The Cambodia Food Security and Nutrition Quarterly Bulletin aims to provide decision makers with a regular overview of trends and emerging threats relating to food and nutrition security in Cambodia. It is a collaborative effort between the Council for Agricultural and Rural Development (CARD), the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Ministry of Water Resource and Meteorology (MoWRAM), the Ministry of Health (MoH), the National Committee for Disaster Management (NCDM) and the National Institute of Statistics (NIS), with technical and financial support from UNICEF, the World Food Programme, the EC-FAO Food Security Programme and the World Health Organization, and with financial support from the MDG Achievement Fund for Children, Food Security and Nutrition.

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ENVIRONMENTAL CONDITIONS AND HAZARDS

Rainfall

In the third quarter of 2011 (July to September), Cambodia experienced rainfall levels that were significantly higher than historical levels (Table 1). The cumulative rainfall in all provinces in Cambodia in the third quarter of 2011 (July 2010 to September 2011) was 8.3% higher than the 2000-10 historical average for the same time period, and 23.1% higher than in 2010 Q3.

Table 1: Rainfall in Cambodia in July, August and September

<table>
<thead>
<tr>
<th></th>
<th>2000-10 avg (mm)</th>
<th>2010 (mm)</th>
<th>2011 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>244.0</td>
<td>218.9</td>
<td>226.4</td>
</tr>
<tr>
<td>August</td>
<td>259.6</td>
<td>245.8</td>
<td>275.9</td>
</tr>
<tr>
<td>September</td>
<td>272.6</td>
<td>218.3</td>
<td>338.6</td>
</tr>
<tr>
<td>average</td>
<td>258.7</td>
<td>227.7</td>
<td>280.3</td>
</tr>
</tbody>
</table>

Source: Ministry of Water Resources and Meteorology

Rainfall patterns in four selected provinces representing the main agro-ecological zones are reported in Figure 1.

High rainfall in September was a primary cause of flooding in September. In September 2011, rainfall levels in Cambodia were 55.1% higher than in September 2010 and 24.2% higher than the 10-year historical average for the same month. Rainfall levels in September were especially high in Kampong Thom and Stung Treng, where rainfall increased by 268% and 257%, respectively, compared to September 2010, and by 66% and 84%, respectively, compared to the historical average for the same month.

The differential of the past quarter’s rainfall (July to September 2011) to the 10-year historical average rainfall level during the same months is displayed below in Map 1. Most provinces in Cambodia saw an increase in rainfall levels in the third quarter of 2011 compared to the historical average.

1 Kampot is in the Coastal zone, Prey Veng in Plains zone, Banteay Meanchey in Tonle Sap zone, Kratie in Plateau/Mountain zone

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River water levels

At the end of September 2011, water levels in both the Mekong and Tonle Sap rivers surpassed alarming levels and were at or near flooding levels. Water levels were significantly higher than the 30-year historical average and 2010 levels.

The Mekong River water level (as measured by the Kampong Cham station) exceeded the alarming level in mid-August, but soon receded without exceeding the flooding level (Figure 2). In mid-September, water levels in the Mekong surpassed alarming-levels again and nearly reached flooding levels, while continuing to stay above alarming levels when this bulletin is being published.

The Tonle Sap water level (as measured by the Prek Kdam station) exceeded the alarming level for the first time on 22 September 2011 and exceeded the flooding level on 2 October 2011. The water level is above the flooding level as this bulletin is being published.

Figure 2: Water levels in selected stations in Mekong and Tonle Sap rivers

Disasters

According to the National Committee for Disaster Management (NCDM),2 floods since mid-August have:

- Killed at least 207 people
- Affected about 279,868 families of which 34,204 displaced
- Affected 333,327 hectares of rice paddies of which 158,981 hectares are damaged
- Affected 207 km of national and provincial roads and 2,326 km of rural roads
- Affected 205,306 houses, 402 pagodas, 94 health care facilities and 1,138 schools

17 provinces (of 24 provinces in Cambodia) have been affected. The worst affected areas are Prey Veng (77,495 households affected and 51 dead), Kandal (39,194 affected and 4 dead), Kampong Cham (33,436 affected and 46 dead), and Kampong Thom (26,894 affected and 34 dead). Map 2 below shows the affected households by province.

Map 2: Affected households from floods in September/October

FOOD PRODUCTION

Rice cultivation

In 2011, rains came earlier than last year (in April), which allowed rice farmers to start planting earlier than in 2010. By the end of September 2011, the total planted area for all types of rice was 2.46 million hectares, 4.4% higher than the total planted area by the end of September 2010 (Figure 3). However, the increase in

2 According to NCDM report on 11 October 2011
rice cultivation will be muted when taking the areas affected and damaged by the floods into account (discussed below).

**Figure 3**: Rice planted area, cumulative by month

<table>
<thead>
<tr>
<th>Month</th>
<th>2010 (ha)</th>
<th>2011 (ha)</th>
<th>2010-11 change (%)</th>
<th>achieved/planned (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>1,000</td>
<td>1,200</td>
<td>20%</td>
<td>105.8%</td>
</tr>
<tr>
<td>June</td>
<td>2,000</td>
<td>2,500</td>
<td>25%</td>
<td>114.4%</td>
</tr>
<tr>
<td>July</td>
<td>2,500</td>
<td>3,000</td>
<td>20%</td>
<td>105.8%</td>
</tr>
<tr>
<td>August</td>
<td>3,000</td>
<td>3,500</td>
<td>16.7%</td>
<td>114.4%</td>
</tr>
</tbody>
</table>

**Source**: Ministry of Agriculture, Forestry and Fisheries

Table 2 below compares the rice planted area at the end of September in 2011 and 2010. The last column presents the proportion of the total planned wet season rice cultivation that has already been achieved at the end of September.

Compared to last year, the rice planted area in Takeo increased the most, by 10.9%. Kampong Thom and Battambang also saw increases in rice planted area compared to last year, increasing by 6.5% and 6.2%, respectively.

**Table 2**: Rice planted area, by province

<table>
<thead>
<tr>
<th>Province</th>
<th>Through Sep-10 (ha)</th>
<th>Through Sep-11 (ha)</th>
<th>2010-11 annual change (%)</th>
<th>Achieved/planned (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banteay Meanchey</td>
<td>230,681</td>
<td>232,720</td>
<td>0.9%</td>
<td>105.8%</td>
</tr>
<tr>
<td>Battambang</td>
<td>269,498</td>
<td>286,194</td>
<td>6.2%</td>
<td>114.4%</td>
</tr>
<tr>
<td>Prey Veng</td>
<td>267,447</td>
<td>272,617</td>
<td>1.9%</td>
<td>109.0%</td>
</tr>
<tr>
<td>Siem Reap</td>
<td>179,180</td>
<td>179,730</td>
<td>0.3%</td>
<td>100.4%</td>
</tr>
<tr>
<td>Kampong Thom</td>
<td>181,856</td>
<td>193,655</td>
<td>6.5%</td>
<td>99.3%</td>
</tr>
<tr>
<td>Takeo</td>
<td>175,867</td>
<td>194,955</td>
<td>10.9%</td>
<td>114.7%</td>
</tr>
<tr>
<td>Kampong Cham</td>
<td>161,497</td>
<td>165,277</td>
<td>2.3%</td>
<td>99.9%</td>
</tr>
<tr>
<td>others</td>
<td>896,028</td>
<td>939,812</td>
<td>4.9%</td>
<td>134.7%</td>
</tr>
<tr>
<td>total</td>
<td>2,362,054</td>
<td>2,464,940</td>
<td>4.4%</td>
<td>105.8%</td>
</tr>
</tbody>
</table>

**Source**: Ministry of Agriculture, Forestry and Fisheries

By September, the planted area of the rain-fed lowland rice varieties (early, medium and late rice) increased this year. The cumulative planted area of early rice increased by 12% year-on-year in August. The planted area for medium and late rice increased to a lesser degree, by 1.2% and 5.3%, respectively. However, the planted area for upland rice and floating rice decreased by 7.1% and 0.9%, respectively, compared to September 2010.

**Figure 4**: Rice planted area, by type

The heavy flooding in September 2011 has significantly affected rice paddies throughout Cambodia. MAFF reported on 12 October 2011 that 388,124 hectares of rice planted area (15.7% of total) were affected by natural disasters, of which 98% were due to floods. 184,987 hectares of rice crops (8% of total) were confirmed to be destroyed.

Rice planted areas in Kampong Thom and Prey Veng were the most affected by the floods. In Kampong Thom, 37.6% (72,885 hectares) of rice planted areas were affected by floods. In Prey Veng 27.87% (75,841 hectares) of rice planted areas were affected (Map 3).

**Subsidiary and industrial crop cultivation**

Figure 5 compares the planted area of three key subsidiary and industrial crops in September with September 2010. While the cultivation of mung beans decreased by 7.2% year-on-year, the cultivation of maize and cassava saw drastic changes. Maize cultivation decreased by 22.2% compared to last year, while cassava cultivation doubled (99% increase).
The price of cassava has risen rapidly, driven by increased demand in international markets, chiefly Thailand and Vietnam. Driven primarily by increased demand from China, export prices of Thai cassava starch in January and February 2011 were around 40% higher than the previous year. This affected the cassava prices in Cambodia where prices after the end of the 2010-11 cassava harvest in February were 50-100% higher than they were after the 2009-10 harvest.\(^3\)

As cassava is reportedly easier to grow than other crops, this increase in cassava prices has pushed farmers to increase cassava cultivation this year. The decrease in the cultivation of maize can be explained as a substitution away from maize to cassava.

The increased cultivation of rice and industrial crops compared to last year could have resulted in increased demand of agricultural labour activities. If this is the case, more labour opportunities in rural areas and the subsequent increase in agricultural wage rates will have a positive effect on the food security situation of the landless and land-poor households in rural areas. However, if the rapid decline in Thai cassava starch prices during the past quarter continues into the harvest season early next year, cassava farmers will be affected by lower price levels compared to earlier this year.

5 The daily wage of unskilled labour could be used to calculated the terms of trade for unskilled labour and rice, a proxy indicator for the food purchasing power of households. However, regular data collection and reporting of unskilled wages are not available.

6 The FAO Food Price Index consists of the average of commodity group price indices (i.e. meat, dairy, cereals, oils/fats, and sugar) weighted with the average export shares of each of the groups for 2002-2004.

7 Free on board (f.o.b.) price includes all charges up to the placing of goods on board a ship at the port of departure specified by the buyer.
The Thai A1 Super white rice price increased by 5.6% month-on-month and by 20.2% year-on-year. The Thai government’s rice pledging policy which guarantees to purchase paddy rice from farmers at rates much higher than the current market price started on 7 October 2011. This is expected to drive Thai export prices upward.

The Vietnamese 25% broken white rice price decreased by 2.8% month-on-month but increased by 20.6% year-on-year (Figure 9). The year-on-year increase in prices was in line with the general inflation rate of 22% in September which was driven primarily by higher food and fuel costs, according to the Vietnam General Statistics Office.

**Figure 9: Export price of Thai and Vietnamese white rice**


**Local consumer price index and food price index**

The general Consumer Price Index (CPI) measures the cost of a consumption basket composed of 259 items. Each item is weighted based on their importance in an average household’s expenditure. In August, the general CPI increased by 0.1% month-on-month. The inflation rate, as measured by the year-on-year increase in the consumer price index, was 6.4%.

The Food Price Index (FPI) measures the cost of the food items in the general CPI’s consumption basket. Food items make up 50.4% of the total consumption basket. In August, food price inflation, at 7.6% year-on-year and 0.4% month-on-month, was driving overall inflation (Figure 10).

**Figure 10: Relative change in general consumer prices, food prices and non-food prices (base = Oct-Dec 2006)**

Source: National Institute of Statistics

A key driver in the inflation rate is the significant increase in the price of gasoline. Gasoline prices have increased by 19.2% year-on-year, closely tracking international oil price trends. Higher gasoline prices increase transportation costs and are directly transmitted to wholesale and retail prices (Figure 11).

**Figure 11: Wholesale price of mixed rice and gasoline prices**

Source: Cambodia Agricultural Market Information Service, MAFF; National Institute of Statistics

**Local wholesale and retail food commodity prices**

Price reports from the Agricultural Marketing Office of the Ministry of Agriculture, Forestry and Fisheries show that in September 2011 the average wholesale price of mixed rice in Cambodia increased by 2.3% month-on-month (Figure 12).

**Figure 12: Wholesale price of mixed rice**

Source: Cambodia Agricultural Market Information Service, MAFF

Nominal prices of wholesale mixed rice in September 2011 were 9.1% above prices in September 2010. Real prices (adjusted for inflation) increased by 2.7% (Figure 13).

**Figure 13: Real price of mixed rice (base = Oct-Dec 2006)**

Source: National Institute of Statistics

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8 The Thai government will guarantee THB 15,000 (US$500) per ton for paddy rice and THB 20,000 (US$670) per ton for fragrant paddy rice (Bloomberg, 7 October 2011)

9 Relative item expenditure weights are derived from the 2004 Cambodia Socio-Economic Survey and adjusted to October-December 2006 price levels.

10 The CPI is collected and reported by the National Institute of Statistics (NIS).

11 Data analysis on food expenditure data of CSES 2009 is expected to be available by the next issue of this bulletin.

12 Mixed rice is considered a low quality rice.

13 Wholesale rice prices are calculated with price quotes from urban markets or rice mills in the following provinces: Kampong Chhnang, Kampong Cham, Takeo, Siem Reap, Prey Veng, Phnom Penh, Kampot, Battambang, Banteay Meanchey.
The retail prices of key food commodities increased on an annual basis (Figure 14). Compared to September 2010, the retail price of pork in Cambodia increased by 48.4% and duck eggs prices increased by 23.2%. Retail prices of mud fish and mixed rice increased, less dramatically, by 14.2% and 13.7%, respectively. The increases in these key food commodities are in line with the CPI report that shows that food prices are driving the general CPI.

**Figure 14: Year-on-year change (%) in food prices and key food commodity prices (from September 2010 to September 2011)**

The retail prices of key food commodities increased on an annual basis (Figure 14). Compared to September 2010, the retail price of pork in Cambodia increased by 48.4% and duck eggs prices increased by 23.2%. Retail prices of mud fish and mixed rice increased, less dramatically, by 14.2% and 13.7%, respectively. The increases in these key food commodities are in line with the CPI report that shows that food prices are driving the general CPI.

**Health information system**

While the total number of new outpatient cases for children has increased in the first semester of 2011, both diarrhea and dysentery cases have gone down (Figure 15). Total new child cases increased by 3%; diarrhea cases dropped by 4.5% and dysentery dropped by 26%. These trends suggest better care-seeking for children by parents and a real drop in diarrheal disease.
turned to normal and are now similar to 2009 levels (Figure 18).

**Figure 18**: Outpatient new cases of dysentery at health centers by month

The 2010 cholera outbreak has stopped and there is no reported widespread outbreak in 2011 (Figure 19). Isolated cases in September are reported in Sampov Luon Operational District of Battambang Province.

**Figure 19**: Inpatient discharge of cholera by month

The National Institute of Statistics (NIS) conducted a trend analysis of food consumption data using the 2004 and 2009 Cambodia Socioeconomic Survey (CSES).

Using the indirect measure of household expenditure on food, the proportion of the population that is undernourished fell from 37 percent in 2004 to 33 percent in 2009 (Figure 20).

**Figure 20**: Percentage of Undernourishment, National, Rural, Urban

In urban areas, the main source of food was market purchases, composing 75% of consumed food (Figure 16). In rural areas, 42% of consumed food was from market purchases, while 45% was from own production. This can help explain why higher food prices in 2009 compared to 2004 affected the undernourishment level of urban population more.

**Food security trend analysis**

Dietary diversity in Cambodia has changed from 2004 to 2009. Compared to 2004, in 2009, Cambodians were eating less cereals and vegetables, but more fish and meat, eggs and pulses (Figure 17).

15 Undernourishment refers to the condition of people whose dietary energy consumption is continuously below a minimum dietary energy requirement for maintaining a healthy life and carrying out a light physical activity with an acceptable minimum body-weight for attained-height. For Cambodia, the Minimum Dietary Energy Requirement (kcal/person/day) is 1,770.
The result of the change in dietary diversity has been that carbohydrate consumption has decreased (from 370.5 g/person/day to 354.2 g/person/day), while the consumption of protein and fat has increased (from 54.5 g/person/day to 62.8 g/person/day and 28.7 g/person/day to 36.3 g/person/day, respectively) from 2004 to 2009 (Figures 23).

In urban areas, the change in macronutrient consumption from 2004 to 2009 has been more drastic than in rural areas. In urban areas, carbohydrate consumption decreased by 10.5% and protein consumption increased by 25.4%. In rural areas, carbohydrate consumption decreased by 3% and protein consumption increased by 12.3%. Fat consumption increased by similar levels in both urban and rural areas (26.7% and 24.5%, respectively).

Compared to WHO global macronutrients recommendations for a balanced diet, the average Cambodian diet had improved from its 2004 level. In 2009, data showed that consumption of carbohydrates, fats and protein were all within the recommended norms, while in 2004 only protein consumption was within the recommended levels.