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Flood Action Plan

North West Regional Study (FAP-2)

# DRAFT FINAL REPORT



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# SOCIAL IMPACTS



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# INTRODUCTION

## Scope of this Report

In the following chapters a number of sociological issues are addressed. They follow the terms of reference of the study with emphasis on the following main features:

- Flood survival strategies of communities;
- Community consultation and participation;
- Social impacts of proposed options;
- Institutional aspects especially Operation and Maintenance.
- The role of women in floods.

Chapter One deals with national, regional and Gaibandha Improvement Project demographic and socio-economic features. It looks especially at what makes the area chosen for the improvement project a deserving case for special consideration in terms of flood action planning.

The second chapter looks at community profiles throughout the northwest region. Its concern is how communities perceive floods and what their attitudes to them are. It highlights the community need for water as well protection from it when it attempts to destroy lives and crops.

The third chapter deals with gender issues concentrating on women's perceptions and attitudes to floods and the problems they bring in their wake. It also permits women to give a value to flooding problems in terms of development issues generally.

Chapter four summarises in detail the survival strategies of communities before, during and after flooding has occurred. It does it from the standpoint of different types of communities.

In the fifth chapter the issue addressed is public consultation and participation. It examines the rationale behind the process and the methodology utilised. It also attempts to look at the future of such processes. The actual results of the process, community and official, are contained in appendix one.

Finally chapter six looks at social impacts of proposed options. To do so it uses existing FCD/I schemes in an attempt to derive some way of evaluating options. It looks at the implications of options in terms of social disruption, fisheries and agriculture and nutrition.

It should also be pointed out here that this sociological section is also utilised in determining positive and negative impacts on human populations for environmental impact analyses. The value placed on these impacts will be found in the matrices in the environmental impact assessment.

## Conclusions of the Study

A number of general conclusions from the study are summarised as follows:

- Communities want some protection from floods and have always done so;

- Communities and union level officials want flood protection that does not impede the entry of normal levels of water to the floodplain and internal rivers and khals since they need this valuable resource for agriculture, fisheries and river transportation;

- Protection from floods is seldom the highest priority of the communities ; this is very often better health facilities, access to land and credit and local employment opportunities;

- Community breaching of embankments (known locally as public cuts) is only carried out when villagers'lives and property are threatened and then only as a last resort:

- Communities want to operate and maintain both existing embankments and any new ones which are proposed but do not have the resources to do so;

- Public consultation and participation are highly welcomed in the communities and need to be institutionalised and expanded if flood control measures are to have longterm impact;

- Women play a vital role in flood preparation and survival strategies and should be consulted and utilised in any flood action planning;

- In every survey and rural appraisal there was a high degree of support for properly sealing the embankments on the major rivers Brahmaputra and Teesta;

- The embankments on the major rivers now have permanent communities living on them and planning should include a provision that caters for their needs;

- Landless families especially on the chars and embankments are under considerable stress due to the absence of male household heads who migrate for work for large parts of the year.

These general conclusions will be expanded upon in the following chapters based on sociological analysis of information communities, officials and individuals have given to field workers during structured interviews, rural appraisals and public participation meetings. This forms the public **persona** of the NWRS rather than the hydrological and engineering **persona** derived from models, concepts and academic definitions of flooding and its consequences.

## Methodology

The NWRS has focused its sociological attention on a number of distinct geographical areas and for reasons of time and human resources these have been to the exclusion of other areas. But there is a logic to this process since the flood action plan study in general is about problems facing communities and it is to those communities facing the severest problems that most attention has been paid. This choice coincides with the work being done by FAP2 engineers, hydrologists, soil scientists etc., etc., who were also constrained by the time available for the study and what personnel the budget would permit.

For these reasons the reader will find that the work mainly concentrates on Gaibandha, Chalan Beel and its surrounds, the villages along the Karatoya and Bangali and naturally the communities living on or near the main embankments of the Brahmaputra and the Teesta. These are areas with particular flooding problems which are severe.

On a more specific issue the villages were selected both purposively and randomly. When a village in a particular flood situation was required the general area of such a situation was selected purposively but when the field workers arrived in the area they walked along village roads until a meeting could be arranged or interviews held in the first village randomly arrived at. In other cases on a transactional walk along village roads or embankments villagers would be asked where the severe flood problems were and the field workers would go to that location.

Often the starting point at the junction of the main road and the village road was a matter of telling the driver to stop when one was sighted. In this situation the field workers had no idea when they left Dhaka which village they would find themselves in with their questionnaires and checklists for rural appraisals.

The exception when the process was purely purposive were the public participation meetings held in the Gaibandha Improvement Project (GIP) area. Prior to doing the fieldwork the various disciplines of the FAP2 team were asked to select a village or community which represented a particular flooding or hydrological problem that they were attempting to deal with. Meetings were then pre-arranged in these sites to ensure good participation by local people. But even these were supplemented by random transactional walks through the same area when farmers or fishermen were interviewed as they worked. In one situation the field workers hired a boat on the spur of the moment and were rowed into the middle of a beel where they interviewed the crew of a fishing boat.

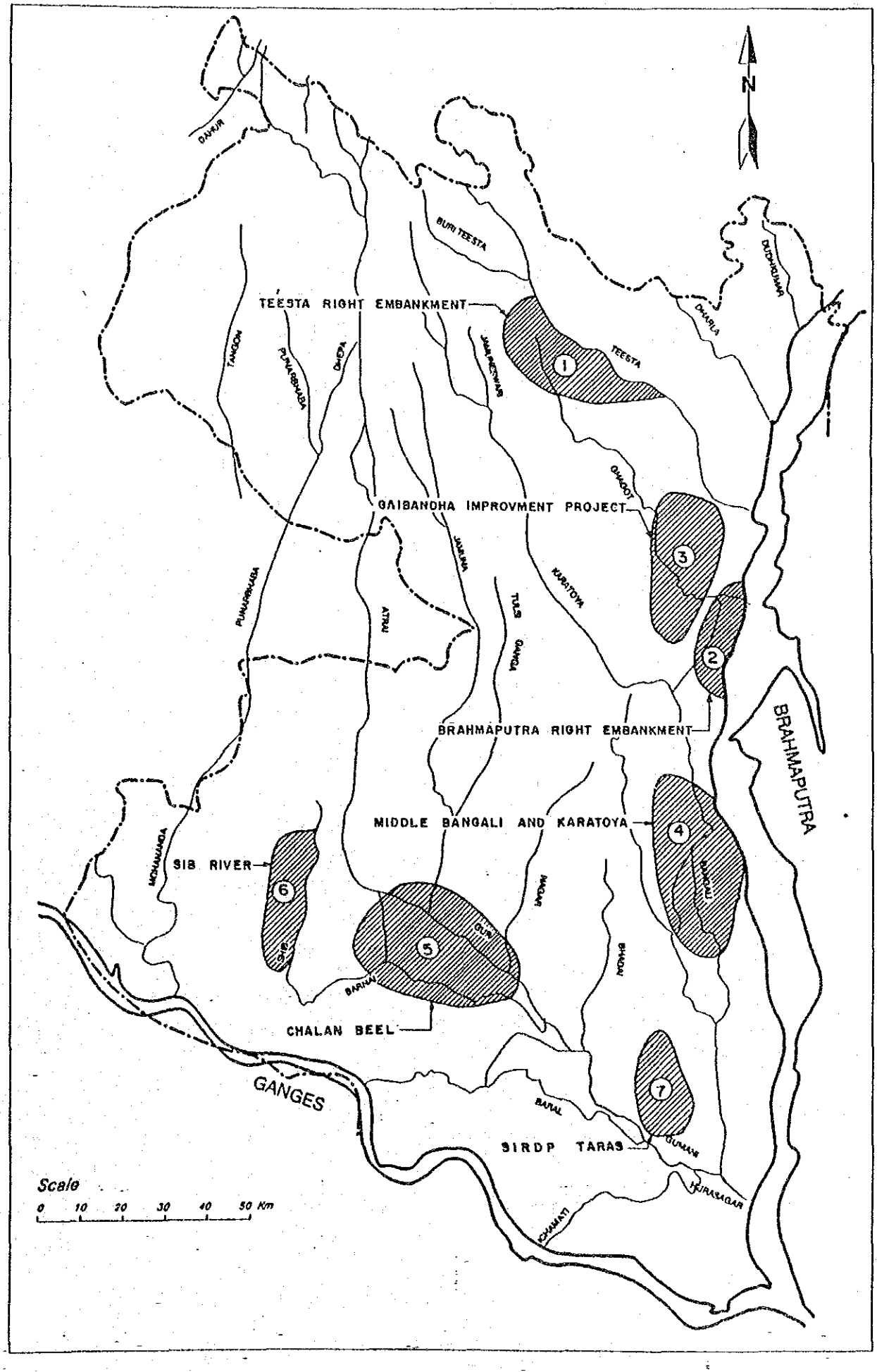
The fieldwork techniques were a combination of structured questionnaires, rapid rural appraisals, pre-arranged village meetings, random transactional walks and meetings with officials at district, thana and union levels. In the structured questionnaires women as well as men were the respondents to ensure against gender bias. In some cases women were exclusively interviewed for special studies of women in floods. In nearly all locations where structured questionnaires were used a rapid rural appraisal was carried out later to fill in any gaps in knowledge and also to ask open-ended questions about community flood situations.

Structured Questionnaires were carried out in the following locations (Figure 1)

| Village | Union | Thana | Survey Area |
|---|---|---|---|
| Sadra Taluk | Tepa Madhupur | Kaunia | 1 |
| Rahmatchar | Tambalpur | Pirgacha | 1 |
| Tambalpur | Tambalpur | Pirgacha | 1 |
| Dhutipara | Gideri | Gaibandha | 2 |
| Faliarghop | Kamarjani | Gaibandha | 2 |
| Rahmatpur | Fazlepur | Phulchari | 2 |
| Par-Diara | Fazlepur | Phulchari | 2 |
| Hussainpur | Hussainpur | Palashbari | 3 |
| Zafar | Hussainpur | Palashbari | 3 |
| Mahishbandi | Rasulpur | Saidullahpur | 3 |
| Kumargani | Ghagoa | Gaibandha | 3 |
| Kismat Malibari | Malibari | Gaibandha | 3 |
| Hatia | Dhopadanga | Sundarganj | 3 |
| Taluk Ramvadra | Sarbananda | Sundarganj | 3 |
| Taluk Bajit | Sarbananda | Sundarganj | 3 |

Figure 1

# SOCIO-ECONOMIC SURVEY AREAS



| Village | Union | Thana | Survey Area |
|---|---|---|---|
| Titparal | Sariakandi | Sariakandi | 4 |
| Gajara | Sariakandi | Sariakandi | 4 |
| Chillipara | Karnibari | Sariakandi | 4 |
| Mathurapara | Karnibari | Sariakandi | 4 |
| Saghal | Chankibari | Dhunot | 4 |
| Ghoshgram | Gona | Rainagar | 5 |
| Chaugram | Chaugram | Singra | 5 |
| Sultanpur | Sripur | Bagmara | 6 |
| Sripur | Sripur | Bagmara | 6 |
| Ramrama | Boalhanki | Bagmara | 6 |
| Khubjipur | Biaghat | Guraduspur | 7 |
| Ishwarpur | Saguna | Taras | 7 |
| Naokhadi | Saguna | Taras | 7 |

Rapid Rural Appraisals were carried out at

| Village | Union | Thana | Survey Area |
|---|---|---|---|
| Mohipur | Lakshimitari | Gangachara | 1 |
| Kachua | Nawhali | Gangachara | 1 |
| Mohonpur | Benail | Birampur | - |
| Katlaghat | Katla | Birampur | - |
| Ghoraghat | Ghoragat | Ghoraghat | - |
| Manush Mera | | Chilmari | 3 |
| Mathurapara | Karnibari | Sariakandi | 4 |
| Chillipara | Karnibari | Sariakandi | 4 |
| Jagonathpur | Gurkha | Raiganj | 4 |
| Beelgazaria | Bahalia | Sirajganj | 4 |
| Chaubaria | Khanpur | Sherpur | 4 |
| hubgacha | Kamarkandi | Sherpur | 4 |
| Kaludanga | Nepaltoli | Gabtoli | 4 |
| Antarpara | Sariakandi | Sariakandi | 4 |
| Bujruk | Shapgram | Bogra Sadar | 4 |
| Purbo Laxmikola | Dhangora | Raiganj | 4 |
| Roua | Dhangora | Raiganj | 4 |
| Sultanpur | Kagoil | Gabtoli | 4 |
| Kalinja | Pangasi | Raiganj | 4 |
| Chakanadamur | Pangasi | Raiganj | 4 |
| Raisinghapur | Piprul | Nator | 5 |
| Sadar Nagar | Singra | Singra | 5 |
| Srikhanda | Kamargram | Tanor | 6 |
| Ekdala | Gonipur | Bagmara | 6 |
| Sultanpur | Sripur | Bagmara | 6 |
| Bagshimul | Mohanpur | Mohanpur | 6 |
| Chanchkhoir | Guraduspur | Guraduspur | 7 |
| Ulipur | Taras | Taras | 7 |

Transectional Surveys were held at a number of location including

| | Survey Area |
|---|---|
| Brahmaputra Left Embankment - Bhuapur | - |
| Teesta Right Embankment - Painalghat | 1 |
| Brahamputra Right Embankment - Manos Regulator | 2 |
| Sonail Embankment - Boalia | 2 |
| Sonail Embankment - Gaibandha | 2 |
| Alai Left Bank - Pearapur | 2 |
| Tepa Madhupur near Maramanos Khal | 3 |
| Ghagot Right Bank - Bholanjor Union | 3 |
| Atrai River - Guraduspur to Singra | 5 |
| Chalan Beel - Halti Beel | 5 |
| Chalan Beel - Polder D | 6 |
| Sib River Right Bank | 6 |
| Taras - Taras Embankment | 7 |

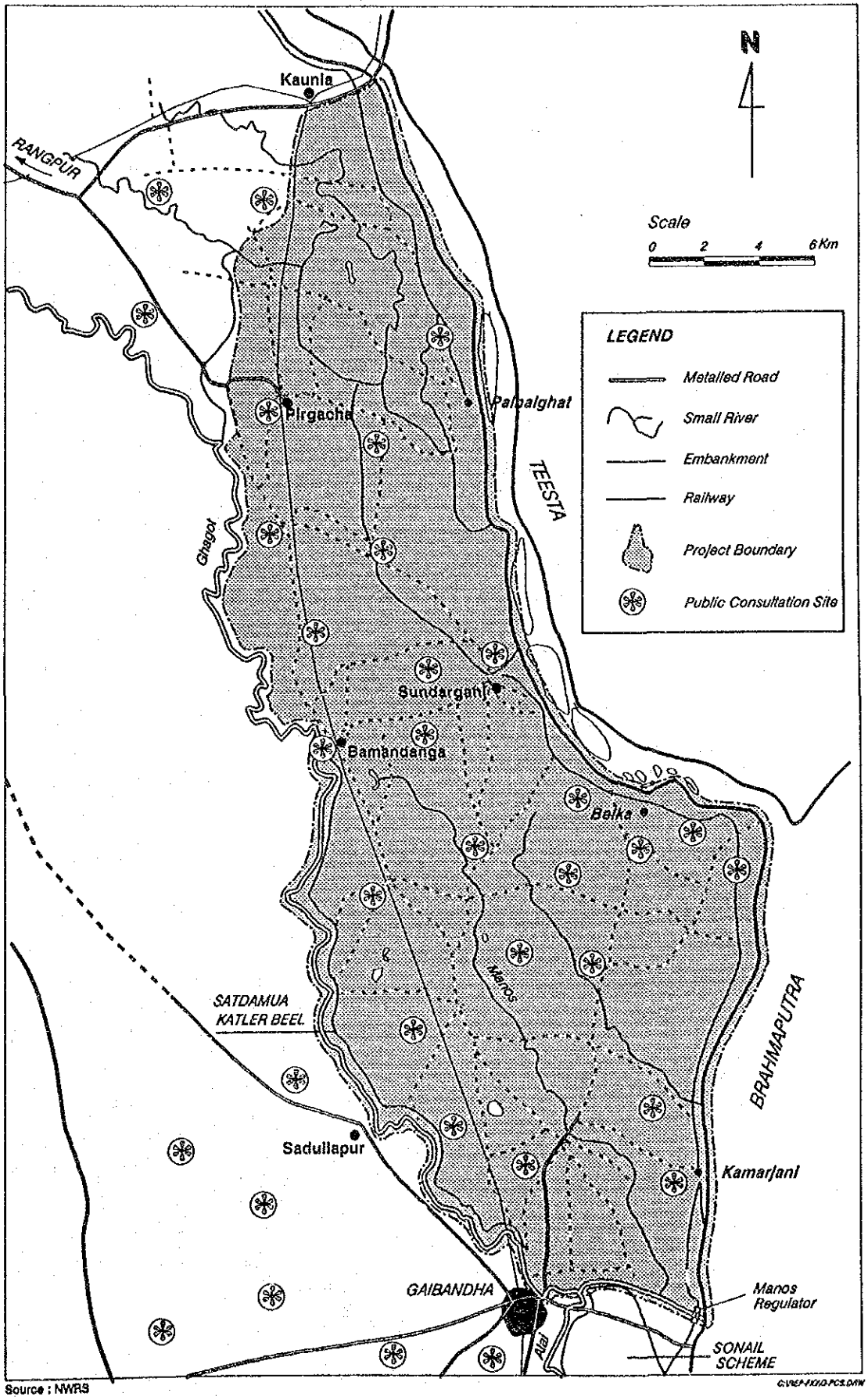
Village Meetings for public consultation were particularly concerned with the Gaibandha Improvement Project and were held at the following locations.

| Village | Union | Upazila |
|---|---|---|
| Rupa Bazaar | Ghagoa | Gaibandha |
| Salai Idgah | Banagram | Saidullahpur |
| Uttar Dakshin | Banagram | Saidullahpur |
| Manduwar | Banagram | Saidullahpur |
| Rasulpur | Kanchipara | Gaibandha |
| South Gideri | Gideri | Gaibandha |
| North Gideri | Gideri | Gaibandha |
| Janpar Shimultola | Sarbananda | Sundarganj |
| Taluk Ramvadra | Sarbananda | Sundarganj |
| Kandikabila | Kandi | Pirgacha |
| Bamanjal | Dahabanda | Sundarganj |
| Kumargani | Ghagoa | Gaibanda |

In additions meetings were held with local government and agency officials in Gaibandha and the thanas within the Gaibandha project area. these are fully described in Appendix 2. Sites where consultations were held are shown in Figure 2.

Figure 2

# PUBLIC CONSULTATION SITES




Source : NWRS

# CHAPTER 1

# DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS IN THE NW REGION

## 1.1 Regional Demography

According to the unadjusted census returns for 1991 out of a national population of nearly 108 million people the northwest region comprised just over 23 percent of the total; in numerical terms the estimated size was 25,432,000 millions. The annual linear growth rate was calculated at 2.01 percent. With a population density of 751 per square kilometre it was below the national figure which was estimated to be 781 per square kilometre.

Table 1 compares the national picture between 1981 and 1991:

**Table 1 National Demographic Characteristics 1981-1991**

| Item | 1991 | 1981 |
|---|---|---|
| No. of households | 19.7m | 15.1m |
| Population | 108m | 89.9m |
| Male | 55.6m | 46.3m |
| Female | 52.4m | 43.6m |
| Av. Household Size | 5.31 | 5.78 |
| Sex Ratio | 106.1 | 106.4 |
| Literacy rate (all ages) | 24.82 | 19.70 |
| Population Density, (persons sq. km) | 781 | 624 |

By division (Rajshahi division is the NW Region) the key indicators in 1991 were as follows:

**Table 2 Key Indicators by Division 1991**

| Location | Area Sq.Km (000) | House holds (000) | Popu lation (000) | Hh Size | Literacy All ages | Density Sq. km. |
|---|---|---|---|---|---|---|
| Bangladesh | 134 | 19,617 | 104,766 | 5.34 | 24.82 | 781 |
| Rajshahi | 33 | 4,923 | 25,432 | 5.17 | 20.47 | 751 |
| Khulna | 28 | 3,715 | 19,966 | 5.37 | 20.47 | 714 |
| Dhaka | 30 | 6,220 | 32,270 | 5.19 | 27.83 | 1,070 |
| Chittagong | 42 | 4,758 | 27,096 | 5.69 | 25.83 | 640 |

(The above figures are based on unadjusted Census returns)

Table 3 presents a comparative picture of the various districts comprising the northwest region.

**Table 3 Population by District NW Region, 1991.**

| Location | Area Sq.Km (000) | House holds (000) | Popu lation (000) | Hh Size | Literacy All ages | Sex Ratio M/F | Density Sq. km. |
|---|---|---|---|---|---|---|---|
| NW Region | 35,592 | 4,923 | 25,431 | 5.17 | 20.47 | 105.1 | 751 |
| Panchagarh | 1,405 | 138 | 696 | 5.04 | 23.65 | 105.5 | 495 |
| Thakurgaon | 1,774 | 189 | 978 | 5.16 | 21.61 | 106.5 | 551 |
| Dinajpur | 3,438 | 429 | 2,182 | 5.08 | 22.45 | 106.6 | 634 |
| Nilphamari | 1,641 | 264 | 1,339 | 5.06 | 17.00 | 106.0 | 816 |
| Lalmonirhat | 1,241 | 181 | 920 | 5.08 | 18.21 | 106.1 | 741 |
| Rangpur | 2,300 | 422 | 2,107 | 4.98 | 20.64 | 106.2 | 916 |
| Kurigram | 2,237 | 307 | 1,557 | 5.07 | 17.32 | 101.7 | 696 |
| Gaibandha | 2,179 | 379 | 1,855 | 4.89 | 18.35 | 102.0 | 851 |
| Joypurhat | 965 | 152 | 736 | 4.83 | 23.44 | 107.4 | 763 |
| Bogra | 2,659 | 516 | 2,565 | 4.96 | 22.04 | 105.5 | 964 |
| Naogaon | 3,418 | 404 | 2,058 | 5.09 | 21.95 | 103.8 | 602 |
| Natore | 1,883 | 244 | 1,296 | 5.30 | 20.43 | 105.2 | 688 |
| Nawabganj | 1,602 | 196 | 1,146 | 5.85 | 17.63 | 102.8 | 715 |
| Rajshahi | 2,026 | 360 | 1,882 | 5.22 | 23.43 | 104.9 | 929 |
| Sirajganj | 2,455 | 412 | 2,243 | 5.44 | 18.42 | 105.8 | 918 |
| Pabna | 2,369 | 323 | 1,863 | 5.77 | 20.86 | 107.0 | 786 |

(BBS : 1991)

North West Region has a population of over 25 million people, in an area of some 36 thousand square kilometers. The region is essentially a rural one. Although it has 25 urban municipalities, the total population of these is only 1.752 million, in an area of 465 sq. km. The urban centres with more than 100,000 people are Dinajpur (126), Naogaon (101), Nawabganj (121), Pabna (104), Rajshahi (300), Rangpur (203) and Sayedpur (102).

Increases in population put pressure on land and this has consequences for flood action planning since land becomes fragmented under such pressure making the acquisition of it for flood control purposes difficult. A rich peasant with over ten acres is far more likely to be willing to sell a few bighas for an embankment or a berm than is a marginal farmer who is trying to make a living from one acre.

Jansen (1987) demonstrated that at the start of the twentieth century there was one person per acre of rural land while now the figure is four and may rise as high as eight per rural acre by the year 2000. At liberation from Pakistan very few families owned no farm land while nearly twenty years later one observer (Monan 1990) claimed that although the official statistic for the landless was 62 percent a more realistic observation might be nearer 75 percent.

In the NW region the population has increased by over four millions between 1981 and 1991 forcing population density up over the same period from 630 to 751 per square kilometre (BBS July 1991). While population growth in the northwest region has contributed to pressure on land it is also true that for flood action planning purposes the disappearance of land into the Brahmaputra and Teesta also creates problems.

Increases in population density can also create problems when planning for flooding contingencies of a non-engineering nature. Resettlement costs if calculated on a reasonable basis for house and homestead garden will increase if humanitarian considerations are fully taken into account. One of the problems of impoverished communities generally is a lack of space. Both the FAO (1974) and WHO (1981) highlighted this issue.

The WHO study found that in 34 percent of village households only one room was the residential space for a family of average size 6.6 members. In the FAO study which was carried out longitudinally between 1952 and 1974 the population had increased by 58 percent yet the land utilised for non-agricultural purposes had risen by only one percent.

## 1.2 Socio-Economic Features of the North-West Region

The thana Development Monitoring Project gathered information on socio-economic and development indicators for a national sample of thanas (formally called upazilas). Eleven in NWR have been studied, and their key features (in 1989) are shown in Table 4.

### *Housing and Drinking Water*

The great majority of housing in the sample thanas is of "katcha" construction, using no permanent materials such as brick or concrete. Water supply shows more variation. In Khetlal thana in Joypurhat, virtually all drinking water comes from tubewells, while in Pirganj in Thakurgaon, one third of homes rely on traditional wells.

### *Literacy and Economic Activity*

Literacy rates vary considerably between the thanas, with Shibganj in Nawabganj Zila having less than 17%, compared with 37% in Naogaon, the highest performing area. In all areas, women fare substantially worse than men, and there is very considerable variation. In Chawhali in Sirajganj, less than 10% of women are literate, while in Ishwardi in Pabna one third have attained this stage.

The refined activity rate measures the proportion of those over 10 years old who are economically active. Women's economic activity goes largely unrecorded, since most of it is regarded as domestic work. Much of the difference between the activity rates for males is accounted for by the higher proportion at school in areas such as Ishwardi in Pabna, which means that boys enter the labour market later.

### *Land Ownership and Use*

Unfortunately, the information collected on land ownership is not in any detail. However, it does give an indication of the proportion of households with little or not land. A holding of less than half an acre is extremely marginal, and cannot support a household. In most areas, around half of the families are in this position, reflecting the prevalence of poverty in the region. This represents the proportion of the population in an area who are not in a position to derive any but the smallest benefit from FCD projects, since they cannot grow any surplus crops.

# Table–4: Key Socio Economic and Development Indicators for samples Upazilas in NW Region

| Zila | Upazila | Type of Housing unit (%) | | | Sources of drinking water (% of households) | | | | | | | Literacy Rate | | | Refined Activity Rate | | | Ownership of Land (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pucca | Semi-Pucca | Katcha | Pond | | Well | Canal | River | Tube-Well | Tap | Both Sexes | Male | Female | Both Sexes | Male | Female | No Land | Marg. Land (.01-.49 acre) | Land Owner (.50+acre) |
| Joypurhat | Khetlal | 1.60 | 1.60 | 96.80 | - | | - | - | 0.20 | 99.80 | - | 29.64 | 37.25 | 21.65 | 44.25 | 77.01 | 8.22 | 6.20 | 48.60 | 45.20 |
| Joypurhat | Panchbibi | 1.80 | 6.20 | 92.00 | 2.80 | | 6.20 | 0.20 | 0.60 | 90.20 | - | 28.90 | 38.12 | 19.03 | 46.22 | 79.63 | 9.02 | 3.00 | 39.00 | 53.00 |
| Dinajpur | Ghoraghat | 2.00 | 3.60 | 94.40 | - | | 34.40 | - | 0.20 | 64.60 | 0.80 | 35.48 | 40.63 | 30.02 | 45.13 | 80.65 | 7.70 | 8.20 | 43.60 | 48.20 |
| Thakurgaon | Pirganj | 0.60 | 13.00 | 86.40 | - | | 37.00 | 0.60 | 0.20 | 62.20 | - | 23.81 | 32.46 | 14.26 | 48.27 | 82.74 | 9.12 | 70.40 | 39.00 | 50.60 |
| Pabna | Iskwardi | 2.00 | 10.00 | 88.00 | 1.00 | | 7.40 | 0.20 | - | 91.40 | - | 37.75 | 41.64 | 33.36 | 40.41 | 69.40 | 7.49 | 9.20 | 53.80 | 37.00 |
| Serajgonj | Chawhali | 0.20 | 0.20 | 99.60 | 0.40 | | 2.80 | - | 8.00 | 88.80 | - | 18.80 | 27.07 | 9.75 | 44.57 | 78.46 | 7.01 | 15.60 | 28.00 | 56.40 |
| Naogaon | Naogaon | 0.20 | 5.60 | 92.40 | 1.20 | | 8.40 | - | - | 90.40 | - | 37.30 | 48.02 | 25.86 | 44.09 | 86.07 | 7.74 | 2.80 | 53.60 | 43.60 |
| Nawabganj | Nachole | 0.40 | 1.20 | 98.40 | 9.40 | | 28.60 | - | 1.00 | 61.00 | - | 23.23 | 29.44 | 16.39 | 44.02 | 77.45 | 7.33 | 14.40 | 42.80 | 42.80 |
| Nawabganj | Shibganj | 3.20 | 6.80 | 90.00 | - | | 19.00 | - | 1.80 | 77.80 | 1.40 | 16.94 | 20.57 | 12.98 | 45.98 | 77.19 | 7.13 | 4.80 | 49.00 | 46.20 |
| Gaibandha | Gaibandha | 1.00 | 1.60 | 97.40 | - | | 23.60 | - | 0.20 | 74.20 | - | 24.05 | 30.85 | 16.89 | 45.64 | 80.87 | 7.60 | 8.60 | 53.40 | 38.00 |
| Gaibandha | Palashbari | 0.80 | 7.80 | 91.40 | 0.20 | | 16.80 | - | 2.40 | 80.60 | - | 24.66 | 31.05 | 17.69 | 44.73 | 78.35 | 8.09 | 5.00 | 54.20 | 40.80 |
| Bangladesh | (Rural) | 1.41 | 5.98 | 94.61 | 9.03 | | 9.18 | 1.57 | 3.10 | 76.82 | 0.30 | 29.53 | 36.29 | 22.29 | 44.13 | 77.71 | 7.66 | 7.23 | 44.46 | 48.31 |

| Zila | Upazila | Operated land size(%) | | Farm & Non farm Households (%) | | | Land size (acre) per Household | | | Land use (%) | | | | | Land under Local and HYV crop (%) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.1-0.49 acre | .50 + acre | Farm Households | Non farm Households | | Own Land | Operated Land | Cultivable | Homestead | Permanent crop | Temporary crop | Current fallow | Others | Aus | | Aman | | Boro | | Aus+Aman+Boro | |
| | | | | | | | | | | | | | | | Local | HYV | Local | HYV | Local | HYV | Local | HYV |
| Joypurhat | Khetlal | 49.20 | 50.80 | 78.40 | 21.60 | | 1.60 | 1.54 | 1.39 | 5.81 | 4.90 | 75.49 | 9.72 | 6.08 | 4.92 | 95.08 | 31.08 | 68.92 | - | 100.00 | 17.62 | 82.38 |
| Joypurhat | Panchbibi | 41.60 | 58.40 | 71.00 | 29.00 | | 1.90 | 1.84 | 1.69 | 4.09 | 1.73 | 87.67 | 2.02 | 4.49 | 60.43 | 39.57 | 48.30 | 51.70 | - | 100.00 | 45.92 | 54.08 |
| Dinajpur | Ghoraghat | 44.60 | 55.40 | 71.60 | 28.40 | | 0.69 | 1.79 | 1.61 | 6.05 | 2.39 | 84.41 | 3.60 | 3.55 | 53.15 | 46.85 | 77.46 | 22.54 | 1.95 | 98.05 | 58.52 | 41.68 |
| Thakurgaon | Pirganj | 38.80 | 61.20 | 67.00 | 33.00 | | 1.77 | 2.05 | 1.86 | 4.07 | 1.79 | 84.57 | 3.55 | 4.04 | 86.22 | 13.78 | 61.79 | 38.21 | 3.81 | 96.19 | 66.92 | 330.80 |
| Pabna | Iskwardi | 66.40 | 33.60 | 61.40 | 38.60 | | 1.32 | 1.16 | 1.02 | 7.68 | 7.25 | 79.69 | 0.88 | 4.50 | 88.77 | 11.23 | 88.21 | 11.79 | 2.50 | 97.70 | 71.28 | 28.72 |
| Serajgonj | Chawhali | 41.60 | 58.40 | 62.20 | 37.80 | | 0.25 | 1.4 | 1.07 | 4.50 | 2.04 | 70.76 | 10.22 | 12.48 | 98.66 | 1.34 | 98.95 | 1.05 | 11.48 | 88.52 | 91.80 | 8.20 |
| Naogaon | Naogaon | 47.00 | 53.00 | 68.20 | 31.80 | | 1.09 | 1.26 | 1.15 | 4.14 | 2.97 | 84.71 | 3.72 | 4.46 | 73.12 | 26.88 | 76.58 | 23.42 | 6.58 | 93.42 | 37.73 | 62.27 |
| Nawabganj | Nachole | 41.20 | 58.60 | 61.80 | 38.20 | | 1.71 | 2.67 | 2.51 | 5.81 | 1.51 | 91.69 | 0.67 | 2.32 | 91.82 | 8.18 | 37.59 | 62.41 | 5.07 | 94.93 | 42.57 | 57.43 |
| Nawabganj | Shibganj | 52.60 | 47.40 | 63.40 | 36.60 | | 1.87 | 1.45 | 1.35 | 2.57 | 7.09 | 75.64 | 12.40 | 4.30 | 97.93 | 2.07 | 74.77 | 25.23 | 1.55 | 98.45 | 82.79 | 17.21 |
| Gaibandha | Gaibandha | 58.20 | 41.80 | 58.80 | 41.20 | | 1.02 | 0.98 | 0.87 | 6.09 | 2.73 | 81.65 | 3.89 | 5.64 | 76.66 | 23.34 | 85.44 | 14.56 | 1.97 | 98.03 | 58.11 | 41.89 |
| Gaibandha | Palashbari | 49.60 | 50.40 | 67.40 | 32.60 | | 1.04 | 1.05 | 0.93 | 5.92 | 3.03 | 82.26 | 3.40 | 5.39 | 85.77 | 14.23 | 69.84 | 30.16 | 3.26 | 96.74 | 50.59 | 49.41 |
| Bangladesh | (Rural) | 49.17 | 50.83 | 69.34 | 30.66 | | 0.41 | 1.34 | 1.19 | 5.04 | 4.22 | 79.76 | 50.10 | 5.97 | 82.15 | 17.85 | 67.48 | 32.52 | 23.67 | 76.33 | 58.81 | 41.19 |

Contd.....

| Zila | Upazila | Land under Single, Double & Triple Crop (%) | | | Cropping intensity | Gross Area irrigated with respect to Cultivated area (%) | Gross area fertilized with respect to Cultivated area (%) | Bovine animal (No.) | Bovine animal used in agriculture(%) | Sheep & Goat No. Per Household | Poultry Birds (No.) Per Household | Tractor | Power tiller | Deep Tube-well | Shallow Tube-Well | Power Pump |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Single Crop | Double Crop | Triple Crop | | | | Per Household | | | | | | | | |
| Joypurhat | Khetlal | 28.57 | 60.55 | 11.28 | 182.91 | 43.14 | 93.68 | 1.58 | 53.11 | 1.23 | 10.13 | - | 5 | 181 | 400 | 25 |
| Joypurhat | Panchbibi | 75.23 | 23.28 | 3.49 | 130.27 | 12.28 | 40.89 | 1.61 | 46.40 | 1.26 | 9.05 | 2 | 2 | 157 | 150 | 60 |
| Dinajpur | Ghoraghat | 62.10 | 36.42 | 1.48 | 139.37 | 25.46 | 66.77 | 2.24 | 44.07 | 0.93 | 11.76 | 6 | - | 135 | 155 | 43 |
| Thakurgaon | Pirganj | 36.48 | 54.54 | 8.98 | 172.50 | 11.44 | 58.65 | 1.99 | 57.79 | 1.57 | 5.88 | 1 | 3 | 56 | 300 | 70 |
| Pabna | Ishwardi | 38.15 | 57.36 | 4.49 | 166.34 | 19.05 | 56.71 | 1.23 | 42.18 | 1.50 | 4.87 | 3 | 1 | 113 | 165 | 33 |
| Serajgonj | Chawhali | 28.32 | 44.63 | 27.05 | 198.73 | 5.35 | 51.45 | 1.75 | 51.37 | 1.61 | 6.19 | - | - | - | 128 | - |
| Naogaon | Naogaon | 64.30 | 32.04 | 3.66 | 139.37 | 51.02 | 65.77 | 1.18 | 58.47 | 1.06 | 6.94 | - | 3 | 58 | 1442 | 214 |
| Nawabganj | Nachole | 89.16 | 10.34 | 0.50 | 111.34 | 7.25 | 62.15 | 2.20 | 51.45 | 2.22 | 8.83 | - | - | 46 | 176 | 716 |
| Nawabganj | Shibganj | 36.11 | 61.28 | 2.61 | 166.50 | 12.28 | 38.92 | 1.34 | 54.33 | 1.74 | 5.57 | - | - | 218 | 300 | 104 |
| Gaibandha | Gaibandha | 34.88 | 56.61 | 8.51 | 173.63 | 30.03 | 66.03 | 1.34 | 46.06 | 0.96 | 7.28 | 1 | 1 | 103 | 841 | 169 |
| Gaibandha | Palashbari | 21.85 | 68.27 | 9.88 | 188.03 | 36.75 | 67.18 | 1.41 | 58.72 | 0.89 | 7.37 | 1 | 1 | 85 | 152 | 51 |
| Bangladesh | (Rural) | 53.06 | 40.02 | 6.92 | 153.87 | 24.68 | 53.98 | 1.44 | 48.46 | 0.85 | 6.95 | N/A | N/A | N/A | N/A | N/A |

| Zila | Upazila | Roads (K.M) | | | No. of Colleges and Schools | | | | Credit | | Co-operative societies | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pucca Road | Semi-Pucca roads | Katcha Roads | College | High Schools boys | High School girls | Junior High School | Primary School | Household received credit(%) | Household received Agri. credit | Household having at least 1 membe (%) | Members based on Pop. age 10+(%) | Facility enjoyed (% of col.2) | Have insurance(% of col. 2) | Withdrawn membership (% of col. 2) |
| Joypurhat | Khetlal | 13.00 | 7.00 | 138.00 | 1 | 7 | 1 | 5 | 139 | 21.60 | 75.00 | 14.40 | 4.33 | 84.72 | 90.28 | 1.39 |
| Joypurhat | Panchbibi | 14.00 | 15.00 | 343.00 | 1 | 14 | 1 | 1 | 79 | 22.20 | 65.79 | 3.80 | 1.10 | 52.63 | 47.37 | 15.79 |
| Dinajpur | Ghoraghat | 32.00 | 7.00 | 478.00 | 1 | 7 | 1 | 2 | 57 | 17.40 | 75.00 | 18.00 | 5.33 | 62.22 | 46.67 | - |
| Thakurgaon | Pirganj | 31.00 | 21.00 | 696.00 | 1 | 18 | 1 | 4 | 87 | 20.80 | 58.65 | 5.20 | 1.67 | 27.59 | 56.62 | 6.90 |
| Pabna | Ishwardi | 78.00 | 54.00 | 736.00 | 1 | 10 | 3 | 4 | 56 | 5.20 | 46.15 | 7.20 | 2.14 | 43.90 | 41.46 | 12.20 |
| Serajgonj | Chawhali | - | - | 80.00 | 1 | 7 | 2 | 2 | 82 | 17.60 | 27.27 | 6.60 | 2.03 | 48.72 | 46.15 | 20.51 |
| Naogaon | Naogaon | 44.80 | 9.00 | 720.00 | 1 | 21 | - | 9 | 93 | 20.20 | 51.49 | 6.40 | 2.51 | 55.49 | 55.49 | - |
| Nawabganj | Nachole | 10.00 | 5.00 | 50.00 | 1 | 10 | 1 | 3 | 46 | 17.40 | 67.82 | 11.60 | 3.07 | 84.46 | 70.69 | 3.45 |
| Nawabganj | Shibganj | 11.00 | 30.00 | 314.00 | 7 | 28 | 6 | 10 | 120 | 9.80 | 42.86 | 3.80 | 0.90 | 47.37 | 47.37 | 5.26 |
| Gaibandha | Gaibandha | 42.00 | 10.00 | 304.00 | 1 | 21 | 3 | 10 | 121 | 19.80 | 59.00 | 17.00 | 5.97 | 78.57 | 73.47 | 6.12 |
| Gaibandha | Palashbari | 36.00 | - | 30.00 | 1 | 18 | 1 | 7 | 112 | 18.40 | 48.91 | 4.80 | 1.52 | 70.83 | 87.50 | - |

Source: Report on the upazila Development Monitoring Project, November 1991 BBS

Allowing for land which is operated, but not owned by the household, the proportion with farms over half an acre rises somewhat. Differences between thanas also emerge, with some such as Ishwardi and Gaibandha having substantially less than half of their households above the marginal farming category. The proportion of households operating so little land that they can be regarded as non-farming varies substantially between thanas. In Gaibandha, some 40% of households are in this position, while the best area, Khetlal in Joypurhat, has less than half this proportion.

Land is primarily used to grow seasonal crops, with very few permanent tree crops. Fallow land varies considerably between areas, as does "other" land. These two categories together represent the maximum amount of land that might be available for grazing during any one year, and areas such as Nachole in Nawabganj appear already to have virtually none. the "other" category also includes such uses as fish ponds.

*Agriculture*

Agriculture in North-West Region is fully described elsewhere in this report. An outline is presented in Table 4. This shows that there are very substantial differences between thanas in farming practices. For example, whereas 95% of aus rice grown in Khetlal thana is of HYV, only 1% in Chawhali is so. Variations among aman crops are also substantial. There is a clearer tendency in favour of HYV boro in all areas, and NWR is ahead of the overall rural Bangladesh trend in this respect.

Variations are also substantial with regard to the number of crops grown. Whilst single cropping is predominant in Nachole, in areas such as Palashbari two thirds of the land is double cropped, whilst in Chawhali one quarter is triple cropped. Thus, cropping intensity varies from 111% to 198%. Irrigation also varies considerably, from 6% of cultivated area to over 50%. There is no clear relationship between irrigation and cropping intensity, and both the highest and lowest intensities occur in areas with very little irrigation.

Animal holdings in rural Bangladesh are low, and show some variation between thanas. The average bovine holding in Nachole is almost twice that in Naogaon. Since only about half of the bovines are used in agriculture, this indicates a substantial undersupply. This has not been countered by any substantial introduction of mechanisation. Tractors will generally be unsuitable for the small parcels of land farmed, but the more appropriate power tillers have made virtually no impact in any of the thanas studied. Modern irrigation equipment is unevenly distributed, with Naogaon and Gaibandha having substantial numbers of shallow tube wells, while other areas utilise deep tube wells, or power pumps.

*Social Infrastructure and Services*

It is not possible to make a detailed interpretation of the provision of infrastructure and services without information on the area and population of thanas. However, it is clear that there are substantial variations within the region. While Chawhali and Palashbari have a dearth of any sort of road, Ishwardi in Pabna has extensive provision of pucca, semi-pucca and katcha roads.

Educational facilities also vary considerably, with Shibganj in Nawabganj and Gaibandha both having relatively good provision. The different level of school provision for boys and girls is evident throughout the region, and at its most extreme in Naogaon, where there are 21 boys high schools and none at all for girls.

The degree of commercial activity, as indicated by the presence of local "hat" markets and bazars, again varies substantially between thanas. While some areas such as Ghoraghat show a remarkable lack of commerce, others are far more active, Pirganj has considerably more markets than any other thana.

Religious centres are the most prevalent social facility, with mosques predominant. The distribution of temples gives some indication of the presence of the minority Hindu community. Ishwardi in Pabna shows a high number of temples, and even the proportion in comparison with mosques is high.

Overall, it can be said that the NW Region has considerable diversity within it, which will need to be taken into account in planning any FCD interventions. The key feature to emerge is the high proportion of the population with marginal landholding, or less, and the shortage of either animal or mechanised draft power. This indicates that a substantial proportion of the population in all areas of the region will be unable to realise benefits from FCD, other than marginal benefits through increased agricultural employment or construction and maintenance work.

*Credit and Cooperatives*

Access to credit from formal sources varies considerably between thanas, but in no case reaches more than 25% of households. since virtually all landless and marginal families need credit, this clearly indicates the predominance of informal sources. Whilst the majority of loans are in principle received for agricultural purposes, a number of studies suggest that they may often actually be used for consumption or social purposes.

Membership of cooperatives is generally low, and in some areas less than 5% of households. The proportion who value the service received again shows great variation by thana, but in some areas it is very high. In other areas, the withdrawal of membership has been notable, usually for reasons of perceived corruption or mismanagement.

## 1.3 The Gaibandha Project Area

In Gaibandha district where FAP2 has a special improvement project (see following chapters) the pressure on land has been greater than that of the national and regional areas. Between 1981 and 1991 the population grew from 1.57 to 1.85 million increasing the population density for the same period from 723 to 851 persons per square kilometre (ibid 1991). There is, therefore, greater pressure on land in this special improvement area of the order of one hundred persons more than the regional figure. If this is coupled to the fact that the northern and eastern boundaries of the district are the Teesta and Brahmaputra rivers with the erosion they have caused over the last twenty years the pressure is even more significant.

In the area which specifically comprises the special improvement project the increases in population density are even greater. Table 5 compares the three major thanas in the improvement project area with national and regional figures over the same decade.

**Table 5** **Population by Thana - Gaibandha Improvement Project (Density per square kilometre)**

| Area/thana | PopDen 1981 | PopDen 1991 | Increase |
|---|---|---|---|
| Bangladesh | 651 | 781 | 131 |
| NW Region | 630 | 751 | 121 |
| Pirgacha | 788 | 973 | 165 |
| Sundarganj | 758 | 892 | 134 |
| Saidullahpur | 856 | 1008 | 152 |

(BBS : 1991)

The Thana Development Monitoring Project (1989) included Gaibandha and Palashbari thanas. The latter lies close to but just outside the project area. Key features for these thanas are given in Table 6.

**Table 6** **Key Socio-Economic Indicators (Selected Areas)**

| Indicator % | Rural Bangladesh | Gaibandha | Palashbari |
|---|---|---|---|
| Drink | | | |
| Pond Water | 9.03 | Nil | 0.20 |
| River Water | 3.10 | 0.20 | 2.40 |
| Tubewell | 76.82 | 74.20 | 80.60 |
| Literacy | | | |
| Males | 36.29 | 30.85 | 31.05 |
| Females | 22.29 | 16.89 | 17.69 |
| Combined | 29.55 | 24.05 | 24.66 |
| Housing | | | |
| Pucca | 1.41 | 1.00 | 0.20 |
| Semi-Pucca | 3.98 | 1.60 | 7.80 |
| Katcha | 94.61 | 97.40 | 91.40 |
| RAR* | | | |
| Male | 77.71 | 80.87 | 78.35 |
| Female | 7.66 | 7.60 | 8.09 |
| Combined | 44.15 | 45.64 | 44.75 |

* The Refined Activity Rate is the proportion of those over 10 years old who are economically active. The figures for females should be treated with caution as many young women working eg as domestic servants are not recorded.

(UDMP : 1989)

In the same study for Gaibandha and Palashbari it showed that around seven percent of the population was totally landless while almost 45 percent in both thanas were functionally landless ie having less than half an acre. Only 2.73 and 3.03 percent of the land in Gaibandha and Palashbari respectively was under permanent cultivation. In the winter season the boro rice crop was over 95 percent a high yielding variety for which expensive chemical inputs are required; the figure for Bangladesh as a whole was around 75 percent. In Gaibandha district as a whole over forty percent of all households are now non-farming.

The population of the area of the Gaibandha Improvement Project is approximately 550,000 people with an average population density of between 900 and 1,000 persons per square kilometre. This is nearly two hundred more than the average for the country as a whole. This high density coupled with other demographic and socio-economic features make the project area one of the poorest in Bangladesh. These features can be summarised thus:

- low rates of literacy
- poor housing
- few good quality roads
- poor drainage in the project area
- high levels of male migrant labour
- high rates of landlessness
- large number of embankment dwellers

These features make the chosen area for the improvement project a flood action plan venture worth undertaking.

### 1.4 Overview of the NW Region

All of the above data show the northwest region in general and Gaibandha district in particular to be extremely impoverished. In the following chapters the part that floods and flood control, drainage and irrigation play in this will be examined. For the moment, however, a preliminary analysis from these secondary sources is appropriate.

Gaibandha district has one of the poorest literacy attainments in the country while Sirajganj, which is extremely flood prone, is only slightly better. Gaibandha at 18.35 percent and Sirajganj at 18.42 percent fall well behind the attainment for rural Bangladesh which as a whole is 29.55 percent. For females the situation is not much better with Gaibandha at 16.89 and Palashbari at 17.69 percent respectively being approximately five percent lower than the national rate for rural female literacy.

Agricultural data from the thana Development Monitoring Project show that in Chawhali thana in Sirajganj there is not a single power tiller or tractor. In the same thana there is not a single deep tubewell. In no thana did access to formal credit reach more than 25 percent. In Gaibandha town and the surrounding rural thana there are only 42 kilometres of metalled roads making it difficult to move agricultural products to markets and to transport centres for onward shipment to other parts of the country.

Unfortunately, the information collected on land ownership is not very detailed. However, it does give an indication of the proportion of households with little or no land. A holding of less than half an acre is extremely marginal and cannot support an average household. In most areas, around half of the families are in this position, reflecting the prevalence of poverty in the region. This represents the

proportion of the population in an area who are not in a position to derive any but the smallest benefit from FCD projects, since they cannot grow any surplus crops.

Allowing for land which is operated, but not owned by the household, the proportion with farms over half an acre rises somewhat. Differences between thanas also emerge with some such as Ishwardi and Gaibandha having substantially less than half of their households above the marginal farming category. The proportion of households operating so little land that they can be regarded as non-farming varies substantially between thanas. In Gaibandha, some 40% of households are in this position, while the best area, Khetlal in Joypurhat has less than half this proportion.

In the northwest region traditional fishermen have also suffered substantially. Between 1985 and 1989 riverine production dropped from 3684 to 1248 metric tonnes according to Department of Fishery (DoF) statistics. In Gaibandha and Kurigram districts the catch in the Brahmaputra dropped in the same period from 3,317 to a mere 523 metric tonnes according again to the DoF figures.

All of these demographic and socio-economic features highlight enormous problems for the region in general and for the Gaibandha Improvement Project area in particular. Any plan to relieve flooding and improve the quality of life in the region is to be welcomed and any special initiative to bring a better standard of living to Gaibandha district is appropriate in terms of its impoverished socio-economic status.

# CHAPTER 2

# NORTHWEST REGIONAL PROFILES

## 2.1 Floodwater - A Vital Village Resource

It has been estimated that there are over sixty five thousand villages in Bangladesh comprising around ninety percent of the total population. In other words approximately ninety million Bangladeshis live in villages. These villages are the lifeblood of an agricultural system which somehow manages to increase productivity fairly consistently against difficult odds. And of course water is the key to all of it.

Water can be a blessing and a curse; it can create and it can just as easily destroy. Every villager from the very young to the very old understands this fact. Rice and jute can be termed aquatic plants which is why they have developed in the Bangladesh floodplain. The enormous variety of freshwater fish which live on the floodplain and which are now under threat are also an evolutionary aspect of this ancient hydraulic civilisation.

Yet if water is the key it is the Bangladeshi villager who has control of it. And except in very severe flood years he has tamed it and turned it to advantage. Even in severe floods when families are forced to sit on the roofs of their houses there is some degree of control over it since it cannot defeat them. The **macha** (bamboo sleeping platform), the **bhela** (banana tree raft) and the **agla chula** (portable clay stove) may be simple technologies but they are vital village developments when the water turns against the villagers.

In the FAP2 surveys and rural appraisals, even in the chars where the danger from the major rivers is at its worst, the villagers made no voluble complaints. In fact they were at pains to point out that even the severest flood has a limited lifespan and it is part of their way of life. In the surveyed villages , which were chosen for their vulnerability, it is amply demonstrated that survival in the Bangladesh village demands courage, strength and a high degree of adaptability. While the villager does want some protection from the severest floods he also needs the water above all for the agricultural products he grows and for the fish which supply a large part of his protein needs.

Finally, the villager also needs to be consulted on all aspects of water and its control and management if he is to contribute significantly to any form of flood action planning and if flood control measures are to be acceptable to rural communities in Bangladesh.

## 2.2 Villages in Chalan Beel

Chalan Beel is one of the most important wetlands in the whole of Asia supporting a wide range of flora and fauna and a human population which has been estimated recently at 1.3 million people with a density of 750 persons per square kilometre. As might be expected it has a large number of perennial beels which traditionally supported a number of Hindu fishing communities.

Since the 1950s Chalan Beel has been the subject of a number of FCD/I measures to bring more land into agricultural production. This culminated in the polderisation of the area from 1973 as a method of flood control and improved rice production. Four polders were created covering a total area of 166,000 hectares. These polders are bounded on three sides by rivers which are the main drains for

the polders in floods. The Sib is the western boundary with the Barnai forming the southern one and the Atrai to the north.

In a household survey and rural appraisal carried out in villages in Chalan Beel questions concerning security from floods, employment opportunities, disbenefits to those living outside the polder system, availability of resources and the quality of human life in the area were addressed. Agro-economic surveys supplemented the sociological work.

The sampling was purposive to ensure that genuinely marginalised people, ie small farmers with less than one acre and the landless, were the respondents. The household head and his wife were asked the same questions and their responses recorded separately to ensure against gender bias. There were 98 households in the sample and in the figures which follow the data are generally shown by household.

To ensure some comparability five villages were chosen in different areas of the polder system. One was inside polder A with another nearby but outside the same polder. Another was inside polder C with a corresponding one on the edge of that polder while the final choice was a site inside the Barnai project but close to the embankment of polder C.

In order to ensure the survey was dealing with marginal farmers and the landless the survey instrument carried a question determining landholding and land utilisation. Figure 1 shows that over seventy respondents had no cultivable land while Figure 2 indicates that over eighty of them had no access to sharecropped land. Only eight of them had land between one half and one acre while four of them sharecropped land greater than 0.4 of an acre.

**Figure 1**

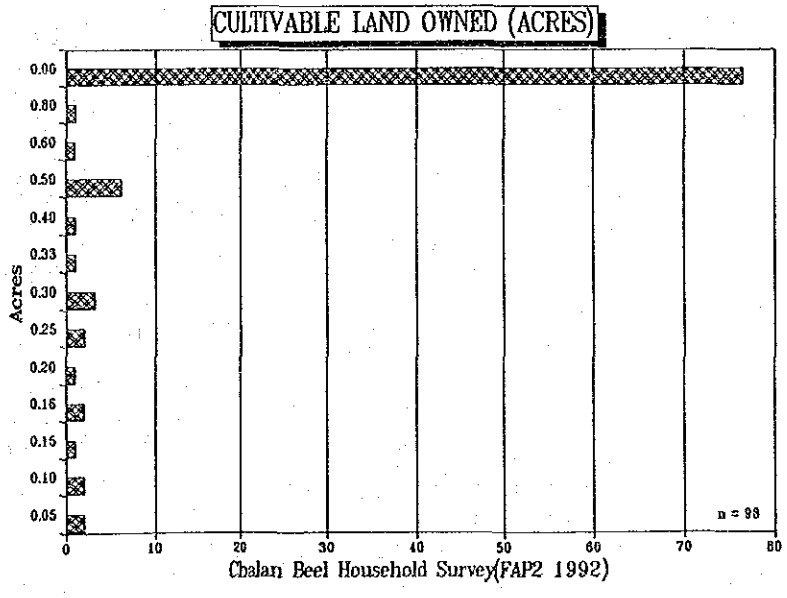
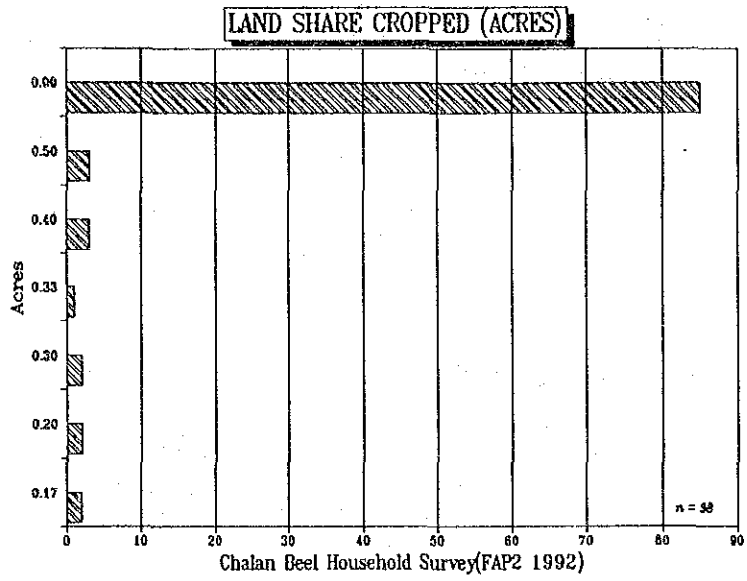


**Figure 2**




During floods these impoverished sectors of the villages face food crises. In severe flooding these can be critical but even in normal floods nutrition becomes a serious problem. Fig 3 shows the months of food crises as stated by both male and female of the households.It is noticeable that nearly every month of the year presents a food crisis for some family or other but in the months of seasonal flooding the number increases dramatically; in Chalan Beel these are principally July and August.

The large discrepancy in male/female descriptions of crisis months especially August (see Fig 3) is partly explained by the fact that when food is in short supply it is the women and especially the mother of the household who make the greatest sacrifice. In fact she will only eat when everyone else has been fed . Fig 4 highlights not only this point but also that during the July/August crisis months no women in the sample ate a full meal but very few men and children did so either. Most of them eat only half meals while in a few instances they either starve or only eat wild fruit when it is available. The indication from these statistics is that one might have expected a general increase in agricultural employment opportunities since the polder system was supposed to increase rice production through introducing better water control and management. These responses suggest that in general an increase has not taken place. The fact that some households report an increase while others do not suggest that flood control may have been effective in raising production in some areas but not in others.

**Figure 3**

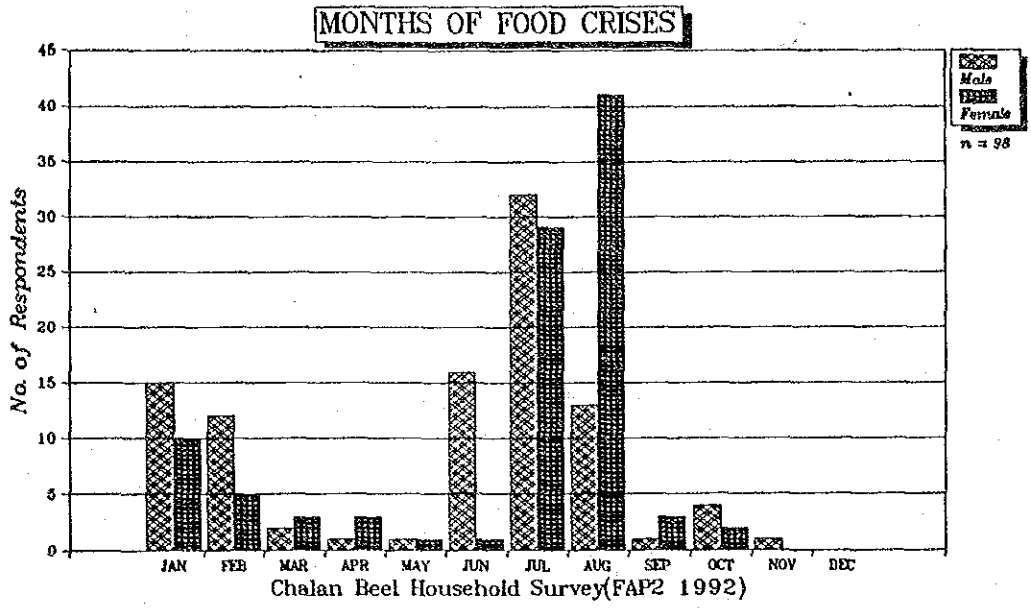



**Figure 4**

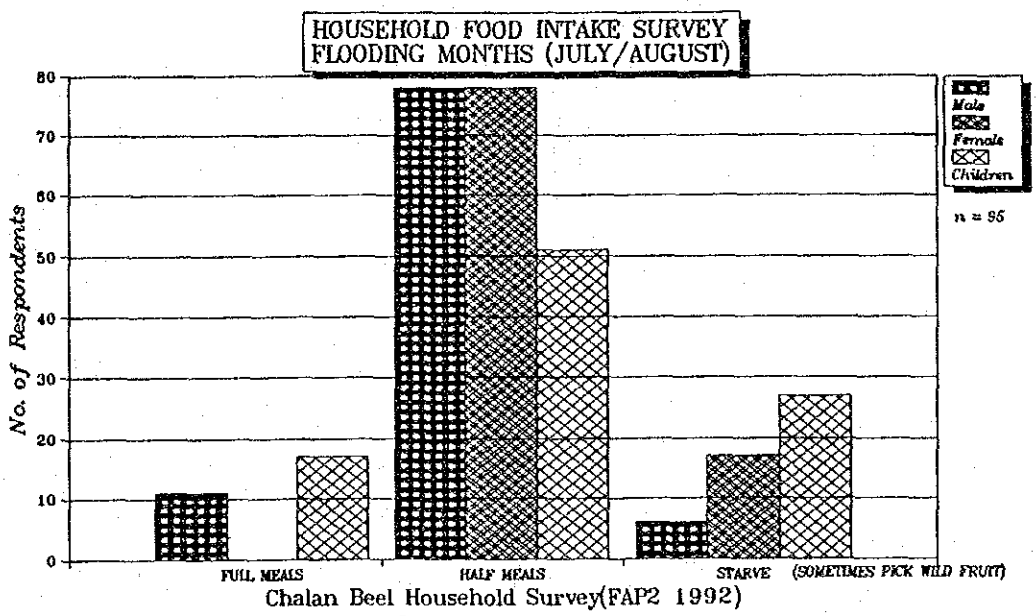
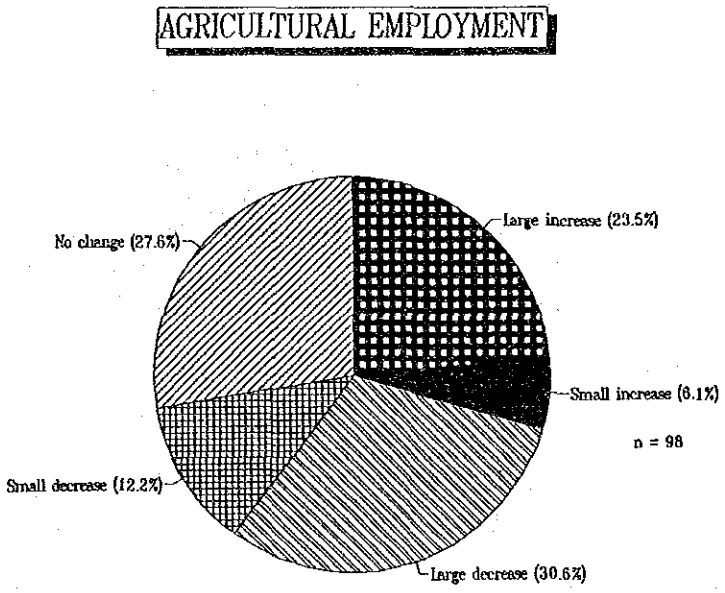


Fig 5 details the respondents' agricultural day labour potential after the polder system came into operation. This shows that more respondents stated that agricultural employment opportunities had decreased than those who stated that such opportunities had increased.

**Figure 5**

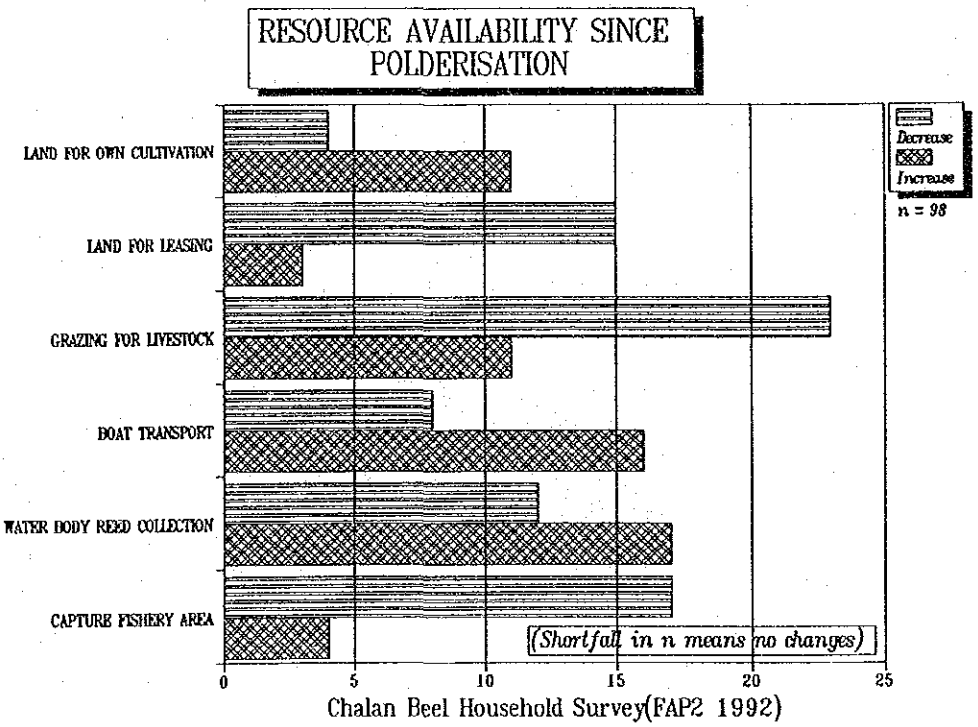



Chalan Beel Household Survey (FAP2 1992)

In terms of non-agricultural development opportunities created by polderisation, a majority of respondents stated that rickshaw pulling and cart driving had increased while many respondents also said that rice trading had increased. These results suggest that better communications do increase trading opportunities and also the transport of agricultural commodities.

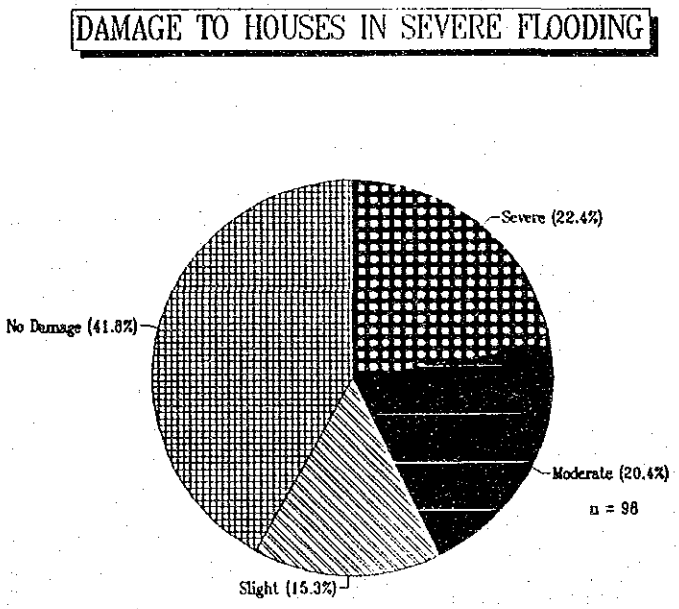
Polderisation has had a mixed impact on households' access to resources (see Fig 6), but responses suggest some decline in availability of land for leasing, water bodies for fishing and grazing land for livestock. A majority of respondents indicated no change in access to resources generally as a result of polderisation.

**Figure 6**



The survey conducted by FAP2 indicates that the quality of life generally for marginal farmers and the landless has not improved greatly as a result of the Chalan Beel polder system. Indeed on the outside of the embankments close to the polders the quality of life may have considerably worsened. Fig 7 depicts housing damage; ninety percent of those whose houses were severely or moderately damaged lived in villages outside the polder system. The results of an open-ended question in the same survey showed that 65 percent of the sample thought embankments had made no positive impact whatsoever and reported both house and surroundings heavily inundated; on the other hand all of the respondents inside polder C claimed the embankments gave them good protection.

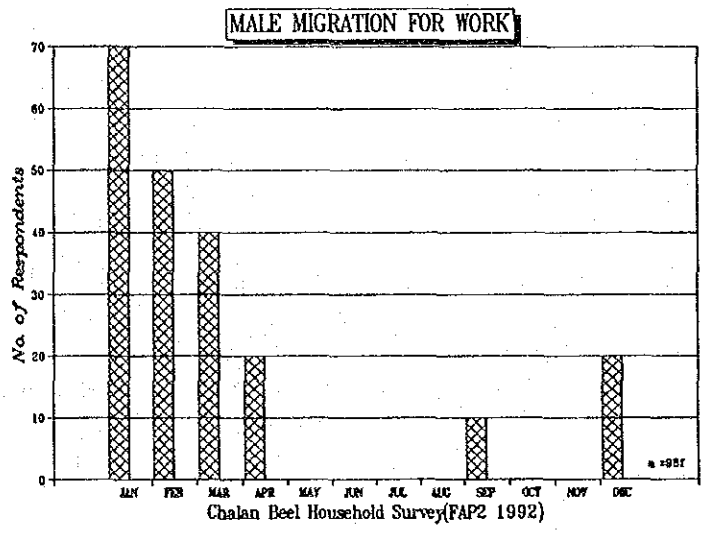
**Figure 7**




Chalan Beel Household Survey (FAP2 1992)

One of the common features of the poor family in rural Bangladesh is the absence of the father when he is forced to migrate for work. This creates stress in the family generally and puts an enormous burden on the woman of the household to provide for the rest of the members. Polderisation of Chalan Beel has not increased family stability for the respondents in this survey. On average twenty of the male household heads have to migrate for five months of the year to find work as demonstrated by Fig 8. In the peak months of unemployment before the boro is harvested forty of them were absent for up to three months while in the worst month of January seventy had to migrate to find employment.

**Figure 8**




The quality of life for the poorest people living in and close to the Chalan Beel polder system has not markedly improved since its inception. The improved agricultural employment which might have been expected with polderisation has not materialised because by and large higher agricultural productivity of land has not been achieved. Breaches in the embankments made by communities outside the polders to relieve flooding has been a major factor as has been the poor water management of the polder system generally.

There has been some improved economic activity in the non-agricultural sector. The embankments have produced a road network which has improved communications and the carriage of goods. Such improvement could be expected to act as a catalyst for the local economy. The poorest sector of the community, however, has not noticeably gained as a result of this improvement. It still has to migrate for long periods to maintain the basic needs of survival.

The security of life and property has worsened for those living immediately outside the polder system. While the polders provide protection for some people living within them, this protection is gained partly at the expense of those living outside.

In the Chalan Beel feasability report over twenty years ago there was an explicit assumption that agricultural production would increase significantly and an implicit one that everyone would benefit as a result of this. The poorest people in the villages of Chalan Beel have not seen this happening.

## 2.3 Villages in Gaibandha

Shabaz village is a community living on the edge of Bamandanga Beel which covers an area of approximately ninety acres. More than half the beel dries out in the winter and can be used for boro rice, wheat and some jute. Villagers complained that the union chairman was using a large part of it as a private farm. To control water levels for T amon he built a crossdam on the khal which feeds the beel from the Ghagot. In the late floods of 1991 the communities outside of the beel had to go to the upazilla chairman to get the crossdam cut as they were heavily inundated.

For the capture fishermen who were once the predominant community (we were told a few had recently migrated to India) the crossdam meant that the beel was not being naturally restocked from the rivers nearby and that the low levels of water would not shelter larger fish. They wanted the crossdam completely removed.

In the meantime, however, extension fishery has been introduced to Bamandanga and some smaller surrounding beels and these areas are leased to fishing cooperatives which are quite strong in the locality. This is one of the few areas of the study where it has been found that fishing cooperatives are being given preferential access to water bodies.

In communities along the Ghagot near the beel the people claimed that siltation of the Ghagot was now causing major problems and in the last three years had seriously damaged T amon, vegetables and their homes. They were fully cognisant that slow meandering rivers cause lots of spillage on to the land. They also stated, however, that embankments were not the answer since they would increase the levels of deposits by keeping them in the main channel. What they wanted was regular re-excavation and that to be carried out by the villagers as a source of local employment.

Narayanpur village is on the right bank of the Ghagot river which runs the entire length of Gaibandha district. It is close to the the Gaibandha and Saidullahpur road and from 1987 onwards has been the victim of heavy flooding. Since then the community told us over ninety percent of their amon had been destroyed while for late-planted aus and jute it was fifty percent. A boro crop is grown but they claimed they did not like it as it failed to give good straw and they therefore preferred local varieties; they would also like to grow wheat.

This community and others nearby are 'trapped' between the road and the embankment on the left bank of the Ghagot. There is no evidence of any drainage through the road which appears unplanned in respect of the embankment system and the people claimed they were not consulted when these schemes were planned. The embankment has not been completed and the community expects the situation to worsen when that happens.

In Rasulpur village on the BRE near Gaibandha around half of the women interviewed had goitre which they blamed on a wind coming off the Brahmaputra. Many of them were also suffering from scabies, swollen gums and skin disease. The children were obviously malnourished with the classical symptons of swollen stomaches and thin spindly legs. The only time they eat fish is when the men come home from spells as migrant labourers and catch them in the river or have enough money to buy them. They never eat meat.

They said they only cook one meal per day for consumption in the evening and from that they try to save a little which they give to the children in the morning. This will usually be rice and occasionally pulses and chillies.

The reason why all of these women and their families are perched on the embankment is the result of floods forcing them to leave previous homesteads where in many instances they had a little land. A far greater psychological reason, and it came up again and again in interviews, is that they hope that new land will emerge near where they are squatting and if they are able to cultivate it they can return to a normal family existence with their husbands and children.

Like their menfolk village women do not fear floods and stressed they could cope with them even in extremis. What is a greater concern is the lack of land and employment which might permit a decent family life and better health for them and their children.

## 2.4 Villages along the Bangali and Karatoya

In June 1992 rural appraisals were held in ten villages in the general area of the Bangali and Karatoya rivers roughly between Gobindhaganj in the north and Sirajganj in the south. Men and women were interviewed in depth to find out about these villages in what is one of the most flood-ravaged parts of the entire northwest region.

What the researchers did was to record virtually verbatim what the villagers were saying and the viewpoints which follow are the result of collating the words of a number of these people about their problems and hopes for solutions. The men's testimony is followed by that of the women.

1. Chaubaria village is in Khanpur union and is situated on the right bank of the Bangali which is locally known as the Halhalla. Ninety percent of the villagers are engaged in agricultural with those owning land having no more than two thirds of an acre on average. They get one boro crop which they irrigate with shallow tubewells; prior to the major flood of 1984 they also got an amon crop but this is no longer possible due to flooding. Even in 1991 when the floods were of short duration their homesteads were flooded to a depth of three feet.

**Men**

"We need boats to move around in during floods but we have no boats. We have to make our houses of mud and straw and they are swept away. To feed ourselves during floods we need to take loans from the mohajons (loan sharks) at high rates of interest.

It would be better if the embankment of the Jamuna were sealed properly. This river has made us poor even when it is ten miles from our village. If it was sealed we would have no big problem although it would help also to dredge the Halhalla.

Because of the flooding our land is now sandy and does not give good crops. Before 1984 we could grow amon but not since then.

Because of the erosion and breaches in the Jamuna and the spillage from the Halhalla the floods last for five months.

We do not want a high embankment on the Halhalla since we need the water for our crops."

**Women**

"In 1988 the embankment of the Jamuna was destroyed near Sariakandi and we have suffered for three consecutive years. Our houses have been flooded for four months and the land for one month longer. Even our chillies and potatoes were destroyed.

During the floods we cannot go to the bazaar to get food since we have no boats. We lose poultry, livestock and even the material of our houses. To feed livestock we use the leaves of banana trees and water hyacinth. We also lost young fruit trees we had planted.

During the flood our latrines cannot be used and we have to drink floodwater. We only get one meal per day.

In our families we have five or six children and for five months of the flood we have no money from our men since there is no employment.

We have to build machas (high lofts inside the house for sleeping) and we are vulnerable. Cobras come onto the machas and in 1991 twelve people died from their bites.

In 1988 one of the families had to spend over one month on a bhela (a raft made from banana trees).

The embankment of the Jamuna at Sariakandi must be made strong and the Halhalla should be dredged."

2. Shubagacha village is in Kamarkandi union one and one half miles east of the Karatoya and four miles from the Bangali. It is an agricultural village and only gets one rice crop of boro annually. They also grow jute, chillies and vegetables.

**Men**

"Before the floods of 1984 75 percent of us were rich farmers and the rest small farmers and day labourers. Now 75 percent of us are either small farmers or are now landless. Before those floods we got two rice crops and also good crops of jute, mustard and vegetable. Now we have to borrow money from the banks or from the mohajons to survive.

Before the heavy floods that came ten years ago we were the most productive farmers in the area. Now we are impoverished.

The floods do not come to us from the Karatoya but from through the Bangali from the Jamuna. This is because the Jamuna embankment is eroded and broken.

If you can solve the problem of the Jamuna embankment you will solve our problem. If the government will not do this we will pay Taka 100 per household to solve this problem.

The breaches in the Jamuna embankment are the cause of our poverty."

*

Women

"The flooding period is three months and has happened every year from 1987 with three of those years very bad.

We have problems feeding our poultry and livestock and they become diseased. We cannot get to the bazaar since we have no boats.

We have to take loans to feed our families or we sell our trees and belongings. A few of us got relief from the government but the food crisis is for three months.

Some of us cooperated in the dry season to collect dung, dry it and store it for cooking fuel in the floods.

When the floods come we have to share houses on the high ground in the village.

The only solution is the make the Jamuna embankment strong and stop the water coming through."

3. Kaludanga village is in Nepaltoli union four miles west of the Bangali (Halhalla).It has approximately 200 households with over ninety percent of them involved in agriculture. Nearly half of them are landless with the rest owning on average between three and four bighas. They grow boro and sometimes a little aus and some jute which is irrigated by a shallow tubewell.

Men

"Because of the erosion and breaches in the Jamuna south of Sariakandi in 1984 we have not been able to harvest amon.

Some years we tried it but it was always destroyed. Water lies in our land for between three and five months.

During these floods we have no boats and are isolated. We move our goods to high ground but we always lose poultry and livestock.

We are unemployed for these flood months and have difficulty feeding our families. We suffer from dysentery and our water supplies are contaminated. No medical services exist for us during these flood months.

The embankment on the Jamuna needs to be sealed properly both north and south of Sariakandi. We also need an embankment on the right side of the Bangali. Our village roads which are indundated need to be raised and culverts."

*

**Women**

"We have suffered for ten years from the floods caused by the Jamuna near Sariakandi. Our land is flooded for four months and our homestead for three months when the water level is two feet above the homestead land.

In recent years we have prepared for floods by organising ourselves to make agla chulas (portable stoves), drying and storing cattle dung for cooking and making bhelas (banana tree raft).

We have had to sell our poultry and livestock before the flood comes since we cannot find food for them during it. We have tried transplanted amon but it is nearly always destroyed.

Because we have no boats we cannot go to the local bazaar to get food. We have no latrines during heavy flooding and our husbands are unemployed.

Snakes are a problem coming into our homesteads to escape the flood and when they kill we have difficulty burying our dead. Sometimes it is impossible to sleep for the presence of snakes.

During these floods we suffer from dysentery, malaria and typhoid and we cannot get medical services.

For survival we sometimes have to sell bits of our land and take loans which moneylenders charge at twenty percent per month.

Sometimes even our men have to sell their own labour in advance to keep us alive.

You must seal the Jamuna strongly and perhaps build an embankment on the right bank of the Bangali."

4. Antarpara village is just north of Sariakandi town and is barely quarter of a mile inside the BRE. To the west the Bangali is less than one mile distant. It is a big village with two paras and over five hundred households which are all affected by floods. Before 1984 they grew aus, amon, boro, jute and chillies as a cash crop. There are two hundred farmers who own on average two to three bighas and nearly two hundred landless labourers many of whom owned land years ago.

**Men**

"Our first floods come from the Bangali followed closely by water backing up from the breaches in the Jamuna to the south of Sariakandi. They cause us terrible problems since we are so near to both rivers. The floods in the Bangali come from the Teesta far to the north.

We have to rent boats to go to the bazaar and to move our belongings to the high ground. Food prices go up and we cannot get enough food for our cattle. Bamboo which we use to build our machas (sleeping lofts) becomes very dear and since we are unemployed for this period we become very very poor.

We also have difficulty getting clean drinking water.

If the embankment is strong we have no problems; when it breaks everything is wrong. We villagers should be entrusted with maintaining the Jamuna embankment because it affects us most and we would look after it properly. But we need good resources to do so.

To solve most of our problems we need to seal the Jamuna properly and dredge the Bangali. It would also be good to embank the left bank of the Bangali."

*

**Men**

"The breaches at Mathurapara south of Sariakandi forces water into the Bangali and it comes up here and floods our villages.

Since it now happens nearly every year we women prepare in advance by making a macha, a agla chula, store fuel and sell our poultry before the damage is done.

The severe floods can last for four months and nearly half of the village has to squat illegally on top of the embankment for two to three months.

We have no transport during this time and all the village roads are under water. The school closes and our children suffer. Our work is increased as we have to look after the children constantly in case they drown.

Only one woman in the entire village got government relief food during the 1991 floods. Some of our husbands fish during this period but the minute the floods go down we have to plant chillies to get a cash crop.

The only solution to our problem is to seal the Jamuna from Phulchari to Sirajganj."

5. Bujruk village is in Shapgram (trans:" place of the snakes") union only a few miles southeast of Bogra city. It is about one and a half miles east of the Karatoya and ten miles west of the Bangali. There are three hundred households roughly with two thirds of the men owning land of about three bighas. They do get two rice crops boro and amon and also grow jute and vegetables.

**Men**

"Normally the floods are not a problem and the Karatoya does not give us much trouble. Only in 1987 and 1988 were we subject to heavy inundation. The water came from the Karatoya but we think it was caused by breaches in the Jamuna flooding the Bangali which in turn flooded the Karatoya.

In 1988 our transplanted amon was totally destroyed.

It would be better if the Jamuna were properly sealed. We would also like the village road to be raised and to get irrigation from the Karatoya.

But we say again that flooding is not a major problem in this area.

*

**Women**

"In the severe floods of 1987 and 1988 the water came from the Jamuna which is far away.

Our biggest problem was feeding ourselves since we could get no fuel for cooking and the roads to the bazaar were flooded cutting us off. In these years our houses were also damaged.

Although the water came from the Karatoya it came there from the Jamuna and it flooded our houses to a depth of nearly two feet for one month.

In 1988 the flood damaged all our amon and we only got a boro crop. During these times it would be better if the women got work.

We do not need much flood protection but we do need our villages developed especially training and employment for women."

6. Purbo Laxmikola village in Dhangora union is a village of nearly four hundred households with over three hundred farmers and seventy day labourers. The farmers have on average three bighas of land. The Karatoya is one mile to the west, the Bangali five miles to the east and the Brahmaputra twelve miles to the east.

**Men**

"Our flooding problems began in 1984 when we lost cattle, poultry and over ten thousand fingerlings from a fishpond. The road was under water and we had to rent boats since we have none of our own.

In 1988 the situation was worse and our amon crop was totally destoyed. In good years we get very good amon crops but now we worry about its destruction. In 1988 the floods went up and down seven times.

Our families got dysentery, diarrhoeia and skin diseases and we have no medical facilities. We also had trouble with the gokra shap (lit trans: very dangerous snake - the cobra) which comes into our homes.

Nearby there are forty families settled who lost their land in the Jamuna some years ago.

To feed our families during the 1988 flood we took loans from the mohajon at 40-45 percent interest.

Before 1984 we were able to grow boro, amon, mustard, chillies and wheat. Now we only get one rice crop, winter boro.

We need the Jamuna embankment repaired and maintained properly. There are breaches at Sariakandi, Aliakandi, Kazipur and Meghalia which must be repaired if we are to be protected. It would also be better to have a sluice gate in the embankment where the Jamuna breaks into the Bangali so the amount of water going into it could be controlled. We would also like local embankments to allow us to grow transplanted amon."

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**Women**

"The worst floods came in 1988 when all our homestead land was inundated. The water came from the breaches in the Jamuna at Sariakandi and those near Sirajganj when the water came up here. After the floods receded our land was full of stagnant water which damaged crops since there is no good drainage.

The 1988 flood affected us for over four months and we had to sell our poultry and livestock. We had no income and could only afford to eat one meal per day. Only thirty families got any government assistance and the rest of us had to take loans from the mohajons to survive.

Our tubewells were polluted and the latrines unusable and our children could not go to school.

Since then some of us have organised a group and we prepare for floods by making and storing fuel, making agla chulas and machas. When we get work at the winter boro we collect some and store it in case floods come.

There is only one solution to this problem and that is the proper and strong sealing of the embankment on the Jamuna."

7. Roua village is also in Dhangora and comprises three paras with 155 households, 55 of whom are farmers and just over 80 day labourers. Average landholdings are between three and four bighas. The It is two miles east of the Karatoya and three miles west of the Bangali (Ichamoti).

**Men**

"The floodwater comes initially from the Jamuna through the cuts in the embankments. From there it goes into the Karatoya and Bangali and then into our homes and our land.

In 1988 we had to sleep on machas and fifty percent of the village had to move on to the main Bogra road to escape the water. Less than five percent of our houses were above the flood level.

Our problems in severe floods are lack of transport as we have no boats and cannot get to the bazaar. In 1988 all our food in the village store was washed away. We have no jobs and have difficulty feeding our family.

The government have now built a shelter at Raiganj so maybe we can go there in future floods and get relief.

Before 1988 we were able to grow amon rice but now we can only grow boro which is expensive.

The main way to solve our problem is to seal the Jamuna properly at Sariakandi. You must also dredge the Karatoya and perhaps embank its left bank."

**Women**

"We have been flooded every year since 1988 with water which comes from the Jamuna to the north. In 1988 we were flooded for four months with our houses flooded to a depth of three feet for fifteen days.

In 1988 not only was our amon destroyed but damage was done to our jute, mustard and chillies. These are difficult to cultivate anyway since there is poor drainage and much of the water is stagnant.

We also had to take loans from mohajons at twenty percent interest compounded monthly. Those of us who have land had to mortgage it to rich men to feed ourselves.

Our livestock was diseased, our tubewell head under water and we could only sleep with great difficulty.

Since 1988 we now prepare by making an agla chula, store fuel for cooking, store food for our cattle and make the macha in advance of the floods.

You will solve all our problems if you seal the embankment on the Jamuna properly."

8. Sultanpur village in Kagoil union is only fifteen miles south of the Katakhali and the Nurullah Beel Embankment.It is four miles east of the Karatoya. It is a very large village with over 700 households seventy percent of which are engaged in agriculture. Approximately one hundred families are landless and the rest in service industry and business. Average landholdings are only three to four bighas.

**Men**

"We are not normally flooded although in 1988 water did come across the Bogra road and through the Gazaria from the Nurullah Beel and did cause us some problems which we do not expect and therefore were unprepared.

In 1988 we only got a boro crop when nearly every year we get good amon. In 1988 it also damaged our banana trees, jute and brinjal. This all happened in the space of fifteen days.

Our houses were damaged and we had no medical services to help us with the diarrhoeia epidemic the village suffered at that time.

We have water problems the main one being the canal between the Katakhali and the Gazaria which some men use as farmland and no water can pass through it to provide drainage. It is also helpful if the Gazaria channel is re-excavated to let water pass."

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**Women**

"The floods in 1988 which we think came from the Jamuna caught us unawares since we are not used to floods in our area. Our amon, jute, chillies and potatoes were severely damaged.

Because of the damage in 1988 we had to sell our poultry and livestock. Some of us had to mortgage our labour to the large landowners.

Some relief was given from the union chairmen in 1988 but we still had to take loans from the mohajons at high rates of interest since there was no work for our men and we had to feed our families.

We saw three or four dead bodies floating in the water perhaps killed by cobras.

We now build machas and agla chulas in advance but we still need medical supplies for diarrhoeia, skin diseases and high fevers.

The Karatoya must be dredged since the water in it comes up from the Jamuna at Sariakandi."

9. Kalinja village is in Pangasi union only two miles north of the main road to Sirajganj. It is entirely Hindu and consists of 53 households. A major industry in the village is yogurt making. There are also a number of small farmers who have no more than two bighas. The village sits right on the banks of the Bangali (Ichamoti) and is only two miles east of the Karatoya. *Only men were interviewed since women were interviewed in an adjacent village.*

**Men**

"We have been heavily flooded every year since 1984 when the embankment on the Jamuna was first cut. Some years it is not severe as in 1991 but in others it is terrible as in both 1987 and 1988. In 1988 the embankment was cut both at Khokshabari and Charmara causing us enormous problems as the Jamuna flooded into the Bangali (Ichamoti).

In 1988 we lost all our cattle and even the pens we keep them in were washed away. We could not get to the bazaar and on many days we just starved.

We slept on machas and lived on bhelas for many weeks. Four members of our community died from cobra bites.

Since 1988 we have only been able to grow boro rice and some wheat and mustard. Many years ago we got a good amon crop and also aus, sugarcane, cotton and jute. Now it is very difficult to grow these things.

There are many solutions but first the embankment on the Jamuna must be strengthened all the way from Kazipur to Sirajganj. We do not want relief but we need a very good embankment which can be the present one as long as it is strengthened and maintained properly.

We would also like as regulator where the Bangali (Ichamoti) meets the Karatoya. It would also be better if they put a sluice gate in the Taras embankment to let the water out slowly since it has caused us terrible problems when the public cut it."

10. Chakanadamur village in Pangasi union is also just slightly north of the main Sirajganj road and very close to the Bangali the bank of which is a only a quarter of a mile away. It has a population of sixty households, thirty of which are landless and twenty five of which are farmers; five families do not even have homestead land. Only women were interviewed in this village.

**Women**

"In 1988 we were flooded in our homes for one to two months and in our land and village for four months. In 1988 we did not even know the water was coming. It came into the Bangali (Ichamoti) from the breaches in the Jamuna at Sariakandi.

We prepare for floods now in advance. We store fuel, rice chillies and lentils and make machas and bhelas in case the water is very high.

In 1988 our drinking water was contaminated and the latrines could not be used. Every family had diarrhoeia and skin diseases and we had no medical supplies. We have been trained in oral rehydration therapy and were able to keep our children alive. Five people died from cobra bites.

We lost poultry and homestead vegetables and often had tostarve. Our husbands were unemployed for months and some of us had to take loans at twenty five percent monthly compound interest. We did get water purification tablets from the Red Crescent.

Our amon was totally destroyed and our jute, sugarcane and chillies were badly damaged. We now only grow boro as a main crop.

The first thing that must be done is to strengthen and seal the embankment of the Jamuna properly. We must also get improved drainage through the Bangali (Ichamoti) since the floods leave lots of stagnant water behind."

## 2.5 Villages on the Teesta

Flood survival strategy surveys were carried out on the Teesta Right Embankment (TRE) in order to analyse comparatively different situations facing people both protected by the TRE and disadvantaged by the river's behaviour in recent severe floods.

Basically the community types were:

a. A community totally protected in recent years by the TRE and where everyone has access to land;

b. One which is now outside the TRE but also where nearly everyone has access to land;

c. Finally one where the people have had to migrate having lost everything to the river in recent years.

Sadra Taluk village is in Kaunia upazilla and is well protected by the TRE. The 32 households in the sample all had land which they owned. The range was from a quarter of an acre to over seven with the mean being 2.4 acres and the mode 0.66 acres. They farm all the rice varieties, aus, amon and boro and reported that wheat yields have increased in recent years. A wide range of vegetables and tobacco are grown as cash crops and the road along the top of the embankment has improved trading and access to markets.

Rahmatchar village in Pirgacha upazilla is also a settled village but the sample was chosen from farmers living outside the TRE. Out of the 28 households interviewed only one was landless with the others owning a range of land from 0.05 to 6.33 acres with the mean being 1.4 and the mode 0.7 acres. In 1991 a breach in the embankment brought large amounts of water into the area ultimately leaving behind large amounts of sand which has destroyed the agricultural potential of the land. Very little of the land is now fully productive.

Tambalpur village in Pirgacha upazilla is the refuge of around four hundred migrants who came from another community called Tambalpurchara three to four kilometres away. In their previous community nearly all of them reported to have had land. In the flash floods of 1991 bank erosion of the Teesta saw their village disappear into the river. These migrants are living in the school and government buildings and now only find work as seasonal agricultural labourers and as migrant labour in the urban areas when there is no work locally. Thirty six families were interviewed.

A structured questionnaire and a participatory rural appraisal were carried out in the same areas at different times. Both the male household head and his wife were interviewed in order to avoid gender bias.

When asked about the effects of the 1991 flash floods in the Teesta all respondents in Sadra Taluk said they has suffered no damage whatsoever. In Rahmatchar 22 said the damage was moderate to severe while nine suffered slight damage and the other three reported no damage. In Tambalpur the entire migrant community had to move inside the TRE to their present refuge when their homes in the previous location of Tambalpurchara disappeared into the river.

When asked the same question about the 1988 flood which was much more severe only five percent of the housing in Sadra Taluk was damaged. In Rahmatchar over fifty percent of the housing suffered moderate to severe damage, thirty percent reported slight damage while the rest reported no damage. In Tambalpurchara in 1988 all of the housing suffered moderate to severe damage.

Another indicator of perceptions of flood damage is elicited by questions asking for village definitions of floods. In Sadra Taluk a severe flood was defined in the context of how much damage it did to crops while in the more vulnerable locations like Rahmatchar and the ill-fated Tambalpurchara they perceived flood danger in terms of the inundation and damage to household and homestead. Ninety four percent of the residents of Sadra Taluk defined flood damage as destruction of crops while in both Rahmatchar and the now non-existent Tambalpurchara over ninety percent of all respondents said severe flooding was when their houses were submerged.

Perceptions of the role of the embankment (in this case the TRE) also reflect different flood experiences and sixty five percent of those living outside it in Rahmatchar said it was useful as a flood shelter while all of those in Sadra Taluk saw it in terms of crop protection. When this question was followed up with the direct effect of the embankment on crops all respondents in Sadra Taluk claimed enormous benefits to agriculture while in Rahmatchar only four said they felt any benefit to crops while thirteen claimed it delayed amon cultivation and ten said it was counterproductive since too much sand was deposited on good land as a result of its existence. In Sadra Taluk the farmers also said that the existence of the road on the TRE had improved their economy considerably since they had better access to markets as a result of its construction.

Another indicator of stress in floods is nutritional standards during the flooding period. Respondents in Sadra Taluk reported no difference in food intake during floods and at other times of the year. In Rahmatchar for a minority of respondents of about five percent at no time of the year were they able to afford three meals per day. In this village in the severe flood months from July to September approximately ten percent of the village only ate one meal per day, while another twenty percent were only able to obtain two meals. All of them reported that the nutritional quality of what they were able to get was much lower than in the dry season and a meal would frequently consist of rice and chillies.

The status of health in these villages was also elicited for the severe flood years of 1987, 1988 and 1991. Those who previously lived in Tambalpurchara said seventy percent of them had had dysentery and diarrhoea , five percent had typhoid and the remainder a variety of fevers and skin infections. In Rahmatchar around fifty percent of them had dysentery and diarrhoea while Sadra Taluk reported little difference from other times of the year. On the more general question of family illnesses over seventy percent of Rahmatchar said illness had increased in heavy floods while Sadra Taluk no difference had been noticed.

The major inference from this survey is that embankments do afford protection to those communities which happen to be in the right place when they are constructed. Sadra Taluk is a thriving agricultural community behind an area of the TRE which is secure and as such has improved the lot of the community. That part of Rahmatchar which is outside the TRE struggles to provide the community with a reasonable existence while Tambalpurchara no longer exists.

With this study and others done behind the BRE from Sariakandi southwards (see below) it is emerging that many of the problems of the region can be attenuated if the existing embankments are in good condition and maintained properly. Spillage from the internal rivers in the northwest appear to be the result of breaches in the main embankments which do one of two things. They increase the volume of discharge down the smaller rivers to a level that these cannot take without overspilling or they bring so much sediment that the bed levels of the smaller rivers rise and severely diminish the capacity of these to hold a reasonable volume of water. The outcome for those communities on the region's major rivers with no protection from embankments is misery when flooding becomes severe.

From this survey and the one done on the BRE it is clear that the communities are aware that most solutions to their flood problems must be predicated upon the good working order of the major embankments which provide the best line of defence from the ravages of excess water.

## 2.6 Chars in the Brahmaputra

In surveys and rural appraisals carried out in chars off Gaibandha, Chilmari and Bhuapur a number of observations and findings support the conclusion that living on the these islands and sandbanks in the major rivers is one of the harshest types of existence imaginable. They are physically isolated from centres of government and therefore services and from markets and social institutions like credit facilities and medical practices.

They are also agriculturally difficult and producing crops is an arduous and hazardous occupation. The only cash crop that was in evidence was groundnuts and only a little aus and an amon variety which does not require much fertiliser; some sweet potato and wheat are also grown. There is also the problem of accreted land which legally becomes government khas but in effect is frequently settled by rich landowners (jotedars and talukdars) who "permit" the char settlers to sharecrop or to rent the land from them. Only in Bhuapur and Chilmari where a strong NGO presence was evident was there any attempt to get land titles for the people who had settled the chars.

They are also regarded with disdain by mainland communities. This is almost caste-like in character and they become a sub-culture which is referred to as chaura which has a negative connotation. They are extremely aware of this and reported to the fieldworkers that when they have to go to the mainland for help during very severe floods they feel like outcasts.

Yet there is a degree of collective endeavour on the chars that is not much in evidence in villages elsewhere. They told the fieldworkers that they do help each other and even involve the women and children to a high degree in this. For example, prior to the flood season women and older children help in the consruction of the macha which is a type of bamboo loft inside the house above the flood levels. Making the bhelas ( rafts made of banana tree) on which the women and children squat during very high floods is a community effort. Data show that men of the chars tend not to migrate for work during the floods, unlike the landless men on the embankments, preferring to stay and protect family and community.

The availability of clean drinking water is a perennial problem for char dwellers and in the household survey for over ninety percent of the respondents the supply of clean drinking water and the provision of sanitary latrines came high on the list of priorities for improving the quality of life. They told the fieldworkers that they had constant problems from water-borne diseases like diarrhoea and dysentery.

Unlike many of the mainland communities their social conscience is strong. They have a salish (community arbiter) who settles disputes and is consulted on access to reclaimed land which has not been grabbed by powerful mainland interests. Neighbours help each other when the men migrate for work and support is given during sickness and when the community has to move during severe flooding.

When asked what sort of flood control they would like to see on the char they found it difficult to respond since no one had ever asked their opinion before. It took fully fifteen minutes to get the dialogue re-established after the question was asked. Yet they have opinions which if sought more regularly and acted upon would lead to an improvement in their way of life. They also have individual and collective strength to survive in situations which many would find impossible.

## CHAPTER 3

## WOMEN IN FLOODS

### 3.1 Women's Roles in Floods

A survey of women's perceptions, attitudes and survival strategies during floods was carried out in the general area of the BRE around Sariakandi and the part of Dhunot which is affected by the Bangali river. These areas are particularly critical since the erosion and natural breaching of the Brahmaputra near Sariakandi causes enormous damage during heavy floods . Indeed the Brahmaputra breaks into the Bangali on occasion and the flows are so great that there are added problems of back up from the Hurasagar to the south where the system is supposed to drain. In Dhunot there are added problems from spillage from the Karatoya which comes into the area from Dinajpur and is subject to heavy siltation.

Four villages were chosen on the BRE and one on the Bangali near Sherpur. They were :

1. Titparal: Union Sariakandi: Upazilla Sariakandi.
   This village straddles the BRE a few kilometres north of Sariakandi town and is composed of families which have had to migrate from other flooded areas in the district. When flooding is severe they spend the day on the top of the BRE where they cook and look after their children. In the evenings they go down the embankment to sleep on the macha (raised loft inside the house) in their homes.

2. Gajara: Union Sariakandi: Upazilla Sariakandi.
   This village is just to the south of Sariakandi town on the BRE.This village was formed on a retired part of the BRE after the villagers lost their homes due to the erosion of the previous one. Their original village called Daruna is now submerged in the Brahamaputra. These villagers also shelter on the crest of the BRE during heavy floods.

3. Chillipara: Union Karnibari: Upazilla Sariakandi.
   This is a settled village approximately ten kilometres south of Sariakandi town where most of the people have some land. But during the flash floods of 1991 the embankment was breached and the village washed away. When the embankment was rebuilt it was retired and this village is now outside the BRE and in the last year it was impossible to grow crops as sand has taken over the land. In this village even rich and middle peasants have had to sell their animals and belongings to survive heavy floods. Many of the richer farmers have migrated to Bogra and Sherpur.

4. Mathurapara: Union Karnibari: Upazilla Sariakandi.
   This village south of Chillipara also suffered during the 1991 flash floods and much land was lost including 100 acres by the local school teacher. The village is again now outside the new retired embankment. Again there is evidence of those who could afford it moving to Sherpur and Bogra.

5. Sagdaha: Union Chaukibari: Upazilla Dhunot.
   This village is well behind the BRE on the right bank of the Bangali river. When the BRE is breached during heavy floods this village and adjoining ones are totally inundated. The problem is compounded by water backing up from the Hurasagar system to the south. The villagers also claimed that heavy siltation in the Bangali is creating problems. During the 1991 flash floods which came into the area from Dinajpur District many of them took refuge in Sherpur school.

Since women play a major role in flood survival strategies and also since many flood studies done in Bangladesh have proved to be gender blind this study was especially commissioned to make sure that at least in the NWRS these shortcomings would be overcome. Women's needs, both practical and strategic, are often quite different to those of men and flood survival techniques are no exception to this general principle. Practical needs might be better and less hazardous access to clean water for themselves and their families while employment for these women would not only fulfil a strategic need but could also dispense with the dependency on high interest loans from mohajons in order to feed their families during severe floods.

One hundred women were interviewed with both a structured questionnaire and an open ended survey instrument. Part of the methodology was designed to allow the women to rank order their needs both during flooding and also in the context of general development of themselves and their communities and families.In the bulk of the cases the women were interviewed away from the presence of the husband; only in Titparal on a day the men could get no work at earthcutting were they present but most of them on request left their wives to be interviewed alone.

Figure 1 describes the age ranges of the sample and shows an expected distribution of women across these ranges. All of their husbands were alive. The average family size was only 3.57 which is considerably lower than national averages but the fieldworkers report that family planning services are well known to the sample and these exist extensively in the area. Indeed over thirty percent of the sample claimed to have had a ligation and others expressed a desire to adopt this method. The average number of children for women below 35 years was 2.6 and that of those over this age 4.3 demonstrating the greater fertility span of the older women but perhaps also indicating that the message of limiting family size does appeal to younger women.

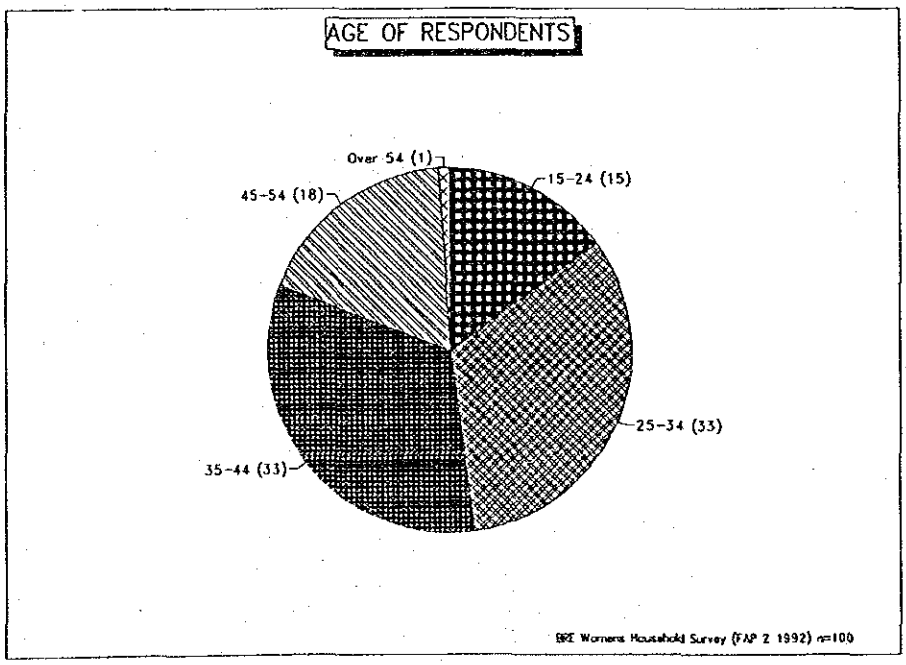


**Figure 1**

By far the largest perception of the approach of floods was by visual observation of the rise in river levels as depicted in Figure 2. These statistics would seem to indicate that the number who find out the approach of floods by radio is low and if national flood warning systems are to have any impact far more women either need a radio or information about when and what to listen for during the monsoon season. Since women in Bangladesh spend more time in and around the homestead they are often better situated than their husbands to listen for warnings especially when flash floods are likely. This requirement is also supported by the high number of women who claimed not to know until inundation was taking place.

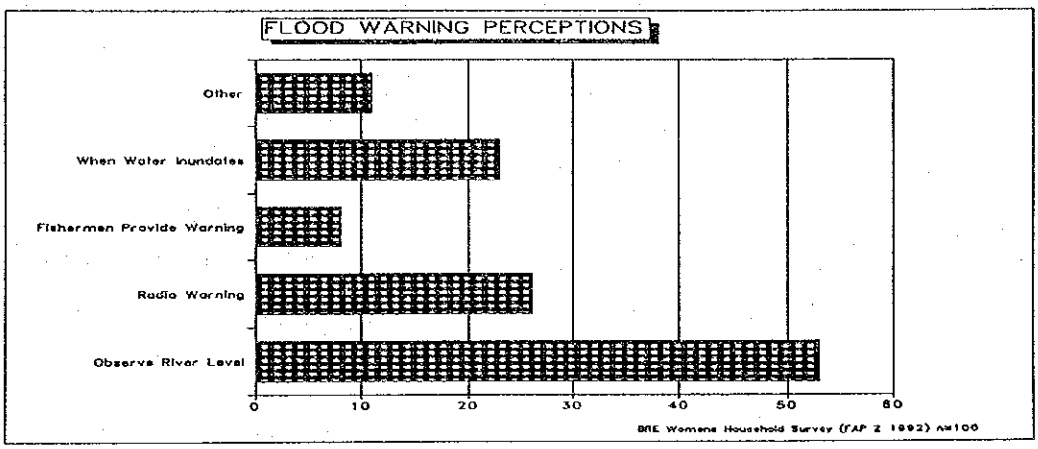


**Figure 2**

Unsurprisingly in an area which is heavily embanked the largest single group, as demonstrated by Figure 3, take shelter on the embankment during heavy flooding. Indeed only just over 25 percent of the sample were able or were forced by circumstance to stay in their own homes during the floods. Those moving either go to Bogra or Sherpur where as indicated above the school is used as a flood shelter in extremis. The fact that 75 percent of them have to move also indicates the flood-ravaged nature of this area of the BRE and the land to the west of it between Sariakandi and Sirajganj.

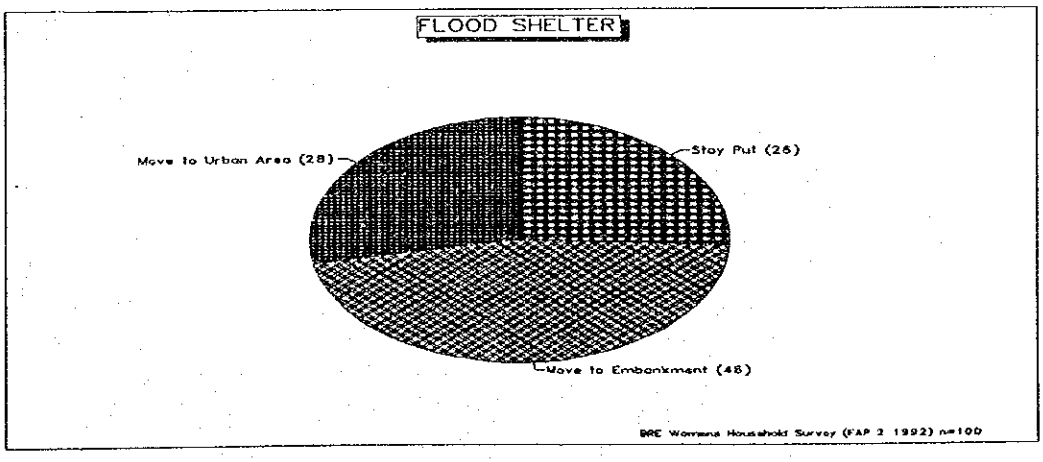


**Figure 3**

Table 1 lists the survival strategies adopted by these women and their families during severe floods. Only a small number reported starvation but the number taking loans at exorbitant rates of interest from mohajons is high and the sale of assets, whether animals or domestic, is also high and when floods occur in consecutive years ie 1987 and 1988 it is difficult to see how families can recover from these depredations. Indeed in the villages of Chillipara and Mathurapara families which owned substantial areas of land prior to 1987 are now almost destitute largely due to the river erosion and the continuous retirement of the embankment.

Drinking water and health services are better than average and if the tubewells are clean the value of these sources of drinking water demonstrate the foresight of planners in the large scale provision of tubewells throughout the country. The nine women listing Oral Rehydration Therapy as a service were in fact indicating that they had had to use it but nearly all of them reported an understanding of how to make it and its value in flood conditions.

Table 1

FLOOD SURVIVAL STRATEGIES

| Providing Family Food | | Obtaining Water | | Medical Services | |
|---|---|---|---|---|---|
| Sell Domestic Assets | 10 | Tubewell | 87 | Local Clinics | 43 |
| Sell Cattle/Poultry | 13 | Flood water | 10 | Kobiraj (Village Doctor) | 26 |
| Informal Loans | 43 | Boil Floodwater | 3 | ORT | 9 |
| Sell Trees | 3 | | | NGOs | 10 |
| Govt Relief | 9 | | | None | 22 |
| Starve | 12 | | | | |
| No Problems | 26 | | | | |

BRE Womens Household Survey (FAP 2) n=100

A small majority of the sample (see Figure 5) thought that the most necessary requirement during floods was government relief. This is perhaps not surprising since the statistic in Figure 4 indicated that only nine of the women had received any government relief during the last severe flooding period in 1991. A not insignificant number also claimed the need for boats, better medical services and employment. Interestingly in an area which suffers heavy inundation only six claimed shelters were needed.

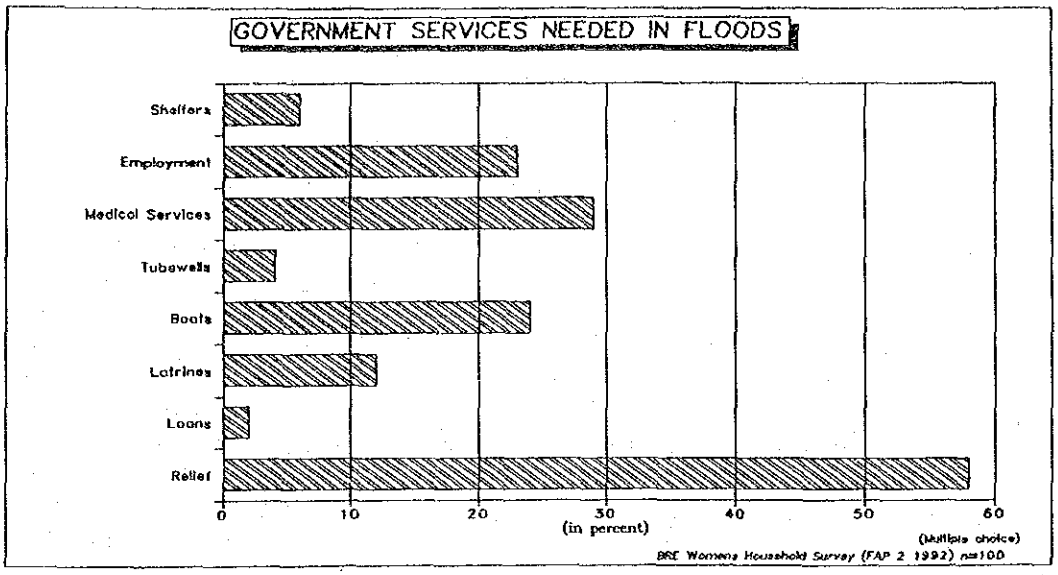


**Figure 5**

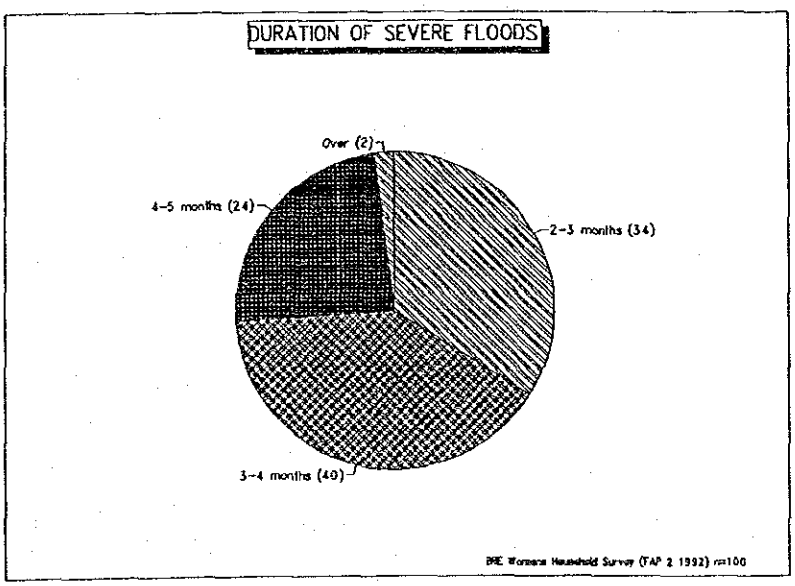


**Figure 6**

The duration of severe flooding indicates the parlous nature of this part of the northwest region. As indicated in Figure 6 this period can range from two to six months according to the experience of these women. It needs to be pointed out that the longest duration they could not use their homesteads was only six weeks and is frequently as little as one week but the water congested the area for much longer periods. Since there are enormous breaches in the BRE where Mathurapara and Chillipara are situated this lengthy period of water congestion is perhaps understandable.
The remainder of the survey gave the women a chance to rank order a number of problems experienced during severe flooding and also what they considered to be the important development options they face as women.

Figure 7 demonstrates that once again the need for dry shelter is not considered by these women to be a high priority even when the question is about flood conditions. By far their greater concern was with employment followed by latrines amd the problem of cooking for the family when surrounded by water. When, however, the question specifically indicated a ranking of flood proofing and flood control measures high earthen shelters (see Figure 8) were by far the greatest choice. Preference for embankments was most predominant in the villages where the greatest erosion and breaching of the BRE takes place. These villagers also wanted a groyne constructed to the north of where the embankments were repaired or reinforced.

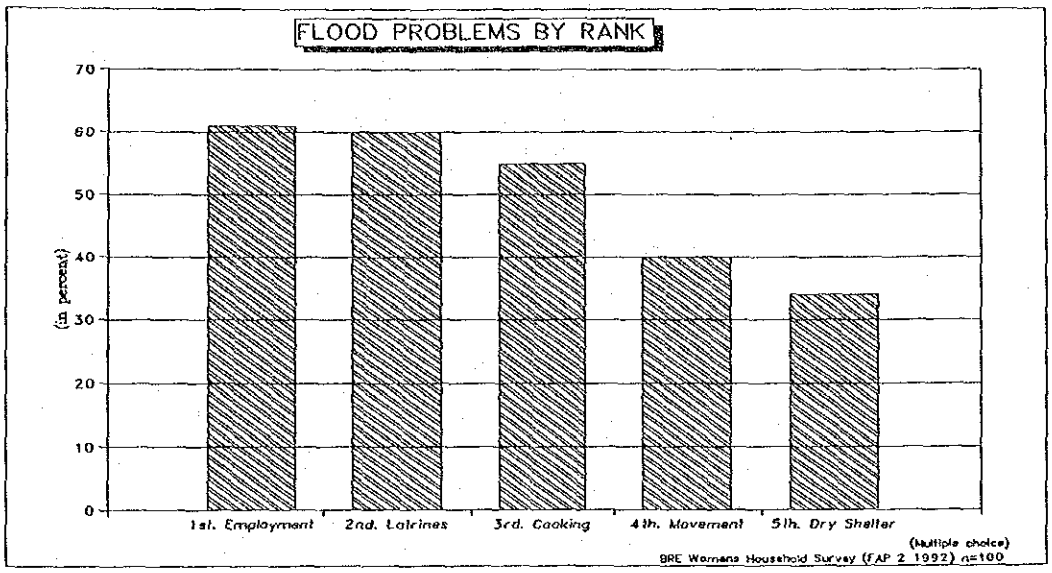


**Figure 7**

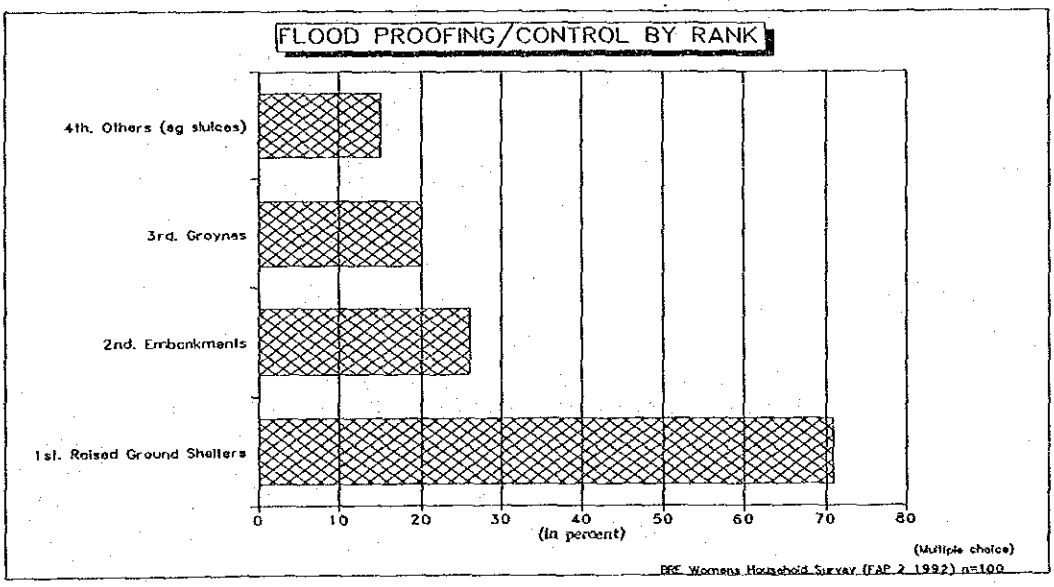


**Figure 8**

In an open ended follow-up session all of the embankment dwellers wanted a permanent solution to their problem since many of them have seen the embankment retired and retired while land disappears into the river. Many of them expressed quite categorically that they wanted no further retirement of the BRE.

On the question of the general development of themselves and their families and communities the women ranked gainful employment for themselves higher than that of their husbands. The difference as outlined in Figure 9 is not all that great but it perhaps indicates a change in the women's own attitudes towards the domestic economy. That training for women ranked third would also support the idea that, in society in general, attitudes to purdah and its implications for women are changing.

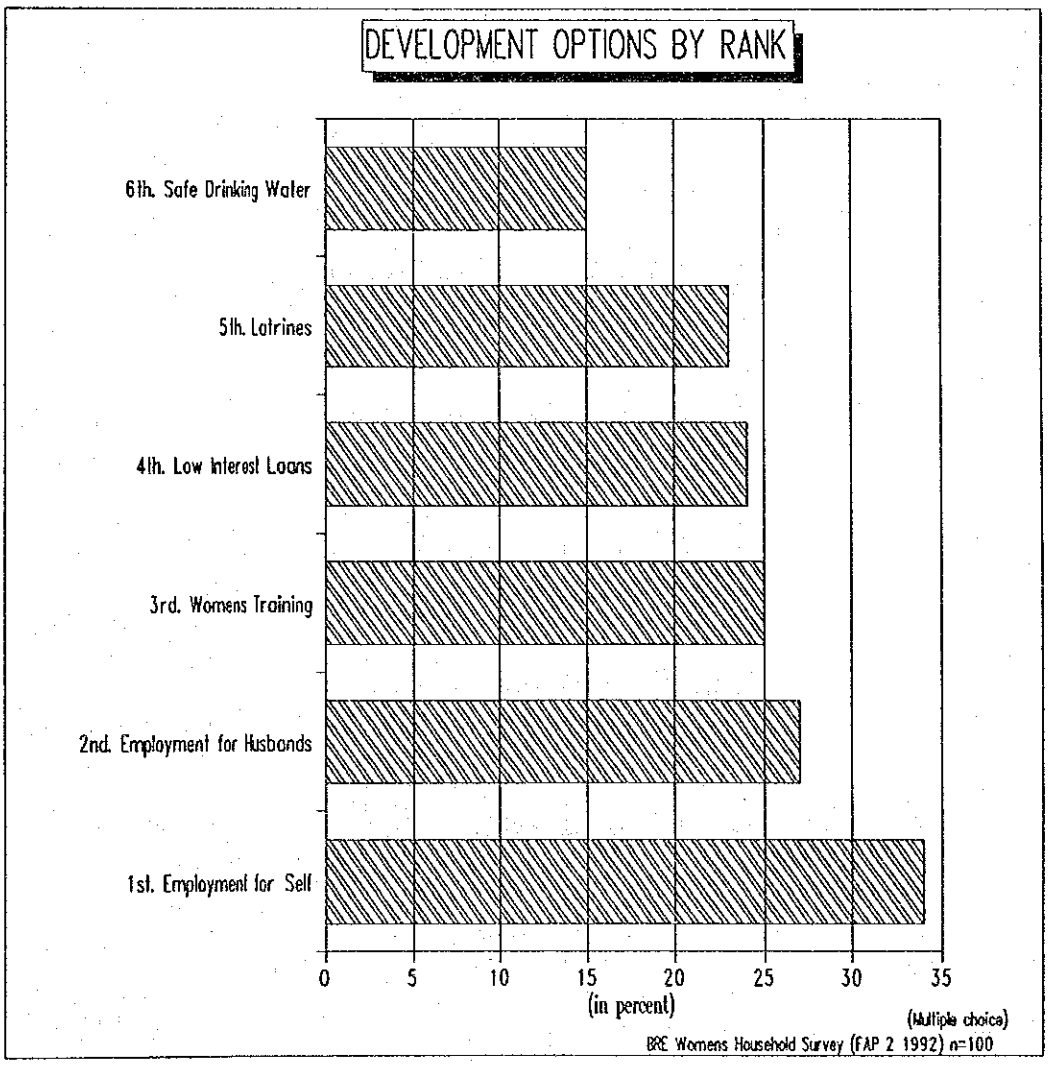


**Figure 9**