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Levels and Sources of Household Income in Rural Cambodia 2012

TONG Kimsun, LUN Pide
and SRY Bopharath with the assistance of PON Dorina

Working Paper Series No. 83

August 2013

A CDRI Publication

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Responsibility for ideas, facts and opinions presented in this research paper rests solely with the authors. Their opinions and interpretations do not necessarily reflect the views of the Cambodia Development Resource Institute.

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ACRONYMS AND ABBREVIATIONS

CDRI	Cambodia Development Resource Institute
CPI	Consumer Price Index
CSES	Cambodia Socio-Economic Survey
ILO	International Labour Organisation
IMF	International Monetary Fund
MOP	Ministry of Planning
NGO	Non-governmental Organisation

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Phnom Penh
August 2013

EXECUTIVE SUMMARY

Households in Cambodia derive their income mainly from non-farm self-employment, salaries and wages, agricultural crops and other activities. On average, non-farm self-employment income amounts to 29 percent of total income, but its share was largest during the oil and food price increases and the global financial crisis that occurred in 2008 and 2009. However, household participation rates in non-farm self-employment during the crisis were exactly the same as in 2007 and two percentage points lower than in 2010. This suggests that households engaged in non-farm self-employment are likely to gain more benefit during income shocks, which appears to contradict the perception of non-farm self-employment as an insurance strategy (Lay et al. 2009)—particularly when households face income shocks for which they are unable to compensate with labour.

Phnom Penh and other urban areas seem to depend on only two primary sources of income, self-employment and wage labour, while rural households rely mostly on agriculture, but self-employment and wage labour are also important. The lowest quintile of households relies on wage labour and agricultural crops rather than non-farm self-employment. In contrast, the highest quintile of households derives a higher share of their income from non-farm self-employment. More than 60 percent of the highest quintile participated in non-farm self-employment, while the corresponding figure in the lowest quintile was only 20 percent. This inactivity in the non-farm self-employment sector largely reflects a lack of entrepreneurship and/or education. This finding is consistent with the recent study by Rahut and Micevska Scharf (2012), who confirm that education plays a major role in access to the non-agricultural sector and reducing poverty in Cambodia.

Female-headed households had lower income than male-headed households over the study period. In addition, the income of female-headed households fluctuated more sharply. The difference is likely due to capital constraints and a lack of agricultural land and education. Therefore, female-headed households depended more on low-paid jobs, while male–headed households relied mainly on self-employment, particularly during the crisis.

Income per capita in rural areas amounted to 1,850,000 riels per year in 2004 and edged up to 2,138,000 riels in 2012—an increase of 16 percent. Income per capita in rural areas was the lowest among the three regions (Phnom Penh, other urban and rural). The income gap between other urban and rural areas increased over 2004-08 and decreased in 2009 before reaching its narrowest point in 2011. The main source of income in rural areas was agriculture: crops, fishing, forestry and hunting—representing 33 percent of total income per capita in 2004, and remained almost unchanged over the study period except in 2012. Income from non-farm self-employment was the least important source for rural households, at 21 percent of total income in 2004 and remaining almost the same during 2004-12. Salaries and wages showed increasing importance in the last few years, rising from 21 percent in 2004 to 37 percent in 2012—the trend being the same across wealth quintiles, agro-ecological zones and gender of household head.

Rural income per capita grew by 29.5 percent between 2004 and 2007—equivalent to an annualised rate of 9 percent. In 2008, this contracted by 9 percent. Female-headed households experienced a larger income loss than male-headed households. The decline was greatest among the second and fifth quintile households. In 2009, rural income per capita grew at the fastest rate, 20 percent, with the largest gain in the highest quintile and female-headed households. It

experienced slower growth of 6 percent in 2010 and registered negative growth of 4 percent and 20 percent in 2011 and 2012.

Income per capita for the highest quintile in rural areas was 2.8 times larger than in the lowest quintile in 2004. Income inequality between the lowest and highest quintiles in rural households widened over the study period, although the ratio between them declined in the last two years. In other words, the highest quintile households are more likely to have benefited from rural income growth than the lowest quintile households. Importantly, income disparity in rural areas seems to be higher than at the national level. However, income inequality between rural and urban area especially Phnom Penh started to narrow down in 2009 and reached its lowest level in 2011. The decrease in the income gap between Phnom Penh and rural areas in 2010 and 2011 was mostly due to the sharp drop of incomes in Phnom Penh, while those in rural areas remain unchanged. This suggests that broad-based growth strategies are needed to help poor rural households to benefit more from overall economic growth.

More than two-thirds of households thought their incomes from various sources would remain at least the same, with 21 percent believing that their income would decrease. Factors influencing households' perceptions about their levels of income in the future are both internal and external. Households engaged in agriculture mostly viewed internal factors, specifically factor endowments, as the main determinant. Internal and external factors can determine the future of other sources of income. External factors include the villagers' initial income, local labour markets and the business situation. Infrastructure and access to credit are not viewed by many as main influences on their future levels of income. Lastly, the past level of income shapes current views about future income.

1

INTRODUCTION

The research reported here measured the level and sources of household income in rural Cambodia over 2004-12. The analysis will provide insights into rural household livelihood strategies that can help identify ways to increase and/or stabilise rural income in the future and serve as an input to the Poverty Assessment—the key instrument of the World Bank's poverty reduction strategy. The justification for a focus on rural areas is that rural households represent 80 percent of Cambodia's population (MOP 2009), and poverty incidence in rural areas remains high: 34.7 percent in 2007 compared to 21.8 percent in other urban areas and 0.8 percent in Phnom Penh (World Bank 2009).

Rural households in developing countries are traditionally assumed to be overwhelmingly dependent on agriculture. However, there is evidence suggesting that rural households' livelihoods draw on various activities—e.g., Murshid (1998), Chan & Acharya (2002), Helmers *et al.* (2004), Tong & Sry (2011) and Tong & Phay (2013). Rural households can participate in waged employment and self-employment in commerce along with the traditional rural activities of farming and agricultural labour. Such non-farm self-employment income sources contribute significantly to total incomes of farming households and to some extent allow rural households to ensure food security and improve well-being. Therefore, analysing household income and understanding how it has changed over the past nine years can offer new perspectives into rural livelihood strategies that can help identify ways to increase and/or stabilise incomes in the future.

This report draws on nationally representative household survey data, i.e. the Cambodia Socio-Economic Survey (CSES), in 2004, 2007, 2008, 2009, 2010 and 2011, and a 2012 rural household survey conducted by CDRI. This paper specifically responds to these questions:

1. What were the levels and sources of income of rural households in 2004? How does the general pattern vary across wealth quintiles and agro-ecological zones?
2. To what extent do the levels and sources of income of rural households in 2004 differ from those of urban households?
3. What are the trends over time? Were there any changes in the relative importance of different income sources? What are the factors explaining these trends?
4. What are the perceptions of rural people of the levels and sources of their incomes in the next three years (to 2015)?
5. Within each of the above questions, are there any importance differences in terms of gender?

Section 2 of this report reviews previous studies related to rural income in Cambodia. Section 3 describes the data which underlie the analysis. Section 4 presents the descriptive results and Section 5 concludes.

2

LITERATURE REVIEW

Over the past 20 years, several studies have attempted to estimate the levels and sources of household income in Cambodia. Understanding the structure of household incomes and their distribution across years and geographical areas as well as income classes is extremely important from various perspectives, including rural development and food security. However, estimates of household income are somewhat inconsistent because income has been defined differently—e.g. Murshid (1998), Helmers *et at.* (2004) and Tong and Sry (2011) draw on both cash and in-kind income, while Chan and Acharya (2002) use cash income only (Table 1). As noted by Murshid (1998), income levels are important, but it is much more interesting to examine income composition. These studies clearly illustrate that agricultural income plays a critical role for rural Cambodian households, although there are varying findings on the relative importance of income sources. The lowest wealth quintile households depend on agriculture the most, as do households in the plains.

Helmers *et al.* (2004), using the 1999 CSES to examine rural households' sources of income and livelihood strategies in Cambodia, point out that rice—recognised as the most important item for food production—contributes 23 percent of total household income, followed by livestock at 17 percent, non-rice crops 7 percent, forestry and hunting 6 percent and fisheries 6 percent. They also note that the lack of infrastructure and functioning support services such as markets, extension and research services and agricultural credit are major constraints to increasing rural agricultural incomes. They reveal further that other incomes represent 43 percent of total household income—of which non-farm business accounts for 18 percent and wages 17 percent.

Rahut and Micevska Scharf (2012) used the 2004 CSES to examine the relationship between education and participation in the non-farm sector by taking the heterogeneity of non-farm employment into account. Having adopted probit and tobit models, with the education of the oldest household member and smoking at an early age as instrumental variables for education and sample selection model, they find that education plays a major role in accessing non-farm employment. They note that the poor and the less educated are unlikely to participate in the non-farm sector, and that when they do so, they work in low-paid jobs and earn less. The share of non-farm income to total income accounts for 56 percent, followed by farm self-employment at 25 percent, wage income 10 percent and other income 9 percent. The highest quintile households derive their income from the non-farm sector and the lowest quintile households from farm self-employment.

Having noted that the quality of income data is an issue in CSES, the Ministry of Planning (2012) nevertheless acknowledged that the estimated incomes are reasonable as useful information about the different regions in Cambodia and how Cambodians earn their living. Using CSES 2009 and 2010, it observes that agriculture is the main income source in rural Cambodia and non-agricultural activities are the main sources in Phnom Penh and other urban areas. Salaries and wages represent one-third of total income. Households engaged in casual labour also have income from self-employment.

Table 1. Household Income in Previous Studies (1997-2011)

	Data source	Survey year	Total household income		Income per capita/ year (riels)
			Riels	Measurements	
Murshid (1998)	CDRI—3 villages	1997	132133	household per month	317119
Helmers *et. al.* (2004)	CSES 1999	1999	3076817	household per year	615363
Chan & Acharya (2002)	CDRI—9 villages	2001	2750000	household per year	550000
So (2012)	CDRI—9 villages	2001	1233	per capita per day	450045
Tong & Phay (2013)	CDRI—9 villages	2001	470800	per capita per year	470800
Rahut & Micevska Scharf (2012)	CSES 2004	2004	249241	household per month	598177
Fitzgerald and So (2007)	CDRI—9 villages	2004	2007	per capita per day	732555
Tong & Phay (2013)	CDRI—9 villages	2004	899700	per capita per year	899700
Tong & Sry (2011)	CSES 2007	2007	2842	per capita per day	1037494
So (2012)	CDRI—9 villages	2008	3437	per capita per day	1254505
Tong & Phay (2013)	CDRI—9 villages	2008	1854900	per capita per year	1854900
Ministry of Planning (2012)	CSES 2009	2009	736000	household per month	1766400
Ministry of Planning (2012)	CSES 2011	2010	877000	household per month	2104800
Tong & Phay (2013)	CDRI—9 villages	2011	1931100	per capita per year	1931100

Note: The last column is estimated by the authors. To convert income per capita to income per household, we assumed that the average size of Cambodian households is five members. This approach could either overestimate or underestimate household income per month given that the original calculation is based on an adult equivalent scale.

Tong and Sry (2011), who also used nationally representative household survey data (i.e. CSES 2007) to examine the impact of environmental income on poverty, indicated that salaries and wages account for 32.7 percent of total income, followed by agricultural income 29.4 percent, non-agricultural income 26.7 percent and other income 11.1 percent. Dependence on non-agricultural activities by households in the coastal zone is higher than in other regions. This reflects some variations in income sources across agro-ecological zones. These variations are largely due to agricultural landholdings, availability and access to common property resources such as fisheries and forestry and local economic opportunities.

Fitzgerald and So (2007) used the two-period panel data of 890 households in nine villages in rural Cambodia to examine poverty mobility. They argued that the main income sources of rural households are agriculture, self-employment, wage labour and common property resources. However, they note that the proportion of household income from agriculture and common property resources fell, while the contribution of self-employment and wage labour

increased between 2001 and 2004. Self-employment and agricultural activities were the most important sources of income for never poor groups, and wage labour for the chronically poor groups.

Using the same dataset as Fitzgerald and So (2007) for 2001-04 and two additional follow-up surveys conducted in 2008 and 2011,[1] Tong and Phay (2013) confirm that rural household income is derived from many different sources. They also observe that income from crops, livestock and off-farm activities grew significantly over 2001-08 before turning negative in 2011. In addition, they note that the share of crops income in total income increased from 33 percent in 2001 to 50 percent in 2011. In contrast, the share of livestock income decreased from 23 percent in 2001 to 15 percent in 2011, while off-farm income declined from 43 percent in 2001 to 35 percent in 2011.

[1] Some households were dropped because they had migrated to other places. Therefore, the balance panel sample amounts to 793 households.

3

DATA

This study is based on nationally representative household data: the CSES conducted by the National Institute of Statistics in 2004, 2007, 2008, 2009, 2010 and 2011 and a household survey in rural areas collected by Cambodia Development Resource Institute in 2012. The sampling designs of the CSES used three-stage sampling methods with villages in the first stage, enumeration areas (or primary sampling units) in the second stage and households in the third. The sampling frame for 2004, 2007 and 2008 was based on the general population census in 1998 and the remaining CSES based on the general population census in 2008. The 2004 and 2009 surveys sampled around 720 villages, while in 2007, 2008, 2010 and 2011 half the number of villages and about one-third of the households were sampled. The sample villages for CSES 2007 and 2008 were a sub-sample of CSES 2004, and those of CSES 2010 and 2011 sub-samples of CSES 2009. The 2009 survey sampled different villages from the 2004 survey. The CSES data contain detailed information on a wide range of household characteristics and economic activities, which allows us to estimate a comprehensive household income. This can then be related to household demographics, gender and educational attainment of household head, land and other asset ownership and location.

Although the sampling frame of the household survey conducted by CDRI in 2012 is also based on the general population census in 2008, we adopted a different sampling design because of budget and time limitations. We purposively selected 78 villages from 14 provinces in the first stage and drew 20 households randomly within each village in the second stage. In total, the 2012 rural household survey questioned 1560 households (Appendix 1). Given the different sampling design from CSES, CDRI attempted to design the household questionnaire to collect comparable information. The sample surveys, particularly in 2007, 2008, 2010, 2011 and 2012, do not greatly differ and, to some extent, permit comparisons of income data (Table 2).

Table 2. Sample Size

	2004	2007	2008	2009	2010	2011	2012
Phnom Penh	1400	737	729	1113	744	747	-
Other urban	2100	628	626	1332	640	638	-
Rural	11500	2228	2193	9526	2208	2207	1560
Total	15000	3593	3548	11971	3592	3592	1560

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011, and CDRI Rural Household Survey 2012

4

ESTIMATION METHODS OF HOUSEHOLD INCOME

This section will explain how household incomes were estimated in this report from the Cambodia Socio-Economic Survey data in 2004, 2007, 2008, 2009 and 2010 and rural household survey in 2012. Theoretically, income is defined as the sum of consumption expenditure and change in net worth in a given period (Simons 1938 in Atkinson and Stiglitz 1980). Operationally, income largely depends on a list of its components. At present, there is no standard classification of income components, although several are used at national levels and proposed at the international level (ILO 2003). Of these, Mckay (2000) argues that households can derive their income from many different sources, which can be classified into factor and non-factor income. Total household income is the sum of these sources and represents the total purchasing power available to a household in a given time period.

Factor income can be defined as payment received by a household for supplying factors it owns to productive activities. There are three main types of factor income: wages, rental and self-employment income. Wages are received in return for the supply of labour services; rental is received in return for the supply of land, capital or other assets; self-employment income is typically a return both to labour supplied by household members and to other factors these members own.

Non-factor income is defined as net transfers received from various sources including firms, government agencies, other households, and nongovernmental organisations. There are two types of transfer: current transfers and capital transfers. Only current transfers (such as inter-household transfers of cash or food) and not capital transfers (such as inheritance of land or receipt of a loan) should be regarded as income.

Table 3 reflects the above discussion in setting out the income components on which information should be collected in the survey questionnaire.

In practice, it is difficult to be sure that all income sources for a given household have been identified since some sources may be very casual or infrequent, and therefore the respondent might not think to mention them in response to questions about waged employment or non-farm enterprises. Respondents may not remember their income from certain activities, especially self-employment activities for which they often do not keep accounts. In addition, it is very difficult for them to make imputations such as placing a valuation on wages received in kind. Importantly, it is challenging to incorporate the depreciation of capital equipment in an estimate of total household income, especially in developing countries such as Cambodia.

Estimating total household income in accordance with Table 3 involves collecting information on at least the following four elements: wages, agricultural income, non-farm self-employment income and non-labour income. Given the different nature of these sources, the data necessary to estimate them have been collected in different modules within the questionnaire. The natural place to collect the data for estimating income from wages is the employment module. Data income from household agriculture and non-farm enterprises can naturally be collected in the agriculture and household enterprise module, while data on non-labour income can be gathered in one or more short modules designed mainly to identify such income.

Table 3. Measuring Total Household Income

Income component	Data that must be collected
Wage	• Wage in cash • Wage in kind*
Agricultural income	• Revenue from sale of crops • Revenue from the sale of processed crops • Revenue from the sale of animal products and by-products • Consumption of self-produced food* Minus • Expenditure on inputs for crops • Expenditure on inputs for processing crops • Expenditure on livestock inputs • Depreciation of agricultural capital equipment
Non-farm self-employment income	• Revenue in cash from sale of outputs • Revenue in kind from sale of outputs • Consumption of own produced outputs* Minus • Expenditure on inputs • Depreciation of capital equipment
Imputation for commodities obtained from natural resources	• Food commodities • Non-food commodities*
Actual and imputed rental income	• Income from renting out household assets • Imputed rent of owner-occupied dwelling*
Income from private inter-household transfers	• Income from private inter-household transfers in cash and kind
Other	• Various miscellaneous income (pensions, unemployment benefits)

* Elements that should also be included in an estimate of total household consumption.

Source: McKay (2000)

Table 4 provides the sources of data in the 2004, 2007, 2008, 2009, 2010 and 2011 CSES used to estimate income for this report. As noted by the Ministry of Planning (2012), there are no rules for depreciation—i.e. how to divide expenditure for investments into several years. Therefore, it is very common to find households whose expenditure for agricultural income and non-farm self employment is higher than receipts and the estimated value of own consumption of own production. In this case, households have a deficit or negative income. To address the negative income, we have followed the suggestion of the Ministry of Planning (2012) by replacing negative income from both agriculture and non-farm self employment by 3500 riels in 2004, 3800 riels in 2007, 3900 riels in 2008, 4000 riels in 2009, 4100 riels in 2010 and 4200 riels in 2011. Given time constraints, we have not yet incorporated income from owner-occupied dwellings into total household income. To simplify our estimates, we have included income from private inter-household transfers in "other income".

Since households differ in size and composition, a simple comparison of aggregate household income can be quite misleading about the well-being of individuals. The straightforward method is to convert household income to individual income by dividing the former by the number of people in the household. Then, total income per capita is the measure of welfare assigned to each member.

Table 4. Sources of Data Used to Estimate Household Income in 2004, 2007, 2008, 2009, 2010, 2011 CSES

Income component		Sources of information					
		2004 CSES	**2007 CSES**	**2008 CSES**	**2009 CSES**	**2010 CSES**	**2011 CSES**
Wages		Section 13B, question 8 (1 month)	Section 13B, question 8 (1 month)	Section 13B, question 8 (1 month)	Section 15, question 20 (1 month)	Section 15, question 20 (1 month)	Section 15, question 20 (1 month)
Agricultural income (crops)	Revenue	Section 04B, questions 6,7 & 10 (two seasons-12 months)	Section 05B, questions 6,7 & 9 (two seasons-12 months)	Section 05B, questions 6,7 & 9 (two seasons-12 months)	Section 05B, questions 6,7 & 9 (two seasons-12 months)	Section 05B, questions 6,7 & 9 (two seasons-12 months)	Section 05B, questions 6,7 & 9 (two seasons-12 months)
	Expenditure	Section 04C, question 4 (two seasons-12 months)	Section 05C, question 16 (two seasons-12 months)	Section 05C, question 16 (two seasons-12 months)	Section 05C, question 16 (two seasons-12 months)	Section 05C, question 16 (two seasons-12 months)	Section 05C, question 16 (two seasons-12 months)
Agricultural income (livestock)	Revenue	Section 04E, question 8, 10, 11,12, 13 & 14 (12 months)	Section 05E, questions 9, 11, 12, 13, 14 & 15 (12 months)	Section 05E, questions 9, 11, 12, 13, 14 & 15 (12 months)	Section 05E, questions 9, 11, 12, 13, 14 & 15 (12 months)	Section 05E, questions 9, 11, 12, 13, 14 & 15 (12 months)	Section 05E, questions 9, 11, 12, 13, 14 & 15 (12 months)
	Expenditure	Section 04E, question 16 (12 months)	Section 05E, question 3 (12 months)	Section 05E, question 3 (12 months)	Section 05E, question 3 (12 months)	Section 05E, question 3 (12 months)	Section 05E, question 3 (12 months)
Agricultural income (fishing)	Revenue	Section 04F, question 11 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)
	Expenditure	Section 04F, question 11 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)	Section 05F, question 3 (12 months)
Agricultural income (forestry and hunting)	Revenue	Section 04G, question 7 (12 months)	Section 05G, question 6 (12 months)	Section 05G, question 6 (12 months)	Section 05G, question 6 (12 months)	Section 05G, question 6 (12 months)	Section 05G, question 6 (12 months)

Income component		Sources of information					
		2004 CSES	**2007 CSES**	**2008 CSES**	**2009 CSES**	**2010 CSES**	**2011 CSES**
	Expenditure	Section 04G, question 9 (12 months)	Section 05G, question 3 (12 months)	Section 05G, question 3 (12 months)	Section 05G, question 3 (12 months)	Section 05G, question 3 (12 months)	Section 05G, question 3 (12 months)
Non-farm self-employment income	Revenue	Section 04H, question 23-30 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)
	Expenditure	Section 04H, question 14-21 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)	Section 05H, question 3-7 (12 months)
Consumption of own produced output	Food commodities	Section 01D, question 3, item 1-20 excluding tobacco (7 days)	Section 01B, question 4, item 1-20 excluding tobacco (7 days)	Section 01B, question 4, item 1-20 excluding tobacco (7 days)	Section 01B, question 4, item 1-20 excluding tobacco (7 days)	Section 01B, question 4, item 1-20 excluding tobacco (7 days)	Section 01B, question 4, item 1-20 excluding tobacco (7 days)
	Non-food commodities	Section 07B, question 4, item 1-5 (1-2: 6 months) (3-5: 12 months) Section 01D, question 3, item 17 -tobacco (7 days)	Section 01C, question 5, item 1-16 (1-8: 1 months) (9: 6 months) (10-16: 12 months) Section 01B, question 4, item 17 -tobacco (7 days)	Section 01C, question 5, item 1-16 (1-8: 1 months) (9: 6 months) (10-16: 12 months) Section 01B, question 4, item 17 -tobacco (7 days)	Section 01C, question 5, item 1-13 (1-4: 1 month) (5: 6 months) (6-13: 12 months) Section 01B, question 4, item 17 -tobacco (7 days)	Section 01C, question 5, item 1-13 (1-4: 1 month) (5: 6 months) (6-13: 12 months) Section 01B, question 4, item 17 -tobacco (7 days)	Section 01C, question 5, item 1-13 (1-4: 1 month) (5: 6 months) (6-13: 12 months) Section 01B, question 4, item 17 -tobacco (7 days)
Other (including income from private inter-household transfers)		Section 06, question 2, item 1-13 (12 months)	Section 07, question 5, item 1-11 (12 months)	Section 07, question 5, item 1-11 (12 months)	Section 07, question 5, item 1-12 (12 months)	Section 07, question 5, item 1-12 (12 months)	Section 07, question 5, item 1-14 (12 months)

Note: Reference period is in parentheses.

Source: CSES 2004, 2007, 2008, 2009, 2010 and 2011

The comparison of income per capita over time is likely to be erroneous if price increases are not taken into account. The consumer price index (CPI), which measures the cost of a basket of goods and services representative of household consumption expenditure, has been considered the best available measure of inflation in the prices of consumer goods and services. In this study, the spatial price index and annual rate of inflation estimated by the World Bank (2012) were used to adjust price differences among Phnom Penh, other urban and rural during 2004-11 and price differences over the same period. Since the CPI is available for 2004-11, the team used the inflation rate for 2012 released by the IMF and estimated for rural areas based on previous trends (Table 5).

Table 5. Consumer Price Index (Phnom Penh Prices=100) and Annual Inflation Rate

	2004	2007	2008	2009	2010	2011	2012
CPI							
Phnom Penh	63.09	82.49	112.30	100.00	105.30	112.92	116.98
Other Urban	49.25	64.39	86.26	80.22	84.50	90.64	93.99*
Rural	45.20	59.27	86.32	73.48	77.40	83.02	86.10*
Inflation Rate (%)							
Phnom Penh		30.74	36.14	-10.95	5.30	7.23	3.60
Other Urban		30.75	33.97	-7.01	5.33	7.27	3.70*
Rural		31.15	45.63	-14.88	5.33	7.27	3.70*

* Estimated by CDRI for other urban and rural given the estimated annual inflation rate in Phnom Penh of 3.6 percent by IMF, http://www.imf.org/external/country/KHM/index.htm (accessed on 15 November 2012)
Source: World Bank (2012)

5

EMPIRICAL EVIDENCE ON RURAL INCOME

5.1 Level and Sources of Income

As illustrated in Table 6, the average income per capita in Cambodia rose over 2004-11. Yearly income per capita amounted to 2,091,000 riels in 2004, and reached its highest value, 3,043,000 riels, in 2010 before dropping to 2,881,000 riels in 2011. In 2004, non-farm self-employment income made up 27 percent of the total income, the largest share among income sources defined in this study, followed by income from salaries and wages (25 percent), other income[2] (21 percent), crops (8 percent), livestock (8 percent), forestry and hunting (6 percent) and fishing (4 percent). On average, non-farm self-employment income comprised about one-third of total income over 2004-11. This suggests that the non-farm self-employment sector is the most important income source for households, even at this highly aggregated national level and despite the drop in its share from 33 percent in 2009 to 26 percent 2011. Salaries and wages' share gradually increased from 25 percent in 2004 to 34 percent in 2011, although it went down to 25 percent in 2009 due to the effect of the oil and food price increases and the global financial crisis. Income from other sources dropped from 21 percent in 2004 to 15 percent in 2011, while the share of agricultural crops rose from 8 percent in 2004 to 15 percent in 2011. The proportion of livestock, fishery, forestry and hunting in total income declined over 2004-11.[3] In general, income from salaries and wages and agricultural crops has become more important for Cambodians in the 2000s.

Average income per capita grew by 29 percent between 2004 and 2007 at an annualised rate of 6 percent per year, but declined by 4 percent in 2008 before jumping to a 15 percent increase in 2009. However, it grew only 3 percent in 2010 and shrank by 5 percent in 2011. Both income gains and losses during 2009-11 appear to contradict macroeconomic indicators, which suggested that Cambodia's economic growth registered only 0.1 percent in 2009, recovered to 6 percent in 2010 and was projected to be 5.8 percent in 2011 (IMF 2012).

Phnom Penh is clearly better off, followed by other urban, with rural areas being the poorest. Yearly income per capita in Phnom Penh was about 3,555,000 riels in 2004—1.2 and 1.9 times higher than in other urban and rural areas, respectively. This gap reached a high of 1.5 times in 2007 (urban) and 2.5 times in 2008 (rural) before it gradually decreased to 1.2 times (urban) and 1.5 (rural) times in 2011. The most important sources of income in Phnom Penh were salaries and wages at more than 45 percent of total income in 2004-11, except in 2008 and 2009, when their share dropped below 40 percent. Non-farm self-employment income was the second most important source in Phnom Penh, at 43 percent in 2004, increasing to more than 55 percent in 2008 and 2009 and dropping to below 40 percent in 2010 and 2011.

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2 Other included pensions, remittances, government or NGO transfers (scholarships), bank interest, dividends and winnings from lotteries and gambling.

3 If we define crops, livestock, fishing, forestry and hunting as agricultural income sources, we find that agriculture still accounts for an average of 24.7 percent of total income in 2004-11, which is 7.5 percentage points lower than non-agricultural income and 1.6 percentage points lower than salaries and wages, but 8.1 percentage points higher than other income.

Table 6. Yearly Income Per Capita, by Source ('000 riels at 2009 prices—full sample)

	2004	2007	2008	2009	2010	2011
Salaries and wages	517	761	666	743	914	982
Non-farm self-employment	574	734	844	964	893	743
Crops	175	375	316	424	414	429
Livestock	176	143	130	126	133	125
Fishing	86	85	79	82	61	54
Forestry and hunting	119	131	87	122	117	117
Other	444	459	457	504	511	432
Total	2091	2688	2580	2965	3043	2881
Share (%)						
Salaries and wages	25	28	26	25	30	34
Non-farm self-employment	27	27	33	33	29	26
Crops	8	14	12	14	14	15
Livestock	8	5	5	4	4	4
Fishing	4	3	3	3	2	2
Forestry and hunting	6	5	3	4	4	4
Other	21	17	18	17	17	15
Total	100	100	100	100	100	100
Sample Size	14653	3194	3070	11760	3501	3502

Note: Sampling weight is applied

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

Achieving an 8 percent growth rate per annum between 2004 and 2007, income per capita in Phnom Penh accelerated to 10 percent in 2008 before registering negative of 2 percent and 24 percent in 2009 and 2010, respectively. In 2011, income per capita in Phnom Penh remained almost the same as in 2010. The decline of income per capita in Phnom Penh was likely in line with the GDP growth indicator in 2009, however, it highlighted further that the global financial crisis in 2009 hit Cambodia—particularly households in Phnom Penh—the hardest in the following year and lasted until 2011.

Table 7. Yearly Income Per Capita, by Region ('000 riels at 2009 prices—full sample)

	2004	2007	2008	2009	2010	2011
Phnom Penh	3555	4889	5387	5268	4013	4015
Other urban	2893	3254	3585	3705	4198	3375
Other rural	1850	2397	2178	2621	2780	2665

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

In other urban areas, yearly income per capita amounted to 2,893,000 riels in 2004 and increased to 4,198,000 riels in 2010 before dropping to 3,375,000 riels in 2011. The main source of income in other urban areas was non-farm self-employment, representing more than 46 percent of the total over 2004-11, except in 2008, when its share was only 37 percent. During the same period, salaries and wages were the second most important source, contributing around one-third of total income. The share of salaries and wages in total income in other urban

areas increased from 26 percent in 2004 to 39 percent in 2011. Income per capita in other urban areas grew at an average of 3 percent per year in 2004-07, slower than in Phnom Penh and rural areas. However, the growth rate of income per capita in other urban areas tripled to 10 percent in 2008 before decelerating to 3 percent in 2009, and fluctuated very sharply between 2010 (13 percent) and 2011 (-20 percent).

In rural areas, income per capita was only 1,850,000 riels in 2004, edging up to 2,665,000 riels in 2011. Its main source was agriculture (crops, fishing, forestry and hunting), making up 33 percent of total income per capita in 2004 and remaining almost unchanged over the study period. The share of salaries and wages rose from 21 percent in 2004 to 28 percent in 2011, making these the second most important income source for rural Cambodians. Non-farm self-employment income was as important source for rural households as salaries and wages in 2004, and its share gradually increased to 24 percent in 2009 before declining to 20 percent in 2011. Based on the share of each income source, rural households were more likely to have diversified their income than those in Phnom Penh and other urban areas. Rural income per capita grew at an annual rate of 7 percent between 2004 and 2007, higher than in other urban areas. However, in contrast to other regions, it declined by 9 percent in 2008, indicating that the oil and food price crisis likely impacted directly on rural households more than on urban households. Surprisingly, rural income per capita gained by 20 percent in 2009 compared to the preceding year, but its growth rate slowed to 6 percent in 2010 and registered a negative 4 percent in 2011. This evidence suggests that the global financial crisis did not affect rural households immediately; it did so one or two years later.

Table 8. Yearly Income Per Capita, by Wealth Quintile ('000 riels at 2009 prices—full sample)

	2004	2007	2008	2009	2010	2011
1 (lowest)	1356	1790	1851	1749	1907	2032
2	1625	2041	1824	1999	2017	2184
3	1760	2417	2416	2219	3144	2610
4	1954	3469	2755	3209	3691	3922
5 (highest)	4051	5560	6152	5790	6633	5118

Note: Sampling weight is applied.
Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

Since policy makers are also concerned about whether economic growth benefited a large or small proportion of households, we divide the sample households in each year into five quintiles based on a wealth index.[4] As illustrated in Table 8, income per capita for the lowest quintile amounted to 1,356,000 riels in 2004—3 times lower than in the highest quintile. The income ratio between the highest and lowest quintile households reached a high of 3.5 times in 2010 before narrowing to 2.5 times in 2011. About 60 percent of the total sample (i.e. the three lowest quintiles) depended largely on agriculture; however, agricultural income's share

[4] The wealth index is estimated by using the principal component analysis method. Wealth is largely represented by durable assets such as radios, televisions, telephones, cell phones, video/VCD/DVD players/recorders, stereos, cameras, satellite dishes, bicycles, motorcycles, cars, jeeps/vans, sewing machines, refrigerators, electric/gas stoves, washing machines, dishwashers, freezers, vacuum cleaners, electric irons, electric fans, air conditioners, suitcases/boxes for storage/travel, generators, batteries, sofas, dining tables and chairs, beds and mattresses, wardrobes, cabinets, computers, printers, musical instruments, sport equipment, rowing boats, motorboats, animal carts, tractors, bulldozers/rollers, ploughs, threshing machines, harrows/rakes/hoes/spades/axes, hand tractors, rice mills and water pumps.

in total income declined over the study period, dropping significantly for the lowest quintiles. In contrast, the share of salaries and wages rose during the same period. The fifth quintile households derived their income mainly from non-farm self-employment and secondly from salaries and wages.

Men and women have different assets, access to resources and opportunities. Women may have lower education, and their access to productive resources as well as decision making may occur through the mediation of men. Women typically confront a narrower range of labour opportunities than men, and lower wage rates. As shown in Table 9, male-headed households tend have a higher income per capita than female-headed households. On average, income per capita in male-headed households grew faster and was more stable than in female-headed households. Non-farm self-employment income, salaries and wages and agricultural activities were almost equally important for male-headed households, while female-headed households relied more on salaries and wages, followed by non-farm self-employment income. The share of salaries and wages in total income rose, especially in 2010 and 2011, while that of non-farm self-employment sources fell.

Table 9. Yearly Income Per Capita, by Household Head ('000 riels at 2009 prices—full sample)

	2004	2007	2008	2009	2010	2011
HHH male	2099	2684	2625	2967	3059	2914
HHH female	2064	2703	2380	2959	2987	2772

Note: Sampling weight is applied.
Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

5.2 Level and Sources of Income in Rural Areas

Based on our recent household survey of 78 rural villages in 14 provinces, yearly income per capita was only 2,138,000 riels in 2012, down from 2,665,000 riels in 2011—a decline of 20 percent, made up of a decrease in agricultural income of 50 percent, non-farm self-employment income of 18 percent and other income of 4 percent. The drop in income from crops (48 percent) may be partially due to the floods of September and October 2011, which damaged about 390,000 hectares of paddy, 12 percent of cultivated areas in 2010 (Lun & Tong 2012).[5] Given this, the share of agricultural income in total income dropped to 21 percent in 2012, approximately 10 percentage points lower than its average over 2004-10, while the share of salaries and wages went up by 8 percentage points to 37 percent in 2012.

However, rural income per capita in 2012 rose by 16 percent compared to 2004—due to an increase in earnings from salaries and wages (101 percent), crops (36 percent), non-farm self-employment (15 percent), and off-set by livestock, fishing, forestry and hunting (59 percent).

[5] The average yield of paddy, which accounted for 70 percent of the total value of crops, dropped to 2.22 tonnes per hectare in 2012, down from 2.37 tonnes in 2011, while the average price of paddy remained stable at 950-1000 riels per kilogram. However, the average yield per hectare does not necessarily reflect the total amount lost to the flood, since only the total harvested area is available. More importantly, our household survey questionnaire was not designed to capture crops loss due to floods or other natural disasters. However, enumerators reported that some villages they visited lost most of their paddy rice during the last wet season. Taking all available information into account, the decrease of crops is likely due to floods. But the scale of the decline is unlikely to be explained by flooding alone, which destroyed only 12 percent of cultivated areas in 2010.

Table 10. Yearly Income Per Capita, by Source ('000 riels at 2009 prices—rural areas)

	2004	2007	2008	2009	2010	2011	2012
Salaries and wages	389	575	475	571	692	753	781
Non-farm self-employment	393	505	564	620	658	547	451
Crops	200	440	349	502	482	525	272
Livestock	197	161	150	144	159	152	60
Fishing	92	94	83	95	73	64	49
Forestry and hunting	137	154	100	145	141	143	64
Other	443	466	458	543	575	480	460
Total	1850	2397	2178	2621	2780	2665	2138
Share (%)							
Salaries and wages	21	24	22	22	25	28	37
Non-farm self-employment	21	21	26	24	24	21	21
Crops	11	18	16	19	17	20	13
Livestock	11	7	7	6	6	6	3
Fishing	5	4	4	4	3	2	2
Forestry and hunting	7	6	5	6	5	5	3
Other	24	19	21	21	21	18	22
Total	100	100	100	100	100	100	100
Sample size	11361	2169	2080	9580	2238	2237	1557

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas), and CDRI rural household survey 2012

Income per capita by wealth quintile is reported in Table 11 to examine rural income disparity. Income per capita for the lowest quintile in rural areas amounted to 1,354,000 riels in 2004—2.8 times lower than that in the highest quintile. Income inequality between the lowest and highest quintiles in rural households widened over the study period, although the ratio between them declined in the last two years. In other words, the highest quintile households have benefited from rural income growth than the lowest quintile households.[6] Importantly, income disparity in rural areas seems to be higher than at the national level. This suggests that broad-based growth strategies are needed to help poor rural households to benefit more from overall economic growth.

Table 11. Yearly Income Per Capita, by Wealth Quintile ('000 riels at 2009 prices—rural areas)

	2004	2007	2008	2009	2010	2011	2012
1 **(lowest)**	1354	1805	1820	1744	1916	2042	1340
2	1629	2044	1789	2003	1998	2200	1681
3	1769	2369	2431	2227	3014	2597	2025
4	1932	3508	2706	3189	3693	4378	2120
5 **(highest)**	3850	5966	4590	6809	12918	7013	3247

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas), and CDRI rural household survey 2012

[6] Using consumption quintiles does not change the conclusions.

Agriculture was the most important income source for the lowest quintile households, while those in the highest quintile depended more on non-farm self-employment income. For the lowest quintile households, non-farm self-employment income accounted for only 5 percent of total income in 2004. This was 7 percent for second quintile households and increased in each higher quintile, reaching 55 percent in the highest quintile. The agricultural income share decreased with wealth quintile—from 44 percent in the lowest quintile to 13 percent for the highest. These patterns are consistent across the study period. Further, over 2004-12, the share of income from salaries and wages increased significantly for all wealth quintiles while that of agricultural income declined (except for the fifth quintile). There was no definite trend for non-farm self-employment income over time.

Among the four agro-ecological zones, income per capita was lowest in coastal areas and the highest in Plain (Table 12). The mean growth rate in income per capita during the period of 2004-2012 was highest in the plateau and mountain region—reaching 9 percent per year, while that in the plains and coast was 3 percent and 1 percent, respectively; Tonle Sap registered negative growth rate of 1 percent. Decomposing income sources by agro-ecological zone, we note that agriculture was the most important income source in all zones.

Table 12. Yearly Income Per Capita, by Agro-Ecological Zone ('000 riels at 2009 prices—rural areas)

	2004	2007	2008	2009	2010	2011	2012
Plain	1827	2406	2461	2688	2989	2671	2248
Tonle Sap	2042	2396	2039	2681	2750	2751	1945
Coastal	1728	2480	1644	2117	2466	2339	1881
Plateau and Mountain	1416	2316	1733	2491	2197	2590	2580

Note: Sampling weight is applied

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas), and CDRI rural household survey 2012

Male-headed households in rural areas had higher income per capita than female-headed households by an average amount of 168,000 riels per year.7 In line with national trend, income per capita for male-headed households grew faster and was more stable than those of female-headed households. More male-headed units were engaged in agriculture activities than the female-headed households. Thus, agriculture accounted for 32 percent of income in male-headed households in 2004-12—7 percentage points more than in female-headed households. In contrast, female-headed households engaged more in salaried or waged work than male-headed households. The share of salaries and wages in female-headed households' income was always higher than those of other sources. The share of agricultural income declined in both male- and female-headed households over the study period.

7 The comparison of female-headed and male-headed households simply compared one adult in the two different types of households, and this can result in a biased estimate of economic welfare (Canagarajah et al. 2001). This bias does not seem to be serious if we do not compare absolute welfare levels but focus instead on differences in income composition.

Table 13. Yearly Income Per Capita, by Household Head ('000 riels at 2009 prices—rural areas)

	2004	2007	2008	2009	2010	2011	2012
HHH male	1880	2364	2246	2698	2794	2711	2181
HHH female	1740	2543	1870	2334	2729	2507	1978

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas) and CDRI rural household survey 2012

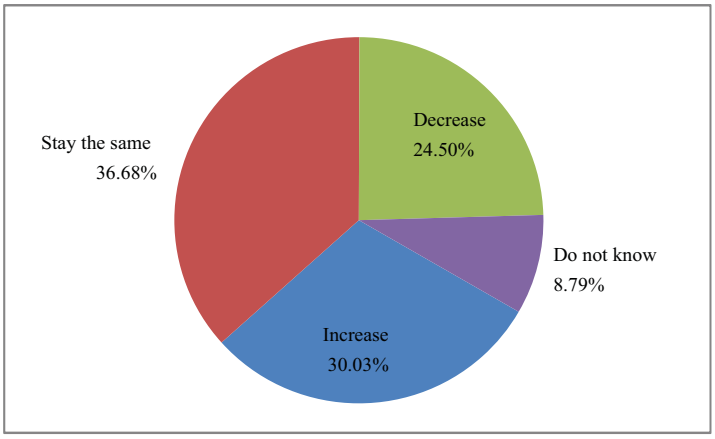
5.3 Household Perceptions of Income over Next Three Years

This section uses qualitative data to explore households' views about their future income, particularly in the next three years. It also pinpoints various factors that influenced their views. Households were asked to give their perceptions of three main sources of income: agricultural activities; wage employment and self-employment; and others such as remittances and transfers.

5.3.1 Perceptions on Income from Agricultural Activities

Of 1535 households engaged in agricultural activities, around 37 percent thought that their income from this source would stay the same in the next three years (Figure 1), citing the fixed quantities of capital, land and labour as the main reason. Around one-third believed that their income from agriculture would increase, because productivity, the amount of factors of production and the price of produce would increase. They also believed that their expertise would improve, which of course contributes to higher productivity. Only a few households thought that better infrastructure would increase their income from this source. On the other hand, some 24 percent stated that their income would decline in the next three years, because of declining factors of production such as land and labour, bad weather, more diseases and increasing input prices.

Figure 1. Households' Perceptions of Income from Agriculture



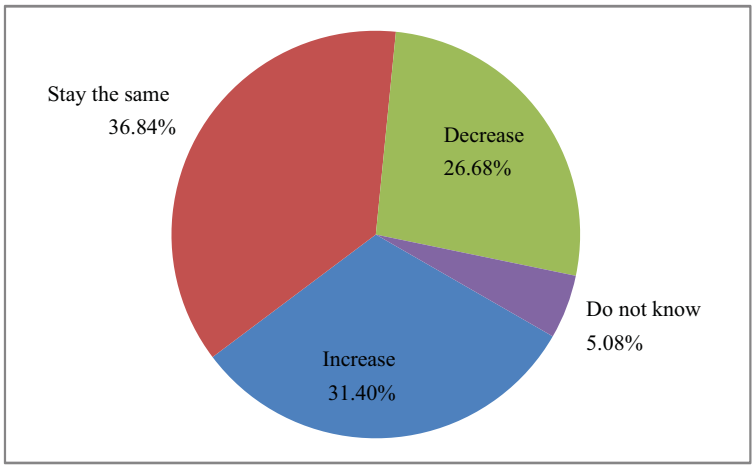
Source: Authors' calculations

Households' views about their income from agriculture were mixed, factors of production being pivotal. Although public infrastructure is crucial in improving agricultural productivity, it was not widely seen by households as an important influence on their future income from this source. A possible reason is that people may not have thought that in the next three years rural infrastructure would improve much.

5.3.2 Perceptions of Self-Employment Income

As shown in Figure 2, around 37 percent of 551 households viewed their self-employment income as staying the same, again because they assumed that their capital and labour would not change in the next three years. Steady income earned by villagers, which results in steady demand for goods and services produced locally, was also one of the reasons households thought that their income from self-employment would not change. These people also believed that in the next three years there would be no change in the population of their locality and so no substantial increases in demand for goods and services. Difficulty in gaining access to credit is also one of the reasons for steady income but only a few respondents viewed it that way. Some 31 percent believed their self-employment income would increase in the next three years. For these households, intensifying their capital and labour, increasing income among villagers and rising population would be the main causes of higher income through own employment. Around 26 percent of households, on the other hand, perceived that their self-employment income would decline due to decreasing capital and labour, followed by decreasing income of villagers.

Figure 2. Households' Perceptions of Income from Self-Employment



Source: Authors' calculations

The main factor shaping households' views on income from self-employment was again the amount of capital and labour they would have available. This could also be influenced by their current situation. If their business was going well and was profitable, they might believe that their enterprise could be expanded. A second factor, external to the household, has to do with villagers' future standard of living, which will determine the demand for goods and services in the village. Other important external factors such as access to credit and infrastructure were less mentioned as determinants of self-employment income.

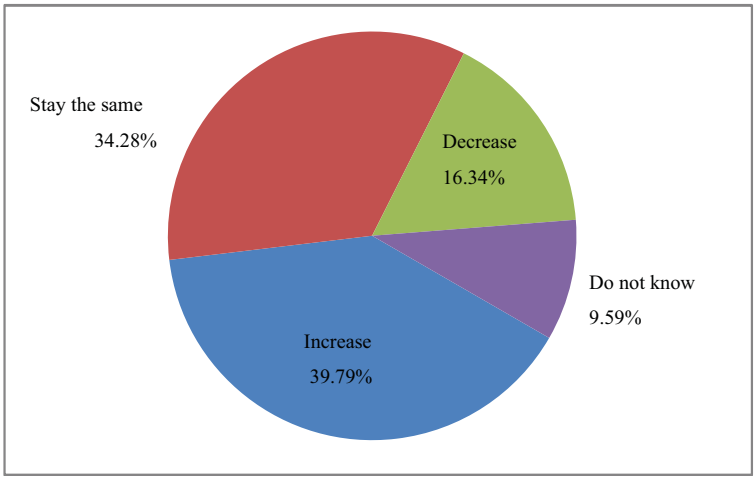
5.3.3 Perceptions of Wage Income

There were 1126 households whose members engaged in waged employment. Around 40 percent of them thought that their income from wages would increase in the next three years. Four main reasons were noted. First, households thought that there would be abundant job opportunities in the village so that people could switch to higher-paid jobs. Second, they believed that their skills and experience would improve, as would (third) their work performance. The last important reason was the belief that the employers' businesses would grow and employees would benefit from this as well.

However, 34 percent of the households viewed their income from waged employment as staying the same. They believed that they would gain no substantial improvement in their skills in the next three years, while job opportunities and employers' business situations would stay more or less the same. Another 16 percent saw their waged employment income decreasing, citing declining job opportunities in the village and faltering employers' business (Figure 3).

Around 72 percent of households in the sample had at least one member in waged employment. This was the second most important income source after agriculture (98 percent) for rural livelihoods. Views about future wages were influenced by both internal and external factors. One internal factor was skills and experience gained from previous and current jobs. An external factor was job opportunities in the area. If households believed that there would be abundant job opportunities in the village, they consequently thought that their wages would rise. Another external factor was households' predictions about employers' business. If the employers' prospects were gloomy, employees would possibly be affected.

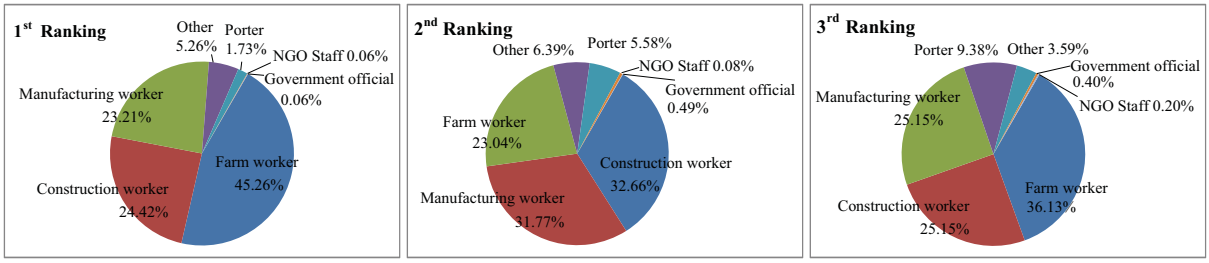
Figure 3. Households' Perceptions of Income from Wages



Source: Authors' calculations

Three occupations predominate in the villages: farm work, construction and manufacturing (Figure 4). Households were asked to rank up to three most available jobs in their villages. In the first ranking, farm work stood at the top, followed by construction and manufacturing. Their second ranking placed construction first, followed by manufacturing and farming; the third ranking put farming first, followed by construction and manufacturing. In contemporary rural Cambodia, these three types of work are viewed as low skilled or unskilled. Farm work is seasonal and includes for example rice transplanting and crops harvesting. Low-skilled construction work is paid by the day, while jobs in manufacturing are mostly in the garment and footwear industry.

Figure 4. Types of Occupation Most Available for Villagers



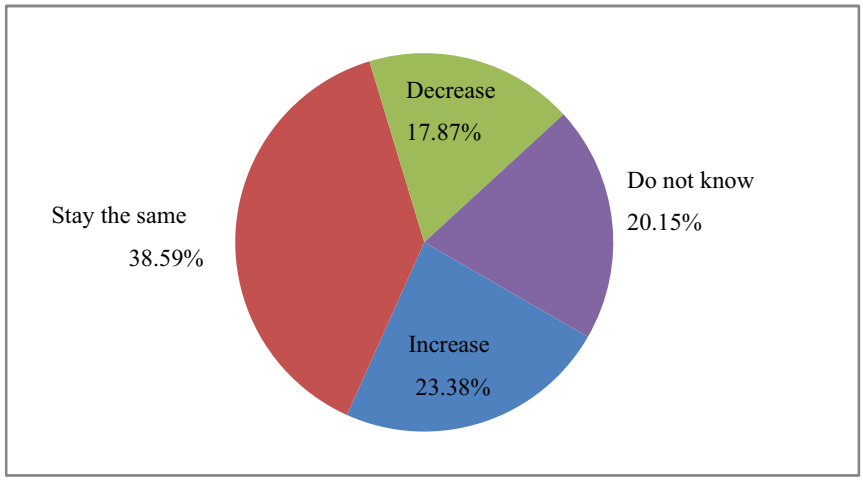
Source: Authors' calculations

5.3.4 Perceptions on Other Income Sources

Remittances

Of 526 households that received remittances from family members or relatives, around 39 percent thought that these would stay the same, because they assumed their migrant family members' wages would not increase and that there would be no additional family members migrating to work during the period (Figure 5). About 23 percent believed that remittances would increase, since migrant family members' wages could rise and more household members could migrate. Some 18 percent thought that their remittances would decline because wages of migrant family members could fall and some members could return home. Around 20 percent had no idea on the future of their current remittances.

Figure 5. Households' Perceptions of Remittances

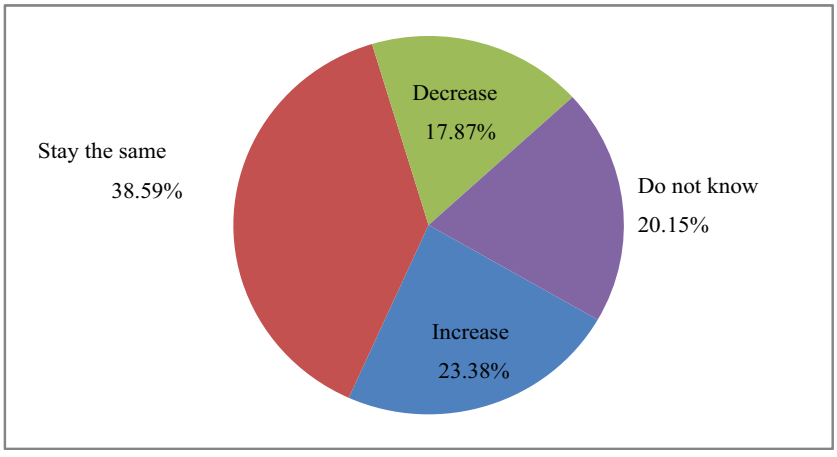


Source: Authors' calculations

Scholarships and Income Transfers

Only 109 households received scholarships or income transfers from either the government or NGOs (Figure 6). More than a third thought their scholarships/transfers would stay the same, predicting that there would be no change in government support, that the number of NGOs providing scholarships would neither increase nor decrease and that there would no additional income transfers. About 21 percent believed their income from this source would decline and 32 percent did not know. Only 11 percent believed that this income would increase.

Figure 6. Households' Perceptions of Scholarships and Income Transfers



Source: Authors' calculations

6

CONCLUSION

This report examines the levels and sources of income in rural areas in Cambodia. We find that the average income per capita in rural areas amounts to 1,850,000 riels per year in 2004—1.6 and 1.9 times lower than in other urban areas and Phnom Penh, respectively. This income gap widened during 2007-08 particularly between rural areas and Phnom Penh, but narrowed in 2009-11. In 2011, rural income per capita was only 1.3 and 1.5 times lower than in other urban areas and Phnom Penh, respectively. Rural households still depend on agriculture. However, agriculture's income share declined over 2004-10 and dropped significantly in 2012—becoming the lowest share among the defined income sources. In contrast, salaries and wages' share rose sharply in the last four years, while non-farm self-employment income's share declined.

Income per capita for the highest quintile was 3 times larger than the lowest quintile households in 2004. This gap increased to 3.5 times in 2010 before falling to 2.5 times in 2011 and 2012. Non-farm self-employment income was the most important source for the highest quintile, while the remaining quintiles depended most on agriculture. This pattern was consistent across the study period except in 2012. On average, income per capita in coastal areas was the lowest among the four regions. The average growth of income per capita in the plateau and mountain area was the highest over the period of 2004-09—reaching 9 percent per year, while that in the plains and coast was 3 percent and 1 percent, respectively; Tonle Sap registered negative growth rate of 1 percent. Agriculture was the most important income source—accounting for more than 30 percent in all zones.

Male-headed households had higher income per capita than female-headed households. The income of households headed by males grew faster and was more stable than those of female-headed households. Male-headed households were more likely to engage in agriculture while female headed households engaged more in wage labour. Agriculture's income share declined in both male- and female-headed households over the study period.

More than two-thirds of the households saw their income from various sources at least remaining the same over the next three years; 21 percent believed that their income would decrease. Both internal and external factors influenced perceptions about future income. Households engaged in agriculture mostly viewed factor endowments as the main determinant. External factors included villagers' standard of living, local labour markets and the business situation. Infrastructure and access to credit were not viewed by many as main influences on their future income. Lastly, past income shaped views about future income.

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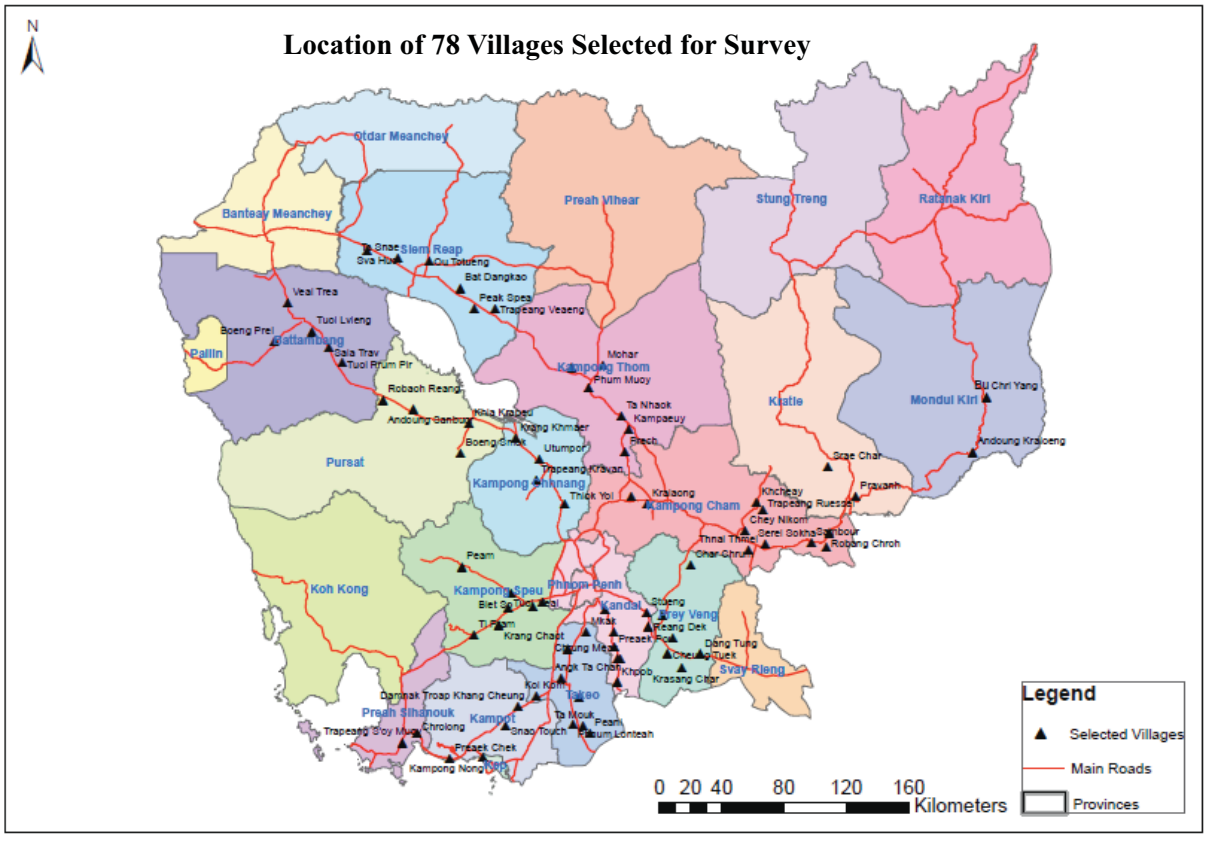
APPENDICES

Appendix 1: Village Sample for Rural Household Survey in 2012

		Plains	Tonle Sap	Coastal	Plateau/ Mountain	Total
1	Battambang		5			5
2	Kompong Cham	10				10
3	Kompong Chhnang		4			4
4	Kompong Speu				8	8
5	Kompong Thom		6			6
6	Kampot			4		4
7	Kandal	8				8
8	Kratie				2	2
9	Mondulkiri				2	2
10	Prey Veng	8				8
11	Pursat		4			4
12	Siem Reap		7			7
13	Sihanoukville			2		2
14	Takeo	8				8
	Total	34	26	6	12	78

Note: 20 households were randomly selected from each village.

Appendix 2: Map



Appendix 3: Yearly Income Per Capita, by Region ('000 riels at 2009 prices)

		2004	2007	2008	2009	2010	2011
Phnom Penh	Salaries and wages	1533	2316	1976	1819	2238	2349
Phnom Penh	Non-farm self-employment	1510	2070	3048	3074	1519	1444
Phnom Penh	Crops	7	10	12	27	47	10
Phnom Penh	Livestock	6	7	3	28	1	2
Phnom Penh	Fishing	9	0	0	14	3	2
Phnom Penh	Forestry and hunting	1	0	0	4	1	4
Phnom Penh	Other	490	485	347	302	203	204
Phnom Penh	Total	3555	4889	5387	5268	4013	4015
Other urban	Salaries and wages	747	986	1172	1188	1414	1317
Other urban	Non-farm self-employment	1315	1527	1338	1889	2162	1539
Other urban	Crops	107	135	301	137	225	117
Other urban	Livestock	144	103	70	58	51	46
Other urban	Fishing	102	81	113	30	19	26
Other urban	Forestry and hunting	67	45	49	41	35	28
Other urban	Other	410	377	543	362	292	302
Other urban	Total	2893	3254	3585	3705	4198	3375
Other rural	Salaries and wages	389	575	475	571	692	753
Other rural	Non-farm self-employment	393	505	564	620	658	547
Other rural	Crops	200	440	349	502	482	525
Other rural	Livestock	197	161	150	144	159	152
Other rural	Fishing	92	94	83	95	73	64
Other rural	Forestry and hunting	137	154	100	145	141	143
Other rural	Other	443	466	458	543	575	480
Other rural	Total	1850	2397	2178	2621	2780	2665

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

Appendix 4: Yearly Income Per Capita, by Wealth Quintile ('000 riels at 2009 prices)

1 (lowest)	2004	2007	2008	2009	2010	2011
Salaries and wages	234	423	394	452	661	671
Non-farm self-employment	75	110	382	83	128	166
Crops	206	377	297	312	293	358
Livestock	177	132	119	94	134	121
Fishing	93	119	99	103	71	66
Forestry and hunting	121	218	117	170	169	176
Other	450	411	441	536	452	474
Total	1356	1790	1851	1749	1907	2032
2						
Salaries and wages	371	632	491	603	581	683
Non-farm self-employment	128	140	283	153	218	186
Crops	178	386	293	354	428	446
Livestock	150	170	131	124	167	147
Fishing	90	100	85	91	68	77
Forestry and hunting	279	170	106	158	148	136
Other	429	442	435	516	407	509
Total	1625	2041	1824	1999	2017	2184
3						
Salaries and wages	404	508	507	560	842	919
Non-farm self-employment	310	552	676	289	882	472
Crops	193	466	444	474	618	457
Livestock	217	176	148	154	156	156
Fishing	103	69	101	86	82	51
Forestry and hunting	97	102	104	140	123	129
Other	435	544	437	516	442	425
Total	1760	2417	2416	2219	3144	2610
4						
Salaries and wages	498	761	739	675	1084	1116
Non-farm self-employment	477	1538	901	1064	1659	1514
Crops	199	442	351	648	405	675
Livestock	224	148	181	157	120	118
Fishing	84	85	56	78	28	38
Forestry and hunting	72	64	44	111	58	60
Other	400	431	483	474	337	402
Total	1954	3469	2755	3209	3691	3922
5 (highest)						
Salaries and wages	1177	2371	1963	1463	2100	2176
Non-farm self-employment	2100	2615	3520	3349	2926	2510
Crops	86	54	80	327	249	130
Livestock	104	31	31	98	31	40
Fishing	56	1	10	47	26	9
Forestry and hunting	18	4	3	28	14	9
Other	511	484	546	478	1287	244
Total	4051	5560	6152	5790	6633	5118

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

Appendix 5: Yearly Income Per Capita, by Household Head Gender ('000 riels at 2009 prices)

HHH Male	2004	2007	2008	2009	2010	2011
Salaries and wages	494	726	635	714	887	960
Non-farm self-employment	591	744	886	948	887	757
Crops	185	394	343	457	434	479
Livestock	175	146	136	137	141	138
Fishing	97	89	87	91	68	57
Forestry and hunting	130	130	84	123	117	115
Other	428	455	454	498	524	408
Total	2099	2684	2625	2967	3059	2914
HHH Female						
Salaries and wages	600	914	807	850	1008	1053
Non-farm self-employment	514	692	654	1021	914	696
Crops	141	295	198	304	344	262
Livestock	183	127	105	86	106	81
Fishing	47	65	45	49	34	42
Forestry and hunting	81	134	97	122	117	123
Other	499	477	474	527	464	514
Total	2064	2703	2380	2959	2987	2772

Note: Sampling weight is applied.
Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011

Appendix 6: Yearly Income Per Capita, by Wealth Quintile ('000 riels at 2009 prices—rural)

1 (lowest)	2004	2007	2008	2009	2010	2011	2012
Salaries and wages	231	412	378	444	661	666	611
Non-farm self-employment	72	103	396	79	124	165	55
Crops	204	390	264	310	299	365	127
Livestock	180	137	123	95	137	123	33
Fishing	93	117	97	104	72	67	70
Forestry and hunting	118	226	115	172	170	178	82
Other	457	421	446	539	453	477	362
Total	1354	1805	1820	1744	1916	2042	1340
2							
Salaries and wages	352	627	444	591	531	674	583
Non-farm self-employment	119	123	272	147	205	179	158
Crops	184	398	301	359	448	461	190
Livestock	155	177	136	128	174	152	43
Fishing	90	103	87	93	70	78	44
Forestry and hunting	293	175	108	161	153	140	84
Other	436	442	439	524	419	516	580
Total	1629	2044	1789	2003	1998	2200	1681
3							
Salaries and wages	385	504	474	533	783	863	730
Non-farm self-employment	305	455	670	280	710	398	446
Crops	200	497	469	497	660	508	244
Livestock	229	178	157	161	167	171	43
Fishing	102	64	102	90	90	55	54
Forestry and hunting	96	108	109	144	134	142	71
Other	452	564	450	522	471	460	437
Total	1769	2369	2431	2227	3014	2597	2025
4							
Salaries and wages	461	675	565	611	842	845	869
Non-farm self-employment	447	1410	870	935	1606	1646	351
Crops	219	587	423	749	511	1079	285
Livestock	223	181	220	174	178	185	35
Fishing	86	101	36	87	41	57	51
Forestry and hunting	80	79	56	125	86	92	58
Other	416	475	536	508	428	475	470
Total	1932	3508	2706	3189	3693	4378	2120
5 (highest)							
Salaries and wages	770	1767	1334	905	1097	1125	1041
Non-farm self-employment	2109	3712	2512	3853	5662	4831	1097
Crops	182	147	208	878	989	545	466
Livestock	210	26	125	219	100	136	133
Fishing	82	2	3	112	114	13	31
Forestry and hunting	37	15	8	73	55	40	31
Other	460	296	398	770	4902	323	448
Total	3850	5966	4590	6809	12918	7013	3247

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas), and CDRI rural household survey 2012

Appendix 7: Yearly Income Per Capita, by Agro-Ecological Zone
('000 riels at 2009 prices - rural)

Plain	2004	2007	2008	2009	2010	2011	2012
Salaries and wages	438	637	521	595	752	771	828
Non-farm self-employment	406	449	751	649	586	511	471
Crops	205	488	405	518	568	600	302
Livestock	212	175	153	143	176	150	43
Fishing	60	70	64	81	72	62	36
Forestry and hunting	87	106	89	145	131	131	54
Other	419	481	479	556	704	448	515
Total	1827	2406	2461	2688	2989	2671	2248
Tonle Sap							
Salaries and wages	369	596	444	614	672	775	705
Non-farm self-employment	485	521	463	661	955	682	347
Crops	198	423	340	486	386	468	242
Livestock	167	127	130	138	100	129	94
Fishing	136	126	115	122	71	62	66
Forestry and hunting	234	159	101	145	138	140	75
Other	454	445	446	515	428	493	416
Total	2042	2396	2039	2681	2750	2751	1945
Coastal							
Salaries and wages	204	315	190	371	580	539	787
Non-farm self-employment	217	1110	255	351	290	459	334
Crops	186	231	175	445	525	376	218
Livestock	229	192	274	186	276	166	41
Fishing	199	110	122	87	85	79	89
Forestry and hunting	118	82	113	128	147	158	70
Other	575	439	514	548	562	562	342
Total	1728	2480	1644	2117	2466	2339	1881
Plateau and Mountain							
Salaries and wages	311	409	533	473	571	758	833
Non-farm self-employment	127	350	268	549	290	337	990
Crops	188	412	244	519	380	496	256
Livestock	195	189	133	140	194	219	30
Fishing	43	91	46	81	73	73	22
Forestry and hunting	103	382	130	155	192	194	71
Other	450	483	380	574	496	514	378
Total	1416	2316	1733	2491	2197	2590	2580

Note: Sampling weight is applied

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas), and CDRI rural household survey 2012

Appendix 8: Yearly Income Per Capita, by Household Head Gender ('000 riels at 2009 prices—rural)

HHH Male	2004	2007	2008	2009	2010	2011	2012
Salaries and wages	370	542	454	551	674	731	778
Non-farm self-employment	419	484	630	666	638	549	496
Crops	210	461	374	539	494	585	307
Livestock	199	163	156	155	167	167	66
Fishing	102	97	91	105	81	68	54
Forestry and hunting	148	153	98	145	140	140	62
Other	431	463	444	539	601	470	417
Total	1880	2364	2246	2698	2794	2711	2181
HHH Female							
Salaries and wages	457	727	568	648	757	829	796
Non-farm self-employment	293	599	261	448	731	540	282
Crops	163	350	235	365	436	321	142
Livestock	192	152	124	107	133	99	40
Fishing	54	79	48	60	42	53	30
Forestry and hunting	95	159	110	147	146	154	68
Other	486	477	524	559	483	512	620
Total	1740	2543	1870	2334	2729	2507	1978

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas) and CDRI rural household survey 2012

Appendix 9: Yearly Income Per Capita-Current Prices in Thousand Riel and USD

	000 riels						USD					
	2004	2007	2008	2009	2010	2011	2004	2007	2008	2009	2010	2011
Salaries and wages	254	493	629	598	778	901	63	121	155	144	186	222
Non-farm self-employment	281	475	807	794	748	675	70	117	199	192	179	166
Crops	78	218	284	313	323	358	19	54	70	76	77	88
Livestock	78	83	117	93	104	104	19	21	29	23	25	26
Fishing	39	50	71	60	47	45	10	12	17	15	11	11
Forestry and hunting	53	76	78	90	91	97	13	19	19	22	22	24
Other	205	278	415	380	403	368	51	68	102	92	96	91
Total	987	1673	2400	2329	2494	2549	245	412	591	563	596	627
Phnom Penh	2243	4033	6050	5268	4226	4533	556	993	1491	1273	1009	1116
Other urban	1386	2039	2961	2972	3549	3061	344	502	730	718	848	754
Other rural	815	1389	1967	1926	2153	2214	202	342	485	465	514	545
1 **(lowest)**	600	1041	1662	1289	1482	1692	149	256	410	311	354	417
2	722	1190	1637	1476	1572	1823	179	293	403	356	375	449
3	784	1418	2171	1642	2476	2203	195	349	535	397	591	542
4	887	2108	2509	2412	3077	3474	220	519	618	583	735	855
5 **(highest)**	2107	4074	6268	4959	5925	5167	523	1003	1545	1198	1415	1272
HHH Male	988	1671	2442	2310	2502	2576	245	411	602	558	597	634
HHH Female	983	1681	2211	2399	2467	2459	244	414	545	580	589	605

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas) and CDRI rural household survey 2012

Appendix 10: Yearly Income Per Capita-Current Price in Thousand Riel and USD (Rural)

	000 riel							USD						
	2004	2007	2008	2009	2010	2011	2012	2004	2007	2008	2009	2010	2011	2012
Salaries and wages	171	334	429	420	536	626	916	42	82	106	101	128	154	225
Non-farm self-employment	173	293	509	455	509	454	529	43	72	125	110	122	112	130
Crops	88	255	315	369	373	436	319	22	63	78	89	89	107	79
Livestock	87	93	136	106	123	126	71	22	23	33	26	29	31	17
Fishing	40	54	75	70	56	54	58	10	13	19	17	13	13	14
Forestry and hunting	60	89	90	107	109	119	75	15	22	22	26	26	29	18
Other	195	270	414	399	446	398	539	48	66	102	96	106	98	133
Total	815	1389	1967	1926	2153	2214	2505	202	342	485	465	514	545	617
1 **(lowest)**	597	1046	1643	1281	1484	1696	1571	148	258	405	309	354	418	387
2	718	1185	1615	1472	1547	1828	1970	178	292	398	356	370	450	485
3	779	1373	2196	1637	2334	2158	2372	193	338	541	395	557	531	584
4	851	2033	2444	2343	2859	3637	2484	211	500	602	566	683	895	611
5 **(highest)**	1697	3457	4144	5004	10002	5826	3805	421	851	1021	1209	2389	1434	937
Plain	805	1394	2222	1975	2314	2219	2634	200	343	548	477	553	546	649
Tonle Sap	900	1388	1841	1970	2129	2286	2279	223	342	454	476	509	563	561
Coastal	761	1437	1484	1555	1909	1943	2204	189	354	366	376	456	478	542
Plateau and Mountain	624	1342	1565	1831	1701	2152	3023	155	330	386	442	406	530	744
HHH Male	828	1370	2028	1982	2164	2252	2556	205	337	500	479	517	554	629
HHH Female	767	1474	1689	1715	2113	2083	2317	190	363	416	414	505	513	570

Note: Sampling weight is applied.

Source: CSES 2004, 2007, 2008, 2009, 2010 & 2011 (rural areas) and CDRI rural household survey 2012

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