ISSN 1560-7607 / ISBN 978-99950-52-05-8

CAMBODIA DEVELOPMENT REVIEW

A Publication of CDRI—Cambodia's leading independent development policy research institute

VOLUME 15, ISSUE 4 OCTOBER-DECEMBER 2011 $4.00

SUSTAINABLE AGRICULTURE AND ENVIRONMENTAL PROTECTION IN THE TONLE SAP PLAIN: IMPROVING IWRM AND FARMER PRACTICES[1]

Introduction

Cambodia's pan-like topography[2] is conducive to collecting and distributing rainwater across the central area i.e. the wide fertile Tonle Sap plain and the lower and upper Mekong plains, where it feeds agricultural (mainly rice) production. The surrounding plateau and highlands (e.g. Dong Rek Mountains to the north and northwest and Cardamom Mountains to the south and southwest) form 16 large natural catchments (MOWRAM 2011) with a number of rivers and tributaries flowing to the Tonle Sap Great Lake in the centre of the country.

At present, many farmers must use pesticide to protect their crop, Damnak Ampil Scheme, Pursat Province.

Agriculture is the backbone of Cambodia's economic development, contributing approximately 29 percent to the gross domestic product (GDP) (MAFF 2010:15). The government has made great efforts and capital investments to rehabilitate and develop physical irrigation infrastructure, including canal systems, dams, dykes and water pumping stations, to ensure adequate water delivery for both wet and dry season rice farming (Nang *et al.* 2007). As a result, annual rice production over the last decade has remarkably improved, from 4 million tonnes in 2001 to 8 million tonnes in 2010 (MAFF 2010: 19).

Loss of tree cover, due to the conversion of forest areas in the catchments for economic development, and increasing chemical fertiliser use to boost yields, both of which have led to land degradation and diminished agricultural productivity, have prompted many institutions to reconsider the way forward for agricultural development and sustainable natural resource management so as to ensure long term

1 This article is prepared by Nang Phirun and Ros Bansok, research associates, and Ouch Chhuong, research assistant, at CDRI.

2 Known as the central low-lying alluvial plain.

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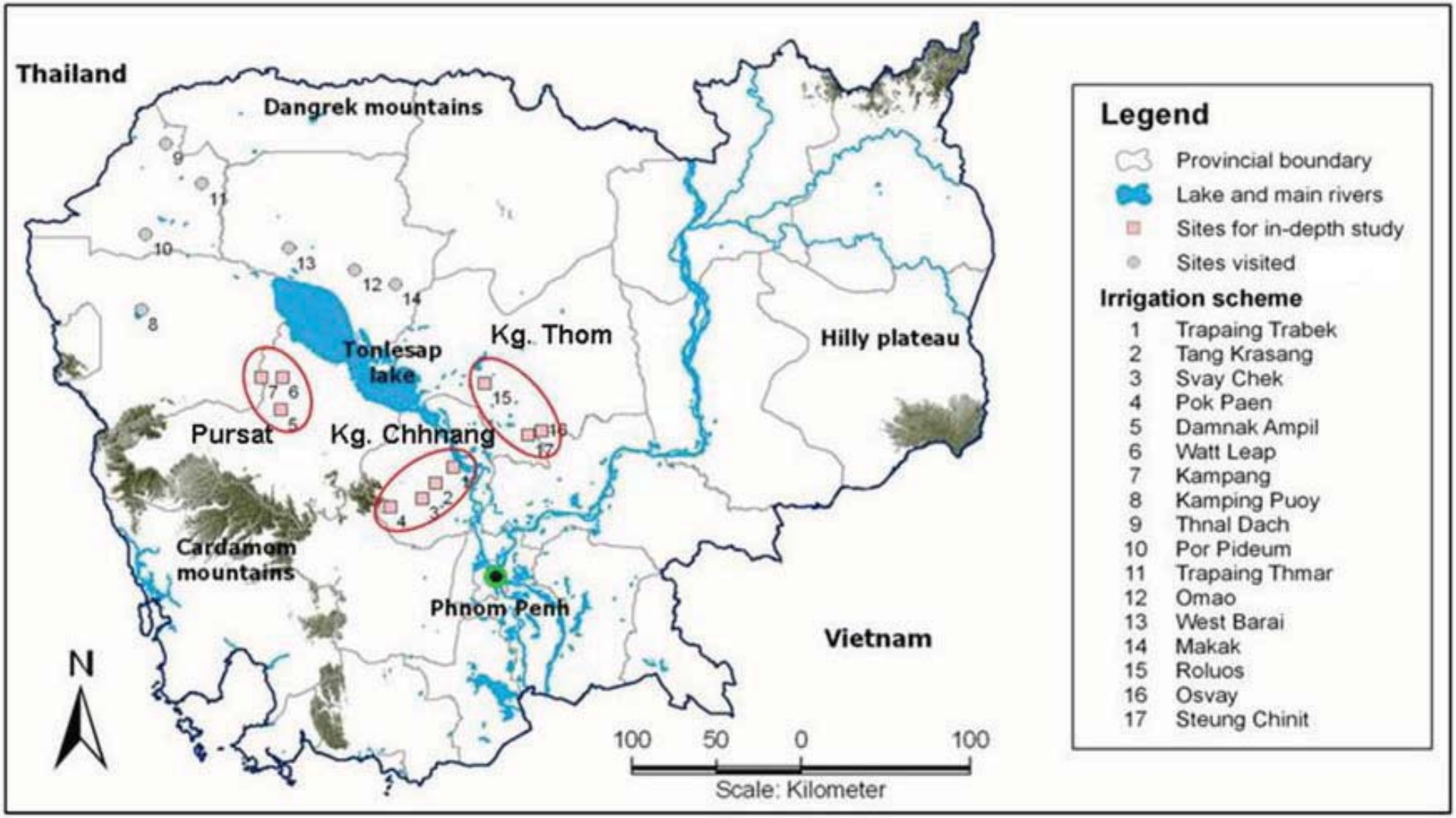
Figure 1: Map of Study Areas



Source: Yem 2009

Table 1: Average Rice Yield and Fertiliser Use

Items	Wet 2008	Dry 2008/09*	Wet 2009	Dry 2009/10**
Number of HHs	205	55	205	55
Average yield (tonnes) per ha	1.6	3.2	1.6	3.7
Average fertiliser use (kg) per ha	68	80	174	194

Note:* November 2008 to March 2009; ** November 2009 to March 2010

benefits. The Ministry of Agriculture, Forestry and Fisheries (MAFF 2011) points out that forest cover declined by about 16.1 percent between 1965 and 2010, while degradation of the watershed and increased fertiliser and pesticide use have led to increasing sedimentation and decreasing water quality of the Tonle Sap Lake. That fertiliser import has almost doubled from 60-80 thousand tonnes in 1998 to 120-140 thousand tonnes in 2008 to some extent reflects the growing use of chemical farming inputs (MOE 2010).

The aim of this study is to examine rice farming practices and assess the trend of chemical fertiliser use in ten irrigation schemes in three provinces around the Tonle Sap Lake. Consistent with the principles of Integrated Water Resources Management (IWRM) set out in the 2007 Water Law (MOWRAM 2007) and the concept of sustainable agricultural development, the study also seeks practicable measures and opportunities to improve rice production while minimising potential adverse impacts on natural resources and the environment, especially land productivity, water quality, aquatic resources and human health and welfare.

Analytical Approach and Scope of the Report

Empirical agricultural data on rice yield, fertiliser use (particularly chemical fertiliser), water resources management and allocation, land use management and farming practices of 205 selected households in ten main irrigation schemes[3] in Kompong Chhnang, Kompong Thom and Pursat provinces (see Figure 1) were collected and analysed to identify the current and future trends of rice production and fertiliser (particularly inorganic fertiliser) use.

The substantial data and information collected from farmers, farmer water user communities (FWUC), local authorities and provincial departments of water resources and meteorology (PDOWRAM) and agriculture, forestry and fishery (PDAFF) and analytical results were used to examine the possible effects resulting from the amount of inputs used in rice cultivation and the challenges these could pose to water resources management, and to identify pragmatic mechanisms that would ensure the environmentally sound use of chemical inputs for improved rice production. Issues related to land degradation due to economic development in the watershed areas, however, are outside the scope of this study.

Challenges to Rice Production Improvement

Rice Production

Farmers usually choose good quality seed for wet and dry season rice cultivation. There are several rice seed varieties. Many farmers opt for the new early maturing (90-100 days) strains of rice which consume little water.

All of the 205 households (HHs) selected for the survey engage in wet season rice farming and only 55 cultivate dry season rice. The wet season cultivated area is about 420 ha, of which 120 ha is suitable for dry season rice farming. Individual household cultivated areas (rice plots) range from less than 0.5 to 8 ha

Table 1 shows that from 2008 to 2010, average wet season rice yield remained constant, i.e. 1.6 tonnes per ha, and dry season rice yield increased by about 0.5 tonnes per ha.

Rice farming is the major agricultural activity in all the study sites. Most farmers use traditional farming methods which, alongside ineffective farming techniques and lack of irrigation infrastructure, keep farmers' rice yields low. Persistently low yields and the high demand for irrigation systems reflect the significant scope for rice farming development in the study areas.

3 Damnak Ampil, Kampang, Wat Leap and Trapeang Trabek schemes are located in Kompong Chhnang province, Taing Krasaing, Svay Chek and Pok Pen schemes are in Kompong Thom province and Rolous, Chinit and O' Svay schemes are in Pursat province.

Fertiliser Consumption and Trends

Farmers apply many kinds of fertiliser which are available on the market; however, NPK[4] is most commonly used. Fertiliser is generally applied two or three times during crop growth, the amount depending on what farmers can afford and when, rather than on the quality or type of fertiliser and soil and crop requirements. The first application entails phosphate (66 percent) and urea (28 percent) fertilisers, the second involves urea (60 percent), phosphate (28 percent) and nitrate (about 7 percent), and the third is made up of urea (40 percent) and other locally made organic fertilisers[5] (40 percent). Average annual fertiliser use is 129 kg per ha (see table 1 above).

The amount of fertiliser used in rice farming has remarkably increased, from 80 kg per ha in 2008/09 to 194 kg per ha in 2009/10 in the dry season, and from 68 kg per ha in 2008 to 174 kg per ha in 2009 in the wet season (Table 1). Farmers in all of the study schemes increasingly believe that agricultural production can be improved by using more inputs. But while fertiliser adds nutrients to soil, over-fertilisation with a vital nutrient (N, P or K) can be as detrimental to soil and crops as under-fertilisation. Farmers also reported the problem of soil infertility in some rice plots as a result of applying too much fertiliser (at rates of about 300-500 kg per ha); the plots have had to be left fallow for one to three months, depending on soil type, to allow the soil to regain normal productivity.

Farmers are using more fertiliser at higher application rates, yet soil and crop nutrient deficiencies remain prevalent (Bell *et al.* 2004). Fertiliser burn can occur if too much is applied, resulting in a drying out of the roots and damage or even death of the plant (Ecochem 2011). MAFF reports that excessive and inappropriate use of agricultural chemicals over the last two decades has adversely impacted on the environment and human health (MAFF 2006: 21). This reflects that the environmental impact of agro-chemical use remains an important issue and requires remedial actions.

4 "N" stands for Nitrogen, "P" for Phosphate and "K", for Potash.

5 Cattle manure, cereal, legume and woodland litter are commonly used as organic fertilisers.

Farmer Practices and Options toward Sustainable Agriculture

Land Management

About 64 percent of the cultivated land in the study sites falls within the alluvial plains of the Tonle Sap Basin. This land type is flat, the soil is fertile with low to moderate permeability and the land slope is ideal for gravity-fed irrigation, characteristics which are favourable to both wet and dry season rice cultivation. However, rice fields are mostly small and not at the same level, and in some areas there are no small dykes around them. This makes it difficult to maintain water and fertilisers in the rice paddies. Some farmers complained of water flowing from their rice fields to those of the adjacent farmers', taking the fertiliser they had applied to their crop with it and resulting in lost time, labour, and money spent on fertiliser, and decreased rice yield. If farmers were to cooperate to join their rice plots so they are less fragmented and level the land, nutrients and water could be better distributed and the total yield would be higher. Building small dykes would also ensure effective fertiliser application and water management.

Land management and supporting agricultural extension services are the most effective tools to meet the government's development priority needs (CIDA 2009), as evidenced in the Stung Chinit scheme where the rice fields had been levelled and rearranged into about 46 blocks of 40-100 ha with canal and drainage systems to ensure effective water delivery and discharge throughout the irrigated area. The results from the regression analysis indicate that a rice crop grown on a plot of 0.5-1 ha could produce a yield of around 2-4 tonnes if fertilisers are applied at the recommended rates introduced by agricultural extension staff working in their respective areas. To ensure robust crop yields, effective irrigation, and economical and effective fertiliser use, farmers must also prepare and tend their land properly.

Improving Fertiliser Application

Most of the farmers in the study areas said that they have had no training on how to use chemical fertilisers or how to balance the three major nutrients N-P-K, and the little they did know had been learned from their neighbours. During the FGDs and interviews, farmers revealed that they

just follow and copy what other farmers do. High rates of fertiliser application can lead to increased leaching of nitrates into groundwater which makes its way into canals, rivers and lakes where excessive nitrate residues cause eutrophication, i.e. accelerate the growth of algae, disrupt the normal functioning of water ecosystems, poison and kill fish[6].

Only a few of the surveyed farmers in Kompong Thom and Pursat provinces had attended a training course on integrated pest management (IPM) delivered by MAFF and PDAFF agricultural extension staff[7]. When questioned about fertiliser use, farmers said they had learned how to make organic fertiliser i.e. compost and manure, but because it is slow to take effect compared to chemical fertiliser, they no longer use it. This suggests a need for more training among farmers and other stakeholders on how to properly and effectively apply pesticide and fertiliser.

Improving IWRM Application

Expand Access to Water

In the last ten years, the government has renewed efforts and invested in a number of technical programmes aimed at minimising farmers' dependence on rain countrywide. However, the proportion of irrigated land in the study sites is still low. Water storage capacity for dry season farming is limited. Farmers can access irrigation water either through customary or legal rights. The Farmer Water User Community (FWUC) has been established to mobilise water services to farmers. The costs of irrigation scheme operation and maintenance are supposedly covered by the set (per ha) Irrigation Service Fee paid by farmer water users. However, the fee is usually neither paid nor collected (except in the Stung Chinit scheme) since most farmers claim that access to water should be free of charge. This makes it difficult to improve water allocation in the schemes since the available resources for renovating, extending or building new irrigation infrastructures cannot meet actual demand.

Recognising the need for greater community participation to improve the performance of irrigation systems, the Participatory Irrigation Management and Development (PIMD) policy[8] has been integrated into the IWRM framework where it forms a critical component of the national policy to promote farmers' participation in the running and management of irrigation schemes. The irrigation service fee charged to farmers contributes to and helps ensure water delivery and sustain the operation and maintenance (O&M) of the irrigation schemes.

Improve Crop Production and Farmer Livelihoods

Land and water resources and their effective use and management are extremely important for agricultural improvement and rural development in Cambodia. Despite the abundance of water in the wet season, insufficient irrigation infrastructure to harvest and store water for the agricultural sector has led to water supply shortages, especially for dry season farming. Most farmers depend on rain water for wet season cropping. Only some farmers that have access to irrigation water can engage in both wet and dry season cropping.

Of the ten study schemes, Stung Chinit is the only one that has appropriate irrigation infrastructure and well-structured water governance. The remaining nine schemes commonly comprise a water gate or sluice and just a few main canals, leaving most of the rice fields in the study areas beyond the reach of irrigation water. Further, about 21 percent of the surveyed households have to use diesel engine pumps to water their fields. To this end, the government's and other stakeholders' efforts in rehabilitating and developing irrigation infrastructures prioritise improved and effective water management. The government's plan to expand the irrigated area by about 50,000 ha per year is set out in the National Water Policy (MOWRAM 2009: 8).

Improve Water Governance Performance

Present water governance is challenged by the lack of effective feedback mechanisms and coordination among the different levels of government. As stipulated in the PIMD policy, FWUCs are mandated the responsibility for the irrigation schemes' O&M

6 This process may cause water to become cloudy and/or discolored i.e. green, yellow, brown or red.

7 Two training courses on fertiliser application were organised by MAFF and PDFF in 2011, one in Kompong Chhnang and the other in Kompong Thom province. These were attended by farmers, fertiliser sellers and other stakeholders involved in agricultural products (particularly fertiliser and pesticide) consumption or distribution.

8 Based on a presentation handout at the National Workshop on "Lessons Learned and Resolutions on PIMD", organised by CEDAC at Phnom Penh Hotel on 17 December 2009.

and water allocation and management with strong coordination between up- and down-stream water users. Moreover, FWUCs play an important role as a dynamic network for improving the function of vertical governance mechanisms, linking central government, provincial and local authorities and villages as well as horizontal governance mechanisms that support decision-making across different provincial line departments and commune and village level authorities. Likewise, these same mechanisms positively strengthen FWUCs' performance in water governance.

Land Water Resources Management and Environmental Protection

The IWRM framework requires integrated action by players from various sectors, including farmers, FWUCs, local authorities, research centres, government ministries and the pirate sector, to achieve sustainable land and water management while protecting the environment. This approach would raise actors' awareness of the needs and the benefits of environmental protection through both bottom-up and top-down processes so that environmental conservation considerations such as sub-sector competition and perspectives on protecting upper catchments, pollution control and environmental flows are harmonised and well integrated in planning and decision-making. FWUC committees and members would have the opportunity to learn and apply appropriate farming strategies and methods, such as the introduction and selection of suitable rice varieties, soil conservation and land husbandry practices. They can also benefit from soil fertility and pest management programmes so as to improve their agricultural production and improve, rehabilitate and conserve land productivity and water resources.

Conclusion

Achieving sustainable agricultural development is one of the greatest challenges for many countries worldwide since it implies not only securing a sustained food supply, but also maintaining and protecting the surrounding environment while taking into account socio-economic and human health impacts. This concept is gaining increasing acceptance and being addressed significantly by the global agricultural community (Gold 2007). Improving the adoption of IWRM would ensure that land and water resources degradation due to unsustainable agricultural practices is addressed. This tool would also ensure that those resources will be no longer depredated; instead their productivity will be maintained, protected and restored to provide long term essential goods and services (Torkil 2004).

The findings suggest that both dry and wet season rice yields did not remarkably increase even though the amount of fertiliser applied has more than doubled. As stated earlier, over-fertilisation without well-informed technical knowledge and environmental consideration will adversely affect rice production and land productivity and likely lead to eutrophication. Optimising local skills and technology to achieve long-term stable yields, environment protection and consumer safety would ensure sustainable agriculture. Effective land and water management that draws on the IWRM framework and the PIMD policy would avoid wasting expensive fertilisers and the potential costs of cleaning up any pollution created as a by product of farming (Ecochem 2011). A well-structured FWUC committee, enthusiastic participation of farmers, paddy field management, agricultural extension service accessibility, sufficient canal and drainage systems, water availability after the rehabilitation and development of irrigation schemes and improved cropping practices can provide better yields to farmers, as evident in the effective application of the IWRM and PIMD in the Stung Chinit scheme. It follows then, that land, water and fertiliser management programmes should be put in place to respond to the problems and challenges faced by farmers in most of the study areas. A catchment conservation plan should be designed and implemented and soil and water quality should be monitored regularly to ensure balanced nutrient enrichment of land and water.

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Migration, Remittances and Poverty Reduction: Evidence from Cambodia[1]

This study utilises the national representative household survey data, Cambodia Socio-Economic Survey (CSES) 2007, to examine the impact of internal and international remittances on poverty, measured by the poverty ratio, poverty gap and squared poverty gap. The result shows that both internal and international remittances reduce the amount, depth and severity of poverty. Remittances have a larger effect on the severity of poverty than on the poverty rate. Our findings also suggest that remittances from international migrants are more effective at reducing poverty than those from internal migrants.

Introduction

Both push and pull factors contribute to migration. For least developed countries, the reasons for migration are based on push factors more than pull factors (Maltoni 2007).

Migration in Cambodia is mostly internal. According to the National Institute of Statistics (2004), 35 percent of the total population are internal migrants—4 percentage points higher than in 1998. Young people (aged 15–25) are 30 percent of migrants, while only 18 percent of the population.

The main foreign destination for Cambodian migrant workers is Thailand. Approximately 90 percent of the migrants to Thailand are irregular (undocumented). Despite a memorandum of understanding on migrant workers signed by the Thai and Cambodia governments in 2003, the number of undocumented migrants is unlikely to decline, because of the high cost of recruitment agencies, visas and registration (Chan 2009a). Malaysia and the Republic of Korea are also major destinations. Migration to those two countries is organised by private recruitment agencies. The majority of Cambodian migrant workers in Malaysia arrive with proper documentation, but many become irregular later. All Cambodian migrant workers employed in the Republic of Korea are documented (Maltoni 2007). There are also Cambodian migrant workers in Hong Kong, Taiwan, Saudi Arabia and Qatar. However, the total Cambodian population living and working abroad is unknown.

According to Ratha and Mohapatra (2009), official international remittances amounted to USD325 million in 2008, which was approximately three-fold higher than 10 years earlier. Despite the increasing size of official international remittances, little attention has been paid to the economic impact of these transfers on households. This study measures the effects of international and internal remittances on poverty.

Data and Empirical Results

The empirical analysis uses the CSES 2007 collected by National Institute of Statistics during July–September. The survey is nationally representative, consisting of 3593 households, of which 2228 are rural. The survey provides detailed information over a wide range, including household characteristics, food and non-food consumption, durable assets, livestock, household farm production, non-timber forest collection, other non-agricultural production, wage work and remittances, which makes it possible to estimate total income for each household in the sample.

However, this survey was not designed as a migration or remittance survey. It collected no information on migrants' characteristics, such as age, education or income earned away from home. Regarding remittances, the survey asked only two questions: (1) How much did your household receive in domestic remittances from relatives or others during the last 12 months? (2) How much did your household receive in international remittances from relatives or others during the last 12 months? However, the information on household income and consumption allows us to examine the impact of remittances on poverty.

Table 1 shows that 2743 households (76.3 percent of the total) received no remittances, 714 households (19.9 percent) received internal remittances, and

1 This article is prepared by Tong Kimsun, research fellow and programme coordinator for the Economic, Trade and Regional Cooperation programme at CDRI. The views expressed are those of the author and do not necessarily reflect the views of CDRI. The author would like to thank Dr Hossein Jalilian and the CDRI's editor for their comments on an earlier draft.

Table 1: Income Sources for Households Receiving and Not Receiving Remittances (riels per capita per day)

Sources	Receive no remittance	Receive domestic remittances	Receive international remittances
Livestock	328.47 (2101.15)	591.92 (2077.98)	240.33 (684.80)
Fishing	113.21 (539.31)	90.89 (579.86)	60.43 (199.48)
Forestry	136.06 (372.37)	146.60 (207.08)	92.83 (247.66)
Non-agricultural production	2197.09 (19,762.08)	1852.08 (26,091.79)	2820.01 (8029.68)
Domestic remittance	0	619.48 (1366.47)	86.06 (373.34)
International remittance	0	23.438 (254.82)	1938.62 (3167.31)
Wages	1807.89 (6009.99)	1686.81 (4229.51)	3775.56 (14,941.30)
Own production for consumption	52.81 (69.74)	66.13 (75.39)	59.22 (121.76)
Other	336.08 (3225.52)	566.55 (10711.07)	426.39 (1947.11)
Total income	4971.61 (21,116.23)	5643.93 (28,543.99)	9499.50 (17,364.90)
Sample	2743	714	153

Note: Standard deviations are in parentheses. Source: Author's calculations

153 households (4.3 percent) received international remittances. Of remittance-receiving households, only 17 households received both internal and international remittances.

For all households, internal remittances were 2.3 percent and international remittances 1.6 percent of net household income. For the 714 households receiving internal remittances, these remittances amounted to 10.9 percent of total net income, while international remittances were 0.4 percent. For the 153 households that received international remittances, these were 20.4 percent of total net income, and the share of internal remittances was 0.9 percent. On average, households receiving remittances had 620 riels (internal remittances) and 1940 riels (international remittances) per capita per day in 2007. These figures are not surprising, since workers abroad can easily earn more than in Cambodia.

Table 1 also reveals that households receiving no remittances have lower incomes than households receiving internal and/or international remittances. But this simple comparison is potentially misleading because it is not known what the income of the remittance-receiving households would have been if those migrants had chosen to stay and work at home. To overcome this methodological problem, we followed the procedure suggested by Adams (2004), who argued that it is necessary to estimate the counterfactual situation. The result can be used as a baseline for evaluating the impact of remittances on poverty. First, the parameters predicting per capita income were estimated from the 2743 households that do not receive remittances. Second, these parameters were applied to the 867 households receiving remittances.

The equation used to estimate the parameters was: $Y_i = aX + \varepsilon_i$ (1)

where Y_i is the per capita income of household i, X_i is a vector of characteristics of household i, a a vector of coefficients to be estimated and ε_i an error term.

However, as noted by Adams (2004), specifying variables that are truly exogenous to household income (consumption) is difficult and complex. Therefore, the main econometric problem for estimating equation (1) lies in selecting variables. We hypothesised that per capita income (consumption) can be predicted as the function of household head characteristics (education, age, gender) and household characteristics (agricultural land, housing condition, regional and ethnic variables):

$$Y_i = \alpha_0 + \alpha_1 HHHAge_i + \alpha_2 HHHGender_i + \alpha_3 HHSize_i + \alpha_4 EDUMale_i + \alpha_5 EDUFemale_i + \alpha_6 Room_i + \alpha_7 Light_i + \alpha_8 Water_i + \alpha_9 Agr\_Land_i + \alpha_{10} Rural_i + \alpha_{11} Urban_i + \varepsilon_i \quad (2)$$

where *Y* is per capita household income (consumption), *HHHAge* is the household head's age, *HHHGender* is equal to 1 if the household head is male and zero otherwise, *HHSize* is household size, *EDUMale* is the average educational level of male household members over 18 years, *EDUFemale* is the average education of female household members over 18 years, *Room* is the number of rooms in the household, *Light* is equal to 1 if the household has electricity and zero otherwise, *Agr_Land* is equal to 1 if the household has agricultural land and zero otherwise and *Rural* and *Urban* are regional dummies. The subscript *i* indexes household. We use ordinary least squares to estimate equation (2). Because the purpose of the study is to estimate the impact of remittances on poverty, and all poverty analysis documents in Cambodia use consumption as an indicator to measure the poverty headcount ratio, poverty gap and squared poverty gap, consumption per capita is used as the dependent variable of equation (2).

As shown in Table 2, some selected explanatory variables are statistically different between households receiving and not receiving remittances, while some are similar. Households receiving remittances tend to have more female and older household heads, smaller household size, more rooms and less electricity and are more likely to live in rural areas. There is no difference between the two groups in terms of male and female educational level, source of drinking water or agricultural land holding. To verify our empirical result, we estimate the predicted per capita household consumption for the two groups in two cases: (a) selected explanatory variables with no statistical difference between two groups and (b) all selected explanatory variables. However, we focus on the latter model for further interpretation.

Table 3 summarises the result obtained by using equation (2) to predict per capita household consumption excluding remittances. All of the coefficients are statistically significant at the 1 percent level, except one variable measuring household head gender. These coefficients can be used to predict per capita household consumption in a situation excluding remittances for households receiving no remittances, households receiving internal remittances and households receiving international remittances. When the per capita household consumption excluding remittances has been estimated, per capita household consumption

Table 2: Summary Data on Households Receiving and Not Receiving Remittances

Variables	Receive no remittance	Receive remittances	t-test
Household head sex (1=male, 0=female)	0.80 (0.39)	0.65 (0.47)	9.09***
Household head age (years)	43.83 (12.73)	52.31 (13.89)	-16.47***
Household size (person)	4.93 (1.97)	4.58 (2.05)	4.47***
Mean adult male educational level (years)	5.90 (4.10)	5.65 (4.18)	1.55
Mean adult female educational level (years)	4.36 (3.42)	4.16 (3.42)	1.44
Number of rooms	1.48 (0.94)	1.58 (1.11)	-2.50**
Lighting (1=electricity, 0=otherwise)	0.36 (0.48)	0.32 (0.47)	2.01**
Drinking water (1=piped, 0=otherwise)	0.25 (0.43)	0.24 (0.43)	0.12
Agricultural land (1=agricultural land, 0=otherwise)	0.60 (0.48)	0.64 (0.47)	-1.88
Rural (1=rural, 0=otherwise)	0.61 (0.48)	0.65 (0.47)	-2.09**

Standard deviations are in parentheses. * Significant at the 0.1 level. ** Significant at the 0.05 level.*** Significant at the 0.01 level.
Source: Author's calculations

Table 3: Regression to Estimate Predicted Per Capita Household Consumption (Excluding Remittances)

	Model 1	Model 2
Mean adult male educational level	0.006***	0.006***
Mean adult female educational level	0.004***	0.004***
Drinking water (1=piped, 0=otherwise)	0.122***	0.100***
Agricultural land (1=agricultural land, 0=otherwise)	-0.007	0.001
Rural dummy	-1.125***	-1.059***
Urban dummy	-0.719***	-0.683***
Household head sex (1=male, 0=female)		0.005
Household head age (years)		0.001***
Household size		-0.019***
Number of rooms		0.041***
Lighting (1=electricity, 0=otherwise)		0.063***
Quintile 2	0.408***	0.391***
Quintile 3	0.688***	0.662***
Quintile 4	0.992***	0.948***
Quintile 5	1.573***	1.493***
Constant	8.409***	8.351***
Adjusted R-squared	0.915	0.918
Sample size	2743	2743

* Significant at the 0.1 level. ** Significant at the 0.05 level. *** Significant at the 0.01 level.
Source: Author's calculations

Table 4: Predicted per Capita Consumption for Households Receiving and Not Receiving Remittances (in riels per capita per day)

	Receive no remittance	Receive domestic remittances	Receive international remittances
Model 1			
Predicted mean consumption excluding remittances	5961.05 (5548.86)	5700.90 (5256.05)	9503.96 (7707.83)
Predicted mean consumption including remittances	5961.05 (5548.86)	6193.46 (5653.87)	11150.28 (9572.14)
Model 2			
Predicted mean consumption excluding remittances	5975.17 (5614.18)	5828.61 (5485.17)	9708.99 (8050.53)
Predicted mean consumption including remittances	5975.17 (5614.18)	6321.17 (5867.83)	11355.30 (9885.59)
Sample	2743	697	136

Note: Standard deviations are in parentheses.
Source: Author's calculations

including remittances can be calculated by adding 80 percent of actual amounts of per capita remittances.[2]

Table 4 reports the predicted per capita household consumption for the three groups of households in two situations: excluding and including remittances. When remittances are excluded, the average per capita consumption for households receiving internal remittances is 2–4 percent lower than for households not receiving remittances. Households receiving international remittances have higher per capita household consumption than the other two groups, implying that most households with international migration are generally wealthier than households of internal migration and non-migration. When remittances are included, the mean per capita consumption for households receiving internal

2 Chan (2009a) notes that 80-87 percent of remittances has been spent on consumption and while only 13-20 percent on production.

and international remittances is 6 percent and 80 percent higher, respectively, than for households not receiving remittances.

Remittances and Poverty Reduction

To examine the impacts of internal and international remittances on poverty and inequality, we consider two scenarios. In one, we estimate the poverty headcount ratio, poverty gap, squared poverty gap and Gini coefficient excluding remittances. In the second scenario, we include remittances. At various poverty measures and poverty lines, the inclusion of remittances reduces the poverty ratio, poverty gap and squared poverty gap. The size of poverty reduction depends on the measures and lines. The poverty ratio in 3576 households relative to the national poverty line was 24.33 percent with remittances included and 25.53 percent with them excluded—an increase of 1.20 percentage points. In remittance-receiving households, including the remittances in household expenditure would reduce poverty more. Table 5 shows that internal and international remittances have lowered the level of poverty by 4.73 and 7.35 percentage points, respectively. However, poverty is reduced even more when measured by poverty gap and squared poverty gap. For example, the squared poverty gap measure shows that internal and international remittances could reduce poverty by 5.7 percent for the sample of 3576 households, by 26.9 percent for households receiving internal remittances and by 60.8 percent for household receiving international remittances. This implies that remittances reduce the severity of poverty more than they reduce the proportion of people living in poverty. Our result stands firm when the international poverty line is applied, although the size of poverty reduction is smaller.

Table 5 also indicates that internal or international remittances have less impact on consumption (income) inequality measured by the Gini coefficient. This reveals that the effects of remittances on poverty reduction are largely due to an increase in mean household income rather than to a change in income inequality.

Conclusion

This paper uses the nationally representative survey of 3593 households and predicted income functions to analyse the impact of internal and international remittances on poverty and inequality in Cambodia. We found that fewer than 24 percent of households receive remittances—of which 19.9 percent receive internal remittances and 4.3 percent

Table 5: Impact of Remittances on Poverty in Receiving and Non-Receiving Households

National poverty line

	All households		Household receiving internal remittances		Household receiving international remittances	
	Receive no remittance	Including Internal and international remittances	Receive no remittance	Including Internal remittances	Receive no remittance	Including Internal remittances
Model 1						
Poverty headcount (%)	27.27	25.76	28.69	22.38	13.24	5.88
Poverty gap (%)	5.60	5.30	5.36	4.10	2.62	1.11
Squared poverty gap (%)	1.79	1.67	1.67	1.20	0.84	0.31
Gini coefficient	0.43	0.44	0.42	0.43	0.43	0.44
Sample	3576	3576	697	697	136	136
Model 2						
Poverty headcount (%)	25.53	24.33	24.39	19.66	12.50	5.15
Poverty gap (%)	5.54	5.28	5.05	3.98	2.45	1.07
Squared poverty gap (%)	1.77	1.67	1.59	1.16	0.77	0.30
Gini coefficient	0.43	0.44	0.42	0.43	0.43	0.44
Sample	3576	3576	697	697	136	136

Note: Households receiving both domestic and international remittances are excluded.
Source: Author's calculations from CSES 2007

international remittances. Remittances account for 11 percent of total income for households receiving internal remittances and for 20 percent for households receiving international remittances. Both types of remittance reduce the level, depth and severity of poverty. The size of the reduction depends on poverty measures. Using the national poverty line, poverty is reduced about 1 percentage point by internal and international remittances. Internal and international remittances could reduce the poverty ratio by 4.73 and 7.35 percentage points, respectively. However, poverty is reduced even more when measured by poverty gap or squared poverty gap, indicating that remittances have a greater impact on the severity of poverty than on the number living in poverty. The study also shows that internal and international remittances have little impact on inequality, which means that poverty reduction is largely due to an increase in mean income.

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Farmer Organisations in Cambodia: Do they Improve Food Security of the Rural Poor?[1]

Introduction

In developing countries a large share of the poor characteristically live in rural areas where the main occupation is small-scale farming. The importance of smallholder agriculture is recognised by both the international donor community and national governments, as demonstrated in their pledges to undertake requisite interventions to enhance and support agricultural development and rural economic growth. The most commonplace intervention policy adopted by developing countries is to promote the creation of rural producer organisations (Bingen *et al.* 2003; Chirwa *et al.* 2005). The main impetus behind this is to provide effective and collective support services to smallholders so as to loosen the major obstacles to productivity improvement, and to enhance self-help and collective power to regulate markets (Barham & Chitemi 2009; Bachke 2010).

In Cambodia, over 90 percent of the poor live in rural areas and rely on agriculture for their primary sources of livelihood. The country's agricultural sector is predominantly characterised by small-scale farming: about 84 percent of rural farmers own less than one hectare of agricultural land (World Bank 2005, 2009). As Cambodia's agriculture holds immense potential where productivity gains could boost sustainable outputs, particularly employment and the incomes of those who are most dependent on agriculture for their livelihoods (Savanti & Sadoulet, 2008; Theng & Koy 2011), promoting small-scale agricultural-based enterprises would improve rural households' welfare and reduce poverty.

In an effort to support smallholders' livelihoods, the Cambodian government has prioritised agricultural development, as stipulated in the Rectangular Strategy (RS), the National Strategic Development Plan (NSDP) and the Strategy for Agriculture and Water (SAW), that recognises and promotes smallholder farming and farmer organisations (FOs) as key to rural economic development and poverty alleviation (Chea 2010).

Although the Cambodian government has articulated FOs as key to rural agricultural and private sector development, there have been few studies on the effect of FOs on rural livelihoods. Further, there is no available research on the extent to which FOs impact on rural smallholders' livelihoods in Cambodia, let alone the differing impacts of the various types of FO. Better understanding of the impact of FO membership on income improvement, identifying the benefits FO members get and the challenges FOs face would build knowledge about the FO sector in Cambodia, help re-shape current policy and identify effective ways that could further improve and address the needs of FOs and better support smallholders for poverty alleviation.

This study assesses the impacts of FOs on the food security of the rural poor. The specific objectives are to: (1) examine FOs' roles, operation and challenges in improving household food security; (2) analyse household characteristics that determine participation in FOs; (3) assess the impact of FOs on food security and livelihoods of the rural poor; and (4) provide specific recommendations for changes in legal and regulatory frameworks associated with FOs.

Methodology

FO types and study location

There are five different types of FO in Cambodia: Farmer Group (FG), Farmer Community (FC), Farmer Association (FA), Agricultural Cooperative (AC) and Farmer Federation (FF). Of these, FGs, FAs and ACs, which focus on agricultural development and improving rural livelihoods, are the most

1 This article is prepared by Theng Vuthy, programme coordinator, Nou Keosothea, senior research fellow, Keo Socheat and Sum Sreymom, research associates and Khiev Pirom, research assistant, of the Poverty, Agriculture and Rural Development Programme (PARD) at CDRI. This article summarises the empirical findings of the study *Impact Assessment of Farmer Organisation on Food Security for Rural Poor,* a project funded by the World Bank.

Table 1: Propensity Score Estimation for FO Participation (logit estimation)

Variables	Pooled	FG	FA	AC
	z	z	z	z
Age of household head	2.58**	0.76	2.50**	2.71**
Square age of household head	-2.40**	-0.59	-2.36**	-2.60**
Number of years of HHH education	0.93	-0.57	1.17	1.59
HHH can read and write (dummy)	1.54	1.52	0.79	1.62
HHH is male (dummy)	-2.96***	-1.22	-3.93***	-0.89
HHH is married (dummy)	1.46	0.59	2.78**	-0.74
HHH is unemployed (dummy)	-3.19***	-3.27***	-1.78**	-0.61
HHH has salary (dummy)	-0.36	-0.82	0.72	-0.04
HHH is a farm worker (dummy)	-0.95	-1.22	0.3	-1.43
Number of years HHH has lived in village	-0.51	-0.15	-1.29	-0.4
Household size	-2.48**	-1.62*	-1.83**	-1.80**
Square of household size	2.40**	1.64*	2.12**	1.14
Dependents ratio (to adult aged 15-65 years)	1.43	0.91	0.62	1.34
Area of cultivated land m^2	-0.47	-0.37	0.4	-1.52
Square of area of cultivated land m^2	0.25	0.4	-0.36	1.25
Agriculture is primary source of HH income (dummy)	0.41	-0.59	1.19	0.48
Household access to loan in last 12 months (dummy)	4.10***	3.50***	2.50**	2.16**
Index of household agricultural assets	1.92**	1.51	0.97	1.74**
Total value of assets	1.87*	0.64	0.11	3.74***
Square of total value of assets	-2.09**	-1.05	0.05	-3.27***
Value of house	1.04	-1.09	1.03	2.08**
Square of house value	-1.11	0.42	-1.31	-1.44
Household cultivated land is irrigated (dummy)	1.11	3.11***	-0.92	-0.95
Svay Rieng province (dummy)	-0.28	2.04**	-1.83**	-2.48**
Kampot province (dummy)	-1.03	-0.38	-0.84	-1.14
Battambang province (dummy)	0.21	0.22	0.05	0.47
Kompong Thom province (dummy)	-	-	-	-
Constant	-2.14	-1.15	-2.73	-3.00
Pseudo R^2	0.079	0.100	0.116	0.221
Number of observations	695	510	470	445

Note: *, **, *** indicate statistically significant difference at 10%, 5% and 1% levels, respectively.

common. Therefore, these three types of FO were selected for case-study. To obtain a geographically representative sample, the four provinces with the highest density of FOs were selected for study, namely: Battambang, Kompong Thom, Svay Rieng and Kampot.

Household sampling

To obtain a good sample and ensure representative and credible results, 54 FOs were selected from the four provinces by simple random sampling and in a ratio proportionate to the total number of each type of selected FO located in each province. The number of FGs, FAs and ACs to be selected was calculated based on the proportion of 50:30:20 percent, respectively, resulting in a sample comprising 29 FGs, 15 FAs and 10 ACs. To estimate the impact of participation in a FO, non-member households were selected and used as a counterfactual group for comparison purposes. A total of 699 households were interviewed; 330 FO member households were randomly selected from 25 communes across the four provinces[2], and 369 non-member households were randomly selected from the same locations.

Estimation of impacts

To measure the impact of FO participation on the food security of the rural poor, household rice and livestock productivities were used as proxies. Total production and production costs of rice and livestock were used to estimate the performance of households benefiting from FO participation. Propensity score matching (PSM) was used to empirically estimate the impact of FO membership

2 See Theng *et al.* (2011) for details of research methodology and sampling procedures.

Table 2: Average Treatment Effects of PSM for Rice Productivity

Variable	Nearest neighbour matching			Kernel matching		
	Difference (ATT)	T-stat	Trt/Cont Obs	Difference (ATT)	T-stat	Trt/Cont Obs
Rice revenue /ha (0000 riels)						
Pooled sample	8.74	0.85	292/313	8.59	0.93	299/313
- Farmer group	-4.00	-0.29	129/313	-1.22	-0.1	132/313
- Farmer association	23.34	1.36	82/313	-0.95	-0.07	91/313
- Agri. cooperative	35.44	1.91**	75/313	32.61	2.07**	74/313
Rice profit /ha (0000 riels)						
Pooled sample	8.23	0.41	292/313	12.94	0.75	299/313
- Farmer group	-13.10	-0.79	129/313	-1.44	-0.07	132/313
- Farmer association	6.07	0.23	82/313	0.37	0.01	91/313
- Agri. cooperative	50.19	2.43**	74/313	52.87	2.41**	74/313

Note: *, **, *** indicate statistically significant difference at 10%, 5% and 1% level, respectively.

on household rice and livestock productivity (Caliendo & Kopeinig 2008).

Results and Discussion[3]

Participation Characteristics in FOs

Empirical analysis of the survey data reveals that the factors affecting FO participation differ between the pooled sample (all FOs) and sub-samples (FGs, FAs, ACs) (Table 1). The age of household head had a positive and significant probability on participation in FOs, but household heads older than 56 were less likely to be a FO member in the pooled sample and FA and AC sub-samples, whereas the household head's age was not a significant determinant of participation in the FG sub-sample. The significant negative relationship between male household heads and participation in FOs suggests that a higher proportion of female-headed households in the pooled sample and FA sub-sample were likely to join FOs, but this was not so for FGs and ACs. Unemployment of household head and size of household had a significant negative impact on FO participation, whereas access to credit was a key positive determinant of the propensity to participate in the pooled sample and sub-samples, findings which are similar to those of Davis et *al.* (2010), Couturier et *al.* (2006) and Chea (2010).

Households with productive agricultural assets were likely to participate in FOs for pooled sample and the AC sub-sample (Bernard & Sphielman 2009). Land size was not a significant indicator of FO participation. Household welfare had a positive relationship with participation in FOs, but this relationship turned to a negative impact on participation when households became rich with total assets worth 13.6 million riels or more. Thus, in the pooled sample and AC sub-sample, farmers with a higher level of productive capital are less likely to become FO members. Education of household head was not a significant determinant of participation for all sub-samples, suggesting that rural households join FOs regardless of the level of human capital (Table 1).

Impact of FO Participation on Livelihoods

The effect of FO participation on revenue and profit from rice and livestock production was empirically estimated for the pooled sample and sub-samples to determine which types of FO significantly impact on members' livelihoods. After balancing covariates of members and non-members using PSM, the empirical results show that in the pooled sample, though FO members have higher revenue and profit than non-members, FO participation (i.e. for FO members) does not exert any significant effect on the value (revenue) and profit of rice production. However, at sub-sample level, the effect of participation in an AC (i.e. for AC members) has a positive and significant impact on rice productivity and profit. AC members' average

3 Both qualitative and quantitative approaches were used to estimate the impacts of FOs on the food security of the rural poor in Cambodia, but only quantitative information is presented in this paper.

Table 3: Average Treatment Effects of PSM for Livestock Productivity

Variable	Nearest neighbour matching			Kernel matching		
	Difference (ATT)	T-stat	Trt/Cont Obs	Difference (ATT)	T-stat	Trt/Cont Obs
Livestock revenue						
Pooled sample	84.30	1.48	275/297	90.33	1.79*	288/297
- Farmer group	-27.86	-0.54	126/297	-30.50	-0.77	125/297
- Farmer association	190.14	1.44	82/297	200.92	1.76*	89/297
- Agri. cooperative	-17.68	-0.17	69/297	150.99	1.72*	70/297
Livestock profit						
Pooled sample	41.79	0.95	275/297	55.59	1.46	288/297
- Farmer group	-12.15	-0.25	123/297	-18.56	-0.51	125/297
- Farmer association	36.80	0.44	86/297	116.56	1.65*	89/297
- Agri. cooperative	-72.51	-0.84	69/297	109.16	1.67*	70/297

Note: *, **, *** indicate statistically significant difference at 10%, 5% and 1% level, respectively.

rice revenue of about 326,100 riels (USD80.32) per ha and rice profit of approximately 528,700 riels (USD130.22) per ha are higher than non-members', implying that AC member households have better technology and are more cost-efficient than non-member households (Table 2)[4]. This finding coincides with the studies of Bratton (1986), Bachke (2010) and Davis *et al.* (2010).

The effects of FO participation on livestock revenue and profit per household are illustrated in Table 3. The estimate indicates that FO participation exerts a positive and statistically significant effect on revenue, but not on profit, from livestock production in the pooled sample. On average, FO members' revenue from livestock production is about 903,300 riels (USD222) per year higher than non-members', and this is statistically significant at 10 percent level. As far as the sub-samples are concerned, there is a positive statistically significant impact on FA and AC members', but not on FG members' revenue and profit from livestock production. The average causal effect of participation in FAs and ACs on livestock revenues is 200,920 riels (USD50) and 150,990 riels (USD37), respectively, higher than that of non-members and statistically significant at 10 percent.

The positive and significant impact of FO participation on the values of rice and livestock production was largely and directly affected by the use of improved agricultural techniques provided by support agencies. This is supported by the survey findings in that FO members had significantly more access to agricultural technical services for improving crop and livestock productivity than non-members. However, the significant impact on rice and livestock productivity cannot be attributed to collective action in terms of access to markets for purchasing inputs or selling outputs. Because collective action by FO members is largely inefficient, the majority of FO members access inputs (76 percent) and sell outputs (81 percent) on an individual basis, thereby paying and attaining similar prices to non-members[5].

Conclusion

The study concludes that farmer organisation is a good rural development vehicle for enhancing rural household food security by improving agricultural productivity. Participation in an AC impacts positively on rural household food security through improved rice productivity and better livestock production, while participation in a FA only has positive impact on livestock production.

4 Discussion of the results is based on the Kernel matching algorithm

5 See Theng *et al.* (2011) for survey results on training service accessibility and sale of produce.

These impacts are basically attributable to training in agricultural techniques provided by support agencies. However, FOs in Cambodia do not enhance members' access to markets because farm inputs are purchased and agricultural products are sold largely on an individual basis which means the prices paid and attained by FO members are similar to those of non-members.

To strengthen FOs as an effective instrument for advancing rural livelihoods in Cambodia, some concerns arising from this study may need to be addressed. Apart from training in improved agricultural practices, which should be continually available to FOs in order to improve productivity, government policy to provide FOs with low interest longer term loans (about 10 percent per annum and repayment terms of at least two years) would help FO members increase investment in agricultural production. In addition, to increase the impact of participation in FOs for promoting rural economic growth and improving rural livelihoods, a set of complementary inputs and better market accessibility should be supported by stakeholders, especially government. Contract farming would be a good mechanism for connecting FOs to lower input costs and secure market prices. To sustain the operations of all types of FO in Cambodia, external support (technical and resources) should be provided with longer term commitment to allow FOs to learn to be effective and efficient before they operate independently.

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Economy Watch—External Environment[1]

This section describes economic indicators of major world economies and economies in east Asia.

South-east, east Asian and industrialised countries have been struggling to revitalise their economies since the outbreak of the global financial crisis. Economic prospects in the second quarter of this year, compared to the previous quarter and a year earlier, were worrisome as most countries experienced slower growth.

In the second quarter, Malaysia's real GDP growth plummeted to 4.0 percent, from 8.9 percent a year earlier. Singapore's GDP went down to 0.9 percent from 18.7 percent, the highest rate since 2006. The Thai economy continued to slip, down to 2.6 percent from 9.2 percent a year earlier, due mainly to a political situation that had jeopardised confidence and private investment and flooding that affected thousands of households. Albeit at a slower pace, China and Hong Kong continued to perform well, having real GDP growth at 9.5 percent and 5.1 percent, respectively, from a year earlier. The GDP growth of South Korea fell to 3.4 percent from 7.1 percent and that of Taiwan contracted to 4.9 percent.

Major industrialised countries have yet to restore trust in consumers and investors. The GDP growth rates of the euro-12 went down to 1.6 percent year on year due partly to the effects of the political turmoil and debt crisis in Greece. With real GDP growth at 1.5 percent, from 2.9 percent in the second quarter last year, the United States continued to fight unemployment, which stood at 9.5 percent in the second quarter of this year. Wall Street continued to experience fluctuations in stock prices, reflecting business uncertainty. Recession continued to loom in Japan, its GDP having contracted by 1.0 percent, from 3.5 percent growth a year earlier. This was partly due to the yet-to-be-restored damages of post-tsunami radiation leak and of consumer confidence in Japanese products.

World Inflation and Exchange Rates

Rising prices remained an issue for most economies although the rates were still at reasonable levels. In the second quarter of 2011, Cambodia's inflation rose to 6.2 percent from 4.1 percent a year earlier. Although inflation in Cambodia is expected to be stable this year and next, a high inflation rate in Vietnam, which stood above 19 percent in the second quarter of this year, compared to 9.0 percent a year earlier, will be of concern to Cambodia since bilateral trade between the countries is increasing. Depreciation of the US dollar and rising oil prices can also affect inflation in this country. In the second quarter, China's inflation went up to 5.7 percent, from 2.7 percent.

In the second quarter, the riel appreciated, year on year, by 3.9 percent against the dollar; the Indonesian rupiah appreciated by 6.0 percent, the Singaporean dollar by 8.8 percent, the Chinese yuan by 4.0 percent and the Taiwanese dollar by 9.5 percent. The Vietnamese dong depreciated by 8.9 percent.

Commodity Prices in World Markets

Prices of major commodities continued to rise in the second quarter. Compared to a year earlier, the prices of maize (USNo.2) increased by 98 percent, palm oil (north-west Europe) by 41 percent and rubber (SMR 5) by 61 percent. Natural disasters in major agricultural countries like Thailand and Vietnam might affect outputs rice and other major products. Prices of rice (Thai 100% B) rose by 12 percent to USD514.3/tonne and soybeans (US No. 1) by 42 percent to USD525.7/tonne. In the same period, the price of crude oil (OPEC spot) went up 47 percent to USD113.3/barrel; gasoline (US Gulf Coast) increased by 45 percent to USD0.78/litre and diesel (low sulphur No.2) by 37 percent to USD0.76/litre.

1 Prepared by Roth Vathana, research associate at CDRI.

Economy Watch—External Environment

Table 1. Real GDP Growth of Selected Trading Partners, 2004–11 (percentage increase over previous year)

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
Selected ASEAN countries												
Cambodia	7.7	13.4	10.6	10.2	6.8	-	-	-	-	-	-	
Indonesia	5.1	5.6	5.4	6.3	6.1	4.5	5.7	6.2	5.8	6.9	6.5	6.5
Malaysia	7.0	5.2	5.9	6.3	4.6	-1.7	16.9	8.9	5.3	4.8	4.6	4.0
Singapore	8.5	5.7	7.7	7.7	1.1	-2.2	17.4	18.7	10.5	12.0	8.3	0.9
Thailand	6.0	4.5	4.8	4.9	2.6	-2.3	12.0	9.2	6.7	3.8	3.0	2.6
Vietnam	7.5	8.4	8.1	8.5	6.2	-	5.8	6.4	7.2	7.3	5.4	5.7
Selected other Asian countries												
China	9.5	9.6	10.5	11.9	9.0	8.2	11.9	10.3	9.7	9.8	9.7	9.5
Hong Kong	8.3	6.5	6.6	6.4	2.4	-2.8	8.0	6.5	6.8	6.2	7.2	5.1
South Korea	4.7	4.7	5.0	4.9	2.2	0.0	8.1	7.1	4.5	4.8	4.2	3.4
Taiwan	5.7	4.1	4.6	5.2	0.1	-6.3	14.6	12.9	9.8	6.9	6.5	4.9
Selected industrial countries												
Euro-12	1.8	1.5	2.7	2.9	0.9	-3.0	0.6	1.7	1.9	2.0	2.5	1.6
Japan	3.4	2.5	2.1	2.0	-0.7	-3.7	5.5	3.5	5.0	2.2	-1.0	-1.0
United States	4.4	3.7	3.3	2.2	1.1	-2.2	2.8	2.9	2.3	2.8	2.3	1.5

Sources: International Monetary Fund, Economist and countries' statistic offices

Table 2. Inflation Rate of Selected Trading Partners, 2004–11 (percentage price increase over previous year—period averages)

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
Selected ASEAN countries												
Cambodia	4.0	5.8	4.7	10.5	19.7	-0.5	7.0	4.1	1.8	3.3	3.6	6.2
Indonesia	8.3	10.5	13.4	6.4	10.1	4.9	3.6	4.4	6.2	6.3	6.8	5.9
Malaysia	1.6	3.1	3.7	2.0	5.3	0.6	1.3	1.6	1.9	2.1	2.8	3.3
Singapore	1.7	0.5	1.0	2.1	6.5	0.2	0.9	3.1	3.4	4.0	5.2	4.7
Thailand	2.7	4.5	4.7	2.2	5.5	-0.8	3.7	3.3	3.3	2.0	3.0	4.1
Vietnam	7.8	8.2	7.7	8.3	23.3	7.1	7.5	9.0	8.4	10.9	12.8	19.4
Selected other Asian countries												
China	3.9	1.8	1.5	4.8	5.9	0.1	2.1	2.7	3.3	4.7	5.1	5.7
Hong Kong	-0.4	1.1	2.2	2.0	4.3	0.5	1.9	2.6	2.3	2.9	4.0	5.1
South Korea	3.5	2.8	2.4	2.5	4.6	2.8	2.7	2.6	2.9	3.6	4.4	4.2
Taiwan	1.6	2.3	0.6	1.8	3.2	-0.7	1.3	1.1	0.4	1.1	1.3	1.6
Selected industrial countries												
Euro-12	2.2	2.2	2.1	2.1	3.3	0.5	1.1	1.5	1.7	2.0	2.5	2.7
Japan	Nil	-0.3	0.5	0.1	1.4	-1.3	-1.2	-0.9	-0.9	0.1	0.0	0.3
United States	2.7	3.4	3.2	2.9	3.8	-0.3	2.3	1.8	1.2	1.3	2.1	3.5

Sources: International Monetary Fund, Economist and National Institute of Statistics

Table 3. Exchange Rates against US Dollar of Selected Trading Partners, 2005–11 (period averages)

	2005	2006	2007	2008	2009	2010				2011	
						Q1	Q2	Q3	Q4	Q1	Q2
Selected ASEAN countries											
Cambodia (riel)	4092.50	4103.20	4062.70	4054.20	4141.03	4180.11	4209.02	4236.69	4122.58	4041.90	4044.89
Indonesia (rupiah)	9705.00	9134.00	9419.00	9699.00	10303.81	9266.93	9,132.00	8995.11	8965.70	8902.02	8593.94
Malaysia (ringgit)	3.80	3.70	3.30	3.30	3.50	3.37	3.24	3.15	3.11	3.05	3.02
Singapore (S$)	1.66	1.59	1.51	4.58	1.45	1.40	1.36	1.36	1.30	1.28	1.24
Thailand (baht)	40.20	37.90	32.22	33.36	34.13	32.90	32.33	31.63	29.99	30.56	30.28
Vietnam (dong)	15,859.00	15,994.00	16,030.00	16,382.00	17767.00	18,825.67	18,993.00	19,485.00	19499.48	20273.83	20693.58
Selected other Asian countries											
China (yuan)	8.19	7.97	8.03	6.94	6.83	6.83	6.77	6.77	6.66	6.58	6.50
Hong Kong (HK$)	7.78	7.77	7.80	7.78	7.75	7.76	7.78	7.77	7.76	7.79	7.78
South Korea (won)	1024.00	955.00	929.04	1137.23	1273.30	1143.97	1166.04	1182.41	1132.85	1120.19	1084.27
Taiwan (NT$)	32.10	32.50	32.85	31.54	33.04	31.93	31.90	31.90	30.36	29.30	28.86
Selected industrial countries											
Euro-12 (euro)	0.80	0.80	0.70	0.84	0.71	0.72	0.79	0.77	0.74	0.73	0.70
Japan (yen)	110.20	116.40	117.80	102.46	93.26	90.73	92.20	85.74	82.53	82.33	81.66

Sources: International Monetary Fund, Economist and National Bank of Cambodia

Table 4. Selected Commodity Prices on World Market, 2005–11 (period averages)

	2005	2006	2007	2008	2009	2010				2011	
						Q1	Q2	Q3	Q4	Q1	Q2
Maize (USNo.2)—USA (USD/tonne)	110.65	111.04	149.08	218.15	167.32	162.88	157.41	176.13	238.81	280.32	311.63
Palm oil—north-west Europe (USD/tonne)	427.47	433.85	707.68	912.23	686.84	807.67	813.00	874.67	1108.00	1251.00	1147.00
Rubber SMR 5	1430.5	1996.30	2202.30	2586.30	1890.5	3105.90	3083.73	3175.97	4257.27	5278.03	4968.77
Rice (Thai 100% B)—Bangkok (USD/tonne)	221.67	282.00	305.36	615.32	474.47	565.67	461.33	468.33	531.00	528.25	514.33
Soybeans (US No.1)—USA (USD/tonne)	262.03	213.88	294.59	460.41	444.25	372.68	370.95	406.88	480.24	537.24	525.66
Crude oil—OPEC spot (USD/barrel)	33.50	61.58	69.25	95.44	237.26	75.73	77.00	74.91	84.17	100.70	113.31
Gasoline—US Gulf Coast (cents/litre)	30.90	47.70	53.58	62.22	51.70	53.87	54.43	51.54	57.23	67.92	78.73
Diesel (low sulphur No.2)—US Gulf Coast (cents/litre)	29.48	51.35	55.51	76.20	42.98	53.87	55.13	53.64	61.68	72.47	75.72

Sources: Food and Agriculture Organisation and US Energy Information Administration

Economy Watch—Domestic Performance[1]

Main Economic Activities

Services continued to be the main driver of economic recovery of the kingdom. Private investment projects in services approved by the Council for the Development of Cambodia were worth USD2229.2 m in the second quarter, a 964 percent rise from a quarter earlier or a 1733 percent increase year on year. The increase came despite declines in foreign visitors by air (33 percent) and land and water (9.0 percent) in the second quarter compared to the previous quarter. Industry, mainly garments, also showed signs of recovery, accelerating by 516 percent compared to the preceding quarter or 659 percent year on year to USD413.5 m. However, the share of garments dropped to 26 percent compared to 85 percent in the first quarter and 39 percent a year earlier. This may indicate industrial diversification.

Despite growing interest from China and ASEAN countries in investment in rice and other agriculture, Cambodia still had difficulty attracting domestic and foreign investment. In the second quarter, no new or expanded agricultural investment projects were approved. Construction continued to recover as suspended construction projects like Vattanac Tower resumed. Although, the value of villas and houses and flat construction increased by 77 percent compared to the previous quarter, to USD77.4 m, this was still far below the pre-crisis level.

Exports continued to be vibrant in the second quarter, growing by 38 percent year on year to USD1132.1 m, garments accounting for 85 percent of the total. The EU and USA were the major destinations for garment exports. However, the year-on-year increase in garment exports, to the US (12 percent) and EU (63 percent) were lower than to ASEAN (121.1 percent), Japan (88 percent) and the rest of the world (66 percent). In the same period, exports of agricultural produce skyrocketed by 517 percent to USD168 m; rubber exports accelerated by 252 percent to USD48.6 m and wood by 273 percent to USD16.8 m. Fish exports dropped 43 percent to USD0.4 m.

In the same period, total imports increased by 63 percent to USD918.8 m, of which imports of gasoline accounted for 8.3 percent and diesel about 15 percent. Imports of gasoline increased 242 percent and of diesel 134 percent. Imports of construction materials went down by 4.0 percent to USD12.7 m because of slow growth in the real estate sector.

Public Finance

The total revenue of the government in the fourth quarter of 2010 increased 17 percent, compared to the third quarter, to KHR1675 bn of which almost 94 percent was current revenue. Tax revenue increased by 0.3 percent to KHR1229.6 bn, while non-tax revenue accelerated 66 percent to KHR340.9 bn. During the same period, total expenditure decreased by 19 percent to KHR1945.4 bn, of which capital expenditure dropped by 24 percent to KHR675.6 bn. Current expenditure dropped by 16 percent to KHR1269.8 bn. In the fourth quarter, wages accounted for 45 percent of current expenditure, while the share of subsidies and social assistance was 18 percent. The budget deficit was KHR207.3 bn.

Inflation and Foreign Exchange Rates

Keeping inflation under control is still an issue. In the second quarter of 2011, the consumer price index (all items) was up by 6.3 percent, year on year. Prices of foods and non-alcoholic beverages were up by 7.6 percent while transportation dropped by 7.3 percent. In the same period, gold rose by 27 percent to USD181.5/chi, diesel by 25 percent to KHR4784.6/litre and gasoline by 16 percent to KHR5065.5/litre. The riel appreciated by 3.8 percent to KHR4044.9/USD and by 11 percent to KHR19.6 per 100 Vietnamese dong. It depreciated by 3.0 percent to KHR133.8 per Thai baht.

Monetary Developments

In the first quarter of 2011, total liquidity increased by 17.6 percent year on year to KHR20,278.3 bn, of which net foreign assets rose by 10.1 percent to KHR17,079 bn and net domestic assets by 86 percent to KHR3199.2 bn. In the same period, money grew by 11.1 percent to KHR3497.2 bn and quasi-money by 19.1 percent to KHR16,781.1 bn.

1 Prepared by Roth Vathana, research associate, Ourn Vimoil and Pon Dorina, research assistant, at CDRI.

Poverty Situation

According to the CDRI vulnerable workers survey in August, of the nine non-garment-worker groups, two experienced a decline in their earnings. Waitresses suffered the most, as their real earnings shrank by 16 percent, followed by porters (0.6 percent). Skilled construction workers, vegetable traders, rice-field workers, motorcycle-taxi drivers, cyclo drivers, scavengers and unskilled construction workers increased their real incomes.

As shown in Table 8, waitresses were found to be the worst-off group. Their daily earnings declined 16 percent, from KHR6427 in the same month last year to KHR5410. However, their daily expenses went down only 2.6 percent, to KHR1402.4. Although their earnings dramatically decreased, only 12 percent of interviewed waitresses were in debt.

Among the nine non-garment-worker groups, porters also experienced a decrease in their daily incomes, but it was not severe, dropping from KHR10,525 to KHR10,465. Moreover, their daily consumption rose 0.8 percent to KHR5605. Of the porters interviewed, 75 percent rented accommodation, 22.5 percent stayed in a relative's house and 2.5 percent stayed on the road or in a pagoda.

Unskilled construction workers' daily income jumped by 20 percent from KHR8744. This resulted from a large number of construction project approvals—a 278 percent rise from August 2010 to August 2011. The survey found that 60 percent of unskilled construction workers are married, 37.5 percent single and 2.5 percent widowers or widows.

Rice-field workers had the second largest increase, their real daily earnings rising by almost 19 percent, from KHR6186 to KHR7345. They experienced a decrease early in the year. Fifty-five percent of them had no agricultural land, while 40 percent had land of less than one hectare.

The real daily income of scavengers was 7557 riels, 17 percent higher than in the same period last year. This was attributable to an increase of the rubbish price. Of scavengers interviewed, 42.5 percent had attended primary school, 12.5 percent secondary school, 2.5 percent high school and 42.5 percent no school.

Cyclo drivers, whose daily earnings contracted in May, increased their income in August. All of them are breadwinners for their families.

Garment workers' real daily earnings jumped up from KHR8470/day to KHR8687/day, a 2.6 increase from the same month last year. Of the garment workers interviewed, 27 percent frequently worked overtime, 58 percent sometimes and 15 percent never.

Table 1. Private Investment Projects Approved, 2004–11

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
	Fixed Assets (USD m)											
Agriculture	12.3	26.8	498.0	135.6	92	445.8	165.7	41.4	278.0	36.7	4.1	0.0
Industry	187.9	914.6	365.3	709.1	724.9	1043.3	247.7	54.5	44.3	87.7	67.1	413.5
. Garments	*132.6*	*174.4*	*89.4*	*170.7*	*142.8*	*87.58*	*13.1*	*21.3*	*29.3*	*50.0*	*57.1*	*108.4*
Services	91.8	155.5	2939.1	1742.5	10,003.2	4121.5	89.5	121.6	0	1096.2	209.5	2229.2
. Hotels and tourism	*55.9*	*102.6*	*345.0*	*1048.3*	*8758.1*	*3980.1*	*3.78*	*14.0*	*0*	*1087.4*	*107.9*	*2221.9*
Total	292.0	1096.9	3802.4	2587.2	10570.9	5610.6	502.9	217.5	322.3	1220.6	280.72	2642.7
	Percentage change from previous quarter											
Total	-	-	-	-	-	-	-91.2	-56.8	48.2	278.8	-77.0	841.4
	Percentage change from previous year											
Total	-5.6	275.6	246.6	-32.0	308.6	-46.9	-59.8	452.0	-16.6	-71.3	-44.2	1115.0

Including expansion project approvals. Source: Cambodian Investment Board

Table 2. Value of Construction Project Approvals in Phnom Penh, 2004–11

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
	USD m											
Villas and houses	30.3	45.5	33.1	79.1	154.7	64.3	5.1	7.5	14.1	9.5	4.1	5.9
Flats	167.6	204.2	213.3	297.2	221.6	149.6	11.1	127.2	25.3	20.3	16.1	22.8
Other	65.6	109.1	76.8	259.6	740.9	187.8	35.2	67.4	38.9	76.2	23.6	48.7
Total	263.5	358.8	323.3	635.8	1117.0	401.7	51.4	202.1	78.4	106.0	43.8	77.4
	Percentage change from previous quarter											
Total	-	-	-	-	-	-	-23.1	293.2	-61.2	35.3	-58.7	76.7
	Percentage change from previous year											
Total	32.5	36.2	-9.9	96.7	75.7	-64.0	-71.6	224.4	-14.2	58.7	-14.8	-61.7

Source: Department of Cadastre and Geography of Phnom Penh municipality

Table 3. Foreign Visitor Arrivals, 2004–11

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
	Thousands											
By air	626.1	856.5	1029.0	1296.5	1239.4	1111.7	371.5	260.9	288.3	383.7	427.4	286.9
By land or water	428.9	565.1	672.9	718.6	881.9	1049.8	312.2	276.6	293.8	321.4	351.0	319.6
Total	1055.0	1421.6	1701.9	2015.1	2121.3	2161.5	683.7	537.5	582.0	705.1	778.4	606.5
	Percentage change from previous quarter											
Total	-	-	-	-	-	-	16.4	-21.4	8.3	21.2	10.4	-22.1
	Percentage change from previous year											
Total	50.5	34.7	19.7	28.4	5.3	1.9	9.9	15.8	19.4	20.0	13.9	12.8

Source: Ministry of Tourism

Table 4. Exports and Imports, 2004–11

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
	USD m											
Total exports	2099.4	2452.4	2922.8	3161.6	3209.5	2889.0	693.8	820.8	1045.4	1070.9	1017.6	1132.1
Of which: Garments	2027.0	2352.8	2810.8	3050.2	3097.8	2565.3	625.5	716.9	938.3	942.7	880.5	964.2
. To U S	1270.9	1555.6	1851.7	1959.9	1913.0	1512.6	380.5	416.7	531.9	524.8	464.5	466.7
. To EU	590.8	506.9	603.0	660.9	693.4	644.7	137.2	184.8	239.4	248.0	232.0	301.4
.To ASEAN	1.7	70.7	80.4	90.3	99.6	6.9	2.2	1.9	2.9	3.0	3.8	4.2
.To Japan	22.1	25.0	40.6	30.1	26.5	44.6	19.8	14.9	25.5	26.3	34.3	28.0
. To rest of the world	141.5	194.6	235.1	309.0	365.3	356.5	85.7	98.6	138.6	140.7	145.9	163.9
Agriculture	53.5	61.3	59.7	55.6	44.6	60.5	21.2	27.2	44.9	72.3	74.0	167.9
. Rubber	30.2	36.7	41.5	41.0	35.8	39.8	11.9	13.8	25.4	38.1	49.9	48.6
. Wood	11.1	10.3	8.6	8.7	3.4	3.5	2.8	4.5	8.8	18.7	6.2	16.8
. Fish	9.8	10.1	5.9	3.2	2.3	3.2	0.8	0.7	0.5	0.8	0.6	0.4
. Other	2.4	4.2	3.7	2.7	3.1	14.0	5.7	8.2	10.2	14.7	17.3	31.3
Others	18.9	38.3	52.3	55.8	67.1	263.2	47.1	76.7	62.2	55.9	63.2	70.8
Total imports	871.1	2513.0	512.2	554.8	1010.9	2239.0	505.6	563.2	731.3	677.1	728.7	918.8
Of which: Gasoline	30.2	40.2	38.8	58.7	70.1	91.2	28.8	22.4	27.6	30.5	62.0	76.7
Diesel	109.4	93.1	113.0	122.8	113.5	180.8	49.8	55.4	48.0	50.5	92.5	129.8
Construction materials	23.2	134.7	56.5	69.0	77.8	49.7	13.7	13.2	16.7	13.8	11.8	12.7
Other	708.4	2245.0	303.9	304.3	749.5	1917.3	413.3	472.2	638.9	582.3	562.4	699.6
Trade balance	1228.3	-60.6	2410.6	2606.8	2198.6	650.0	188.2	257.6	314.1	393.8	289.0	213.3
	Percentage change from previous quarter											
Total garment exports	-	-	-	-	-	-	8.0	14.6	30.9	0.5	-6.6	9.5
Total exports	-	-	-	-	-	-	5.9	18.3	27.3	2.4	-5.0	11.3
Total imports	-	-	-	-	-	-	-5.1	11.4	29.8	-7.4	7.6	26.1
	Percentage change from previous year											
Total garment exports	24.5	16.1	19.5	8.5	1.6	-10.0	4.0	45.6	75.2	62.7	40.8	34.5
Total exports	23.4	16.3	19.2	8.2	1.5	-17.2	-2.3	46.8	68.5	63.5	46.7	37.9
Total imports	13.2	189.6	-79.6	8.3	82.2	121.5	-14.5	-7.4	51.0	27.1	44.1	63.1

Import data include tax-exempt imports. Sources: Department of Trade Preferences Systems, MOC and Customs and Excise Department, MEF (web site)

Table 5. National Budget Operations on Cash Basis, 2005–11 (billion riels)

	2005	2006	2007	2008	2009				2010			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Total revenue	2625.0	3259.2	1146.1	5290.0	1101.7	1252.7	1184.7	1346.1	1536.8	1341.1	1436.0	1675.0
Current revenue	2474.0	2881.8	1141.6	5210.7	1097.7	1245.7	1174.9	1337.7	1526.4	1330.9	1431.2	1570.5
Tax revenue	1911.0	2270.9	965.2	4409.9	947.4	1096.5	999.5	1224.1	1094.1	1143.8	1225.5	1229.6
Domestic tax	-	-	661.8	3248.4	712.0	838.7	731.8	808.5	820.3	890.9	916.9	905.5
Taxes on international trade	-	-	303.5	1161.5	235.4	257.8	268.0	303.4	273.7	253.0	308.6	324.1
Non-tax revenue	563.0	610.9	176.4	800.8	150.3	149.2	176.1	225.7	432.4	187.1	205.7	340.9
Property income	-	-	13.6	78.0	13.1	9.7	27.5	14.3	237.0	20.2	19.5	14.5
Sale of goods and services	-	-	124.3	424.7	93.5	100.9	91.7	121.9	108.4	102.9	127.0	121.7
Other non-tax revenue	-	-	38.5	298.2	43.7	38.6	56.5	89.5	84.0	61.0	59.2	204.8
Capital revenue	152.0	377.4	4.5	79.3	4.0	7.0	9.8	8.4	10.4	10.2	4.8	104.5
Total expenditure	3295.0	4174.7	1689.7	6297.8	1650.6	1766.1	2089.5	1877.1	2129.4	2154.8	2390.3	1945.4
Capital expenditure	1328.0	1638.1	807.4	2574.4	693.6	607.1	759.2	634.9	-	913.0	887.0	675.6
Current expenditure	1967.0	2536.8	882.3	3809.0	752.4	1064.7	1290.4	1332.3	831.8	1168.1	1503.3	1269.8
Wages	711.0	822.0	362.6	1397.0	327.4	515.5	526.6	642.5	-	545.6	562.4	567.4
Subsidies and social assistance	-	-	194.2	927.1	217.3	185.9	272.6	195.6	213.3	253.2	401.5	231.4
Other current expenditure	-	-	325.5	1384.9	207.7	363.2	491.2	494.3	449.6	369.3	539.4	471.0
Overall balance	-706.0	-915.6	-543.6	-1007.8	-548.9	-513.4	-904.8	90.2	-592.6	-813.7	-954.2	-207.3
Foreign financing	1127.0	1360.7	741.5	2055.1	507.8	326.7	484.5	-531.0	270.8	746.0	409.1	419.3
Domestic financing	-396.0	-445.1	-185.8	-127	-310.3	236.5	316.4	406.4	422.8	194.1	343.3	-21.6

Source: MEF web site.

Table 6. Consumer Price Index, Exchange Rates and Gold Prices (period averages), 2004–11

	2004	2005	2006	2007	2008	2009	2010				2011	
							Q1	Q2	Q3	Q4	Q1	Q2
(October-December 2006:100)	Consumer price index (percentage change over previous year)											
P. Penh - All Items	3.9	5.8	4.7	5.8	19.7	-0.7	7.0	4.1	1.8	3.3	3.6	6.3
- Food & non-alcoholic bev.	6.4	8.6	6.4	9.9	33.1	-0.3	7.8	3.6	1.9	4.1	3.9	7.6
- Transportation	9.7	11.4	9.1	5.8	19.4	-10.7	12.9	8.7	3.2	3.1	5.0	7.3
	Exchange rates, gold and oil prices (Phnom Penh market rates)											
Riels per US dollar	4016.3	4119.7	4119.0	4062.7	4058.2	4140.5	4180.1	4209.0	4236.7	4122.6	4041.9	4044.9
Riels per Thai baht	99.9	102.6	108.7	122.8	123.5	121.2	127.0	129.9	138.3	137.3	132.7	133.8
Riels per 100 Vietnamese dong	25.5	25.8	25.1	25.0	24.8	23.4	22.3	22.1	21.4	21.1	19.9	19.6
Gold (US dollars per chi)	46.3	54.0	70.6	83.2	105.9	118.3	133.9	142.9	147.8	165.7	147.9	181.5
Diesel (riels/litre)	2088.0	2633.0	3140.0	3262.3	4555.2	3294.9	3599.5	3835.1	3936.6	4066.1	4427.2	4784.6
Gasoline (riels/litre)	2833.0	3442.0	4004.0	4005.0	4750.8	3469.1	4163.0	4358.7	4415.5	4535.2	4750.1	5065.5

Sources: NIS, NBC and CDRI

Table 7. Monetary Survey, 2006–11 (end of period)

	2006	2007	2008	2009				2010				2011
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
	Billion riels											
Net foreign assets	7224.0	10,735.0	10,345.0	11,222.0	12,611.0	13,869.0	14,655.0	15,514.6	12,610.9	16,903.0	16,697.9	17,079.1
Net domestic assets	-282.0	576.0	1513.3	1266.0	1249.0	1042.0	1573.0	1720.0	1785.3	1984.8	2778.9	3199.2
Net claims on government	-953.0	-1816.0	-2987.0	-3048.0	-2889.0	-2463.0	-2252.0	-2484.8	-2362.7	-2,120.4	-2126.6	-2252.7
Credit to private sector	3630.0	6386.0	9894.0	9814.0	10,129.0	10,127.0	10,532.0	11,146.7	11,859.1	12,479.8	13,331.2	13,909.0
Total liquidity	6942.0	11,311.0	11,858.0	12,488.0	13,859.0	14,912.0	16,228.0	17,234.5	18,267.1	18,887.8	19,476.8	20,278.3
Money	1658.0	2052.0	2399.0	2545.0	2695.0	2773.0	3120.0	3148.5	3115.1	3061.7	3220.9	3497.2
Quasi-money	5285.0	9259.0	9459.0	9942.0	11,164.0	12,139.0	13,108.0	14,086.0	15,152.0	15,826.1	16,255.9	16,781.1
	Percentage change from previous year											
Total liquidity	38.1	62.9	4.8	3.7	9.1	18.7	36.9	38.0	31.8	26.7	20.0	17.7
Money	25.3	23.8	16.9	6.5	9.2	18.7	30.1	23.7	15.6	10.4	3.2	11.1
Quasi-money	42.8	75.2	2.2	2.9	9.1	18.7	38.6	41.7	35.7	30.4	24.0	19.1

Source: National Bank of Cambodia

Table 8. Real Average Daily Earnings of Vulnerable Workers (base November 2000)

	Daily earnings (riels)									Percentage change from previous year		
	2006	2007	2008	2009	2010		2011			2011		
					Aug	Nov	Feb	May	Aug	Feb	May	Aug
Cyclo drivers	7469	8075	12,628	8091	8404	8759	10,633	8,292	9,783	13.0	-13.4	16.4
Porters	6545	8588	9005	9549	10,525	9965	11,184	9861	10,465	12.4	5.6	-0.6
Small vegetable sellers	6390	8220	9926	8273	8291	8821	9149	8599	8405	16.9	6.7	1.4
Scavengers	4416	5422	4652	5857	6461	6628	6931	8661	7557	11.1	16.9	17.0
Waitresses*	4412	4482	4327	4646	6427	5448	6154	6066	5410	19.9	12.7	-15.8
Rice-field workers	5306	5516	8697	6197	6186	4912	4806	5984	7345	-10.3	-4.4	18.7
Garment workers	7649	7568	6554	7085	8470	7944	8312	7950	8687	10.0	6.1	2.6
Motorcycle-taxi drivers	8201	10,634	15,691	10,685	10,558	10,278	11,444	10,630	11,146	1.3	3.5	5.6
Unskilled construction workers	5918	6155	8779	8343	8744	9636	11,291	9415	10,526	46.7	4.5	20.4
Skilled construction workers	10,316	11,154	12,710	12,487	11,738	12,122	12,487	12,368	12,676	4.7	3.7	8.0

* Waitresses' earnings do not include meals and accommodation provided by shop owners. Surveys on the revenue of waitresses, rice-field workers, garment workers, unskilled workers, motorcycle taxi drivers and construction workers began in February 2000. Source: CDRI

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Polity: Localisation of D&D Reform in Cambodia identifies the trend and future of D&D reforms in the context of Cambodia's hybrid state and seeks answers to whether D&D enhances democracy in Cambodia; (3) *A Baseline Survey of Sub-National Governments: Towards a Better Understanding of Decentralisation and Deconcentralisation Reform in Cambodia* explores the perceptions and understanding of commune councillors towards district and provincial administration (councils and boards of governors) and *vice versa*; (4) *Catchment Governance and Cooperation Dilemmas: A Case Study from Cambodia* delves into the cooperation between players in the context of D&D reform; and (5) *Decentralised Governance of Irrigation Water in Cambodia: Matching Principles to Local Realities* investigates the degree of match between the governance arrangements and requirements of irrigation schemes. Policy briefs in Khmer and English for the studies on decentralised governance (2), catchment management (4) and irrigation governance (5) have been published and distributed.

Five studies are being conceptualised: *Impact of D&D on Poverty Reduction*; *Fiscal Decentralisation and Infrastructure; State Society Reciprocity*; *the District and Commune Relationship;* and *Sectoral Decentralisation: The Case of the Education and Health Sectors)*.

The annual dissemination workshop, attended by approximately 280 officials mostly from the sub-national administration, was held on 18-19 October in Phnom Penh.

Economy, Trade and Regional Cooperation Programme

The *"Vulnerable Worker Survey"* and *"Provincial Price Survey"* are in good progress. The project report *Different Streams, Different Needs and Impact: Managing International Labour Migration in ASEAN* is being prepared for publication as a PIDS (Philippines Institute of Development Studies) monograph and CDRI working paper. Reports on *Poverty and Environment Links: Case Study from Rural Cambodia* and the *Analysis of International Investment in the Agricultural Sector of Cambodia* are being re-worked for publication as CDRI working papers.

The first draft report of the third component of the *Poverty Network,* a project commissioned by ADB was completed and preliminary findings presented at a regional workshop in October in Jakarta, Indonesia. The first draft report for the project *Analysing Chronic Poverty in Rural Cambodia: Evidence from Panel Data* is being prepared. The first draft report for *Growth Diagnostic Phase II* is pending editing. The final draft report on *ASEAN 2030: Cambodia Background Paper* has been completed. Following the policy seminar held on 9 August in Phnom Penh, the key findings of the *SME Support Policy* Project were presented in Seoul, South Korea in early October 2011.

The GMS-DAN (Development Analysis Network) workshop on *Collaborative Research on Inclusive Growth and Regional Integration in the GMS – Lessons Learnt from GMS-DAN 8 and Way Forward* was held on 30 August in Bangkok and the proposal on *Building and Strengthening a Sustainable GMS-DAN 2011-2014: Collaborative Policy Relevant Research on Inclusive Growth and Sub-regional Integration in the GMS* has been revised and submitted to the Rockefeller Foundation and the International Development Research Centre (IDRC). The second workshop on the *Global Financial and Economic Crisis and Vulnerability in Cambodia* was hosted by CDRI on 3 October.

The 2011 DRF Symposium on 8-9 September achieved outstanding outcomes; the proposal for Phase II is being revised for submission to IDRC. As part of an exchange programme between CDRI and the Chinese Academy of Social Science, CDRI researchers, with the support of the American Friend Service Committee, conducted a field trip in Beijing on 22 August to 7 September to research Chinese development experiences, particularly poverty reduction.

Three new projects have been awarded, namely: *Industrial Clusters, Business Associations and SME's Productivity: Evidence from Enterprise Survey of Cambodia (ARTNeT); What Are the Constraints to Inclusive Growth?(ARTNeT);* and *Rapid Assessment of the Impact of Rising Food Prices on the Poor and Vulnerable Groups and Policy Responses in Cambodia (NGO Forum on Cambodia).*

Natural Resources and the Environment Programme

Two major research projects, the *Water Resources Management Research Capacity*

Development Programme and the *Tropical Forest for Poverty Alleviation- from Household Data to Global Analysis* project have been completed. The completion reports for both projects have been finalised and published.

The ongoing *Social Impact Monitoring and Vulnerability Assessment Baseline Survey* seeks to determine rural people's dependency on water resources along a 15 km corridor of the Mekong River in order to support the social impact and vulnerability assessment of the Mekong River Commission's climate change and adaptation initiative. The first draft report is being revised based on feedback after it was presented at the technical workshop in Luang Prabang, Laos. The revised report will be presented at the national workshop in November in Siem Reap province. The *Agriculture and Climate Change* project, a joint study with PARD which is funded by USAID through IFPRI, analyses agriculture development and food security in the context of climate change by identifying constraints to improved yields and adaptation. The report is being finalised to incorporate comments received when it was presented at the national workshop in Siem Reap on 22-23 August.

A new study on *Climate Change Impact and Resilience: A Case of Irrigation, Land Use, Rainfall Changes and Water Governance*, a joint project with the Royal University of Phnom Penh (RUPP), is starting. This project seeks to understand the impact of climate change on hydrology and governance responses to changes in food security. Another new project, *Strengthening Aquatic Resources Governance* (STARGO) aims at improving the governance of contested aquatic resources and supporting projects and interventions that improve nutrition, income, welfare and security. It is being conducted in coordination with the WorldFish Centre and Adelphi Research (Berlin), and is funded by BMZ (Federal Ministry of Economic Cooperation and Development, Germany).

Poverty, Agriculture and Rural Development Programme

Six projects are being carried out. The draft report on the *Impact Assessment of Farmers' Organisations on Food Security for Rural Poor* project has been submitted and comments from the World Bank and AusAID are being addressed. The *Development of Impact Assessment Methodology for Mine Action Sector in Cambodia* project has been extended; Phase II is to test the proposed impact assessment tool, while primary field data collection and data analysis has been completed and the report is being drafted. For the three year project on *Agricultural Policies for Rice-based Farming Systems in Cambodia and Laos*, funded by the Australian Centre for International Agricultural Research (ACIAR), the team is reviewing the literature and designing research instruments for the first year's research plan. The first draft report for the study *Promoting Gender Equality for the Labour Market for more Inclusive Growth* project has been completed and sent to ADB international consultants for review and comment. The final draft report for the *Small and Medium Enterprises (SME) Supported Bank Project* has been submitted; the team presented the final report in Seoul, South Korea, on 9-13 October. The *Study to Quantify the Value of the Arbitration Council Service,* funded by World Bank, is set to start in late November.

Social Development Programme

Four projects are underway. The *EQUITAP*[1] project, coordinated by the Institute for Health Policy in Sri Lanka and funded by AusAID/IDRC, is to estimate (i) the impoverishing and catastrophic impacts, progressivity and differentials in healthcare utilisation, and (ii) the benefit incidence of government spending. The results of the first part of the analysis have been reviewed and accepted by the coordinators, and the second part is scheduled to be completed by December 2011.

The six-year research on *Building Pro-Poor Health Systems during the Recovery from Conflict "REBUILD",* funded by DFID-UK and led by the Liverpool School of Tropical Medicine and Queen Margaret University, UK, is nearing the end of its inception year. With the overall aim of producing high quality evidence that contributes to improving the health of the poorest in developing countries, three research protocols are being developed: (1) The Impact of Health Financing Policy Change

1 EQUITAP stands for Equity in Asia-Pacific Health Systems and is the collaborative effort of more than fifteen research teams in Asia and Europe engaged in examining equity in national health systems in the Asia-Pacific region. The collaboration involves the development of methodological tools, and actual assessment of the performance of national health systems.

on Pattern of Poor Rural Household Expenditure for Health Care in Cambodia: An Analysis of Household Health Expenditure, (2) Policies to Attract and Retain Health Workers in Rural Areas: A Review of Policy drivers, Implementation and Effectiveness in Post-Conflict Cambodia, and (3) Contracting Model and Performance Management in Cambodia. In September the team presented the research protocols to the Technical Working Group for Health, Ministry of Health, to obtain feedback from key stakeholders on the research questions and methodologies. Preparations are being made to attend the consortium meeting in Kampala, Uganda, in early November.

The *Situation of Social Capital in Cambodia*, funded by Senshu University Japan, explores the realities and potentials of social capital in relation to: (1) living conditions and their improvements, (2) social safety nets, and (3) social rituals, customs and norms. Enumerator training has been conducted and the questionnaire pre-tested; fieldwork in Prey Veng and Siem Reap provinces is scheduled to be completed by the end of October.

The collaborative research with the Nossal Institute for Global Health of the University of Melbourne, Australia seeks to identify contextual, resource and policy barriers along *Pathways to Universal Health Coverage in Cambodia* so as to inform policy discussion in Cambodia and suggest ways forward. The researcher working on this project is to attend the project meeting in Australia in October.

Copies of the book titled *Improving Health Sector Performance: Institutions, Motivations and Incentives—The Cambodia Dialogue,* a CDRI international publication, arrived from the publisher, the Institute of Southeast Asian Studies. The book is now on sale; copies are being distributed to the authors, all those that attended the International Health Conference, held in Phnom Penh in April 2010, and libraries around Cambodia.

CDRI UPDATE

MANAGEMENT

On 6-7 October CDRI co-hosted the 7th East Asian Institutions Forum with the Korean Institute for International Economic Policy (KIEP) in Phnom Penh, the first time the forum has been held outside South Korea. The 2011 Forum was on the theme *East Asian Economic Integration: The Role of Development Cooperation*. CDRI designed a session on *Development Cooperation in Cambodia,* moderated by the CDRI Board Chair, Dr Sok Siphana, with presentations from former CDRI Board Chair, HE Dr Hang Chuon Naron, and CDRI's Executive Director, Mr Larry Strange.

On 4 November CDRI's Executive Director participated in a brainstorming meeting at the Asian Development Bank headquarters in Manila on the design of a major new ADB-ADB Institute initiative on *Strengthening ASEAN Transitional Economies: A Policy-Oriented Research and Capacity Building Program*. He made a presentation on *Needs for Capacity Building and Training – The CDRI Experience in Cambodia: What Have We Learned?*

On 25 November CDRI participated in the visit to Cambodia of the Director-General of the Swedish International Development Agency (Sida), Ms Charlotte Petri-Gornitzka, including a working luncheon on youth and employment in Cambodia. Sida is CDRI's major resource partner, providing significant resource support for both research and operations over the life of CDRI's 2011-15 Strategic Plan.

On 7-9 December CDRI co-hosted the visit to Cambodia of the Vice-President of the Board of Governors of the International Development Research Center (IDRC) of Canada, Dr Rohinton Medhora, including a briefing at CDRI on major socio-economic development trends and issues in Cambodia, and in the broader Greater Mekong Sub-region, and a round table with senior representatives of local partners in the Development Research Forum (DRF) of Cambodia. IDRC provides support to the Greater Mekong Sub-region Development Analysis Network (GMS-DAN) which is coordinated by CDRI, the DRF, and a major policy research project analysing the medium to longer term impacts of the global financial crisis and economic downturn on Cambodia.

On 14-16 December CDRI held its annual management-staff retreat, this year in the coastal town of Sihanoukville, to assess and celebrate its achievements in 2011 and lessons learned, to confirm priorities for 2012 in the further implementation of its 2011-15 Strategic Plan and Cambodia 2020 Research Strategy, and to identify organisational issues that require priority attention in the coming year.

RESEARCH

Democratic Governance and Public Sector Reform Programme

Five studies have been completed: (1) *Questioning the Conventional Cambodian State Capacity in the Transforming Economy* assesses the current state capacity; (2) *Decentralised Governance in Hybrid*

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CAMBODIA DEVELOPMENT REVIEW
A Publication of CDRI—Cambodia's leading independent development policy research institute

Volume 15, Issue 4 (OCTOBER-DECEMBER 2011)

Cambodia Development Review is published four times a year in simultaneous English- and Khmer-language editions by the Cambodia Development Resource Institute in Phnom Penh.

Cambodia Development *Review* provides a forum for the discussion of development issues affecting Cambodia. Economy Watch offers an independent assessment of Cambodia's economic performance.

Cambodia Development *Review* welcomes correspondence and submissions. Letters must be signed and verifiable and must include a return address and telephone number. Prospective authors are advised to contact CDRI before submitting articles, though unsolicited material will be considered. All submissions are subject to editing. CDRI reserves the right to refuse publication without explanation.

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9 789995 052058

Publisher: CDRI
Managing Editor: YOU Sethirith,
Production Editor: OUM Chantha
Cover Photograph: CDRI's staff courtesy

Printing: T & S Printing, Phnom Penh

ISSN 1560-7607 / ISBN 978-99950-52-05-8