



## Flood-affected areas – the situation 4 months later

### BACKGROUND

Last monsoon a large number of Terai districts were severely affected by one of the worst floods the country had experienced in a decade. A rapid inter-agency flood assessment (WFP, UNICEF and SC Alliance) was conducted in the second-half of August leading to an emergency response where WFP distributed 2,365 Mt of rice, 364 Mt of pulses, 154 Mt of vegetable oil and 46 Mt of salt to almost 200,000 beneficiaries in 12 of the worst affected districts. Numerous other organizations (UN, NGO and GoN) equally provided essential emergency relief.

The inter-agency assessment was conducted across 13 districts and found that an estimated 25,250 households were severely affected. A further 40,000 households were highly affected and 17,240 were moderately affected. It was found that most of the affected households belonged to the poorest, marginalized and landless Dalits, Madhesi, Tharu, Muslim and Janjati population groups. The assessment classified affected areas into worst, highly, moderately and lightly affected areas (see Food Security Bulletin No. 18 - page 7).

This follow-up assessment aims to shed light on the current condition of the flood-affected population and assess the impact of relief efforts on the recovery of people's livelihoods.

### METHODOLOGY

The results presented in this emergency update are based on data collected in eight flood-affected districts<sup>1</sup> between 31 October and 21 December 2007. A stratified random sampling approach was used in areas identified by the inter-agency assessment as worst affected and as such 23 communities were selected by PPS<sup>2</sup>. Subsequently, in each community 10 households were randomly chosen. This was done by first identifying the centre point of the community, then determining the direction for selecting the households by spinning a bottle and lastly establishing the interval for each household to be interviewed by counting the number of houses from the centre point to the edge of the community. This resulted in an overall sample of 229 households, out of which 216 responded that they were affected by the flood during the month of August 2007. The results of the survey were compared against available baseline data applicable to these areas and collected as part of WFP's regular food security monitoring. This includes data from 494 households collected in twelve Terai districts<sup>3</sup> between 1<sup>st</sup> January and 13<sup>th</sup> December 2007. Figure 1 shows the baseline districts and flood-affected VDCs that were sampled.

The household questionnaire was designed in such a way that it could be compared with this baseline information. It also included questions related to impact and recovery.

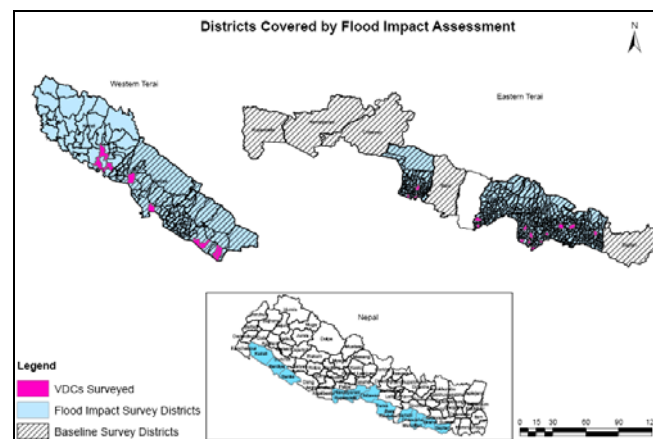


Figure 1 – Baseline districts and flood assessment VDCs

### SELECTED SOCIO-ECONOMIC INDICATORS

This section compares selected socio-economic indicators with the baseline information. The overall conclusion is that the population in the worst flood-affected areas scores somewhat lower on selected socio-economic indicators than the average generally found in Terai districts.

#### Household composition

According to our baseline data, the overall household size<sup>4</sup> generally encountered in the Terai districts is seven. In addition, 7.6% of households are headed by a female. The average size of the household is larger in the worst flood-affected areas (8.3) and more households are headed by women (10.6%).

#### Ethnicity

Figure 2 shows the ethnic distribution according to the baseline and the flood assessment data. In the worst flood-affected areas, the population consist, on average, of 9% more Janjatis<sup>5</sup> and 5% more Dalits than the baseline population.

#### Land

On average for the two datasets, 68% of the respondents own land and 27% lease land. Compared to the baseline data, people living in the worst flood-affected areas are 1.3 times less likely to own land and 1.4 times more likely to lease land.

<sup>1</sup> Banke, Bardiya, Dhanusa, Kailali, Mahottari, Parsa, Sarlahi and Siraha (due to security concerns no data could be collected in Saptari)

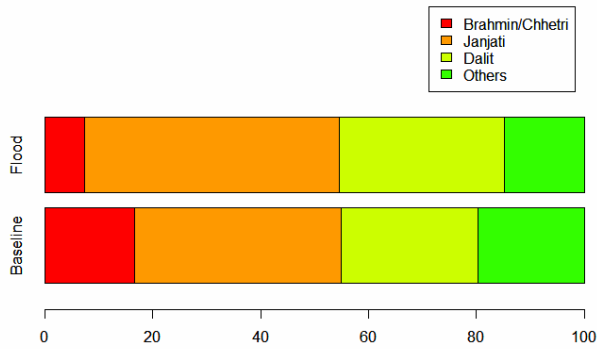
<sup>2</sup> Probability proportionate to size (pps) sampling

<sup>3</sup> Banke, Bara, Bardiya, Chitawan, Dhanusa, Mahottari, Nawalparasi, Parsa, Rupandehi, Saptari, Sarlahi and Siraha

<sup>4</sup> Household size is defined as the number of people that eat from the same cooking pot.

<sup>5</sup> Janjati includes Terai (Tharu, Danuwar, etc.) as well as Hill Janjati.

**What caste/ethnicity is your household?**

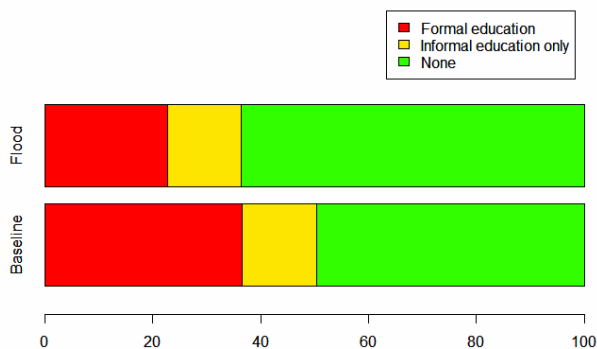


**Figure 2 – Comparison of ethnic distribution**

**Education**

The average education level is lower for households in the worst flood-affected areas compared to those in the baseline. Generally, in the Terai districts 36, 14 and 50% of the male head of household had received formal, informal or no education, respectively. Corresponding figures for the flood-affected households are 22, 14 and 63%, respectively (Figure 3). The trend is similar, but much worse, for the education level of the women head of household. Only 7% of the women head of household had received formal education in the baseline districts while only 3% had received formal education in the worst flood-affected areas.

**Education level of the father of the HH**



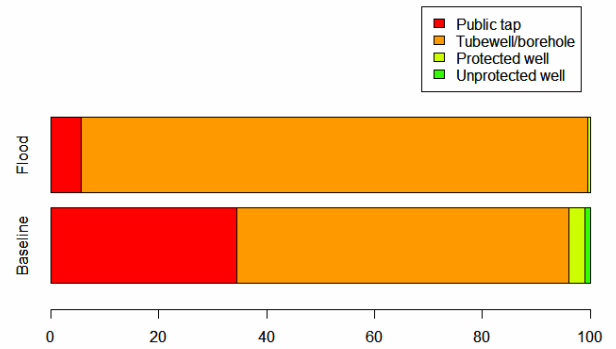
**Figure 3 – Education level of the male head of the household**

**Sanitation**

Both for baseline and flood areas, the majority of households get their drinking water from tubewells or boreholes (Figure 4). Public taps are used by 34% of the households in the baseline districts and by only 5% in the worst flood-affected VDCs.

While the vast majority of respondents indicate that they usually defecate in open fields (77% for the baseline area and 88% for the worst flood-affected areas), a closed latrine is less likely to be used by households in the worst flood-affected areas than by households in the baseline area (5% as compared to 17%).

**Where does your household get drinking water from?**

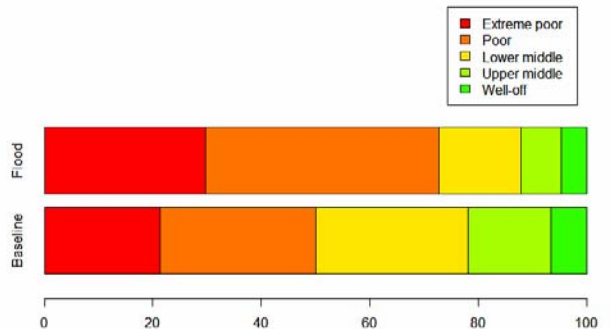


**Figure 4 – Source of drinking water for household**

**Wealth categories**

The field monitors assessed the wealth category of the household at the end of each interview. Although this information is based on perception, the socio-economic questions asked earlier during the interview are taken into account when classifying the household. Based on this, the findings show that households living in the worst flood-affected areas are more likely to be poor or extremely poor (Figure 5).

**Which wealth category best fit this household? (Field Monitor perception)**



**Figure 5 – Household wealth category**

## Vulnerability and coping

The three main shocks or issues faced by the respondents in the baseline districts in order of importance are: lack or loss of employment, disease or illness in the household and civil unrest/bandh. In the worst flood-affected areas, the main shocks are flood, disease and illness, and lack or loss of employment.

As reported by the household, these combined shocks resulted in a food shortage for 89% of the households in the worst flood-affected areas (compared to 59% for the baseline households), as can be seen in Figure 6.

Did any of these events cause a food shortage in your households?

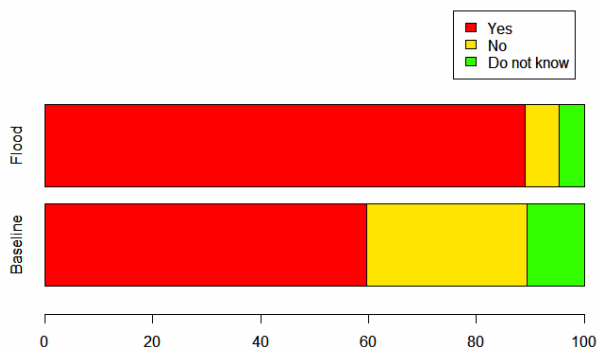


Figure 6 – Impact of shocks registered by the households on food availability

In the worst flood-affected VDCs, these combined shocks were said to be more severe than last year by 71% of all households.

Four months after the flood, on average, 42% of the respondents indicated that they had not recovered. Fifty four percent reported that they had partially recovered, and only 4% indicated that they had completely recovered. Figure 7 shows the rate of recovery by wealth group. As expected, the poorest reported the lowest level of recovery. Two-thirds indicate not having recovered at all while one-third report to have partially recovered.

Has your household recovered from the shocks?

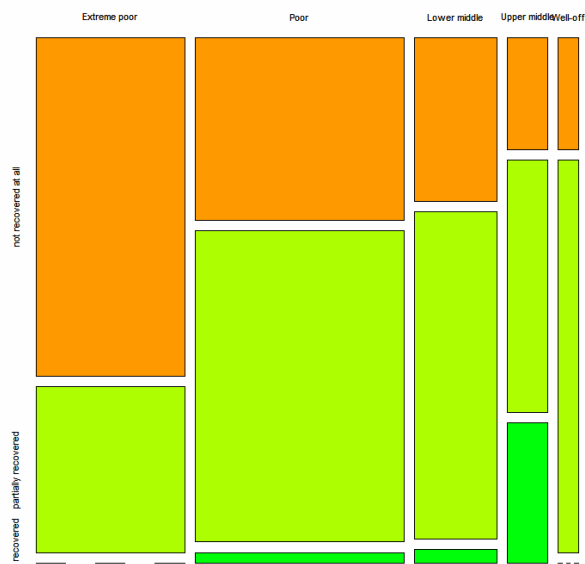


Figure 7 – Recovery from flood by wealth group

COPING STRATEGIES

Figure 8 shows that even four months after the flood there are still many more households than usual practicing normal coping strategies, such as reliance on less preferred foods (51%), using savings to purchase food (32%) and reduce food intake (16%).

A worrying sign is that the more severe coping strategies are also still much higher than normal, including selling of household assets (34%) and agricultural assets (23%). Out-migration from the worst affected flood areas was more than double from what

we normally expect (32% of households in the baseline to 67% in the worst flood-affected areas).

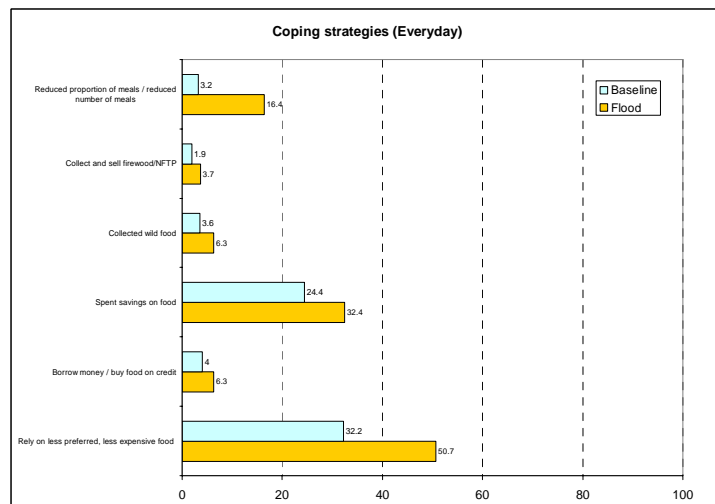


Figure 8 – Use of daily coping strategies compared to baseline

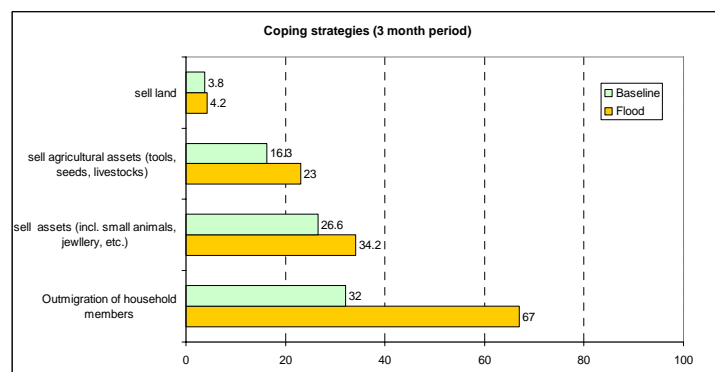


Figure 9 – Use of critical coping strategies in past three months

A coping index was calculated for each sample household by assigning a severity factor to each coping strategy and multiplying this with the frequency the coping strategy was practiced by the respective household<sup>6</sup>. Figure 10 show the cross-tabulation of wealth categories with this coping index.

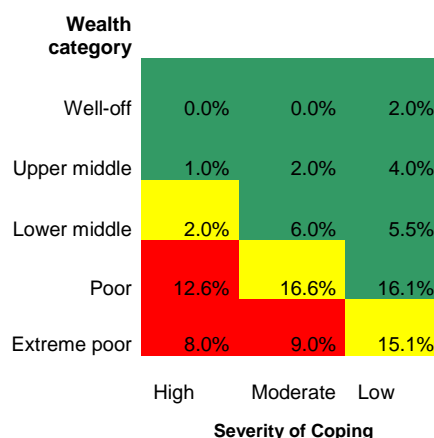


Figure 10 – Wealth categories and severity of coping (four months after the flood)

<sup>6</sup> Coping index = Σ[(severity factor) . (frequency)].

The red shaded area indicates the most vulnerable population, poor and thus low resilience, with high coping intensity. This adds up to almost one-third of the population in the worst flood-affected areas. The moderately at risk population (yellow) is almost 34%. These consist of lower middle income families with high coping intensity, poor households with moderate coping intensity and extreme poor households with low coping intensity.

## Food Availability

### CROP SITUATION

Paddy was the main crop during the time of the assessment. Paddy was reported to be planted on time by 53% of farm households, late by 42% and early by the remaining 5%.

The germination and harvesting prospects were reported as normal to good by the majority of households (60%).

### FOOD STOCK

The average stock for four main commodities is summarized in Table 1. Forty six percent of households living in the worst flood-affected areas reported that they have food stocks sufficient only for less than one month; 26% of them had enough food up to three months, 11% up to six months and 17% for more than six months.

Commodities	Rice	Paddy	Potato	Wheat
Flood	37	168	2.5	16
Baseline	49	390	25	88

**Table 1** – Average stock at household level for baseline and flood data (in kg).

## Access to food

### LIVELIHOODS

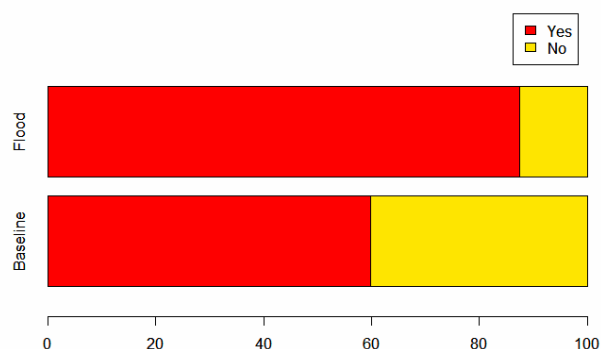
For both flood and baseline data, the three principle means of livelihood are (in order of importance) casual wage labour, crop farming and remittance. The relative importance of wage labour and crop farming is similar for flood and baseline data (64% for casual wage labour and 60% for crop farming). However, for households affected by the floods, remittances as a principle means of livelihood have become much more important. Forty one percent of households in the worst flood-affected areas reported remittances as their third principle means of livelihood as compared to 20% for the baseline.

### INCOME AND EXPENDITURE

Income is reported to be less than normal in 87% of the households in the worst flood-affected areas compared to 70% for the baseline (Figure 11).

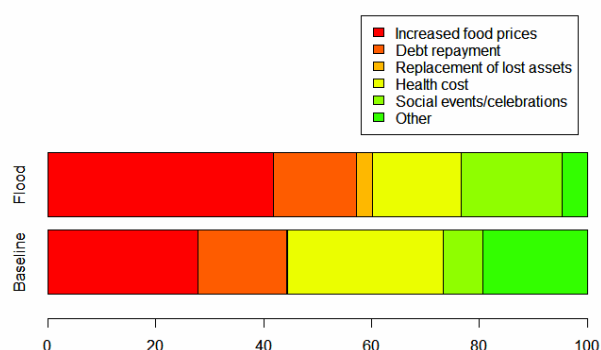
At the same time, 98% of the households in the worst flood-affected areas (compared to 68% for baseline) reported that their expenditure level has increased. Rising food prices was reported to be the main reason for the increase in household expenditure (Figure 12)

**Figure 11** – Difference in income



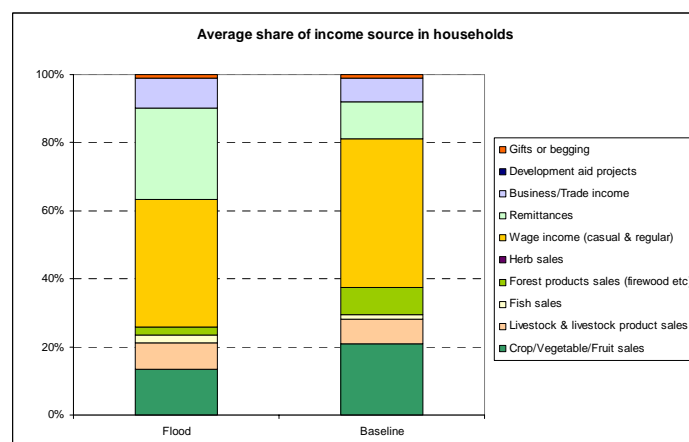
**Figure 11** – Difference in income

**Figure 12** – Reasons for increase in expenditure



**Figure 12** – Reasons for increase in expenditure

Figure 13 shows the changes in relative importance of different household income sources. Remittances as a part of total income increased considerably for households in the worst flood-affected areas, while the contribution to total household income from wage labour and sales of agricultural produce declined. This is consistent with the shifts observed in the primary means of livelihoods.



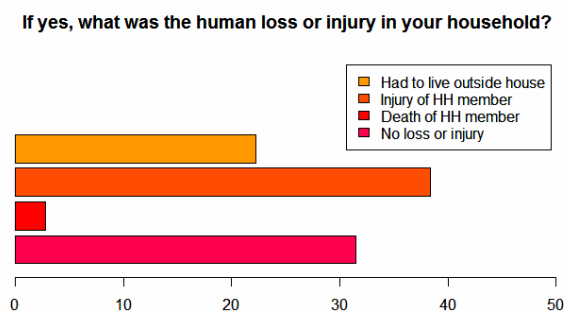
**Figure 13** – Average share of income source

# Impact and recovery

This section analyzes how households in the worst flood-affected areas were impacted and assesses their progress towards recovery.

## HUMAN IMPACT

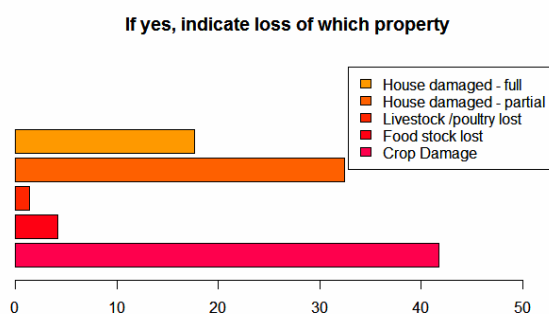
Injury of a household member was reported by 38% of the households. Almost a quarter of all households (22%) had to abandon their house during the flood due to flood water or serious or complete damage to their house. Death of a household member occurred in 2.8% of households (Figure 14).



**Figure 14** – Type of human impact on households affected by the flood.

## IMPACT ON HOUSEHOLD AND AGRICULTURAL ASSETS

Ninety six percent of the households reported damage to property such as housing, crops, livestock and food stocks. Most common damage reported was to the standing paddy crop (43% of households) followed by damage to houses (33% for partial damage and 18% for full damage). Most households were able to save their food stocks as the water level rose gradually. Consequently, only 6% reported loss of food stocks either fully or partly as a result of the flood. Loss of livestock and poultry was uncommon at 3% (Figure 15).



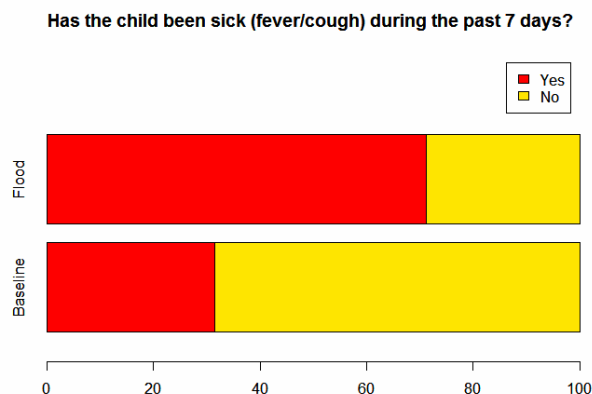
**Figure 15** – Type of damage to households, when a loss of property was reported (data displayed in %).

## IMPACT ON HEALTH AND NUTRITION

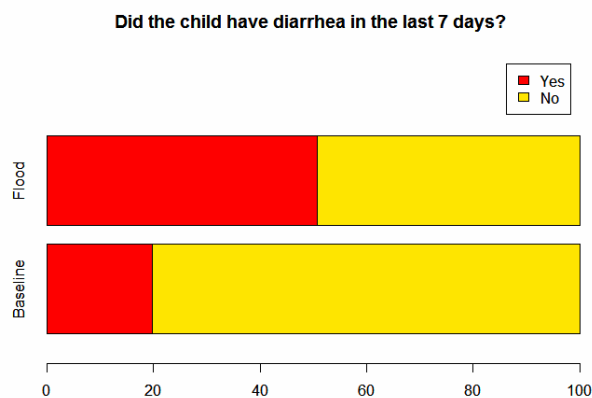
### Health

Four months after the flood a high number of children suffering from diarrhoea and sickness (cough or fever) can be observed. Seventy-one percent of the households in the worst flood-affected flood areas reported that their children were sick during the seven days prior to the time of the survey. Our baseline data suggest that this is normally around 33% for the baseline area

(Figure 16). Corresponding figures for the prevalence of diarrhoea were 52% and 21% respectively (Figure 17), indicating a 31% increase in the prevalence of diarrhoea in the worst flood-affected areas.



**Figure 16** – Cases of children being sick in flood and baseline areas.



**Figure 17** – Cases of children having diarrhoea in flood and baseline areas.

## Nutrition

Given the increased likelihood of sickness and diarrhoea among children in the worst flood-affected areas, we may expect the malnutrition rate to increase in these areas. Table 2 provides indicative estimates for the prevalence of malnutrition for children between the age of 6 and 59 months using MUAC (mid-upper arm circumference) measurements found in the worst flood-affected areas<sup>7</sup>.

	%
Severe acute malnutrition (MUAC < 11cm)	0.0
Moderate acute malnutrition (MUAC between 11 and 12.5cm)	14.1
At risk (MUAC between 12.5 and 13.5cm)	29.6
Mean MUAC	13.7

**Table 2** – Mid-upper arm circumference

No cases of severe acute malnutrition were found and moderate acute malnutrition was relatively acceptable at 14.1%<sup>8</sup>. However, there are a significant number of children at risk of becoming malnourished. A comprehensive supplementary

<sup>7</sup> These MUAC figures are indicative only as the sample was too small (71 measurements) to derive statistical significant conclusions.

<sup>8</sup> The average prevalence of acute malnutrition as measured by weight-for-height among children under the age of 5 for the Terai is 17%.

feeding programme coupled with health and nutrition education and water and sanitation interventions could prevent an increase in malnutrition rates.

### Food intake

Figure 18 shows the percentage of households that did not consume selected food items during one week prior to the survey date and compares this with the baseline data. Rice is generally consumed everyday both by households in the worst affected flood areas and in the baseline area. Meat, eggs and fresh fruit are generally not consumed by a large percentage of either population due to the relative high costs of these food items. Less than 5% of households in the worst flood-affected areas did not consume *dal* (pulses/lentils) seven days prior to the assessment which is better than the 11% of households we find for our baseline. Timing of the survey and deliveries of pulses as one of the relief commodities could possibly explain this.

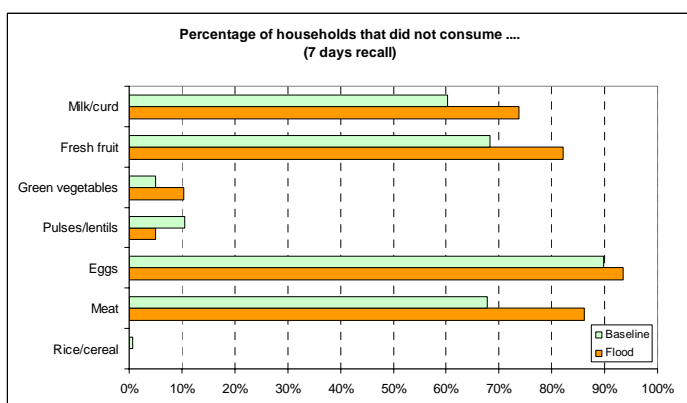


Figure 18 – Food intake variety

Using the food consumption score (FCS) the population was divided in food consumption groups by using a pre-defined and standard set of cut-off scores<sup>9</sup>. Using this method, it showed that 3.5% of the population in the worst flood-affected areas had a poor food consumption score. A further 35.1% have a moderate food consumption score.

However, in Nepal, the traditional diet of the poor consists of rice with *dal* (*Dal Bhat*). Using the standard weights and cut-offs normally used in calculating the food consumption score (see footnote 6) quickly translates into a moderately food consumption score although food variety is minimal as can be seen from Figure 18. Cross-tabulating the food consumption scores with the wealth categories shows that 9.4% of the extreme poor have a poor consumption score, while 50% have a moderate food consumption score. In addition, a little over 1% of the poor have poor consumption scores (Figure 19).

Cross-tabulating these outcomes with households' coping severity as presented in Figure 20 indicates that about 10.5% of the population in the worst affected areas are highly food insecure (red shaded area). A further 28.7% is borderline food insecure (yellow shaded area).

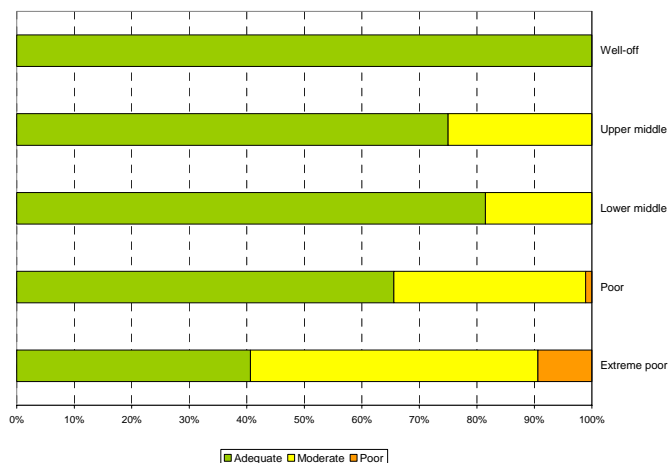


Figure 19 – Food consumption group and wealth category

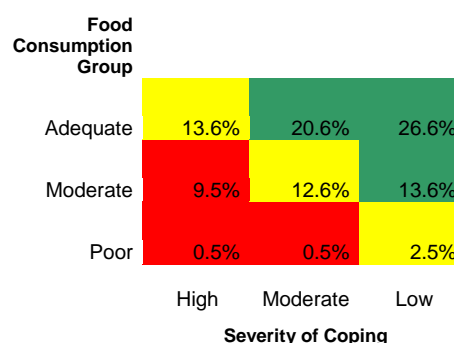


Figure 20 – Food consumption group and wealth category

### RELIEF AND RECOVERY ASSISTANCE

External assistance was received by 36.6% of the households in the worst flood-affected areas. In most cases the type of assistance received was food aid (73%).

If you received assistance, what was the level?

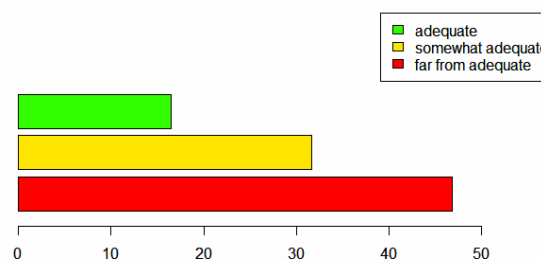
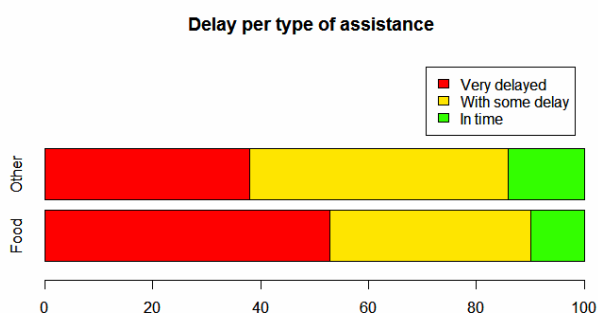


Figure 21 – Adequacy of assistance received (displayed in %).

In terms of perception of adequacy of the external assistance, only 16.5% of households that received assistance indicated that the level was adequate, and almost half of them (46.8%) reported that the level was far from adequate (Figure 21).

<sup>9</sup> The food consumption score was calculated based on the number of days particular food groups were consumed as follows: FCS = 2(cereal)+3(pulses)+4(poultry/meat/eggs)+0.5(oil)+4(milk products)+1(vegetables)+1(fruit)+0.5(sugar/sweets). Cut-offs were as follows: Poor food consumption is score between 0.5 – 21. Moderately food consumption is score between 21.5 – 34.5. Adequate food consumption is score of more than 35+





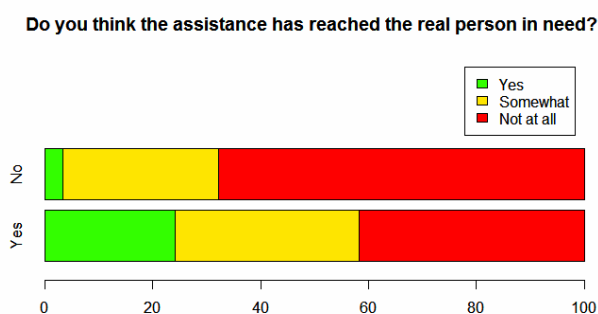
**Figure 22** – Delay for assistance provided for food and other types of assistance (displayed in %).

In terms of timeliness, the percentage of households who reported receiving assistance when most needed was only 10% for food assistance and 15% for other assistance. Respectively, 53% and 39% of households reported that delivery of food and other assistance was very delayed. The deterioration in the security situation, especially in the Eastern Terai, which prevented timely delivery of relief assistance, is the main reason for these results. However, further improvements need to be made to ensure delivery of relief assistance when it is most urgently needed (Figure 22) through for example strategically pre-positioning food stocks and other essential relief items in the most flood vulnerable areas.

Among the households who received assistance, 78% indicated that their situation had improved during the past 4 months, whereas this was 50% for households who did not receive any assistance. This indicates that the provided emergency assistance was effective in providing essential support to the affected population.

**TARGETING**

On average, 12%, 31% and 56% of households perceived that the assistance had fully, somewhat or not at all reached the households most in need. However, this perception varied greatly depending on whether the respondents themselves had received any assistance as illustrated in Figure 23.



**Figure 23** – Perception on the accuracy of targeting assistance according to households who received themselves assistance ("Yes") and those that did not receive any assistance ("No").

Nevertheless, it indicates that improvements need to be made towards developing better targeting mechanism for targeting food insecure and affected households for relief and recovery support.

Any further recovery assistance needs to be carefully targeted to the poorest households. The analysis above indicates that recovery assistance should be targeted to the poorest population groups and cover up to a maximum of approximately one-third of the flood affected population (see Figure 10).

## Conclusions

Four months after the floods, most of the poor households in the worst flood-affected districts have not yet recovered from the shock. Migration rates are twice as high as usual and the share of remittances in household income has increased considerably. Many households are still practicing damaging coping strategies, such as selling agricultural and agricultural assets which confirms an ongoing struggle for survival.

Health indicators such as prevalence of diarrhoea and sickness were found to have deteriorated significantly. Acute malnutrition rate however seem to be just below the average of the Terai (17%)<sup>10</sup> but the sample size was too small to provide any conclusive evidence. The same figures indicate that the number of children at risk to malnutrition could be very high.

Food prices have increased making it increasingly difficult for poor households to purchase sufficient nutritious food, especially during the months prior to the wheat harvesting period which starts at the end of March in the Terai.

Food consumption scores using international standards are still acceptable. However, the timing of the survey, during the main paddy harvest period, and the traditional Nepali diet of rice and *dal* may explain the predominantly moderate food consumption scores that we find.

The overall picture that appears is that the extreme poor are still struggling to overcome the flood impact of last August. Targeted assistance to these extreme poor using specific targeting criteria such as landless, current housing conditions, type of livelihood, female headed etc., or using a community targeting approach with wealth ranking, is recommended. Recovery assistance could be directed through a food for work modality aimed at developing disaster risk reduction infrastructure including raised homestead, small embankments and safe havens.

For the longer-term, a comprehensive nutrition intervention is highly recommended including supplementary feeding to undernourished children and pregnant women and nursing mothers, water and sanitation improvement, as well as nutrition and health awareness training.

Emergency Updates are produced by WFP Nepal as part of its Food Security Monitoring and Analysis System.

All information products produced by the Food Security Monitoring and Analysis System are available on the UN Nepal Information platform ([www.un.org.np](http://www.un.org.np)) or on the following WFP website: <http://vam.wfp.org/country/docs?country=524>

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<sup>10</sup> Note that in this survey MUAC measurements were taken which are not directly comparable to weight-for-height measurements.