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# IMPACT OF THE 1998 FLOOD ON LABOR MARKETS AND FOOD SECURITY AND EFFECTIVENESS OF RELIEF OPERATIONS IN BANGLADESH

**CARLO DEL NINNO**

**DILIP K ROY**

**JUNE 1999**

*FMRSP Working Paper No. 8*

**FMRSP Bangladesh**
**Food Management & Research Support Project**
**Ministry of Food, Government of the People's Republic of Bangladesh**

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*This work was funded by the United States Agency for International Development (USAID)*

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*The views expressed in this report are those of the authors and do not necessarily reflect the official position of the Government of Bangladesh or USAID.*

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# LIST OF ABBREVIATIONS

| | | |
|---|---|---|
| Asian Development Bank | — | ADB |
| Federation of Bangladesh Chamber of Commerce and Industry | — | FBCCI |
| Disaster Management Bureau | — | DMB |
| Nagorik Durjog Mukabela Uddyog | — | NDMU |
| Helen Keller International | — | HKI |
| Non-Government Organization | — | NGO |
| Household Expenditure Survey | — | HES |
| International Food Policy Research Institute | — | IFPRI |
| Union Parishad | — | UP |
| Water Development Board | — | WDB |
| Local Government Engineering Department | — | LGED |
| Statistical Yearbook of Bangladesh | — | SYB |
| Bangladesh Bureau of Statistics | — | BBS |
| Gross Domestic Product | — | GDP |
| Department of Agricultural Marketing | — | DAM |
| Coefficient of variation | — | CV |
| Gratuitous Relief | — | GR |
| Vulnerable Group Feeding | — | VGF |
| Test Relief | — | TR |
| Food for Works | — | FFW |
| High Yield Variety | — | HYV |

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# EXECUTIVE SUMMARY

The flood of 1998 has been one of the most severe and longest floods in recent decades in Bangladesh. Large losses in agricultural production had a direct impact on the income of farmers and an indirect impact on the income of the landless laborers that rely on the employment in the agricultural sector. As a consequence, their access and ability of acquiring food were reduced, thereby increasing their food insecurity.

The main purpose of this paper has been to determine the effect of the 1998 flood on the rural economy and the structure of the rural labor market and to evaluate the effectiveness of government relief distribution programs and the overall food security of the people in the flood affected areas. The analysis was based on the results of a rural rapid appraisal conducted in 64 villages in 7 thanas using structural village level questionnaires and focus group interviews.

## HOUSEHOLD FOOD SECURITY

The adverse impact of the flood on the rural economy, caused by the slowing down of economic activity and the reduced demands for jobs for the landless laborers, together with the increase in the prices of grains and other essentials, caused a reduction in the access of households to food.

### *Food prices*

In our investigation we found that even though food was generally available in the market, prices were higher than in the period before the flood. Rice prices increased between 5 and 20 percent in the period of the flood and then remained stable in all areas at 15 to 16 taka per kg. The same thing can be said for atta, which was available for 11 to 13 taka per kg. The price of vegetables increased even more, especially in the case of onions and eggplants. It is fair to say that the prices of all major commodities turned out to be very similar between the areas under investigation. This can be explained by the

fact that in most areas some bazaars and weekly market remained opened, despite of the flood even though village shops were not always available.

*Food Consumption*

It appears from the focus group discussions that farmers were a little better off than the landless. In fact, not all farmers had to reduce the amount of food eaten, because they could use their own stock of rice. Most of the landless, instead, had to reduce the number of meals eaten per day from three to two and they had also to reduce the amount of food intake as well. This situation is not unusual in rural Bangladesh for landless people. Also, in areas not affected by the flood, we found that landless households were reporting some level of distress. The poor did not have any stocks, assets, cash reserves or access to credit to enable them to offset the sharp declines in income. They ate once or twice a day food that was prepared only once a day. Unfortunately, women as usual appeared to suffer more. They reported they had to reduce the number of meals eaten and that because they were the last ones to eat, sometimes they were left without anything at all to eat.

## IMPACT ON THE LABOR MARKET

The impact of the flood on employment was particularly severe for those engaged in agricultural activities. The flood completely damaged the standing crops of aman reducing the level of labor demand for harvesting activities in a period when there is usually a high demand for hired labor (nearly half of the required labor for harvesting and threshing is hired), causing a great reduction in agricultural employment. As a result, the thanas that relied more on the cultivation of aman and had a higher percentages of landless labor were affected the most. During the flood, and in the immediate post-flood period, there was some work available for boatmen and fishermen, but in general, there were very few employment opportunities available in non-farm activities.

In the seven flood-affected thanas, the loss of total direct labor demand in the aman rice crop due to harvesting and threshing was 3,919 thousand person-days, of which about 49 percent were hired labor. The reduction in indirect demand for rural labor was the result of the reduction of trading activities caused by the smaller level of gross marketed surplus of aman rice. At full employment, the loss of indirect labor was equivalent to 1,254 thousand person-days. The loss of direct hired labor demand alone accounted for 38 percent of all daily laborer demand over a period of three months.

Due to the low level of economic activity and the low level of labor demand, it was very hard for landless people to find alternative sources of income. Most people tried to engage themselves in petty trade, transport, fishing, and other minor activities, associated with lower returns, to cope with the loss of agricultural wage. Some people looked for jobs outside the area (16 percent). More than 10 percent of all landless migrated to non-affected areas although, 50 percent of affected people had to take temporary shelter. Fishing provided some relief to poor people as the supply of fish increased in the open-water bodies.

The average loss of total income from agricultural wage labor due to the loss of direct labor demand in aman crop harvesting was estimated to be, on the average, Tk. 958 per month per worker in the flood and post-flood period. If the loss is compared to the full employment level (22.5 days per month), the average loss of monthly wage income could be increased to Tk. 1,337.

*Effect on Female Rural Employment*

Female wage laborers, who constitute only 14 percent of the total workers in wage employment, were particularly affected during the flood. About 60 percent of female workers were engaged as maidservants, and only 6 percent of working women were engaged in the agricultural sector. Their wage rate is usually lower, in part because of the lower effective demand caused by the specificity of tasks they perform such as threshing,

processing, and their geographical immobility. Diversification of their occupations and government programs, such as earthen work, may enhance their status and the return to their labor.

## EFFECTIVENESS OF RELIEF OPERATIONS

In our analysis, we found that the amount of relief received by each area was more or less consistent with the need as expressed by the number of people affected and other key indicators like the number of people in shelter, the number of people reported dead and the share of affected people over the total population. In some local communities, though, people received more relief than expected and in others they received less than expected.

The immediate relief (GR) received at the local level was distributed with equity and helped the poor during the flood. In most cases, the resources available have been directed to the landless poor and other poor people. In only half of the cases, farmers received some relief. The amount of additional relief (mostly VGF) took some time to be organized and local communities relied on the support already assigned to them.

## CONCLUSIONS

The 1998 flood affected a large number of people for a period of almost three months and its effects could last for several months or years. It reduced food security in two major ways. It hampered the ability of households to acquire food because of the loss of income caused by the losses of production and assets, and the level of general slowing down of the economic activity that reduced the possibilities of finding a job in the labor market. Second, it has considerably reduced the access of households to food. The prices of grain and other essentials were higher than usual due to the reduction in production and the disruptions in transport and markets.

The resilience of the people and the relief received in the immediate post flood period helped to avoid much worse consequences to the people in the affected areas. Even after the floodwater receded, the impact of the flood on the economy and the on the

welfare of the people will be felt for some time to come. It may take even longer for the poor landless households to make up for the loss of income they suffered at the time of the flood. Therefore, in the affected areas it is necessary to generate more jobs through specific government or NGO programs on a short and long run basis.

# 1. INTRODUCTION

The flood of 1998 has been one of the most severe and longest floods in Bangladesh in recent decades. During the period between July and September 1998, the flood affected, in different magnitude, an area of 100,250 sq. km covering 68 percent of the country in 370 of the 460 *Thanas*[1], compared to 61 percent in 1988. In total, more than 30 million people have been affected, reducing their access to and ability to acquire food, thus increasing their food insecurity.

The flood caused damages to infrastructures and to the economy in general and to the agricultural and fishing sector in particular. The area of rice crop damaged is estimated to be 1.5 million hectares, which caused a loss in production of approximately Tk. 30,877 million, while the losses in the fisheries sector amounted to Tk. 1,736 million. In the same time, the FBCCI estimates that 5,000 industries were affected by flood causing a loss of $ 425 million. The cottage industry suffered a loss of Tk. 880 million ($ 18.7 million), while the loss in garments production was estimated at Tk. 1,880 million ($ 40 million). In total, the Disaster Management Bureau (DMB) estimates the extent of the damages at around US$ 3 billion.

Several assessments and studies have been carried out by the government and other agencies, alongside with their relief work (Asian Development Bank, 1998; Helen Keller International, 1998; NDMU, 1998). The primary concern of these studies was to make an assessment of the level of the damage in terms of production and income loss to help guide the relief efforts. Most of the studies cited used rapid appraisal methodologies.

[1] Bangladesh is administratively divided into six divisions and each division consists of several districts. Thana is an administrative unit of a district in Bangladesh. Several unions (at least five) and semi-urban areas together constitute one Thana. A Union is the smallest local administrative unit of rural area is comprised of a number of villages.

The study done by HKI (1998) was one of the few that used rural household data and made an attempt to quantify the effects of the flood on the individual households. They selected a group of flood-affected *thanas* from all the *thanas* included in their nutrition project areas. A large scale rapid survey was conducted by NDMU (1998) but the area selection is certainly tilted toward those areas where their associated NGOs are working.

In this study, we focused our attention on the impact of the flood on food security. We concentrated a large part of our investigation on the impact of the flood on the economy and in particular on the labor market. The large losses suffered by the agricultural production had a direct impact on the income of the farmers and an indirect impact on the income of the landless laborers that rely on the jobs provided by the agricultural sector.

We also analyzed the availability and the cost of food in a selected number of locations. Finally, we looked at the distribution of relief from the government and evaluated the effectiveness of the distribution program.

## METHODOLOGY AND AREAS OF INVESTIGATION

To evaluate the immediate impact of the flood on poverty and food security, we used secondary data, community questionnaires, focus group interviews and other information collected in the field. The investigation was carried out in 10 *thanas* that have been selected using a set of specific criteria. The two most important criteria utilized were the severity of the flood as determined by the Flood Warning Centre and the level of poverty calculated as the percentages of poor people in the district according to the 1995/96 HES data (BBS, 1998).

In addition to these two main criteria, we also purposively selected some *thanas* covered by other projects of the World Bank and IFPRI. Finally, in order to maintain a balanced geographical representation, we selected at least one *thana* in each of the six administrative divisions of Bangladesh: three from Dhaka, two from both Rajshahi and Khulna, and one each from Sylhet, Chittagong and Barisal. In each of the *thanas*, three

Union Parishad (UP), were randomly selected among UPs with different level of access to roads and markets. The list of the *thanas* selected and their classification is reported in Table 1 (a complete list of *thanas* and UPs selected is reported in the Table A1 in the appendix A). Even though the sample is not nationally representative, it will enable an analysis of issues and behavioral responses that broadly reflect much of the country.

**Table 1 — List of Thanas in the Sample**

| Severity of flood | Non-Poor Thanas | | Poor Thanas | | Total | |
|---|---|---|---|---|---|---|
| | Thanas | Villages | Thanas | Villages | Thanas | Villages |
| Severely affected | Muladi BARISAL (BA) | 8 | Mohammadpur MAGURA (KH) BINP | 10 | ... | 18 |
| | Shibpur NARSHINGDI (DH) BINP | 8 | Saturia MANIKGANJ (DH) Micro | 10 | ... | 18 |
| | Total Village → | 16 | Total Village → | 20 | 4 | 36 |
| Moderately affected | Shahrasti CHANDPUR (CI) BINP | 9 | Madaripur MADARIPUR (DH) BINP | 10 | ... | 19 |
| | | ... | Derai SUNAMGANJ (SY) HKI | 9 | 3 | 9 |
| | Total Village → | 9 | Total Village → | 19 | ... | 28 |
| Not affected | Jessore JESSORE (KH) Micro | ... | Adamdighi BOGRA (RJ) BINP | ... | 3 | ... |
| | | ... | Birganj DINAJPUR (RJ) | ... | 3 | ... |
| All Total | 4 | 25 | 6 | 39 | 10 | 64 |

Source: Authors calculations using Household Expenditure Survey (HES) and Water Development Board (WDB) reports

To collect the data in the field we used several types of instruments. We administered a community questionnaire and we conducted three focus group discussions (one with male farmers, one with male landless labor and another with women[2]) in three UPs in each one of the sample *thanas*. In addition, we also administered a labor market questionnaire at the village level in 64 villages located in seven flood-affected *thanas*.

The community questionnaire contains questions relative to:

- The profile of the community before, during and after the flood
- The status of community infrastructure
- The price and availability of essential commodities

[2] Groups of farmers and landless did not necessary exclude women. A separate group consisting of only women was selected to highlight their prospective with respect to both the general situation and their food security situation.

The focus group discussions helped to collect first account information of the impact of the flood and the coping strategies employed by different groups of people. The discussions centered on the perception of poverty and vulnerability and the level of income, food and health security, and the effectiveness of the relief operation carried out by the government.

The labor questionnaire, administered to key informants in each village, contains questions on rural labor markets pertaining to labor use in paddy production, mode of labor sales, days worked by each occupation during flood, female employment, mobility of rural labor and wage rate. Copies of all the questionnaire forms are attached in Appendix B.

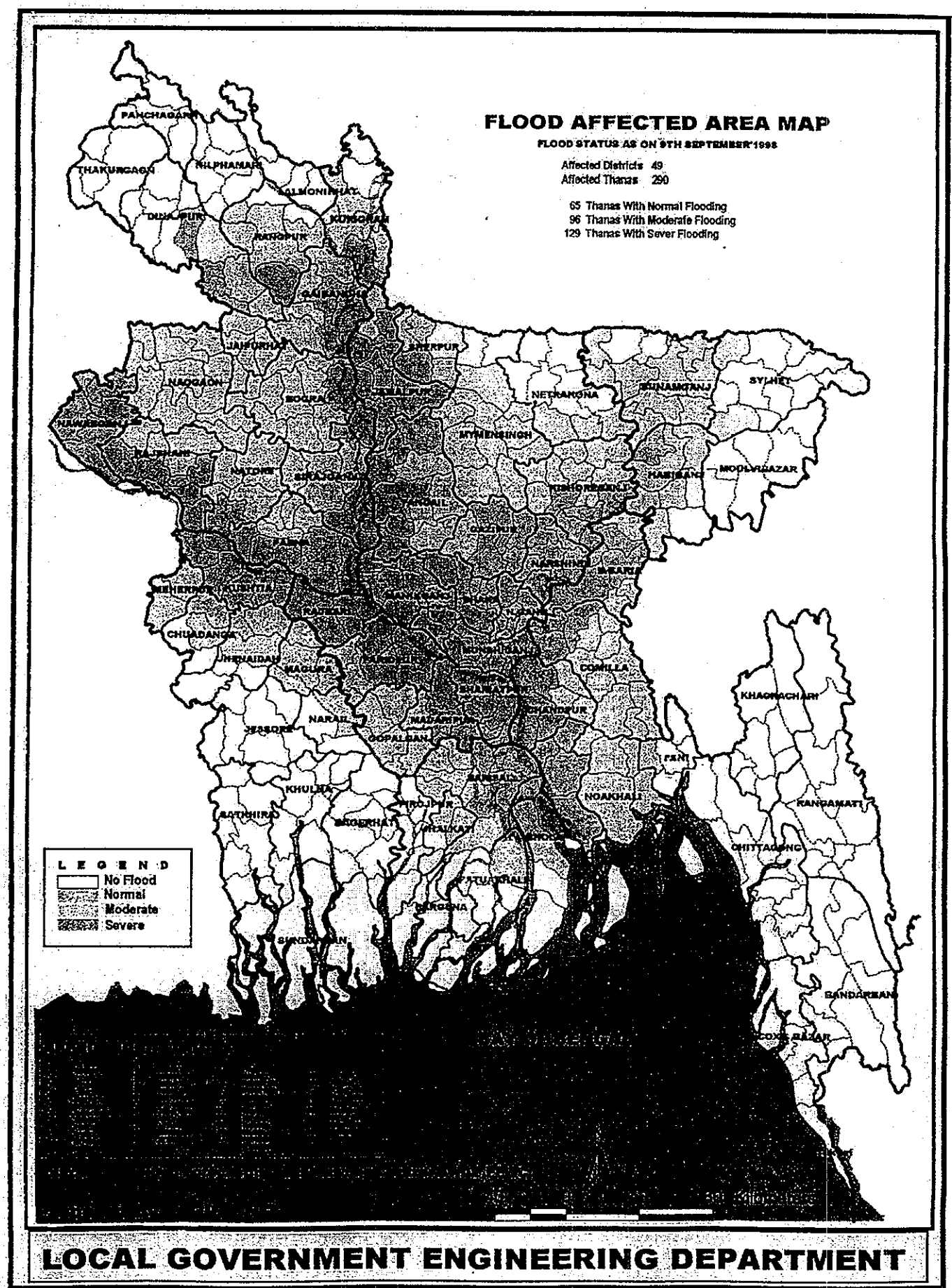
# 2. SEVERITY OF THE 1998 FLOOD

The extent and severity of the flood has been determined by a number of agencies and organizations. The Water Board maintained very accurate records of the level of water in the main rivers of Bangladesh (WDB, 1998). The information was extremely useful to determine the level of immediate danger in the different parts of the country. The information collected was also used to classify *thanas* as severely affected, moderately affected, normally affected or not affected at all by the flood. This information was also mapped (see Figure 1) by the LGED and made available on the Internet.

At the same time, the Ministry of Relief collected data from the District offices regarding the percentage of the area affected and the number of people affected by the flood (reported in Table A2 in the appendix A). This information has been proven to be very important and accurate, even though the level of severity reported in some areas did not coincide with the ranking provided by the Water Board. This happened because while the Water Board used a classification criteria based on the level of the floodwater compared to the usual flood level, the Ministry of Relief relied on the number of people affected as reported by the District offices.

In the investigation that we carried out in the 10 *thanas*, we tried to reconcile the information from the two sources and determine some objective measure of the severity of flood. For this reason we collected data on the size of the area under water and the depth and length of the flood as compared to the usual flood. The results of the interviews have been reported in Table 2. Here first we have reported some basic information relative to the *thanas* that have been visited including their population, the names of the Union Parishad visited and the date of the visit.

**Figure 1 — Flood Status as of September 1998 in Bangladesh**



## Table 2 — Extent and Severity of Flood

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| Population of thana | 195,000 | 205,000 | 341,000 | 181,000 | 154,000 | 274,000 | 211,000 | 195,000 | 264,000 | 601,000 |
| Unions Visited | Kagirchar<br>Shafipur<br>Char Kali khan | Tamta<br>Dhakshin-Mehar<br>Purba Chitoshi | Bhadurpur<br>Kalikapur<br>Mostafapur | Muhamadpur<br>Polasbari<br>Binodpur | Daragram<br>Digulia<br>Pukurhati | Bagaba<br>Putia<br>Dulalpur | Rajanagar<br>Rafinagar<br>Karimpur | Shantahar<br>Adamdighi<br>Chapapur | Sujalpur<br>Nijpara<br>Shatagram | Chamchara<br>Ichali<br>Daira |
| Total Population of Unions Visited | 80,000 | 84,177 | 50,000 | 82,000 | 46,000 | 92,000 | 87,000 | 69,000 | 71,000 | 91,000 |
| Date of visit | 10/2-5 | 9/26-28 | 9/29-10/1 | 9/25-28 | 10/6-9 | 9/29-30 | 10/6-9 | 10/24-25 | 10/26-27 | 11/28-30 |
| Severity of flood | | | | | | | | | | |
| **District information** | | | | | | | | | | |
| - Area Affected | 90% | 87% | 100% | 37% | 99% | 89% | 100% | 10% | NA | NA |
| - People affected | 28% | 65% | 94% | 15% | 64% | 46% | 44% | 0% | NA | NA |
| - Affected people in shelter | 12% | 1.4% | 2% | - | - | 5% | - | NA | NA | NA |
| **Water Board** | | | | | | | | | | |
| **Classification** | | | | | | | | | | |
| - As of August 19, 1998 | Moderate | Moderate | Moderate | Normal | Severe | Severe | Moderate | No Flood | No Flood | No Flood |
| - As of September 14, 1998 | Severe | Moderate | Severe | Moderate | Severe | Severe | Moderate | Moderate | No Flood | No Flood |
| **RRA Information (3Ups)** | | | | | | | | | | |
| - Depth of water[1] Ft. | 6-10 (1-6) | 4-11 (1-4) | 7-10.5 (1-7.5) | 4-8(2-5) | 6-9(3-5) | 4-12(4-6) | 10-15(4-12) | 3-6.5(1-3) | 3-4.5(1-4) | |
| - Length of flood [1] days | 65 (15-20) | 90 (60) | 30-70(30-70) | 30-35(15-30) | 60(15-20) | 60-75(15-30) | 100-120(90- | 30-70(20-35) | 30-35(10-20) | |
| - Number of days isolated | 25-35 | 20-70 | 30-60 | 18-25 | 18-23 | 60-75 | 120) | 7-20 | 7-12 | NA |
| - Area Affected | 80-100% | 100% | 95-100% | 10-50% | 90-100% | 33-70% | 60-75 | 50% | 47% | |
| - People Affected | 75-100% | 100% | 100% | 5-53% | 100% | 70-95% | 70-85% | 57% | 62% | |
| - Affected people in shelter | 19-14% | 4% | 16% | 156-15% | 16% | 43-32% | 45-50% | 2% | 11% | |
| | | | | | | | 13-12% | | | |
| *Damage to infrastructure* | | | | | | | | | | |
| - Roads/highway km | 52km | 5km | 25km | 5km | 43km | 25km (3km) | - | 36km | 35km | |
| - Kacha roads | - | 60-100% partially | 12km | 12km | -- | - | 4km (149km) | | - | |
| - Bridges | 16 | 9 | 4 | 1 | 8 | 2 | 4 | 8 | 4 | |
| - Culverts | 25 | 10 partial | 9 | 6 | 11 | 28 partial | 12 fully( 6) | 6 | 18 | No Flood |
| - Irrigation canals | - | 25km partial | -- | Partially | - | 11 partial | 2km 25% dam | - | - | |
| - Bazaar/markets | 11 | 2 (6) | 6 | - | 6 | 2 (3) | 6 partial | - | 4 | |
| - Institution | 26 | 19 partial | 22 partially | 13 | 13 | 15 partial | 3 partial | - | 22 | |

## Table 2 — Extent and Severity of Flood (continued)

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| ***Migration*** | | | | | | | | | | |
| Short term | 4% | 5-10% | Less than 1% | Less than 1% | 9% | 5-20% | 5-15% | 2000 | 400 | - |
| Long term | 150 people | None | None | None | None | None | None | - | - | - |
| **Impact on people** | | | | | | | | | | |
| Deaths | • 21 people | • 11 people | • 13 people | • 2 people | • 10 people | • 10 people | • None | • None | • None | • None |
| Inundation | • All houses under water | • All houses under water | • All houses under water | | | | | | | |
| Isolation, Migration and transports | • 90% isolated from their houses | • 50% people isolated from their houses | • 30-50% people were isolated from their houses | • 90% people isolated from their own houses | • 20-60% people were isolated, | | • Unions totally isolated boat, engine boat and swimming. | • Only one union isolated | • None isolated | • None isolated |
| | • 80% migrated for short time to friend and relatives | • Only transport vella boats | • Those who were in their houses tied their children with their body at night. | • Unions totally isolated, vella and only a few had boat | • Only transport vella, boats, and swimming. | • People used only vella | | • Nobody migrated permanently. Only in one Union people migrated temporarily | • Nobody migrated | • Nobody migrated |
| | • Used vella boat | | • All kacha roads under flood water and major portion washed away | | | | | | | |

Note: 1. Normal level is reported in parentheses

Source: Ministry of Relief and Rehabilitation
Food Management and Research Support Project (FMRSP) - Rapid Appraisal, October 1998

It is evident from the data reported that not only the depth of the water of the flood was deeper than usual, but also the water remained for a much longer time than usual on the fields. In this respect, this flood has been different from other past floods. In a usual year, the floodwater remains on the fields for less than a month (with the exceptions of Shahrasti and Derai). This year the water was standing for at least one month and more often for two to three months.

The level of severity of the flood was measured at the District level in terms of percentage of the area and people affected. At the same time the Water Board classified the areas as normal, moderate, severe or non-affected depending on the level and depth of the floodwater. Most of the time the information provided by the two sources was comparable, even though we found that the information provided by the District level was more useful for determining the amount of resources to be provided to the affected population.

During this flood the water rose very slowly and therefore did not cause a great amount of disruption at the immediate onset of the flood. Nevertheless the amount of the damage to infrastructure reported in the official data was enormous. As reported in NDMU (1998), 15,927 kilometers of roads and highways were severely damaged while 45,896 km. were partially affected, a total of 20,500 bridges and culverts were damaged, about 5.5 lacs[3] houses were damaged and there was even a loss of 1,050 human lives. The data collected in our area confirmed that many roads, bridges and culverts were damaged during the flood.

## MIGRATION

In the areas in which we conducted the analysis it did not appear that many people left or migrated out to other places (Table 2). This result is confirmed by the analysis of Hossain's study (1998) that shows the rate of migration to Dhaka to be in the range of 20

[3] 10 Lacs = 1 Million

to 23 percent. Of these, 81 percent arrived after the flood and 19 percent during the flood time. The percentage of flood-affected recent arrivals in floating population of Dhaka city is used as an indicator for rates of in-migration. Migration appears to be originated from traditionally vulnerable areas, Madaripur, Barisal, greater Mymensingh and greater Rangpur. We were told in the group interviews that most often, when the houses were under water, people moved to a nearby location on higher ground or they moved in with friends and relatives and in some instances they set up makeshift homes on the sides of the roads. This occurred because people were reluctant to abandon their homes and also because even though labor availability was scarce, food was still available.

The overall impact of the flood on the people was quite severe. In the group interviews we conducted, we learned that several people died, many people had their homes flooded and remained isolated from their houses (90 percent in Muladi and Mohamudpur) for some time and that they did not have access to any form of transportation except for regular of makeshift boats (vella).

# 3. THE ECONOMY

The impact of the flood on the economy has been enormous. Most of the standing *aman* crop, normally transplanted in August and harvested in December, was lost in the worst affected areas. Most fisheries and other agro-business have been destroyed. As a result, there have been very few opportunities for the landless poor to find any job.

The impact of the flood on agricultural sector has been reported on Table 3. In the flood-affected areas, most of the *aman* crop has been lost. In the areas in which farmers rely more on the *aman* production and do not have other significant crops during the other times of the year, like in Muladi and Mahmudpur, the effect of the flood has been felt more acutely. On the other hand, in areas that do not usually plant any crops during this time, like in Derai, the actual losses have been smaller. Unfortunately, in some areas also vegetable gardens (like in Mahmudpur and Shibpur), and banana trees have been affected, further increasing the losses in the agricultural sector.

The prospects for recovering from the losses of the flood depended largely on the usual winter cropping pattern. In most areas, there was not enough time to plant alternative crops to those that were lost, because the water receded too late and the fields did not become ready for planting in time. Some farmers mentioned that they were going to plant some rice anyhow, even though they knew that it was not going to mature on time, but just to get at least some fodder for the cattle. Others mentioned that they were anticipating the cultivation of wheat, hoping to recover some of the losses with an early harvest. In some areas (Madaripur and Mahmudpur) there was also fear that the soil fertility might be affected by the amount of sand left by the flood.

The adverse situation caused by the floodwater, the spread of diseases and lack

## Table 3 — Economic Activity

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| Agriculture | | | | | | | | | | |
| **Cropping Pattern** | | | | | | | | | | |
| - One Crop | 10-25% | 10-30% | 25-75% | 2-60% | 5-10% | 10% | 75-100% | 2-50% | 1-10% | 0-25% |
| - Two Crops | 40-80 % | 30-40% | 65-75% | 40-95% | 20-40% | 20-90% | 10-25% | 47-88% | 60-99% | 40-90% |
| - Three crops | 10-50% | 50-60% | 10-25% | 5-18% | 50-75% | 40-80% | - | 3-20% | 0-20% | 10-35% |
| **Typical crops** | | | | | | | | | | |
| - August-December | Amon – All | Aman 70% | Aman 70% | Aman 80% | Aman 50% | Aman 30% | Aman 30% | Aman 100% | Aman 100% | |
| - December-May | Boro – 30% | Boro 80% | Boro 30% | Boro 60% | Boro 80% | Boro 30% | Boro 80% | Boro 60% | Boro 30% | |
| - February-July | Aus – 70% | Aus 10% | Aus 30% | Aus 70% | Aus 40% | Jute 20% | Potato 10% | Potato 50% | Aus 60% | |
| - Other | Must, veg30% | Potato 40% | Pulses 40% | Vegeta 60% | Musterd 40% | Vegeta 70% | Musterd 10% | Aus 10% | Vegeta 30% | |
| Loss of Agricultural output (%) | Aman-80-100%<br>Aus- 50%<br>Jute- 25%<br>S.Cane- 70% | Aman 100%<br>Aus 100%<br>Jute 70%<br>Veget. 100%<br>S.Cane 60%<br>Seedling100% | Aman 100%<br>Aus 50-90%<br>Seedling100% | Aman 95%<br>Aus 50%<br>Jute 50%<br>Mustard 100% | Aman 100%<br>Aus 70-100%<br>Jute 40-80% | Aus 100%<br>Aman 100%<br>Vegeta 100%<br>Seedling100% | Crop lost, because in most of the areas only Boro is produced. | Aman 75%<br>Farmers planted Aman 2/3 times | Aman 25%<br>Most of the area is not flood affected, | Aman 20% due to heavy rain<br>No flood took place |
| Farmers prospects | | | | | | | | | | |
| ***Expected crops November to May*** | Mustard, onion, pulse/ IRRI/wheat | Mustard, onion, Vegetables, pulse, potato/ IRRI/wheat | Mustard, onion, garlic, Vegetables, pulse, potato/Wheat | Brown nut, Wheat, Pulse, Mustard, Vegetables, Potato/ wheat (50%) | Potato, Mustard, Pulses, Vegetables/ wheat | Mustard, onions, Vegetables, pulse, potato/ IRRI/wheat | Boro one Cropland, in few areas Mustard, onion, pulse | Mustard, onion, garlic, vegetables, potato/Wheat | Mustard, onion, garlic, vegetables, pulse, potato/Wheat | Robi crop, Mustard, Potato, Wheat, Vegetables, Soybean |
| **Loss of Cattle (%)** | 5% died | 5-15% | 25-40% died | 6-10% died | 3-5% died | 5-15% died<br>No cattle food | 5-25% died<br>No cattle food | 5% died | No loss | No Loss |
| **Loss of Poultry (%)** | 50-60% lost | 80% lost<br>20% eaten and sold at low price | 40-90% died | 50% died | 20-40% died | 40-70% died<br>60-30% eaten and sold at low price | 60-75% died<br>Rest sold at low price | 50% died | 20% lost | No Loss |
| **Loss of Fish ponds (%)** | 75-100% lost<br>All ponds are flooded. | 100% lost | 100% lost | 30% lost | 50-100% lost | 100% lost | No major losses | 75% lost | 40% lost | 15% lost |

## Table 3 — Economic Activity (continued)

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| Agribusiness Activities | | | | | | | | | | |
| ***Existing enterprises and extent of damage*** | | | | | | | | | | |
| - Poultry | 1 100% | 103 50% | 20 50% | - | 51 95% | 28 40% | 17 10% | 2 - | 1 100% | 23 - |
| - Nursery | 25 100% | 122 80% | 2 100% | 6 80% | 15 100% | 46 90% | 2 0% | 22 - | 209 96% | 32 - |
| - Fish Farm | 5,000 100% | 1227 100% | 1090 95% | 1200 40% | 165 95% | 155 100% | 38 80% | 1650 82% | 950 73% | 675 - |
| Business Activities | | | | | | | | | | |
| **- Capital lost** | 15-20% | 20% | 10-50% | 20-25% | 5-20% | 5% | They loss their capital | No major loss | Less than 5% lost | Less than 10% |
| - Assets lost | 20-25% furniture, shops damages | furniture, shops damaged, closed many days | 20-40% | 10-20% | 2-10% | Shops closed many days | | No asset lost | No asset lost | - |
| ***People prospect*** | | | | | | | | | | |
| (a) Crops | • Farmer loss Aus, Aman, Jackfruit, bananas, Vegetables. | • Aus, Aman Jackfruit, banana tree, Vegetables, banana were Damaged | • All crops – Aus, Amon, Jute, S.cane, Veget. were damaged<br>• Field fertility reduced due to sand bar. | • Crops-Amon, pulse, Jute, Brown nut, Chilies, egg-plant destroyed<br>• Field fertility reduced due to sand bar. | • Trees Seedlings , Veget., Amon, Boro, were damaged | • All crops-Aus, amon, veget., Jute banana damaged and 35-65% trees especially the big ones damaged | • No crop loss (90% Boro) A few cultivate Aman which was totally lost | • All attempts to Aman failed | • Loss varied from 5-50% | • Loss of Aman 20%. No other crop loss. |
| (b) Cattle/poultry | • 25 Cattle died, others were suffering for food shortages<br>• Farmer sold cattle.<br>• 50-75% poultry died | • 5-25% cattle died Cattle-food scarce<br>• 50-60% poultry died and the rest sold at low price. | • 5-20% cattle were died<br>• 90% poultry died | • No cattle loss but cattle-food scarce. | • 5-10% cattle died, Cattle-food scarce,<br>• 10-25% chicken died, | • 15% cattle died,<br>• 40-70% chicken died | • 10-30% cattle died and .75% ducks were washed away by high tidal | • No significant loss of cattle. But acute scarcity of fodder. | • No significant loss of cattle. Loss of poultry 0-10% | • No significant loss of cattle. But scarcity of fodder. |
| (c) Fishing | • All fishpond damaged | • All fishpond damaged | • All fishpond damaged | • All Fishponds (few) totally damaged | • Fishponds totally damaged | • 75-100% fishponds were washed away | • 0-100% fishponds washed away | • 50-100% lost | • 0-100% loss of fishes | • Some fishes washed away. |

Note: Normal level are reported in parenthesis

Source: Food Management and Research Support Project (FMRSP) - Rapid Appraisal, October 1998

of feed and fodder caused many losses to the livestock sector. Between 5 to 15 percent and up to 40 percent, in Madaripur, of the cattle died in the flood affected *Thanas*. The situation was even worse for the poultry. About half of them died and those that survived were sold at low price. The situation was equally bad for the commercial poultry business. In Saturia, the flood damaged 95 percent of the 51 poultry businesses.

With the exception of Magura and Derai, almost all the fishponds owned by private individuals and fish farms suffered some losses.

Business activities suffered in the period of the flood. About 20 percent of them reported losing some capital, others lost assets and furniture. In general, businesses and several shops (Sharasti and Derai) remained closed several days.

In conclusion, although the economic activity did not come to a complete halt, at least for not more than a few days, the impact on the economy and on the earning income possibility was very large.

# 4. THE LABOR MARKET

The flood's impact on employment has been severe given the devastating effect on the agricultural sector, which is by far the largest sector in the economy. Its share of the GDP is very high (it was approximately 30 percent in 1996/97) and absorbs the majority of the rural labor force (73 percent in 1995/96) (BBS, SYB 1997). The situation has not changed recently, even though there has been an increase in labor productivity in the past seven years. In fact, the total employment in agriculture has grown at an annual compound rate of growth of 1.22 percent over a period of 7 years from 1989 to 1995/96, while the trend growth rate of agricultural production over the period 1989/90-1994/95 at 1989/90 prices is 1.78 per cent. In the non-agricultural sector, employment in the rural area grows at a slightly higher rate with an annual compound rate of growth of 1.49 percent over a period of five years, 1990/91-95/96, still not fast enough to absorb more surplus labor.

On the other hand, the supply of agricultural labor has grown as well. The limited scope for expanding employment in the agricultural sector and an increase in landlessness due to growing concentration of land ownership are causing a transfer of labor from the agricultural sector to non-farm sectors. More than half of rural households are landless, do not have other assets, do not have access to credit, and receive a large portion of their income from daily wages. This situation makes them most vulnerable to natural disruptions like the flood, which provided a sizeable shock to the rural labor market.

The heavy flooding caused a decrease in the demand for labor and an increase in the number of functional landless[4] (those farmers that could not operate their land) resulting in the excess supply of rural labor. The employment loss in crop production,

[4] Functional landless refers to those owning 0.5 acre or less land.

due to the '98 flood, occurred mostly in November-December when the *aman* crop is harvested and nearly half of the required labor for harvesting and threshing is hired.

A few landless workers migrated to non-affected areas to look for jobs. Others self-employed themselves in transport activities such as boat and in petty trade of fish etc. As the supply of fish has increased in the open-water bodies, which were accessible to the community at large for fishing, a large portion of the landless were engaged in fishing activity for their earnings. The changes caused by the flood may alter the patterns and magnitudes of rural employment patterns and also have an impact on the incidence and characteristics of poverty. In this section, an attempt will be made to provide an account of the structure of rural employment and the effect of the 1998 flood on the loss of rural labor demand.

**Table 4 — Duration of Flood (days) and Depth of Water by Thana**

| Thana | Number of Village | Duration of Flood (days) | Depth of Flood (Ft) | |
|---|---|---|---|---|
| | | | Normal Flood | 1998 Flood |
| Muladi | 8 | 63.3 | 1-6 | 6-10 |
| Madaripur | 10 | 47.5 | 1-7 | 7-10 |
| Mohammadpur | 10 | 48.3 | 2-5 | 4-8 |
| Saturia | 10 | 60.0 | 3-5 | 6-9 |
| Derai | 9 | 108.3 | 4-12 | 10-15 |
| Shibpur | 8 | 65.0 | 4-6 | 4-12 |
| Shahrasti | 9 | 79.0 | 1-5 | 4-11 |
| Total | 64 | 67.34 | 1-12 | 4-15 |

Source: Food Management & Research Support Project (FMRSP), Village and Union Parishad Survey, 1998

## THE SURVEY AREA

The sample villages in seven *thanas* include low lying flood prone wet zone as well as medium elevation less flood prone areas. As can be seen in Table 4, the average days of flood duration in the 1998 flood varies from 48 days to more than 108 days in our sample areas. The minimum depth of floodwater in the '98 flood was 2-4 times the depth found in a normal flood.

In the seven flood affected *thanas* more than half of the households have an average size of landholding below half an acre. The incidence of landlessness is higher in three *thanas*—Muladi, Madaripur and Saturia—nearing two-thirds of the households (Table 5). These are the households who depend on wage labor in the rural areas and are most likely to be affected by natural disasters. In fact, two-thirds of the unions in three *thanas* and all the unions in the remaining four of the seven flood affected *thanas* reported losses of *aman* crop, and therefore required much less or no hired labor for agriculture labor (Table 6).

**Table 5 — Percentage of Households by Size of Land Ownership by Thanas**

| Thana | Size of Land ownership (acre) | | | | |
|---|---|---|---|---|---|
| | Landless (0 < .5) | Small (.5 < 2.5) | Medium (2.5 < 5.0) | Large (5.0 & above) | Total |
| Muladi | 64.08 | 22.67 | 7.44 | 5.81 | 100 |
| Madaripur | 62.99 | 22.34 | 9.10 | 5.57 | 100 |
| Mohammadpur | 57.24 | 19.61 | 17.27 | 5.88 | 100 |
| Saturia | 61.60 | 25.12 | 10.65 | 2.63 | 100 |
| Derai | 54.58 | 20.46 | 19.02 | 5.94 | 100 |
| Shibpur | 44.83 | 36.53 | 14.82 | 3.82 | 100 |
| Shahrasti | 30.23 | 45.54 | 17.73 | 6.50 | 100 |
| All Seven Thanas | 52.58 | 28.01 | 14.11 | 5.30 | 100 |

Source: Food Management and Research Support Project (FMRSP) , Union Parishad Survey, 1998

**Table 6 — Percentage of Unions Reporting Aman and Aus Crop Loss by Thana**

| Thana | Union reporting Loss of Aman Crop | | Union reporting Loss of Aus Crop | | Union reporting Loss of Aus & Aman Mixed | |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % |
| Muladi | 3 | 100 | 2 | 66.7 | - | - |
| Madaripur | 3 | 100 | 2 | 66.7 | - | - |
| Mohadmmadpur | 3 | 100 | 2 | 66.7 | - | - |
| Saturia | 3 | 100 | 1 | 33.3 | - | - |
| Derai | 2 | 66.7 | - | - | - | - |
| Shibpur | 2 | 66.7 | - | - | 1 | 33.3 |
| Shahrasti | 3 | 66.7 | 1 | 33.3 | 2 | 66.7 |
| All Seven Thanas | 19 | 90.5 | 8 | 38.1 | 3 | 14.3 |

Source: Food Management and Research Support Project (FMRSP), Community Level Survey, 1998

## MODE OF EMPLOYMENT IN RURAL LABOR MARKET

The labor market in rural areas of Bangladesh is not very big. The agricultural sector, which absorbs 73 percent of all workers (Table 7), cannot provide full employment to the agricultural daily wage laborer and family workers. It is not surprising that most workers (43 percent) are unpaid family laborers. As a result most

**Table 7 — Percentage of Employment (aged 15 years and above) by Sectors and by Type of Employment in Rural and Urban Areas of Bangladesh, 1995/96**

| | Rural Area (%) | Urban (%) | Bangladesh (%) |
|---|---|---|---|
| **Sectors** | | | |
| Agriculture, forestry & fisheries | 72.66 | 18.64 | 62.99 |
| Manufacturing | 5.56 | 15.79 | 7.39 |
| Trade, Hotels & Restaurants | 9.59 | 25.00 | 12.35 |
| Community & Personal Services | 6.20 | 22.95 | 9.20 |
| Transport, Storage & Communication | 3.09 | 10.85 | 4.48 |
| Total | 100 | 100 | 100 |
| **Type of Employment** | | | |
| Day Laborer | 19.1 | 12.5 | 17.9 |
| Self-employment/own account work | 31.2 | 36.7 | 32.2 |
| Unpaid family Worker | 42.5 | 15.4 | 37.7 |
| Total | 100 | 100 | 100 |

Source: Report on Labor Force Survey in Bangladesh, 1995/96, Bangladesh Bureau of Statistics (BBS), December 1996

**Table 8 — Mode of Labor Sales (%) in Sample Thanas**

| Thana | Casual (%) | Contract (%) |
|---|---|---|
| Muladi | 90.43 | 9.57 |
| Madaripur | 88.70 | 11.30 |
| Mohammadpur | 91.80 | 8.20 |
| Saturia | 86.50 | 13.50 |
| Derai | 72.44 | 27.55 |
| Shibpur | 76.87 | 23.12 |
| Shahrasti | 71.67 | 28.33 |
| All Thana Average | 82.63 | 17.37 |

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

workers in the rural areas usually change jobs from one day to another, from self-employment to wage labor and vice versa, and from unpaid family helper to wage labor.

The demand for agricultural labor usually increases during the crucial busy periods of transplanting and harvesting when large and small farmers hire-in some labor on a casual or contract basis. Casual labor, which accounts for about 83 percent of all workdays sold in a year in the seven flood affected *thanas*—the percentages being higher (more than 91 percent) in the case of Mohammadpur and Muladi (Table 8)—is usually hired for one or more consecutive days for various crop operations when needed. Wages are paid on a daily basis, including cash and kind (meals).

The contract mode for labor sales is next in importance representing 17 percent of hired-labor transactions. The main difference between casual daily labor and contract labor is that in the 'contract' case the job has to be completed within a certain number of days irrespective of the wage rate. Usually, in this type of arrangement, the workers are organized under the leadership of one person who takes the responsibility for completing the contracted task within the stipulated time. In this case the wage is often found to be higher.

This year, because of the flood, there was virtually no *aman* harvest and therefore the demand for daily casual and contract labor was much lower than usual.

## THE OCCUPATIONAL STRUCTURE OF RURAL EMPLOYMENT

Here we shall first examine the allocation of labor into different occupations i.e. the proportion of working adults devoted to various categories of activities. This will give an indication about the structure of rural economy as well as the effect of the flood on the rural labor market. In rural areas people may be engaged in more than one

occupation. In this study we refer to the principal occupation as the occupation that provides the largest source of income[5].

**Table 9 — Distribution of Labor Allocation by Occupations by Thanas**

| Occupation | All Thanas | Muladi | Madar-ipur | Moham-madpur | Saturia | Derai | Shibpur | Shahrasti |
|---|---|---|---|---|---|---|---|---|
| **Agricultural Sector** | 55.40 | 70.68 | 59.94 | 35.76 | 50.73 | 84.93 | 38.75 | 47.22 |
| Agricultural Wage Labor | 40.52 | 58.67 | 49.58 | 30.68 | 43.04 | 39.79 | 27.64 | 36.32 |
| Fishing | 14.88 | 12.01 | 10.36 | 5.08 | 7.69 | 45.14 | 11.11 | 10.90 |
| **Rural Manufacturing** | 6.79 | 1.83 | 5.60 | 7.72 | 8.76 | 4.57 | 11.67 | 7.43 |
| Carpenters | 1.93 | 1.19 | 1.46 | 3.73 | 1.43 | 2.81 | 0.53 | 2.01 |
| Mason and Helper | 1.28 | 0.61 | 0.98 | 0.99 | 1.00 | 0.26 | 1.71 | 3.83 |
| Weavers | 1.12 | 0.03 | 0.35 | 0.00 | 0.66 | 0.00 | 6.66 | 0.00 |
| Other Artisans | 2.46 | 0.00 | 2.81 | 3.00 | 5.67 | 1.50 | 2.77 | 1.59 |
| **Doctor/ Kabiraj** | 0.94 | 0.95 | 1.05 | 1.04 | 1.06 | 0.61 | 1.12 | 0.73 |
| **Service holder** | 12.10 | 13.56 | 7.15 | 18.55 | 16.93 | 1.40 | 12.78 | 16.57 |
| **Traders** | 12.30 | 6.90 | 10.13 | 24.09 | 12.53 | 3.50 | 16.11 | 11.31 |
| **Transport Sector** | 9.39 | 5.95 | 15.68 | 11.92 | 8.71 | 4.06 | 11.45 | 5.80 |
| Rickshaw Pullers/Van | 8.34 | 4.27 | 13.40 | 10.38 | 8.05 | 3.32 | 11.45 | 5.70 |
| Boatmen | 1.05 | 1.68 | 2.28 | 1.54 | 0.66 | 0.74 | 0 | 0.10 |
| **All others** | 3.08 | 0.15 | 0.46 | 0.92 | 1.29 | 0.94 | 8.12 | 10.95 |

Notes: a) Other Artisan includes occupation in blacksmith, porter, milkman, barber, washermen, tailoring, bamboo product activity and net making.
b) All others refer to rice mill owners, power tiller, mechanics, contractors, driver, sand carrying labor, hawker in Dhaka, service abroad, poultry farm and other professionals.

Source: Food Management and Research Support Project (FMRSP), Village Level Survey, '98.

[5] The respondents (usually the key informants) were asked to name their principal occupation based on their income. It may be noted that the workers may be involved in more than one activity. In case of pure time criterion, the problems may appear when a worker is engaged in a certain occupation (characterized by low productivity) for longer hours and more number of days, which gives him low earnings.

It can be seen from Table 9 that when working adults are classified into different sectors, the agriculture and fish sector accounts for more than 55 percent, followed by trade (12.3 percent), service (12.1 percent) and transport activities (9.4 percent). The proportion of labor engaged in the agriculture sector varies widely among different *thanas*. The percentage of labor absorption in the agricultural sector is about 71 percent in Muladi area compared to about 36 percent in Mohammadpur *thana*. Agricultural wage labor is the single largest sector representing about 41 percent of the total working population. The incidence of agricultural wage labor is higher in Muladi (59 percent), followed by Madaripur (50 percent) and Saturia (43 percent). Fishing is the second most important occupation in all *thanas* with the exception of Derai, where 45 percent of wage laborers are in fishing compared to 40 percent of total working people in agriculture.

For the full sample of *thanas*, 45 percent of the working population is involved in non-agricultural activities (Table 9). This shows that there is some scope for employment opportunities outside the agricultural sector in the immediate post-flood period. Rural industrial (weaving and other artisans) activities take up a larger share of employment in Shibpur and Saturia. Trading activities, in Mohammadpur area, employ about one-fourth of total employed persons, followed by 16 percent in Shibpur, 13 percent in Saturia and 10 percent in Madaripur. The Transport sector is the largest provider of employment in Madaripur compared to other areas. Rickshaw/ Van pullers, who represent the largest percentage of transport workers, account for 8.3 percent of all the working adults in all *thanas*. In Shibpur, Madaripur and Mohammadpur, the percentage of transport workers is higher than average. This may be explained to some extent by the fact that some survey areas are closer to urban centers and offer more employment opportunities in the non-farm sector.

## LOSS OF LABOR USE DURING THE FLOOD

The loss of labor demand during flood period has been tremendous particularly for those who are directly engaged in agricultural activities. Table 10 reports average days

## Table 10 — Average Working Days (AWD) Unemployment Rates (UR) by Occupations Thanas in September - October 1998

| Occupation | | All Thanas | Muladi | Madar-ipur | Mohamm adpur | Saturia | Derai | Shibpur | Shahrasti |
|---|---|---|---|---|---|---|---|---|---|
| **Agricultural Sector** | AWD | 5.35 | 2.72 | 2.59 | 8.32 | 3.79 | 8.35 | 4.77 | 3.08 |
| | UR (%) | 88.11 | 93.96 | 94.24 | 81.51 | 91.58 | 81.44 | 89.40 | 93.16 |
| Agricultural Wage Labor | AWD | 0.89 | 0 | 0 | 6.25 | 0 | 0 | 0 | 0 |
| | UR (%) | 98.02 | 100 | 100 | 86.11 | 100 | 100 | 100 | 100 |
| Fisherman | AWD | 17.50 | 16 | 15 | 20.83 | 25 | 15.71 | 16.66 | 13.33 |
| | UR (%) | 61.10 | 64.44 | 66.67 | 53.71 | 44.44 | 65.09 | 62.98 | 70.38 |
| **Manufacturing** | AWD | 10.47 | 3.25 | 21.76 | 18.61 | 13.09 | 7.84 | 7.58 | 9.93 |
| | UR (%) | 76.73 | 92.78 | 51.64 | 58.64 | 70.91 | 82.58 | 83.16 | 77.93 |
| Carpenters | AWD | 10.48 | 5 | 8.33 | 20 | 0 | 10 | 30 | 0 |
| | UR (%) | 76.72 | 88.89 | 81.49 | 55.56 | 100 | 77.78 | 33.33 | 100 |
| Mason and Helper | AWD | 13.57 | 0 | 0 | 10 | 30 | 30 | 10 | 15 |
| | UR (%) | 61.98 | 100 | 100 | 77.78 | 33.33 | 33.33 | 77.78 | 66.67 |
| Weavers | AWD | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | UR (%) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Other Artisans | AWD | 11.20 | 0 | 13.75 | 19.72 | 14.93 | 0 | 20 | 10 |
| | UR (%) | 75.11 | 100 | 69.44 | 56.18 | 66.82 | 100 | 55.56 | 77.78 |
| **Doctor/Kabiraj** | AWD | 23.15 | 17.85 | 19.16 | 29 | 29.16 | 25.83 | 28.57 | 22.50 |
| | UR (%) | 45.36 | 60.33 | 57.42 | 35.56 | 35.20 | 42.60 | 36.51 | 50.00 |
| **Traders** | AWD | 18.10 | 8.75 | 20.08 | 21.28 | 20.56 | 17.25 | 23.54 | 15.25 |
| | UR (%) | 59.78 | 80.56 | 55.38 | 52.71 | 54.31 | 61.67 | 47.69 | 66.11 |
| **Transport Sector** | AWD | 11.30 | 14.71 | 11.09 | 14.69 | 12.29 | 13.56 | 12.00 | 0.32 |
| | UR (%) | 74.90 | 67.30 | 75.30 | 67.40 | 72.70 | 69.90 | 73.30 | 99.30 |
| Rickshaw/ Van Pullers | AWD | 10.63 | 15 | 10 | 13.66 | 11.25 | 12.50 | 12 | 0 |
| | UR (%) | 76.38 | 66.67 | 77.78 | 69.64 | 75.00 | 72.22 | 73.33 | 100 |
| Boatmen | AWD | 16.64 | 14 | 17.50 | 21.66 | 25 | 18.33 | 0 | 20 |
| | UR (%) | 63.02 | 68.89 | 61.11 | 51.87 | 44.44 | 59.27 | 100 | 55.26 |
| **All others** | AWD | 14.40 | 20 | 10 | 10 | 20 | 0 | 18.33 | 22.50 |
| | UR (%) | 67.99 | 55.56 | 77.78 | 77.78 | 55.56 | 100 | 59.27 | 50 |

Note: a) Full Employment Norm: 270 days standard 8-hour labor day (22.5 days per month)
b) Unemployment rate is calculated based on the reported villages for day's work
c) Same as in Table 6.

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98.

worked (AWD) and unemployment rates[6] (UR) for each occupational category during and immediately after the flood time in September and October 1998. It can be observed that during this period there was virtually no work for agricultural wage laborers. There was some work for two weeks for boatmen and fishermen in the two months. Doctors worked more (23 days). It appears that the economic activities have slowed down, but not halted, although the agriculture was affected the most. As stated earlier, there were also fewer employment opportunities available in non-farm activities.

The rate of unemployment varies widely among different occupations even during this time. Almost one hundred percent labor time remain unutilized for weaver and agricultural wage laborers. Doctor/Kabiraj, boatmen, traders and fishermen have lower rates of unemployment. The great majority (55.4 percent) of people engaged in agriculture reported the highest (88 percent) levels of unemployment during the flood. Unemployment rates are higher in Muladi, Madaripur and Derai, where a larger proportion of working people is engaged in agriculture, compared to other areas. Theunemployment rate in Derai, where *boro* is the major crop, is mostly due to normal seasonal fluctuations.

As it has been pointed out earlier, the impact of the flood on labor demand has been caused mostly by the loss of agriculture crops. In fact, because the standing transplanted *aman* paddy was completely damaged during September-October 1998, there were no harvesting or threshing activities. The area of *aman* crop, which accounts for 56.33 percent of total rice area, contributed to more than 50 percent of total rice production in 1996/97 in Bangladesh. To estimate the amount of losses of labor demand we analyzed the labor requirement of various crops in normal years. The average use of

[6] Unemployment has been defined here as the difference between full employment, defined as 270 standard 8-hour labor days and actual working days. We believe that this assumption is acceptable in rural Bangladesh even though it may be argued that assuming fixed labor supply per worker completely ignores the preference of individuals in the society, because richer groups in some occupations may have higher demand for leisure.

**Table 11 — Average Use of Labor in Various Crops**

| Crop | Persons-days of Labor Used per Acre | | |
|---|---|---|---|
| | Area Intensive Activities | Production Intensive Activities | Total Labor Requirements |
| Aman (HYV) | 57.54 | 27.93 | 85.47 |
| Aman (Local) | 42.18 | 25.97 | 68.15 |
| Boro (HYV) | 71.09 | 29.33 | 100.42 |
| Boro (Local) | 54.07 | 26.14 | 80.21 |
| Aus (Local) | 42.53 | 27.76 | 70.29 |

Source: Appendix Tables 1 to 3

**Table 12 — Estimated Loss of Direct Labor Demand in Aman Crop Due to 1998 Flood for Seven Thanas**

| Thana | Crop area (Hectares)* | | Labor Requirements in Production Intensive Activities per hectare (man days) | | Estimated Loss of Labor Demand in Production Intensive Activities of Aman Crop (thousand man days) | |
|---|---|---|---|---|---|---|
| | T.Aman (HYV) | Aman (Local) | T.Aman (HYV) | Aman (Local) | Total Labor | Hired as % of Total Labor |
| Muladi | 3725 | 9958 | 66.10 | 55.91 | 802.95 | 48.52 |
| Madaripur | 2070 | 6598 | 63.63 | 65.24 | 562.14 | 47.93 |
| Mohammadpur | 4580 | 3909 | 73.41 | 68.94 | 605.70 | 50.55 |
| Saturia | 653 | 6949 | 69.44 | 65.98 | 503.84 | 46.75 |
| Derai** | Not Cultivated in '98 | 3988 | - | 59.30 | 236.46 | 46.02 |
| Shibpur*** | 7570 | 1345 | 65.48 | 63.01 | 447.18 | 52.64 |
| Shahrasti | 2110 | 8475 | 75.98 | 70.84 | 760.69 | 47.74 |
| Total | 20708 | 41221 | - | - | 3,918.96 | 1,908.26 |
| Average | - | - | 69.00 | 64.17 | | 48.69 |

Note: a) Average figures of 1996/97 & 1997/98
b) Whereas total area under Boro (HYV) & Boro (L) is 18900 hectares for the average of two years , 1997/98 & 1996/97.
c) About 27% of T.Aman (HYV) area was harvested in 1998/99.

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, 1998

labor (measured in person-days per acre) in various rice and *rabi* crops[7] are reported by sample *thanas* in Table 11 (see also Appendix Tables A3 to A7). We found that the *boro*

[7] Rabi crops refer to pulses, oilseeds, vegetables etc.

HYV, which accounts for 84 percent of *boro* rice area, absorbs more labor per acre than *aus, aman* and local *boro* crops in both area and production intensive activities[8].

Looking at the estimate of direct labor demand in *aman* crop in the sample area reported in Table 12, it is evident that employment loss was higher in Muladi, followed by Shahrasti. Derai was the least affected compared to other areas because they only grow *boro* rice, which was harvested before the flood. In the seven flood-affected *thanas*, the loss of total direct labor demand in *aman* rice crop due to harvesting and threshing is 3,919 thousand person-days, of which about 49 percent are hired labor (1,908 thousand person-days).

The loss of demand for rural labor is reflected in the higher unemployment rates of different occupations in agricultural sector, rural industry, trade and transport activities. The reduction in direct demand was caused by the losses of the agricultural crops. The reduction in indirect demand for rural labor was the result of the reduction of trading activities, and therefore reduction of wage employment and income, caused by the smaller level of gross marketed surplus of *aman* rice, defined as the gross sale of paddy in total *aman* production.

To estimate the loss of labor demand we calculated the loss of agricultural output and marketed surplus. The loss of output is given by the difference between the expected *aman* rice production in 1998/99, equal to 107,388 tons, calculated as the average production of the last two years (1997/98 and 1996/97) in seven flood affected *thanas*, and the reported harvest equal to 7,206 tons. The loss of gross marketed surplus, which usually equals to 16.60 percent of the harvest (Ghafur; Roy et. al, 1996), was estimated to be equal to 16,630 tons. The loss of gross marketed surplus due to loss of *aman* rice

[8] The area intensive activities include land preparation, plowing, raking and weeding and transplanting/broadcasting, while harvesting, carrying the harvest and threshing with animal power fall into production intensive category.

production has caused a loss of at least 4,645 person-years of indirect labor demand, excluding unpaid family labor, in seven flood-affected *thanas*.[9]

At full employment, the loss of indirect labor use is equivalent to 1,254 thousand person-days. That is to say, the loss of total direct and indirect employment together now stands at 5,173 thousand person-days (Table 11 and 12). The loss of direct hired labor demand alone accounts for 38 percent of all daily laborer demand over a period of three months in the seven flood affected *thanas*.

## SEASONALITY IN LABOR USE AND EXTENT OF UNEMPLOYMENT

Because the demand for labor from the agricultural sector is subject to seasonal fluctuation, in order to evaluate the impact of the loss of labor on the welfare of the workers it is important to analyze the pattern of labor demand over the course of the year. If the loss of labor demand occurs during a peak period, then the loss is even more significant and the need for public intervention is more acute. In fact, the 1998 flood caused loss of employment during the peak period of *aman* harvesting in all areas except in Derai, where *boro* is the only major crop.

Usually, during the slack season, rural laborers seek employment in non-agricultural activities. This year they tried to make up for the loss of income in agricultural activities during the flood and post-flood period, although they endured with limited success. The evidence of complementarity in rural labor use between agricultural and non-agricultural work is mixed even in a normal year. During the busy agricultural season, laborers may choose to work in agriculture if the wage rate is higher than the return from non-agricultural activities. In our sample, we observed that to supplement their income, rural laborers engaged themselves in self-employment activities and looked for employment opportunities in other areas (short term migration).

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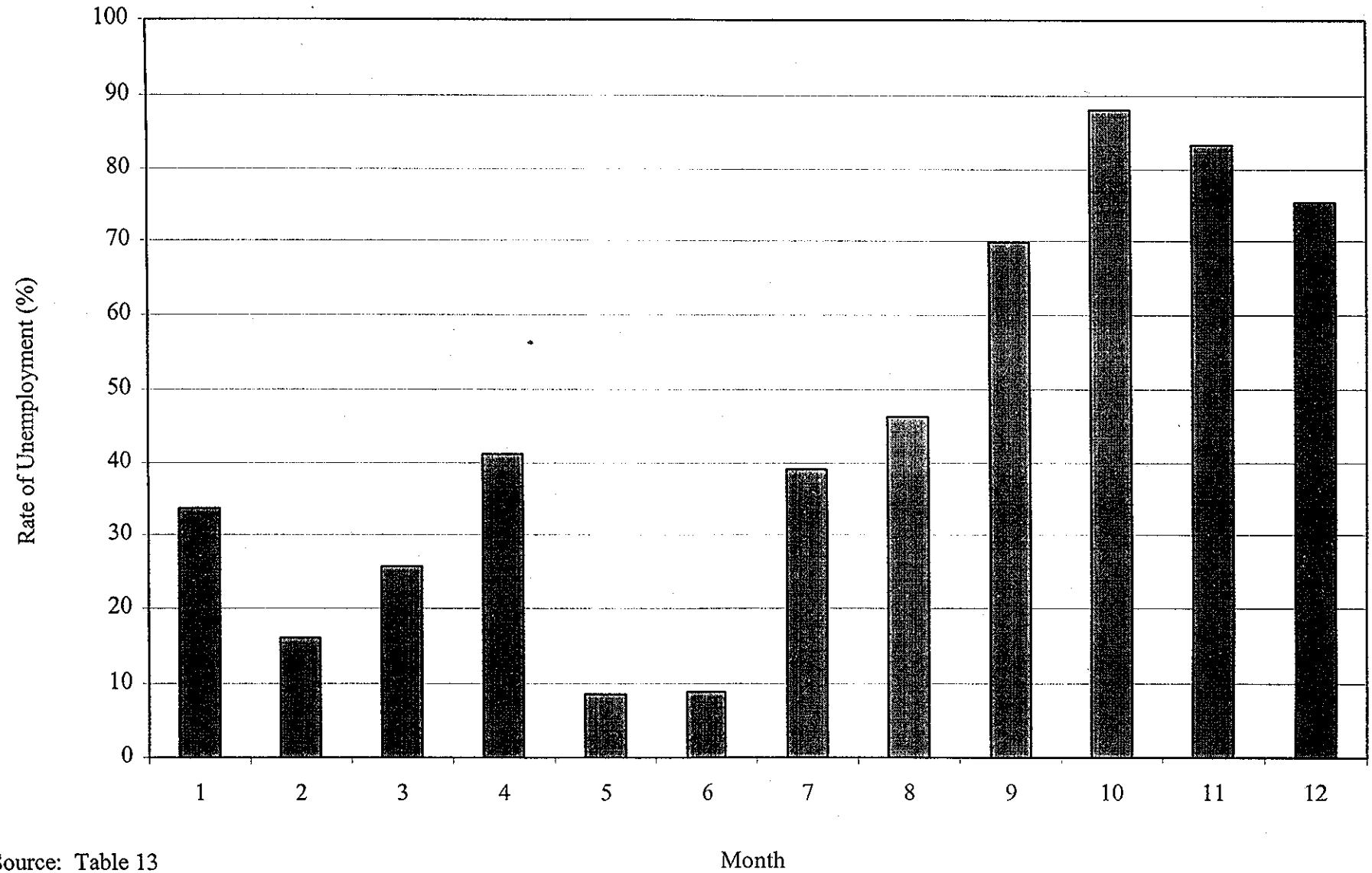
[9] Recent work of BIDS on National Input-Output Table has been used to estimate indirect labor loss (BIDS 1998)

The use of agricultural wage labor and the unemployment rate by month are reported in Table 13 and shown in Figure 2. It can be observed that agricultural wage laborers have, on the average, worked less than 5 days per month between the beginning of the flood on 15 August to 14 December '98, which in a normal year is a peak period because of the harvesting of the *aman* crop. Another peak time for the demand of agricultural labor is in the period between 15 April to 14 June, due to the land preparation for the Aus and Jute crops, and in some areas, for *boro* weeding and harvesting. The average monthly labor days used by agricultural wage labor are observed to be high (21 days) in the months of Baisak (15 April-14 May) and Jaistha (15 May-14 June).

The extent of variation in monthly unemployment rate would obviously be high (a coefficient of variations of 67.91 percent) for all *thanas* together (Table 13). The variation in unemployment rates among *thanas* is also very large (the coefficient of variation between *thanas* is 51 percent). The proportion of the lowest level of unemployment (9 percent) as observed in the busiest months for agricultural activities (from 15 April to 14 June) may be considered as non-seasonal unemployment.

The seasonal structure of agricultural labor demand presented above creates shortages and surpluses of agricultural labor in the surveyed villages. In Table 14 it is observed that 87.5 percent percent of the surveyed villages reported to have surplus labor at some point in 1998, while 12.5 percent of the villages have experienced a shortage of wage labor. On average, more than 16 percent of total working people worked outside the locality from the villages with surplus labor. The process of migration is particularly strong for the poor, who are facing lack of employment opportunities in the villages. The

**Figure 2 — Unemployment Rate of Agricultural Wage Labor by Month: All Thanas**




Source: Table 13

**Table 13 — Average Working Days (AWD) Unemployment Rates (UR) by Month and by Thanas**

| Month | | All Thanas | Muladi | Madari-pur | Moham madpur | Saturia | Derai | Shibpur | Shah-rasti |
|---|---|---|---|---|---|---|---|---|---|
| 15 Dec - | AWD | 14.92 | 18.88 | 14.00 | 11.20 | 11.70 | 19.67 | 15.63 | 13.33 |
| 14 Jan '97 | UR (%) | 33.69 | 16.09 | 37.78 | 50.22 | 48.00 | 12.58 | 30.53 | 40.76 |
| 15 Jan - | AWD | 18.88 | 17.38 | 16.33 | 15.40 | 18.80 | 20.56 | 23.12 | 20.56 |
| 14 Feb '97 | UR (%) | 16.09 | 22.75 | 27.42 | 31.56 | 16.44 | 8.62 | -2.76 | 8.62 |
| 15 Feb - | AWD | 16.73 | 17.12 | 16.80 | 16.50 | 17.30 | 11.67 | 18.13 | 19.56 |
| 14 Mar '97 | UR (%) | 25.64 | 23.91 | 25.33 | 26.67 | 23.11 | 48.13 | 19.42 | 13.07 |
| 15 Mar - | AWD | 13.23 | 15.00 | 17.33 | 18.10 | 11.50 | 9.44 | 11.25 | 10.00 |
| 14 Apr '97 | UR (%) | 41.20 | 33.33 | 22.98 | 19.56 | 48.89 | 58.04 | 50.00 | 55.56 |
| 15 April - | AWD | 20.57 | 19.00 | 20.80 | 16.20 | 19.00 | 25.56 | 24.75 | 18.67 |
| 14 May '98 | UR (%) | 8.58 | 15.55 | 7.56 | 28.00 | 15.55 | -13.60 | -10.00 | 17.02 |
| 15 May - | AWD | 20.50 | 16.88 | 17.80 | 19.30 | 22.80 | 20.00 | 25.63 | 21.11 |
| 14 June '98 | UR (%) | 8.89 | 24.98 | 20.89 | 14.22 | -1.33 | 11.11 | -13.91 | 6.18 |
| 15 June - | AWD | 13.70 | 14.88 | 12.50 | 18.80 | 15.20 | 8.13 | 15.38 | 11.00 |
| 14 July '98 | UR (%) | 39.12 | 33.87 | 44.44 | 16.44 | 32.44 | 63.87 | 31.64 | 51.11 |
| 15 July - | AWD | 12.08 | 15.71 | 10.55 | 17.20 | 14.30 | 8.75 | 12.50 | 5.56 |
| 14 August '98 | UR (%) | 46.31 | 30.18 | 53.11 | 23.56 | 36.44 | 61.11 | 44.44 | 75.29 |
| 15 Aug - | AWD | 6.78 | 15.00 | 0 | 12.50 | 10.00 | 10.00 | 0 | 0 |
| 14 Sept '98 | UR (%) | 69.84 | 33.33 | 100 | 44.44 | 55.56 | 55.56 | 100 | 100 |
| 15 Sept - | AWD | 2.68 | 0 | 0 | 8.75 | 0 | 10.00 | 0 | 0 |
| 14 Oct '98 | UR (%) | 88.09 | 100 | 100 | 61.11 | 100 | 55.56 | 100 | 100 |
| 15 Oct - | AWD | 3.75 | 0 | 0 | 16.25 | 0 | 10.00 | 0 | 0 |
| 14 Nov '98 | UR (%) | 83.33 | 100 | 100 | 27.78 | 100 | 55.56 | 100 | 100 |
| 15 Nov - | AWD | 5.54 | 5.00 | 0 | 23.75 | 0 | 10.00 | 0 | 0 |
| 14 Dec '98 | UR (%) | 75.38 | 77.78 | 100 | -5.56 | 100 | 55.56 | 100 | 100 |

Note: a) Full Employment Norm: 270 days standard 8-hour labor day (i.e. 22.5 days per month)
b) Unemployment rate is calculated based on the villages reporting at least 5 days work.

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table 14 — Shortage & Surplus of Agricultural Wage Labor in the Reporting Villages During the Year**

| Thana | Villages reporting Surplus Labor (N) | Persons Working Outside Area (N) | People Working in all Occupations (%) | Villages Reporting Shortage of Agricultural Wage Labor(N) | Month of Shortage | Activities in which Shortage of labor was observed | Villages in Sample (N) |
|---|---|---|---|---|---|---|---|
| Muladi | 5 | 855 | 26.06 | 3 | 15 May - August; Nov. - Dec | Weeding & harvesting of Aus; Plantation of Aman; Harvest & cutting of Jute | 8 |
| Madaripur | 8 | 770 | 17.88 | 2 | 15 Feb - 14 May 15 Apr - 14 June | Harvesting, Weeding of Paddy, Jute & Pulses | 10 |
| Mohammadpur | 8 | 515 | 12.17 | 2 | May - Sept, December | Harvesting, Plantation & Weeding of Paddy | 10 |
| Saturia | 9 | 528 | 17.50 | 1 | May - June | Harvesting of Paddy | 10 |
| Derai | 9 | 1065 | 27.16 | 0 | - | - | 9 |
| Shibpur | 8 | 97 | 2.58 | 0 | - | - | 8 |
| Shahrasti | 9 | 290 | 9.24 | 0 | - | - | 9 |
| Average | | | | | - | - | |
| All Thanas | 56 | 4120 | 16.08 | 8 | - | - | 64 |

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

highest percentage (about 27 percent) of short migrant persons is recorded in Muladi and Derai followed by Madaripur and Saturia (18 percent). The shortages of labor are usually found mostly in the period of activities of harvesting and plantation operations. It is reckoned that the short migrants of rural wage laborer move even from distant deficit employment areas to the area of higher employment opportunities, and in a way, help to reduce regional imbalances in seasonal labor demand. As a consequence of the seasonal structure of the labor market in Bangladesh, the workers affected by the flood will require even longer periods of time to recuperate the days of work lost.

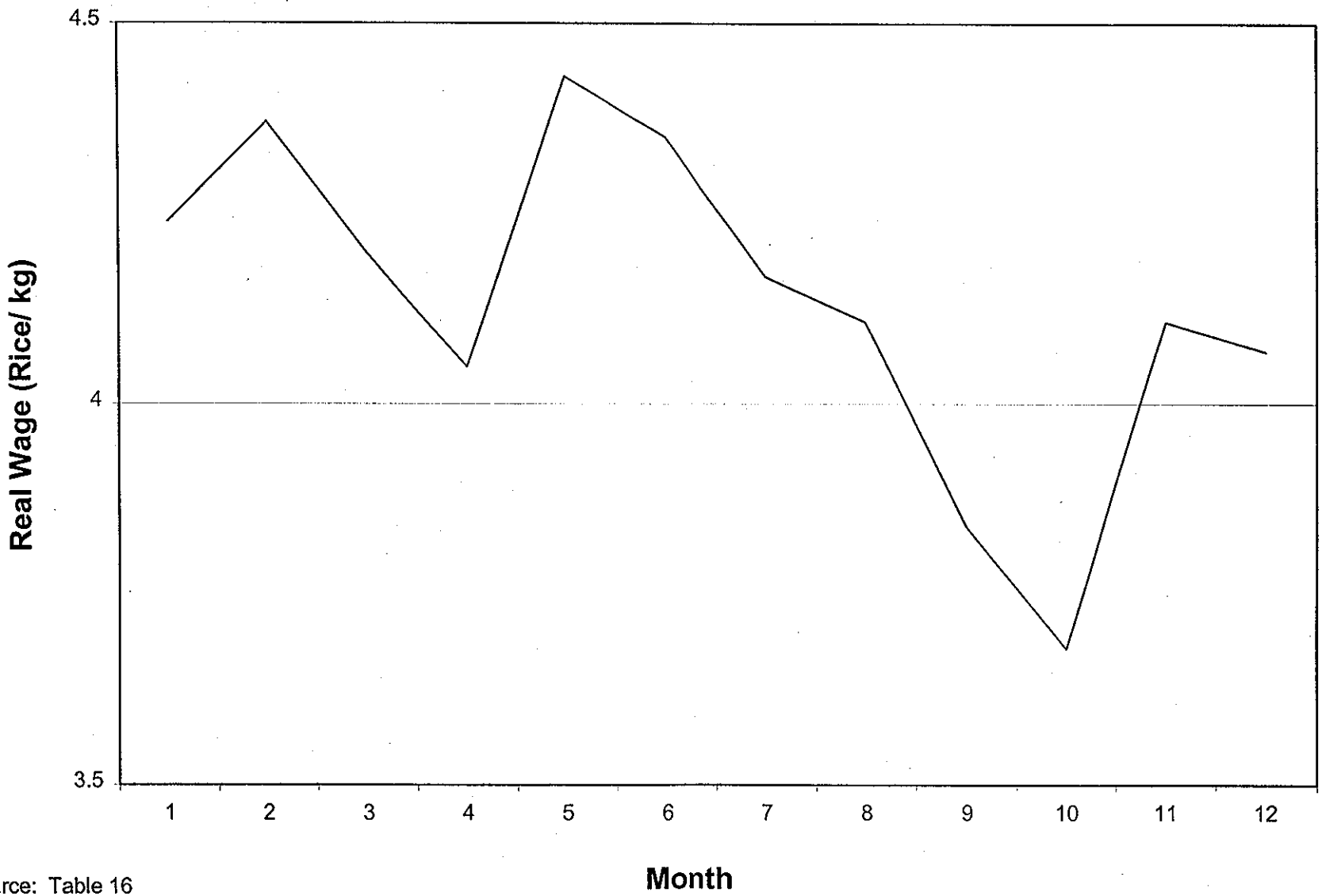
## WAGE INCOME

The average loss of total income from agricultural wage labor due to the loss of direct labor demand in *aman* crop harvesting is estimated to be, on the average, Tk. 958 per month per worker in the flood and post-flood period. If the loss is compared to the full employment level (22.5 days per month), the average loss of monthly wage income could be increased to Tk. 1,337.

The average daily wage rate of male agricultural labor by month across the seven flood-affected *thanas* is reported in Table 15 and plotted in Figure 3. Male wages averaged Tk.56.50 (without food) per day with a coefficient of variation across *thanas* equal to 3.7 percent. The variation in daily wage rate over the year, which reflects seasonal variation, is even higher (4.3 percent), and this variation is found to be as high as 8.3 percent in some months. A similar pattern (but rather higher) of variations exists when real wage rate (rice in kg) is considered (Table 16). The coefficient of variation of average daily rice wage over one year is found to be 4.2 percent across the seven *thanas* and 5.2 percent across months. These results clearly show that wage rates do vary a great deal both over time and across areas when measured either in money wages or in real wages.

The literature on economic development offers a number of theories for explaining wage formation in rural labor markets. The Lewis theory as well as 'efficiency

**Figure 3 — Real Wage Rate of Agricultural Wage Labor by Month: All Thanas**




Source: Table 16

## Table 15 — Average Daily Wage Rate (Tk.) of Agricultural Wage Labor in Sample Villages

| Thana | 15 Dec - 14 Jan '97 | 15 Jan - 14 Feb '97 | 15 Feb - 14 Mar '97 | 15 Mar - 14 Apr '97 | 15 April- 14 May | 15 May- 14 June | 15 June- 14 July '98 | 15 July- 14 Aug '98 | 15 Aug- 14 Sept '98 | 15 Sept- 14 Oct '98 | 15 Oct- 14 Nov '98 | 15 Nov- 14 Dec '98 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Muladi | 58.12 | 57.50 | 57.50 | 56.88 | 55.00 | 55.00 | 55.00 | 56.88 | 57.51 | 60.00 | 70.00 | 60.00 |
| Madaripur | 55.00 | 56.11 | 56.50 | 56.11 | 58.50 | 58.50 | 58.00 | 56.66 | 0 | 0 | 0 | 0 |
| Mohammadpur | 47.50 | 48.50 | 51.50 | 53.00 | 53.00 | 54.50 | 54.00 | 54.00 | 52.50 | 50.00 | 55.00 | 57.50 |
| Saturia | 57.30 | 59.50 | 58.50 | 56.00 | 62.00 | 62.50 | 58.00 | 57.50 | 52.50 | 0 | 0 | 0 |
| Derai | 62.22 | 62.22 | 52.22 | 52.22 | 64.44 | 53.33 | 52.50 | 55.00 | 0 | 0 | 0 | 0 |
| Shibpur | 55.00 | 58.75 | 56.25 | 52.50 | 60.00 | 60.00 | 58.75 | 53.75 | 0 | 0 | 0 | 0 |
| Shahrasti | 52.78 | 58.89 | 57.22 | 52.22 | 56.11 | 58.89 | 53.33 | 52.78 | 0 | 0 | 0 | 0 |
| All Thana | 55.42 | 57.35 | 55.67 | 54.13 | 58.44 | 57.53 | 55.65 | 55.22 | 54.17 | 55.00 | 62.50 | 58.75 |

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

## Table 16 — Average Daily Real Wage Rate (Kg of Rice) of Agricultural Labor in Sample Thanas

| Thana | 15 Dec - 14 Jan '97 | 15 Jan - 14 Feb '97 | 15 Feb - 14 Mar '97 | 15 Mar - 14 Apr '97 | 15 Apr - 14 May '98 | 15 May- 14 June '98 | 15 June- 14 July '98 | 15 July- 14 Aug '98 | 15 Aug- 14 Sept '98 | 15 Sept- 14 Oct '98 | 15 Oct- 14 Nov '98 | 15 Nov- 14 Dec '98 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Muladi | 4.40 | 4.35 | 4.34 | 4.27 | 4.06 | 4.07 | 4.05 | 4.11 | 3.94 | 3.75 | 4.37 | 4.14 |
| Madaripur | 4.21 | 4.22 | 4.21 | 4.15 | 4.36 | 4.35 | 4.27 | 4.13 | 0 | 0 | 0 | 0 |
| Mohammadpur | 3.71 | 3.76 | 3.84 | 3.83 | 4.03 | 4.09 | 4.02 | 3.98 | 3.75 | 3.61 | 3.85 | 4.00 |
| Saturia | 4.33 | 4.50 | 4.40 | 4.16 | 4.66 | 4.69 | 4.31 | 4.24 | 3.84 | 0 | 0 | 0 |
| Derai | 4.77 | 4.73 | 3.99 | 3.99 | 4.98 | 4.13 | 4.01 | 4.15 | 0 | 0 | 0 | 0 |
| Shibpur | 4.25 | 4.54 | 4.31 | 4.00 | 4.69 | 4.66 | 4.54 | 4.16 | 0 | 0 | 0 | 0 |
| Shahrasti | 4.01 | 4.46 | 4.33 | 3.95 | 4.24 | 4.45 | 4.02 | 3.97 | 0 | 0 | 0 | 0 |
| All Thana | 4.24 | 4.37 | 4.20 | 4.05 | 4.43 | 4.35 | 4.17 | 4.11 | 3.84 | 3.68 | 4.11 | 4.07 |

**Table 17 — Pooled OLS Regression Estimates between Money Wage Rate and Price of Rice (Dependent Variable: Money Wage Rate)**

| lwage | Coefficients | Std. Error | t-statistics |
|---|---|---|---|
| lprice | .8635 | .3792 | 2.277 |
| dummoth | -.0033 | .0035 | -0.940 |
| dthana1 | .0074 | .0270 | 0.274 |
| dthana2 | .0170 | .0274 | 0.622 |
| dthana3 | -.0667 | .0250 | -2.671 |
| dthana4 | .0425 | .0263 | 1.618 |
| dthana5 | .0344 | .0271 | 1.269 |
| dthana6 | .0470 | .0280 | 1.679 |
| _cons | 1.7962 | .9681 | 1.855 |

| | | | | | |
|---|---|---|---|---|---|
| Number of observations | = | 63 | F (8, 54) | = | 4.45 |
| R-square | = | 0.3974 | Adj R-square | = | 0.3081 |

wage' hypothesis, which assumes real wage rate to be constant at subsistence level in labor surplus rural economy, do not conform to our findings. There are also problems in explaining wage determination of agricultural wage laborers based on a supply-demand framework in a competitive market model, as a substantial level of involuntary unemployment among poor rural laborers is persistent. The role of rice prices has been brought into the discussion to explain responsiveness of wages to food prices. The wage elasticity with respect to price of rice is found to be low (Martin Ravallion, 1990). Our estimates employing pooled data (for 1997-98) over seven flood -affected *thanas* covering twelve months corroborates Ravallion's findings (Table 17).

The results show that to some extent, the price of rice is positively associated with money wage rate. The coefficient of rice price, which represents the elasticity is estimated to be less than one (0.86) and is significant at 1 percent level.

The coefficient of variation of the monetary wage rates among all *thanas* over twelve months is higher (7.01 percent) compared to that of rice prices (4.61 percent). This result might help to corroborate Osmani's theory on implicit co-operation (1990), which looks at the determination of wage rates from the workers' perspective: "Theory of wage formation involves both the existence of involuntary unemployment as well as responsiveness to forces of supply and demand." This is yet to be empirically tested.

## FEMALE RURAL EMPLOYMENT AND WAGE RATE

The adverse impact of the flood on the labor market might have been greater for women. Even though the 1995/96 Labor Force Survey reports that about 41 percent of persons (aged 15 and over in the extended definition employed in rural areas) are females, only 14 percent of the total workers in wage employment are females (Table 18). Women not only have less access to the same jobs, but are also paid significantly less. The average female daily wage rate (Tk. 27.56 without food) in the seven flood-affected *thanas* is less than half of that (Tk.56.65) for males (the differences are significant at the 1 percent level of significance). It also varies significantly across *thanas* (the coefficient of variation 10.9 percent) and this variation in average female wage rate across *thanas* is two and a half times greater than that variation for male money wage rate.

The lower wages of female wage laborers is probably caused by the fact that they are confined to tasks, which are associated with low wages. This is a result of the apparent segregation of male and female labor markets. Table 19 provides the distribution of female employment in rural areas by five types of activities, such as earthen work, harvesting and threshing, factory work, homestead[10] jobs and maidservant

[10] Homestead job refers to all tasks other than harvesting and processing (which is treated as a separate task) within the employer's house where the woman works as a wage laborer not as maidservant.

work. In Saturia, more than 76 percent of employed females have participated in earthen work. On an average for all *thanas*, about half of rural working women were engaged in homestead work. It is noticeable that about 60 percent of female workers were engaged as maidservants, and in Derai *thana*, it was as high as 98 percent. Only 6 percent of working women are in the agricultural sector and the jobs they perform exclusively are fewer than those done by men (Table 18). These types of agricultural work are restricted to harvesting, threshing and processing and nursery-bed raising at the employers' house. The segmentation of tasks for rural women also limits the effective demand for female labor. Women also face a labor market of geographical immobility in the rural area. All these have an impact on low wages and unemployment.

Table 19 shows that the wage rate of female wage labor varies among activities (the coefficient of variation is found to be 11.1 percent). Because the wage rate in earthen work is higher compared to the other work performed, female participation in earthen work of Food For Work Programs can be very important for female wages, and can create a positive pressure on salaries.

**Table 18 — Percentages of Female Wage Labor by Activity in Sample Thanas**

| Thana | % of Female over total wage & Service Workers | Female labor allocation by activity** | | | | | No. of Females in Wage Employ-ment |
|---|---|---|---|---|---|---|---|
| | | Earth work | Household homestead help | Factory work | Maid servant | Harvesting & agri processing | |
| Muladi | 6.92 | 0.00 | 31.71 | 30.49 | 25.61 | 27.44 | 164 |
| Madaripur | 8.76 | 0.00 | 83.65 | 14.02 | 39.72 | 35.05 | 214 |
| Mohamma dpur | 22.32 | 12.90 | 82.15 | 7.10 | 86.45 | 0.00 | 465 |
| Saturia | 17.61 | 76.42 | 0.00 | 18.87 | 17.30 | 0.00 | 318 |
| Derai | 14.98 | 20.66 | 18.60 | 0.00 | 97.93 | 0.00 | 242 |
| Shibpur | 20.82 | 0.00 | 58.54 | 41.46 | 58.54 | 0.00 | 316 |
| Shahrasti | 5.96 | 0.00 | 63.64 | 24.24 | 75.76 | 0.00 | 99 |
| All Thanas | 13.91 | 19.4 | 49.80 | 18.00 | 59.50 | 6.00 | 1818 |

Note: ** The total of female labor in different activities maybe longer than 100 as one female may be engaged in five types of activities.

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

**Table 19 — Daily Wage Rate of Female Employees by Type of Activities**

| Thana | Average Wage Rate (Tk.) | Earthen Work | | Household HomesteadHelp | | Factory work | | Maid Servant | | Harvesting & Agri processing | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. | Wage Rate (Tk.) | No. | Wage Rate (Tk.) | No. | Wage Rate (Tk.) | No. | Wage Rate (Tk.) | No. | Wage Rate (Tk.) |
| Muladi | 33.25 | 0 | - | 52 | 30.77 | 50 | 30.00 | 42 | 34.85 | 45 | 35.44 |
| Madaripur | 28.33 | 0 | - | 179 | 28.77 | 30 | 30.00 | 85 | 29.70 | 75 | 29.00 |
| Mohammadpur | 26.77 | 60 | 31.50 | 382 | 28.18 | 33 | 27.58 | 402 | 26.06 | 0 | 0 |
| Saturia | 29.10 | 243 | 36.58 | 0 | 0 | 60 | 33.17 | 55 | 23.00 | 0 | 0 |
| Derai | 24.55 | 50 | 25.00 | 45 | 25.78 | 0 | 0 | 237 | 22.72 | 0 | 0 |
| Shibpur | 25.85 | 0 | - | 185 | 25.49 | 131 | 26.33 | 185 | 25.49 | 0 | 0 |
| Shahrasti | 25.11 | 0 | - | 63 | 26.48 | 24 | 26.79 | 75 | 25.96 | 0 | 0 |
| All Thanas | 27.56 | 353 | 34.07 | 906 | 27.66 | 328 | 28.64 | 1081 | 25.70 | 120 | 31.42 |

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

## OCCUPATIONAL MOBILITY OF RURAL WAGE LABOR

The prospects for employment in rural areas, especially in a period of stress, can be measured by the level of horizontal or upward mobility. Horizontal mobility from labor to self-employed or vice-versa is measured by the percentage of total wage laborers who have changed their occupation in the same type of tasks over the last two to three years including the flood period. Upward occupational mobility is estimated by the percentage of rural wage laborers who have changed their occupation using acquired training. The training is generally given by NGOs on forestry, fishing, poultry rearing, mulberry production etc.

Estimates of horizontal and upward occupational mobility for male and female workers over the last two to three years in the surveyed areas are reported in Tables 20 and 21. The data show that the mobility of rural wage laborer (either male or female) was extremely limited. The occupational horizontal mobility (almost 5 percent) of female wage labor is slightly higher compared to that (4.2 percent) of male wage laborers, while at the same time, 2 percent of male self-employed are now transformed as wage laborers. Usually, the rural wage laborer and self-employed people with petty working capital, change jobs from self-employed to wage labor or vice versa. Here the jobs in which mobility occurs, refer to those tasks, which earn them a major share of income.

The upward occupational mobility of male wage laborers is observed to be larger than female wage laborers (Table 21). In the surveyed villages, more than 26 percent of total male workers are now engaged as self-employed compared to only 10 percent of trained females in self-employed activities. Credit is provided to female wageworkers who receive training to be engaged in productive activities and to improve their level of living. It is argued that the spouses of the female wage laborers utilize the credit received in their own income earning activities, and they become self-employed. Thus training might be a positive factor also for male wage laborers with respect to upward occupational mobility in the rural area.

**Table 20 — Horizontal Occupational Mobility of Rural Wage Labor Over the Last Two to Three Years**

| Thana | From Labor to Self-Employed | | From Self-employed to Labor | | Total | |
|---|---|---|---|---|---|---|
| | Male (%) | Female (%) | Male (%) | Female (%) | Male (No.) | Female (No.) |
| Muladi | 7.47 | 18.29 | 2.62 | 0 | 3280 | 164 |
| Madaripur | 11.98 | 28.04 | 4.99 | 0 | 4307 | 214 |
| Mohammadpur | 3.47 | 0 | 2.34 | 0 | 4230 | 465 |
| Saturia | 1.86 | 0 | 0.50 | 0 | 3010 | 318 |
| Derai | 0.28 | 0 | 0 | 0 | 3929 | 242 |
| Shibpur | 1.20 | 0 | 0.80 | 0 | 3750 | 316 |
| Shahrasti | 1.72 | 0 | 1.75 | 0 | 3139 | 99 |
| Total | 4.19 | 4.95 | 1.95 | 0 | 25,645 | 1,818 |

Source: Food Management and Research Support Project (FMRSP) - Village Level Survey, '98

**Table 21 — Upward Occupational Mobility of Rural Wage Labor Over the Last Two to Three Years**

| Thana | No. of Workers Received training | | From labor to Self-employed | | % of Trained Workers | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| Muladi | 0 | 50 | 0 | 0 | 0 | 0 |
| Madaripur | 320 | 1031 | 155 | 228 | 48.44 | 22.11 |
| Mohammadpur | 460 | 840 | 80 | 157 | 17.39 | 18.69 |
| Saturia | 325 | 2020 | 65 | 73 | 20 | 3.61 |
| Derai | 0 | 100 | 0 | 0 | 0 | 0 |
| Shibpur | 0 | 790 | 0 | 50 | 0 | 6.33 |
| Shahrasti | 34 | 611 | 0 | 39 | 0 | 6.38 |
| Total | 1139 | 5442 | 300 | 547 | 26.34 | 10.05 |

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

## WELFARE SITUATION OF RURAL EMPLOYED PERSONS IN DIFFERENT OCCUPATIONS

Key informants in the villages were asked to compare the welfare situation of rural workers in immediate post-flood periods with respect to the period before the flood and the previous years. The results are reported in Tables 22 to 24.

The overall situation in the flood-affected *thanas* improved in the immediate post-flood period for all the occupations considered in the study. Fishermen reported a better welfare situation compared to the same period in 1997 on average, in 44 percent of the villages, and in 75 percent of villages in Muladi.

**Table 22 — Perception of Welfare Situation of Agricultural Wage Labor and Fisherman Reported in Sample Villages Compared to Previous Year and Flood Period**

| Thana | % of Villages Reporting on Situation in agricultural Wage Labor immediately after Flood compared to Flood Period | | % of Villages reporting on Situation in Agricultural Wage Labor in December '97 compared to Dec '98 | | % of Villages reporting on situation of Fisherman immediately after flood compared to Flood Period | | % of Villages reporting on Fisherman in December '97 compared to Dec '98 | |
|---|---|---|---|---|---|---|---|---|
| | Better | Same | Better | Worse | Better | Worse | Better | Worse |
| Muladi | 100 | - | 100 | - | 37.5 | 62.5 | 25.0 | 75.0 |
| Madaripur | 70 | 30 | 100 | - | 70.0 | 10.0 | 50.0 | 40.0 |
| Mohammadpur | 70 | 30 | 80 | - | 20.0 | 30.0 | 20.0 | 40.0 |
| Saturia | 100 | - | 100 | - | 30.0 | 10.0 | 10.0 | 30.0 |
| Derai | 89 | 11 | 100 | - | 66.7 | 11.1 | 55.6 | 22.2 |
| Shibpur | 100 | - | 100 | - | 37.5 | - | 37.5 | 0.00 |
| Shahrasti | 100 | - | 100 | - | 33.3 | - | 33.3 | 0.00 |
| All Thanas | 8986 | 23.7 | 97.2 | - | 42.1 | 24.7 | 33.1 | 44.4 |

Note : 1. Village Level Survey was conducted in November - December, 1998.
2. Flood in 1998 covers two months of September & October 1998.

**Table 23 — Perception of Welfare Situation of Sample Villages Reporting on Rickshaw/Van Puller and Carpenter Compared to Previous Year and Flood Period**

| Thana | % of Villages reporting on Rickshaw/Van Puller immediately after flood compared to flood period | | % of Villages reporting on Rickshaw/ Van Puller in December, '97 Compared to Dec '98 | | % of Villages reporting on Carpenter immediately after flood compared to flood period | | % of Villages reporting on Carpenter in December, '97 compared to Dec '98 | |
|---|---|---|---|---|---|---|---|---|
| | Better | Same | Better | Worse | Better | Same | Better | Worse |
| Muladi | 75.0 | 12.5 | 87.5 | 0.00 | 50.0 | 0.0 | 50.0 | 0.0 |
| Madaripur | 80.0 | 20.0 | 100 | - | 60.0 | 10.0 | 70.0 | 0.0 |
| Mohammadpur | 60.0 | 20.0 | 80.0 | - | 60.0 | 20.0 | 80.0 | 0.0 |
| Saturia | 100 | - | 100 | - | 80.0 | 0.0 | 80.0 | 0.0 |
| Derai | 88.9 | 0.0 | 88.9 | 0.0 | 88.9 | 0.0 | 88.9 | 0.0 |
| Shibpur | 75.0 | 0.0 | 75.0 | 0.0 | 62.5 | 0.0 | 62.5 | 0.0 |
| Shahrasti | 100 | - | 100 | - | 66.7 | 0.0 | 66.7 | 0.0 |
| All Thanas | 82.7 | 17.5 | 90.2 | | 66.9 | 15.0 | 71.2 | |

Note : 1. Village Level Survey was conducted in November - December, 1998.
2. Flood in 1998 covers two months of September & October 1998.

**Table 24 — Perception of Welfare Situation of Sample Villages Reporting on Boatmen Compared to Previous Year and Flood Period**

| Thana | % of Villages reporting on Boatmen immediately after flood compared to flood period | | % of Villages reporting on Boatmen in December, '97 Compared to Dec '98 | |
|---|---|---|---|---|
| | Better | Same | Better | Worse |
| Muladi | 25.00 | 50.00 | 62.50 | 12.50 |
| Madaripur | 50.00 | 0.00 | 50.00 | 0.00 |
| Mohammadpur | 10.00 | 20.00 | 20.00 | 10.00 |
| Saturia | 20.00 | 0.00 | 20.00 | 0.00 |
| Derai | 55.56 | 11.11 | 55.56 | 11.11 |
| Shibpur | - | - | - | - |
| Shahrasti | 77.78 | 0.00 | 77.78 | 0.00 |
| All Thanas | 34.05 | 27.04 | 47.64 | 11.20 |

Note: Village Level Survey was conducted in November - December, 1998.
Flood in 1998 covers two months of September & October 1998.

**Table 25 — Unions Reporting Availability of Work Possibilities Immediately after Flood by Type of Occupation**

| Activity | Unions reporting existing Job possibilities (%) |
|---|---|
| Fishing | 14.81 |
| Land preparation for agricultural activity | 92.59 |
| Earthen Work | 81.48 |
| House Repairing | 74.07 |
| Construction | 44.44 |
| Weaving in Textiles | 11.11 |
| Tree Planting | 7.40 |
| Transport | 3.70 |
| Cottage Industry | 3.70 |
| Small Trading | 7.41 |
| Other NonFarm Activity | 7.41 |
| Others (Garments, Brick-field Labor, Reeling, Banana field work etc.) | 14.81 |

Note: Total No. of Unions is 27
Source: Food Management and Research Support Project (FMRSP) - Community Level Survey, '98

# 5. FOOD AVAILABILITY, WELFARE AND COPING STRATEGIES

A critical issue for the determination of household food security is the availability of food at affordable prices. During the time of the flood there was a lot of concern that markets were not able to operate and that prices would increase tremendously. In our investigation we found that food was generally available in the market even though prices had gone up.

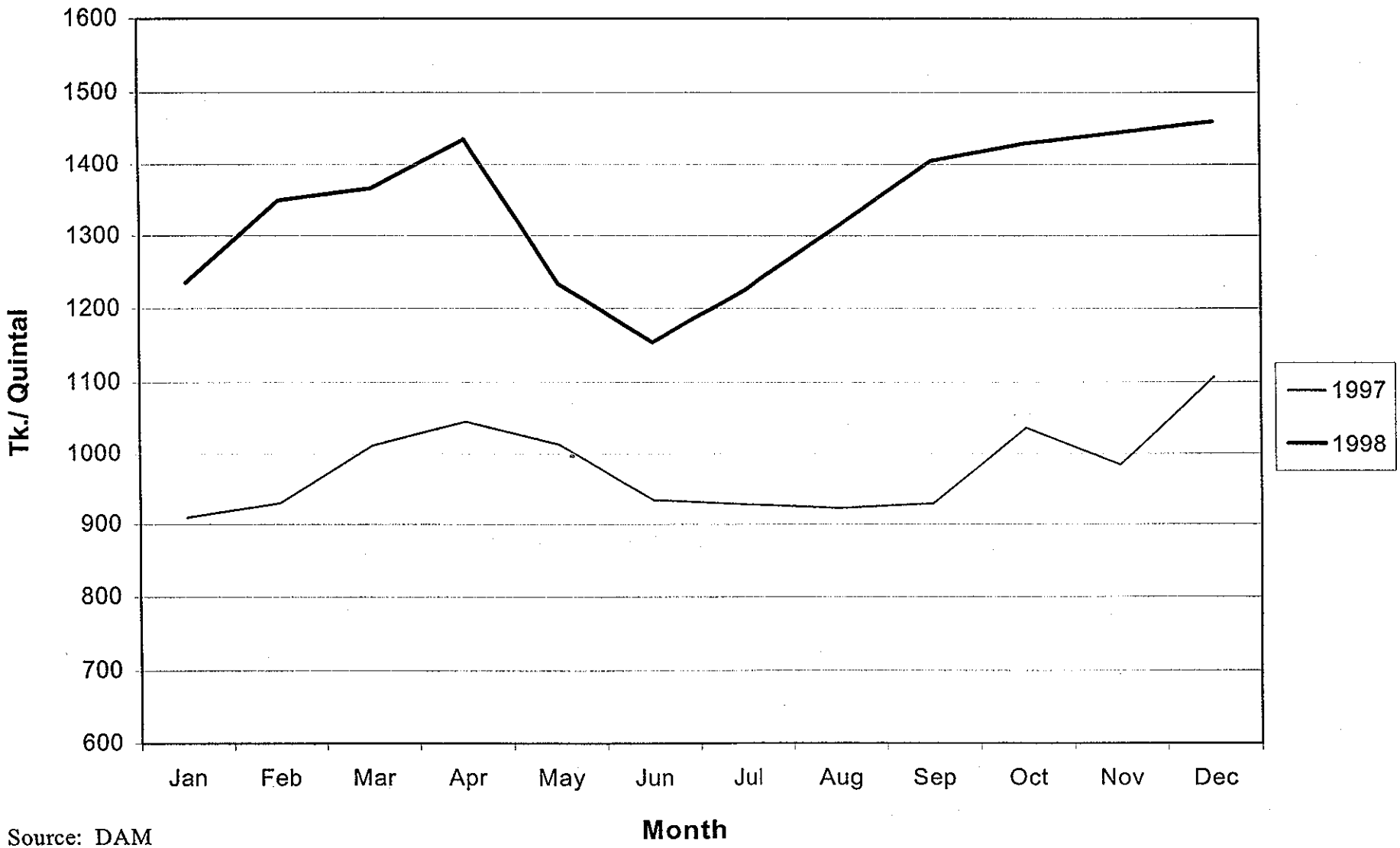
## FOOD PRICES AND AVAILABILITY OF FOOD

Looking at the wholesale prices of coarse rice collected from the Department of Agricultural Marketing (DAM) in the ten districts where our field investigation is conducted (reported in Figure 4), a clear pattern emerges. The prices in 1998 are considerably higher than in 1997. In 1998, the price of rice reached the highest level in April, just before the *boro* harvest. Then, after reaching the lowest level in July, it started rising steadily until it reached the highest level between September and October. At that point it remained steady.

The same pattern can be observed when the prices of the individual districts are plotted together (see Figures 5a and 5b). It is clear that the difference in prices between areas was not very large and that the two lowest prices were registered in Dinajpur and Jessore that were not affected at all by the flood.

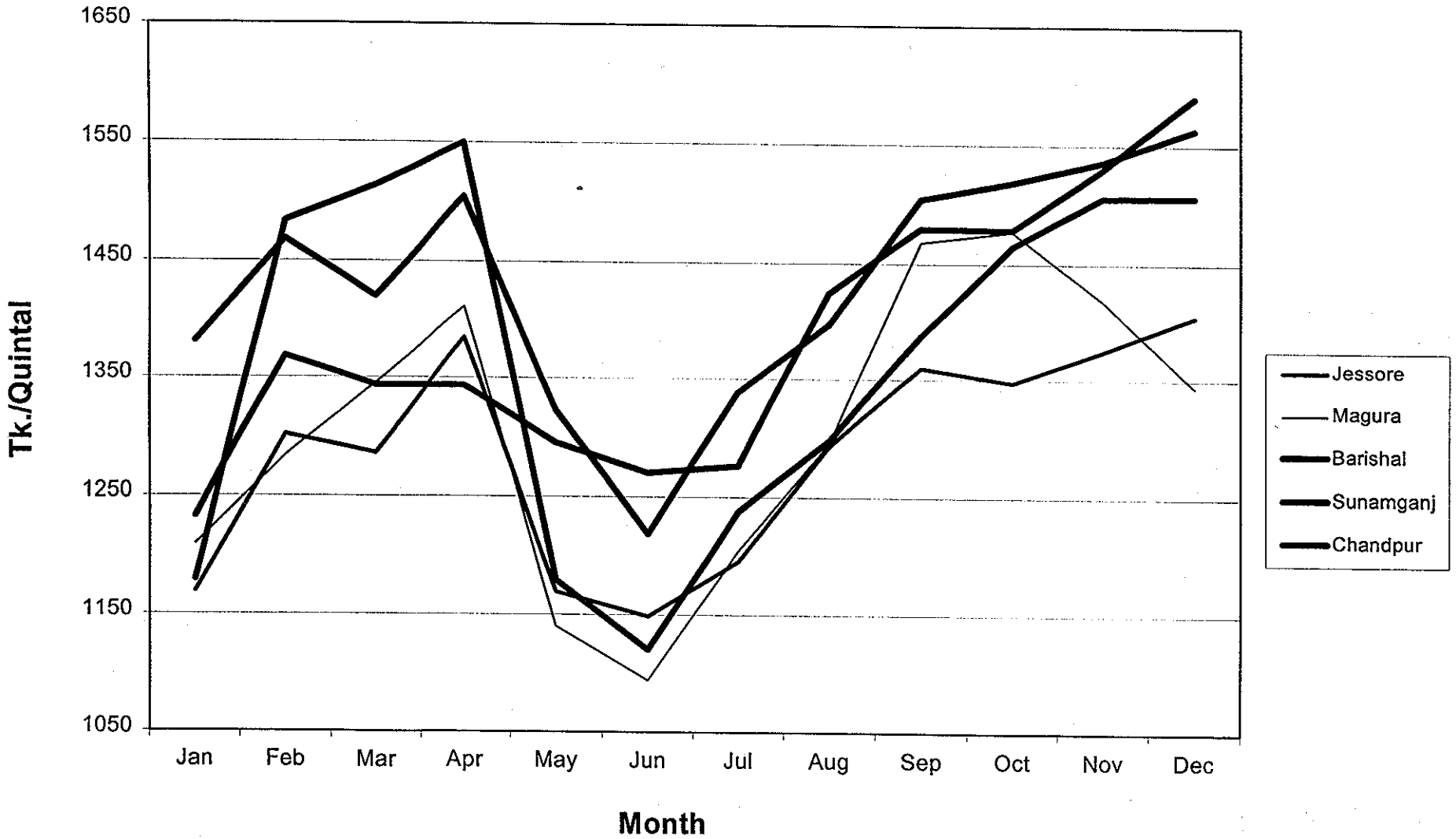
A very similar pattern emerges from the analysis of the retail prices of rice reported in the community questionnaire (Table 26). According to the data collected, the price of rice increased between 5 and 20 percent in the period of the flood and then remained stable in all areas between 15 and 16 taka per kg. The same thing can be said for *atta*, which was available for 11 to 13 taka per kg. The price of vegetables increased more rapidly, especially for onions and eggplants.

**Figure 4 — Ten Thanas' Average Wholesale Price of Coarse Rice, 1997 - 1998**



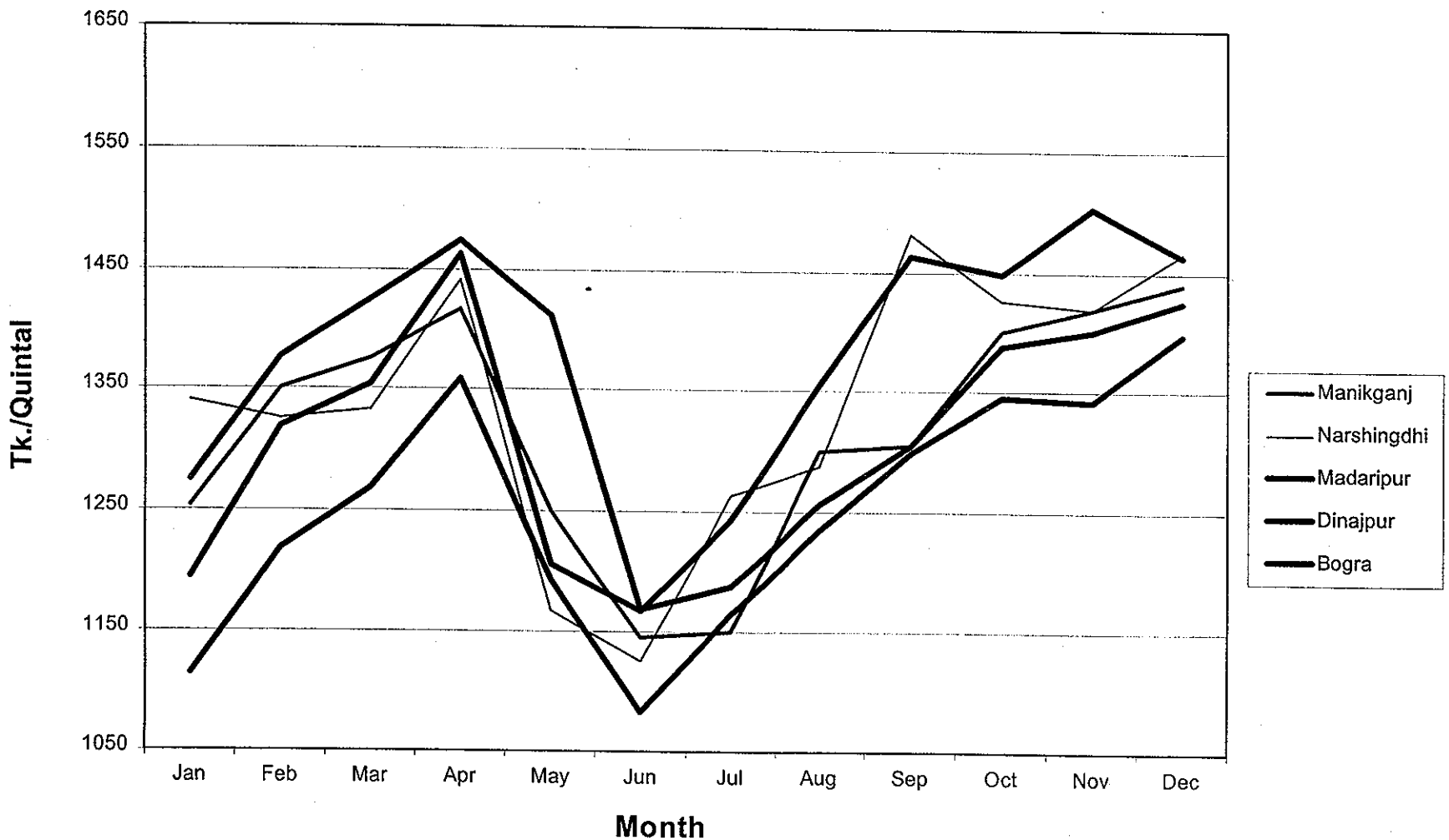

Source: DAM

**Figure 5a — Average Wholesale Price of Coarse Rice, 1998: Districts**




Source: Data from DAM

**Figure 5b — Average Wholesale Price of Coarse Rice, 1998: Districts**




Source: Data from DAM

## Table 26 — Markets and Prices

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| **Availability of Markets** | | | | | | | | | | |
| Days non available | | | | | | | | | | |
| - Village shops | 4 – 30 days | 30 - 90 days | 0 - 15 days | 0 - 20 days | 15 - 20 days | 35 - 60 days | 25 - 60 days | - | 0 - 15 days | - |
| - Weekly Market | 6 - 8 days | 0 - 21 days | - | - | - | 0 - 35 days | - | - | - | - |
| - Bazer | 4 - 6 Days | 0 - 21 days | 0 - 10 days | - | - | 0 - 35 days | - | - | 0 - 15 days | - |
| Prices at the time of the flood and percentage changes with respect to prices prior to the flood | | | | | | | | | | |
| - Rice | 16.3 - 19.3% | 16.7 - 28.2% | 15.3 - 13.6% | 15.0 - 2.3% | 15.4 - 12.5% | 15.0 - 21.6% | 15.5 - 47.6% | 15.3 - 12.2% | 14.6 - 12.5% | NA |
| - Atta (Bad Quality) | 12.8 - 27.5% | 11.5 - 9.5% | 11.5 - 27.8% | 11.0 - 0.0% | 10.8 - 7.5% | 12.0 - 9.09% | 13.0 - 25.8% | 12.0 - 12.5% | 11.0 - 4.8% | NA |
| - Onions | 37.0 - 58.8% | 38.5 - 69.9% | 38.0 - 90.0% | 32.0 - 4.0% | 36.5 - 40.4% | 38.0 - 58.3% | 40.0 - 224.3% | 39.0 - 19.4% | 39.0 - 46.3% | NA |
| - Potatoes | 10.8 - 35.4% | 10.0 - 7.1% | 10.8 - 34.4% | 10.0 - 7.1% | 10.3 - 13.9% | 10.0 - 5.3% | 10.0 - 76.5% | 8.0 - 4.4% | 9.2 - 14.6% | NA |
| - Eggplants | 25.0 - 257.1% | 20.0 - 25.0% | 17.5 - 118.8% | 15.0 - 32.4% | 19.5 - 95.0% | 18.0 12.5% | | 12.0 - 2.9% | 14.5 - 20.8% | Na |
| - Mustard oil | 59.7 - 10.5% | 58.7 - 2.3% | 63.0 - 14.6% | 65.3 - 15.3% | 59.0 - 9.3% | 59.0 - 0.6% | 66.7 - 19.05% | 55.3 - 0% | 59.3 - -0.6% | NA |

Source: Food Management and Research Support Project (FMRSP) - Rapid Appraisal

## Table 27 — Loss of Welfare

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| *Housing* | | | | | | | | | | |
| -katcha houses | 100% damaged | 90% damaged | 50% damaged | 100% damaged | 20-40% | 50% | 25-75% damaged | Most houses of soil walls destroyed. | 25% soil walls damaged, fences broken. | |
| -Shed houses (bamboo stick wall and tin roof) | Walls washed away | Walls and floor's soil washed way | 100% houses affected. Soil and bamboo fence washed away. | Walls washed way | Walls and floor's are washed way | 50% Walls and floor's earth washed way | Sometimes water above sheets. Soil and bamboo fence washed away | | | NA |
| - Tin houses | Floors soil was washed away by high current | | | | | Floors soil washed way | 35% fences and floor soil washed away | | | |
| **Availability and use of food** -Farmers | 75% ate three times and 25% ate two times | 40% can eat up to Nov and cook one time and eat two times, because lack of food and fuel. | 10% sufficient food to eat in future. During flood people eat two times in a day. | 10-50% had stored food. During flood ate two times and cooked once. No change in behavior | Only 20-40% had enough food to eat and they eat less than their normal amount. | 75% had no storage food, cooked once ate twice due to lack of food and fuel. | Only 10-25% people have food up to November. Most ate two times cooking once a day. | Only 25-30% people had food up to Nov. Most ate three times but amount was not sufficient. | Only 10-40% had food up to November. | No significant shortage. Ate 3 times a day. |
| -Landless/Day laborers | Ate hand to mouth, they had no stock | Ate twice but cooked once. Food was not sufficient. | Ate two times a day. Borrowed money to buy food. | Ate two times but cooked once a day. | Most ate once a day due to shortages of money. Ate 50% less than normal amount. | Eat two times, but cooked once. Food not sufficient. A few eat three times a day. | Didn't have enough food in store | Didn't have enough food in store, ate lesser than usual. | Not enough food in store for next season. Food insufficient. Ate twice, cook once. | Had shortage of food. 3 times is usual but at times had to limit meals to 2 times a day. |
| -Women | Had no stock of food. Ate twice but cooked once a day due to lack of food and fuel. | Ate if food was available after the children and the man ate. | Nobody had sufficient food. Most ate two times, cooked once.Sometimes women did not eat anything. | Most did not have sufficient food, they eat three times but cook two times a day. | Cooked once a day but ate two/three times. Most of the time man and child ate first than women ate what was left. | Women ate once a day. Now they eat two times but still the amount is small. | Ate after all members have had food given that food was left. | Most had no food in store. Ate lesser than normal amount. Cooked once a day but two times. | Most didn't have sufficient food. Most of the time. Men and children ate first. Sometimes they ate nothing. | Housekeepers due to heavy rains. Also had to adopt some changes in food habit due to shortages. |

## Table 27 — Loss of Welfare (continued)

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| *Sanitation* Type used | Vela[1] | Trees, Vela | Trees, Vela | Trees, Vela | Trees, Vela, sometimes surrounding water | Trees, bamboo made toilet, Vela, water and polythin | Toilet made of wood, bamboo | Open space | Vela, open space | Mainly open space |
| *Coping Strategy* | Selling trees, ornaments, cattle, poultry. Begging. Borrowing money etc. Mortgaging land for money. | Selling trees, ornaments, cattle, poultry. Begging. Borrowing money etc. Mortgaging land to rich people for money. | Selling trees, ornaments, cattle, poultry. Begging. Borrowing money etc. Some took credit from Mohajan with high interest. | Selling tin, trees, ornaments; cattle; poultry, Borrowing money etc. | Selling trees, cattle; poultry, ornaments, Borrowing of money from NGO. Borrowing money on high interest. | Selling trees, ornaments, cattle, poultry. Begging. Borrowing money etc. Mortgaging land to rich people for money. | Selling trees, cattle; poultry, ornaments. Borrowing money at high interest. Bank loan etc. Selling and mortgaging land to rich people for money. | Selling trees, tin, cattle, poultry, ornaments, utensil, furniture. Borrowing money at high interest, bank loans. Some sold or mortgaged land to rich people for money. | Selling tin of own house, trees, cattle; poultry, ornaments, utensil. Borrowing money at high interest etc. Some sold and mortgaged land to rich people for money. | Borrowed interest free from relatives. Borrowed from cooperatives. Also begging and seeking help from the local rich. Women adopted some changes in food habit. |
| **Most affected groups** -Farmers | • Affected because of loss of crop, did not receive any relief from GO/NGO and they invested loans | • Lost 100% crop and became the main victims of flood. | • Those who have 200-500 decimal land suffered most. Did not get any help from GO/NGO and had nothing to do in this time. | • Two Unions affected by flood. Others affected by heavy rainfall • Returns to investment low, and couldn't beg either. | • Small farmers affected because of short of enough food and did not get any assistance or have no work to do. | • 90% farmers lost their crop and suffered most. Lost their capital. | | | | |
| -Day Laborers and landless | • Ag laborers suffered because there was no work in fields • Suffered because lost many working days | • Lost working days. This time of the year they can work in the farmer's field. | • Day labor and marginal farmers most affected. Day labor lost many working days. | • Day labors most affected. | • As there was no opportunity for work the land less labor affected. | • Day laborers loss many working days. | • Day laborers most affected due to loss of many working days. | • Day laborers and Ag laborers most affected. Day labor lost many working days. They still don't have any work | • Day laborers and landless suffered, because they lost many working days. | • Day lab and landless suffered the most as 10-60 workdays were lost. |

1. Vela is made of banana tree;

NA = Not applicable as Jessore was not affected by flood

In conclusion, it is fair to say that the prices of all major commodities turned out to be very similar between the areas under investigation (the CV for the price of rice reported in the community questionnaire is 4.3). This can be explained by the fact that in most areas some bazaars and weekly market remained opened despite the flood although village shops were not always available. This was true also in Shahrasti and Derai where village shops remained closed for a minimum of 25 days to a maximum of 90 days.

## WELFARE SITUATION AND COPING STRATEGIES

In addition to the income loss due to the flood, households lost many assets and suffered damages to their houses. From the data reported in Table 27 it is evident that most households suffered damage to their houses, even if not to the same degree. It appears that people in *katcha* houses suffered less damage than people in shed houses probably because although the water level rose slowly it did not cause much damage to heavier structures.

The real problem was that because of the loss of jobs, production and assets the poor were especially hit hard by the flood, since they did not have any stocks, assets, cash reserves and access to credit to enable them to offset sharp declines in income. As a result, not everybody was able to eat as much as they wanted and they had to reduce the number of meals taken per day. They ate once or twice a day food that was prepared only once a day. Women suffered the most because they are usually the last ones to eat. Therefore, if there is not enough food they eat less and sometimes they also have to skip meals, as it was mentioned in Madaripur.

The situation with respect to sanitation was also very poor. Across all areas of investigation, people used makeshift toilets and in some instances, where the level of the flood was deeper, they also use open waters.

To face the problems encountered, most people resorted to alternative strategies to collect some cash to purchase food. The results of the group interviews confirm the indication of the village survey. Most people who did not have jobs, engaged in petty

trade, trying to sell trees, ornaments, cattle and so on. When this was not sufficient they borrowed cash at high interest rates, mortgaged land to rich people and, in extreme situations, begged for money.

In the end, the amount of suffering and hardship depended on the level of economic welfare of the household and, as we have seen before, it appears that farmers did better than landless. It was also evident from the group discussions (see Table 27) that farmers were a little better off than landless. In fact, not all farmers had to reduce the amount of food eaten, because they could use their own stock of rice. Most of the landless, instead, had to reduce the number of meals eaten a day from three to two and they had also reduce the amount of food intake as well. This situation is not unusual in rural Bangladesh for landless people. Also in areas not affected by the flood we found that landless households were reporting some level of distress. Unfortunately, women as usual appeared to be hit the most. They reported that they had to reduce the number of meals prepared and taken. In addition, they confirmed that because they were the last ones to eat, sometimes they were left without anything to eat at all.

In conclusion, it appears that landless people were the most affected because they lost many labor days and they did not have any food reserves or other assets that would help them to get through the flood. In the same time, farmers felt that they were in a worse situation, because, not only they lost most of their standing crop, but they did not receive any relief from either government or non-government organizations.

# 6. DISTRIBUTION OF RELIEF

In response to the flood, the Government of Bangladesh, the NGOs and the donor community have launched relief operations and expanded the public food distribution program to help poor people.

A number of instruments have been used by the Government of Bangladesh to provide immediate food relief to the people in the aftermath of the flood. The main instruments used were the Gratuitous Relief (GR), the Vulnerable Group Feeding Program (VGF), the Test Relief (TR) and the Food for Work (FFW). The total allocation of the amount of relief distributed is reported in Table 28.

**Table 28 — Summary Description of the Targeted Food Programs**

| Program → | | GR | TR | VGF | FFW | Total |
|---|---|---|---|---|---|---|
| July | Rice | 60.4 | 0.0 | 58.4 | 0.0 | 118.8 |
| October 1998 | Wheat | 3.5 | 3.4 | 28.8 | 21.0 | 56.7 |
| | Total | 63.9 | 3.4 | 87.2 | 21.0 | 175.5 |
| November 1998 | Rice | 1.8 | 0.0 | 28.1 | 0.0 | 29.9 |
| | Wheat | 0.3 | 25.7 | 26.9 | 2.4 | 55.3 |
| | Total | 2.1 | 25.7 | 55.0 | 2.4 | 85.2 |
| December 1998 | Rice | 0.7 | 0.0 | 20.0 | 0.0 | 20.7 |
| | Wheat | 0.0 | 18.0 | 59.5 | 16.6 | 94.1 |
| | Total | 0.7 | 18.0 | 79.5 | 16.6 | 114.8 |
| Total | Total Rice | 62.9 | 0.0 | 106.5 | 0.0 | 169.4 |
| | Total Wheat | 3.8 | 47.1 | 115.2 | 40.0 | 206.1 |
| | Total Cereal | 66.7 | 47.1 | 221.7 | 40.0 | 375.5 |

Source: Food Planning and Monitoring Unit (FPMU)

The GR is a program designed to provide immediate relief, mainly in the form of food, to people affected by disasters. Grain, a little bit of cash and other supplies (cloths and biscuits) were given to the districts. Eventually, the grain was given to the UP chairmen who distributed it in small rations of 3 to 10 kilograms to the people believed to need it the most. In total, over 62 million MT of grain was distributed by the end of October 1998 (Table 28).

The VGF is a program designed to provide additional food resources to a selected number of women in a period of distress. Usually, the women selected by the UP chairman receive a card that entitles them to receive a given amount of grain a month for a period of two months. In the period of August and September, approximately one million women received 8 kilograms of rice for two months. In October, this number increased to 4 million and the ration was increased to 8 kg of rice and 8 kg of wheat. In November, the number of participants increased to 4.2 million and in December the ration was increased to 15 kg of wheat and 5 kg of rice (see Table 29). After December the program is scheduled to continue until April.

The other programs such as, the TR and the FFW were not fully operational in the immediate aftermath of the flood and they were expected to start after January 1999.

## THE ALLOCATION OF GR AND VGD

The amount of resources allocated to each district for the GR distribution was based on a number of *ad hoc* criteria. The actual amounts of rice and wheat supplies distributed over July-December '98, are reported in Table A8 in the appendix. We used a simple regression analysis to test if the criteria used for the distribution of the relief followed a specific pattern. The results of the model are reported in Table 30c. It appears that the main determinants for the allocation of the amount of relief given to each district are the share of the number of affected people over the total population, the number of people in shelter and the number of people reported dead. The number of affected *thanas*

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**Table 29 — VGF Distribution**

(000 MT)

| Month | No. of Cards (Million) | Ration Per Card | | | G.O. issued by MDMR (upto December 1998) | | |
|---|---|---|---|---|---|---|---|
| | | Rice (kgs) | Wheat (kgs) | Total | Rice | Wheat | Total |
| August | 1.1 | 8 | 0 | 8 | 15.167 | 0 | 15.167 |
| September | 1.1 | 8 | 0 | 8 | 15.167 | 0 | 15.167 |
| October | 4.0 | 8 | 8 | 16 | 32.000 | 32 | 64.000 |
| November | 4.2 | 8 | 8 | 16 | 33.600 | 33.6 | 67.200 |
| December | 4.2 | 5 | 15 | 20 | 21.000 | 63 | 0.000 |
| January | 0.0 | 0 | 0 | 0 | 0.000 | 0 | 0.000 |
| February | 4.2 | 5 | 15 | 20 | 21.000 | 63 | 84.000 |
| March | 4.2 | 5 | 15 | 20 | 21.000 | 63 | 84.000 |

Source: Ministry of Disaster Management and Relief (MDMR)

**Table 30a — Summary Statistics of Determining Variables**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Amount of rice received | 52 | 1,075.08 | 994.71 | 0 | 4,225.00 |
| Population affected (%) | 50 | 33.98 | 25.72 | 0.71 | 96.29 |
| Affected Thanas (N) | 52 | 6.88 | 2.96 | 2 | 14.00 |
| Affected Unions (N) | 52 | 62.27 | 32.95 | 2 | 179.00 |
| Population in shelters (N) | 52 | 37,490.87 | 150,899.90 | 0 | 1,080,943.00 |
| Deaths (N) | 52 | 16.21 | 21.14 | 0 | 109.00 |

Source: Ministry of Disaster Management and Relief (MDMR)

**Table 30b — Regression Results**

Dependent variable: Amount of rice received

| Dependent variable | Coef. | t |
|---|---|---|
| Population affected (%) | 19.00 | 4.27 |
| Affected Thanas (N) | 35.54 | 0.66 |
| Affected Unions (N) | -1.28 | -0.23 |
| Population in shelters (N/1,000) | 1.25 | 2.03 |
| Deaths (N) | 16.45 | 5.64 |
| Constant | -26.56 | -0.10 |

Number of obs = 50
F(5,44) = 17.10
R-squared = 0.66
Source: Author's Calculations

**Table 30c — Districts Receiving Either More or Less Allocation of Resources than Expected for Distribution in the Period Immediately After the Flood**

| District | Amount of rice received | Amount of rice should have received | Difference |
|---|---|---|---|
| **Received more** | | | |
| CHANDPUR | 4,225 | 2,025 | 2,1200 |
| MUNSHIGONJ | 3,500 | 1,696 | 1,804 |
| PUBNA | 1,725 | 503 | 1,222 |
| SERAJGONJ | 3,075 | 2,212 | 863 |
| BOGRA | 1,350 | 561 | 789 |
| **Received less** | | | |
| FENI | 325 | 1,033 | -708 |
| SUNAMGONJ | 425 | 1,149 | -724 |
| CHITTAGONG | 75 | 1,074.66 | -1,000 |

Source: Author's Calculations

or unions reported in each district does not appear to have been considered in the decision process since they are not very statistically significant.

We carried out a simple analysis of the residuals of the results of the regression to identify the districts that have received either more or less relief than expected. In other words, we identified the cases in which the difference between the amount of relief expected to be received according to the model and the amount actually received was larger than the average. In practice, we selected the districts for which the difference between the actual value and the value predicted by the model was larger (or smaller) than the standard deviation of the residuals[11]. According to this calculation (see in Table 30c), three districts (Feni, Sunamgonj and Chittagong) received fewer resources than expected and four districts (Chandpur, Munshigonj, Pabna, Bogra and Serajgonj) received more than expected.

The analysis of the amounts of resources allocated for immediate relief (GR) in the *thanas* under investigation, reported in Table 31, was comparable to the distribution of resources reported at the district level. In fact, if we look at the amount of rice received per person affected, it is evident that the Chandpur and Bogra districts, for some reason, received more than expected. In Chandpur, affected people received more than 3 kg on average and 5 kg in Bogra. This pattern was confirmed in our union level investigation reported in Table 32. The chairman in Sharasti union (Chadpur district) was able to distribute 4 to 5 kg of rice 14 to 16 times. On the other hand, while it is understandable that the amount of resources received in Mohamudpur (in Magura district) was small due to the small percentage of affected people, the people in Sunamgonj received far less than they needed (.53 kg of rice per affected person). This was confirmed in our interviews in Derai (Sunamgang district), where we were told that the UP chairmen could distribute a very small amount of relief.

[11] The residuals of regression models have a distribution with mean equal to zero and standard deviation equal to Sigma.

The allocation of the resources for the VGF program was done in a different way. The number of cards allocated to the different *Thanas* was decided using the classification of the Water Board. *Thanas* that were severely affected received 1,000 cards per union, those moderately affected 700 cards, those normally affected 500 cards and those not affected at all 300 cards. The distribution of the cards allocated to each division is summarized in Table 33.

At the time of our field investigation, at the end of the month of September, the allocation of the VGF cards appeared not to have been completely organized. In fact, we found out that not everybody was aware of the amount of resources that had been allocated to them and the new allocation had not been received yet and the local communities had to rely on the support already assigned to them prior to the flood (Table 32).

## AVAILABILITY OF RELIEF

The distribution of resources received at the local level appeared to follow a similar pattern across the *thanas* under investigation. In most cases, the UP chairman has directed the resources available towards landless women and other poor people he has identified (Table 32). As a result, in only about half of the cases, farmers received some relief. Landless men received relief in all the areas and also in two of the three areas not affected by the flood. The amount received was larger in Sharasti and in Madaripur, reflecting the availability of more resources, and very few people voiced any complaints. Women received some relief in almost all the unions visited. In all but one case, women received smaller amounts than landless men and, as in the previous case, women in Sharasti received larger rations (20 to 25 kg of rice) than in the other areas.

## Table 32 — Distribution of Relief Operations by Thana

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| **Distribution of GR in 3 UPs** | | | | | | | | | | |
| Amount received in 3 Ups by Visit | 15.5 MT | 184.5 MT | 105.1 MT | 30.0 MT | 42.2 MT | 40.0 MT | 26.0 MT | 16.0 MT | 2.68 MT | |
| Distribution of GR | UP Chairman distributed relief 4 times. People received 2-11kg rice 4 times. | UP Chairman distributed relief 14-16 times. Everybody received 4-5kg of rice 4-5 times. | UP Chairman distributed relief 1-2 times. Everybody received 4.6-10 kg of rice. | In one of the three Unions they did not receive any relief. UP Chairman distributed relief 1-2 times. Each time 2.5-5kg rice. | UP Chairman distributed relief 2 times. Each time people received 4-5kg rice. | UP Chairman distributed relief 4-5 times. Each time people received 4-5kg rice. | UP Chairman explained to people that they received only small amount of relief | - | - | - |
| **VGF** | | | | | | | | | | |
| Proposed allocation<br>Received<br>Allocation by the end of Sept '98 | No information (GO) received | 1,000 in each UP | No information (GO) received | No information (GO) received | No information (GO) received. UP Chairman did not know number of cards. | No information (GO) received. UP Chairmen did not know how many cards they will receive | TNO said that 1000 cards per UP were allocated. Chairmen did not know | - | - | - |
| Cards received by Sept. '98 | 700 | 900 | 1,384 | 449 | 900 | 660 | 900 | 2700 | 3000 | |

Note: 1. AP = Affected Person as reported by district officials
PC = Per Capita

## Table 32 — Distribution of Relief Operations by Thana (Continued)

| District | 1. Barisal | 2. Chandpur | 3. Madaripur | 4. Magura | 5. Manikgang | 6. Narshindi | 7. Sunamgang | 8. Bogra | 9. Dinajpur | 10. Jessore |
|---|---|---|---|---|---|---|---|---|---|---|
| Thana | Muladi | Sharasti | Madaripur | Mahamudpur | Shaturia | Shibpur | Derai | Adamdighi | Birganj | Sadar |
| Farmers | • Received 7-11kg of rice from the UP Chairman.<br>• NGO provided some relief.<br>• No complaints about distribution | • Did not receive anything from GOB or UP office | • Received 20kg of rice.<br>• BRAC, CARE, Prosika and other NGOs provided some relief.<br>• All complained about distribution | • Received 5kg of rice<br>• NGO provided some relief<br>• They complained about distribution. | • Received 6-10kg of rice from UP office.<br>• BRAC, Proshika, Gono Kallann Trust and Grameen<br>• No complaints about distribution. | • Farmers did not receive anything from the GOV.<br>• They complained about distribution. | • Farmers did not receive any kind of relief from the UP office or GO NGO. | • A few received 4-5kg of rice from UP office once<br>• No NGO relief<br>• One UP did not received anything<br>• No complaints | • A few received 2kg of rice from UP office once<br>• No NGO relief arrived<br>• Two UP did not received any relief<br>• Several complaints | • Did not receive anything form anyone. Later received some wheat through VGF cards. |
| Landless Laborers | • Lendless received 10-11kg of rice from UP Chairman.<br>• NGOs provided some medical assistance. | • Each landless person received 20-25kg of rice and 100tk from UP office.<br>• Nobody complained about the relief distribution. | • Each land less received 10-20kg of rice.<br>• Nobody complained about distribution | • Landless received 4kg of rice.<br>• BRAC, Jaguroniny Chakra provided some relief.<br>• Nobody complained about distribution. | • Received 6-10kg of rice.<br>• BRAC,Proshika, Gameen Bank, Gono Kallan Trust provided relief to their beficiaries<br>• Some complained about distribution | • Each landless received 5kg of rice.<br>• Only a few complained about the relief distribution | • In two UPs land less received 4-10kg of rice<br>• In one UP they did not receive any relief. | • Received 4-5kg of rice once<br>• Some complaints about distribution : relief provided to those known to UP memebrs | • Received 1.5-2kg of rice for once<br>• No NGO relief<br>• Two UP did not received anything<br>• Most complained about distribution | • Did not receive anything. |
| Women | • Women in shelters received 2-7kg of rice.<br>• BRAC and other NGO provided some relief.<br>In two groups complained about distribution | • Women received 25kg of rice, 100tk and some biscuits.<br>• Only in one UP women complained about relief operation. | • Only in two UP's women received 4-5kg of rice.<br>• CARE, BRAC distributed different commodities.<br>• Some people complained. | • Only in two UP's women received 1-5kg of rice<br>• NGO provided some relief. | • Women received 3-5kg of rice.<br>• Only a few women complained about the relief distribution | • Women received 12-16-20 kg rice.<br>• In one UP women complained about relief distribution | • Only a few women (known by UP members) received 4-15kg of rice.<br>• NGOs distributed some medical assistance.<br>• They were not satisfied with the distribution. | • Received 4-5 kg of rice from UP<br>• No NGO relief UP did not receive anything<br>• Some complained about distribution | • Women received 1kg of rice from UP office for one time<br>• No NGO relief arrived here. And one of the UP did not receive any relief<br>• Some of them complained about relief distribution | • 106 families received 63 kg rice and 63 kg wheat over three months<br>• Received nothing from political party or NGO. |

Source: Food Management and Research Support Project (FMRSP)

**Table 33 — Division Wise VGF Card Distribution**

| Division | Total number | | Sever Affected | | Moderate Affected | | Normal Affected | | No Affected | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Union | Urban Ward | (1000 card per U/W) | | (700 card per U/W) | | (500 Card per U/W) | | (300 Card per U/W) | |
| | | | Union | Urban Ward | Union | Urban Ward | Union | Urban Ward | Union | Urban Ward |
| Dhaka | 1238 | 246 | 1238 | 85 | 0 | 63 | 0 | 23 | 0 | 0 |
| Chittagong | 915 | 135 | 476 | 29 | 66 | 12 | 219 | 14 | 169 | 59 |
| Rajshahi | 1097 | 153 | 770 | 76 | 214 | 29 | 98 | 12 | 0 | 26 |
| Sylhet | 335 | 40 | 100 | 3 | 109 | 13 | 99 | 18 | 27 | 6 |
| Barishal | 332 | 61 | 70 | 6 | 50 | 11 | 132 | 15 | 80 | 29 |
| Khulna | 562 | 113 | 66 | 3 | 66 | 6 | 209 | 0 | 221 | 87 |
| Total | 4479 | 748 | 2720 | 202 | 505 | 134 | 757 | 82 | 497 | 207 |
| Total Card | | | 2,720,000 | 202,000 | 353,500 | 93,800 | 378,500 | 41,000 | 149,100 | 62,100 |
| Grand Total Card | | | 4,000,000 | | | | | | | |

Note: The information given in Table 4 was last updated in October'98.Since then additional 200 thousand cards have been distributed but they had not been categorized according to their affected level. These additional cards have been allocated among 26 districts. The latest information regarding VGF card is until Feb'99 a total of 5,269,870 cards have been distributed. The amount of rice and wheat under these cards was respectively 159,081 MT and 254,600 MT.

Source: Ministry of Disaster Management and Relief (MDMR)

# 7. CONCLUSIONS

The main purpose of this paper has been to determine the effect of the 1998 flood on the rural economy and structure of the rural labor market, the effectiveness of government relief distribution program and the overall food security of the people in the flood affected areas. Several specific findings came out very clearly from the detailed analysis we carried out. First of all, we found that the information provided by the district office was more useful than the classification provided by the WBD to assess the impact of the flood on the affected population and the level of resources needed to provide immediate relief to them.

Second, the economic activities slowed down considerably, but did not come to a complete halt. The agriculture, livestock and fisheries sectors were affected the most. The water receded too late for planting a new crop, and thus the job prospects for agricultural labor appeared to be very slim.

Third, the impact of the flood on employment was severe particularly for those directly engaged in agricultural activities. The flood completely damaged the standing crops of *aman* rice reducing the level of labor demand for harvesting activities in a period when there is usually a peak demand for hired labor, causing a great reduction in agricultural employment. As a result the *thanas* that relied more on the cultivation of *aman* rice crop (in Muladi the *aman* area is 71 percent compared to 36 percent in Mohamudpur and very negligible in Derai) and had a higher percentages of landless labor (in Muladi it is 64 percent) were affected the most. In the surveyed flood-affected *thanas*, the flood caused a loss of direct and indirect labor demand of at least 5,173 thousand person-days and on the average, an agricultural wage laborer lost Tk. 958 per month in the flood and post-flood period. Employment alternatives to agricultural jobs were very small. A few employment opportunities in the non-farm sector were available only in

*thanas* closer to urban areas like Saturia and Shibpur (where more than one-fourth of the working people are engaged in trade and transport activities) and Mohamudpur, Shaharasti and Madaripur.

Fourth, female workers were particularly affected during the flood. Their wage rate is usually lower due to the lower effective demand caused by the specificity of tasks they perform such as threshing, processing, and their geographical immobility. Diversification of their occupations and government programs such as earthen work may enhance their status and the return to their labor. In Saturia, where a number of NGOs and government programs are working, the participation of female employment in earthen work is high (up to 76 percent).

Fifth, food continued to be available in the flood affected *thanas*, albeit at higher prices and not at all the locations, because several village level shops remained closed for several weeks. The prices of vegetables increased much more than the price of rice, which itself increased between 3 and 28 percent at the time of the flood and afterwards stabilized around the same level (16 taka/Kg retail for coarse rice) across the country.

Sixth, because of the low level of economic activity and the low level of labor demand it was very hard for landless people to find alternative sources of income. Most people tried to engage themselves in petty trade, transport, fishing, and other minor activities, associated with lower returns, to cope with loss of agricultural wage. Some looked for jobs outside the area (16 percent). More than 10 percent of all landless migrated to non affected areas and 50 percent of affected people had to take temporary shelter. Fishing provided some relief to poor people as the supply of fish increased in the open-water bodies.

Seventh, the amount of relief received varied by areas and was found to be consistent with the need as expressed by the number of people affected and other key indicators. Even though in some areas such as Chandpur, Munshigonj, Pabna, Serajgonj and Bogra, people in the local communities received more relief than expected and in

other areas such as Feni, Sunamgonj, Chittagong they received less than expected based on needs criteria. The immediate relief (GR) received at the local level was distributed with equity and helped the poor during the flood. The amount of additional relief (mostly VGF) took some time to be organized and local communities relied on the support already assigned to them.

Eighth, the overall welfare situation in the flood-affected *thanas* improved in the immediate post-flood period for all the occupations under study (especially for fishermen who reported to have a better welfare situation compared to 1997). In general, the economic prospects for the period after the flood appeared to be mostly linked to the production of *boro* rice. The local *boro* rice crop absorbs about 18 percent more labor (person-days) per acre than *aman* rice crop in both local and high yielding varieties (HYV), and the HYV *boro* crop requires more than 25 percent more labor than the local crop production. The percentage of hired labor in total labor requirement is 58 percent for the local *boro* variety and 35 percent for the HYV *boro* variety because the activity in *boro* (HYV) production is performed mostly by family labor. Given that HYV *boro* represents about 84 percent of the total *boro* area in the study villages of the respective *thanas*, it will generate more wage employment than the local variety. Other alternatives to agricultural jobs to be available in the labor market that were mentioned in three-fourths of the unions were jobs in earthen work and for house repairing tasks.

To summarize, the 1998 flood affected a large number of people for a period of almost three months and its effects could last for the next several months or years. It has reduced food security in two major ways. First, it hampered the ability of households to acquire food because of the loss of income caused by the losses of production and assets, and the level of general slowing down of the economic activity that reduced the possibilities of finding a job in the labor market. Second, it considerably reduced the access of households to food. The prices of grain and other essentials have gone up due to the reduction in production and the disruptions in transport and markets. The resilience of the people and the immediate relief received in the immediate post flood period helped

to avoid much worse consequences to the people in the affected areas. Even though the floodwater has receded, the impact of the flood on the economy and on the welfare of the people will be felt for some time. It may take even longer for the poor landless households to make up for the loss of income they suffered at the time of the flood. Therefore, in the affected areas where market demand for labor is less it is necessary to generate more jobs through specific government or NGO programs on a short and long run basis.

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# APPENDIX A: TABLES

## Table A1 — List of Thanas and Union Parishads Visited During the Rapid Appraisal

| Sl | Name of Thana | | UP1 | UP2 | UP3 |
|---|---|---|---|---|---|
| 1 | Thana:Shaharasti<br>**District:Chandpur** | Name of UP<br>Population of the UP | Tamta<br>40,000 | Dhakshin Meher<br>30,000 | Purba Chitoshi<br>14,117 |
| 2 | **Thana: Shibpur**<br>District: Narshindi | Name of UP<br>Population of the UP | Bagaba<br>30,000 | Putia<br>34,516 | Dulalpur<br>28,500 |
| 3 | Thana: Derai<br>District: Sunamgang | Name of UP<br>Population of the UP | Rajanagar<br>17,087 | Rafinagar<br>40,000 | Karimpur<br>29,622 |
| 4 | Thana: Shaturia<br>District: Manikgang | Name of UP<br>Population of the UP | Dharagram<br>14,909 | Digulia<br>15,620 | Pukurhati<br>12,670 |
| 5 | Thana: Muladi<br>District: Barishal | Name of UP<br>Population of the UP | Kazir Char<br>30,000 | Shafipur<br>30,594 | Char kalikha<br>19,908 |
| 6 | Thana: Mahmudpur<br>District: Magura | Name of UP<br>Population of the UP | Mahmudpur<br>28,200 | Palasbari<br>28,000 | Binodpur<br>26,120 |
| 7 | Thana: Madaripur<br>District: Madaripur | Name of UP<br>Population of the UP | Bahadurpur<br>10,140 | Kalikapur<br>16,930 | Mostofapur<br>23,000 |
| 8 | Thana: Adamdighi<br>District: Bogra | Name of UP<br>Population of the UP | Adamdighi<br>26000 | Shantahar<br>21,874 | Chapapur<br>2160 |
| 9 | Thana: Birgonj<br>District: Dinajpur | Name of UP<br>Population of the UP | Sujalpur<br>25825 | Nijpara<br>22237 | Shatagram<br>2160 |
| 10 | Thana: Jessore sadar<br>**District: Jessore** | Name of UP<br>Population of the UP | Ichali<br>19,622 | Chanchara<br>34,000 | Daira<br>32,410 |

## Table A2 — Districts Affected by the Flood and Amounts of Resources Received as of 19-09-98

| District | Flood Affected | | | | | | | | | Relief Allocation | | | | | Ratio | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Thana | Affected Thana | Total Union | Affected Union | Total People | Affected People | Shelter Cen. | Sheltered People | Death | Rice mt | Taka | Saree | Lungee | Biscuit | % Of Thana | % of pop |
| BAGERHAT | 9 | 9 | 75 | 75 | 1,489,000 | 268,790 | 30 | 14,680 | 8 | 275 | 300,000 | 0 | 0 | 0 | 100.0 | 18.1 |
| BANDARBAN | 7 | 2 | 29 | 2 | 254,000 | 1,805 | 0 | 0 | 0 | 100 | 75,000 | 200 | 200 | 200 | 28.6 | 0.7 |
| BARISAL | 10 | 10 | 81 | 81 | 2,299,000 | 646,452 | 162 | 77,999 | 9 | 825 | 1,075,000 | 2,200 | 695 | 150 | 100.0 | 28.1 |
| BHOLA | | 7 | | 19 | | 254,707 | 0 | 0 | 1 | 345 | 575,000 | 391 | 339 | 0 | | |
| BOGRA | 11 | 11 | 108 | 52 | 2,799,000 | 266,508 | 0 | 0 | 5 | 1,350 | 1,400,000 | 2,950 | 1,150 | 400 | 100.0 | 9.5 |
| BRAHMANBARIA | 7 | 7 | 99 | 99 | 2,268,000 | 1,379,523 | 70 | 24,626 | 43 | 1,950 | 2,550,000 | 2,200 | 1,900 | 400 | 100.0 | 60.8 |
| CHANDPUR | 7 | 7 | 89 | 88 | 2,149,000 | 1,393,113 | 174 | 20,565 | 40 | 4,225 | 3,300,000 | 6,444 | 1,249 | 350 | 100.0 | 64.8 |
| CHITTAGONG | 20 | 14 | 195 | 104 | 5,744,000 | 1,679,000 | 0 | 0 | 11 | 75 | 150,000 | 200 | 200 | 100 | 70.0 | 29.2 |
| CHUADANGA | 4 | 3 | 31 | 27 | 844,000 | 133,680 | 2 | 50 | 1 | 175 | 100,000 | 100 | 50 | 0 | 75.0 | 15.8 |
| COMILLA | 12 | 12 | 179 | 179 | 4,263,000 | 1,677,450 | 51 | 22,770 | 74 | 1,625 | 1,500,000 | 5,800 | 1,300 | 200 | 100.0 | 39.3 |
| COX'S BAZAR | 7 | 3 | 64 | 44 | 1,502,000 | 431,400 | 0 | 0 | 6 | 75 | 200 | 200 | 0 | 0 | 42.9 | 28.7 |
| DHAKA | 5 | 5 | 74 | 74 | 6,163,000 | 3,138,867 | 259 | 190,476 | 109 | 2,550 | 4,175,000 | 5,600 | 2,800 | 530 | 100.0 | 50.9 |
| FARIDPUR | 8 | 8 | 79 | 77 | 1,558,000 | 537,574 | 34 | 16,039 | 17 | 1,225 | 1,400,000 | 5,300 | 1,450 | 350 | 100.0 | 34.5 |
| FENI | 5 | 5 | 48 | 48 | 1,158,000 | 575,000 | 0 | 0 | 0 | 325 | 550,000 | 194 | 200 | 200 | 100.0 | 49.7 |
| GAIBANDA | 7 | 7 | 82 | 77 | 2,041,000 | 538,487 | 12 | 1,600 | 14 | 1,225 | 1,000,000 | 5,950 | 1,950 | 200 | 100.0 | 26.4 |
| GAZIPUR | 5 | 5 | 45 | 45 | 1,683,000 | 593,350 | 25 | 15,000 | 20 | 1,275 | 975,000 | 1,000 | 700 | 0 | 100.0 | 35.3 |
| GOPALGONJ | 5 | 5 | 69 | 69 | 1,097,000 | 751,805 | 0 | 0 | 3 | 1,175 | 1,225,000 | 6,200 | 3,800 | 100 | 100.0 | 68.5 |
| HABIGONJ | 8 | 8 | 77 | 74 | 1,611,000 | 797,110 | 0 | 0 | 12 | 1,000 | 1,250,000 | 3,100 | 750 | 600 | 100.0 | 49.5 |
| JAMALPUR | 7 | 7 | 68 | 68 | 1,942,000 | 1,132,820 | 10 | 3,500 | 17 | 1,400 | 1,700,000 | 5,450 | 1,450 | 200 | 100.0 | 58.3 |
| JAYPURHAT | 5 | 5 | 32 | 32 | 802,000 | 84,752 | 0 | 0 | 0 | 75 | 125,000 | 200 | 100 | 100 | 100 | 10.6 |
| KESHERGONJ | 13 | 13 | 107 | 107 | 2,388,000 | 721,167 | 42 | 20,871 | 33 | 1,175 | 1,150,000 | 1,000 | 700 | 0 | 100.0 | 30.2 |
| KURIGRAM | 9 | 9 | 74 | 70 | 1,681,000 | 349,784 | 0 | 0 | 9 | 1,225 | 1,100,000 | 6,178 | 2,384 | 400 | 100.0 | 20.8 |
| KUSTIA | 14 | 6 | 67 | 63 | 1,563,000 | 555,601 | 77 | 10,190 | 15 | 550 | 700,000 | 5,000 | 0 | 0 | 42.9 | 35.5 |
| LAKSMIPUR | 4 | 4 | 48 | 44 | 1,391,000 | 715,954 | 17 | 4,446 | 11 | 1,125 | 1,175,000 | 250 | 250 | 0 | 100.0 | 51.5 |
| LALMOIRHAT | 5 | 5 | 42 | 30 | 999,000 | 50,826 | 0 | 0 | 0 | 150 | 50,000 | 200 | 200 | 100 | 100.0 | 5.1 |
| MADARIPUR | 4 | 4 | 58 | 57 | 1,106,000 | 1,035,000 | 68 | 19,366 | 51 | 2,700 | 3,350,000 | 7,989 | 3,630 | 300 | 100.0 | 93.6 |

## Table A2 — Districts Affected by the Flood and Amounts of Resources Received as of 19-09-98 (Continued)

| District | Flood Affected | | | | | | | | | Relief Allocation | | | | | Ratio | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Thana | Affected Thana | Total Union | Affected Union | Total People | Affected People | Shelter Cen. | Sheltered People | Death | Rice mt | Taka | Saree | Lungee | Biscuit | % 0f Thana | % of pop |
| MAGURA | 4 | 3 | 36 | 17 | 752,000 | 110,000 | 0 | 0 | 0 | 25 | 50,000 | 0 | 0 | 100 | 75.0 | 14.6 |
| MANIKGONJ | 7 | 7 | 65 | 65 | 1,217,000 | 776,923 | 0 | 0 | 50 | 1,575 | 1,600,000 | 6,475 | 2,569 | 100 | 100.0 | 63.8 |
| MAOULUVI BAZAR | 6 | 5 | 67 | 62 | 1,454,000 | 115,735 | 0 | 0 | 0 | 225 | 375,000 | 2,830 | 200 | 100 | 83.3 | 8.0 |
| MUNSHIGONJ | 6 | 6 | 70 | 68 | 1,229,000 | 594,249 | 64 | 15,852 | 40 | 3,500 | 3,525,000 | 4,800 | 4,800 | 400 | 100.0 | 48.4 |
| MYMENSHING | 12 | 12 | 146 | 146 | 4,096,000 | 1,057,320 | 71 | 72,963 | 23 | 1,306 | 1,625,000 | 5,200 | 200 | 100 | 100.0 | 25.8 |
| NAOGAON | 11 | 11 | 99 | 72 | 2,251,000 | 117,958 | 105 | 19,535 | 4 | 450 | 500,000 | 2,500 | 200 | 100 | 100.0 | 5.2 |
| NARAIL | 3 | 3 | 37 | 25 | 682,000 | 75,030 | 0 | 0 | 2 | 325 | 225,000 | 250 | 250 | 0 | 100.0 | 11.0 |
| NARAYANGONJ | 5 | 5 | 49 | 47 | 1,819,000 | 1,512,797 | 349 | 1,080,943 | 29 | 3,550 | 4,175,000 | 2,500 | 1,800 | 100 | 100.0 | 83.2 |
| NARSHINDI | 6 | 6 | 70 | 70 | 1,710,000 | 787,621 | 163 | 42,180 | 12 | 1,300 | 1,575,000 | 1,700 | 1,700 | 300 | 100.0 | 46.1 |
| NATORE | 6 | 5 | 51 | 45 | 1,455,000 | 305,164 | 131 | 41,443 | 2 | 700 | 300,000 | 0 | 0 | 0 | 83.3 | 21.0 |
| NAWABGONJ | 5 | 5 | 54 | 54 | 1,232,000 | 1,186,314 | 232 | 72,678 | 24 | 1,900 | 1,800,000 | 6,200 | 1,250 | 500 | 100.0 | 96.3 |
| NETROKONA | 10 | 10 | 85 | 85 | 1,791,000 | 254,060 | 4 | 670 | 9 | 650 | 725,000 | 250 | 250 | 100 | 100.0 | 14.2 |
| NILPHAMARI | 6 | 2 | 61 | 11 | 1,416,000 | 35,100 | 0 | 0 | 1 | 0 | 150,000 | 200 | 150 | 50 | 33.3 | 2.5 |
| NOAKHALI | 6 | 6 | 82 | 82 | 2,347,000 | 531,533 | 26 | 6,378 | 0 | 925 | 1,025,000 | 0 | 0 | 0 | 100.0 | 22.6 |
| PABNA | 9 | 9 | 72 | 71 | 2,016,000 | 283,338 | 0 | 0 | 2 | 1,725 | 3,300,000 | 10,600 | 6,600 | 200 | 100.0 | 14.1 |
| PIRAJPUR | | 5 | | 4 | | 445,802 | 102 | 33,819 | 4 | 225 | 125,000 | 250 | 250 | 0 | | |
| RAJBARI | 4 | 3 | 42 | 29 | 865,000 | 178,061 | 37 | 7,831 | 16 | 1,025 | 1,200,000 | 2,500 | 400 | 200 | 75.0 | 20.6 |
| RAJSHAHI | 13 | 8 | 71 | 33 | 1,988,000 | 341,698 | 78 | 27,170 | 10 | 1,050 | 1,250,000 | 1,700 | 1,998 | 200 | 61.5 | 17.2 |
| RANGAMATI | 8 | 8 | 83 | 48 | 2,269,000 | 136,968 | 0 | 0 | 6 | 125 | 75,000 | 200 | 200 | 100 | 100.0 | 6.0 |
| RANGPUR | 8 | 6 | 83 | 28 | 2,269,000 | 44,053 | 0 | 0 | 1 | 3 | 50,000 | 200 | 200 | 100 | 75.0 | 1.9 |
| SARIATPUR | 6 | 6 | 68 | 68 | 986,000 | 787,621 | 153 | 38,385 | 47 | 1,850 | 1,625,000 | 1,150 | 1,050 | 400 | 100.0 | 79.9 |
| SERAJGONJ | 9 | 9 | 81 | 81 | 2,374,000 | 2,000,869 | 163 | 47,000 | 22 | 3,075 | 2,000,000 | 6,050 | 1,650 | 450 | 100.0 | 84.3 |
| SHERPUR | 5 | 5 | 51 | 51 | 1,179,000 | 338,568 | 0 | 0 | 6 | 625 | 700,000 | 5,000 | 700 | 200 | 100.0 | 28.7 |
| SUNAMGONJ | 10 | 10 | 83 | 83 | 1,802,000 | 800,000 | 0 | 0 | 5 | 425 | 475,000 | 200 | 200 | 200 | 100.0 | 44.4 |
| SYLHET | 11 | 11 | 97 | 87 | 2,281,000 | 57,500 | 0 | 0 | 0 | 125 | 200,000 | 0 | 0 | 0 | 100.0 | 2.5 |
| TANGAIL | 11 | 11 | 103 | 101 | 3,108,000 | 657,374 | 5 | 500 | 19 | 1,025 | 1,050,000 | 3,100 | 1,600 | 400 | 100 | 21 |
| TOTAL | 385 | 358 | 3,726 | 3,137 | 95,382,000 | 33,242,181 | 2,716 | 1,949,525 | 843 | 55,904 | 60,650,200 | 138,151 | 55,664 | 9,280 | 93.0 | 34.9 |

Source: Ministry of Disaster Management and Relief and Statistical pocketbook Bangladesh '97

**Table A3 — Labor Requirements per Acre (Man Days) in Aman Production Activities**

| Thana | Aman (HYV) Area Intensive Activities (AI) | Aman ( HYV) Production Intensive(PI) | Total Labor Requirements (man days) | Aman (Local) (AI) | Aman (Local) (PI) | Total Labor Requirements (man days) |
|---|---|---|---|---|---|---|
| All Thanas | 57.54 | 27.93 | 85.47 | 42.18 | 25.97 | 68.15 |
| Muladi | 55.62 | 26.75 | 82.37 | 36.75 | 22.63 | 59.38 |
| Madaripur | 55.25 | 25.75 | 81.00 | 44.00 | 26.40 | 70.40 |
| Mohammad-pur | 49.00 | 29.71 | 78.71 | 29.90 | 27.90 | 57.80 |
| Saturia | 64.50 | 28.10 | 92.60 | 54.40 | 26.70 | 81.10 |
| Derai | Not cultivated | NC | NC | 37.00 | 24.00 | 61.00 |
| Shibpur | 60.88 | 26.50 | 87.38 | 53.12 | 25.50 | 78.62 |
| Shahrasti | 60.00 | 30.75 | 90.75 | 40.11 | 28.67 | 68.78 |

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table A4 — Labor Requirements per Acre (Man Days) in Boro Production Activities**

| Thana | Boro (HYV) Area Intensive Activities (AI) | Boro (HYV) Production Intensive (PI) | Total Labor Requirements (man days) | Boro (Local) (AI) | Boro (Local) (PI) | Total Labor Requirements (man days) |
|---|---|---|---|---|---|---|
| All Thanas | 71.09 | 29.33 | 100.42 | 54.07 | 26.14 | 80.21 |
| Muladi | 68.71 | 27.14 | 95.85 | 33.00 | 18.00 | 51.00 |
| Madaripur | 66.43 | 28.71 | 95.14 | 0 | 0 | 0 |
| Mohammadpur | 64.00 | 29.00 | 93.00 | 65.00 | 29.00 | 94.00 |
| Saturia | 70.90 | 30.20 | 101.10 | 0 | 0 | 0 |
| Derai | 72.57 | 28.57 | 101.14 | 68.28 | 27.57 | 95.85 |
| Shibpur | 75.50 | 29.25 | 104.75 | 0 | 0 | 0 |
| Shahrasti | 79.55 | 32.44 | 111.99 | 50.00 | 30.00 | 80.00 |

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table A5 — Labor Requirements per Acre (Man Days) in Aus Production Activities**

| Thana | Aus (HYV) Area Intensive Activities (AI) | Aus (HYV) Production Intensive(PI) | Total Labor Requirements (man days) | Aus (Local) (AI) | Aus (Local) (PI) | Total Labor Requirements (man days) |
|---|---|---|---|---|---|---|
| All Thanas | 0 | 0 | 0 | 42.53 | 27.76 | 70.29 |
| Muladi | 0 | 0 | 0 | 36.75 | 27.25 | 64.00 |
| Madaripur | 0 | 0 | 0 | 45.56 | 24.78 | 70.34 |
| Mohammad-pur | 0 | 0 | 0 | 33.20 | 28.90 | 62.10 |
| Saturia | 0 | 0 | 0 | 62.14 | 27.86 | 90.00 |
| Derai | 0 | 0 | 0 | 0 | 0 | 0 |
| Shibpur | 0 | 0 | 0 | 0 | 0 | 0 |
| Shahrasti | 0 | 0 | 0 | 35.00 | 30.00 | 65.00 |

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table A6 — Labor Requirements per Acre (man days) in Rabi Crop Production Activities**

| Thana | Khesari Area Intensive Activities (AI) | Khesari Production Intensive (PI) | Total Labor Requirements (man days) | Mushuri (AI) | Mushuri (PI) | Total Labor Requirements (man days) |
|---|---|---|---|---|---|---|
| Muladi | 1.33 | 26.67 | 28.00 | 1.00 | 30.00 | 31.00 |
| Madaripur | 1.00 | 22.50 | 23.50 | 1.00 | 25.00 | 26.00 |
| Mohammad-pur | NC | NC | NC | 18.33 | 21.83 | 40.16 |
| Saturia* | 12 | 15.83 | 27.83 | - | - | - |
| Derai | - | - | - | - | - | - |
| Shibpur* | 15.00 | 18.33 | 33.33 | - | - | - |
| Shahrasti* | 17.00 | 18.00 | 35.00 | - | - | - |

Note: * for mustard

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table A7 — Labor Requirements per Acre (man days) in Rabi Crop Production Activities**

| Thana | Wheat Area Intensive Activities (AI) | Wheat Production Intensive (PI) | Total Labor Requirements (man days) | Jute (AI) | Jute (PI) | Total Labor Requirements (man days) |
|---|---|---|---|---|---|---|
| Muladi | 30 | 30 | 60 | 48 | 45 | 93 |
| Madaripur | - | - | - | 55 | 33.75 | 88.75 |
| Mohammad-pur | 15.75 | 32 | 47.75 | 39 | 41 | 80 |
| Saturia | - | - | - | 48 | 35 | 83 |
| Derai | - | - | - | - | - | - |
| Shibpur | **38 | **15 | **53 | 55 | 40 | 90 |
| Shahrasti | **30 | **20 | 50 | - | - | - |

Note: ** for potato

Source: Food Management and Research Support Project (FMRSP) Village Level Survey, '98

**Table A8 — Monthly GR Distribution from July to December, 1998**

('000 MT)

| Month | Rice | Wheat |
|---|---|---|
| July | 2.6 | 0.4 |
| August | 20.4 | 0.7 |
| September | 30.8 | 1.8 |
| October | 6.6 | 0.6 |
| November | 1.8 | 0.3 |
| December | 0.7 | 0 |
| Total | 62.9 | 3.8 |
| Total cereal | 66.7 | |

Source: Food Planning and Monitoring Unit (FPMU)

# APPENDIX B: QUESTIONNAIRE

*APPENDIX B.1:*

## Community Level Questionnaire

*District* ...../ _____ /

*Thana* ...../ _____ /

*Union* ...../ _____ /

*Date of visit* ...../ _____ /

*Name enumerator* ...../ _____ /

### *Characteristics of the Respondent*

| Code | Name | Occupation | Position in UP |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

(Key informants include: UP Chairman/ Secretary, Teacher, and businessman

## A. FLOOD OF 98

1. **Severity of the flood**
   - Day water started to flow above danger level...../ _____ /
   - Depth of flood water...../ _____ /
   - Percent of area affected...../ _____ /
   - Day the water started to recede...../ _____ /
   - Day expect the flood totally recede ...../ _____ /

2. **People affected**
   - Percent of people isolated...../ _____ /
   - Number of days isolated ...../ _____ /
   - People in shelters ...../ _____ /
   - Percentage of people eating once a day normal...../ _____ /
   - Percentage of people eating once a day during this flood...../ _____ /

3. **Infrastructure damages in this Union during the flood**

| Name | |
|---|---|
| Road/highway | |
| Bridge/culvert | |
| Irrigation canal | |
| Bazar/market | |
| Institution | |

4. **Priorities for the rehabilitation**
   1.
   2.
   3.

5. **Prospect for public work programs**

## B. GENERAL INFORMATION – Main respondent

6. **Population:**

| | Number | Affected | Percent |
|---|---|---|---|
| Total Pop | | | |
| Male Pop | | | |
| Households | | | |

7. **Religions (Islam, Hindu, others)**

8. **Migration pattern – Regular and due to the flood**

| | People moving out | People moving into the area |
|---|---|---|
| Long term (No) | | |
| Where | | |
| Short Term (No) | | |
| Where | | |
| When (Month) | | |
| During this flood | | |
| Where | | |

## C. ECONOMIC ACTIVITY and AGRICULTURE

9. **What are the major income earning opportunities in this UP? – List in order of importance**

| Before monsoon | During flood | After flood | Last year in the same time |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

Crop..... 1
Livestock..... 2
Poultry..... 3
Fisheries ..... 4
Industry ..... 5
Construction..... 6
Business/hotel ..... 7
Transport..... 8
Other..... 9

**10. What are the main sources of occupation and their wage rates? (Include value of food)**

| Before monsoon | | During flood | | After flood | | Last year in the same time | |
|---|---|---|---|---|---|---|---|
| Activity | Wage | Activity | Wage | Activity | Wage | Activity | Wage |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

Agriculture ..... 1
Livestock ..... 2
Poultry ..... 3
Fisheries ..... 4
Industry ..... 5
Construction ..... 6
Business/hotel ..... 7
Transport ..... 8
Small Trade ..... 9

**11. Land ownership access to land. Percent of households**

- Landless (0 – .5 acre) ..... / _____ /
- Small (.5 to 2.5 acre) ..... / _____ /
- Medium (2.5 to 5 acre) ..... / _____ /
- Large (more than 5 acre) ..... / _____ /

**12. Price for cultivable land per decimal**

Ask for the most recent transaction if there is no reference

- Rainfed low land ..... / _____ /
- Reinfed high land ..... / _____ /
- Irrigated low land ..... / _____ /
- Irrigated high land ..... / _____ /

**13. Percent of tenancy and cost of rent**

- Percent of land rented out ..... / _____ /
- Rent per decimal per year in Tk ..... / _____ /
- Share of crop (percentage) ..... / _____ /

**14. Irrigation**

- Percent of farm land irrigated ..... / _____ /
- Is irrigation easily available? (yes/no) ..... / _____ /
- Cost per acre feet
- Shallow tube well (Tk) per decimal ..... / _____ /
- Deep tube well (Tk) per decimal ..... / _____ /

**15. Cost of farming** After Before

Fertilizer Urea (Tk per 50 kg) ..... / _____ / ..... / _____ /

Fertilizer MP (Tk per mound) ..... / _____ / ..... / _____ /
Rent for Bullock per acre per plow ..... / _____ / ..... / _____ /
Power tiller per acre per plow daily ..... / _____ / ..... / _____ /
Seeds ..... / _____ / ..... / _____ /
Seedlings ..... / _____ / ..... / _____ /

**16. Agricultural practices – Number of crops a year. Usual and this year due to flood**

| | One crop | Two crops | More than two |
|---|---|---|---|
| Usual percentage (upto June) | | | |
| Usual crops (list 3 in order of importance) | 1. 2. 3. | 1. 2. 3. | 1. 2. 3. |
| This year (from June to June) | | | |
| This year crops (list 3 in order of importance | 1. 2. 3. | 1. 2. 3. | 1. 2. 3. |

Rice Amon ..... 1
Rice Boro ..... 2
Rice Aus ..... 3
Potatoes ..... 4
Mustard /oil seeds ..... 5
Sugar cane ..... 6
Vegetables ..... 7
Jute ..... 8
Wheat ..... 9
Pulses ..... 10

**17. Existence of Facilities like**

| | Before flood | During flood | After flood | Last year same time |
|---|---|---|---|---|
| Poultry farm (No) | | | | |
| Plant nursery(No) | | | | |
| Fish hatchery(No) | | | | |
| Commercial fish farm(No) | | | | |

**18. Agricultural wage rate**

| | Before flood | During flood | After flood | Last year same time |
|---|---|---|---|---|
| Man No food | | | | |
| Man Food | | | | |
| Woman food | | | | |
| Woman no food | | | | |

## D. INFRASTRUCTURES

**19. Communication from UP**

| | Distance | Days not accessible | Time Minutes | Type of road | Mode of communication | Total Cost |
|---|---|---|---|---|---|---|
| Thana Dry | | | | | | |
| Thana wet | | | | | | |
| Thana flood | | | | | | |
| District HQ | | | | | | |
| | | | | | | |
| | | | | | | |

Car..... 1
Rickshaw..... 2
Baby taxi..... 3
Bus ..... 4
Truck..... 5
Train..... 6
Launch ..... 7
Other ..... 8

**20. Which markets are available to the people of the community to buy and sell goods?**

| | If yes then write the number | If not then the nearest institution's distance in km and minimum time in minutes with common mode of transport | | Days not available during the flood |
|---|---|---|---|---|
| | | km | Minutes | |
| Village Shop | | | | |
| Weekly market | | | | |
| Bazar | | | | |
| Union Parishad Shop | | | | |
| Fertilizer shop | | | | |
| | | | | |
| | | | | |

**21. Water – Main three sources of drinking water**

| | First source | Second source | Third source |
|---|---|---|---|
| Source | | | |
| Percentage of households | | | |
| Quality of water | | | |
| Cost of water? Tk. | | | |
| Who pays? | | | |
| Distance from source (K) | | | |
| Reliability of supply (1, . . . 3) | | | |
| Days not available due to flood | | | |

**22. Primary source and type of latrine**

| | First source | Second source | Third source |
|---|---|---|---|
| Source | | | |
| Percentage of households | | | |
| Days not available due to flood | | | |

**23. Electricity**

- Are the villages w/ electricity? (Yes, No)...../ _____ /
- Current number of connections..... _____ /
  - Domestic use...../ _____ /
  - Non domestic use (Industrial and Business)...../ _____ /
- Average cost per month per household...../ _____ /
- Percent of people not receiving due to flood ...../ _____ /
- Number of days connections lost due to flood...../ _____ /

**24. Telephone**

- Any telephone available (Yes, No)...../ _____ /
- If not what is the distance from nearest ...../ _____ /
- Days not available due to the floods ...../ _____ /

**25. Source of cooking fuel**

| | First source | Second source | Third source |
|---|---|---|---|
| Source | | | |
| Percentage of households | | | |
| Average cost per month | | | |
| Days not available due to flood | | | |

## E. SOCIAL INFRASTRUCTURE

**26. Availability of health facilities**

| | If yes then write the number | If not then the nearest institution's distance in km and minimum time in minute | | Days not available during the flood |
|---|---|---|---|---|
| | | km | minute | |
| Govt. Hospital | | | | |
| Rural health center | | | | |
| Satellite clinic (?) | | | | |
| Family planning | | | | |
| Private hospital | | | | |
| Private Clinic | | | | |
| Private Doctor | | | | |
| Pharmacy | | | | |
| Immunization center | | | | |
| NGO primary HCC | | | | |
| Maternity and child center | | | | |
| | | | | |

Discuss: Problems with the health facility

- quality of service
- cost
- availability of doctors
- availability of medicines
- distance
- time wated for service
- others

**27. Drainage**

| | Normal | This flood |
|---|---|---|
| Service provisions & maintenance | | |
| Is there any drainage system in this village | | |
| Is drainage a problem? Extent of problem | | |
| Comments | | |

**28. Availability of education facilities in the UP**

| | Number of facilities available | Nearest Distance (in km) | Time to get there in minutes | |
|---|---|---|---|---|
| | | | Dry | Monsoon |
| Primary | | | | |
| Secondary (both) | | | | |
| Secondary (boys) | | | | |
| Secondary (girls) | | | | |
| Collage | | | | |
| Madrassa & Islamic foundation | | | | |
| NGO/non-formal | | | | |
| Adult education center | | | | |
| Comments | | | | |

**29. List all the schools primary and secondary in which the people are enrolled**

| Name of Institution | Type: Govt.-1 Govt. aided-2 Private-3 NGO-4 | For Boys-1 Girls-2 Coeducation-3 | Highest Class year code | Lowest class year code | No. of Students Currently enrolled | No. of Shifts | Year of Establishment | Teaching hour per class per week | Open now? Yes 1 No 2 | Total no. of weeks closed during the flood |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**30. Complains and problems with the school due to flood**

**31. Non formal/ non government organization's Credit system**

*Are the following credit facility available in this village*

| | Facility available Yes/No | Number | Interest rate | Nearest Distance (in km) | Available during Flood |
|---|---|---|---|---|---|
| Mohajan of the own village | | | | | |
| Mohajan of the other village | | | | | |
| Trader (agri input seller) | | | | | |
| Large farmer | | | | | |
| Input system (Forward sale) | | | | | |
| NGO | | | | | |
| Other | | | | | |

**32. Availability of other facilities**

| | If yes then write the number | If not then the nearest institution's distance in km and minimum time in minute – Usual mode of trnsport | | Days not available during the flood |
|---|---|---|---|---|
| | | km | Minutes | |
| Krishi Bank | | | | |
| Commercial bank | | | | |
| Grameen Bank | | | | |
| Hat Bazar | | | | |
| Veterinarian | | | | |
| LSD | | | | |
| Club | | | | |
| Cinema | | | | |
| Community center | | | | |
| Shelter | | | | |
| Post office | | | | |
| Police station | | | | |
| Fertilizer deposit | | | | |

## F. PROGRAM INTERVENTION

**33. Programs and people covered**

| | Last year | People participating | At this time | People participating |
|---|---|---|---|---|
| FFW (Project) | | | | |
| FFE | | | | |
| VGD | | | | |
| Farmers coop Society | | | | |
| BSS (Shomobai) | | | | |
| VGF (Given) | | | | |
| GR | | | | |
| TR | | | | |
| | | | | |
| Emergency distribution | | | | |
| - Food | | | | |
| - Clothes (Sharee) | | | | |
| - Clothes (Lungi) | | | | |
| - Cash | | | | |

## G. PRICES – To be collected at two different points

**34. Price of essential commodities**

| Commodity | Now | | | | Before Flood | After Flood |
|---|---|---|---|---|---|---|
| | Market 1 | Time | Market 2 | Time | | |
| | | | | | | |
| Rice | | | | | | |
| Wheat | | | | | | |
| Atta (Good quality) | | | | | | |
| Atta (Bad quality) | | | | | | |
| Onions | | | | | | |
| Potatoes | | | | | | |
| Eggplants | | | | | | |
| Mustard oil | | | | | | |
| Soybean oil | | | | | | |
| | | | | | | |

**35. Quality and availability of Rice (in market)**

Name ..... / _____ /

Type of rice ..... / _____ /

## *APPENDIX B2 :*

### *FOCUS GROUP: WOMEN / LANDLESS / FARMERS*

**Place** ...../ _____ /
**No. of people present** ...../ _____ /
**Time of start** ...../ _____ /
**Time of Finish** ...../ _____ /

### A. EXTENT OF FLOOD IN 1998 – [ALL]

1. Effect on people – Death and isolation
2. Effect on homes – habitable refuge to shelter
3. Effect on agriculture and fields
4. Effect on fish ponds
5. Effect on poultry an livestock
6. Effect on communications - isolated
7. How different from other year and from 1988
8. Migration due to flood

### B. PERCEPTION OF POVERTY AND VULNERABILITY – [ALL]

1. Who are the poor and the vulnerable in your community?
2. Why are they poor?
3. Who has been affected more by the flood and why
   - Children
   - Women and mothers

### C. ECONOMIC SECURITY - [ALL]

1. Usual sources of income – Non Farm activities
2. Availability of these during the flood and in the coming weeks
3. Which kind of work can you find and where
4. Estimate loss of revenue
   - Days of work lost
   - Agricultural output lost
   - Business lost
5. Loss of assets
   - Loss of business assets
   - Loss of cattle
   - Loss of chickens
   - Loss of Fish
6. Coping strategy
   - Distress sales (which assets)
   - Borrowing (formal and informal)
   - Borrow from friends and relatives
   - Change diet
   - Begging

- Formal safety nets
- Migrated to other parts of the country
- From whom did you seek help
- Prospects for the future

**D. AGRICULTURE – [Farmers]**

1. Extent of damage to inputs (seeds, seedlings)
2. Loss of Aush
3. Loss of Tamon/Bamon
4. Crop diversification
   - Prospects for next season
   - Alternative crops

**E. FOOD SECURITY – [ALL]**

1. Do people have enough to eat all the time
2. Number of meals a day
3. Prices of essentials
   - Which commodities were available?
   - Which prices went up and which went down
4. What foods are eaten – Change in diet
5. Availability of cooking
6. How is food shared among family members
   - Who eats first
   - Who decides who eats first
7. What did you do if you did not have anything to eat?

**F. HEALTH SECURITY – [W]**

1. Impact on sanitation
   - dispose of waste
2. Availability of drinking water
   - How did you manage
3. Most common illness
   - Causes
   - Was treatment available
   - How different from usual situation
   - Cost

**G. HABITAT SECURITY – [ALL]**

1. Impact of flood on home
2. Use of shelter/ Make shift home
3. Estimated cost of repair

## H. COMMUNITY PARTICIPATION – [ALL]

1. What has the community done to help you
2. Combined effort
3. Has the flood affected the work of NGOs

## I. EFFECTIVNESS OF RELIEF OPERATIONS – [ALL]

1. Flood Warning
2. Amount of resources received
3. Timing of resources received
4. From whom were the resources received
5. Were allocated fairly?
    - Complaint in distribution
    - Type of FFW programs

## H. COMMUNITY GOVERNANCE – [ALL]

1. Role of UP chairman
2. Role of political parties
3. Role and functioning of NGOs

## I. SUMMARY OF NEEDS AND PRIORITIES – [ALL]

1. Most important issues in the rehabilitation
    - Roads
    - Markets
    - Agricultural inputs
    - Food assistance

## APPENDIX B3 :

**FMRSP PROJECT**
VILLAGE LEVEL QUESTIONNAIRE

Village Name: _____

1. In this village, is there any shortage of Agricultural wage labor?

(yes=1, no=2)

If yes, which month? _____For which Activity?_____

How is the shortage of labor met? _____

Does the labor come from other another district?_____

Does the wage labor of this villages go to other areas for work ?
Within three miles : Local

2. Unemployment and wage rate of agricultural labor

| Months | Unemployment | Wage rate per day | |
|---|---|---|---|
| | No. of days worked | Money wage with food (Tk.) | Real wage (Rice in Kg.) |
| 15 April - 14 May | | | |
| 15 May - 14 June | | | |
| 15 June - 14 July | | | |
| 15 July - 14 August | | | |
| 15 Aug - 14 Sept | | | |
| 15 Sept - 14 Oct | | | |
| 15 Oct - 14 Nov | | | |
| 15 Nov - 14 Dec | | | |
| 15 Dec - 14 Jan | | | |
| 15 Jan - 14 Feb | | | |
| 15 Feb - 14 Mar | | | |
| 15 Mar - 14 April | | | |

3. Labor requirements per acre (days)

| Activities | Boro | | Aus | | Aman | | Rabi | Other |
|---|---|---|---|---|---|---|---|---|
| | HYV | Local | HYV | Local | HYV | Local | | |
| Land Preparation, Ploughing, Raking, weeding, broadcasting/ transplanting | | | | | | | | |
| Harvesting, threshing, carrying from fields to households | | | | | | | | |

4. No. of Households in Agricultural and Non-agricultural Activities (based on major source of income)

| Occupation | Nos of people involved | Days worked during flood (Sept.-Oct.) | Situation (increase/ decrease) (Oct-Dec) 1998 | (Oct-Dec) 1997 |
|---|---|---|---|---|
| Agricultural Wage Labor | | | | |
| Fisherman | | | | |
| Blacksmiths | | | | |
| Porters | | | | |
| Weavers | | | | |
| Boatmen | | | | |
| Rickshaw pullers / Van | | | | |
| Milkman | | | | |
| Doctor/Kabiraj | | | | |
| Mason | | | | |
| Service holder | | | | |
| Rice mill Owners | | | | |
| Traders | | | | |
| a) Grain | | | | |
| b) Jute | | | | |
| c) Stationary | | | | |
| d) medicine | | | | |
| e) fertilizer | | | | |
| f) others | | | | |

Question 4 (Continued):

Landless labor
On Farm
Off Farm
Non Farm

5. Female Wage Employment

No. of Female headed households: _____

No. of Female Wage Labour: _____

| Activity | Wage rate |
|---|---|
| 1. | |
| 2. | |

Share of female labor in total hired labor: _____

6. Mode of Labor Sales in the Village:

Casual: _____, Contract: _____, Permanent: _____

Exchanged: _____

(Please mention if possible no. and % of total hired labor)

7. Horizontal Mobility

No. of Female and Male Workers by Job Changes with same type of job:

From labor to Self Employed : _____

Name Of Activity: _____ No. of Male Labor:_____

Name of Activity_____ No. of Female Labor---------

From self-employed to Labor: _____

Activity_____ Male Labor (No.)_____
Female Labor(No.) _____

8. Upward Occupational Mobility:

No of Workers received training:

Male _____ Activity _____ By Whom_____

Female_____ Activity_____ By whom_____

From labor to self employed using training:

No. of Males_____ Activity_____
No. of Males_____ Activity_____

No. of Females_____ Activity_____
No. of Females_____ Activity_____

9. Is there any construction work on new earthen roads by FFW in your village? (Yes/ No).

a) If yes, do your think, it has an effect on

Increase of waterlogging area? (Yes/ No)

Increase of fallow land ? (Yes/ No)

recession of flood water ? (Yes/ No)

b) Were there some parts of earthen road been destroyed due to flood ? (Yes/ No).

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**Ministry of Food, Government of the People's Republic of Bangladesh**

International Food Policy Research Institute

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