

101567



Lao PDR Poverty Policy Notes

Drivers of Poverty Reduction in Lao PDR

October 2015





Currency Equivalents

Exchange Rate Effective as of October 9, 2015

Currency Unit = LAK (Lao Kip)

LAK8,138 = US\$1.00

Fiscal Year = October to September

Acronyms and abbreviations

ICA	Investment Climate Assessment
DFAT	Australian Government, Department of Foreign Affairs and Trade
FAO	Food and Agriculture Organization
GIEWS	Global Early Warning and Information Systems
GDP	Gross Domestic Product
LECS	Lao Expenditure and Consumption Survey
LSB	Lao Statistics Bureau
MDG	Millennium Development Goals
PPP	Purchasing Power Parity
USD	United States Dollars
WDI	World Development Indicators

IDA		
Regional Vice President	:	Axel van Trotsenburg
Country Director	:	Ulrich Zachau
Senior Practice Director	:	Ana L. Revenga
Country Manager	:	Sally Burningham
Practice Manager	:	Salman Zaidi
Primary Authors	:	Obert Pimhidzai

Acknowledgements

This policy note was prepared by Obert Pimhidzai – Economist, GPVDR. It draws on a background paper written by Nina Fenton – Consultant, GVPDR and the Lao PDR poverty profile report of 2014 produced jointly with the Lao Statistics Bureau. The author is grateful for comments received from Lars M. Sondergaard- Program Leader, EACTF; Sergiy Zorya - Senior Economist, GAFDR and Clarence Tsimpo – Economist, GPVDR. Inputs for this policy note were prepared with the support of funding from the Australian Government, Department of Foreign Affairs and Trade (DFAT). We would like also to thank the Government of Lao PDR, especially Ministry of Planning and Investment and Lao Statistics Bureau for data access and collaboration.

Disclaimer: The findings, interpretations, and conclusions expressed herein are those of the authors, and do not necessarily reflect the views of the International Bank for Reconstruction and Development / The World Bank and its affiliated organizations, or those of the Executive Directors of The World Bank or the governments they represent



Table of Contents

Executive summary	9
Background – Poverty dynamics and economic mobility in Lao PDR: 2002/3 – 2012/13	13
Poverty reduction continued and other aspects of wellbeing improved	13
Economic mobility was high, with both downwards and upwards movements	16
Drivers of poverty in Lao PDR: 2002/3 – 2012/13	21
Increasing labor income was important for poverty reduction	21
Education and off-farm job creation are major drivers of poverty	23
Raising agriculture income remains an important driver of poverty reduction	26
Access to roads is critical for reducing poverty in rural areas	27
Drivers of household vulnerability in Lao PDR: 2002/3 – 2012/13	29
Agriculture households are the most at risk	29
Uninsured households are vulnerable to catastrophic out of pocket health expenditures	31
Remittances and ownership of productive assets mitigate vulnerability	32
Conclusion and policy implications	33
References	35
Annexes	36
Annex 1: Construction of the panel from the LECS 3 -5 surveys	36
Annex 2: Regression results	40



List of Figures

Figure 1. Trends in poverty in Lao PDR: 2002/3 – 2012/13	13
Figure 2. Social indicators in Lao PDR: 2002/3 - 2012/13	13
Figure 3. Economic mobility in Lao PDR: 2002/3 – 2012/13	17
Figure 4. Poverty rate by socio-economic characteristics: 2002/3 – 2012/13	19
Figure 5. Poverty rate by province: 2012/13	19
Figure 6. Asset based framework for poverty reduction	21
Figure 7. Trends in selected household characteristics: 2002/3 – 2012/13	22
Figure 8. Educational composition of working age population: 2002/3 – 2012/13	22
Figure 9. Growth in employment by sector and job type: 2002/3 – 2012/13	22
Figure 10. Probability of exiting poverty by education levels	24
Figure 11. Education attainment and primary employment sector: 2012/13	24
Figure 12. Comparison of changes in share of value added and employment by sector: 2002/3 – 2012/13	25
Figure 13. Rice productivity by education of household head and village altitude: 2012/13	26
Figure 14. Probability of entering into poverty by livelihood, level of education and ethnicity	29
Figure 15. Probability of farming households entering into poverty by change in rice prices	29
Figure 16. Trends in glutinous rice prices in selected provinces: 2002/3 – 2012/13	30



List of Tables

Table 1: Poverty transitions in Lao PDR: 2002/3 - 2012/13	14
Table 2: Poverty transitions in Lao PDR: 2002/3 -2012/13	15
Table 3: Profile of gainers and sliders	18
Table 4: Selected agriculture indicators by education level of household head	26
Table 5: Education attainment of subsistence agriculture workers by age group: 2012/13	27
Table 6: Net rice buyers and sellers by welfare status	30
Table 7: Summary of the LECS 3 - LECS 5 survey samples and the panel	37
Table 8: Year of birth and gender match in panel households	37
Table 9: Comparison of panel and non-panel households	39
Table 10: Probit marginal effect estimates for the probability of exiting poverty: 2007/8 – 2012/13	41
Table 11: Probit marginal effects estimates for the probability of entering into poverty	42

Executive summary

Poverty continues to decline, Lao PDR met the MDG target of halving extreme poverty

- a) Poverty in Lao PDR declined from 33.5 percent to 23.2 percent over the 10 year period between 2002/3 and 2012/13. The number of poor people declined by about half a million to 1.35 million in 2013 and Lao PDR has met its MDG target of reducing poverty to below 24 percent by 2015. Improvements in welfare are evident in the changes in other socio-economic indicators such as the ownership of televisions and access to electricity, which doubled, and the number of households living in houses built with bricks or concrete, which nearly tripled, while the proportion of those without a toilet halved. Net secondary enrollment increased from 27 percent in 2002/3 to 50 percent in 2012/13 showing significant improvements in education.

Increases in endowments, primarily human capital and access to land coupled with non-farm job creation were major drivers of poverty reduction

- b) Welfare gains were driven by increasing educational attainment and transition to non-farm employment. The increase in education attainment was especially critical in facilitating the transition to non-farm incomes and increases in returns to agriculture. Complete primary education was associated with higher productivity in agriculture while lower secondary education facilitated the transition into non-farm activities. Increases in endowments and productive opportunities were thus the key drivers of poverty reduction.

Many households are vulnerable as consumption levels in Lao PDR are still low by international standards

- c) Poverty could have declined by more had a large number of vulnerable households not fallen back into poverty. About half of the poor in 2012/13 were previously non-poor in 2007/8 and more than two thirds of them had been non-poor at some point during that 10 year period. Many people escaping poverty remained close to the poverty line where vulnerability is high. About 80 percent of the population in 2012/13 still lived on less than PPP 2005 \$2.5 per day and faced at least a 10 percent chance of falling into poverty in subsequent periods.

Agriculture shocks and health shocks are main drivers of household vulnerability

- d) The losses in welfare were driven by agriculture shocks, mainly in the form of food price changes and loss of land, and to some extent catastrophic health expenditures. There are more net sellers than net buyers of rice in Lao PDR, especially in the rice surplus areas in the center and the south, therefore an increase in the price of rice has a net benefit while a decrease results in a net aggregate loss in welfare. The drop in prices in 2012/13 compared to 2007/8 thus had a negative welfare impact in the center and the south. The loss of land impacted urban dwellers who supplement their non-farm incomes with farming, which serves as a strong reminder that productivity at the entry level in the non-farm sector is not yet high enough to sustain livelihoods of poorly skilled people to completely transition out of agriculture. Vulnerability is highest among ethnic minorities, some of whom (the Monkhmer and Hmong-Lu-Mien) are twice likely to fall back into poverty than other groups.

Poverty reduction could have been much higher had growth been broad based.

- e) Natural resource led economic growth in Lao PDR did not translate into a commensurate increase in household consumption and disproportionately benefited the non-poor, resulting in a smaller decline in poverty than if it had been equitably distributed across all income groups. Average consumption per capita grew by 2.2 percent per year between 2002/3 and 2012/13, almost four percentage points less than the rate of economic growth. At just 1.3 percent per year, consumption growth was even lower for the bottom 40 percent. Lao PDR had one of the lowest growth elasticities of poverty in the South East Asia region as hydro-electricity generation and mining drove output growth but only created a few jobs. This limited shared prosperity because more jobs are created in other sectors (especially in services) whose growth lagged the natural resource sectors due to a poor business environment and skills constraints.

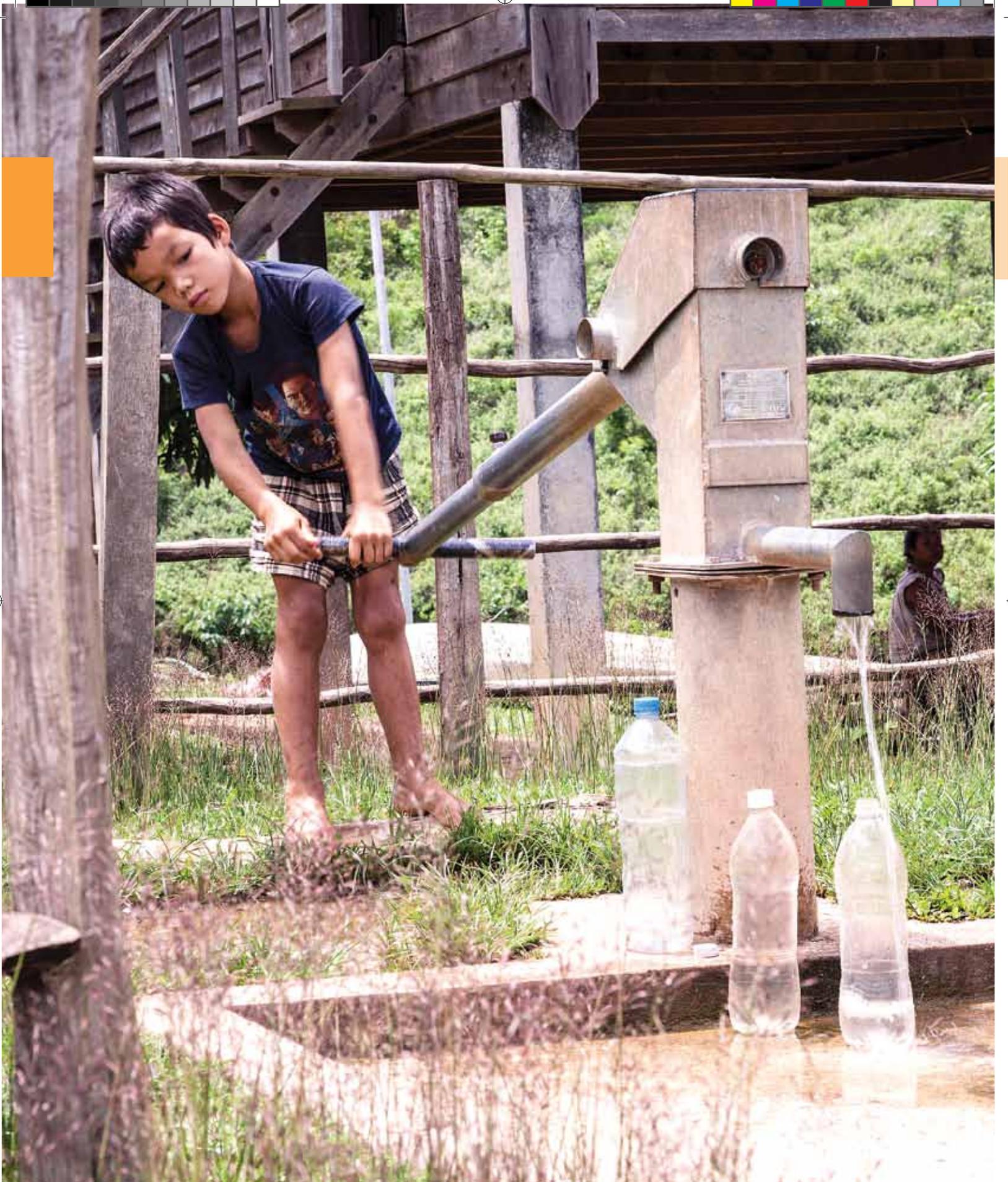
Looking ahead, higher poverty reduction in Lao PDR can be achieved by creating better economic opportunities for both the poor and non-poor, and by strengthening the social protection system.

- f) Job creation, stimulating productivity growth and improving the quality of jobs in the non-farm sector is a key pathway for reducing poverty in Lao PDR, to be achieved by creating a vibrant labor intensive non-farm sector, especially in services. This requires improving the regulatory and business environment where Lao PDR is the lowest ranked within the region, coupled with continued investment in education. An improved business environment and higher productivity in the non-farm sector are necessary for attracting investment for creating more non-farm jobs and raising wage earnings without hurting competitiveness, while further investment in education is needed to provide people with the pre-requisite skills to obtain non-farm jobs rewarding enough to keep them out of poverty and alleviate the skills constraints that have also hampered firm growth.



- g) Growth in agriculture incomes is still an important pillar for reducing poverty. Many people engaged in agriculture, especially the less educated mid-aged, will remain in the sector for the foreseeable future. Raising agriculture income is the main pathway out of poverty for them. This will require i) lowering marketing costs through public investments and better regulations and supporting open trade policies to uplift farm prices and increase the profitability of farming, ii) focusing on increasing productivity given the unsustainability of further land expansion to increase agriculture production which has driven growth in agriculture income thus far and iii) improving human capital of farmers through training and agricultural extension services to allow the majority of less educated farmers to catch up with more educated farmers in raising their productivity.
- h) Promoting greater resilience, especially in the agricultural sector, through improved social safety nets and insurance will be important for ensuring the sustainability of poverty reduction going forward. Key areas of focus should be i) increasing resilience in agriculture since farming households are twice as likely to fall back into poverty than non-farming households, ii) strengthening social insurance – especially on health insurance or universal access to health care, iii) putting in place social welfare programs that target the vulnerable and the chronically poor and iv) deepening financial inclusion to expand options available for households to cope with shocks.





Background – Poverty dynamics and economic mobility in Lao PDR: 2002/3 – 2012/13

Poverty reduction continued and other aspects of wellbeing improved

- Poverty declined gradually in Lao PDR over the past decade. Estimates from the Lao Expenditure and Consumption Surveys (LECS) show that poverty declined from 33.5 percent in 2002/3 to 23.2 percent in 2012/13 (see Figure 1). This translates to half a million less poor people in 2012/13 compared to the 1.85 million people living in poverty in 2002/3. It also means that Lao PDR achieved the MDG target of halving extreme poverty by 2015 (now below the poverty target of 24 percent in 2015) - a conclusion that is also reached when considering the proportion of the population living on less than PPP (2005) 1.25 dollars per day per person. The improvements in living standards is reflected in the cumulative growth in average consumption of 25 percent over that period, but the cumulative growth of 14 percent for the bottom 40 percent, explains why the pace of poverty reduction was only gradual.

Figure 1. Trends in poverty in Lao PDR: 2002/3 – 2012/13

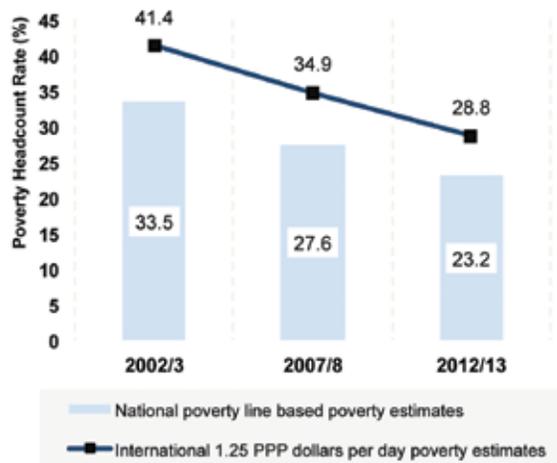
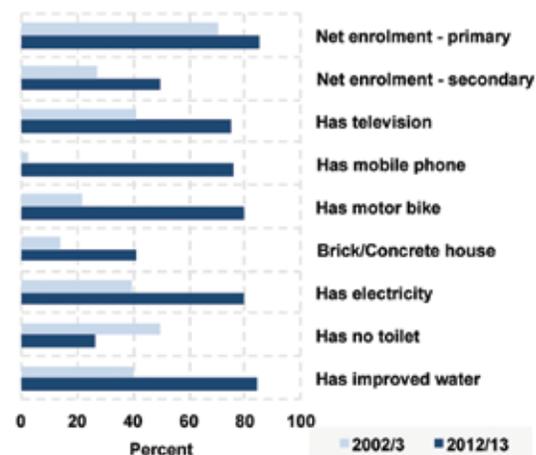


Figure 2. Social indicators in Lao PDR: 2002/3 -2012/13



Source: Authors calculations from LECS 3 -5

2. Improvements in other socio-economic indicators provide further evidence that living standards of people got better (see Figure 2). Households are living in better houses and significantly more of them own more assets, even among the poor. More households (41 percent in 2012/13 compared to 14 percent in 2002/3) are living in houses built with bricks or concrete and more of them are living in houses with cement floors or floor tiles compared to 2002/3. Nearly 80 percent of households were connected to electricity in 2012/13. The proportion of households without any type of toilet came down to 27 percent in 2012/13 compared to 50 percent in 2002/3. This is a significant improvement especially in rural areas. Net enrollment in lower secondary school increased to about 50 percent in 2012/13 from 26.8 in 2002/3, but the increase was greater for the non-poor than the poor (a detailed discussion is provided in the poverty profile, see World Bank, 2014).

There was significant churning - while many households escaped poverty, a considerable number also fell into poverty

3. These significant gains in welfare are confirmed in the analysis of panel data (see Annex 1), which tracks the same households over two or more periods in time. This data shows that overall, 55 percent of people who were poor in 2002/3, had moved out of poverty in 2007/8 and that 3 out of every 5 poor people in 2007/8 had become non-poor in 2012/13. Consumption growth among the poor or bottom 40 percent in 2007/8 averaged 76 percent and 65 percent respectively, which is higher than estimates based on the cross section data but shows the same trend.

Table 1: Poverty transitions in Lao PDR: 2002/3 - 2012/13

	2002/3 – 2007/8		2007/8 -2012/13		
	Poverty Status in 2007/8		Poverty Status in 2012/13		
Poverty Status in 2002/3	Poor	Non-poor	Poverty Status in 2007/8	Poor	Non-poor
Poor	44.7	55.3	Poor	36.7	63.3
Non-poor	14.8	85.2	Non-poor	13.6	86.4

Source: Authors calculations from LECS 3 -5 panel data

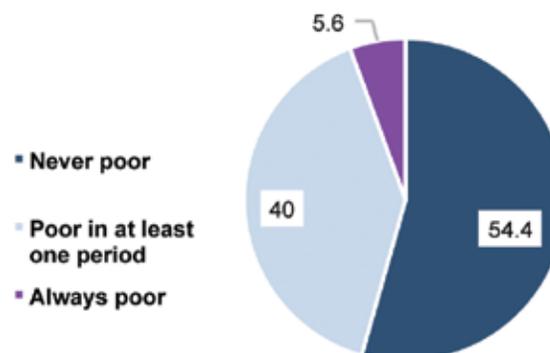
4. However, welfare improvements were clearly not shared by every Laotian and movements out of poverty were reversible for a significant number of them. The decline in poverty at the aggregate level hides significant churning. Table 1 shows that while 63 percent of the poor (equivalent to 16.7 percent of the population) in 2007/8 moved out of poverty, 14 percent (equivalent to 10 percent of the population) became poor in 2012/13 despite being non-poor in 2007/8. The national poverty rate still declined because those who escaped poverty outnumbered those who fell into poverty, but clearly a significant number of people were worse-off in 2012/13 than they were previously. Those previously non-poor in 2007/8 constituted slightly more than half of poor people in 2012/13 for example. A similar trend is observed during 2002/3 – 07/8 as well. In fact, only 32 percent of the poor in 2012/13 had been poor in both 2002/3 and 2007/8 (see Table 2a). Thus just 5.6 percent of people observed in all three rounds of the panel reported being poor across all periods while 40 percent were found poor in at least one of the years (see Table 2b). Holding on to the gains previously made proved to be a major challenge during the past decade.

Table 2: Poverty transitions in Lao PDR: 2002/3 - 2012/13

a) Three period poverty transition:
2002/3 -2012/13

Poverty Status		Poverty Status in 2012/13	
in 2002/3	in 2007/8	Poor	Non-poor
Poor	Poor	31.8	9.1
	Non-poor	23.3	15.2
Non-poor	Poor	14.2	9.7
	Non-poor	30.7	66.0

b) Three period poverty status:
2002/3 -2012/13

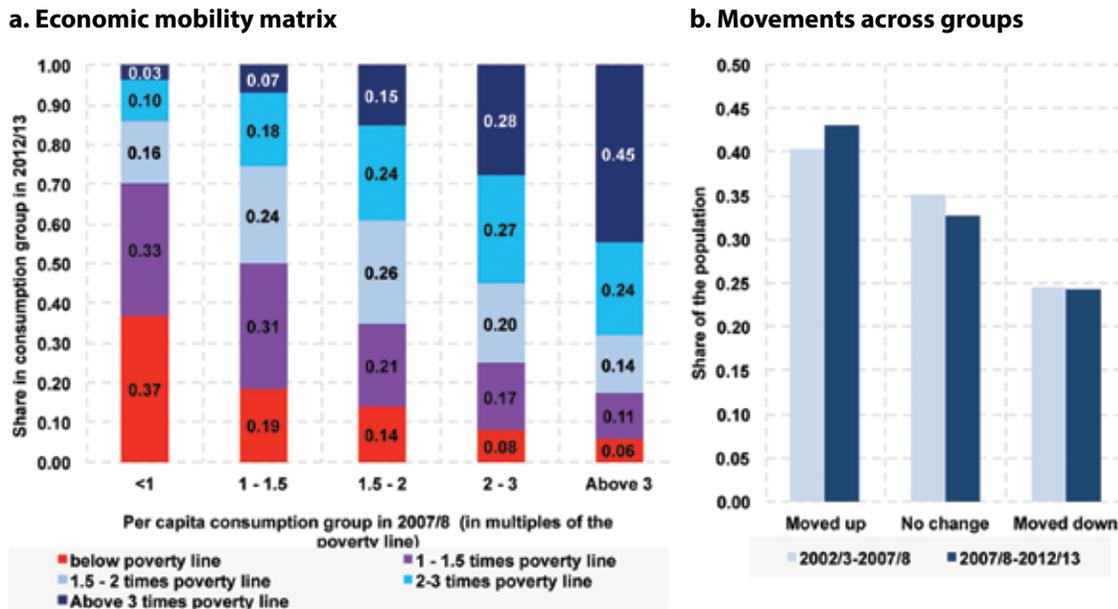


Source: Authors calculations from LECS 3 -5 panel data

Economic mobility was high, with both downwards and upwards movements



5. Economic mobility is very high across all levels of welfare but it is also characterized by high churning similar to the patterns observed for the poor or the near poor. As Figure 3 shows, two fifth of the population were able to move to a higher consumption group within the five year period between 2007/8 and 2012/13 with higher mobility among lower consumption groups. The risks of falling back were also high across all consumption groups. Nearly a quarter of people ended up in a lower consumption group five years later (Figure 3b). The risks of a decline in consumption was highest among those in the highest consumption group (above 3 times the poverty line) where more than half of people in this group in 2007/8 ended up in a lower consumption group in 2012/13. Holding on to gains in consumption is thus a general problem encountered by many households across the entire welfare distribution in Lao PDR.
6. Most households that escaped poverty did so by slim margins, only moving to a consumption zone close to the poverty line where the risk of falling back into poverty is high. Over a period of 5 years, the per capita consumption of sixty percent of those who moved out of poverty between 2007/8 and 2012/13 was no more than 50 percent above the poverty line. The panel data shows that a fifth of people in this per capita consumption group fell back into poverty. Those whose consumption grew to more than 50 percent of the poverty line face a relatively lower but still moderate risk, as 14 percent of them fell back into poverty (Figure 3a). This high exposure to negative shocks offsets the high consumption growth among the upward mobile population, contributing to the low overall growth elasticity of poverty (of -0.47) in Lao PDR. This accounts for the difference between the cross section estimates of percentile growth (which includes both people who started in that part of the distribution and didn't move up and those who fell behind to that part of the distribution).

Figure 3. Economic mobility in Lao PDR: 2002/3 – 2012/13

Source: Authors calculations from LECS 3 -5 panel data

- While both opportunities to move up and risks of sliding down were significant, some types of households were more exposed to these opportunities and risks than others. Movements out of poverty were significantly higher among those with post primary education, had a non-farm labor income or those receiving remittances. Non-poor households with these characteristics also faced a lower risk of falling into poverty between 2007/8 and 2012/13. That means agricultural households, those with less than complete primary education or live in hard to reach villages faced the highest risk of falling into poverty. Among the non-poor, farming households were twice more likely to fall back into poverty than non-farming households (see Table 3).
- There is considerable upward mobility among ethnic minorities though significantly lower than upward mobility among the Lao-Tai group. About half of the poor among the Mon-Khmer and Hmong-Lu-Mien moved out of poverty, compared to 77 percent among the Lao-Tai. Instead, the Mon-Khmer and Hmong-Lu-Mien, have a much higher chance of falling into poverty than any other group. The Chine-Tibet ethnic group however faced a similar chance of moving out of poverty and equally lower chance of moving into poverty to the Lao-Tai between 2007/8 and 2012/13.

Table 3: Profile of gainers and sliders

Household characteristics	...of which			...of which		
	Poor in 2007/8	Remained poor	Exited Poverty	Non-poor in 2007/8	Remained non-poor	Entered Poverty
Ethnicity						
Lao-Tai	0.159	0.231	0.767	0.841	0.905	0.095
Mon-Khmer	0.451	0.512	0.488	0.549	0.776	0.222
Chine-Tibet	0.318	0.272	0.730	0.682	0.913	0.087
Hmong-Lu-Mien	0.405	0.479	0.521	0.595	0.692	0.308
Gender						
Male household head	0.258	0.383	0.616	0.742	0.868	0.132
Female household head	0.224	0.383	0.616	0.776	0.902	0.098
Education						
No formal education	0.408	0.490	0.510	0.592	0.704	0.296
Some primary	0.449	0.555	0.445	0.551	0.713	0.287
Completed primary	0.322	0.398	0.599	0.678	0.838	0.164
Completed lower secondary	0.191	0.224	0.775	0.809	0.902	0.097
Completed upper secondary	0.127	0.176	0.827	0.873	0.921	0.078
Completed vocational	0.074	0.125	0.875	0.926	0.964	0.036
Livelihood						
Non-farming household	0.108	0.175	0.823	0.892	0.938	0.062
Farming household	0.289	0.401	0.599	0.711	0.851	0.149
No wage employment	0.340	0.429	0.574	0.660	0.824	0.174
Household has wage work	0.156	0.267	0.731	0.844	0.910	0.090
No household business	0.307	0.407	0.593	0.693	0.847	0.154
Household business	0.109	0.183	0.814	0.891	0.923	0.078
No remittances	0.268	0.392	0.608	0.732	0.863	0.136
Remittances	0.143	0.264	0.741	0.857	0.915	0.085
Location						
Urban	0.142	0.194	0.803	0.858	0.932	0.068
Rural with road	0.269	0.387	0.617	0.731	0.852	0.148
Rural without road	0.410	0.505	0.495	0.590	0.798	0.203
Vientiane Capital	0.129	0.128	0.876	0.871	0.940	0.060
North	0.296	0.416	0.584	0.704	0.878	0.123
Central	0.257	0.331	0.669	0.743	0.871	0.129
South	0.236	0.458	0.538	0.764	0.821	0.179
District priority						
1st priority	0.420	0.445	0.555	0.580	0.805	0.195
2nd priority	0.340	0.418	0.582	0.660	0.841	0.159
Non-priority	0.170	0.305	0.694	0.830	0.894	0.107

Source: Authors calculations from LECS 4 -5 panel data

9. The differences in opportunities and risks faced by different socio-economic groups are reflected in the poverty profile of Lao PDR (Figures 4 and 5). Poverty is substantially higher in rural areas, at 28.6 percent, compared to 10 percent in urban areas, a gap that has widened over the past five years during which poverty declined faster in urban areas. Poverty is concentrated among minority (non Lao-Tai) ethnic groups, the less educated - still a disproportionate share of them ethnic minorities, and those who primarily depend on family farming or are unemployed. However, the Chine-Tibet ethnic group has fared better in recent years, as their poverty rate significantly declined to levels close to the Lao-Tai group (more details in poverty profile: World Bank, 2014).

Figure 4. Poverty rate by socio-economic characteristics: 2002/3 – 2012/13

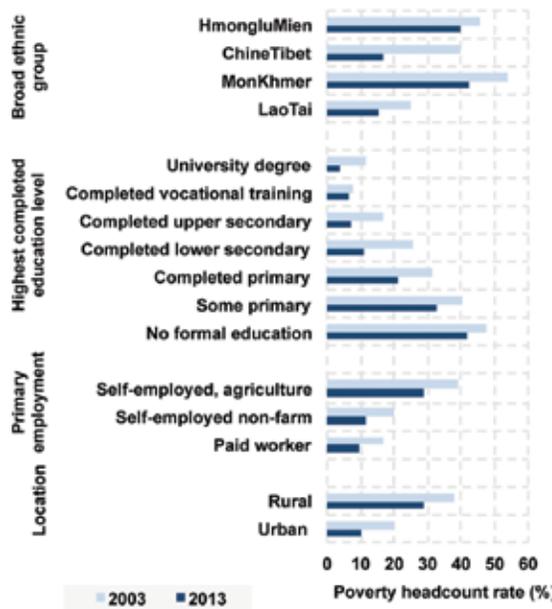
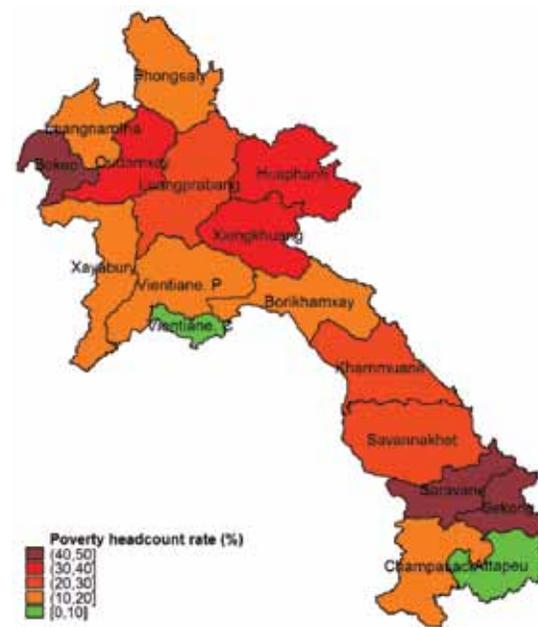


Figure 5. Poverty rate by province: 2012/13



Source: Authors calculations from LECS 3 and 5

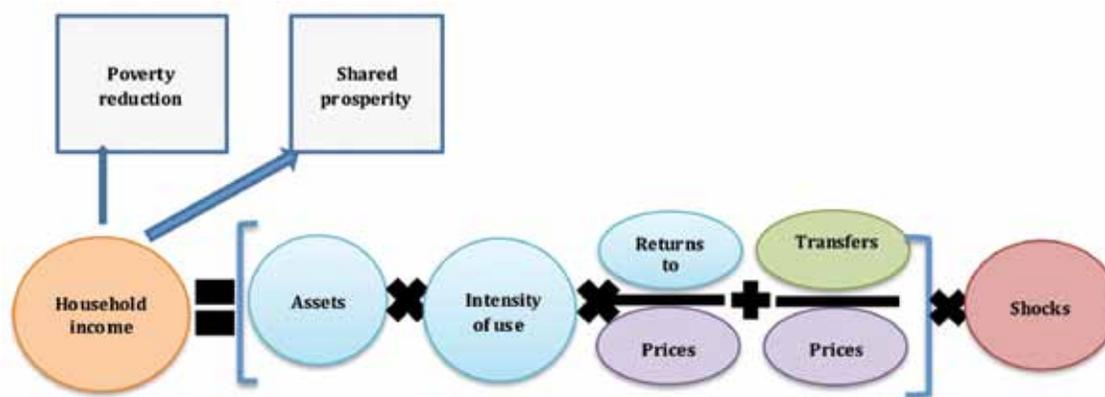


Drivers of poverty in Lao PDR: 2002/3 – 2012/13

Increasing labor income was important for poverty reduction

10. From an asset framework perspective (Bussolo and Lopez-Culva, 2014), poverty reduction depends on the expansion of household's income generating capacity. This is primarily driven by increases in endowments of the poor and increases in the intensity of use and returns to these endowments combined with changes in prices. These factors determine household labor income, which in addition to transfers and shocks households face, determine overall households' income, hence their ability to escape poverty (see Figure 6).

Figure 6. Asset based framework for poverty reduction



11. In Lao PDR, labor and access to land are the main assets owned by the poor. Thus improvements in human capital (thus augmenting labor assets), access to land and raising labor productivity along with creation of productive off-farm opportunities are key to lifting the poor out of poverty. Non-labor income in the form of remittances and social transfers provide a second avenue for reducing poverty, but their scale in Lao PDR is small. Poverty reduction in the past decade can thus be attributed to increases in the per capita labor incomes of the poor, driven by a combination of an increase in agriculture income and a transition to off-farm activities which raised both the intensity of use and productivity of labor.

12. The increase in human capital and access to agriculture land suggests that changes in endowments played a role in increasing labor incomes during 2002/3 - 2012/13. Education and household demographic changes underpinned improvement in human capital. The proportion of working age people (aged 15 – 64) with complete lower secondary education or more increased from 26.7 percent in 2002/3 to 35 percent in 2012/13 (Figure 8). At the same time, the dependency ratio declined from 2.7 to 1.9 (see Figure 7) as families became smaller (e.g. by one person less in rural areas) with fewer children. Access to agriculture land in rural areas increased by 26 percent between 2002/3 and 2012/13, mostly in the second half of the decade. Commodity prices were however volatile, introducing uncertainty in agriculture returns.

Figure 7. Trends in selected household characteristics: 2002/3 – 2012/13

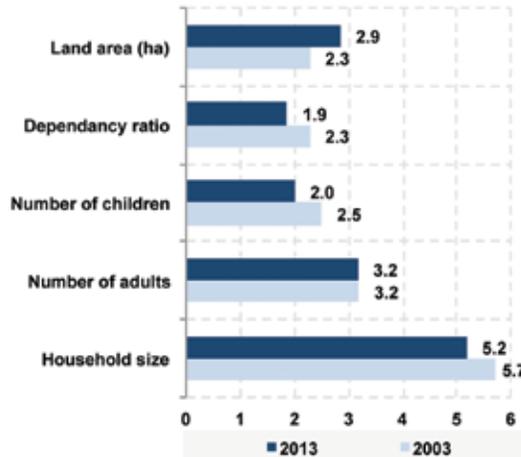
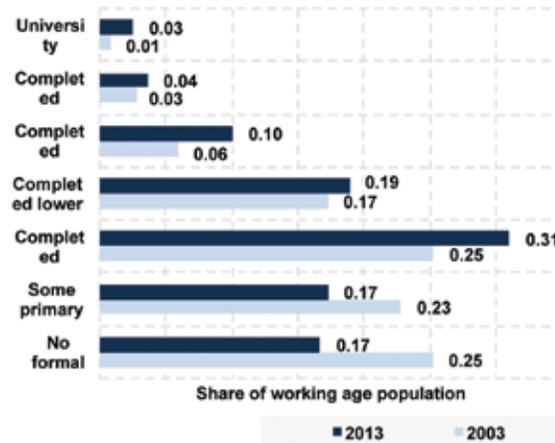
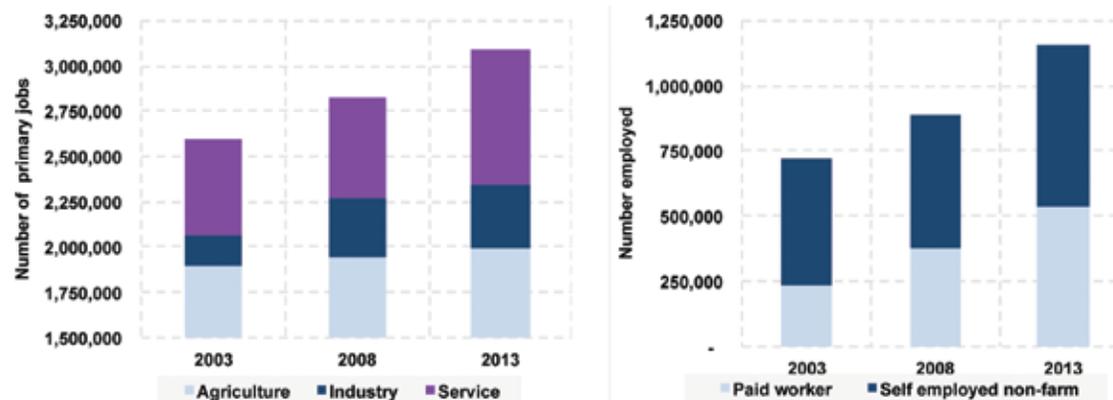


Figure 8. Educational composition of working age population: 2002/3 – 2012/13



Source: Authors calculations from LECS 3 -5

Figure 9. Growth in employment by sector and job type: 2002/3 – 2012/13



Source: Authors calculations from LECS 3 -5

13. Non-farm economic opportunities gradually expanded, thus facilitating the transition into non-farm employment. The economy added about 400 000 non-agriculture jobs, about 270 000 of them being wage jobs (see Figure 9). Jobs in industry doubled between 2002/3 and 2007/8 but have since stagnated and services have become the engine of non-farm job growth, accounting for more than 85 percent of the increase in non-farm jobs between 2007/8 and 2012/13. New non-farm jobs could absorb two thirds of the 610 000 new labor market entrants between 2002/3 and 2012/13, resulting in an increase in the share of employment in the non-farm sector. By 2012/13, agriculture was the primary occupation for about 64 percent of the labor force, down from 73 percent a decade earlier. Others in agriculture diversified into non-farm activities but did not leave agriculture completely, contributing to a decline in the depth of underemployment in rural areas. There was an addition of 4 hours to the total hours worked per week among people with both a farm and non-farm income in rural areas, signifying an increase in the intensity of use of labor among these people.
14. The contribution of various factors to poverty reduction is analyzed by estimating the influence of each of them on the probabilities of moving or entering into poverty while controlling for the influence of other factors. This is done using multivariate probit regressions based on the panel data component of the last two LECS surveys. Two sets of probit regressions are estimated. One set estimates the probability of moving out of poverty for only those who were poor in 2007/8 and the other estimates the probability of falling into poverty for those who were non-poor in 2007/8 only. Detailed results of these estimates are presented in Annex 2.

Education and off-farm job creation are major drivers of poverty

15. The increase in educational attainment and growth in opportunities for transitioning into non-farm employment emerge as primary drivers of poverty reduction in Lao PDR. The likelihood of moving out of poverty for an agricultural, non-LaoTai household with at least one person with post primary education was at least 80 percent, compared to the 47 percent chance faced by a similar household without anyone with formal education. The chances jump to 88 percent among non-farming households similar in other characteristics (see Figure 10). The gap in the likelihood of exiting poverty between ethnic minorities and the Lao-Tai narrows when one controls for education attainment and livelihoods, but is not completely eliminated. The Mon-Khmer in particular would still face a lower chance of exiting poverty, suggesting they get lower returns for their assets.
16. More education facilitated transition into better rewarding non-farm economic activities, with the highly skilled moving out of agriculture completely and low skilled diversifying their income portfolio from agriculture. People with higher levels of education are more likely to be in non-farm employment (see Figure 11). The odds of having primary employment in the non-farm sector increase from 11 percent for people with no formal education to 27 percent when one has complete primary education and 45 percent among those with complete lower secondary education. At 82 percent and 91.5 percent respectively, those with vocational training or a university degree have the highest likelihood of being in a non-farm primary economic activity, most likely in the service sector. Such people were likely to have spent none of their time on farming unlike people with lower education who tend to be self-employed, with small household businesses that generate low returns which they supplement with farming income.

Figure 10. Probability of exiting poverty by education levels

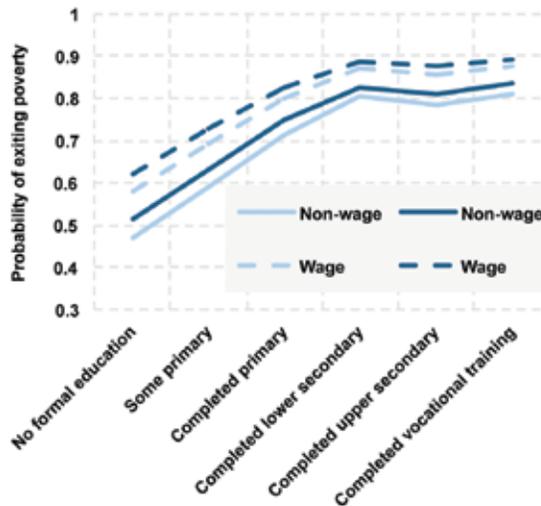
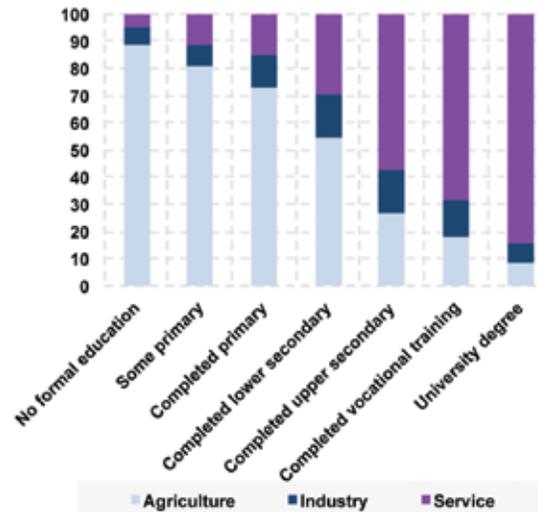


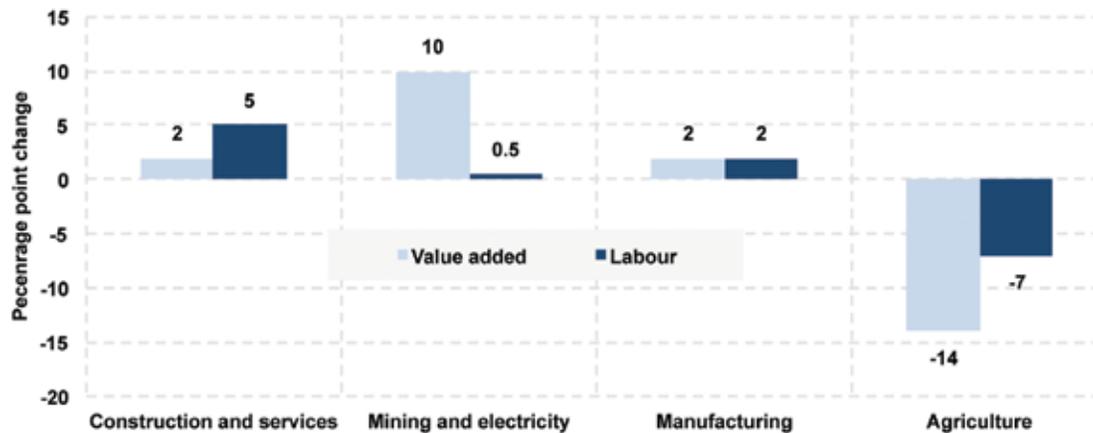
Figure 11. Education attainment and primary employment sector: 2012/13



Notes: Estimated for a household, with no household business, did not borrow for health expenditure, male headed, in village with road and electricity and has average household size, dependency ratio, household head age

Source: Authors calculations from LECS 5

17. Growth in non-farm employment created better opportunities for people with higher education and reduced underemployment thus becoming a main pathway out of poverty for people employed or switching from agriculture. Among farming households, those with a non-farm wage income were 12 percent more likely to escape poverty. However, having a non-farm wage income did not improve the chances of escaping poverty among poor non-farming households, indicating the working poor in low productivity non-farm jobs have difficulties escaping poverty without supplementary farm income. This is confirmed in consumption growth regressions showing that consumption growth within the non-farm wage sector is insignificant while growth is higher for household businesses. Thus either one attains an adequate level of education so they never become working poor in the first place, or else resort to supplementing non-farm wage income with farming income. Only the transition out of agriculture to higher paying jobs (mostly in the service sector) is sufficient to lift people out of poverty, highlighting the need for productivity growth and improved quality of employment at the low skill, entry level in the non-farm sector.

Figure 12. Comparison of changes in share of value added and employment by sector: 2002/3 – 2012/13

Source: Authors calculations from LECS 3 -5 and WDI, 2015

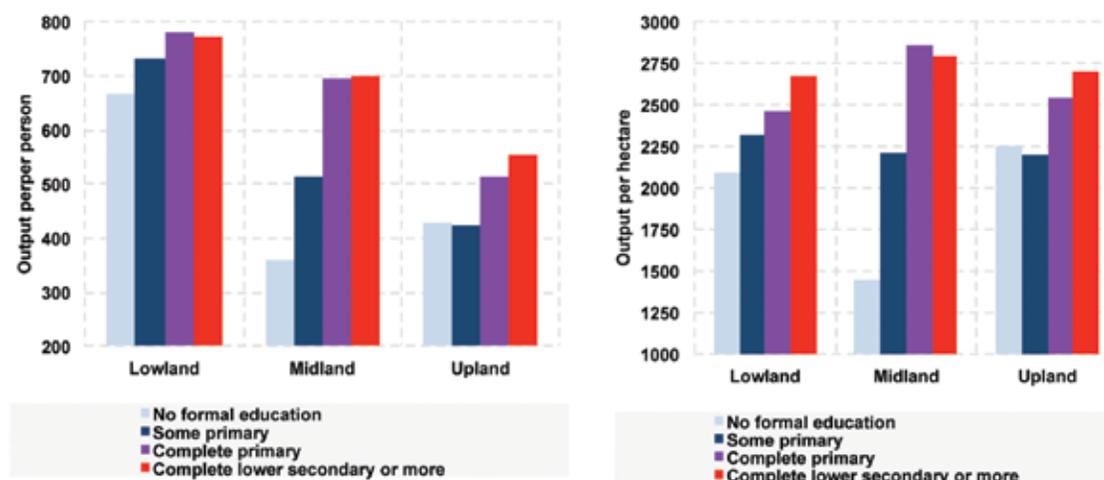
18. The transition out of agriculture could have been quicker and poverty reduced faster had non-farm job creation matched up to the rate of economic growth. Despite non-farm jobs increasing by 400 000 between 2002/3 and 2012/13, structural transformation in employment was not commensurate to the higher pace of non-agriculture output growth. The aggregate share of non-agriculture sectors in economic output increased by 14 percentage points. However, growth was driven by capital intensive sectors that did not create many jobs. The increase in the share of value added from hydropower generation and mining accounted for 10 out of the 14 percentage points increase of the non-agriculture sectors' share of economic output, but its share of employment increased by less than half a percentage point (see Figure 12). Other non-agriculture sectors contributed to almost all of the 7 percentage point increase in non-agriculture sectors' share of employment instead – an increase proportionately higher than the increase in their share of economic output. The transition to the non-farm sector can be faster and poverty reduction greater, with faster growth in these labor intensive non-farm sectors. This requires improving the business climate (see Lao PDR Development Report; World Bank, 2014b) where Lao PDR is currently the lowest ranked in the region.

19. Education plays an instrumental role in increasing agriculture income in Lao PDR, with productivity gains in the sector associated with higher education attainment up to completion of primary education. More educated households produce both more rice per person and more rice per area planted. Households headed by someone with completed primary education or above produce 30 percent more rice per person (and also per adult) than households headed by someone without any formal education (see Table 4) for example. Their average rice yields are at least 26 percent higher - even among households with a similar land terrain, most notably in midland and upland areas (see Figure 13). Households with more education also have a higher degree of commercialization. At least 56 percent of households headed by a person with complete primary education or more sold rice on the market compared to 40 percent among those headed by someone with no formal education. Thus higher education attainment not only facilitates movements out of agriculture, it also raises productivity and incomes within the sector too.

Table 4: Selected agriculture indicators by education level of household head

Household head's highest level of completed education	Output (KGs) per hectare		Output (KGs) per person per year		Sold produce on market (%)	
	2008	2013	2008	2013	2008	2013
No formal education	2119	2016	474	532	40.5	39.6
Some primary education	2437	2265	529	607	48.7	49.0
Complete primary education	2644	2552	660	695	57.7	59.1
Complete lower secondary or more	2743	2700	707	719	59.5	56.7
Lao PDR	2541	2454	610	659	53.0	53.3

Source: Authors calculations from LECS 4 -5

Figure 13. Rice productivity by education of household head and village altitude: 2012/13

Source: Authors calculations from LECS 5

Raising agriculture income remains an important driver of poverty reduction

20. A large majority in agriculture will remain in the sector in the foreseeable future, thus raising agriculture incomes is their main pathway out of poverty. About 35 percent of people engaged in family agriculture are 40 years old and above and have at most primary education (see Table 5). Also, 85 percent of people engaged in family agriculture attained primary education at most, while a fifth have no formal education at all. Given their age and poor literacy standards (World Bank, 2014b), the benefits of continued investment in formal education will not accrue to them. They will continue to have difficulties finding employment in the non-farm sectors where higher education is required to obtain a rewarding job. For them, growth in agriculture income - either through increasing access to land, higher profitability of farming and general increases in productivity, is the main pathway out of poverty.

21. Access to agriculture land was important for poverty reduction in Lao PDR so far as it helped the near poor in rural areas from sliding back into poverty, but there are limits to which increases in access can drive poverty reduction. Households with access to more land in 2007/8 were less likely to fall into poverty between 2007/8 and 2012/13, even after controlling for other household and regional characteristics. Land constrained households fully utilize their land, thus an increase in access to land would necessarily increase their productive capacity. Improved access to land partly contributed to poverty reduction in the north, where own produced food consumption increased significantly. However, land is not limitless thus continued expansion of land will at some point encroach on unsuitable land or become environmentally unsustainable. Further agriculture income growth should be driven by increased productivity, prices or both, as the marginal contribution of increasing acreage would sharply decline.

Table 5: Education attainment of subsistence agriculture workers by age group: 2012/13

Highest level of completed education	Age group						Lao PDR
	15-24	25-29	30-39	40-49	50-64	65+	
No formal education	3.1	2.2	4.7	4.3	4.6	1.3	20.3
Some primary education	4.7	2.4	4.8	4.5	5.4	0.8	22.7
Completed primary	11.0	4.4	6.7	7.1	6.3	0.8	36.3
Completed lower secondary	6.1	2.0	2.8	2.6	1.5	0.2	15.2
Completed upper secondary	1.8	0.7	0.7	0.6	0.4	0.1	4.2
Completed vocational training	0.1	0.2	0.1	0.3	0.4	0.1	1.1
University degree	0.1	0.1	0.0	0.0	0.0	0.0	0.3
Lao PDR	26.8	12.0	19.9	19.3	18.7	3.3	100

Source: Authors calculations from LECS 5

Access to roads is critical for reducing poverty in rural areas

22. Access to roads is important for reducing poverty in rural areas. Rural households with access to a road had a 10 percent higher chance of exiting poverty compared to similar households without access to a road in the same regions. Better connectivity is associated with more off-farm opportunities, which in rural areas, are an important pathway out of poverty. In a few provinces in the North, access to a road is correlated with higher farm gate prices of rice in 2012/13 too, but this effect is absent in the south, where there are no significant differences in farm gate prices of paddy rice within provinces between villages with access to roads and those without access to roads.

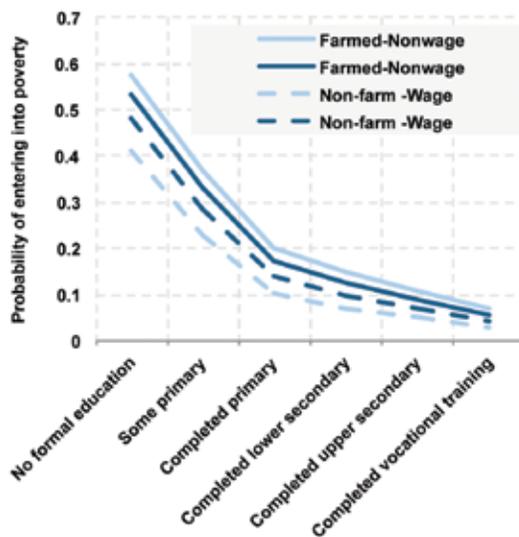


Drivers of household vulnerability in Lao PDR: 2002/3 – 2012/13

Agriculture households are the most at risk

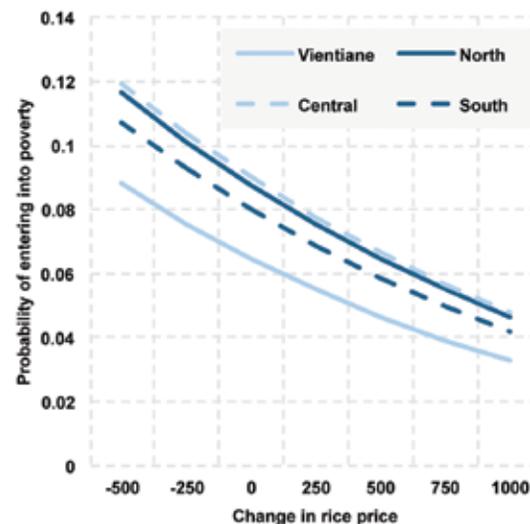
23. The risk of falling into poverty is greatest among people primarily dependent on agriculture, irrespective of their other characteristics (see Figure 14). The difference is pronounced among ethnic minorities. For example, a non Lao-Tai agriculture household had a 17 percent chance of ending up poor in 2012/13 compared to the 10 percent chance faced by a similar rural, non-agriculture household headed by a person with complete primary education in the absence of health shocks. In general, the risk was low for higher levels of education attainment.

Figure 14. Probability of entering into poverty by livelihood, level of education and ethnicity



Notes: Estimated for household, with no household business, did not borrow for health expenditure, male headed, in village with road and electricity, average household size, dependency ratio, household head age

Figure 15. Probability of farming households entering into poverty by change in rice prices

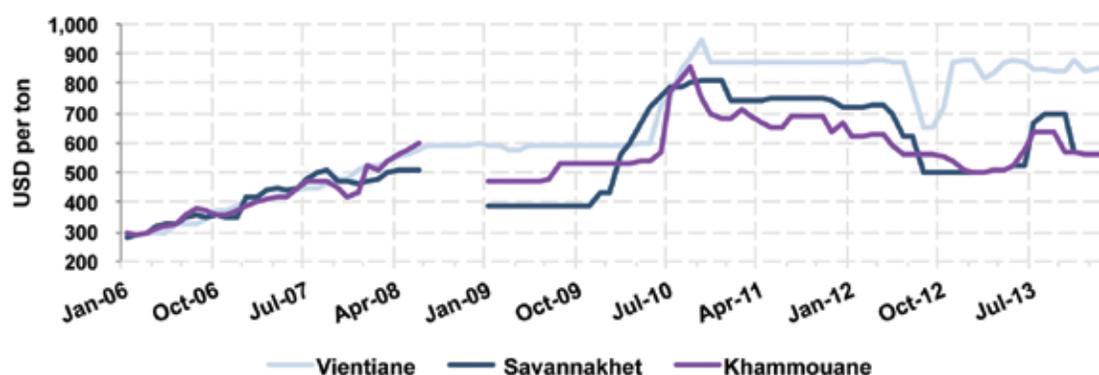


Notes: Estimated for a Lao-Tai household, with no non-farm income, maximum education at complete primary, did not borrow for health expenditure, male headed, in village with road and electricity with average household size, dependency ratio and head's age

Source: Authors calculations from LECS 4 -5 panel data regressions

24. Farm produce price changes are a risk factor faced by households. Initially, higher agriculture prices between 2002/3 and 2007/8 contributed to poverty reduction in rural areas, but declining prices in the central and south provinces in 2012 (see Figure 16) reversed some of those gains. While a third of the poor and near poor are seasonal net buyers of rice and another 5 percent all year net buyers, more than half of them are in fact net sellers of rice (see Table 6). Thus more of the poor and less well-off benefit from increases in rice prices. An increase in the price of rice on average raises the likelihood of agriculture household escaping poverty while a decline had a negative effect on farmers, increasing their likelihood of entering into poverty. The probability of falling into poverty among farmers increases by about 50 percent when the median price of a kilogram of glutinous paddy rice drops by 500 Kip, compared to when the price stays the same (see Figure 15). Thus the decline in farm gate prices for paddy rice between 2007/8 and 2012/13 in the central and south provinces had a net negative welfare impact thereby slowing down the pace of poverty reduction in these regions.

Figure 16. Trends in glutinous rice prices in selected provinces: 2002/3 – 2012/13



Source: FAO (GIEWS). Note: Prices for Lao PDR are for second-quality glutinous rice, retail prices

Table 6: Net rice buyers and sellers by welfare status

Welfare status	All year net buyers	Seasonal net buyers	Autarky	Subsistence sellers	Large sellers	Yearly rice consumption
Non-Poor	0.203	0.262	0.031	0.204	0.299	218.1
Poor	0.055	0.341	0.070	0.291	0.243	184.0
Poorest quintile	0.054	0.339	0.072	0.295	0.240	181.6
Second quintile	0.092	0.316	0.054	0.266	0.272	197.7
Third quintile	0.138	0.279	0.032	0.260	0.290	207.3
Fourth quintile	0.196	0.251	0.033	0.193	0.326	221.0
Richest quintile	0.329	0.228	0.014	0.129	0.299	237.2
Lao PDR	0.176	0.277	0.038	0.220	0.289	211.8

Source: Authors calculations from LECS 5

25. Changes in government policy and regulations are necessary to pass through higher output prices to farmers, increase profitability of agriculture and lift many farming households out of poverty. Price fluctuations in Lao PDR are partly policy induced, especially through trade restrictions (Durevall and Van der Walle, 2014). Thus unlike in Cambodia, where rice price increases accounted for 24 percent of the poverty reduction between 2007 and 2011 (World Bank, 2013a), deliberate policies suppressing the price of rice in Lao PDR inhibited poverty reduction among farmers, making them more vulnerable to falling into poverty instead. Lao PDR needs to adopt open trade policies that will uplift farm prices. Marketing costs too, can be lowered through public investments and better regulations to further increase the profitability of farming (World Bank, 2014b).
26. The “loss” of agriculture land is a risk factor for urban households engaged in farming. Among urban households engaged in farming in 2007/8, those who lost access to more than 10 percent of their agriculture land were 8 percent more likely to end up in poverty in 2012/13. Most of the near poor in urban areas, mainly among the low skilled, have small plots which they use to supplement inadequate non-farm incomes and losing this means of income pushes them into poverty, proving that moving out of agriculture is beneficial mostly for those with higher human capital who can get higher paying non-agriculture jobs. As highlighted earlier, those with lower education transition into non-farming activities through self-employment in low returns activities. Productivity gains at the entry level in the non-farm sector would need to improve significantly to sustain livelihoods if they completely move out of agriculture.

Uninsured households are vulnerable to catastrophic out of pocket health expenditures

27. Catastrophic out of pocket health expenditures were another risk factor for households, but this is only evident among urban households whose health care utilization is higher than rural areas. About 9.4 percent of households had a household member who was hospitalized in 2012/13. A higher proportion of them were either supported by relatives or had some form of insurance as health care utilization among the uninsured was extremely low. The uninsured who had to borrow to pay for hospitalization were 17 percent more likely to fall into poverty in urban areas. No effect was detected in rural areas where health care utilization is very low among people without insurance (Powell-Jackson, 2010), which could imply that the cost of care may in fact be a barrier to access to health care by the uninsured poor. Health insurance coverage in Lao PDR is very low, with only 12 percent of the population covered by some form of insurance (World Bank, 2013b) and those covered are mainly formal wage workers and likely to be well off. Most of the less well-off are therefore highly vulnerable to being pushed into poverty in the event of a health shock that leads to catastrophic out of pocket expenditures.

Remittances and ownership of productive assets mitigate vulnerability

28. Having productive assets and remittances are mitigating factors for household risks. Farming households with more land, agriculture or business assets were less likely to fall into poverty. This could either demonstrate that households mitigate against negative shocks by depleting their assets or that non-poor households with more assets are able to make better use of them or are less credit constrained and hence less vulnerable to begin with. Across all sub-groups, households receiving remittances were less likely to fall into poverty, underlining the importance of social support mechanisms in mitigating households' risks. Deepening financial inclusion should be pursued to expand options available for households to cope with shocks, either through easy access to credit, insurance, pensions and other financial instruments.



Conclusion and policy implications

29. Poverty in Lao PDR has declined gradually. Analysis of changes in poverty status of the same households across time confirms this improvement of welfare, but also reveals significant movements in and out of poverty, and that households moving out of poverty stay close to the poverty line. About 16 percent of the people moved out of poverty between 2007/8 and 2012/13, but 10 percent fell into poverty at the same time, so that half the poor people in 2012/13 were previously non-poor. This high vulnerability is not a phenomenon faced only by the near poor. It is observed across the entire distribution.
30. Poverty reduction was driven by a combination of creation of non-farm opportunities and growth in agriculture income, and education was instrumental for both of these factors. Households with a non-farm income were more likely to move out of poverty, but even in agriculture, those with higher educational attainment were also more likely to escape poverty. Education played a role by providing the pre-request skills for people to transition out of agriculture, while within agriculture, it was associated with improved average productivity.
31. Productivity gains in the non-farm sector are still required to support structural transformation from agriculture and put people on a higher earning path. Currently, a significant number of households who became non-poor by moving into non-farm activities supplement their earnings with agriculture income even in urban areas. Indications that households who end up with non-farm incomes only after losing access to agriculture land are more likely to fall back into poverty further highlights the importance of supplemental agriculture income to the less well off with low skills. This also means average productivity and earnings in the non-farm sector at the entry level are currently not high enough to support a full transition out of agriculture for households at the bottom of the distribution.
32. Creation of non-farm opportunities however remains a major pathway out of poverty. Faster poverty reduction can be achieved by additional investments in human capital and improving the business environment to raise productivity and foster economic diversification towards more labor intensive sectors that create more non-farm jobs. While education attainment has been improving, still just above a third of the working age population have completed lower secondary education, so the majority of the people lack the skills necessary to move them out of agriculture. At the same time, this lack of skills is a constraint to productivity growth and job creation in the non-farm sector. As the findings from the recent Investment Climate Assessment in Lao PDR (World Bank, 2014c) showed, growth in manufacturing and service sectors has been lagging in part due to skills constraints. A weak business environment was found to be a major impediment to productivity growth and job creation. Thus investment in education and skills and improving the business environment are key priorities for poverty reduction in Lao PDR.

33. Growth of agriculture incomes is necessary for poverty reduction, but that requires a focus on improving productivity and returns to agriculture by allowing higher farm gate prices for rice. The gains in agriculture in recent years have been dominated by increases in acreage, which is not limitless and may already started having a negative effect on average yields, as people utilize unsuitable land. Lower farm produce prices, which in Lao PDR is partly policy induced, harm farmers. The lower farm gate prices of rice in the center and south provinces meant that farmers in Lao PDR failed to benefit from rice production to the same extent that lifted rice farmers out of poverty in Cambodia.
34. Building resilience in agriculture and a stronger social protection mechanism are necessary to protect the gains from progress made so far. Most of the poor in the past decade had been non-poor at some point during that time, but risks such as agriculture income shocks (in the form of loss of land and lower prices) and catastrophic out of pocket health expenditures, pushed them back into poverty. Putting in place policies for sustainable growth in agriculture, social safety nets, social health insurance and expanding financial inclusion would mitigate against shocks and safeguard the poverty gains Lao PDR has made.

References

Bussolo, Maurizio and Luis Felipe Lopez-Calva. 2014. Shared Prosperity: Paving the Way in Europe and Central Asia," Europe and Central Asia Regional Framework for Shared Prosperity. The World Bank. Washington, DC

Durevall, Dick, Roy, Van der Weide. 2014. Importing high food prices by exporting: rice prices in Lao PDR. Policy Research Working Paper WPS 7119. The World Bank Washington DC.

Kristen Himelein (2014) Weight Calculations for Panel Surveys with Subsampling and Split-off Tracking, *Statistics and Public Policy*, 1:1, 40-45

Powell-Jackson, T, and Magnus Lindelow. 2010. "Community-Based Health Insurance in Lao PDR: Understanding Enrollment and Impacts". The World Bank, Washington, DC.

World Bank. 2013a. Where Have All the Poor Gone? Cambodia Poverty Assessment 2013. The World Bank, Washington, DC.

World Bank. 2013b. Maternal Health Out-of-Pocket Expenditure and Service Readiness in Lao PDR: Evidence for the National Free Maternal and Child Health Policy from a household and health center survey. The World Bank, Washington, DC.

World Bank. 2013c. Lao PDR - Skills for quality jobs and development in Lao PDR: A technical assessment of the current context. Policy. The World Bank. Washington, DC

World Bank and Lao Statistics Bureau. 2014. Poverty Profile in Lao PDR: Poverty Report for Lao Consumption and Expenditure Survey 2012 -2013. The World Bank. Washington, DC

World Bank, 2014a. South East Europe Regular Economic Report No.5 - Special Topic: First Insights into Promoting Shared Prosperity in South East Europe. The World Bank. Washington, DC

World Bank. 2014b. Lao PDR Development Report 2014: Expanding Productive Employment for Broad Based Growth. The World Bank. Washington, DC

World Bank. 2014c. Investment climate assessment 2014: Policy uncertainty in the midst of a natural resources boom. The World Bank. Washington, DC

Annexes

Annex 1: Construction of the panel from the LECS 3 -5 surveys¹

1. The LECS is a nationally representative household survey designed to generate representative poverty estimates and other socioeconomic information at the national and provincial levels. The survey sample covers the whole country and is stratified by province and village type (urban, rural with road and rural without road). In the 2002/3 LECS 3 survey, 15 households were surveyed in 540 villages. In the 2007/8 LECS 4 survey, 16 households were surveyed in 519 villages. A panel element to the survey was added at this stage. Enumerators first randomly selected 8 households from a list of LECS 3 households for inclusion in the LECS 4, after which they randomly selected sufficient households to make up a sample of 16 households in each village from the list of non-LECS 3 households. If fewer than 8 LECS 3 households remained in the village, the enumerators selected enough non-LECS 3 households to guarantee a sample of 16. The non-panel households were assigned numbers from 16 onwards in LECS 4. The same procedure was repeated in LECS 5, this time additional non-panel households were assigned numbers from 24 onwards. No tracking of households that moved villages, split-off or individuals who migrated was done at each stage.

Identifying panel households

2. The LECS nine-digit household identification numbers (HHID) are made up of two-digit province numbers, two-digit district numbers, three-digit village numbers, and two-digit household numbers. In LECS 3 a sequential six-digit household number (HHI) was also assigned to each household and used as the household identifier. The HHID variable was deleted in the main data, although province, district and village numbers were kept. The HHID could however be recovered from the agricultural and household business modules which retained both HHID and HHI, but did not contain all households, therefore a manual match had to be made for some. This was done by comparing the households surveyed in LECS 3 (with missing household numbers) in a given village, with the households surveyed in LECS 4 (with household numbers ranging from 1 - 15). In cases with only one missing household number in a village, the correct HHID could easily be added. Where more than one household lacked the correct number, basic household characteristics in LECS 3 were compared with LECS 4. Households were identified by comparing age, gender and ethnicity of household members. Where there were multiple plausible matches the households were not matched, to avoid false matching. The LECS 4 – 5 panel could be more easily constructed as the HHID variable for panel households was kept identical across time, although there was risk of false matches for 55 households numbered 24-66 in 18 villages in LECS 5 because in some cases in LECS 4, households had numbers from 1-31 instead of 1 to 23.

¹ A full description is provided in the report by Nina Fenton, 2015.

Matching outcomes

3. After following the strategies for matching outlined above, 4,061 households could be traced between LECS 3 and LECS 4, and 4,088 between LECS 4 and LECS 5. Of these, 2,085 could be traced back to LECS 3 (see Table 7) for a summary. The number of matches per village suggests that attrition was small. About 497 out of 519 villages in LECS 4 and 496 out of 515 villages in LECS 5 had 8 (the expected maximum) or more successful matches, although no match was found in 13 villages in LECS 4 and 2 villages in LECS 5. There are 12 villages in LECS3-4 and 8 in LECS4-5 where more than 8 panel households were included.

Table 7: Summary of the LECS 3 - LECS 5 survey samples and the panel

Survey	Villages	Households	Individuals	"Panel" households	Villages with panel households in
LECS3: 2002/3	540	8,092	49,790	-	-
LECS4: 2007/8	519	8,296	48,021	4,061	505

4. An assessment of the quality of matches was also done by comparing characteristics of the household head and other members (ethnicity, date and year of birth and gender). However, differences in these characteristics do not necessarily imply an incorrect match. The panel did not specifically track individuals therefore a consistent assignment of individual IDs across rounds is not guaranteed, resulting in inconsistencies in individual characteristics when different individual IDs are assigned across surveys. There could also be a change in the household head or misreporting on variables such as age. A substantial number of respondents did not report a day and month of birth so a comparison on the year of birth is presented instead. This shows that that 1,974 and 2,464 of household heads appear to have been present in the previous round, and 3,164 and 3,458 households respectively (78% and 85% of households) contain at least one exact match on gender and year of birth (see Table 8).

Table 8: Year of birth and gender match in panel households

Anyone in the household matches:	LECS3- LECS4	LECS4- LECS5	LECS3- LECS5	LECS4-LECS5 household numbers 24-31
At least one match in the household	3,164	3,458		44
At least two matches in the household	1,753	2,844		36
At least three matches in the household	1,232	2,088		26
All members from previous round matched	244	492		9
Total number of panel households	4,061	4,085	55	55

Notes: "panel" means villages or households that can be identified as having been included in the previous round.

Panel weights construction

5. The panel weights were constructed following the procedure outlined in Himelein (2014), done in the following 3 steps:

- Calculating the probability of selection into the panel – this is calculated at the level of the strata defined by village type (rural, rural no road and urban) and province. The probability of a household in strata h being selected into the panel sample is $p_1 = \frac{m_h}{M_h}$, Where m is the number of households in strata h in the first round of the panel and M is the total number of households from that strata in the second round of the panel.
- A post-stratification adjustment – calculate the post-stratification adjustment, w_1 , at the strata level. The post-stratification adjustment is equal to the total population in the strata, as calculated from the base household weights for the first survey, divided by the total of the panel weights for that strata.
- Final weights - The household is conceived of as a concrete unit, so there was no tracking attempted of household members that had left the household between survey rounds. Thus, there is no need to correct for household selection into tracking or to conduct “fair share correction” for new household members who are added to the sample because of a household member joining their household. Therefore the final panel weight for a household is:

$$w_{\text{final}} = p_1^{-1} * w_1$$

The panel weights have been designed so that the weighted estimates will be representative of the sample of households at the time of the earliest panel wave in question.

Comparability of the panel to the cross-section

6. A comparison of panel households to non-panel households shows statistically insignificant or very small differences at the baseline for two wave panels (LECS 3 -4 and LECS 4 -5), with the exception of education attainment in the LECS 4 -5 and ethnicity of household head in LECS 3 – 4 (see Table 8). Larger differences are observed at the baseline for three round the LECS 3 -5 panel households, suggesting a poor representativeness for the three wave panel even at the baseline. Statistically significant differences are also observed at the end line even in two wave panels in which panel households show up in the endline survey with older household heads, larger household sizes and in LECS 4-5 panel, a 2 percentage points lower poverty rate. These differences may suggest presence of some attrition bias, but no data on the identification of households that moved or replacement rules that were employed are available for one to effect a correction of this bias.

Table 9: Comparison of panel and non-panel households

	Baseline comparison			Endline comparison		
	LECS3-4	LECS4-5	LECS3-5	LECS4-3	LECS5-4	LECS5-3
Real monthly per capita consumption in 2003 prices	2127.7 (0.60)	8497.0 (1.94)	1233.3 (0.37)	-4778.5 (-1.11)	3907.2 (0.82)	3777.9 (0.74)
Household size	0.139* (2.33)	0.0316 (0.57)	0.0522 (0.79)	0.360*** (6.75)	0.353*** (7.07)	0.328*** (5.66)
Age of household head	0.538 (1.76)	-0.188 (-0.62)	-0.255 (-0.73)	3.616*** (12.23)	4.765*** (15.63)	5.413*** (16.86)
Poverty headcount	-0.0220 (-1.94)	-0.0113 (-1.13)	-0.0394*** (-3.35)	-0.00469 (-0.48)	-0.0223* (-2.44)	-0.0294** (-2.94)
Household head is Lao-Tai	0.0282* (2.53)	0.00570 (0.53)	0.0261* (2.44)	0.0112 (1.07)	-0.00079 (-0.08)	0.0174 (1.48)
Household member has completed primary school	0.0243 (1.83)	0.0746*** (4.80)	0.0500** (3.09)	0.0186 (1.22)	0.0246 (1.41)	0.00639 (0.32)
Observations	8092	8296	8092	8296	8226	8226

Notes: "panel" means villages or households that can be identified as having been included in the previous round.

Annex 2: Regression results

1. The analysis of drivers of poverty is done using multivariate probit regressions based on the panel data component of the last two LECS surveys. Two sets of probit regressions are estimated. One set estimates the probability of moving out of poverty for only those who were poor in 2007/8 (see equation 1) and the other set estimates the probability of falling into poverty for those who were non-poor in 2007/8 only (see equation 2).

$$\Pr(P_{0,it} = 0 | P_{0,it-1} = 1) = \alpha + \beta X_{i,t-1} + \gamma Z_{i,t-1} + \theta W_{i,t-1} + \delta S_{i,t} + \varepsilon_i \quad (1)$$

$$\Pr(P_{0,it} = 1 | P_{0,it-1} = 0) = \alpha + \beta X_{i,t-1} + \gamma Z_{i,t-1} + \theta W_{i,t-1} + \delta S_{i,t} + \varepsilon_i \quad (2)$$

2. Equations 1 and 2 represent the types of regressions estimated where $P_{0,it}$ is the poverty status in year (t) so that $\Pr(P_{0,it} = 0 | P_{0,it-1} = 1)$ is the probability of being non-poor in year (t) for people who were non-poor in the previous period and $\Pr(P_{0,it} = 1 | P_{0,it-1} = 0)$ is the probability of exiting poverty. The explanatory variables are selected to estimate a reduced form regression based on the asset based framework, so that $X_{i,t-1}$ is a vector of household characteristics representing initial (previous wave) household assets/endowments (demographics – household size, dependency ratio and gender of household head; endowments – education, land and productive assets), $Z_{i,t-1}$ represents household livelihoods in previous wave (having a wage income, household business and received remittances), $W_{i,t-1}$ is a set of community or location characteristics (village access to road, electricity, land terrain, region), and $S_{i,t}$ are contemporaneous shocks (changes in median paddy rice price in province, loss of land, household borrowed to pay out of pocket hospitalization expenses).
3. These equations predict the probability of people with given initial endowments, livelihoods and community characteristics to escape poverty, or fall back into poverty in subsequent years. Thus it answers a question like “Are people with a wage income more likely to escape (or fall into) poverty” or “Are people with more education more likely to escape (or fall into) poverty in subsequent periods. Shocks are entered in contemporaneous, terms i) to capture the impact of temporary shocks given the five year gap between the surveys and ii) in recognition that current shocks have a more direct impact on any given amount generated from one’s endowments as opposed to shocks 5 years back whose impact may have dissipated. The results of these regressions are presented in tables 10 and 11 below.

Table 10: Probit marginal effect estimates for the probability of exiting poverty: 2007/8 – 2012/13

	Lao PDR		Lao PDR		Agricultural		Rural	
	coef	se	coef	se	coef	se	coef	se
Number of children below 15 years old	-0.054***	0.016	-0.055***	0.016	-0.051***	0.016	-0.059***	0.017
Number of members 15 years and above	-0.018	0.014	-0.018	0.014	-0.023	0.015	-0.026	0.016
Dependency ratio	0.074	0.183	0.082	0.183	0.050	0.195	0.040	0.204
Age of household head	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Gender of household head	-0.047	0.087	-0.047	0.087	-0.046	0.100	-0.045	0.093
Ethnicity: LaoTai = reference								
MonKhmer	-0.139***	0.039	-0.138***	0.040	-0.154***	0.041	-0.148***	0.044
Chine-Tibet	0.146*	0.081	0.149*	0.081	0.130	0.084	0.122	0.086
Hmong-Lu-Mien	-0.075	0.062	-0.073	0.062	-0.089	0.064	-0.087	0.066
Other ethnic group	-0.587**	0.249	-0.589**	0.248	-0.592**	0.260	-0.297	0.344
Education: No formal education = reference								
Some primary education	0.066	0.069	0.067	0.069	0.058	0.072	0.094	0.071
Completed primary education	0.193***	0.069	0.195***	0.069	0.191***	0.072	0.209***	0.072
Completed lower secondary education	0.287***	0.075	0.290***	0.075	0.280***	0.078	0.300***	0.080
Completed upper secondary education	0.303***	0.096	0.308***	0.095	0.270***	0.104	0.249**	0.108
Completed vocational training	0.403***	0.128	0.404***	0.131	0.283**	0.144	0.252	0.169
Completed university degree ^a	-		-		-		-	
Other assets								
Agriculture land accessed(in hectares)	0.015	0.011	0.015	0.011	0.015	0.011	0.018	0.012
Value of productive assets (in logs)	-0.005	0.021	-0.004	0.021	-0.005	0.022	-0.010	0.024
Livelihoods								
Has non-farm income	0.082*	0.049	-	-	-	-	-	-
Has non-farm wage income	-	-	0.054	0.059	0.129*	0.071	0.212***	0.074
Has household business	-	-	0.064	0.065	0.069	0.070	0.028	0.079
Received remittances	0.120	0.104	0.118	0.104	0.094	0.116	0.223*	0.123
Shocks								
Borrowed for health care	-0.039	0.089	-0.042	0.089	-0.036	0.093	-0.006	0.096
Change in median paddy rice price in province	0.099*	0.055	0.099*	0.055	0.120**	0.057	0.120**	0.060
Lost more than 10 percent of land	0.036	0.036	0.037	0.036	0.037	0.037	0.005	0.040
Community characteristics								
Village has access to road	0.108***	0.041	0.109***	0.041	0.117***	0.043	0.110**	0.043
Village connected to electric grid	0.039	0.036	0.040	0.036	0.032	0.038	0.025	0.039
Altitude: Lowland = reference								
Midland	0.097**	0.046	0.099**	0.046	0.078	0.048	0.034	0.052
Upland	-0.007	0.045	-0.008	0.045	-0.020	0.047	-0.048	0.049
Region: Vientiane Municipality = reference								
North	0.011	0.099	0.011	0.101	-0.094	0.147	-0.329**	0.149
Center	0.038	0.092	0.040	0.093	-0.071	0.145	-0.323**	0.146
South	0.057	0.099	0.058	0.100	-0.051	0.151	-0.308**	0.150
Urban area	0.037	0.057	0.035	0.058	0.050	0.067	-	

Source: Authors calculations from LECS 4 – 5 panel

Notes: All regressions are weighted, No separate urban regression because of a small sample size, resulting in many perfect predictors for either moving out or staying in poverty. (a) Households with university education excluded because the perfectly predict staying non-poor
Level of significance: 0.01- ***, 0.05 - **, 0.01 - *

Table 11: Probit marginal effects estimates for the probability of entering into poverty

	Lao PDR		Lao PDR		Agricultural		Rural		Urban	
	coef	se	coef	se	coef	se	coef	se	coef	se
Number of children below 15 years old	0.023***	0.008	0.022***	0.008	0.025***	0.009	0.029***	0.010	0.009	0.013
Number of members 15 years and above	0.021***	0.006	0.021***	0.006	0.020***	0.007	0.029***	0.008	0.009	0.008
Dependency ratio	-0.010	0.062	-0.007	0.062	-0.034	0.076	-0.042	0.077	0.014	0.089
Age of household head	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.001	0.002**	0.001
Gender of household head	0.001	0.039	0.001	0.039	0.017	0.051	0.004	0.041	0.000	0.051
Ethnicity: LaoTai = reference										
MonKhmer	0.049***	0.019	0.048**	0.019	0.061***	0.022	0.050**	0.023	0.084**	0.038
Chine-Tibet	-0.104**	0.044	-0.105**	0.043	-0.126**	0.049	-0.151***	0.055	0.014	0.064
Hmong-Lu-Miena	0.089***	0.029	0.088***	0.029	0.096***	0.033	0.095***	0.034		
Other ethnic group	0.041	0.077	0.042	0.076	0.074	0.086	0.046	0.091	0.071	0.068
Education: No formal education = reference										
Some primary education	-0.107***	0.039	-0.107***	0.039	-0.117***	0.045	-0.110**	0.046	0.058	0.080
Completed primary education	-0.177***	0.039	-0.178***	0.039	-0.198***	0.045	-0.218***	0.047	0.154***	0.051
Completed lower secondary education	-0.227***	0.041	-0.228***	0.040	-0.253***	0.046	-0.263***	0.047	0.071	0.046
Completed upper secondary education	-0.272***	0.045	-0.269***	0.045	-0.318***	0.053	-0.302***	0.053	0.035	0.046
Completed vocational training	-0.371***	0.054	-0.369***	0.054	-0.385***	0.066	-0.359***	0.063	-0.043	0.056
Completed university degree	-0.370***	0.075	-0.366***	0.075	-	-	-	-	-	-
Other assets										
Agriculture land accessed(in hectares)	-0.010***	0.004	-0.011***	0.004	-0.012***	0.005	-0.010**	0.005	-0.008	0.007
Value of productive assets (in logs)	-0.007	0.008	-0.007	0.008	-0.012	0.009	-0.016*	0.009	0.006	0.013
Livelihoods										
Has non-farm income	-0.032*	0.017	-	-	-	-	-	-	-	-
Has non-farm wage income	-	-	-0.020	0.022	-0.023	0.030	-0.000	0.030	-0.006	0.023
Has household business	-	-	-0.038**	0.018	-0.038	0.024	-0.074***	0.025	0.015	0.023
Received remittances	-0.031	0.025	-0.032	0.024	-0.021	0.030	-0.020	0.030	-0.035	0.032
Shocks										
Borrowed for health care	0.055	0.035	0.055	0.035	0.036	0.040	0.043	0.042	0.116**	0.054
Change in median paddy rice price in province	-0.071***	0.025	-0.072***	0.025	-0.071**	0.029	-0.071**	0.031	-0.146***	0.054
Lost more than 10 percent of land	0.022	0.017	0.022	0.017	0.019	0.018	-0.004	0.019	0.071***	0.026
Community characteristics										
Village has access to road	0.002	0.021	0.002	0.021	-0.005	0.024	-0.003	0.024	-	-
Village connected to electric grid	-0.019	0.017	-0.019	0.017	-0.027	0.019	-0.020	0.019	0.062	0.099
Altitude: Lowland = reference										
Midland	-0.045**	0.021	-0.045**	0.021	-0.089***	0.025	-0.094***	0.026	0.046	0.029
Upland	0.008	0.020	0.009	0.020	-0.010	0.023	-0.016	0.024	0.054	0.039
Region: Vientiane Municipality = reference										
North	-0.025	0.032	-0.027	0.032	-0.060	0.046	-0.014	0.050	-0.060	0.037
Center	0.002	0.030	0.001	0.030	-0.021	0.044	0.006	0.047	-0.036	0.029
South	0.005	0.031	0.004	0.031	-0.042	0.046	-0.009	0.050	-0.004	0.036
Urban area	0.006	0.024	0.008	0.024	0.009	0.031	-	-	-	-

Source: Authors calculations from LECS 4 - 5 panel

Notes: All regressions are weighted, No separate urban regression because of a small sample size, resulting in many perfect predictors for either moving out or staying in poverty. (a) Hmong-Lu-Mien dummy excluded in urban regressions because it perfectly predicts failure (b) Households with university education excluded because the perfectly predict staying non-poor

Level of significance: 0.01- ***; 0.05 - **, 0.01 -*





The World Bank Lao PDR
Patouxay Nehru Road
P.O Box: 345
Vientiane, Lao PDR
Tel: (856-21) 266 200
Fax: (856-21) 266 299
Website: www.worldbank.org/lao

The World Bank
1818 H Street, NW
Washington, D.C. 20433, USA
Tel: (202) 4731000
Fax: (202) 4776391
Website: www.worldbank.org