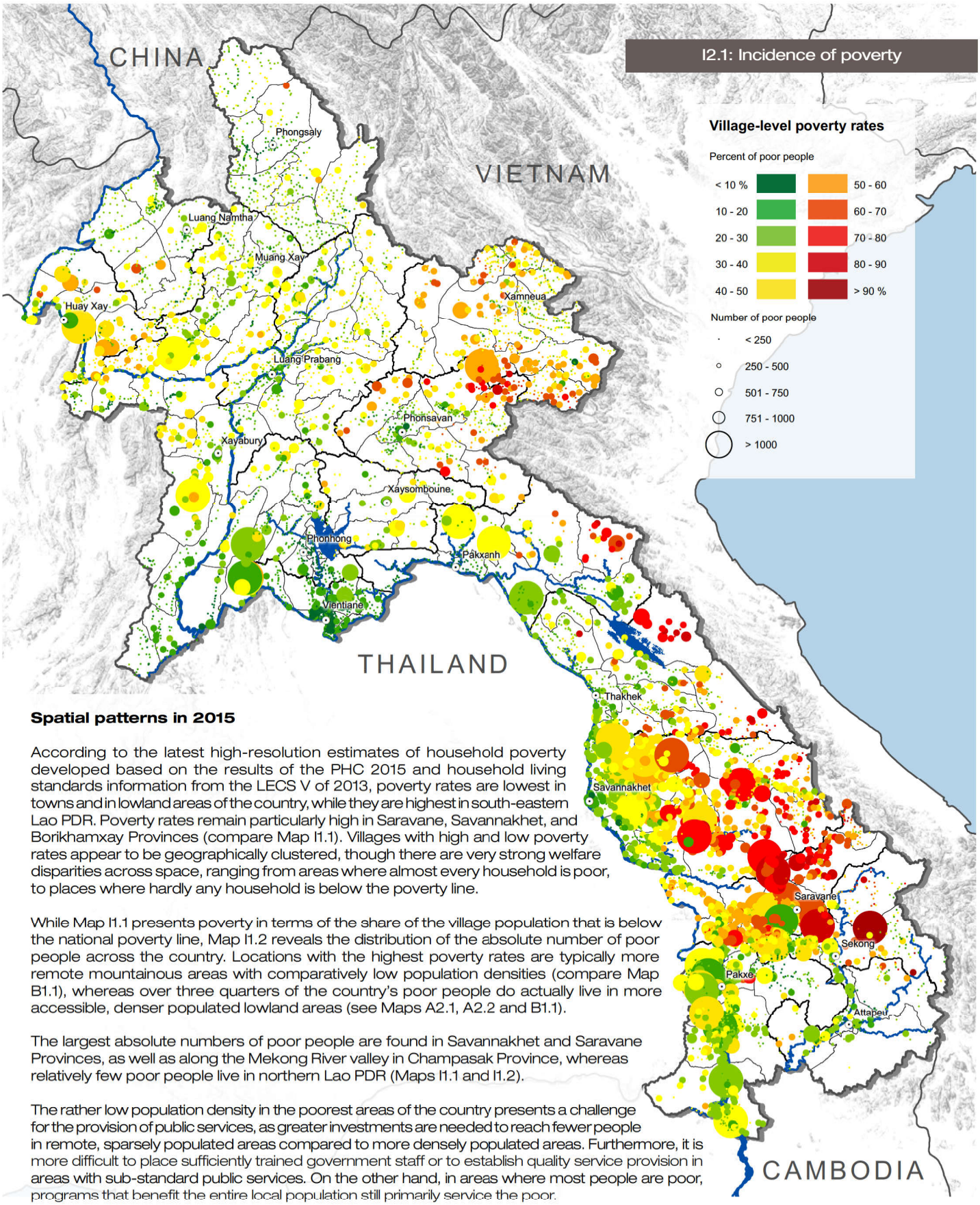
Measuring poverty

Although the census provides highly relevant insights into a wide range of aspects of socio-economic development, as illustrated in the previous chapters of this atlas, census information does not lend itself to measuring certain aspects of monetary poverty directly.

To monitor progress in poverty reduction in a standardized manner, every 5 years over the past 25 years the LSB has conducted extensive household sample surveys. These Lao Expenditure and Consumption Surveys (LECS) enumerate a large number of variables from a nationally representative sample of households to assess different aspects of living standards for each surveyed household, and give a fairly comprehensive picture of the livelihoods of each of those households.

Combining such detailed household information from the sample survey with the information of all households in the census, detailed estimates of household poverty can be generated.

Such high-resolution poverty estimates for the Lao PDR were first developed using the PHC 2005 in combination with LECS data from 2003 (see Epprecht *et al.*, 2008), and then later again using the LECS data from 2013 and the latest census data from 2015 (Coulombe *et al.*, 2016). The combination of these datasets allows for a detailed poverty analysis across the country for both 2005 and 2015, and provides the basis for an analysis of trends in poverty across space and time presented here.



Spatial patterns in 2015

According to the latest high-resolution estimates of household poverty developed based on the results of the PHC 2015 and household living standards information from the LECS V of 2013, poverty rates are lowest in towns and in lowland areas of the country, while they are highest in south-eastern Lao PDR. Poverty rates remain particularly high in Saravane, Savannakhet, and Borikhamxay Provinces (compare Map I1.1). Villages with high and low poverty rates appear to be geographically clustered, though there are very strong welfare disparities across space, ranging from areas where almost every household is poor, to places where hardly any household is below the poverty line.

While Map I1.1 presents poverty in terms of the share of the village population that is below the national poverty line, Map I1.2 reveals the distribution of the absolute number of poor people across the country. Locations with the highest poverty rates are typically more remote mountainous areas with comparatively low population densities (compare Map B1.1), whereas over three quarters of the country's poor people do actually live in more accessible, denser populated lowland areas (see Maps A2.1, A2.2 and B1.1).

The largest absolute numbers of poor people are found in Savannakhet and Saravane Provinces, as well as along the Mekong River valley in Champasak Province, whereas relatively few poor people live in northern Lao PDR (Maps I1.1 and I1.2).

The rather low population density in the poorest areas of the country presents a challenge for the provision of public services, as greater investments are needed to reach fewer people in remote, sparsely populated areas compared to more densely populated areas. Furthermore, it is more difficult to place sufficiently trained government staff or to establish quality service provision in areas with sub-standard public services. On the other hand, in areas where most people are poor, programs that benefit the entire local population still primarily service the poor.

In areas where only a small share of the population is poor, programs that benefit the entire population would primarily reach the non-poor. The lower cost of reaching more accessible areas (with low poverty rates but still high numbers of poor) can therefore be compared to the higher cost either of providing resources that go to mainly the non-poor, or of selectively identifying and targeting the poor only.

As such, poverty alleviation efforts require different targeting approaches in high density or high incidence areas.

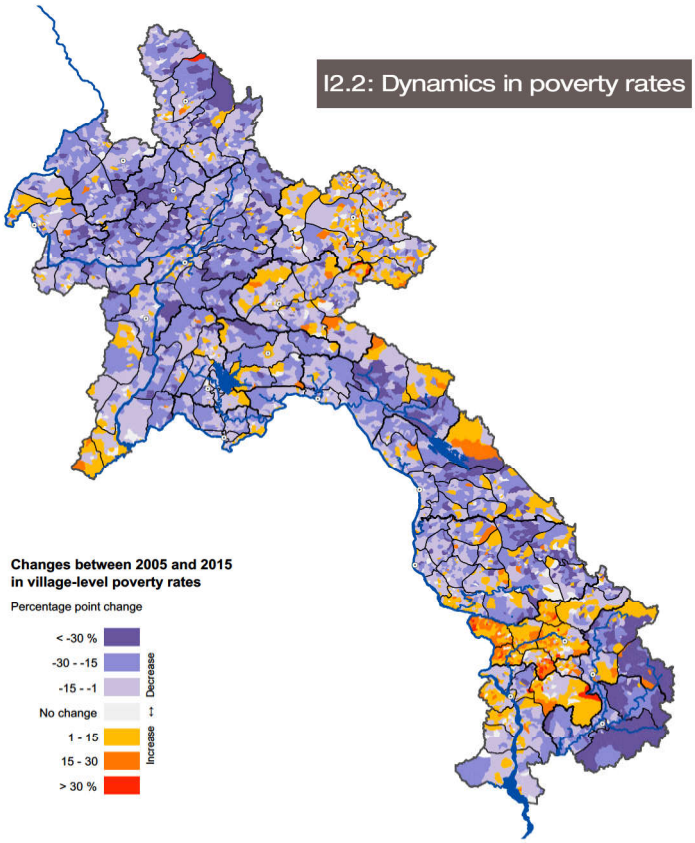
Dynamics between 2005 and 2015

The Lao PDR has achieved a significant reduction in poverty, decreasing the national poverty rate by about ten percentage points within one decade to roughly 25% in 2015. Within the same time, the total number of poor also decreased by 16%, despite an increase of the total population by 20%.

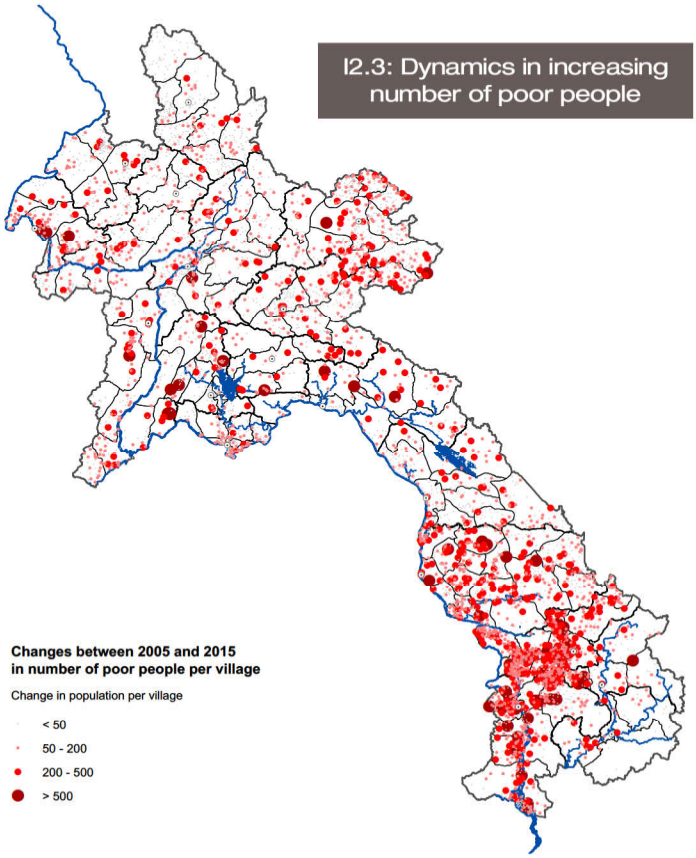
These achievements can be attributed in part to the GoL and development partners' efforts to reduce poverty in the poorest areas of the country, but also to the general macro-economic improvements, from which mostly people in the better off lowland areas were able to benefit.

Nonetheless, there are significant differences in how much poverty alleviation progress has been made across the country. In most parts of the Lao PDR, poverty rates indeed decreased significantly, with the highest rates of progress achieved in Attapeu and Sekong Provinces. Still, in several areas, poverty rates, as well as the number of poor, have actually increased. Meanwhile, Huaphanh Province appears to have made little progress in terms of lowering poverty rates, and Saravane Province has experienced a negative trend: in much of central and western Saravane, poverty rates and the absolute number of poor have increased significantly (Maps I2.2 and I2.3).

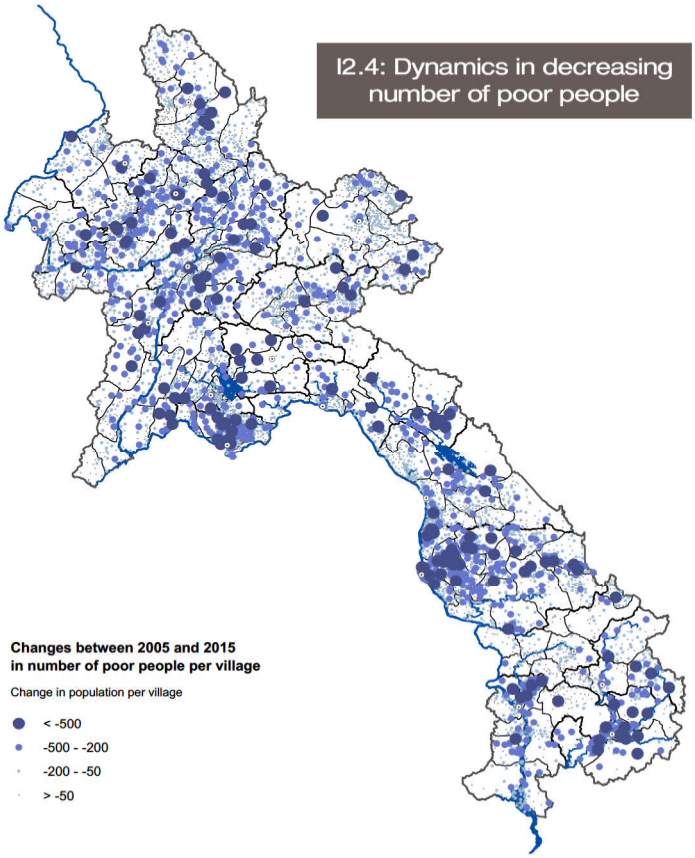
I2.2: Dynamics in poverty rates

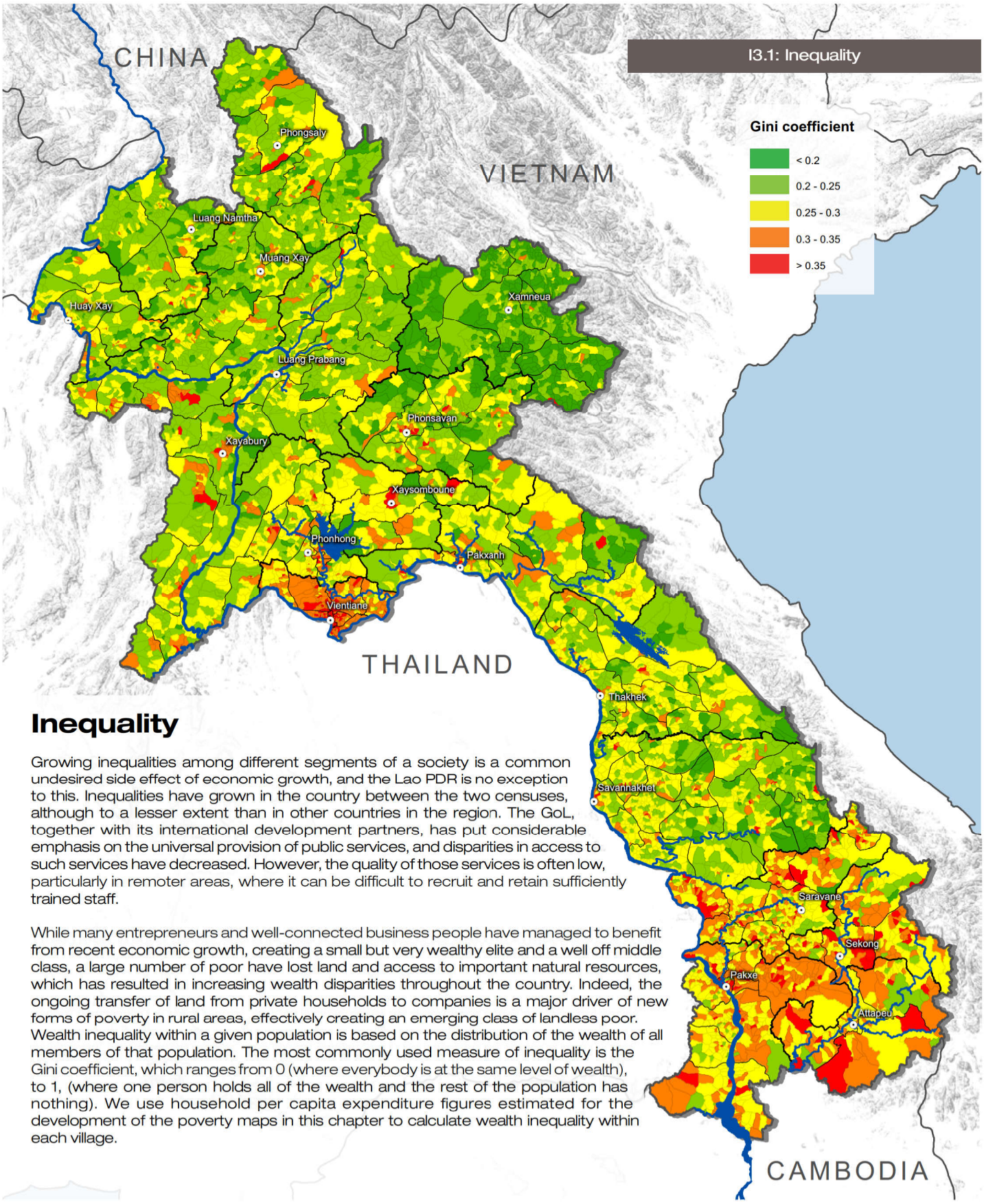


I2.3: Dynamics in increasing number of poor people



I2.4: Dynamics in decreasing number of poor people





Inequality

Growing inequalities among different segments of a society is a common undesired side effect of economic growth, and the Lao PDR is no exception to this. Inequalities have grown in the country between the two censuses, although to a lesser extent than in other countries in the region. The GoL, together with its international development partners, has put considerable emphasis on the universal provision of public services, and disparities in access to such services have decreased. However, the quality of those services is often low, particularly in remoter areas, where it can be difficult to recruit and retain sufficiently trained staff.

While many entrepreneurs and well-connected business people have managed to benefit from recent economic growth, creating a small but very wealthy elite and a well off middle class, a large number of poor have lost land and access to important natural resources, which has resulted in increasing wealth disparities throughout the country. Indeed, the ongoing transfer of land from private households to companies is a major driver of new forms of poverty in rural areas, effectively creating an emerging class of landless poor. Wealth inequality within a given population is based on the distribution of the wealth of all members of that population. The most commonly used measure of inequality is the Gini coefficient, which ranges from 0 (where everybody is at the same level of wealth), to 1, (where one person holds all of the wealth and the rest of the population has nothing). We use household per capita expenditure figures estimated for the development of the poverty maps in this chapter to calculate wealth inequality within each village.

Spatial patterns in 2015

Inequality in the Lao PDR is relatively low compared to other countries at similar stages of development. Map I3.1 presents the Gini coefficient for each village. Typically, inequality is greater in urban areas than in rural places. Vientiane Capital City, for instance, is shaded reddish-orange, implying a higher level of inequality there compared to most of the rural areas of northern and central Lao PDR. Inequality within villages appears particularly low in Huaphanh Province, whereas a comparatively high degree of inequality within villages – roughly equivalent to the levels observed in Vientiane Capital City – is evident throughout the four southernmost provinces of Champasak, Attapeu, Saravanh and Sekong. The stark contrast between village level inequality in those rural areas and rural villages in central and northern Lao PDR is striking, and does come out as quite a surprising pattern.

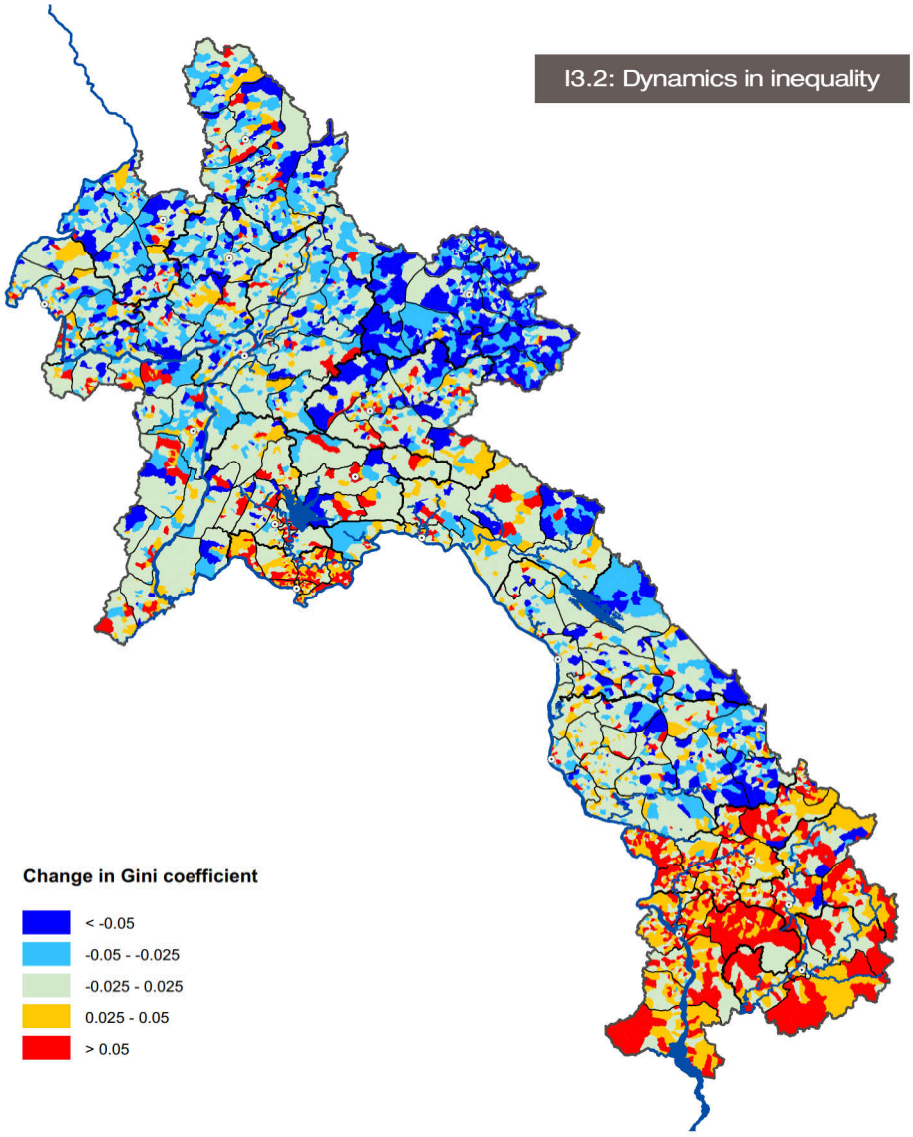
Dynamics between 2005 and 2015

Overall, inequality in the Lao PDR has increased only slightly over the past ten years, with a national Gini coefficient of 0.33 in 2005 and 0.35 in 2015. While the increase was rather small in rural areas overall, inequality increased substantially in urban areas between 2005 and 2015, from a Gini coefficient of 0.32 to 0.36.

In rural areas, however, we observe significant changes in both directions – increases and decreases in inequality – and both in very geographically distinct areas: in several mountainous areas in central Lao PDR along the border with Vietnam, wealth inequality decreased significantly (Map I3.2). Incidentally, these are areas that also experienced an increase in poverty rates, and are today among the poorest areas in the country. This implies that in those areas, people who were not poor in 2005 fell into poverty in the subsequent years, while people who were poor in 2005 remained poor, resulting in an overall decrease in inequality, but a lower level of overall welfare. While one typically expects decreasing poverty to come at the cost of increasing inequality, we have here decreasing inequality at the cost of increasing poverty.

All of the four southernmost provinces experienced a marked increase in inequality between 2005 and 2015, resulting in the highest levels of rural inequality in 2015. In Saravane, both inequality and poverty rates typically increased, and are now among the highest in the Lao PDR. Inequality mostly increased with decreasing poverty rates in the other three southernmost provinces (Attapeu, Champasak, and Sekong), which are now among the country's better-off rural areas.

I3.2: Dynamics in inequality



Huaphanh Province has both the lowest current level of inequality and exhibited the strongest decrease in inequality since 2005 of any province in the Lao PDR.

The contrast across provinces in terms of both current levels of inequality and change since 2005 are striking. Further research is required to shed light on the degree to which state policies shaped these patterns, and to glean important insights into what specific policies were able to most affect overall equality.

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Title: Socio-Economic Atlas of the Lao PDR – Patterns and Trends from 2005 to 2015

Edition: 1st edition

Languages: Printed in Lao and in English

Institutions: Lao Statistics Bureau (LSB), Ministry of Planning and Investment (MPI), Lao PDR
Centre for Development and Environment (CDE), University of Bern, Switzerland

Size: A3

Total pages: 124

Registration number: 254-255/ผจ23112018

Printed at: Pankham Jampa Printing, Vientiane, Lao PDR

Socio-Economic Atlas of the Lao PDR

Patterns and Trends from 2005 to 2015

The past decades brought about significant changes to the population of the Lao PDR. Living standards have improved in many aspects throughout the country, and poverty rates have fallen significantly. With improved infrastructure and more disposable income, the mobility of the population has increased drastically, resulting in even more dynamic changes to the country.

The Population and Housing Censuses of the Lao PDR, conducted every decade, represent one of the most invaluable sources of information on these increasingly dynamic demographic, social and economic changes in the country. By combining the latest two censuses of 2005 and 2015 with detailed geographic information, a multifunctional tool for enhancing the planning and monitoring of socio-economic development programs and policies in the country has been developed.

This new Socio-Economic Atlas of the Lao PDR provides readers with a highly detailed, multidimensional set of insights through the inclusion not only of multiple censuses for comparison, but also of new visual representations of the data. The demographic, social, and economic characteristics of the population of the Lao PDR are presented as a large set of key indicators depicted in detailed maps accompanied with text descriptions. This allows readers to rapidly discern complex variations, trends, and disparities across the Lao population and its territory.

The atlas was developed by the Centre for Development and Environment (CDE) of the University of Bern, Switzerland, jointly with the Lao Statistics Bureau (LSB), within the framework of the Lao DECIDE info initiative. The initiative is funded by the Government of Switzerland through the Swiss Agency for Development and Cooperation (SDC), and aims at promoting information sharing and integration towards enhanced development analysis and planning.

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