Final Report
on
Inventory of Community Risk Reduction Program

Volume I: Main Report

November 2006

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Final Report

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Executive Summary

Natural disasters like flood, cyclone, drought, erosion, etc. frequently disrupt the development activities and live-livelihoods in Bangladesh. The Government of Bangladesh (GoB) has taken many initiatives for poverty alleviation through risk reduction programmes under multi hazards and multi sectoral environment. Over the periods, risk reductions programmes have been carried out by individual organizations with the development partners according to their own views and targets focused on relief and rehabilitation with uni-hazard environment. A coordinated approach was felt necessary to achieve the national goal. The GOB established the Comprehensive Disaster Management Programmes (CDMP) as an initiative under the Ministry of Food and Disaster. As part of the CDMP activities, the project 'Inventory of Community Risk Reduction Programme (ICRRP)' was conceived to prepare a database containing the inventory of ongoing, recently completed and proposed community risk reduction initiatives. CDMP has assigned CEGIS to prepare this inventory along with a prototype MIS.

The main objective of this project is to prepare a comprehensive database on PPRR (Prevention, Preparedness, Relief and Rehabilitation) activities in seven pilot district as well as nation level for assessment of state of programmes and capabilities of the respective key stakeholders. The major activities of the project were (i) preparation of ICRRP at national and seven pilot district level, (ii) Risk and Hazard, SWOT and Gap analysis and, (iv) prototype GIS based MIS development.

ICRRP information were collected from more than 50 national level organizations, and from more than 200 district level organizations in seven pilot districts namely Cox's Bazar, Faridpur, Lalmonirhat, Rajshahi, Satkhira, Sirajganj, Sunamganj through structured questionnaire survey, agency visits and consultation workshops.

The inventory shows that over 80 and 60 percent organization work with flood and cyclone respectively, out of which 30 percent are purely govt. initiatives at national level, where as at district level 50 percent organizations are NGOs. Most of the organizations are engaged in flood, cyclone and erosion hazards. About 50 percent GO organizations are engaged in prevention activities where as only 20 percent GO-NGO organizations are involved in preparedness.

The summarized data were used in SWOT (Strength, Weakness, Opportunities and Risks/Threats) and GAP analysis with multi-hazard and multi-risk approach. The analyses of the study found that, out of 52 national level organizations 10 organizations are working with prevention, 33 organizations are working with preparedness, 15 organizations are working with relief and 18 organizations are working with rehabilitation activities. The SWOT analysis revealed that among 38 National level GO and NGO organizations, 32 organizations have adequate Management strength; 13 have weakness in availability of Skill Resources; 18 have the opportunity of Improved Institutional Mechanism. The social and political conflicts are identified as threat to 7 organizations. Among seven pilot districts, Management and Skill Resources was found as the key strength, Availability of Fund was found as weakness, Improved Institutional Mechanism/coordination was found as opportunity and the Social and Political Conflicts were found as Risk/Threats.

According to the Risk Management Framework of CDMP, GAP analyses were done for (i) hazard analysis, (ii) risk assessment and (iii) risk treatment.

Another important activity exercised under this study is *hazard and risk* mapping, this has been done as pilot basis in Rajshahi district. An important product of this study is a GIS based prototype MIS for helping the planners and decision makers to fetch the inventory different summarized information on organizational capacity and PPRR activities.

The study recommended (i) prototypes MIS developed under this study need to be extended for the whole country (ii) The PPRR activities delineated under this study is *initial* which should be further improved (iii) National level inventory should be made detailed as pilot districts. (iv) tools should be developed to abstract and extract data and information for CRA. (v) pilot resources mapping for risk reduction that has been done under this study should be done for whole country..

Acronyms

ABIRD	Association for Bangladesh Integrated Rural Development
ACD	Association for Community Development
ADB	Asian Development Bank
ADD	Action on Disability and Development
ADO	Agriculture Development Organization
ADPC	Asian Disaster Preparedness Center
ADSS	Arsenic Decision Support System
AKK	Amra Kaj Kory
AMP	Arsenic Mitigation Project
AqDP	Aquaculture Development Project
ARCHES	Association for Renovation of Community Health Education Services
ASC	Association for Save Community
ASOD	Association for Social Organization Development
BADC	Bangladesh Agricultural Development Corporation
BARSA	Bangladesh Association of Rural and Social Advancement
BCAS	Bangladesh Centre for Advance Studies
BDPC	Bangladesh Disaster Preparedness Center
BDRCS	Bangladesh Red Crescent Society
BFF	Bangladesh Freedom Foundation
BFF	Beneficiary's Friendship Forum
BGS	Bangladesh Geographical Society
BIDS	Bangladesh Institute of Development Studies
BMD	Bangladesh Metrological Department
BMDA	Barendra Multipurpose Development Association
BRAC	Bangladesh Rural Advancement Committee
BSDS	Bangladesh Social Development Services
BUET	Bangladesh University of Engineering and Technology
BUP	Bangladesh Unnayan Parishad
BUS	Bichitra Unnayan Sangsthya
BWDB	Bangladesh Water Development Board
CBO	Community Based Organization
CCBVO	Centre for Capacity Building of Voluntary Organization
CCDB	Christian Commission for Development in Bangladesh
CDMP	Comprehensive Disaster Management Program
CDOW	Coastal Development Organization for Women
CEGIS	Center for Environmental and Geographic Information Services
CFW	Cash for Work
CHT	Chittagong Hill Tracts
CIDA	Canadian International Development Agency

CISD	Center for Integrated Social Development
CNRS	Center for Natural Resources Study
COAST	Coastal Association for Social Transformation Trust
CPP	Cyclone Preparedness Programme
CRA	Community Risk Assessment
CRIS	Children Rights Implementation Society
CRS	Catholic Relief Source
CYSMIS	Cyclone Shelter Management Information System
DAE	Department of Agriculture Extension
DANIDA	Danish International Development Agency
DASCOH	Development Association for Self-Reliance, Communication and Health
DCC	Dhaka City Corporation
DFID	Department for International Development
DMB	Disaster Management Bureau
DMIC	Disaster Management Information Centre
DMP	Disaster Management Project
DNK	Dariddra Nibaron Kendra
DNP	Dariddra Niroson Parishad
DoE	Department of Environment
DPHE	Department of Public Health and Engineering
DPPMP	Disaster Prevention, Preparedness and Mitigation Program
DRR	Directorate of Relief and Rehabilitation
DRRO	District Relief & Rehabilitation Officer
EC	European Commission
ERA	Efforts for Rural Advancement
ESDO	Eco-Social Development Organization
ETRM	Empowerment through Resource Mobilization
EWS	Early Warning System
FAO	Food and Agriculture Organization
FDA	Faridpur Development Agency
FFWC	Flood Forecasting and Warning Center
FIVDB	Friends in Village Development Bangladesh
FSP	Financial Support for the Poorest
FSVGD	Food Security for Vulnerable Group Development
GJKS	Grameen Jono Kollyan Sangsthya
GKS	Gono Kallayan Sangsthya
GoB	Government of Bangladesh
GSB	Geological Survey of Bangladesh
GSK	Gono Shastha Kendra
GUS	Gono Unnayan Sangsthya
HCP	Hard Core Poor
HFPP	Homestead Food Production Project
HUNO	Haor Elaka Unnayane Nagorik Oikko

ICCO	Interchurch Organization for Development Cooperation, Germany
ICRC	International Committee of the Red Cross
ICRD	Integrated Coastal Resources Database
ICZMP	Integrated Coastal Zone Management Plan
IDEA	Institute for Development Affairs
IDEAL	Institute of Development Education for Advancement of Landless
IEC	Information, Education and Communication
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red-Cross and Red Crescent
IGA	Income Generating Actively
IGP	Income Generating Project
IIRD	Institute of Integrated Rural Development
IPM	Integrated Pest Management
IRDF	Integrated Rural Development Foundation
IRDP	Integrated Rural Development Programme
ISDR	International Strategy for Disaster Reduction
ITDG	Intermediate Technology Development Group
IWFM	Institute of Water and Flood Management
IWM	Institute of Water Modeling
JICA	Japan International Cooperation Agency
KPED	Knowledge Portal on Estuary Development
KPUS	Kamarkhanda Polli Unnayan Sangsthya
LDCs	Least Developed Countries
LEAF	Livelihoods Empowerment Agro Forestry Project
LGED	Local Government and Engineering Department
LWF	Lutheran World Federation
MCC	Mennonite Central Committee
MIS	Management Information System
MKS	Manab Kallayan Sangsthya
MMS	Manob Mukti Sangsthya
MoFDM	Ministry of Food and Disaster Management
MPO	Master Plan Organization
NAPA	National Adaptation Programme of Action
NAZIR	Natun Zibon Rochi
NCAP	Netherlands Climate Change Assistance Programme
NCDS	North Char Development Society
NCU	NGO Cooperation Unit
NDP	National Development Programme
NDRRP	Natural Disaster Risk Reduction Programme
NSKS	Nari-o-Shishu Kallayan Sangsthya
NWRD	National Water Resources Database
OREDAR	Organization of Rural Economic Development and Rehabilitation
OVA	Own Village Advancement

PADMA	Polli Advancement & Disaster Management Association
PARAS	Polli Rakkhya Sangsthya
PHALS	Programme for Helpless and Lagged Societies
PHD	Partners in Health and Development (former BPHC)
PIO	Project Implementation Officer
PKS	Pathokoli Sangsthya
PKSF	Polli Karma Sahayak Foundation
POPI	People Oriented Program Implementation
PPD	Programmes for Peoples Development
PPRR	Prevention, Preparedness, Response and Recovery
PVA	Participatory Vulnerable Assessment
PWD	Public Works Department
PWO	Poor Welfare Organization
R&H	Roads and Highways
RBDM	Right Based Disaster Management
RDRS	Rangpur Dinajpur Rural Service
RIC	Resource Integration Centre
RISKPLAN	Risk Based Planning
RMC	Rural Micro Credit
RULFAO	Rural Under Privileged & Landless Farmer Organization
SAP- BD	South Asia Partnership-Bangladesh
SAPMP	Strengthening of Arsenic Preparedness and Mitigation Project
SARPV	Social Assistance and Rehabilitation for the Physically Vulnerable
SCRWFP	Strengthening of Community Resilience to Withstand Flood Project
SDC	Society Development Committee
SDC	Swiss Development Corporation
SDF	Sylhet Disaster Forum
SEMP	Sustainable Environment Management Programme
SFF	Sirajganj Flood Forum
SFGD	Stakeholder Focus Group Discussion
SHARP	Socio Health and Rehabilitation Program
SHED	Society for Health Extension & Development
SHETU	Shirashuni Humanitarian Enhance Territorial Unity
SHISUK	Shikkhya Shasta Unnayan Karjakrom
SHOUHARDO	Strengthening Household Ability to Respond to Development Opportunities
SIDA	Swedish International Development Cooperation Agency
SKSSS	Sa-Karma Samaj Sheba Sangsthya
SMC	Shelter Management Community
SMKS	Sonirvor Mohila Kallayan Sangsthya
SMS	Shapla Mohila Sangsthya
SODESH	Society of Development and Education for Small Households
SPARRSO	Space Research and Remote Sensing Organization
SPHERE	Right to Minimum Standard

SRDI	Soil Resource Development Institute
SSKS	Sramjibi Samaj Kallayan Samitee
SURP	Seasonal Unemployment Reduction Programme
SUS	Satkhira Unnayan Sangsthya
SWC	Social Work Center
SWOT	Strength, Weakness, Opportunities, Risk and Threats
TMSS	Thangamara Mohila Sobuj Sangha
ULO	Upazila Livestock Officer
UNDP	United Nations Development Program
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
UNO	Upazila Nirbahi Officer
USA	Unity for Social Advancement
USAID	United States Agency for International Development
VAM	Vulnerability Analysis and Mapping
VARD	Voluntary Association for Development
VDA	Village Development Association
VERC	Village Education Resource Center
VGD	Vulnerable Group Development
VGF	Vulnerable Group Feeding
WARPO	Water Resources Planning Organization
WDC	Work Development Centre
WFP	World Food Program
WHO	World Health Organization

Chapter 1
Introduction

1.1 Background

The developing countries of Asia and the Pacific are situated in the world's hazard belts and are subject to frequent floods, droughts, cyclones, earthquakes, windstorms, tidal waves, land slides, etc. The major natural disasters that occur periodically in this region are largely due to climatic and seismic factors. The region has suffered 50% of the world's major natural disasters (ESCAP, 1995a). Since 1990, the total number of deaths due to natural disasters in the region has exceeded 200,000 and the estimated damage to property over this period has been estimated at US$ 100 billion (ESCAP, 1995a). Disaster vulnerability has increased due to the increased aggregation of people in urban centres, environmental degradation, and lack of planning and preparedness.

In recent years, there has been a major shift in people's attitudes and behaviors towards coping with natural disasters. In the past more emphasis was placed on humanitarian response and relief activities, with little attention paid to risk reduction strategies. The latter has the potential to save thousands of lives even with the simplest measures like early warning. Today, there is increasing recognition that while humanitarian efforts are important and need continued attention, risk and vulnerability are crucial elements in reducing the negative impacts of hazards and thus essential to the achievement of sustainable development.

The idea of conducting a global review of disaster reduction initiatives was born in the new millennium following the United Nations International Decade for Natural Disaster Reduction (1990-1999) (United Nations ISDR, 2004). The Decade showed that despite the decline in loss of lives, the number of disasters and related economic loss is in fact increasing. In many cases such losses were due to a lack of coherent disaster reduction strategies by international and regional organizations, governments and decision-makers and the development of a culture of prevention among the public at large.

As a part of international initiatives, Bangladesh has been undertaking several programs for risk reduction over the last few decades. The Comprehensive Disaster Management Programme (CDMP) was approved by the Bangladesh Government in 2003 as a key strategy to advance the risk reduction efforts of the Government and different agencies in the country. CDMP is a strategic institutional and programming approach that is designed to optimize the reduction of long-term risk and to strengthen the operational capacities for responding to emergencies and disaster situations, including actions to improve recovery from these events. The vision of the Government is to reduce the vulnerability of the poor from the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level. The Ministry of Food and Disaster Management (MoFDM) has been given the mandate to drive national risk reduction reform programs. Its mission related to this agenda is to achieve a paradigm shift in disaster management from the conventional response and relief to a more comprehensive risk reduction culture.

CDMP seeks to reduce the level of community vulnerability and enhance sustainable development initiatives through a range of integrated strategies containing five focus areas and ten components. The implementation agencies are drawn from government and non-government sources. CDMP utilizes the International Risk Management Standard AS/NZS 4360:1999 as the basis for effective risk assessment with risk treatments designed around Prevention, Preparedness, Response and Recovery strategies (PPRR). This task can only be achieved through a comprehensive approach that unites the government, NGOs, the community, and the private sectors in a joint strategy for effective risk reduction.

The initial consultations with the major stakeholders directly implementing disaster management programs at the community level or in partnership with local level NGOs, show that most of the agencies follow a single agency and single hazard approach. As a result, there are duplications and repetitions of efforts causing inefficient use of resources. There is a need for an increasing understanding and knowledge of the benefits of scientific and technical information to ensure a comprehensive all hazard Community Risk Assessment (CRA) process that establishes strategies for reducing community risks.

Hence, in order to develop a coherent disaster risk reduction strategy, a comprehensive inventory of initiatives, activities, approaches, mechanisms, technologies and programs is essential.

1.2 Objectives

The objective of this study was to produce a thorough inventory of ongoing, recently completed and proposed community risk reduction initiatives of major players active in the field of disaster management and risk reduction in Bangladesh.

The major specific objectives of the project were:

- Review of existing initiatives of risk reduction in Bangladesh, which includes initiatives, activities, and areas of operation, approach, methods and tools of operation used by relevant organization.
- Identification of resources, which include organizational capacity, institutional structure, organization, software tool availability and use etc.
- Development of inventory database and prototype MIS on Risk Reduction Programs for all hazards.

1.3 Limitations of the Study

The major limitations of the study were:

- Limited resources and time
- Non-cooperation of national organizations
- Differentiation of programs as disaster management at the community levels due to multi-focal objectives of existing programs.

1.4 Structure of the Report

Chapter 1: Introduction: This chapter describes the background, aims and objective of the study.

Chapter 2: Study Area: A description of location, physiographical and socio-economical condition of the seven pilot districts is given in this chapter.

Chapter 3: Methodology and Approach: The methodology and approach of the study is described in this chapter.

Chapter 4: Inventory and Prototype MIS: The Management Information System (MIS) developed for the study is described in this chapter.

Chapter 5: Hazard and Risk Analysis: Natural hazards prevailing in the country and specifically in seven pilot districts with their effects and seasonality and an indicative analysis of resources and risk are described in this chapter.

Chapter 6: Institutions and Programs Involved in Risk Management: all national and community level organizations involved in risk reduction programs, their activities and resources are described in this chapter.

Chapter 7: SWOT and GAP Analysis: SWOT and GAP analysis for the organizations in seven districts and national organizations are presented in this chapter.

Chapter 8: Conclusion and Recommendation: This chapter summarizes the study findings and presents the recommendations.

Chapter 2
Study Area

2.1 Introduction

Bangladesh is mainly an alluvial deltaic plain divided into three zones, namely hills, terraces and flood plains based on geomorphology and physiography. The country has an approximate area of 147,570 sq. km and a 4,685 km. long boundary that form the lower part of the basins of three mighty rivers, the Padma (known as the Ganges in India), the Brahmaputra and the Meghna. Bangladesh with its fragile state of economy depends predominantly on agriculture, which has a strong linkage with seasonal weather systems. The land is frequently visited by natural hazards among which floods, cyclones with accompanying storm surges, droughts, tornadoes, river-bank erosions and earthquakes may be mentioned as the most disastrous. Bangladesh, which is also in close proximity with the Himalayas, has a long history of seismic tremors. The colossal loss of lives and properties caused by frequent natural disasters at short intervals make Bangladesh one of the most disaster prone countries in the world.

Seven pilot districts, Lalmonirhat, Rajshahi, Sirajganj, Sunamganj, Faridpur, Satkhira and Cox's Bazaar, were considered as the study area for detailed preparation and analysis of inventory (Figure 2.1). The whole of Bangladesh was considered for a national level inventory and analysis under this study.

2.2 National level (Bangladesh)

The national organizations are based in Dhaka city and some of them have regional and local offices all over the country. Although the national level organizations play a role in decision-making, risk reduction programs are implemented through community level organizations. Local organizations mainly work on single hazards whereas national organizations work on multiple hazards occurring all over the country.

The natural hazards occurring in different parts of the country are not similar. For instance, the northern parts of Bangladesh face droughts, cold waves, river floods, flash floods, etc. whereas the southern parts of Bangladesh are vulnerable to mostly cyclones, salinity intrusion, tidal surges, drainage congestion, etc. The Chittagong and Sylhet areas are more exposed to earthquake events.

2.3 Seven Pilot Districts

Seven pilot districts were selected by CDMP considering their multi-hazard environments and spatial and temporal diversity with different degrees of vulnerabilities. The vulnerable populations and main hazards in these pilot districts are shown in the following figure:

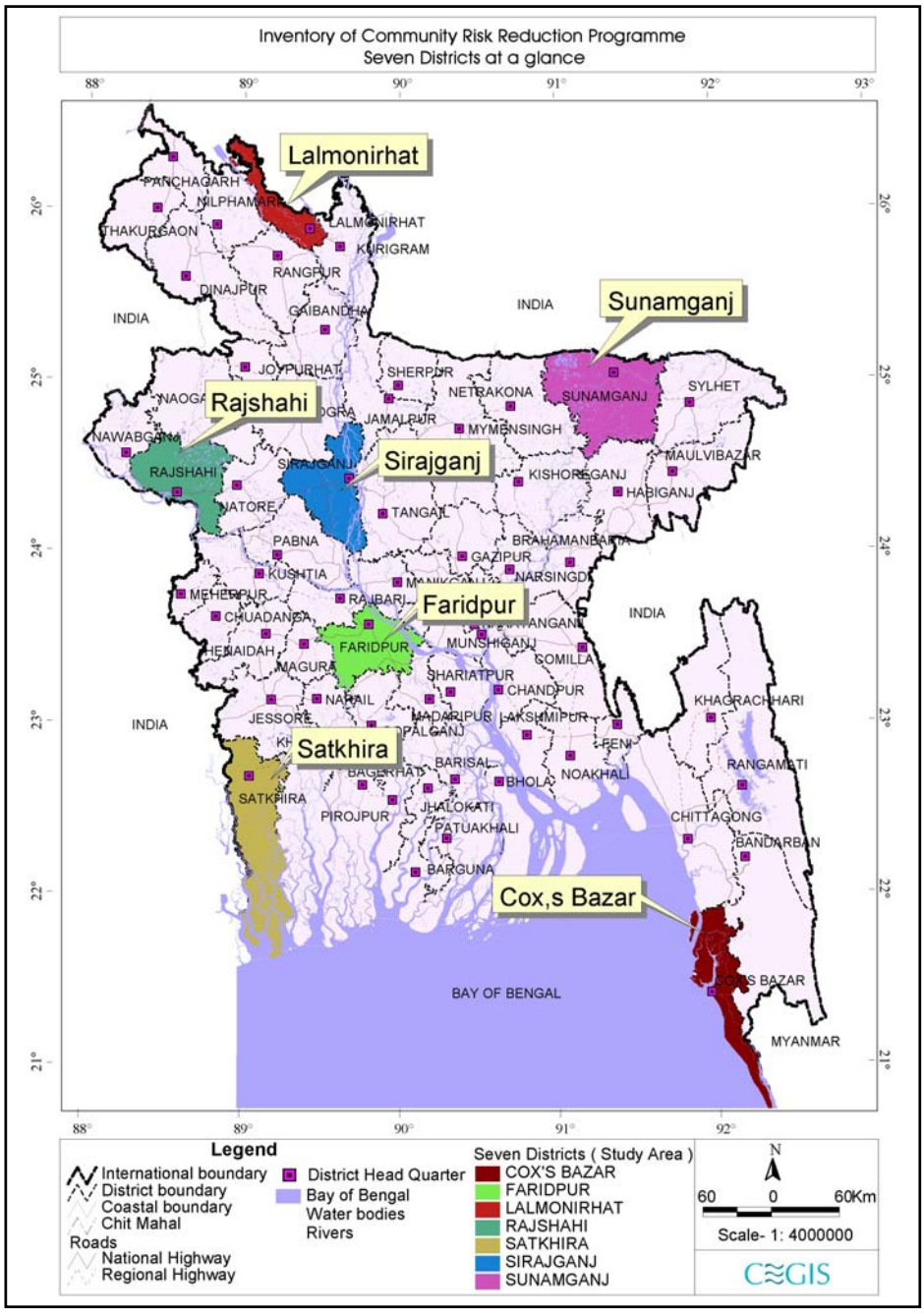


Figure 2.1: The seven pilot districts in Bangladesh

District	Major Hazard	Area (Km^2)	Vulnerable Population ('000)
Cox's Bazaar	Cyclone, Tidal Surge, Earthquake	2492	1759
Faridpur	River Flood, Erosion	2072	1743
Lalmonirhat	Cold, River Flood	1,241	1,109
Rajshahi	Cold, River Flood, Drought	2,407	2287
Satkhira	Arsenic, Water logging	3858	1845
Sirajganj	Erosion, River Flood	2,498	2,694
Sunamganj	Flash Flood, Tornado	3670	1990

Source: Field observation and BBS

The existing geographical, environmental and socio-economical condition of the seven pilot districts are briefly described in the following sections.

2.3.1 Cox's Bazaar

Cox's Bazaar District is situated at the southeastern corner of Bangladesh beside the Bay of Bengal (Fig. 2.3.1). The main rivers of this district are the Matamuhuri, Bakkhali, Reju Khal, Naf, Maheshkhali channel and Kutubdia channel. The main offshore islands are Maheshkhali, Kutubdia, Matarbari, Sonadia, Shah pari and St Martin's or Jinjira. The maximum annual average temperature is 34.8°C, the minimum 16.1°C and the annual rainfall is 4,285 mm (BMD, 2005). Cox's Bazaar District falls under Agro-Ecological Zone – 23, 27 (Source: BARC) and Bio-Ecological Zone - 7b (Chittagong coastal plain) (IUCN, 2002) (see Annex D).

The area of this district is 2490 sq. km and the total population is 1,759,560 (density 706 person/km^2), of which 13% live in urban areas (BBS, 2001). This district comprises 7 thanas and 59 unions. The population characteristics by thana are shown in Table 2.3.1.

Table 2.3.1 Population characteristics of Cox's Bazaar District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Chakaria	643.46	502300	NA	NA	32.76
Cox's Bazaar Sadar	228.23	347060	NA	NA	35.5
Kutubdia	215.8	106280	NA	NA	26.75
Maheshkhali	362.18	246480	NA	NA	23.75
Ramu	391.71	202180	NA	NA	93160
Teknaf	388.68	200980	NA	NA	19.72
Ukhia	261.8	154280	NA	NA	28.14
Total	2492	1,759,560	1,528,920	230,640	27.24

Source: BBS, 2001

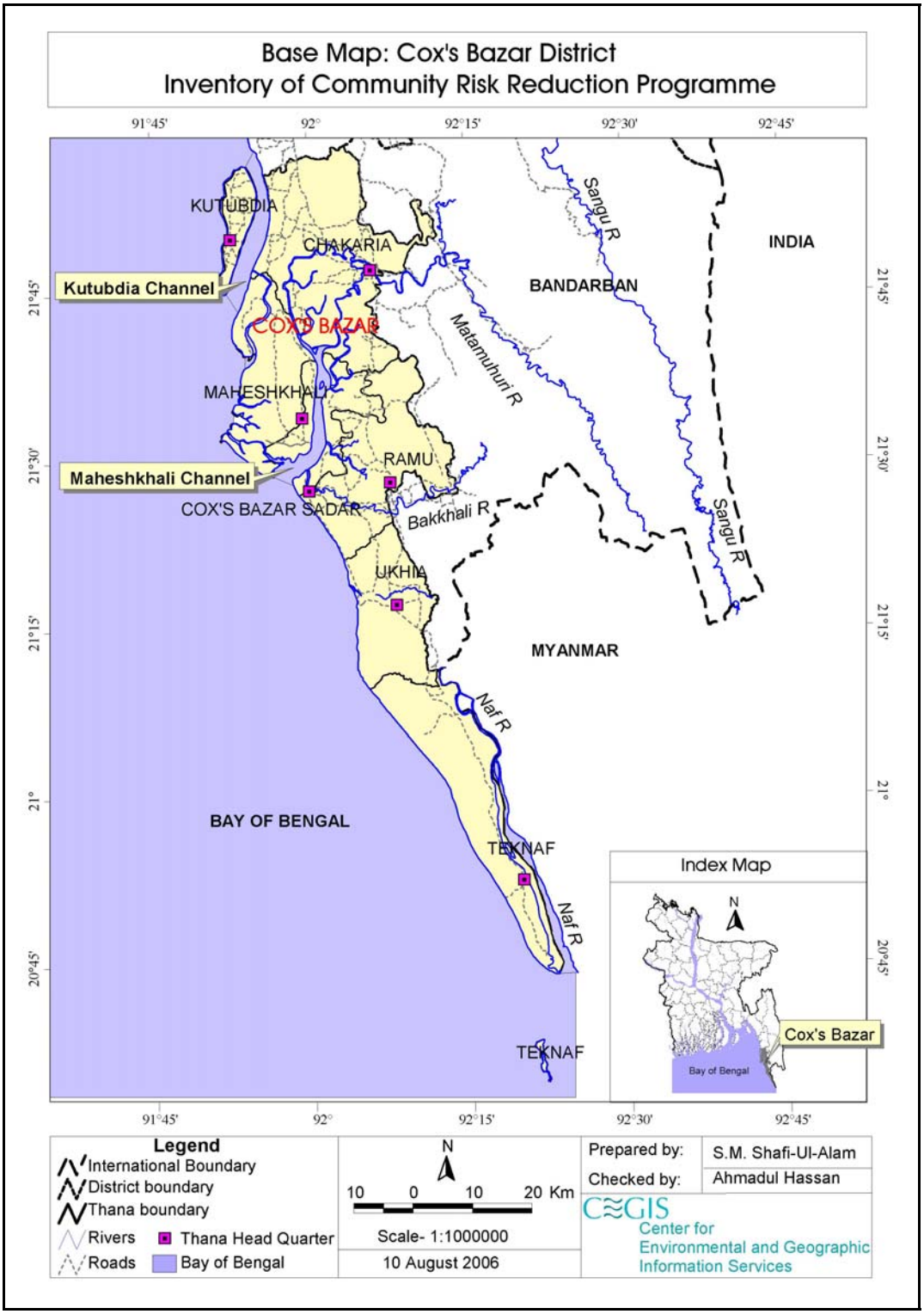


Figure 2.3.1: Location of Cox's Bazaar District

The main sources of income are agriculture and fishing, the major drinking water source is tube-well, 4 % of the households have electricity connection, 35 % of the households have their own agricultural land and most of the people (64%) use various types of toilets other than sanitary toilets (Source: BBS, 1991). Detailed information on the socio-economic profile of Cox's Bazaar District is given in Annex B.

The main hazards in this district are cyclones, flash floods, drainage congestion, erosion, earthquakes, tsunami and nor'wester tornadoes. Moheskhali and Cox's Bazaar suffer from all these major hazards. All thanas under this district fall under Earthquake Zone-2.

2.3.2 Faridpur

Faridpur District is situated on the bank of Padma River. The other main rivers of this district are the Old Kumar, Arial Khan, Gorai, Chandana, Bhubanshwar and Lohartek. The major depressions are the Dhol Samudra, Beel Ramkeli, Shakuner Beel, and Ghoradar Beel (Fig. 2.3.2). The maximum annual average temperature is 35.8°C, the minimum 12.6°C while annual rainfall is 1546 mm (BMD, 2005). Faridpur District falls under Agro-Ecological Zone – 10, 11 (Source: BARC) and Bio-Ecological Zone - 4b (Ganges floodplain) (IUCN, 2002) (see Annex D).

The area of this district is 2072 sq. km and the total population is 1,742,700 (density 773 person/km^2), of which 87% live in rural areas (Population Census, 2001). This district comprises 8 thanas and 80 unions. The population characteristics of the thanas of Faridpur are shown in Table 2.3.2.

Table 2.3.2 Population characteristics of Faridpur District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Alfadanga	136	93840	NA	NA	43.01
Bhanga	216	230300	NA	NA	37.53
Boalmari	272	233460	NA	NA	36.49
Char bhadrasan	142	75100	NA	NA	30
Faridpur Sadar	407	414680	NA	NA	48.85
Madhukhali	230	187240	NA	NA	42.79
Nagarkanda	379	323540	NA	NA	36.42
Sadarpur	290	184560	NA	NA	35.77
Total	2072	1,742,720	1,523,900	218,820	38

Source: BBS, 2001

According to Population Census 1991, the main source of income in Faridpur is agriculture, the major drinking water source is tube-well, 4 % of the households have electricity, 58 % of the households have their own agricultural land and most of the people (80%) use various types of toilets other than sanitary toilets. Detailed information on the socio-economic profile of Faridpur District is given in Annex B.

The major natural hazards that prevail in this district are floods, erosion, nor'wester tornadoes and droughts.

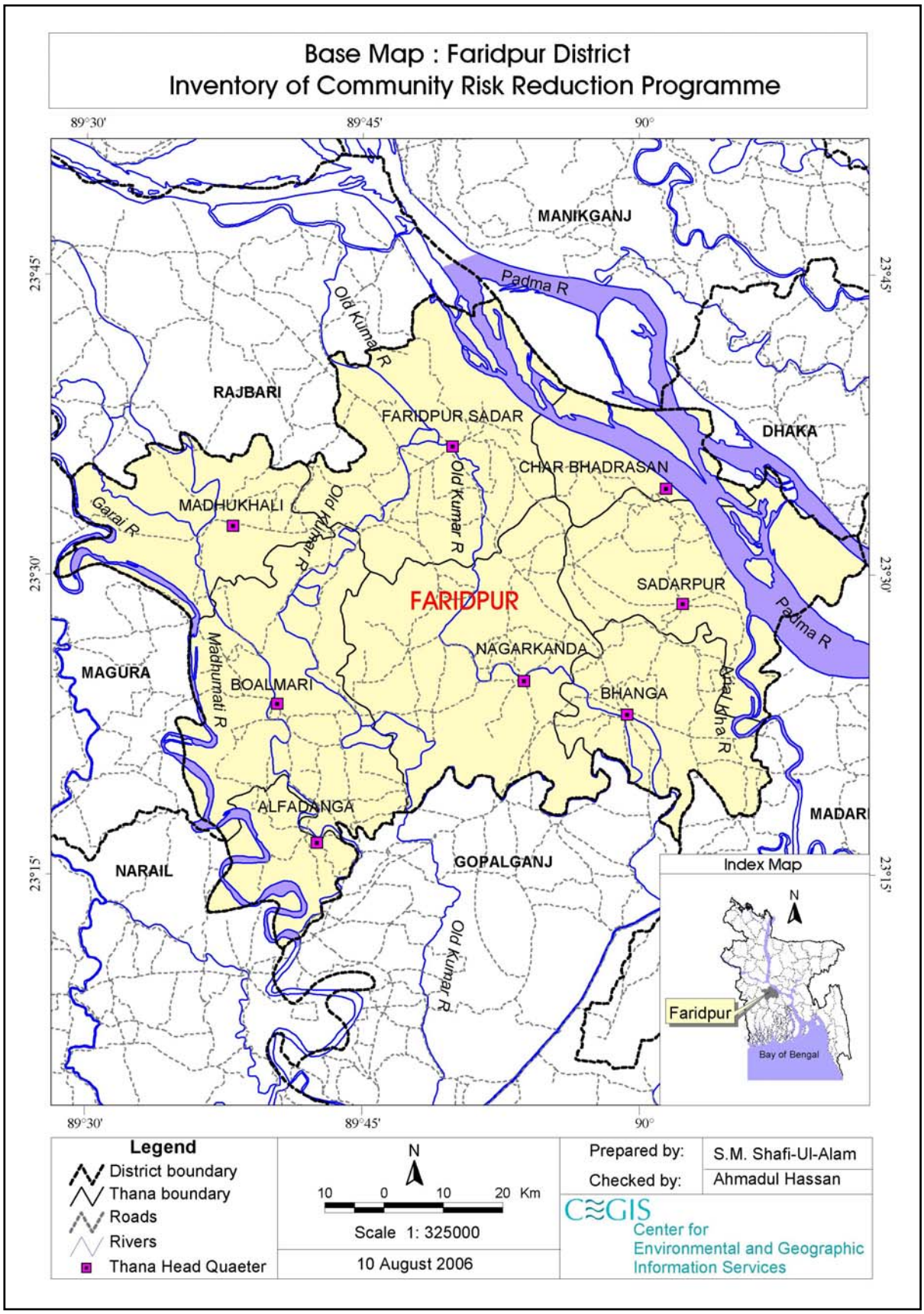


Figure 2.3.2: Location of Faridpur District

2.3.3 Lalmonirhat

Lalmonirhat District is located in the northern part of Bangladesh beside Teesta River (Fig. 2.3.3). Other rivers are the Dharla, Shamalian, and Suti. The maximum annual average temperature is 38°C, the minimum is 10°C while the annual rainfall is 1270-2290 mm (BMD, 2005). Lalmonirhat District falls under Agro-Ecological Zone – 4 (Source: BARC) and Bio-Ecological Zone – 4a (Teesta Floodplain) (IUCN, 2002) (see Annex D).

The area of this district is 1,240 sq. km and the total population is 1,109,300 (density 894 person/km^2), of which about 13% live in urban areas and the rest in rural areas (BBS, 2001). This district comprises 5 thanas and 43 unions. The population characteristics of the thanas of Lalmonirhat are shown in Table 2.3.3.

Table 2.3.3: Population characteristics of Lalmonirhat District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Aditmari Thana	195	203742	185382	18360	39.82
Hatibandha Thana	288	206276	182301	23975	39.31
Kaliganj Thana	237	216868	200350	16518	41.05
Lalmonirhat Sadar Thana	260	289272	232036	57236	45.51
Patgram Thana	262	193185	167913	25272	44.74
Total	1,241	1,109,343	967,982	141,361	42

Source: BBS, 2001

The main sources of income are agriculture, forestry and livestock, the major drinking water source is tube-well, only 7 % of the households have electricity connection, 60 % of the households have their own agricultural land and most of the people (36%) do not use sanitary toilets (BBS, 1991). Detailed information on the socio-economic profile of Lalmonirhat District is given in Annex B. The main hazards in this district are river floods, erosion drainage, earthquakes and nor'wester tornadoes.

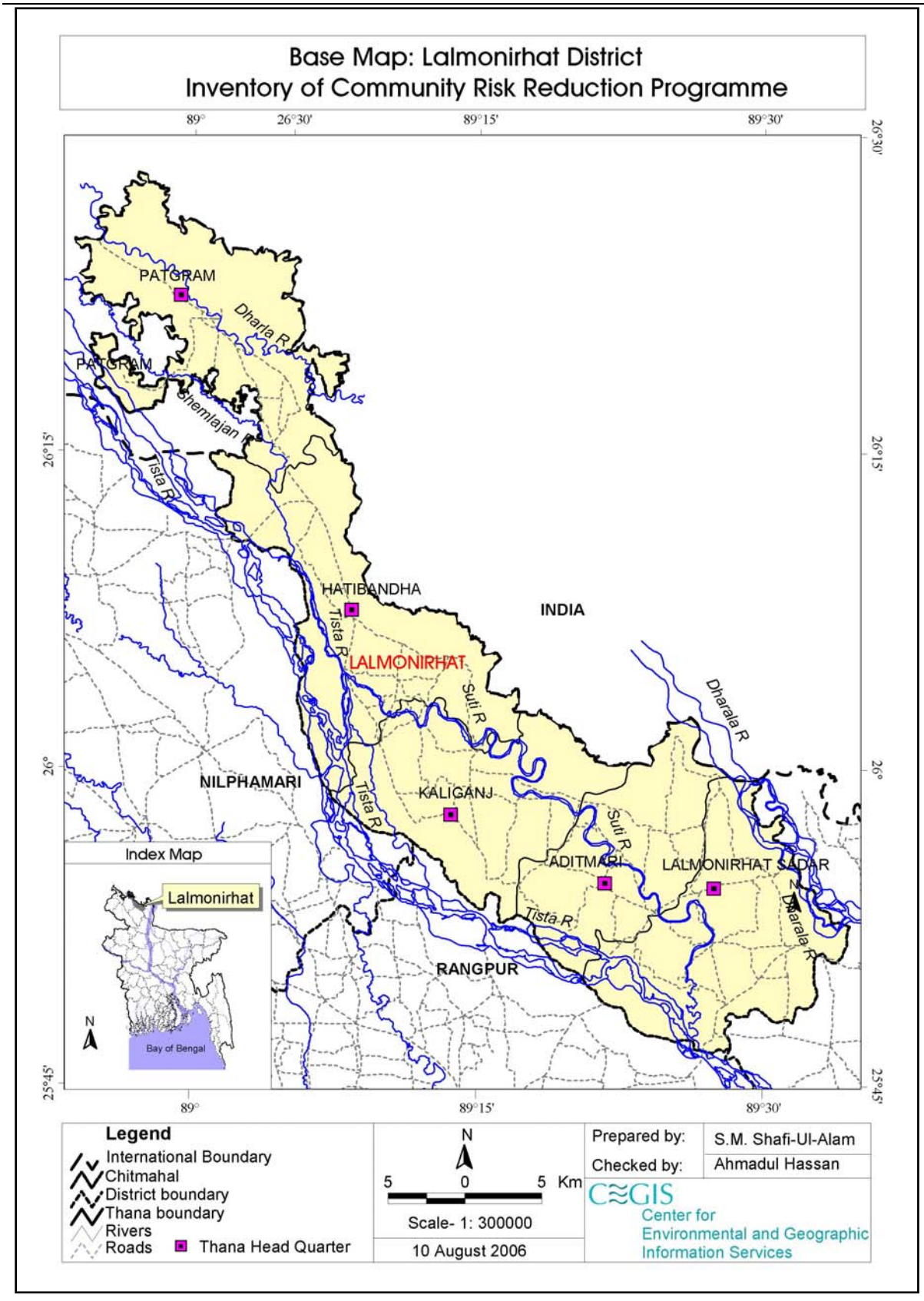


Figure 2.3.3: Location of Lalmonirhat District

2.3.4 Rajshahi

Rajshahi District is situated beside the river Padma (Ganges). The other rivers of this district are the Mahananda, Baral and Barnai (Fig. 2.3.4). The region consists of the Barind Tract, Diara and Char lands. The maximum annual average temperature is 37.8°C, and the minimum is 11.2°C while annual rainfall is 1862 mm (BMD, 2005). Rajshahi District falls under Agro-Ecological Zone – 5, 11, 12 as defined by BARC (Bangladesh Agricultural Research Council) and Bio-Ecological Zone - 4b. (Ganges floodplain) (IUCN, 2002) (see Annex D).

The area of this district is 2400 sq. km and the total population is 2,274,000 (density 945 person/km^2), of which 34% live in urban areas (Population Census, 2001). This district comprises 13 thanas and 74 unions. The population characteristics of the thanas of Rajshahi are shown in Table 2.3.4.

Table 2.3.4: Population characteristics of Rajshahi District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Bagha	184	169527	147489	22038	41.83
Baghmara	363	319968	285336	34632	38.99
Boalia	46	191711		191711	71.22
Charghat	165	183921	149109	34812	45.66
Durgapur	195	167596	160725	6871	40.99
Godagari	472	279545	241914	37631	42.09
Motihar	11	51724		51724	63.55
Mohanpur	163	152896	141238	11658	45.38
Paba	280	262251		262251	43.62
Puthia	193	188864	175888	12976	45.3
Rajpara	25	121076		121076	69.7
Shah mokhdum	15	24300		24300	63.86
Tanore	295	173495	141550	31945	45.35
Total	2,407	22,86,874	14,43,249	8,43,625	48

Source: BBS, 2001

According to Population Census 2001 the average literacy rate of those who are 6 years and above is 48%. The main sources of income are agriculture, forestry and livestock, the major drinking water source is tube-well, 32 % of the households have electricity connection, 54 % of the households have their own agricultural land and most of the people (31%) do not use sanitary toilets. Detailed information on the socio-economic profile of Rajshahi District is given in Annex B.

As per available secondary information the natural hazards of this district are seasonal floods, drainage congestion, erosion and most recurrent droughts. A further discussion on the hazards of this district is presented in Chapter Three.

Figure 2.3.4: Location of Rajshahi District

2.3.5 Satkhira

Satkhira District is located at the southwest corner of Bangladesh (Fig. 2.3.5). The main rivers of this district are the Betna and Kobadak rivers. The maximum annual average temperature is 37°C, the minimum 11°C while the annual rainfall is 1780-2790 mm (Source: BMD, 2005). Satkhira District falls under Agro-Ecological Zone – 13 (Source: BARC) and Bio-Ecological Zone – 7a (Sundarban), 10 (Saline Tidal Floodplain) (IUCN, 2002) (see Annex D).

The area of this district is 3,860 sq. km and the total population is 1,845,120 (density 478 person/km^2), of which about 12 % live in urban areas (Source: BBS, 2001). This district comprises 7 thanas and 80 unions. The population characteristics are shown in Table 2.3.5.

Table 2.3.5: Population characteristics of Satkhira District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Assasuni	402	243980	NA	NA	40.35
Debhata	176	120660	NA	NA	50.16
Kalaroa	233	222260	NA	NA	45.66
Kaliganj	334	258800	NA	NA	46.95
Satkhira sadar	400	392520	NA	NA	46.45
Shyamnagar	1968	315540	NA	NA	41.36
Tala	344	291360	NA	NA	45.91
Total	3860	1,845,120	132,680	1,712,440	45.26

Source: BBS, 2001

The main sources of income are agriculture, forestry and livestock, the major drinking water source is tube-well, 4 % of the households have electricity connection, 57 % of the households have their own agricultural land and most of the people (44%) use various types of toilets other than sanitary toilets (Source: BBS 1991). Detailed information on the socio-economic profile of Satkhira District is given in Annex B. The main hazards in this district are drainage congestion, salinity intrusion, cyclones and tidal surges.

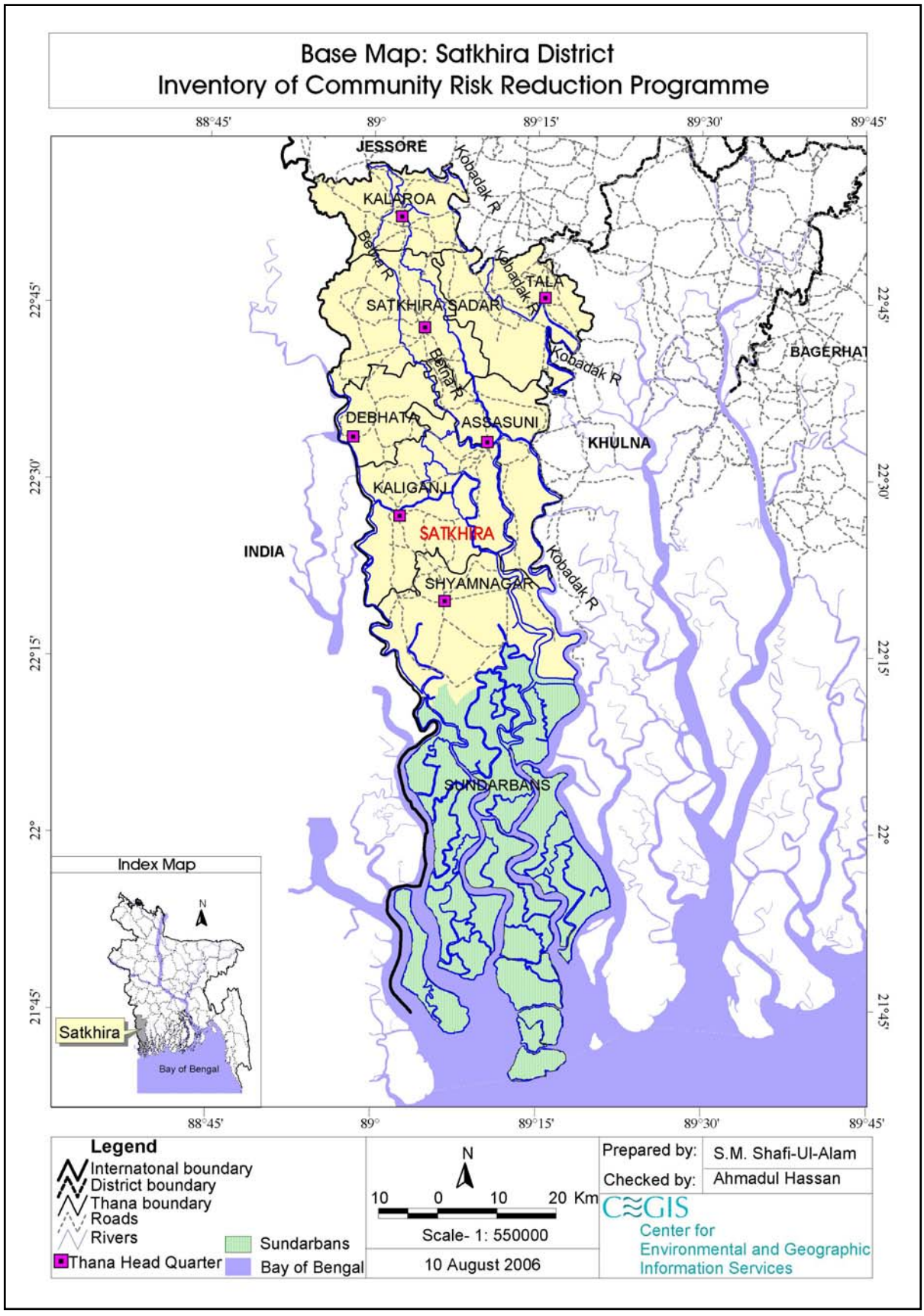


Figure 2.3.5: Location of Satkhira District

2.3.6 Sirajganj

Sirajganj District is located in the central part of Bangladesh on the western side of Jamuna River (Fig. 2.3.6). The main rivers of this district are the Old Bangali, Bangali, Jamuna, Karatoa and Boral Gumnai. The maximum annual average temperature is 38°C, the minimum is 10°C while the annual rainfall is 1270-2290 mm (BMD, 2005). Sirajganj District falls under Agro-Ecological Zone – 4, 25 (Source: BARC) and Bio-Ecological Zone – 4a (Teesta Floodplain) (IUCN, 2002) (see Annex D).

The area of this district is 2,500 sq. km and the total population is 2,693,800 (density 1078 person/km^2), of which about 12 % live in urban areas (BBS, 2001). This district comprises 9 thanas and 81 unions. The population characteristics are shown in Table 2.3.6.

Table 2.3.6: Population characteristics of Sirajganj District.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Belkuchi	164	302678	282350	20328	47.03
Chauhali	244	155260	134026	21234	37.24
Kamarkhanda Thana	92	127839	118959	8880	42.59
Kazipur Thana	369	266950	239115	27835	38.27
Raigonj Thana	268	267522	260760	6762	35.58
Shahjadpur Thana	324	472505	414514	57991	36.98
Sirajgonj Sadar Thana	326	484170	349019	135151	47.44
Tarash Thana	297	167647	161250	6397	35.04
Ullah para Thana	414	449243	412568	36675	39.61
Total	2,498	2,693,814	2,372,561	321,253	41

Source: BBS, 2001

The main sources of income are agriculture, forestry and livestock, the major drinking water source is tube-wells, 23 % of the households have electricity connection, 55 % of the households have their own agricultural land and most of the people (63%) use various types of toilets other than sanitary toilets (Source: BBS 1991). Detailed information on the socio-economic profile of Sirajganj District is given in Annex B. The main hazards in this district are floods, erosion, drainage congestion, earthquakes and nor'wester tornadoes.

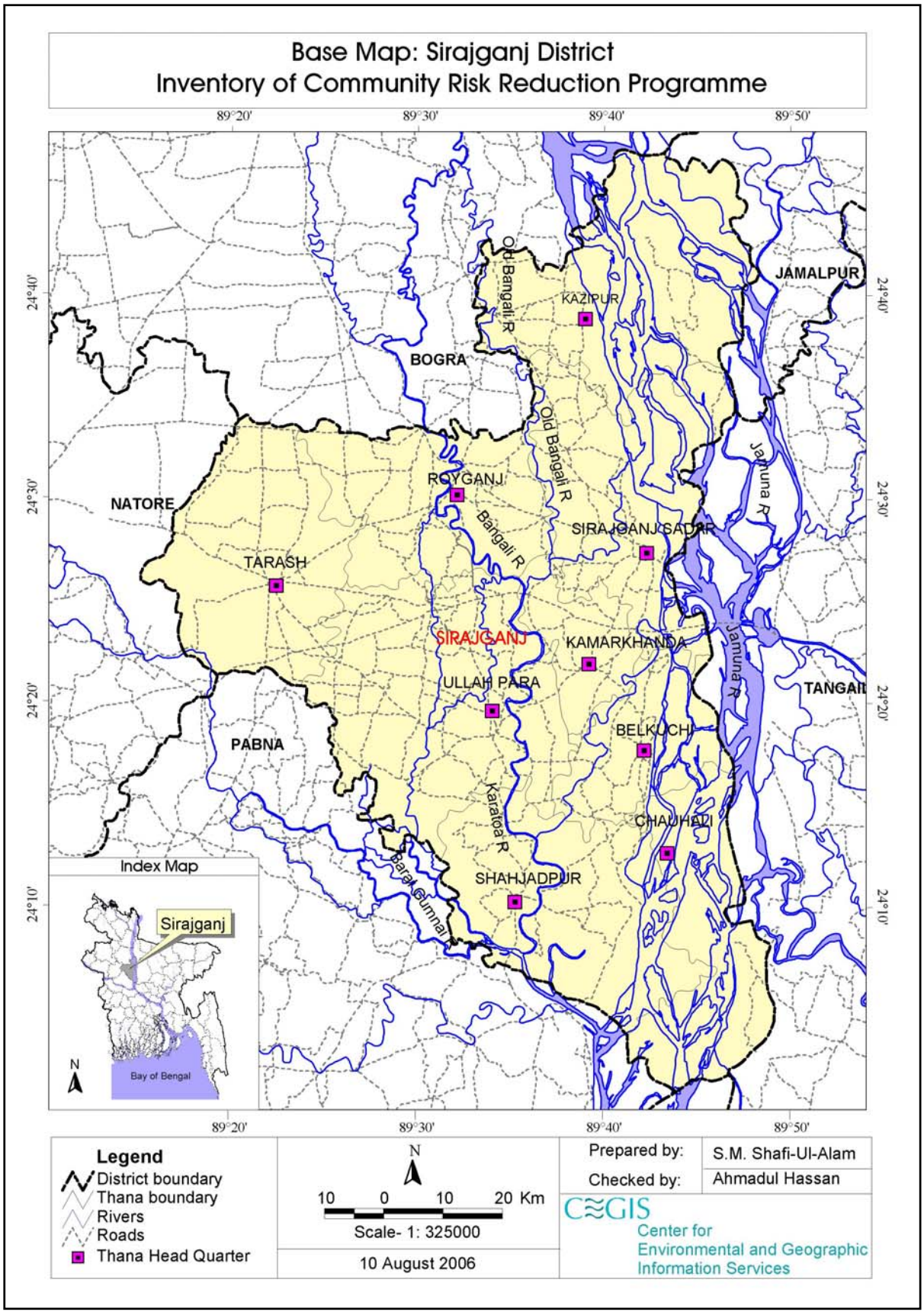


Figure 2.3.6: Location of Sirajganj District

2.3.7 Sunamganj

Sunamganj District is located in the northeastern part of Bangladesh (Fig. 2.3.7). The main river systems of this district are the Surma, Kushiara, and Kalni rivers. The maximum annual average temperature is 33°C, the minimum is 12 °C while the annual rainfall is 4320-5840 mm (Source: BMD, 2005). This district falls under Agro-Ecological Zone – 21, 22 (Source: BARC) and Bio-Ecological Zone – 5a (Haor Basin) (IUCN, 2002) (see Annex D).

The area of this district is 3670 sq. km and the total population is 1,990,360 (density 542 person/km^2), of which about 12 % live in urban areas (Source: BBS, 2001). This district comprises 10 thanas and 85 unions. The population characteristics are shown in Table 2.3.7.

Table 2.3.7: Population characteristics of the Sunamganj district.

Thana	Area (km^2)	Population 2001			Literacy Rate (%)
		Total	Rural	Urban	
Bishwambarpur	194	126040	NA	NA	27.33
Chhatak	435	329260	NA	NA	35.08
Derai	421	202740	NA	NA	35.14
Dharampasha	496	182980	NA	NA	24.03
Dowarabazar	281	176800	NA	NA	32.66
Jagannathpur	368	225980	NA	NA	45.34
Jamalganj	339	138940	NA	NA	25.77
Sulla	261	89400	NA	NA	35.96
Sunamganj sadar	561	366900	NA	NA	33.9
Tahirpur	314	151320	NA	NA	34.68
Total	3670	1,990,360	1,796,060	194,300	33

Source: BBS, 2001

The main sources of income are agriculture, forestry and livestock, the major drinking water source is tube-well, 4 % of the households have electricity connection, 57 % of the households have their own agricultural land and most of the people (74%) use various types of toilets other than sanitary toilets (Source: BBS 1991). Detailed information on the socio-economic profile of Sunamganj District is given in Annex B. The main hazards in this district are flash floods, drainage congestion and earthquakes.

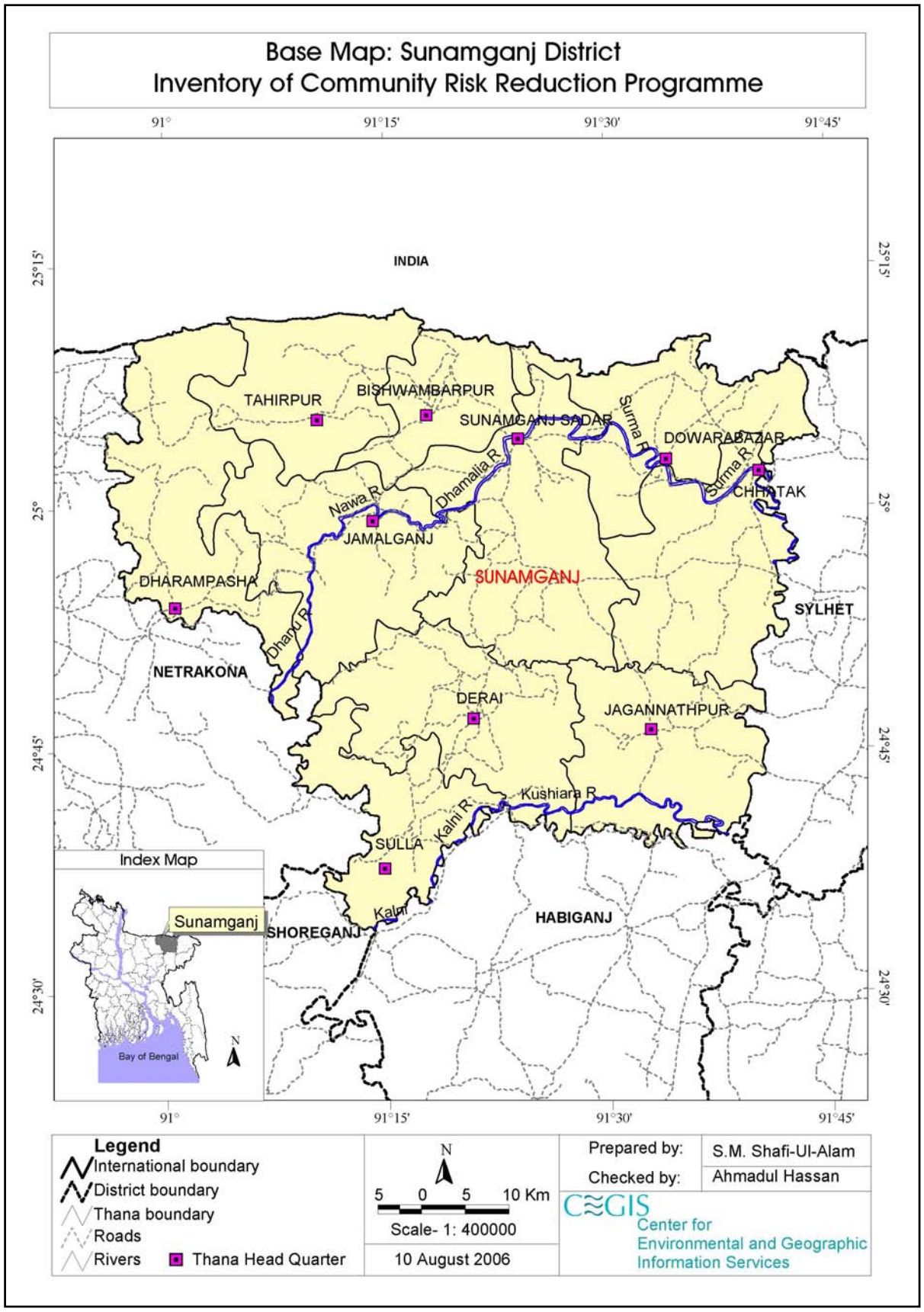


Figure 2.3.7: Location of Sunamganj District

Chapter 3

Methodology and Approach

3.1 Study approach

The study was executed following a systematic approach as shown in Figure 3.1. Four sequential steps were followed to prepare the inventory of initiatives and programs, and a gap analysis in disaster management arena spatially focused on seven pilot districts. The detailed description of the methodology is given in Section 3.2.

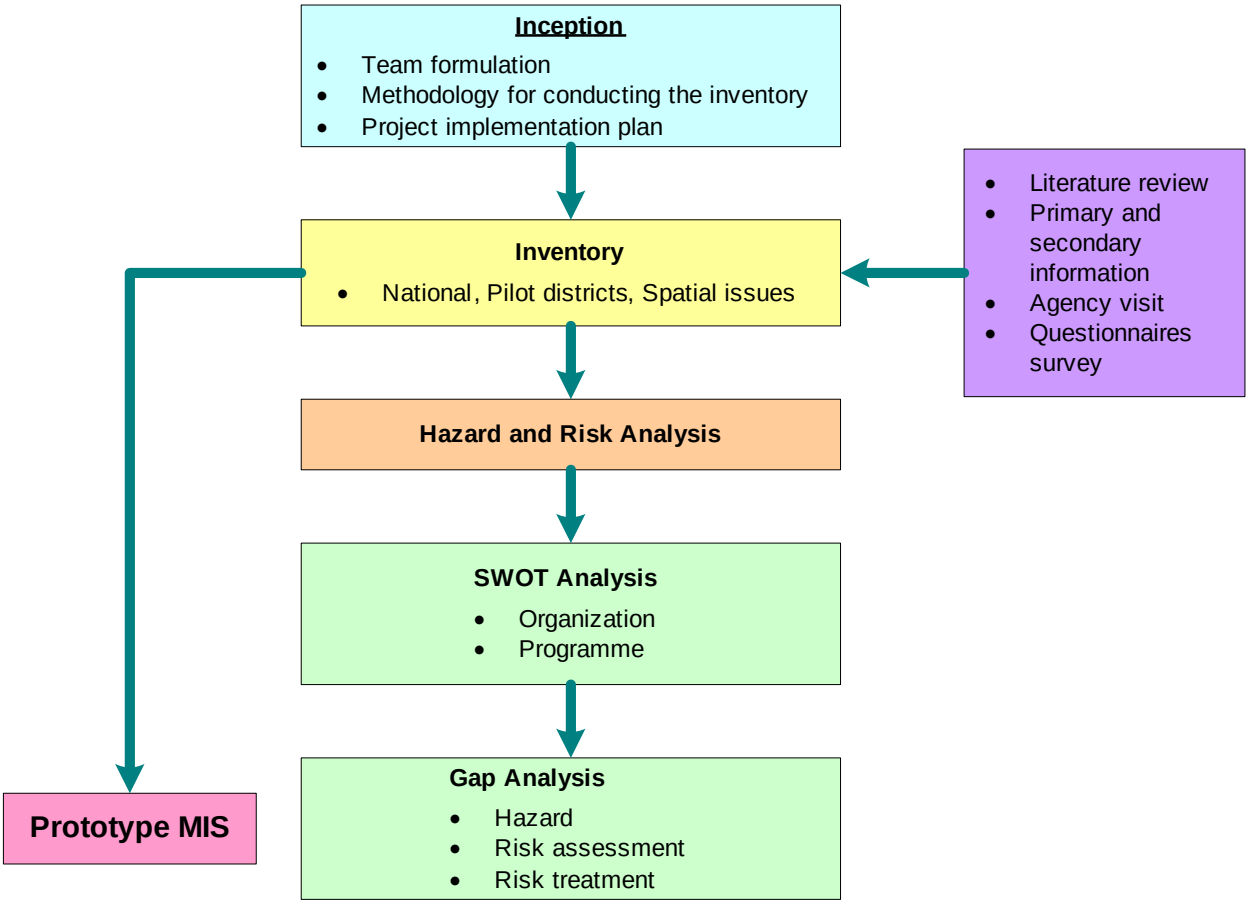


Figure 3.1: Flow diagram of the study approach

3.2 Methods, tools and techniques

A systematic methodology was developed based on the study approach and project implementation plan as described in the inception report. The process involved in the methodology were (i) data inventory, (ii) database development, (iii) data analysis, (iii) GIS based MIS tool development, (iv) preparation of a draft technical report, (v) consultation workshop and (vi) final report preparation. The methodology is presented in Figure 3.2.

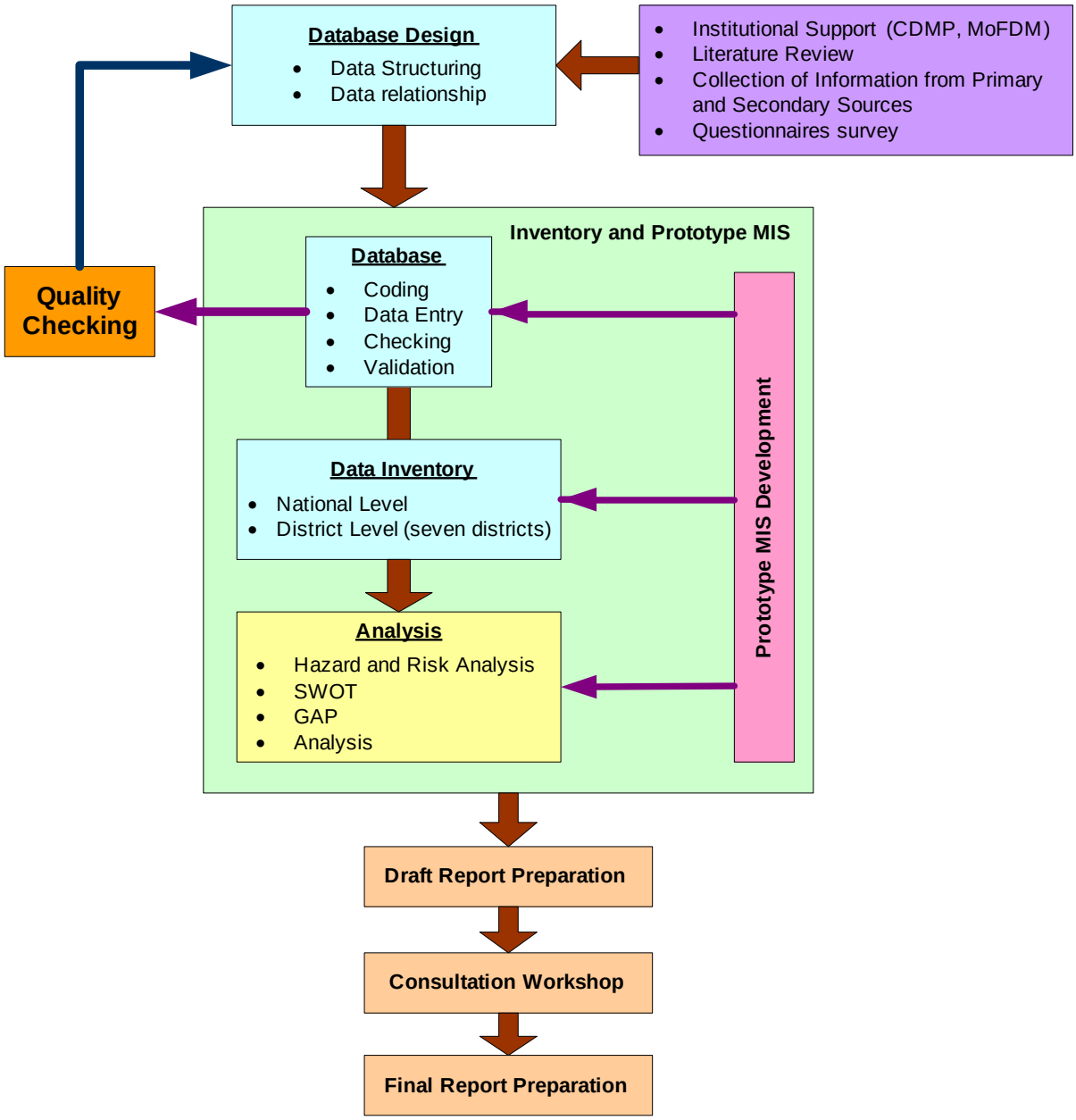


Figure 3.2: Flow diagram of the methodology

3.2.1 Data inventory

An inventory of data on PPRR initiatives was developed for both the national level and seven pilot districts. The inventory preparation was done following the steps: (i) consultation, (ii) literature review, (iii) internet search, (iv) questionnaire development, (v) field test of questionnaires (vi) data collection from the district level organizations through field visits, (vii) data collection from national level organizations through agency visits, and (viii) data processing and preparation (Figure 3.3). A brief description of these steps is presented below:

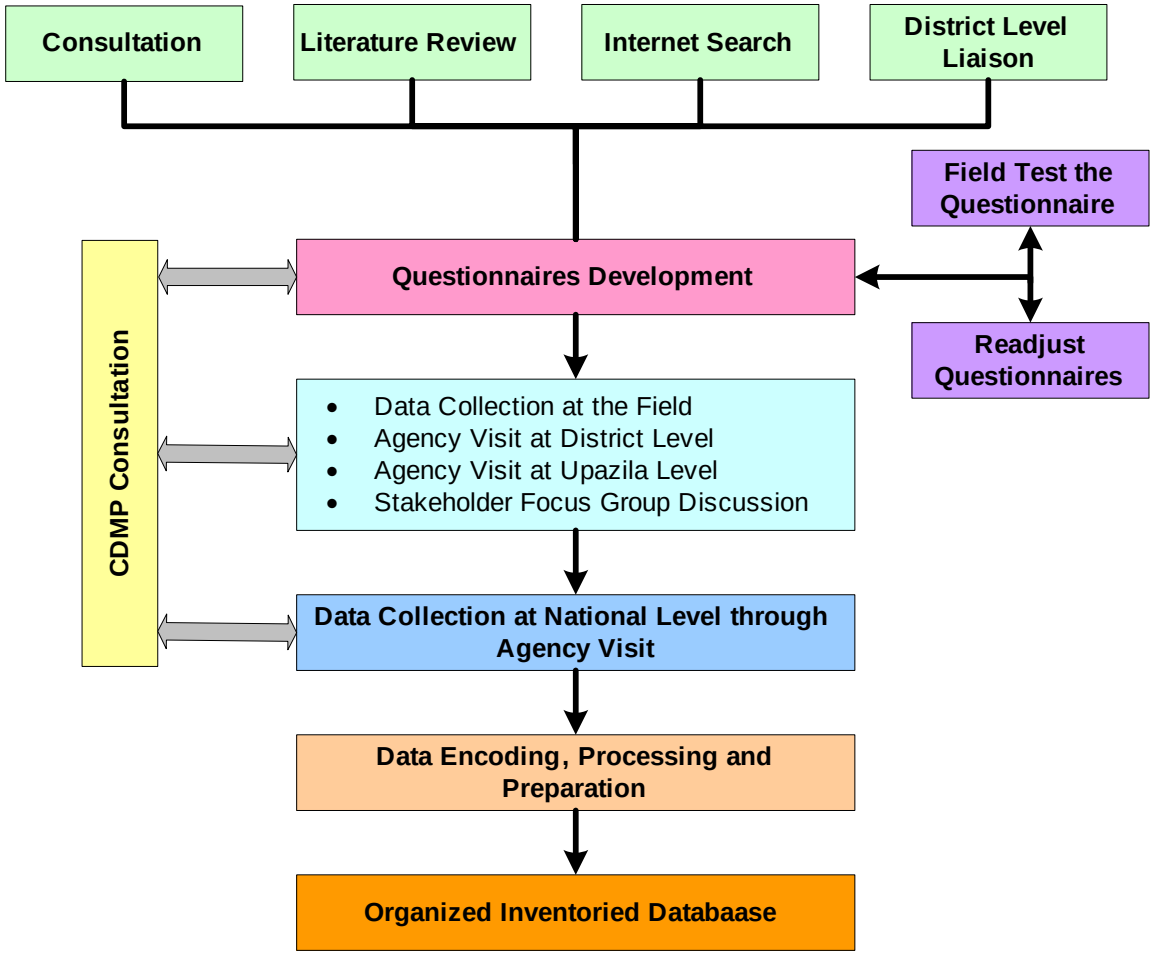


Figure 3.3: The general data inventory preparation process

Consultation

At the inception level of the project, consultations were done among the project professionals and later, discussion was held with CDMP officials for making an efficient and smooth inventory process. The outcome of the consultation was considered in the formulation of the processes of data gathering, processing, summarizing and prototype MIS development.

Literature review

Literature of different projects and organizations were reviewed to gather available information on hazards, working area, activities, knowledge, etc. under different PPRR initiatives and related organizations and agencies. The review list is as follows:

- Consolidation and strengthening of Flood Forecasting and Warning Service,
- EMIN Implementation phase Flood and Erosion information report (CEGIS/CIDA)
- Feasibility Study for Improvement of Flood Forecasting and Warning Services (JICA)
- Cyclone Shelter Management Information System (CYSMIS) – CARE/CEGIS
- Arsenic Hazard and Vulnerability Assessment through ADSS development – CEGIS/UNICEF
- Govt. projects and programs such as NAPA, ICZMP, Risk Reduction Programme of DRR, CPP
- NGOs- Action Aid, Care Bangladesh, Concern Bangladesh, Oxfam, World Vision, Caritas, IIRD, Islamic Relief, IFRC, BDRCS, ITDG, BDPC
- Technical agencies- CEGIS, IWM, BUET, DoE, BMD, DMB, DRR, DU, ADPC, BCAS, BUP, BES, GSB, FFWC, BWDB, Bangladesh Fire Service
- Networks-DER, Nirapad, Disaster Forum, EMIN, CPP
- Database: CYSMIS, NWRD, ICRD, DMB, WFP-VAM, BBS
- ICT/Knowledge portals: KPED, SNBD, BEMP, SEMP, FFWC

Internet Search

Disaster related and important relevant documents and information were also downloaded from the Internet and studied to understand the modern initiatives for risk reduction approaches for different hazards. Websites referred to by different organizations during agency visits were also used to fill up the questionnaires.

Questionnaire development

A well-defined questionnaire was developed covering all the aspects of inventory of risk reduction programs and initiatives. Several consultation meetings with CDMP were also done during questionnaire development. Two types of questionnaires were developed: (i) General inventory fact sheet and (ii) Program inventory sheet.

The general inventory fact sheet covers the overall aspects of risk reduction inventory of organizations, including:

- Major disasters addressed by the organization
- Funding sources or donor agency
- Disaster related programs or activities
- Local partnerships
- Working area (locations)
- Technical capabilities in terms of professional and technologies
- Major beneficiaries
- Training capacity

The program inventory sheet covers program related items including:

- Program name and area
- Objective of the program
- Executing agency
- Funding source
- Project period
- PPRR activities and so on.

Furthermore, the CEGIS field professionals went to Sirajganj to test the developed questionnaires in the field. The questionnaires were then updated as per the field experience and consultation and finally used for data collection.

The questionnaires were classified in the following categories:

(i) General inventory fact sheet for non government organizations (NGOs),

(ii) General inventory fact sheet for government organizations

(iii) General inventory fact sheet for donor agencies, and

(iv) Programme / Project Inventory Fact Sheet.

A sample of the developed questionnaires is presented in **Annex-A**.

Data collection from the district level organization

The district level data collection was carried out in all the 7 CDMP piloted districts: Cox's Bazaar, Faridpur, Lalmonirhat, Rajshahi, Satkhira, Sirajganj and Sunamganj. The district level data collection process involved (i) Collection of list of organizations and related documents, (ii) Data collection from organizations at district level, (iii) Data collection from organizations at upazila level, and (iv) Data collection through stakeholder focus group discussion. The steps are shown in Figure 3.4, and a brief description of these steps is given below:

Document and list collection: The field team met with the District Relief and Rehabilitation Officer (DRRO) to get the particulars of the disaster related organizations working in the districts. Discussions were also held with large and renowned NGOs to get an idea about local disasters and the organizations involved in the disaster related activities in the district. A list of NGOs and organizations involved in the disaster management related activities was compiled under this process.

District level agency visit: A group of field staff visited each of the seven districts for data collection. Initially, the team contacted the respective District Commissioners (DC) and DRROs for their official support to get access to the GO-NGO organizations for the required information. In this process the CEGIS team collected data from different organizations like the Bangladesh Water Development Board (BWDB), Roads and Highways (R&H), Local Government and Engineering Department (LGED), Department of Public Health and Engineering (DPHE), Department of Agriculture Extension (DAE), Department of Fishery, Department of Livestock, Department of Forest, Ansar & VDP, Superintend of Police, Civil Surgeon, Red Crescent and leading NGOs. The whole data collection process was supervised by senior CEGIS professionals for ensuring quality and completeness of data.

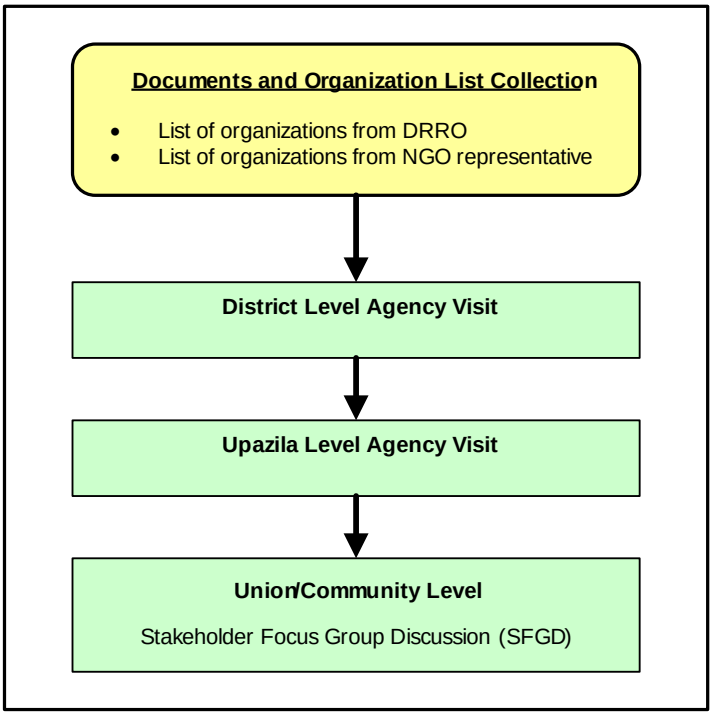


Figure 3.4: Field level data inventory steps

Upazila level agency visit: The field team contacted with all Upazila Nirbahi Officers (UNOs) and Project Implementation Officers (PIOs) of the seven districts. With cooperation from the upazila officials, the field team contacted the relevant government and non-government organization/agencies and collected information using specified questionnaires.

Union/Community level consultation: The study team also prepared a large number of case studies through Stakeholder Focus Group Discussions (SFGD) with Union Parisad members and different livelihood groups at the community level. The targeted groups were farmers, fishermen, wage laborers, women, landless poor men and local knowledgeable people. The number of participats in SFGD in each district is shown in Annex C.

Data collection from the national level organizations

Based on literature review and consultation with CDMP, a preliminary list of agencies was made for visits to collect data. Senior officials of the organizations concerned were contacted at several occasions to cooperate with the inventory team for filling up the questionnaire. The CEGIS team consulted with the officials concerned to make them understand the questionnaire. A brief description of the visited organizations/agencies at the national level is given in Chapter 5.

3.2.2 Database development

Data collected from the questionnaire survey were organized and processed for further analysis. The data processing and preparation activities included (i) encoding the different items of the questionnaire, (ii) checking and re-encoding of the collected information, (iii) entering the data into the computer, (iv) processing and preparation of a database. All the processed data were organized to develop a well-defined database.

In parallel to the initial processing a well-organized database was developed. The attributes and spatial (GIS) data were structured at the two levels (i) national and (ii) district level. All attributes of the data were organized in different tables and all the tables were organized in a structured and relational diagram under an MS Access Database system. On the other hand, the spatial data were

organized as GIS data layer in the ESRI shape file format. Both the spatial and non-spatial data were incorporated into a comprehensive database. Based on this database a prototype MIS system was developed.

3.2.3 Analysis

Three types of analyses were done under this study (i) Hazard and Risk Analysis, (ii) SWOT (Strength, Weakness, Opportunity, Risk and Threat) analysis of different organizations and (iii) GAP analysis of programs. A brief description of the three analyses are given below:

Hazard and Risk Analysis

A hazard and risk analysis for the study area was carried out in three steps, (a) Hazard analysis, (b) Resource analysis, and (c) Risk analysis. A hazard analysis and mapping for each district was done based on the information on hazards obtained from institutions and focus group discussions. Both the spatial and seasonal effects of hazards were identified for all pilot districts. Next, resource analysis and risk analysis were done for Rajshahi District as an indicative to find a way of risk assessment in a multi-hazard perspective.

SWOT Analysis

SWOT analysis provides a framework for identifying critical issues and helps isolate key issues in order to facilitate a strategic planning to resolve the issues. Therefore, a SWOT analysis was done to assess the various types of capabilities and activities of the national and district level organizations. The strengths, weaknesses, opportunities and risks/ threats for an organization were examined in terms of financial, institutional, technical, human resources, policies/ programs and acceptance to the community. This produced a comparative analysis of the status of various attempts, capacities and methods of the institutions working in the field of disaster risk management. The multi-hazard multi-risk approach was the central focus of the SWOT analysis. In this study, SWOT analysis was carried out for all the organizations surveyed.

Gap Analysis

Since CDMP follows the internationally accepted risk management framework to ensure a comprehensive and well coordinated community risk reduction approach, gaps in programs and activities of national and community level organizations were analyzed considering the steps of the risk management framework. Three stages were mainly examined for each organization in this study, such as

- Hazard Analysis (identification of risk/ hazard, both in temporal and spatial context),
- Risk Assessment (both in hazard and resource availability context) and
- Risk Treatment (in terms of prevention, preparedness, response and recovery programs).

3.2.4 Development of Prototype MIS

After the collection of information and analysis of data a user-friendly GIS based prototype MIS was developed. The MIS focused on the following areas:

- Geographical extent (using GIS) of the agencies operating in the field of DRR (a mapping output of spatial and tabular nature);
- Inventory of the initiatives (mode of operation);
- Resources and capacities;
- Structure of the information flow;

The prototype MIS contains data entry, data display, query and analysis and simple mapping options.

3.2.5 Draft Final Report Preparation

After development of inventory and prototype MIS, draft final report has been prepared. The report contains the development process of MIS and summary outputs of the inventory of community risk reduction programmes. The report consists of two volumes. Volume I represents the main report and Volume II represents the appendices and annexes of the report.

3.2.6 Consultation workshop / validation of collected information

National and district level consultation workshop were organized for the validation of the collected information from different organizations. All the organizations working in each district (except GOs), which were visited earlier, were invited to validate their information. Among the Government organizations at district level, only District Relief and Rehabilitation Officer (DRRO) were invited in the validation workshop. Other government organizations were excluded due to time limitation and similarities of programmes at national level. At national workshop, both government and non-government organizations were invited. The district level workshops were held in the Sadar thana of each district (Fig. 3.5). Further, the national level workshop was organized at Dhaka. Summary of the district and national validation workshops are given below.

Figure 3.5: Validation workshop at district level

Cox's Bazaar: The workshop was held on September 24, 2006 and chaired by Md. Ishaqe Miah, District Relief and Rehabilitation Officer (DRRO). Total 13 (65%) organizations out of 20 organizations (Except GO organization) participated in the validation workshop.

Faridpur: The workshop was held on September 26, 2006 and chaired by A.S. Shamsul Alam, District Relief and Rehabilitation Officer (DRRO), Faridpur. All of the leading NGOs/Agencies (Except GO organization) of was attended in the district level validation workshop.

Lalmonirhat: The workshop was held on September 24, 2006 and chaired by Mr. Md. Abdus Salam Bakul, President, Manoshika, Lalmonirhat. Total 26 (72%) organizations out of 36 organizations (Except GO organization) participated in the validation workshop.

Rajshahi: The workshop was held on September 26, 2006 and chaired by Md. Amjad Hossain, District Relief & Rehabilitation Officer, Rajshahi. Total 12 (71%) organizations out of 17 organizations (Except GO organization) participated in the validation workshop.

Sirajganj: The workshop was held on September 24, 2006 and chaired by S.M. Amir Hossain, Coordinator, GKS, Sirajganj. Total 20 (65%) organizations out of 31 organizations (Except GO organization) participated in the validation workshop.

Satkhira: The workshop was held on September 24, 2006 and chaired by Mr. Md. Nashir Uddin Faruq, Executive Director, Shushilan, Satkhira. Total 21 (86%) organizations out of 24 organizations (Except GO organization) participated in the validation workshop.

Sunamganj: The workshop was held on September 26, 2006 and chaired by Md. Mozammel Hoque District Relief & Rehabilitation Officer (DRRO) of Sunamganj district. Total 13 (93%) organizations out of 14 organizations (Except GO organization) participated in the validation workshop.

Very few corrections were made in the spatial coverage of programmes, professionals, training programmes, PPRR activities, bottleneck problems of Early Warning system. A questionnaire regarding Early Warning System (EWS) was filled up by each organization at the district workshop. They have given their expected lead-time for each hazards and possible initiatives during lead-time, which will be helpful for risk reduction of community people. The questionnaire for EWS is given in Annex A. The meeting minutes of district level workshops are given in Annex E.

Figure 3.6: Validation workshop at nationa level

National Workshop: The national workshop was held on November 06, 2006 at Dhaka (Fig. 3.6). Mr. Giasuddin Ahmed Choudhury, Executive Director, CEGIS has chaired in the workshop. Total 20 (40 %) organizations out of 52 organizations (both GO, NGO and donor) participated in the validation workshop. Mr. Ian Rector, Team Leader, CDMP has given the overview of the project. Mr. Ahmadul Hassan, Project Leader, CEGIS has presented the summary of findings and Mr. Mollah M. Awlad Hossain has presented the prototype MIS prepared for the project.

Several corrections were made in the spatial coverage of programmes, professionals, training programmes, PPRR activities, bottleneck problems of Early Warning system. Some of the participated organizations and rest of the national organizations (who did not participate in the national workshop) were given time to correct their information and send to CEGIS within seven days after the workshop. Most of them have returned the corrected questionnaire. The meeting minutes of national workshop is given in Annex E.

All the corrections are incorporated in the respective sections of the report and MIS.

3.2.7 Final report preparation

After correction of the information, final report was prepared.

Chapter 4
Inventory and Prototype MIS

4.1 Introduction

The objective of the *Prototype MIS* is to manage an inventory database of ongoing, recently completed and proposed community risk reduction initiatives of major players active in the field of disaster management and risk reduction in Bangladesh.

The prototype MIS includes two major components: (1) Inventory database, and (b) Front-end Software.

4.2 Inventory Database

The inventory database was developed based on the following elements:

a. *Hazards and Risks:* Natural hazards and risks like floods, cyclones, droughts, storm surges, earthquakes, riverbank erosion, seasonal food crisis, climate change, and arsenic contamination are considered as hazards and risks.

b. *Programs related to risk reduction:* The risks reduction programs under the broad categories – Prevention, Preparedness, Response and Recovery (PPRR) at the community and national levels were included. The data of community level early warning, community based search and rescue, relief management, damage assessments, information, livelihood adaptation, etc. programs were included to find out the strengths, weaknesses, threats and opportunities of organizations and programs in the study area.

c. *Technical Capacities:* The technical capabilities of organizations working in areas like early warning information generation and dissemination, modeling, research, management and coordination, policy formulation, shelter construction and management, relief programs, training, risk assessment, etc. were included in the database to be used for enhancing the condition of existing technical capacity and needs for future actions.

d. *Reviewed data of Programs/Projects of the Major National Actors:* Reviewed data of all the programs and projects of government, non-government and research organizations related to disaster management and risk reduction were included in the database.

e. *Risk Reduction Programs and Projects of all Agencies in Seven Pilot Districts:* The approaches, geographical coverage, methodologies, information generation, organizational strengths, weaknesses, threats and opportunities of risk reduction programs of all agencies in Sunamganj, Sirajganj, Lalmonirhat, Satkhira, Rajshahi and Faridpur districts were organized and included in the database.

4.2.1 Design and Development

The input data of the prototype MIS were questionnaire data organized in structured tables. In order to store the data a structured RDBMS database "DisInvent.mdb" was designed and developed in MS Access. The data was normalized up to a Third Normal Form to eliminate redundancy, inaccuracy, inconsistency, and concurrency. The disaster data were classified into two groups:

- General Inventory Fact Sheet
- Programme/Project Inventory Fact Sheet

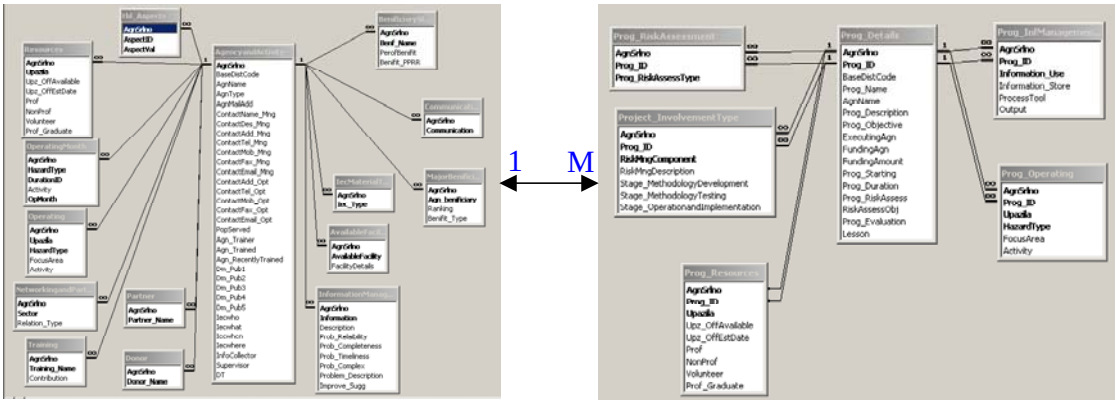
The *General Inventory Fact Sheet* is the Master data. The *Program/Project Inventory Sheet* is linked with the Master by one-to-many relationships. This means that one agency has one or more than one disaster Programs/Projects. The *General Inventory Fact Sheet* data contains the following elements:

- Agency details
- Donor agency
- Local partner/ associates
- Activities
- Information on technical related capabilities of agency
- Agency network related information
- Strengths, Weaknesses, Risks/Treats and Opportunities
- Publications and disaster related educational/communication materials

The Program/Project Inventory Fact Sheet data contains the following areas:

- Project details
- Funding information
- Duration
- Hazard and organizational profile
- Organizational resources
- Project assessment and experiences

The data structure and relationships are shown in Figure 4.1.



Relation Diagram of
General Inventory Fact Sheet

Relation Diagram of
Programme/Project Inventory Fact Sheet

Figure 4.1: Relation Diagram of the Disaster Inventory Database

4.3 Front-end Software

The front-end software of MIS prototype was developed to manage the underlying inventory database of risk reduction initiatives including the facilities of data-entry, update, query, view and some analysis. The analysis capability consists of SWOT and GAP analysis of agencies that are involved in PPRR. The activities at both national and district levels were to find the strengths, weaknesses, opportunities, risks or threats. The prototype MIS links spatial data with tabular inventory. The main interface of the front-end software is shown in Figure 4.2.

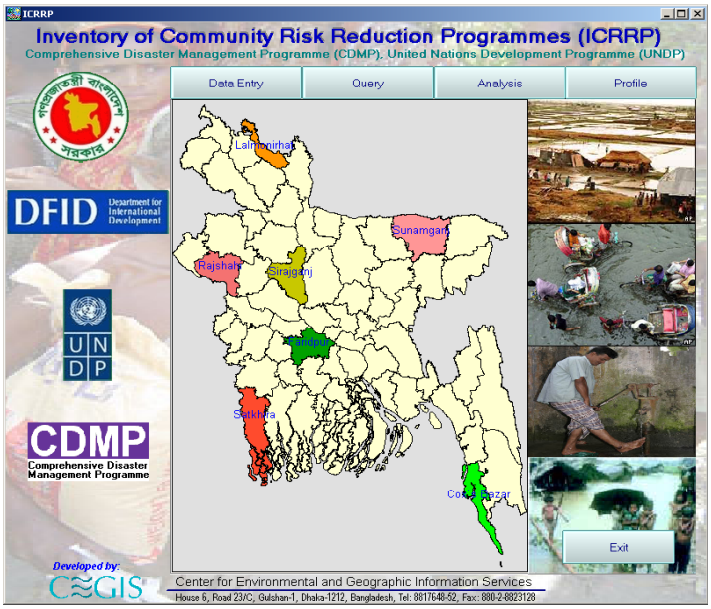


Figure 4.2: Main Interface of the Disaster Inventory Software

4.3.1 Data Entry/ Edit

The data entry interface was developed to enter new data and edit or modify existing data. Through this interface data can also be browsed. The main data entry interface is shown in Figure 4.3.

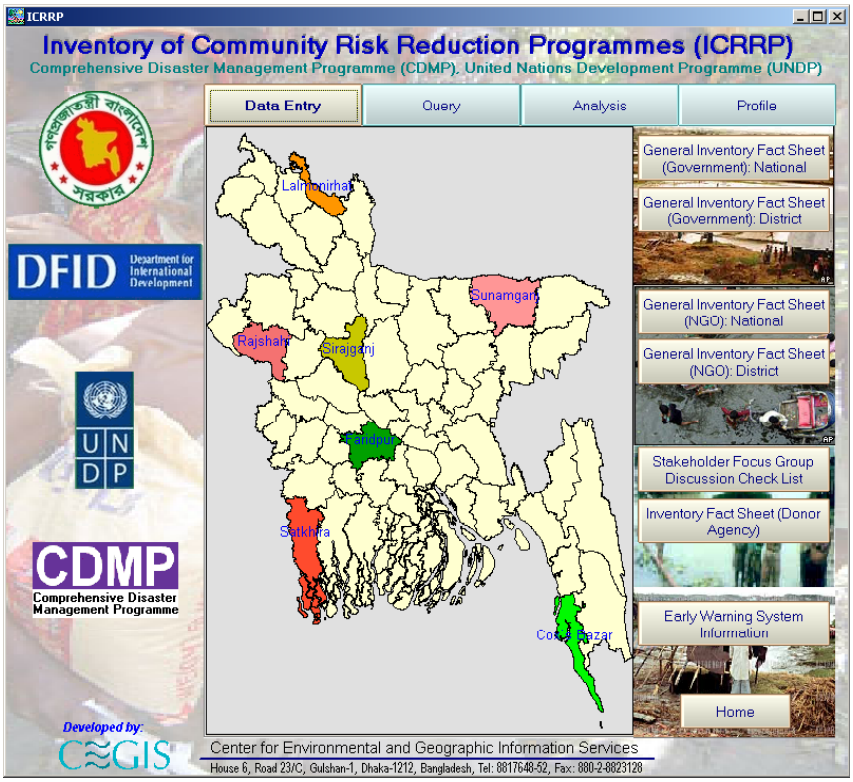


Figure 4.3: Data entry type selection interface

The data entry interface has options of getting for four types of questionnaire data through four sub-keys (Figure 4.3):

- General Inventory Fact Sheets (Government) with Program/project Inventory Fact Sheet
- General Inventory Fact Sheets (NGO) with Program/project Inventory Fact Sheet
- Stakeholder Focus Group Discussion Check List
- Inventory Fact Sheet (Donor Agency)

Each of these interfaces has separate data entry windows for getting data into the inventory database in respective tables with initial consistency checking and validation. The data entry forms are shown in Figure 4.4.

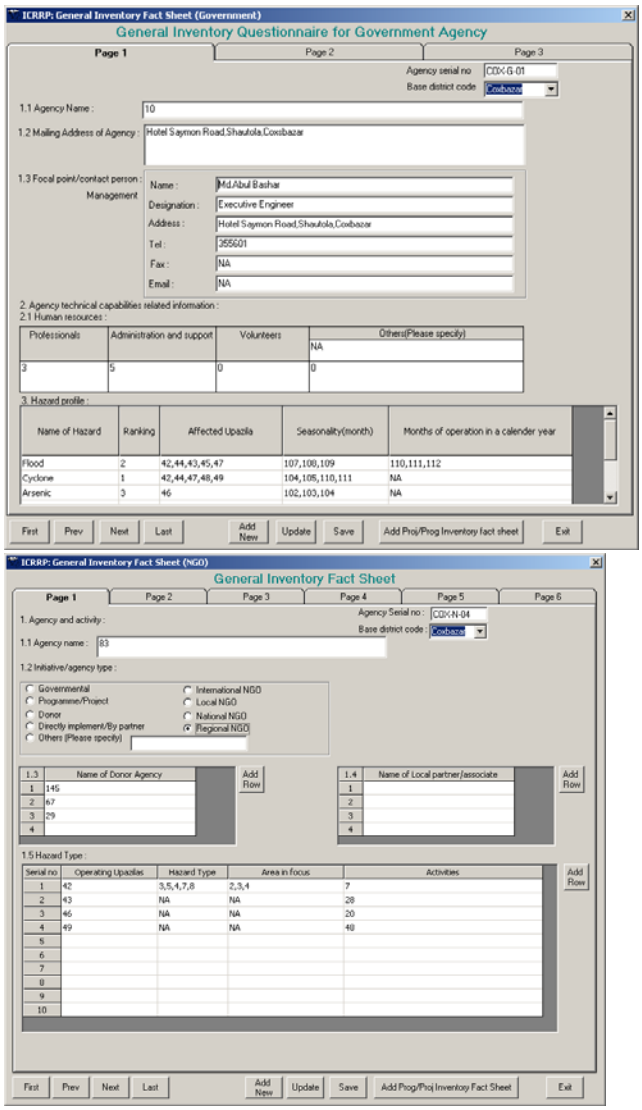


Figure 4.4: Data Entry Interface for General Inventory Fact Sheets

4.3.2 Query and Analysis

The prototype MIS software has facilities of queries on inventory database and some analysis capability using the queried data.

Database Query

Five predefined query categories were developed to view the data of the inventory database. For easy operation a list of queries were incorporated in the query interface: (1) NGO District Level Query, (2) NGO National Level Query, (3) GO District Level Query, (4) GO National Level Query, and (5) Donor Agency Query (Figure 4.5).

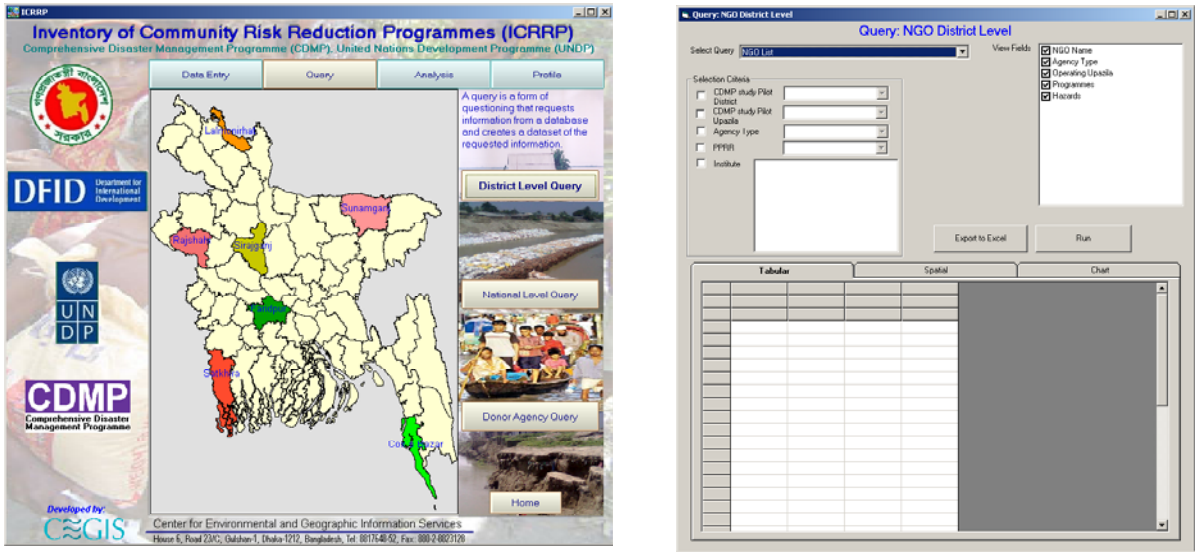


Figure 4.5: Query interfaces

Twenty additional queries were developed to view categorized/summarized data from the underlying inventory database (Table 4.1).

Table 4.1: Predefined Query List

Serial No	Predefined Query
1	NGO List
2	Donor Agency List
3	Local Partner/Associate List
4	Hazard Type List
5	List of Focus Area
6	List of Activities
7	Organizational Resources and Establishment
8	Address
9	Technical Capabilities
10	Communicate/Disseminate Related Information
11	Bottlenecks/ Problems
12	Networking and Partnership
13	Major Beneficiaries of Programme
14	Beneficiary Statistics
15	Population Served
16	Training
17	Major Timing of Operation
18	SWOT in Various Types of Disaster Risk Management
19	Publication
20	IEC Materials

The user can choose any predefined query and view the field, or choose the selection criteria (CDMP study pilot district, upazila, agency type, PPRR and institution) and run the query to generate results. Depending on the query selected the result will be shown in tabular, spatial (Map) and chart views.

Data Analysis:

As mentioned before, this prototype MIS has the facilities of two types of analysis: i) SWOT analysis and ii) GAP analysis (Figure 4.6). The details of the SWOT and GAP analyses are explained in Chapter 6.

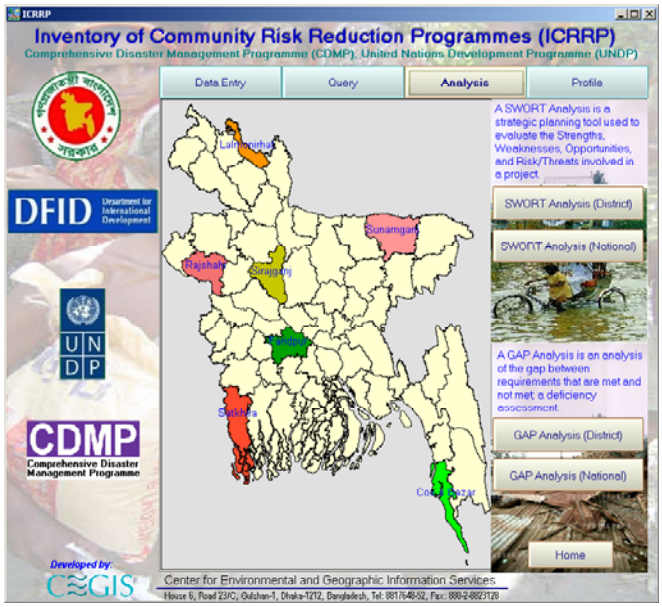


Figure 4.6: Data analysis selection interface

SWOT Analysis:

The analysis can be done by district, PPRR and Institution. The user can easily choose the options. The analysis is done and the results are produced depending on the selected options. The results can be viewed by institution, district summary and in spatial view (Figure 4.7).

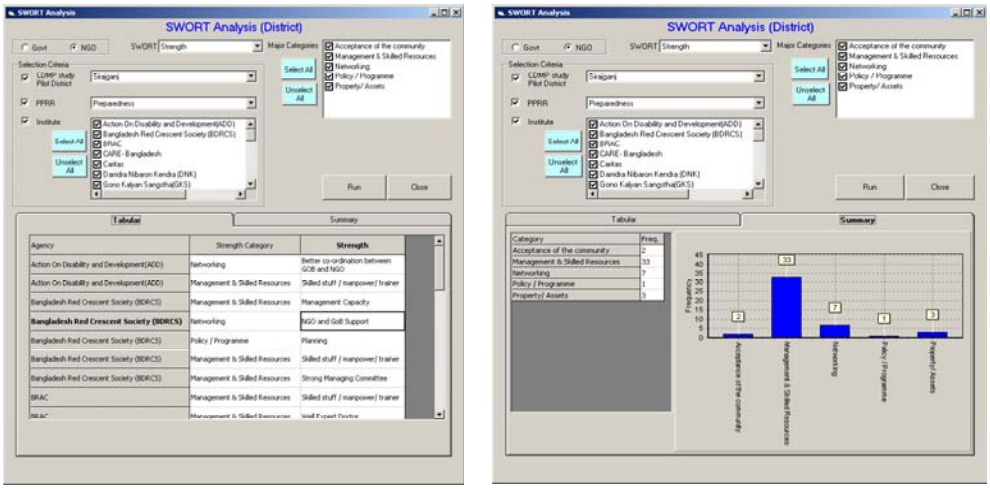


Figure 4.7: SWOT analysis interface with district summary and spatial view

GAP Analysis:

The GAP analysis process is described in detail in another chapter. The selection options are similar to the SWOT analysis as shown in Figure 4.8. The SWOT and GAP analyses are hard coded in MIS software following the process and criteria.

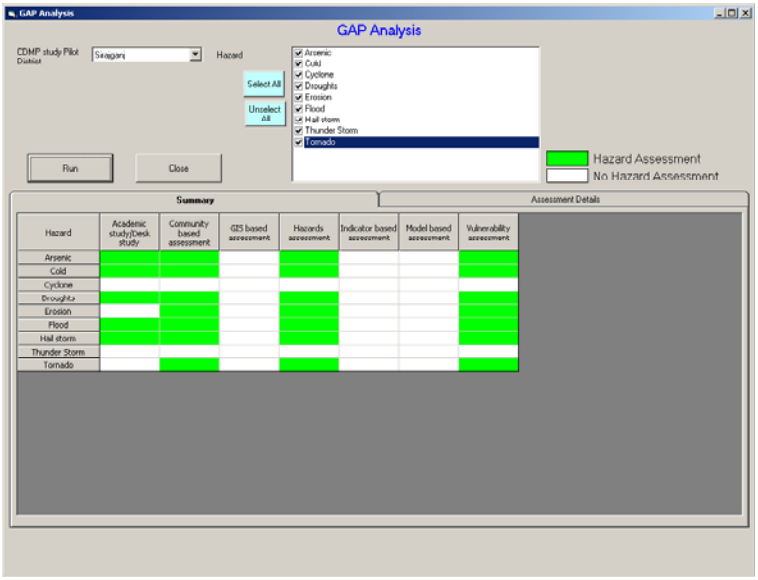


Figure 4.8: GAP analysis interface.

District Profiles based on BBS data:

In additional to the described queries and analyses, the prototype MIS has the capability to generate district profiles based on BBS data. The profile of a district can be viewed by selecting it from a selection interface as shown in Figure 4.9.

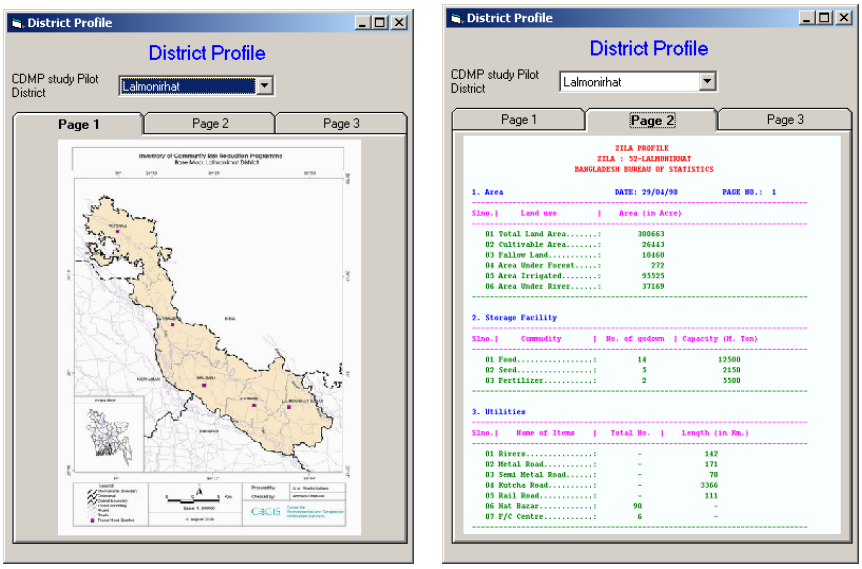


Figure 4.9: District profile (map, BBS data)

4.4 Quality control

As mentioned in the previous chapter, the data was collected through a questionnaire survey. The questionnaires were developed considering standard database development rules and criteria. The data collected were entered into the initial data tables and checked for correctness, completeness and validity. Missing, incomplete or inconsistent data were recollected and verified before final acceptance into the database. The data collection and quality assurance process is shown in Figure 4.10.

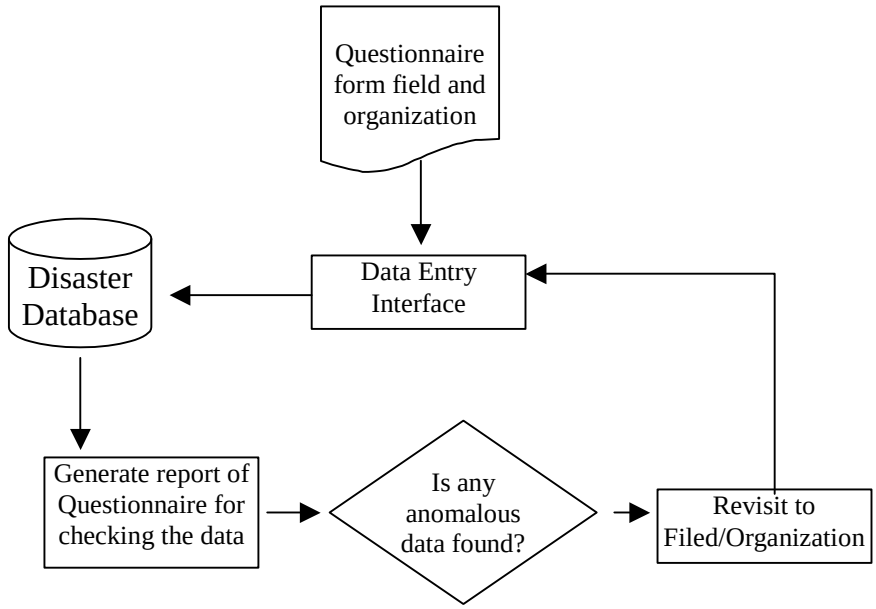


Figure 4.10: Data collection and quality control

4.5 Database Compatibility

The "backend data" of the software was developed with MS Access. With MS Access, data from any format can be exported to other MIS systems being used within MoFDM or other government agencies with the provision for continuous updating.

Chapter 5
Hazard and Risk Analysis

5.1 Introduction

Bangladesh is exposed to natural hazards, such as, floods, river erosion, cyclones, droughts, tornadoes, cold waves, earthquakes, drainage congestion/ water logging, arsenic contamination, etc. But the nature of occurrence, season and extent of effect of the hazards are not the same in all places.

Hazards and risks were analyzed in three contexts: intensity, timing or seasonality and spatial variability. The analysis was done at both national level and in pilot districts using an inventory prepared under this study to generate information on hazards, indicative resources and risk maps.

5.2 Natural Hazards in Bangladesh

5.2.1 Flood

Floods are annual phenomena with the most severe occurring during the months of July and August. Regular river floods affect 20% of the country increasing up to 68% in extreme years. The floods of 1988, 1998 and 2004 were particularly catastrophic, resulting in large-scale destruction and loss of lives.

Approximately 37%, 43%, 52% and 60% of the country is inundated with floods of return periods of 10, 20, 50 and 100 years respectively (MPO, 1986). Four types of flooding occur in Bangladesh (Figure 5.1).

- Flash floods caused by overflowing of hilly rivers of eastern and northern Bangladesh (in April-May and September-November).
- Rain floods caused by drainage congestion and heavy rains.
- Monsoon floods caused by major rivers usually in the monsoon (during June-September).
- Coastal floods caused by storm surges.

In the year 2000, Bangladesh faced an unusual flood over its usually flood-free southwestern plain, which also caused loss of life and massive damage to property. Figure 5.2 shows the percentage of total flood affected areas of the country for some selected years. The 1988 flood affected about two-third area of the country. The 1998 flood alone caused 1,100 deaths, rendered 30 million people homeless, damaged 500,000 homes and caused heavy loss to infrastructure. In 2004, floods inundated 38% of the country (WARPO, 2005).

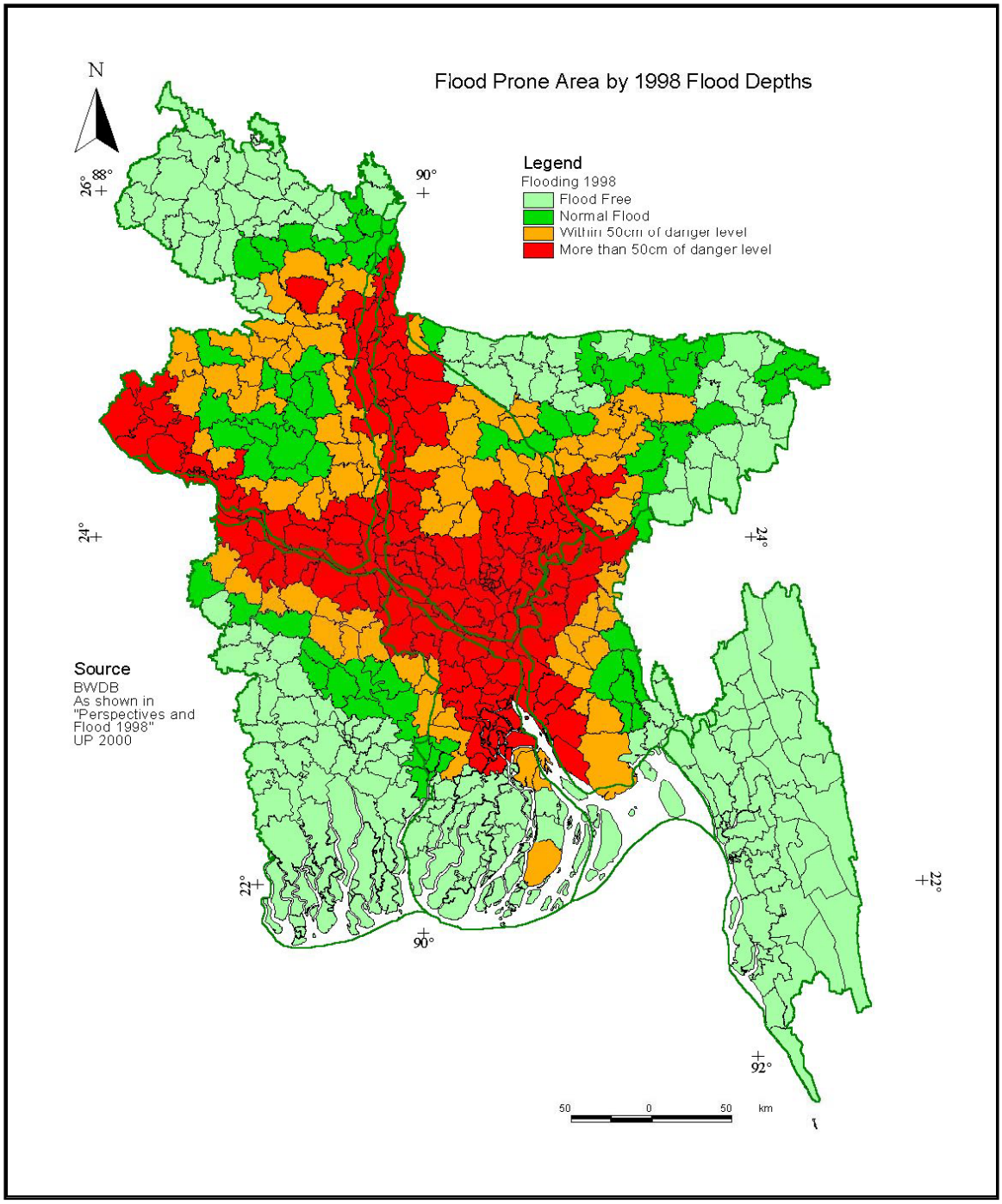


Figure 5.1: Flood prone areas by 1998 flood depth (Source: BWDB, 2000)

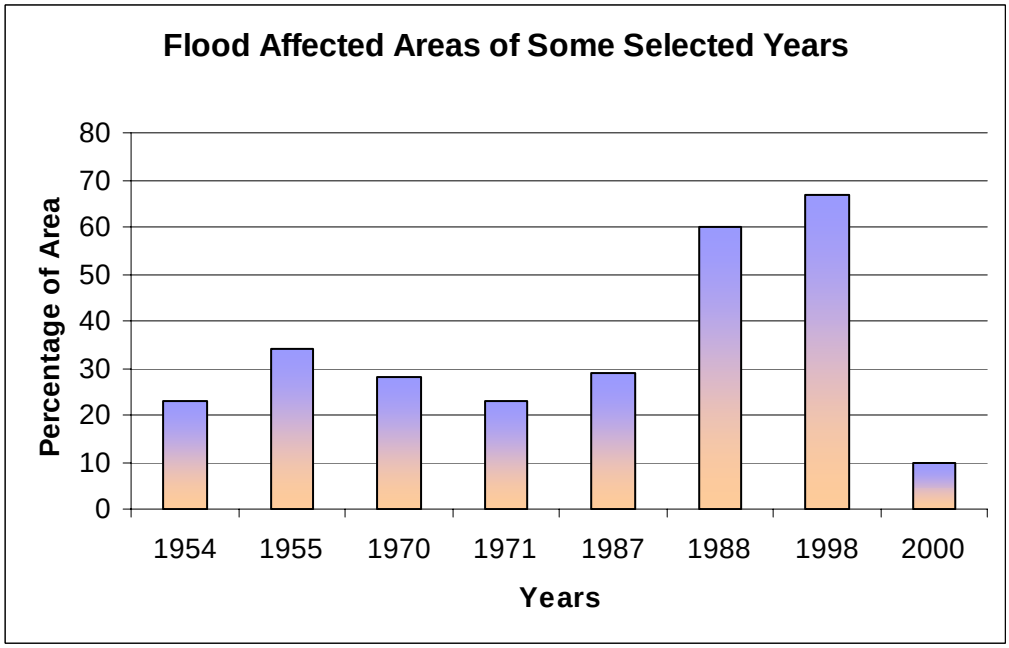


Figure 5.2: Flood affected area in different years (Source: State of Environment 2001)

In 1998 flood occurred for 65 days from July 12 to September 14 and affected about 67% area of the country. This devastating flood had an enormous impact on the national economy, in addition to causing hardships for people, and disrupting livelihood systems in urban and rural areas.

5.2.2 Cyclones and Storm Surges

Tropical cyclones from the Bay of Bengal accompanied by storm surges are one of the major disasters in Bangladesh. The country is one of the worst sufferers of all cyclonic casualties in the world. The high number of casualties is due to the fact that cyclones are always associated with storm surges. Storm surge height in excess of 10m is not uncommon in this region. For example, the 1876 cyclone had a surge height of 13.6 m and in 1970 the height was 10 m (WARPO, 2005).

The cyclone prone areas of Bangladesh are shown in Figure 5.3. A list of devastating cyclones is given in Table 5.1.

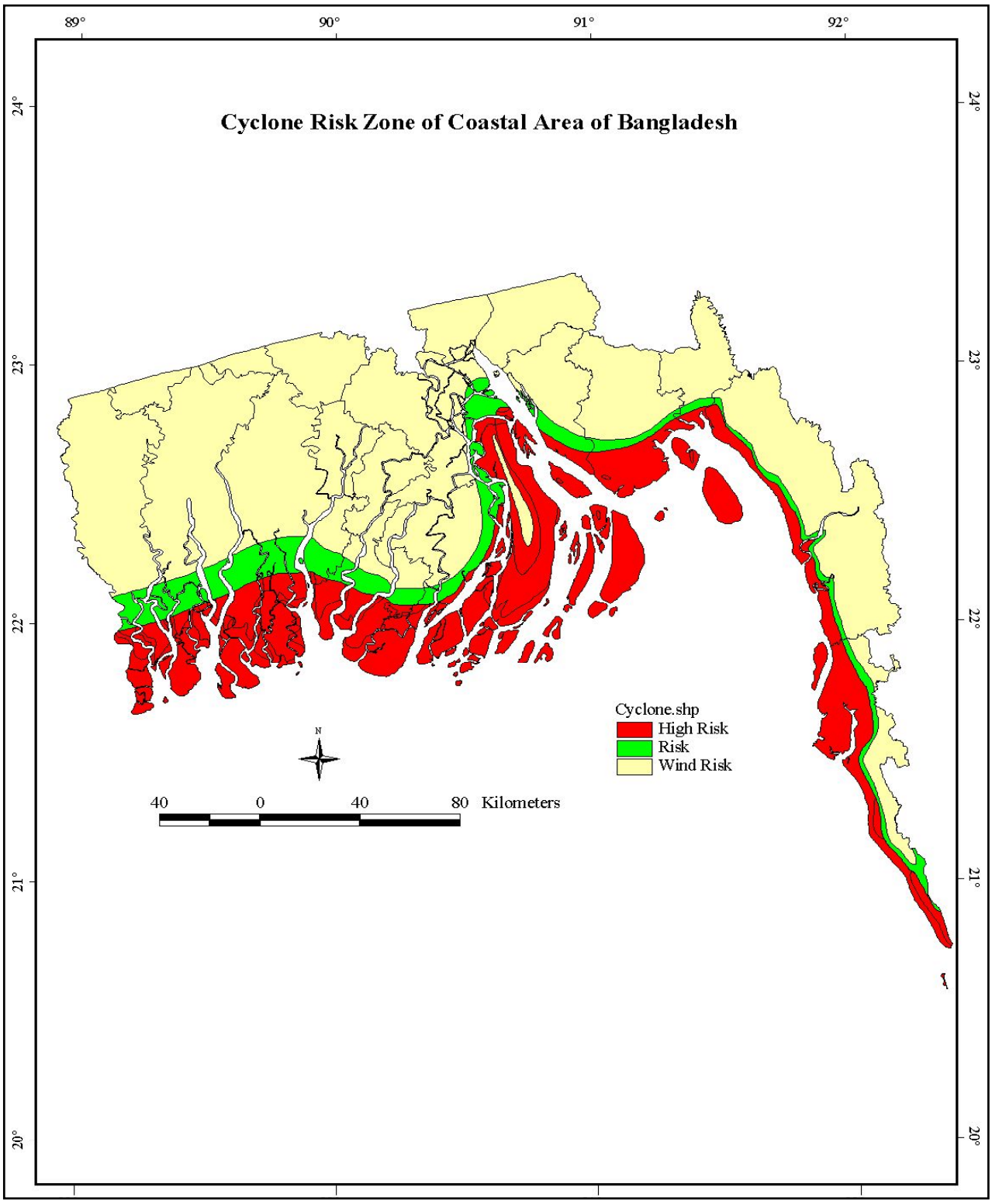


Figure 5.3: Cyclone prone areas of Bangladesh (Source: WARPO, 2005)l

Table 5.1: Major cyclones that hit the Bangladesh coast

Date		Maximum Wind speed (km/hr)	Storm Surge height (Meter)
30 October	1960	211	4.6-6.1
30 May	1961	160	6.1-8.8
28 May	1963	203	4.2-5.2
11 May	1965	160	6.1-7.6
15 December	1965	211	4.6-6.1
1 November	1966	146	4.6-9.1
23 October	1970	163	3.0-4.9
12 November	1970	224	6.1-9.1
25 May	1985	154	3.0-4.9
29 November	1988	160	3.0-4.0
29 April	1991	225	6.0-7.5
2 May	1994	210	2.0-3.0
25 November	1995	140	2.0-3.0
19 May	1997	220	3.1-4.2

Source: Chowdhury 1987, 1991 and Bangladesh Meteorological Department 1988, BBS, 1998

5.2.3 Drought

Drought is an abnormal condition where there is a lack of sufficient water to meet the normal needs of agriculture, livestock, industry, or for human use. While generally associated with semi-arid or desert climates, droughts can also occur in areas that normally enjoy adequate rainfall, and moisture levels (ADB, 1991). It is the result of insufficient or no rainfall for an extended period, and causes a considerable hydrological (water) imbalance. The ensuing water shortage leads to stream flow reduction, depletion of ground water and soil moisture, and hence, crop damage. In drought conditions, evaporation and transpiration exceed normal levels. If it continues for a prolonged period, a serious threat is posed to agricultural production. In the agricultural context drought affects rice production the most. Based on drought severity, crop loss ranges between 20->60% for T. Aman and other rice varieties (Iqbal, 2000). It is one of the most insidious causes of human misery.

Basically, there are three types of droughts:

- Permanent drought characterizes regions with the driest climate, having sparse vegetation that is adapted to aridity. Agriculture cannot be practiced without irrigation.
- Seasonal drought occurs due to abnormal rainfall shortage in places where there are well-defined annual rainy and dry seasons.
- Unpredictable drought involves an abnormal rainfall failure, mostly in localized areas of humid and sub-humid climates.

Bangladesh is at higher risk from droughts. Between 1949 and 1991, droughts occurred in Bangladesh 24 times. Very severe droughts hit the country in 1951, 1957, 1958, 1961, 1972, 1975, 1979, 1981, 1982, 1984 and 1989. Past droughts have typically affected about 47% area of the country and 53% of the population (WARPO, 2005). Figure 5.4 shows the drought prone areas of Bangladesh.

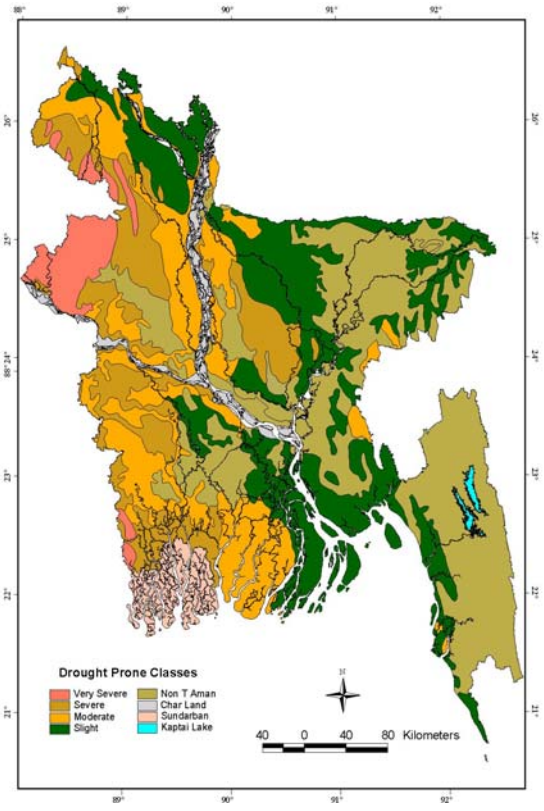


Figure 5.4 (a): Drought prone (Kharif) areas of Bangladesh (Source: SRDI)

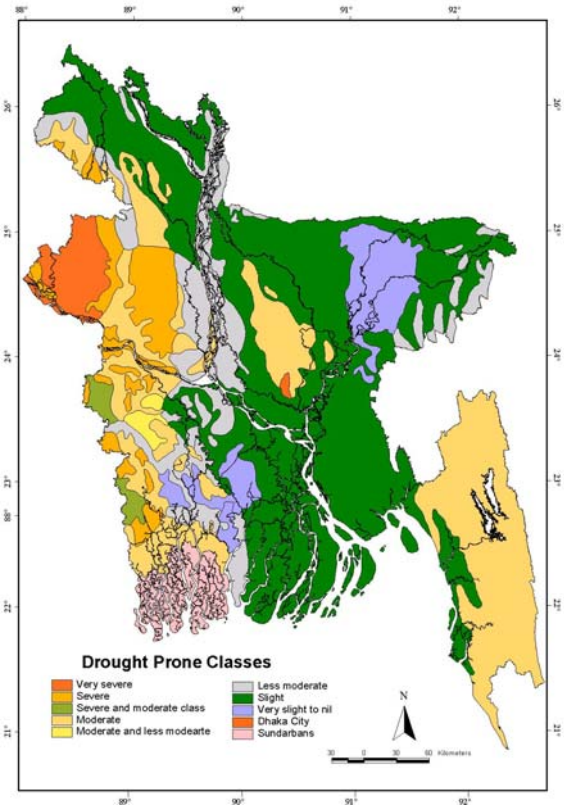


Figure 5.4 (b): Drought prone (Rabi and Pre Kharif) areas of Bangladesh (Source: SRDI)

Drought conditions due to deficiency in rainfall affect different parts of Bangladesh mostly during the pre-monsoon and post-monsoon periods. One study has shown (Figure 5.5) that from 1949 to 1979, drought conditions had never affected the entire country and total population in any drought year. The drought of 1979 was one of the severest in recent times. The percentage of drought-affected areas was 31.63 percent in 1951, 6.54 percent in 1957, 37.47 percent in 1958, 22.39 percent in 1961, 18.42 percent in 1966, 42.48 percent in 1972, and 42.04 percent in 1979 (Chowdhury and Hussain 1981). During 1981 and 1982, drought affected the production of the monsoon crop only.

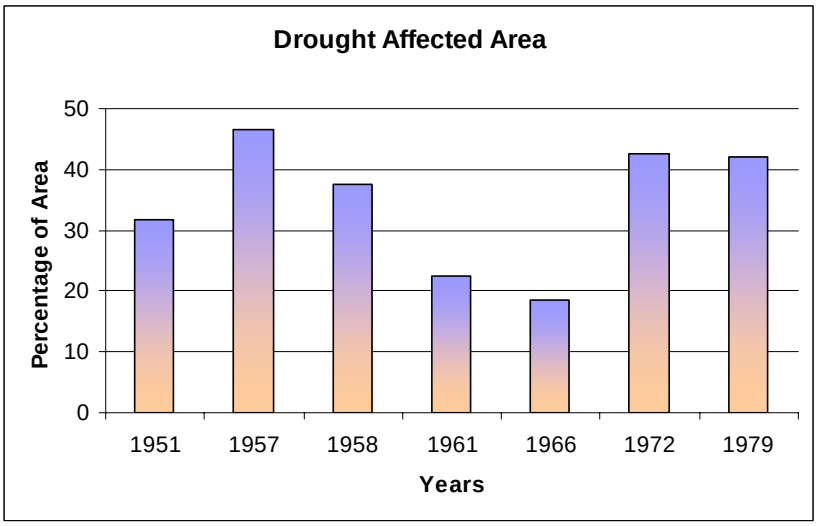


Figure 5.5: Drought affected areas of Bangladesh in different years (Source: State of Environment 2001).

5.2.4 River Erosion

Rivers in Bangladesh are morphologically highly dynamic. The main rivers are braided, and form islands or chars between the braiding channels. These chars, of which many are inhabited, "move with the flow" and are extremely sensitive to changes in the river conditions. Erosion processes are highly unpredictable, and not compensated by accretion. These processes also have dramatic consequences in the lives of people living in those areas. A study concluded in 1991 reported that: out of the 462 administrative units in the country, 100 were subject to some form of riverbank erosion, of which 35 were serious, and affected about 1 million people on a yearly basis. Around 10,000 hectares land is eroded by river per year in Bangladesh (NWMP, 2001). The erosion prone zones of Bangladesh are shown in the Figure 5.6.

Kurigram, Gaibandha, Jamalpur, Bogra, Sirajganj, Tangail, Pabna and Manikganj districts lie in the erosion prone area along Jamuna River. Erosion of total area and settlement is higher along the left bank than that of the right bank. Along Padma River, there are the districts of Rajbari, Faridpur, Manikganj, Dhaka, Munshiganj, Shariatpur, Chandpur. A recent study of CEGIS (2005) shows that bank erosion along Padma River during 1973 – 2004 was 29,390 ha and along Jamuna River during 1973 – 2004, it was 87,790 ha. As relevant to this study, loss of land, settlements, roads and embankments due to erosion in 2004 in Sirajganj and Faridpur districts is shown in Table 5.2.

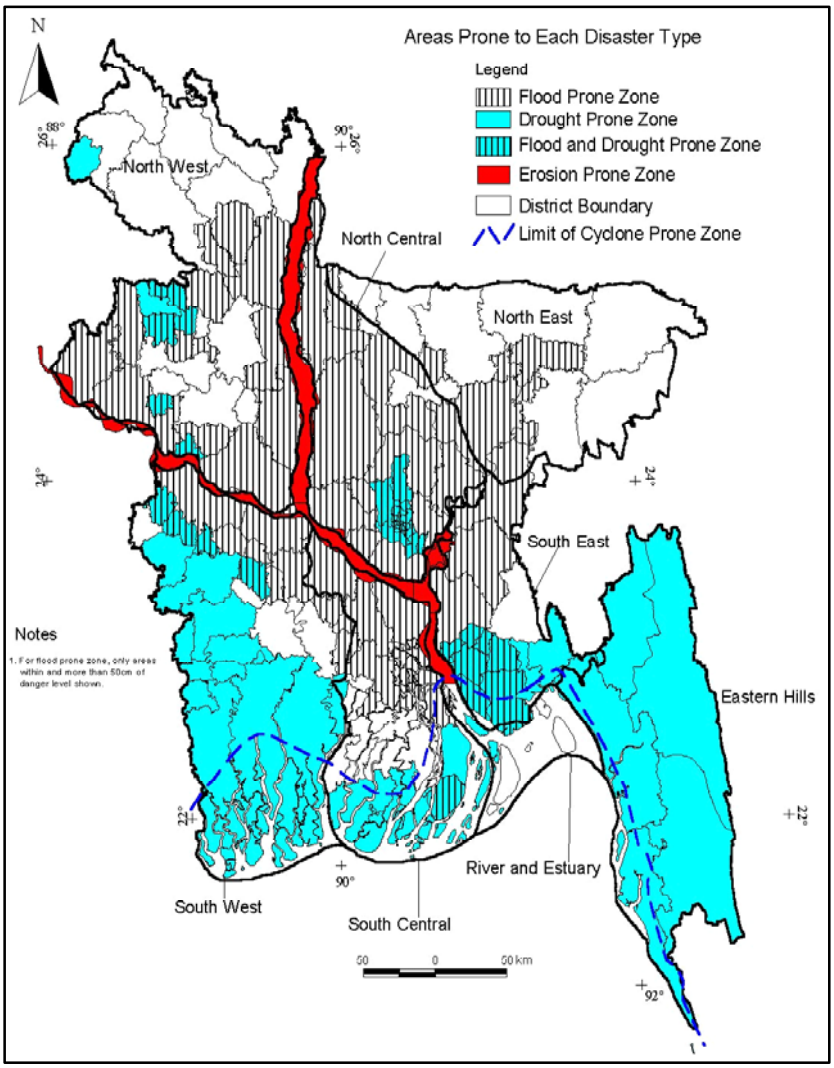


Figure 5.6: Erosion prone zones in Bangladesh (Source: NWRD)

Table 5.2: Erosion of agricultural land, roads, embankments and settlements along the banks of the Jamuna and Padma in 2004 in Sirajganj and Faridpur districts

District	Upazila	Total Land (ha)	Eroded Infrastructures				
			Settlement (ha)	District Road (m)	Upazila Road (m)	Rural Road (m)	Embankment (m)
Sirajganj	Kazipur	177	50		176	84	1617
	Sirajganj Sadar	170	13	1		164	2107
	Belkuchi	0	0				
	Chauhali	207	45		395		
	Shahjadpur	148	31	159			
	Total	*702*	*139*	*160*	*571*	*248*	*3724*
Faridpur	Faridpur Sadar	200	57		1175	370	
	Char Bhadrasan	78	17	320			
	Sadarpur	3	1				
	Total	*281*	*75*	*320*	*1175*	*370*	

Source: CEGIS, 2005

5.2.5 Salinity Intrusion

Saline water intrusion is highly seasonal in Bangladesh; in winter months the saline front begins to penetrate inland, and the affected areas rise sharply from 10 percent in the monsoon to over 40 percent in the dry season. Coastal districts such as Satkhira, Khulna, Bagerhat, Barguna, Patuakhali, Barisal are the victims of salinity intrusion. Agricultural production, fisheries, livestock, and mangrove forests are affected by higher salinity in the dry season.

Salinity data from LRP and MES indicate an enormous seasonal effect due to the influence of huge fresh water discharge from the Lower Meghna River on the horizontal distribution of salinity in the estuary. This distribution is strongly influenced by the fresh water flow in the Lower Meghna River. Figures 5.7 and 5.8 present the movement of the 1 ppt salinity line during monsoon and dry season respectively. High salinity both in monsoon and dry season in the southwest corner and along the Pussur-Sibsa system of the area is associated with the decreasing upstream freshwater flow as well as silting of major channels (WARPO, 2005).

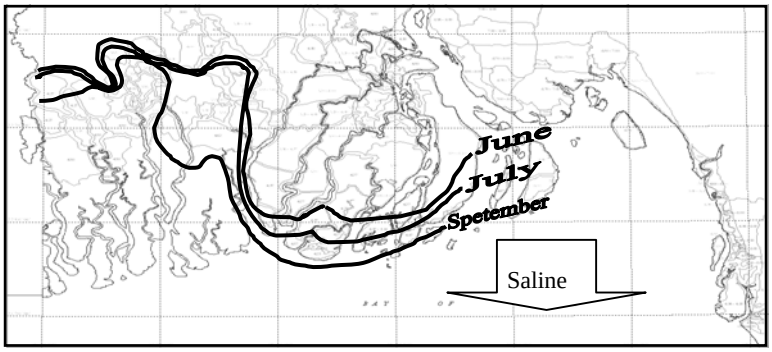


Figure 5.7: Movement of saline front of 1 ppt in the monsoon season (June to September)

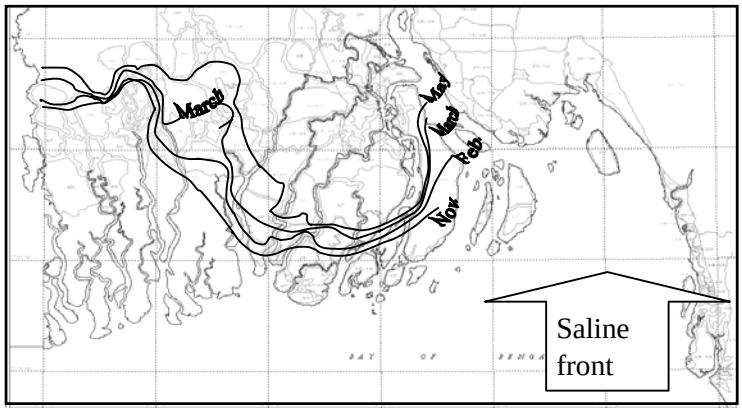


Figure 5.8: Movement of saline front of 1 ppt in the dry season (November to May)

5.2.6 Earthquake

Bangladesh and the northeastern Indian states have long been one of the seismically active regions of the world, and have experienced numerous large earthquakes during the past 200 years at an average rate of one in every 30 years. The catastrophic earthquakes of 1762 and 1782 are believed to have been partially responsible for the diversion of the Old Brahmaputra River from the west of its main Arial Khan distributory to the present Padma channel. Since 1860 over 20 shallow and intermediate major earthquake epicenters have been recorded in Bangladesh and the surrounding areas.

Seismo-tectonic studies have been undertaken by many people in the area comprising the Indo-Burman ranges and their western extension and in the northern India. A complete list of reference of this is provided in Haque, (1990), using data from various sources. A seismicity map of Bangladesh and its adjoining areas has also been prepared by Mominuddin (1991). Bangladesh has been classified by BGS (Fig. 5.9) as falling into seismic zones with zone-III the most and zone-I the least severe.

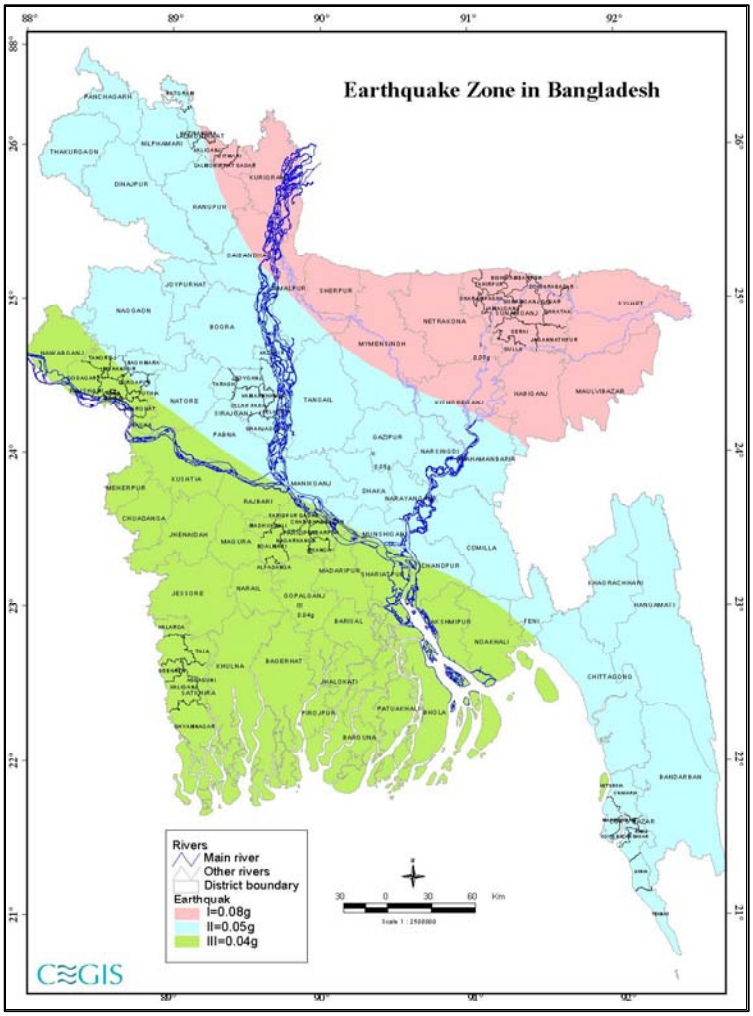


Figure 5.9: Earthquake zones in Bangladesh

The record of approximately 150 years shows that Bangladesh and the surrounding regions experienced seven major earthquakes (with M = 7). In the recent past, a number of tremors of moderate to severe intensity had already taken place in and around Bangladesh. The Chittagong earthquake of 21 November, 1997 (M = 6.1), the Bhuj earthquake of 26 January, 2001 (M = 7.9) and the Chittagong -Rangamati earthquakes of 27 July, 2003 (M = 5.9, M = 3.69 and M = 4.79) may be cited as examples. (Source: www.adrc.or.jp/BGD/2003/page2.html)

5.2.7 Arsenic Contamination

At present, arsenic contamination is considered to be a dangerous environmental threat and a serious health risk. It is identified as a public health emergency in Bangladesh. There is no specific treatment for chronic arsenicosis other than ceasing further intake of arsenic contaminated water and raising awareness of the population about the problem.

The value (recommended limit) for arsenic in drinking water as per the guideline of the World Health Organization (WHO) is 10 mg/L while the national standard in most countries, including Bangladesh, is 50 mg/L. With varying levels of contamination from region to region, groundwater in 61 out of the 64 districts in Bangladesh is contaminated with arsenic. According to a study conducted by the British Geological Survey and DPHE, Bangladesh, arsenic concentrations in the country range from less than 0.25 mg/L to more than 1600 mg/L. This study report estimates that out of the Bangladesh population

of 125.5 million, up to 57 million drinks water that has an arsenic concentration greater than the WHO guideline value and up to 35 million drinks water that has concentrations in excess of the Bangladesh standard. The waters in the southwest and southeast parts of Bangladesh are highly contaminated with arsenic (Figure 5.10).

5.2.8 Tornado

The two transitional periods between southwest and northeast monsoons over the Indian sub-continent are characterized by local severe storms. The transitional periods are usually referred to as pre-monsoon (March-May), and post-monsoon (October- November). It is the pre-monsoon period when most of the abnormal rainfall or drought conditions frequently occur in different parts of Bangladesh. Also there are severe local seasonal storms, popularly known as nor'westers *(kalbaishakhi)*. Severe nor'westers are generally associated with tornadoes. The tornado forms within the nor'wester, and moves along the direction of the squall of the mother storm. The frequency of nor'westers usually reaches the maximum in April, while a few occur in May, and the minimum in March. Nor'westers and tornadoes are more frequent in the afternoon. Table 5.3 shows some of the devastating nor'westers and tornadoes that hit Bangladesh. Nor'westers may occur in late February due to early withdrawal of winter from Bangladesh, Bihar, West Bengal, Assam, and adjoining areas. The occasional occurrence of nor'westers in early June is due to delay in the onset of the southwest monsoon over the region (Karmakar, 1989).

Table 5.3: Some of the devastating nor'westers and tornadoes

14 April 1969	Demra (Dhaka)
17 April 1973	Manikganj (Dhaka)
10 April 1974	Faridpur
11 April 1974	Bogra
09 May 1976	Narayanganj
01 April 1977	Faridpur
26 April 1989	Saturia (Manikganj)

Source: Bangladesh: State of the Environment 2001

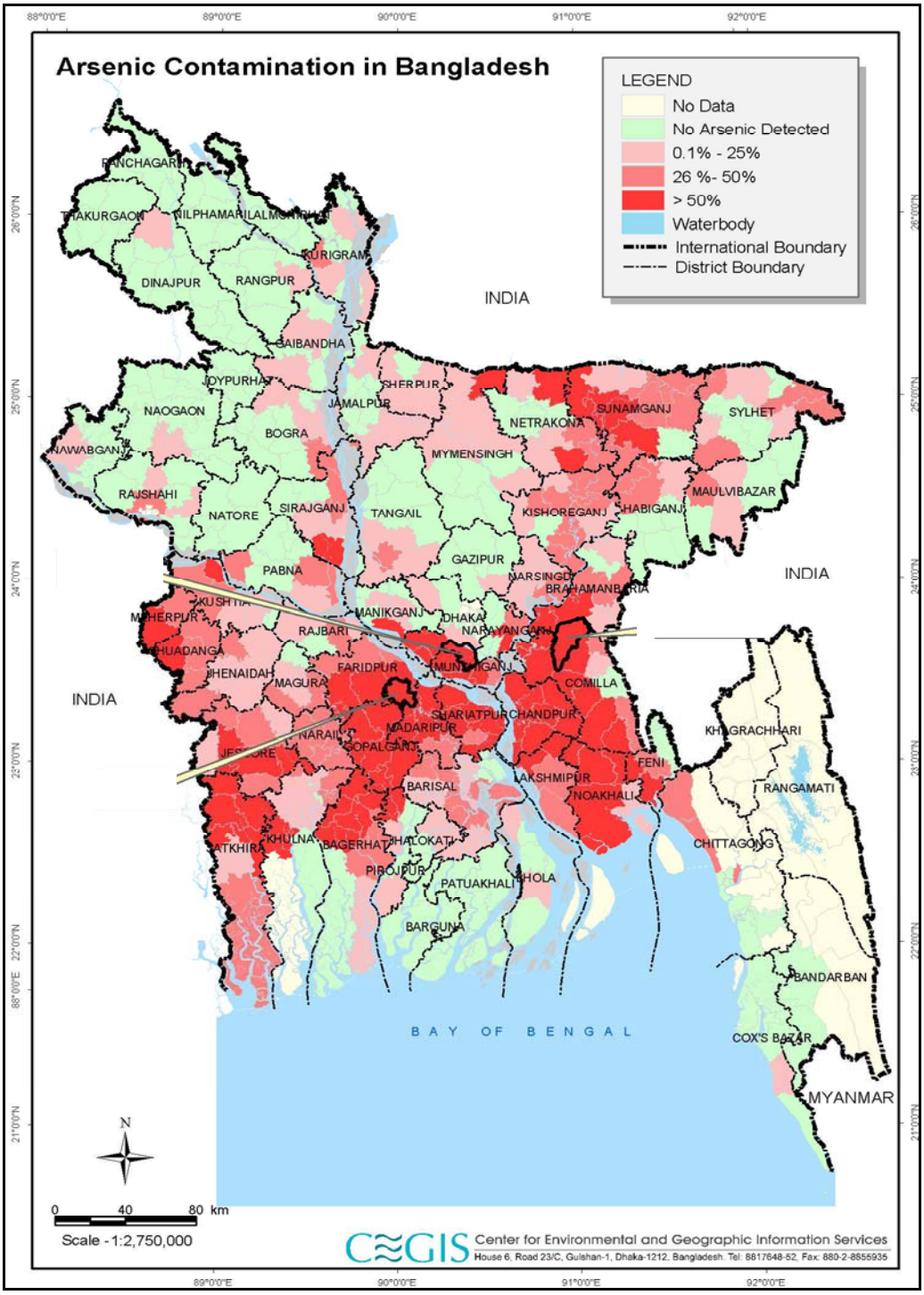


Figure 5.10: Arsenic contamination status in Bangladesh

Wind-speeds in nor'westers usually do not exceed 113-130 km/hr (70-80 miles/hr), though often their speeds ***exceed*** 162 km/hr (100 miles/hr). When the winds become whirling with funnel shaped clouds having a speed of several hundred kilometers or miles per hour, they are called tornadoes. Nor'westers bring the much needed pre-monsoon rain. They can also cause a lot of havoc and destruction. Tornadoes are suddenly formed and are extremely localized in nature and of brief duration. Thus, it is very difficult to locate them or forecast their occurrence with the techniques available at present. However, high-resolution satellite pictures, suitable radar, and a network of densely spaced meteorological observatories could be useful for the prediction or for issuing warnings of nor'westers and tornadoes.

5.3 Natural Hazards in Seven Pilot Districts

Since the pilot districts are located in different parts of the country, each district has some unique natural hazards. All the natural hazards were identified based on consultation with community level organizations. The occurrence and extent of the effects of hazards were classified for each thana/ upazila. The nature and extent of hazards in each district are presented in the following sections.

5.3.1 Cox's Bazaar

The natural hazards that occur in Cox's Bazaar are flash floods, cyclones, tidal surges, earthquakes, floods, landslides, salinity, arsenic, and tsunami. The occurrence of hazards in each upazila is shown in Figure 5.3.1 and the extent of occurrence is given in Table 5.3.1.1. The seasonality of occurrence is shown in Table 5.3.1.2. Pekua Thana has been established recently and the boundary of the thana has not yet been collected. Therefore this thana is not shown in Figure 5.3.1. The nature and cause of these major hazards are described in the following sections.

Flood: The whole of Cox's Bazaar District is affected by flash floods caused by heavy rainfall in the hilly region of Bandarban during July-August. The Matamuhuri river basin is a major carrier of rainwater, which passes through Cox's Bazaar District.

Table 5.3.1.1: Hazard profile of Cox's Bazaar District

Type of Hazards	Effected Thana/ Upazila							
	Cox's Bazar Sadar	Chakaria	Moheshkhali	Pekua	Teknaf	Ukhia	Ramu	Kutubdia
Cyclone								
Tidal surge								
Earthquake								
Drought								
Flood								
Hail storm								
Landslide								
Arsenic								
Tsunami								
Tornado								

Fully Affected *Partially Affected* *Not Affected*

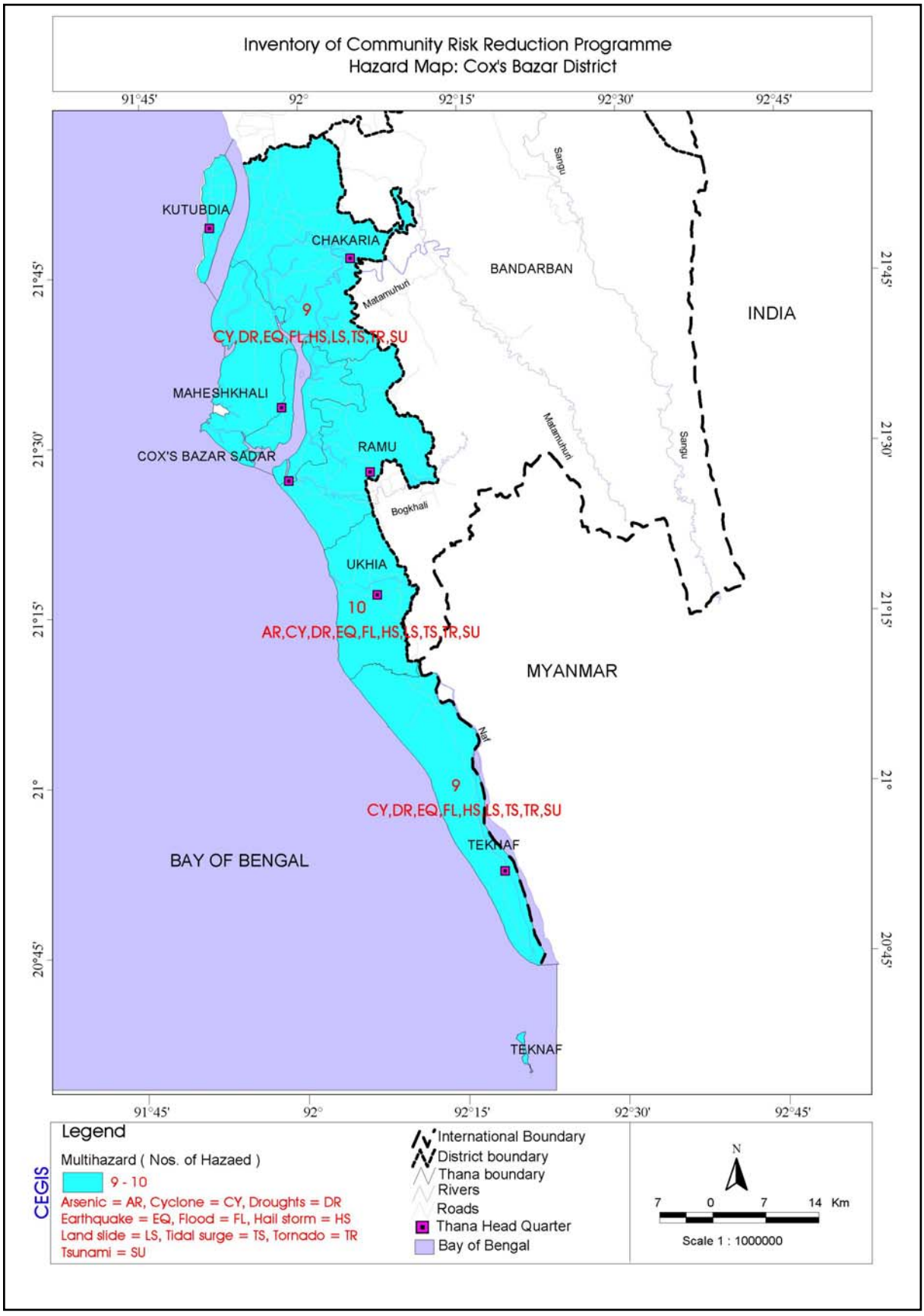


Figure 5.3.1: Hazard map of Cox's Bazaar District

Table 5.3.1.2: Seasons of hazard occurrence in Cox's Bazaar District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cyclone												
Tidal surge												
Earthquake	Not depends on season											
Flood												
Landslide												
Drought												
Arsenic												
Tsunami	Not depends on season											
Hailstorm												
Tornado												

Severe Effect Less Effect No Occurrence

Cyclone: Cyclones occur in this region during pre-monsoon (April – June) and post-monsoon (October –November), which affect all thanas of Cox's Bazaar District (Table 5..3.1.1 and 5.3.1.2). Kutubdia, Moheskhali, Cox's Bazaar, Ramu, Ukhia and Teknaf thanas are in the high risk zone for cyclones. The rest of the thanas are in the Wind Risk Zone.

Tidal surge: Tidal surges occur in this region along with cyclones and heavy wind in pre-monsoon and post-monsoon periods. All thanas are affected by tidal surges (Table 5..3.1.1 and 5.3.1.2).

Earthquake: Cox's Bazaar District falls under Earthquake Zone – II. The whole district is vulnerable to earthquakes. Earthquakes are not dependent on seasons and are unpredictable.

Tsunami: Tsunami occurs due to earthquakes in the ocean. All thanas of Cox's Bazaar are exposed to the tsunami hazard. The recent tsunami did not have any significant effect in the coast of Bangladesh, but as a hazard it could be disastrous if it originated near the Bay of Bengal.

Landslide: The major cause of landslides in Cox's Bazaar District is heavy rainfall in monsoon. All thanas of Cox's Bazaar, except Pekua Thana, are affected by landslides.

Hail storm: Hail storms, associated with heavy wind, usually occur in March – April. All thanas of Cox's Bazaar District are partially affected by hail storms.

Tornado: As mentioned earlier, these are severe seasonal local storms, popularly known as nor'westers (*Kalbaishakhi)*. Severe nor'westers, which are generally associated with tornadoes, are evident in all thanas of this district. The frequency of nor'westers usually reaches the maximum in April, with a few occurring in May, and very little in March.

Drought: Occasional droughts occur all over Cox's Bazaar District during the dry season.

Arsenic: Arsenic contamination in shallow tube-wells is found in Ukhia Thana of Cox's Bazaar District. Arsenic contamination becomes severe in the dry season.

5.3.2 Faridpur

Faridpur District, situated in the floodplain of Ganges River, experiences several natural hazards, such as floods, erosion, droughts, arsenic, tornadoes and water logging depending upon season and locality. The natural hazards that occur in each thana / upazila of Faridpur District are shown in Figure 5.3.2 and the extent of the hazards is shown in Table 5.3.2.1. The seasons for hazards are given in Table 5.3.2.2.

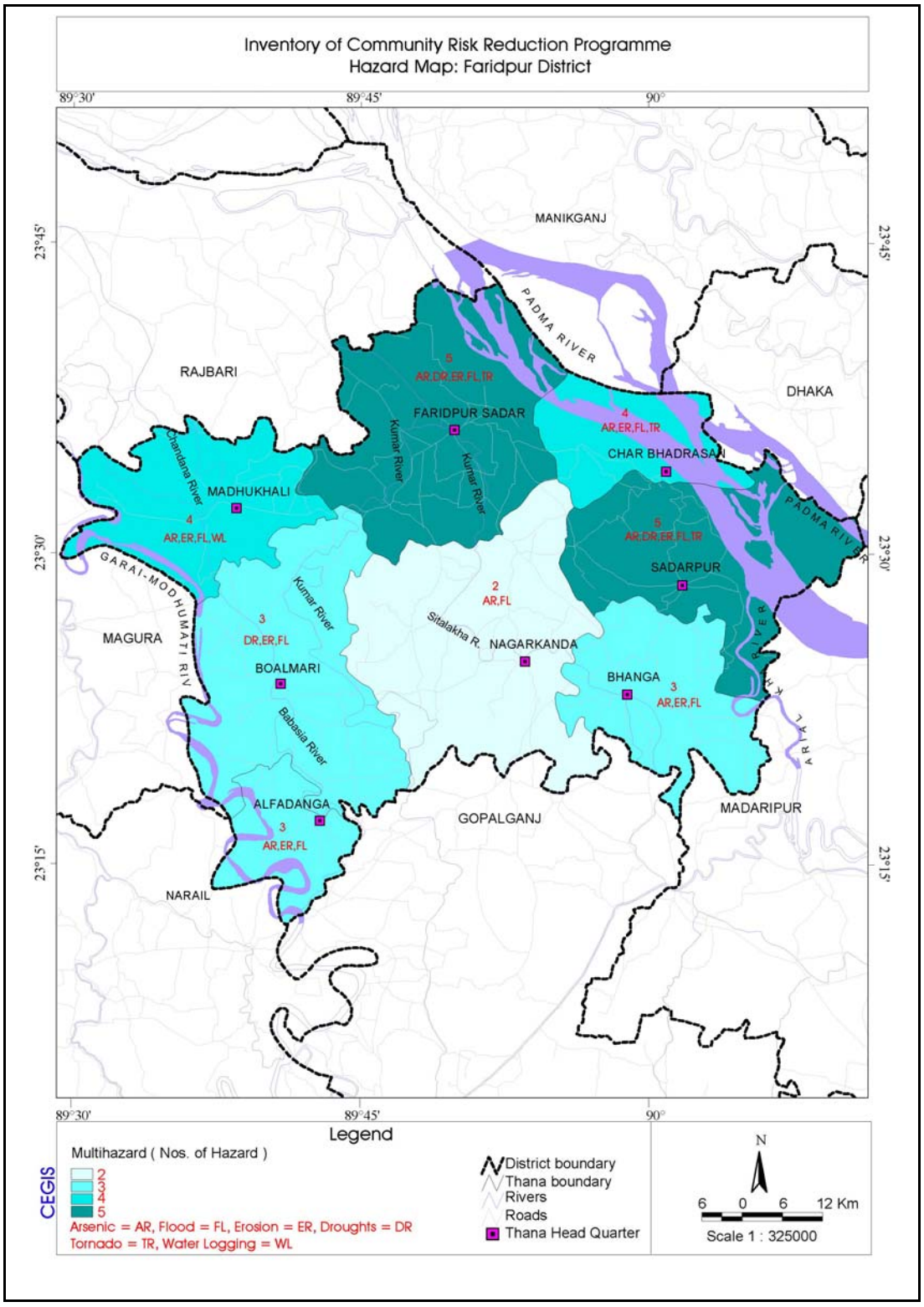


Figure 5.3.2: Hazard map of Faridpur District

Table 5.3.2.1: Hazard profile of Faridpur District

Type of Hazards	Effected Thana/ Upazila							
	Faridpur Sadar	Bhanga	Boalmari	Char Bhadrashan	Nagarkanda	Sadarpur	Modhukhali	Alfadanga
Flood								
Erosion								
Arsenic								
Drought								
Tornado								
Water logging								

Fully Affected *Partially Affected* *Not Affected*

Flood: Most of the upazilas of Faridpur District are affected by floods, more severely in Faridpur Sadar, Bhanga, Char Bhadrasan and Sadarpur, which are flooded by Padma River. Madhumati is responsible for the flood in Alfadanga, Boalmari amd Madhukhali (Table 5.3.2.1). The river Old Kumar is responsible for floods in Nagarkanda Thana. During the peak flow season (July, August and September), these rivers overflow their banks (Table 5.3.2.2).

Erosion: Char Bhadrasan, Faridpur Sadar and Sadarpur thanas have the problem of severe erosion (Table 5.3.2.1), by Padma River in the monsoon (Table 5.3.2.2). Other thanas are partially affected.

Arsenic: Arsenic contamination in ground water is found in three thanas such as Bhanga, Faridpur Sadar, Nagarkanda, and Modhukhali severely, whereas other thanas are partially affected (Table 5.3.2.1). The effect of arsenic increases in the dry season.

Drought: Drought is partially prominent in all thanas of Faridpur District. It is the most severe in April.

Water logging: Drainage congestion is the post effect of flash floods and local rainfall. Modhukhali Thana is affected by drainage congestion during July – August (Table 5.3.2.1 and 5.3.2.2). It is aggravated due to unplanned infrastructure and excessive siltation.

Norwester-Tornado: As described previously, severe local seasonal storms are popularly known as nor'westers (*kalbaishakhi)*. Severe nor'westers are generally associated with tornadoes. Nor'westers are evident in Char Bhadrasan, Faridpur Sadar and Sadarpur thanas. The frequency of nor'westers usually reaches the maximum in April-May and October and the minimum in March. Nor'westers and tornadoes are more frequent in the afternoon. Nor'westers may occur in late February due to early withdrawal of winter from the Shillong Plateau of India, and cause widespread damages of property and life.

Table 5.3.2.2: Seasons of hazard occurrence in Faridpur District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flood												
Erosion												
Arsenic												
Drought												
Tornado												
Water logging												

Severe Effect Less Effect No Occurrence

5.3.3 Lalmonirhat

Lalmonirhat District suffers from several natural hazards, such as arsenic, cold, droughts, erosion, floods, water logging, earthquakes, sedimentation and tornadoes. The occurrence of hazards in each upazila is shown in Figure 5.15. The extent of hazard occurrence in the upazilas is given in Table 5.3.3.1 and the seasonality of hazard occurrence is shown in Table 4.3.3.2. The nature and cause of these major hazards are described in the following sections.

Arsenic: Arsenic contamination in ground water occurs partially in Hatibandha Thana of Lalmonirhat District.

Cold: All upazilas of Lalmonirhat District are fully affected by cold during December-January.

Table 5.3.3.1: Hazard profile of Lalmonirhat District

Type of Hazards	Effected Thana/ Upazila				
	Aditmari	**Hatibandha**	**Kaligonj**	**Lalmonirhat Sadar**	**Patgram**
Arsenic					
Cold					
Earthquake					
Flood					
Erosion					
Drought					
Tornado					
Sedimentation					
Water logging					

Fully Affected *Partially Affected* *Not Affected*

Flood: The whole of Lalmonirhat District is affected by floods, which are mainly caused by water spill from Teesta River during June-August. (Tables 5.3.3.1 and 5.3.3.2).

Tornado: All thanas of Lalmonirhat District are partially affected by tornadoes, which occur in March – April.

Drought: The whole of Lalmonirhat District is affected by droughts during the dry season (March – May). Droughts become worse due to the unavailability of surface water and lowering of the ground water table.

Table 5.3.3.2: Seasons for hazard occurrence in Lalmonirhat District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arsenic												
Cold												
Earthquake	Not depends on season											
Flood												
Erosion												
Drought												
Tornado												
Sedimentation												
Water logging												

Severe Effect *Less Effect* *No Occurrence*

Water logging: Water logging is partially prominent in all thanas except Hatibandha Thana during monsoon, and occurs due to urban infrastructures like roads, embankments, settlements, etc.

Earthquake: Lalmonirhat District falls under Earthquake Zone – I (High risk zone). The whole district is vulnerable to earthquakes but they are only reported in Lalmonirhat Sadar Thana. Earthquakes are not dependent on seasons and are unpredictable.

Erosion: Lalmonirhat Sadar Thana is fully affected by riverbank erosion along the Teesta and Dharla river system during monsoon. Other thanas are partially affected.

Sedimentation: Sedimentation in river channel due to low flow is prominent in Lalmonirhat Sadar and Kaliganj thanas. But sand deposition on the riverbank due to floods occurs in all thanas during August – September.

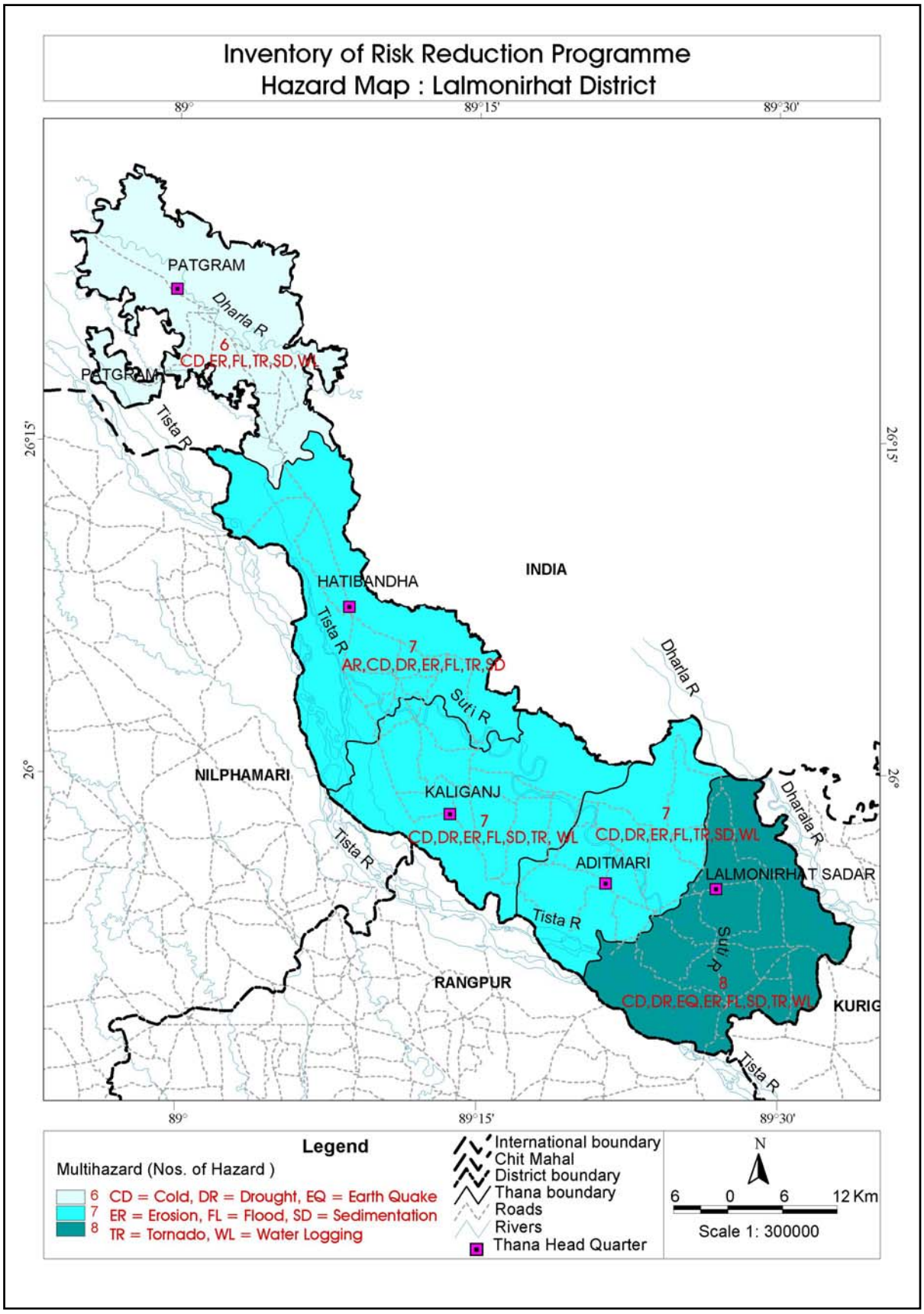


Figure 5.3.3: Hazard map of Lalmonirhat District

5.3.4 Rajshahi

The main hazards in this district are seasonal floods, erosion, cold, droughts and tornadoes. Paba, Bagha and Godagari thanas suffer from all of these major hazards. The occurrence of hazards in each thana / upazila is shown Figure 5.3.4 and the extent of the effects in each thana/ upazila is shown in Table 5.3.4.1. The seasons for the hazards are also shown in Table 5.3.4.2. The nature and cause of these major hazards are described briefly below.

Cold: The whole of Rajshahi District experiences extreme cold almost every year in December - January (Table 5.3.4.2). It is observed from historical records that the yearly average lowest temperature was 7 ^{o}C (in the last 40 years, Source: NWRD) in Rajshahi District.

Table 5.3.4.1: Hazard profile of Rajshahi District

Type of Hazards	Affected Thana/ Upazila									
	Bagha	Baghmara	Charghat	Durgapur	Godagari	Mohonpur	Puthia	Rajshahi City Corporation	Tanore	Paba
Arsenic										
Cold										
Drought										
Earthquake										
Erosion										
Flood										
Tornado										
Hail storm										
Heat wave										
Thunder storm										

Fully Affected *Partially Affected* *Not Affected*

Figure 5.3.4: Hazard map of Rajshahi District

Flood: Floods in this area are mainly from the Ganges-Mohananda river system. During the peak flow season (July, August and September), these rivers overflow their banks. The most flood affected thanas are Bagha, Baghmara, Charghat and Godagari, whereas Mohonpur, Tanore and Paba thanas are partially affected (Table 5.3.4.1).

Erosion: Erosion prone areas are found in Bagha, Charghat and Godagari thanas/ upazilas, which are situated beside the Ganges – Mahanada river system. All other thanas are partially affected. Erosion occurs mainly in monsoon (Table 5.3.4.2).

Drought: Almost all thanas of Rajshahi District are affected by drought due to low rainfall (annual average rainfall is 1862 mm). Tanore and Godagari thana, which is near to the Nawabganj and Naogaon districts, is severely affected every year in pre-monsoon season.

Tornado: All thanas of Rajshahi District experience tornadoes almost every year. But the extent of the effects is not severe in all places. Tornadoes occur usually in April – May. However, there is no historical record of tornadoes and consequent damages in Rajshahi.

Arsenic: The whole of Rajshahi District is partially affected by arsenic contamination in ground water. The arsenic problem is aggravated during the dry season when the ground water level goes down (Table 5.3.4.2).

Earthquake: Though Rajshahi District falls under Earthquake Zone- II and III, there has been no major earthquake in this district.

Hail storm: Hail storms, associated with heavy wind, usually occur in April – May. All thanas of Rajshahi District are partially affected by hail storms.

Heat wave: Seasonal heat waves are felt in Charghat, Godagari, Tanore and Paba thana, usually in April – May – June.

Thunder storm: Thunder occurs partially in all thanas of Rajshahi District during monsoon.

Table 5.3.4.2: Seasons of hazard occurrence in Rajshahi District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arsenic												
Cold												
Drought												
Earthquake	Not depends on season											
Erosion												
Flood												
Tornado												
Hail storm												
Heat wave												
Thunder storm												

Severe Effect *Less Effect* *No Occurrence*

5.3.5 Satkhira

Satkhira District suffers from several natural hazards, such as arsenic, cyclones, droughts, erosion, floods, salinity, water logging and tidal surges. The occurrence of hazards in each upazila is shown in Figure 5.3.5. The extent of hazard occurrence in the upazilas is given in Table 5.3.5.1 and the seasonality of hazard occurrence is shown in Table 5.3.5.2. The nature and cause of these major hazards are described in the following sections.

Arsenic: Arsenic contamination in ground water is severe in Assasuni, Debhata, Kalaroa and Satkhira sadar thana of Satkhira District. Other thanas are partially affected.

Salinity: Salinity intrusion through channels, due to tidal effect from the Bay of Bengal and reduction of freshwater flow from the upstream, is increasing in the southwest region of Bangladesh. Assasuni, Kaliganj and Shyamnagar thanas are fully affected by salinity intrusion, whereas other thanas are partially affected, except Kalaroa and Tala thanas. These areas face this problem throughout the year but the intensity reduces in monsoon due to rainfall and increased upstream freshwater flow (Table 5.3.5.2).

Table 5.3.5.1: Hazard profile of Satkhira District

Type of Hazards	Effected Thana/ Upazila						
	Assasuni	Debhata	Kalaroa	Kaligonj	Satkhira Sadar	Shymnagar	Tala
Arsenic							
Cyclone							
Cold							
Drought							
Erosion							
Flood							
Salinity							
Water Logging							
Tidal surge							
Tornado							

Fully Affected *Partially Affected* *Not Affected*

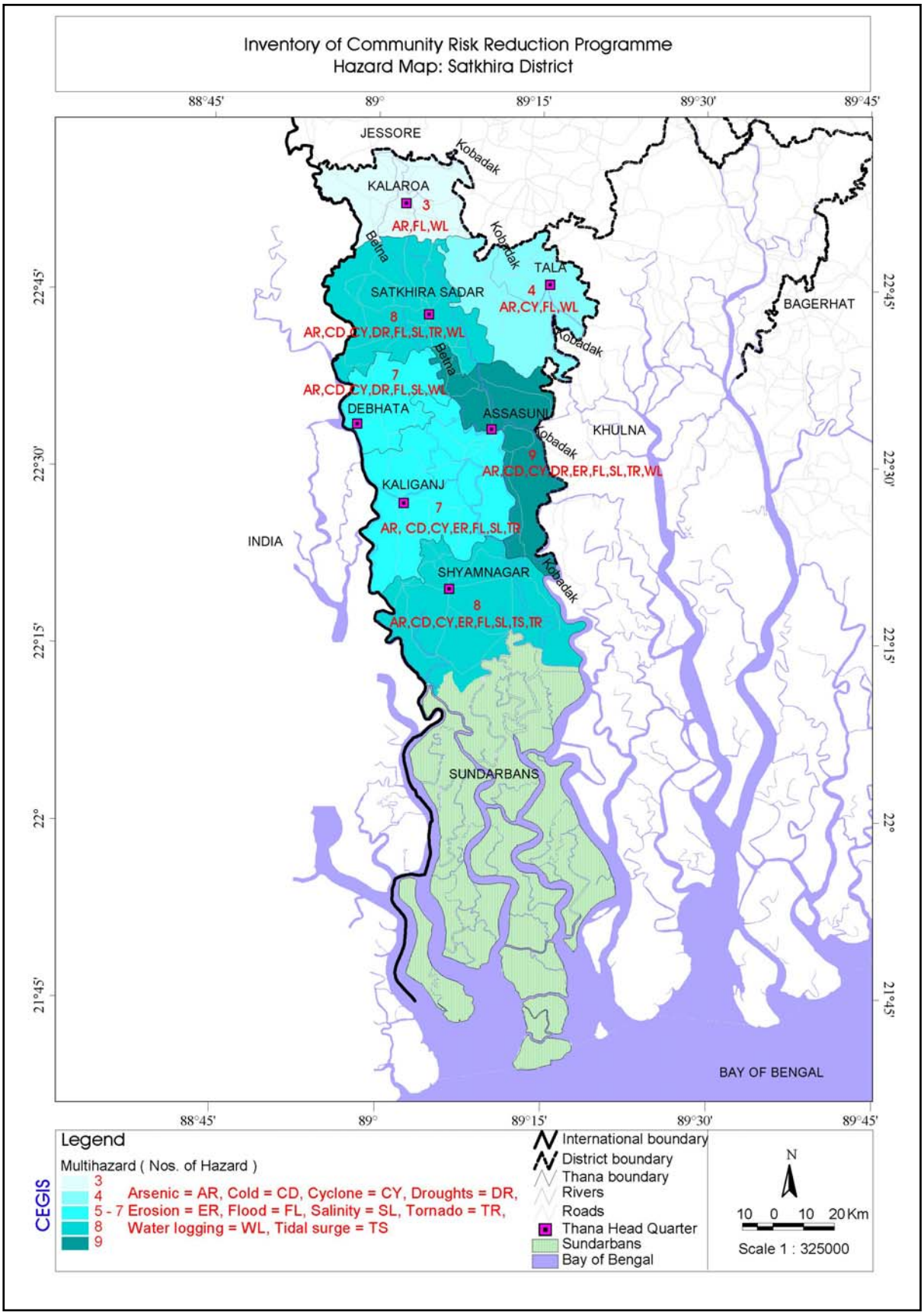


Figure 5.3.5: Hazard map of Satkhira District

Table 5.3.5.2: Seasons for hazard occurrence in Satkhira District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arsenic												
Cyclone												
Cold												
Drought												
Erosion												
Flood												
Salinity												
Water Logging												
Tidal surge												
Tornado												

Severe Effect *Less Effect* *No Occurrence*

Cyclone: Almost all thanas of Satkhira District are affected by cyclones. Cyclones occur in this region during pre-monsoon (April – May) (Tables 5.3.5.1 and 5.3.5.2).

Flood: The whole of Satkhira District is affected by floods, which are mainly caused by heavy rainfall during July-August - September. (Tables 5.3.5.1 and 5.3.5.2).

Tidal surge: Satkhira District is partially affected by tidal surges, which occur in this region along with cyclones and heavy wind in pre-monsoon. Only Shyamnagar Thana is partially affected by tidal surges that come through the Betna- Kobadak river channels (Tables 5.3.5.1 and 5.3.5.2).

Tornado: Assasuni, Kaliganj, Satkhira sadar and Shyamnagar thanas are partially affected by tornadoes. Tornadoes occur here in March – April.

Drought: Assasuni, Debhata and Satkhira thanas are affected by droughts during the dry season (March – April). Droughts become worse due to surface water salinity and no rainfall.

Water logging: Water logging is prominent in Debhata, Kalaroa, Satkhira sadar and Tala Thana during monsoon.

Erosion: Assasuni and Shyamnagar thanas are fully affected by riverbank erosion whereas Kaliganj, Debhata and Kolaroa thanas are partially affected by the Kobadar and Betna river system during monsoon.

Cold: Almost all upazilas of Satkhira District are partially affected by cold, except Kolaroa and Tala thana.

5.3.6 Sirajganj

Sirajganj District is affected by several natural hazards, such as arsenic, cold waves, floods, droughts, erosion, hail storms, thunder storms and tornadoes. The occurrence of hazards in each upazila is shown in Figure 5.3.6. The extent of hazard occurrence in the upazilas is given in Table 5.3.6.1 and the seasonality of hazard occurrence is shown in Table 5.3.6.2. The nature and cause of these major hazards are described in the following sections.

Flood: All thanas of Sirajganj District are affected by floods caused by the Jamuna river system during monsoon (Tables 5.3.6.1 and 5.3.6.2). Belkuchi, Chauhali, Kazipur, Shahzadpur and Sirajganj Sadar thanas are severely affected by floods every year.

Erosion: Belkuchi, Chauhali, Kazipur, Shahzadpur and Sirajganj Sadar thanas are fully affected by riverbank erosion along Jamuna River, which is associated with monsoon flood (Tables 5.3.6.1 and 5.3.6.2).

Drought: All thanas of Sirajganj District, except Shahzadpur Thana, are partially affected by droughts during the dry season (March – May). Droughts become worse due to the unavailability of surface water and lowering of the ground water table.

Table 5.3.6.1: Hazard profile of Sirajganj District

Type of Hazards	Effected Thana/ Upazila								
	Belkuchi	Chauhali	Kamarkhanda	Kazipur	Royganj	Shahzadpur	Sirajganj Sadar	Tarash	Ullapara
Cold									
Erosion									
Drought									
Flood									
Arsenic									
Tornado									
Hail storm									
Thunder storm									

Fully Affected *Partially Affected* *Not Affected*

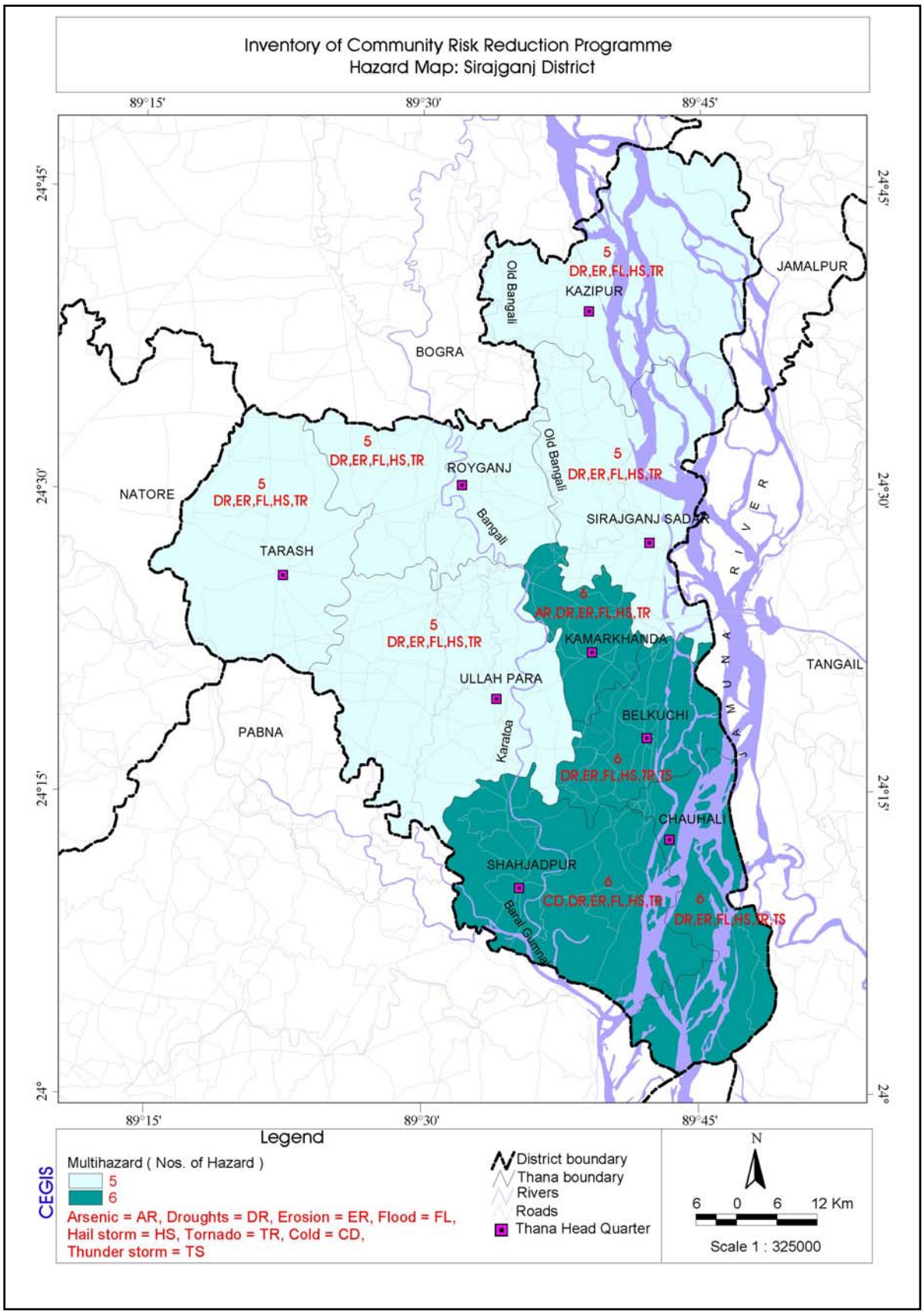


Figure 5.3.6: Hazard map of Sirajganj District

Table 5.3.6.2: Seasons for hazard occurrence in Sirajganj District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cold												
Erosion												
Drought												
Flood												
Arsenic												
Tornado												
Hail storm												
Thunder storm												

Peak Season *Normal Season* *No Occurrence*

Tornado: All thanas of Sirajganj District are affected by tornadoes that occur in April-May. Severe effects are reported in Kazipur and Ullapara thanas.

Arsenic: Kamarkhanda, Shahzadpur and Ullapara thanas of Sirajganj District are partially affected by arsenic contamination in ground water.

Cold Wave: Shahzadpur Thana is partially affected by cold during December-January.

Hail storm: Hail storms, associated with heavy wind, usually occur in April - May. It is reported that all thanas of Sirajganj District are affected by hail storms, except Shahzadpur Thana.

Thunder storm: Thunder storms are evident in Belkuchi and Chauhali thanas of Sirajganj during pre-monsoon (March – April).

Though the natural hazards that occur in all seven districts are almost similar, the causes, seasons and extent are different. Risk reduction measures are usually taken depending on the nature of hazards.

5.3.7 Sunamganj

Sunamganj District is affected by several natural hazards, such as floods, arsenic, cold, earthquakes, sedimentation, heavy rainfall, erosion, hail storms, thunder storms and tornadoes. The occurrence of hazards in each upazila is shown in Figure 5.3.7. The extent of hazard occurrence in the upazilas is given in Table 5.3.7.1 and the seasonality of hazard occurrence is shown in Table 5.3.7.2. The nature and cause of these major hazards are described in the following sections.

Arsenic: Almost all thanas of Sunamganj District are partially affected by arsenic contamination in ground water, but Derai and Dharmapasha thanas are fully affected.

Cold: All upazilas of Sunamganj District are partially affected by cold during December-January.

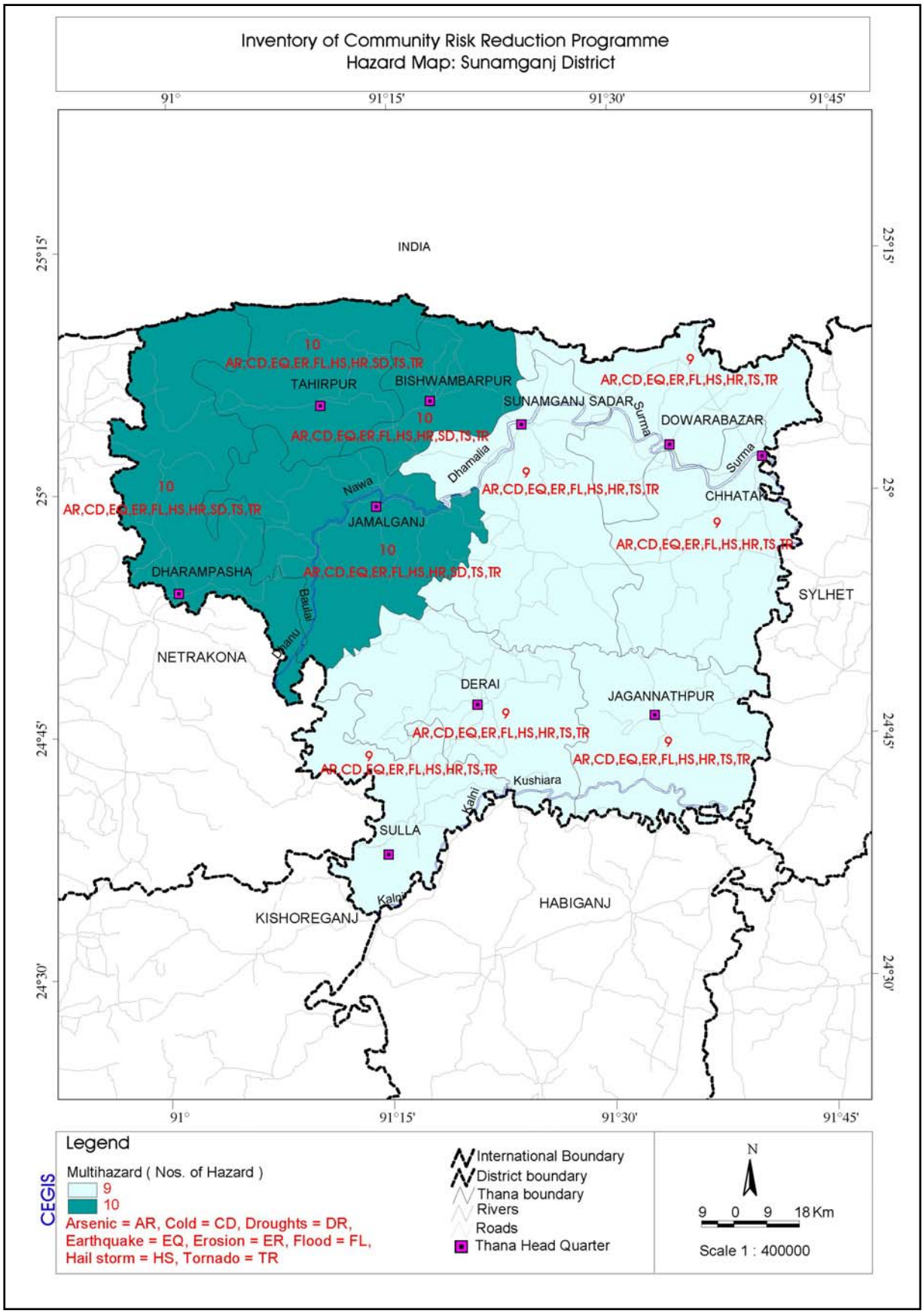


Figure 5.3.7: Hazard map of Sunamganj District

Table 5.3.7.1: Hazard profile of Sunamganj District

Type of Hazards	Effected Thana/ Upazila									
	Bishwambarpur	Chhatak	Derai	Dharmapasha	Dowarabazar	Jagannathpur	Jamalganj	Sulla	Sunamganj Sadar	Tahirpur
Arsenic										
Cold										
Earthquake										
Flood										
Hail storm										
Tornado										
Sedimentation										
Heavy rainfall										
Thunder storm										
Erosion										

Fully Affected *Partially Affected* *Not Affected*

Table 5.3.7.2: Seasons for hazard occurrence in Sunamganj District

Disaster type	Seasonality											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Arsenic												
Cold												
Earthquake	Not depends on season											
Flood												
Hail storm												
Tornado												
Sedimentation												
Heavy rainfall												
Thunder storm												
Erosion												

Severe Effect *Less Effect* *No Occurrence*

Flood: All thanas of Sunamganj District, except Dharmapasha Thana, are fully affected by flash floods, which are mainly caused by heavy rainfall in the nearby northeastern hilly region during April - July (Table 5.3.7.1 and 5.3.7.2). In monsoon, most of the areas in this district go under water by over a meter.

Tornado: All thanas of Sunamganj District are affected by tornadoes that occur in April-May. Tornadoes severely affect Chhatak, Derai, Jamalganj, Sunamganj Sadar and Tahirpur thanas.

Earthquake: Sunamganj District falls under Earthquake Zone – I (High risk zone). The whole district is vulnerable to earthquakes.

Erosion: All thanas are partially affected by riverbank erosion along the Surma – Kushiara river system during monsoon (Table 5.3.7.1 and 5.3.7.2).

Sedimentation: Sedimentation in river channel due to low flow is prominent in Bishwambarpur, Dharmapasha, Tahirpur and Jamalganj thanas. It occurs during March - April (Table 5.3.7.1 and 5.3.7.2).

Hail storm: Hail storms, associated with heavy wind, usually occur in April - May. All thanas of Sunamganj District are affected by hail storms.

Thunder storm: Thunder storms are evident in all thanas of Sunamganj during pre-monsoon (March – April).

Heavy rainfall: Sunamganj District lies in the region of the highest rainfall in Bangladesh. Therefore, all thanas of this district suffer from heavy rainfall, which causes local flooding and crop damage during monsoon.

5.4 Resource Analysis

The resources/assets of a community could be defined as the stock of different types of capital that can be used directly or indirectly to generate livelihoods. These assets are the basis on which community livelihoods are built and the greater and more varied the asset base the higher and more durable the level of social security. Carney (1998) suggests that there are five dominant forms of livelihood assets, which can be arranged in a pentagon (Fig. 5.4.1):

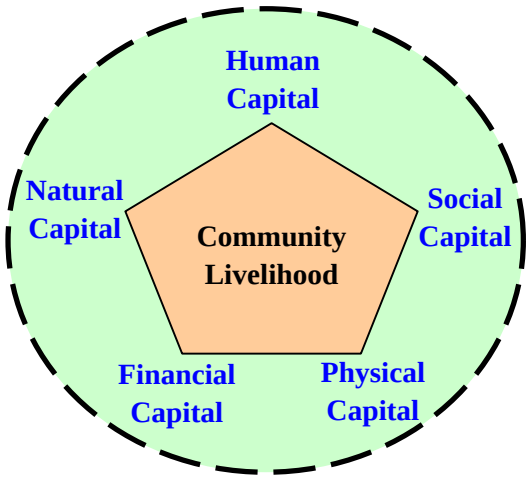


Figure 5.4.1: Livelihood Assets

Natural Capital: The natural capital stock consists of land, water and biological resources such as trees, pasture, and aquatic habitats. The productivity of these resources may be degraded or improved by human management.

Financial capital: Financial capital consists of stocks of money or other savings in liquid form. In this sense it does not includes financial assets only but should also include easily disposable assets such as livestock, which in another sense may be considered as natural capital. It includes income levels, variability over time, and distribution within society of financial savings, access to credit, and debt level.

Physical capital: Physical capital is that created by economic production. It includes infrastructure such as roads, irrigation works, electricity, reticulated equipment and housing.

Human capital: Human capital is constituted by the quantity and quality of labour available. At household level, therefore, it is determined by household size, but also by education, skills, and health of household members.

Social capital: Social capital is any assets such as rights or claims that are derived from membership of a group. This includes the ability to call on friends or kin for help in times of need, support from trade or professional associations (e.g. farmers associations) and political claims on chiefs or politicians to provide assistance.

All these livelihood assets determine the capacity of a community to resist natural hazards. Since all the assets are inter-dependent, balanced development of these assets could lead to sustainable community development.

Considering the assets of community livelihoods, an indicative resource analysis for each thana of Rajshahi District was carried out. The available value of indicators of each asset class was taken from the population census 2001. The criteria and indicators of each asset used in this analysis are given in Table 5.4.1. Thana level financial and social data is not available; therefore, resource analysis is carried out with three capitals.

Table 5.4.1: Criteria and indicators used in the resource analysis of Rajshahi District

Capital Assets	Criteria	Indicators
Natural Capital	Land ownership	% of households having own land
Physical Capital	Communication facility	Road (m/ 100 person)
		Rail (m/ 100 person)
		Navigation route (m/ 100 person)
Human Capital	Young population (15 - 59 years)	% of total population
	Education	Literacy rate (% of total population)
	Access to safe drinking water	% of households using tube-wells
	Sanitation facility	% of households using sanitary latrines

All the indicators are ranked between 0 – 10, where 10 is the highest and 0 is the lowest point. Physical infrastructures- road, rail and navigation routes are estimated as meter per 100 people for each thana. Then these are ranked based on the national average. The national average road per 100 person is about 25 meter (considering the population census 2001 and road length). Similarly, the national average of railway per 100 person is 2 meter and navigation route per 100 person is 4 meter. The national average value is considered as the middle point (i.e. 6) of the ranking class (Table 5.4.2). Other indicators are converted from percent to out of ten. The overall resource ranking for each thana is estimated as given in Table 5.4.3. The sum of all ranked value for each thana is converted from 10.

Table 5.4.2: Ranking of physical infrastructure

Rank	Road (m/ 100 person)	Rail (m/100 person)	Navigation route (m/100 person)
0	0	0	0
1	1 - 5		
2	6 - 10		
3	11 - 15		
4	15 - 19		0 < = 1
5	20 - 24	0 < = 1	2 -3
6	25-29	2 - 3	4 – 5
7	30 -34	4 - 5	6 -7
8	35 - 39	6 - 7	8 – 9
9	40 - 44	8 - 9	10 -11
10	> = 45	> = 10	> = 12

Table 5.4.3: Overall ranking of resources in each thana of Rajshahi District

Thana	Total Population (2001)	Road			Railway			Navigation Route			Young Population (15-59 yr)		Literacy Rate		Main drinking water source (Tube-well)		Use Sanitary Toilet		Own land		Total (Col.5+8+11+13+15+17+19+21)	Overall Rank [(Total * 10)/80]
		Length (m)	Length (m/100 person)	Rank	Length (m)	Length (m/100 person)	Rank	Length (m)	Length (m/100 person)	Rank N	% of Total Population	Rank	%	Rank	% of HH	Rank	% of HH	Rank	% of HH	Rank		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Bagha	167700	30796	18	4	4648	3	6	3839	2	5	58.1	6	42	4	96	10	23	2	57.5	6	43	5
Baghmara	302320	58172	19	4		0	0		0	0	59.8	6	39	4	95	10	16	2	69.9	7	33	4
Boalia	190880	6827	4	1	3349	2	6		0	0	65.9	7	71	7	73	7	87	9	34.3	3	40	5
Charghat	186120	46583	25	6	12980	7	8	14251	8	8	59.5	6	46	5	97	10	29	3	52.6	5	51	6
Durgapur	171560	39487	23	5		0	0		0	0	60.4	6	41	4	96	10	26	3	68.8	7	35	4
Godagari	281640	128638	46	10	38740	14	10	16971	6	7	53.5	5	42	4	92	9	12	1	42.4	4	50	6
Motihar	51400	3843	7	2	3890	8	9		0	0	67.4	7	64	6	89	9	62	6	23.5	2	41	5
Mohanpur	153000	54130	35	8		0	0		0	0	58.9	6	45	5	96	10	25	2	66.7	7	38	5
Paba	262240	75084	29	6	9914	4	7	15342	6	7	58.3	6	44	4	96	10	22	2	49.5	5	47	6
Puthia	188480	55448	29	6	6182	3	6		0	0	59.0	6	45	5	96	10	28	3	58.3	6	42	5
Rajpara	121640	11646	10	2	4591	4	7	2648	2	5	64.2	6	70	7	86	9	77	8	40.2	4	48	6
Shah mokhdum	24100	7199	30	7		0	0		0	0	61.4	6	64	6	89	9	65	6	37.3	4	38	5
Tanore	173260	47077	27	6	1793	1	5		0	0	57.1	6	45	5	95	9	13	1	51.4	5	37	5

The overall ranks of resources are further put into four classes to indicate resource richness. The classes are:

Low	= Overall rank between 0 to 4
Medium	= Overall rank between 5 to 8
High	= Overall rank between 9 to 10

According to the final classification, resource richness of each thana of Rajshahi District is shown in Figure 5.4.2. The figure indicates that all thanas of Rajshahi District have medium resource richness, except Baghmara, Mohanpur and Durgapur, which have low resources due to the non-existence of railway and navigation routes.

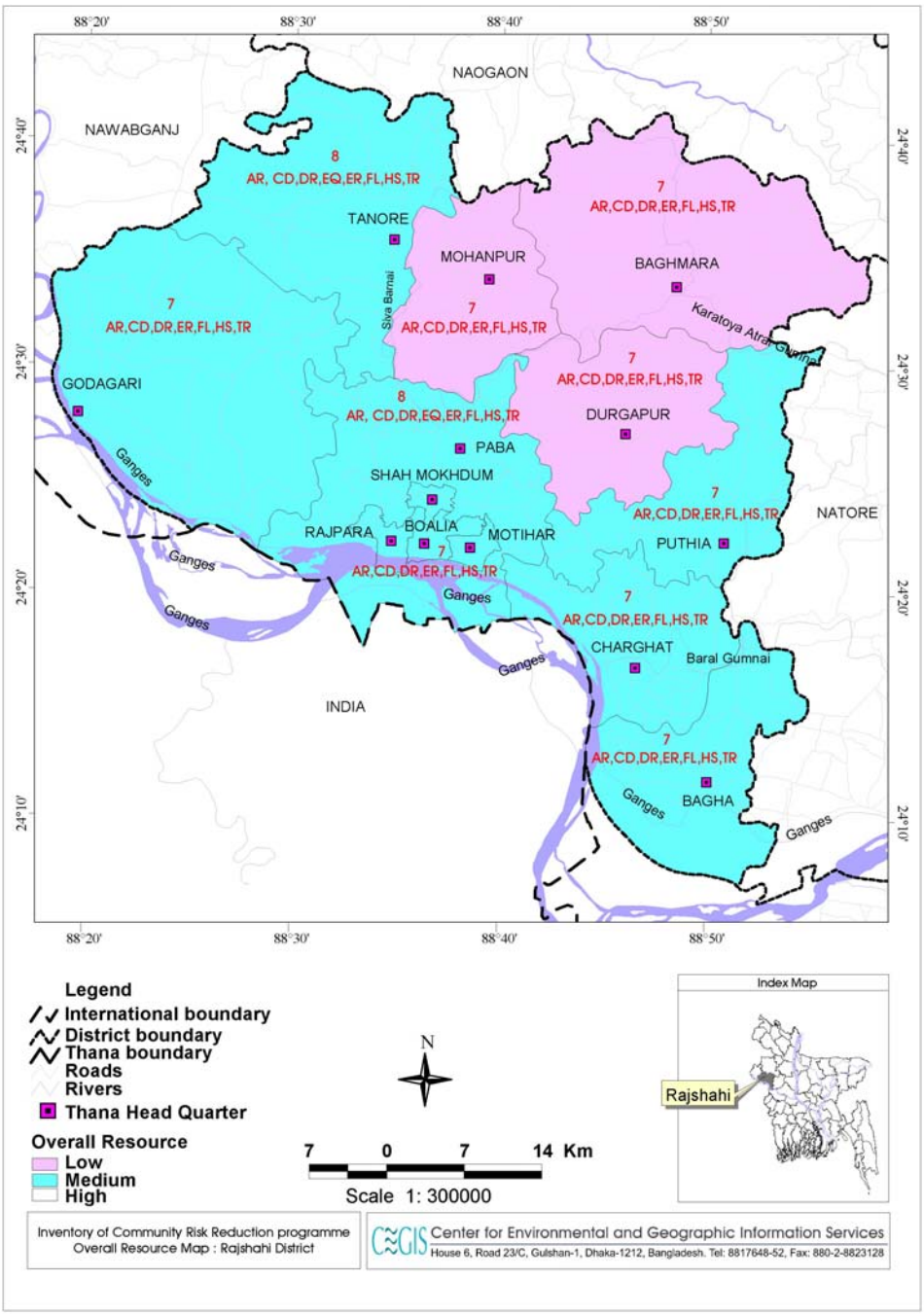


Figure 5.4.2: Resource richness of each thana of Rajshahi District

5.5 Risk Analysis

Risk analysis is done after hazard and resource analysis. The partially affected thanas are given 0.5 point as intensity of hazard, 1.0 point for fully affected thanas and 0 for not affected thanas (Table 5.5.1). The frequency of each is taken as per the national average. Then frequency of hazard is multiplied by intensity to get the hazard rank for each hazard in each thana. All hazard rank points are added to get the multi-hazards points for each thana. This multi-hazard point is used to estimate the risk.

Table 5.5.1: Estimation of multi-hazard point for Rajshahi District

Type of Hazards	Frequency	Multiple hazard point for each thana																			
		Bagha	Hazard Rank (Col. 2 x Col. 3)	Baghmara	Hazard Rank (Col. 2 x Col. 5)	Charghat	Hazard Rank (Col. 2 x Col. 7)	Durgapur	Hazard Rank (Col. 2 x Col. 9)	Godagari	Hazard Rank (Col. 2 x Col. 11)	Mohonpur	Hazard Rank (Col. 2 x Col. 13)	Puthia	Hazard Rank (Col. 2 x Col. 15)	Rajshahi City Corporation	Hazard Rank (Col. 2 x Col. 17)	Tanore	Hazard Rank (Col. 2 x Col. 19)	Paba	Hazard Rank (Col. 2 x Col. 21)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Arsenic	1	0.5	0.5	0.5	0.5	0.5	0.50	0.5	0.50	0.5	0.50	0.5	0.50	0.5	0.50	0.5	0.50	0.5	0.50	0.5	0.50
Cold	0.5	1	0.5	1	0.5	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50	1	0.50
Drought	0.3	0.5	0.2	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17	1	0.33	0.5	0.17
Earthquake	0.02	0	0	0	0	0	0.00	0	0.00	0		0		0.5	0.01	0		0.5	0.01	0.5	0.01
Erosion	0.3	1	0.3	0.5	0.17	1	0.33	0.5	0.17	1	0.33	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17	0.5	0.17
Flood	0.2	1	0.2	1	0.2	1	0.20	0.5	0.10	1	0.20	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10
Tornado	0.05	0.5	0	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03	0.5	0.03
Hail storm	0.2	0.5	0.1	0.5	0.1	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10	0.5	0.10
Total	2.64		1.8		1.7		1.8		1.6		1.8		1.6		1.6		1.6		1.7		1.6

Previously estimated resource rank for each thana was used to estimate the vulnerability. Vulnerability is calculated as 1 divided by resource rank. Then the risk rank is estimated by multiplying vulnerability and hazard rank and expressed in percentage of maximum risk (maximum risk is 2.64, when maximum vulnerability is 1 and maximum multi-hazard point is 2.64) (Table 5.5.2). The risk rank is put into three classes as follows:

High	71- 100%
Medium	31 – 70%
Low	0 – 30%

With this classification, all thanas of Rajshahi District fall under the low risk category as shown in Figure 5.5.1.

Table 5.5.2: Estimation of risk rank for each thana of Rajshahi District

Thana	Resource rank	Vulnerability (1/Resource)	Hazard rank	Risk rank	
				Y = Vulnerability x Hazard	[(Y x 100)/ 2.64)] (in %)
Bagha	5	0.20	1.8	0.36	14
Baghmara	4	0.25	1.7	0.43	16
Boalia	5	0.20	1.6	0.32	12
Charghat	7	0.14	1.8	0.26	10
Durgapur	4	0.25	1.6	0.40	15
Godagari	7	0.14	1.8	0.26	10
Motihar	6	0.17	1.6	0.27	10
Mohanpur	4	0.25	1.6	0.40	15
Paba	6	0.17	1.6	0.27	10
Puthia	5	0.20	1.6	0.32	12
Rajpara	6	0.17	1.6	0.27	10
Shah mokhdum	5	0.20	1.6	0.32	12
Tanore	5	0.20	1.7	0.34	13

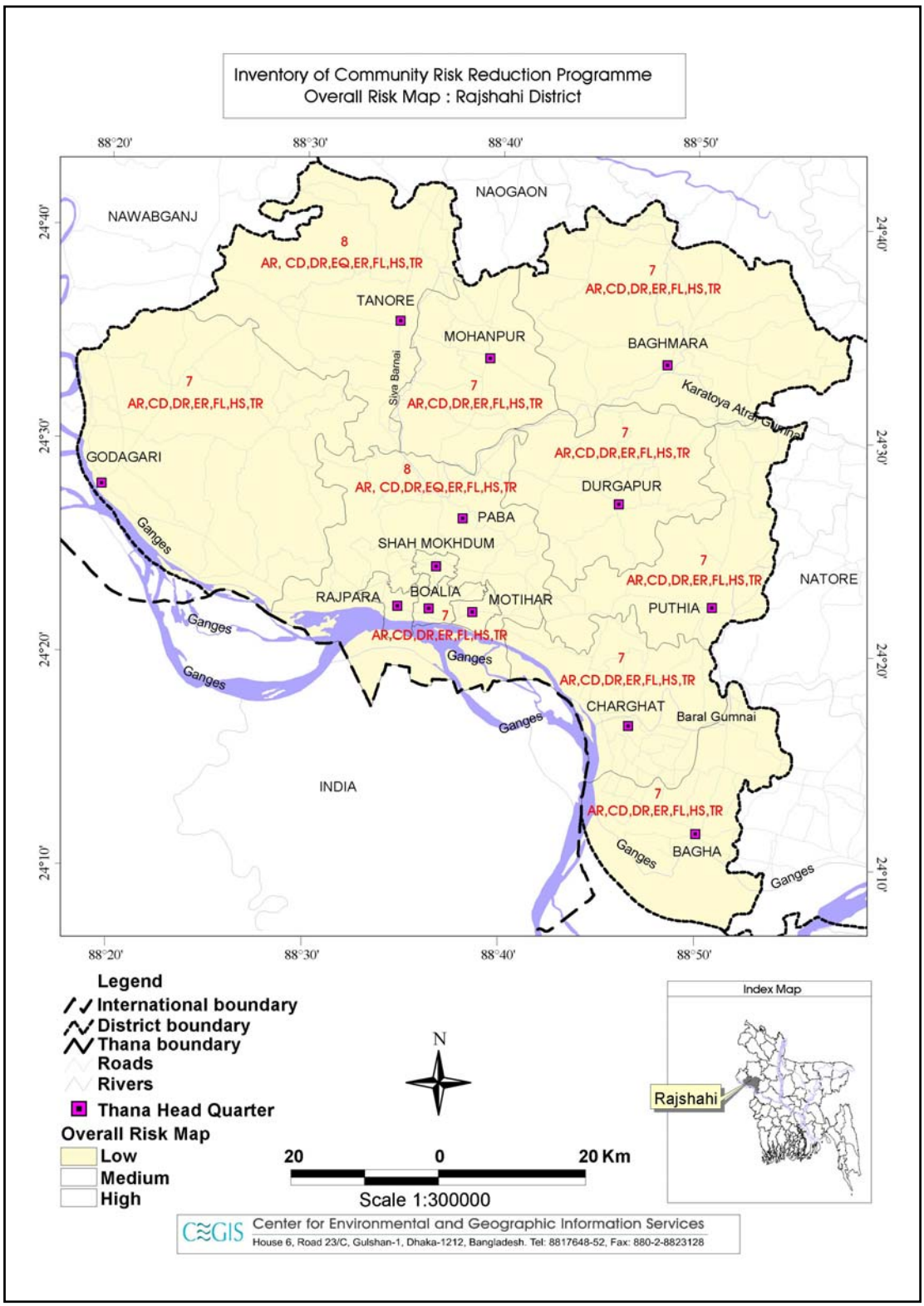


Figure 5.5.1: Risk map of Rajshahi District

Chapter 6

Institutions and Programs Involved in Risk Management

6.1 Introductions:

Bangladesh is striving hard to establish an elaborate and experienced disaster management system from national down to community level to mitigate the effects of disasters. Different organizations at national and local levels are involved in disaster related activities. Since some years, different types of programs for reducing disaster risk and vulnerability have been initiated by different organizations. For sustainable risk reduction for disaster mitigation a well-organized information system is need to be centralized. It has been planned that a Disaster Management Information Cell (DMIC) will be established under the Comprehensive Disaster Management Program (CDMP). The inventory of risk reduction program under this study is the base and pilot initiative to collect data for DMIC. For the DMIC of CDMP the important information or data required are (i) agencies working with disasters, (ii) funding sources or donor agencies, (iii) disaster related programs or activities (iv) local partnerships, (v) working area, (vi) technical professionals and technical capabilities, (vii) problems or bottlenecks in information management and early warning systems, (viii) major beneficiaries from the disaster management or mitigation program, (ix) training related to disaster management, (x) information education and communication materials and (xi) organizational status in terms SWOT (strengths, weaknesses, opportunities, risks and threats) etc.

The above-mentioned information was collected under this study at national and local levels. Detailed lists of agencies working with risk reduction programs have been prepared both for national level and local level organizations (for 7 selected districts) including a brief description given in sections 6.2 and 6.3 respectively. Key contact persons of each organization in national and districts are given in Annex C.

6.2 National Level Organizations

More than 50 national level organizations were visited to collect the risk reduction inventory data. The list of visited national level agencies is given in Table 6.2.1. Out of 52 there are 23 NGOs, 15 government agencies and 14 donor agencies. The detailed list of National level organizations is given in Table A1 of Appendix A.

Table 6.2.1: List of National Level Organizations

Organization Type	No of Organization
GO	15
International NGO	7
National NGO	6
Donor	14
Others	10
Total	**52**

The number of organizations working with disasters is summarized in Table 6.2.2 and in Fig 6.2.1. It appears that out of 52 organizations 90% are operating on flood related activities. Cyclones (63%) and erosion (63%) come next. Some organizations also give priority to droughts (50%), earthquakes (46%), arsenic (46%) and tornadoes (42%). Only 2% of the organizations are active in fire, water and air pollution, soil degradation, pesticide, biological and chemical hazards and hazardous waste related threat. The organizations are less concerned with hazards like water logging (13%), sedimentation (13%) and hail storms (13%). The detailed list of organizations working with hazards is given in Table A1 (Appendix A).

Table 6.2.2: Hazard wise organizational matrix (at national level)

Hazard	No of Org. Working	% of Organization
Flood	47	90%
Cyclone	33	63%
Erosion	33	63%
Droughts	26	50%
Arsenic	24	46%
Earthquake	24	46%
Tornado	22	42%
Tidal surge	21	40%
Cold	15	29%
Salinity	13	25%
Tsunami	11	21%
Hail storm	7	13%
Landslide	7	13%
Sedimentation	7	13%
Water Logging	7	13%
Air Pollution	1	2%
Biological Hazards	1	2%
Chemical management	1	2%
Drinking Water and Health	1	2%
Fire	1	2%
Hazardous wastes (Clinical & others)	1	2%
Monga	1	2%
Pesticides	1	2%
Ship breaking	1	2%
Soil degradation	1	2%
Water Pollution	1	2%

From Fig. 6.2.1 it is also observed that most organizations are active in flood related activities and out of 50 organizations, 47 are working on floods and only 7 have programs on sedimentation or water logging.

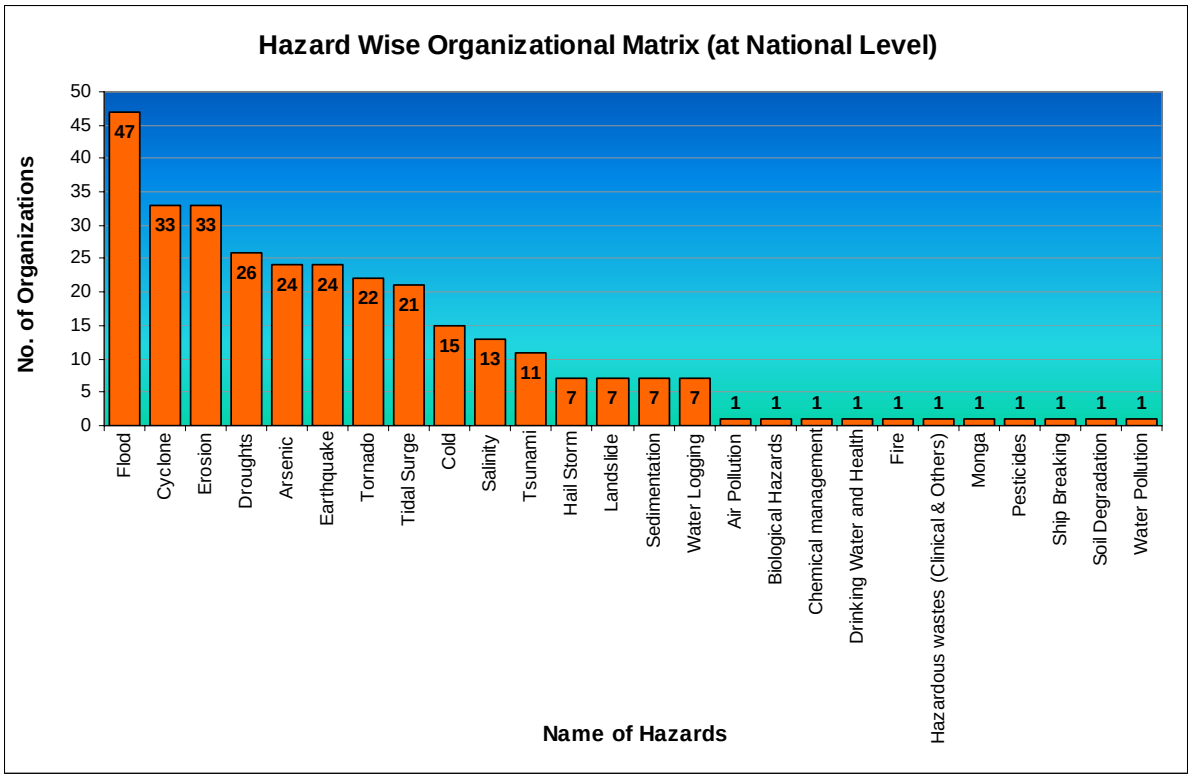


Figure 6.2.1: Number of organizations working on hazards at national level

The different programs or initiatives related to disaster are summarized and presented in Table A2 of Appendix A. The number of programs funded by different donor organizations is presented in Table 6.2.3.

Table 6.2.3: No. of programs funded by different donor agencies at national level

Funding Agency	No. of Program
Asian Development Bank (ADB)	1
Big Lottery Fund (UK)	1
BME, Germany	1
British Red Cross	1
Canadian International Development Agency (CIDA)	1
Care Bangladesh	4
CARITAS-Australia	1
CARITAS-Switzerland	1
Catholic Relief Source (CRS)	2
Christian Aid (CA)	1
Danish International Development Agency (DANIDA)	1
Department For International Development (UK) DFID	2
DFID	1
Dhaka University	1
DIPECHO, European Commission	2
ECHO	1
ETC, Nether land	1
European Commission (EC)	1
Government of Bangladesh	1

Funding Agency	No. of Program
Hongkong Red Cross	1
Interchurch Organization for Development Cooperation (ICCO)-Germany	1
International Committee of the Red Cross (ICRC)	1
International Federation of Red cross and Red Crescent (IFRC)	7
JICA	1
Ministry of food and Disaster Management (MoFDM)	2
Netherlands Government	3
NOVIB	1
Oxfam - GB	1
Oxfam, Netherlands	1
Practical Action	1
Royal Embassy of Netherlands	1
Swiss Development Corporation (SDC)	2
The Dextur Trust	1
Trocaire (Ireland)	1
UNICEF	3
United Kingdom	1
United Nation Development Programme (UNDP)	5
United States Agency for International Development (USAID)	1
UNOPS	1

The risk reduction activities (PPRR) have been analyzed based on available national level data and are presented in Table A3 (Appendix A). The summary of risk reduction activities for different types of organizations is presented in Table 6.2.4 and in Fig 6.2.2 which shows that only 11 organizations are working on prevention, 34 organizations on preparedness, 19 organizations on response and 13 organizations for rehabilitation.

Table 6.2.4: Summary of risk reduction activities (PPRR) at national level

Type of Activity	No of Organization			
	GO	International NGO	National NGO	Others
Prevention	3	2	4	2
Preparedness	12	7	5	10
Response	6	5	6	2
Rehabilitation	5	3	5	

The PPRR analysis results reveal that most of the organizations work on vulnerability reduction programs for preparedness. Detail PPRR activities of each national organization are given in Appendix H and I.

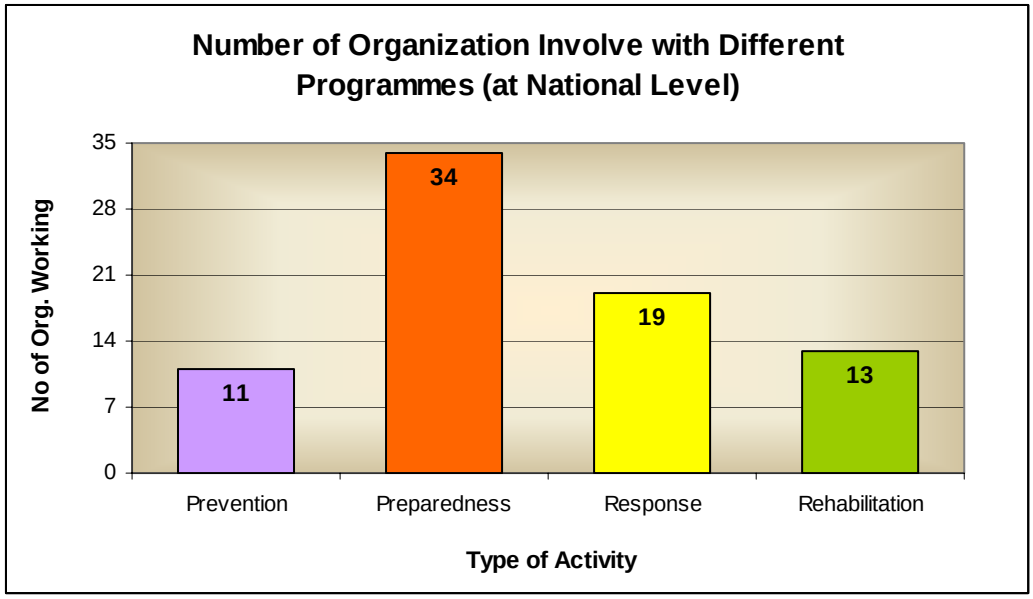


Figure 6.2.2: Number of organizations involved with different programs at national level

6.3 Local Level Organizations:

Seven specific districts were selected for local level survey based on major disasters (like floods, cyclones, cold, droughts, etc.) and disaster-prone areas of Bangladesh in order to produce a thorough inventory of their activities, the area of focus, technical capability, coordination with other organizations, beneficiary groups and the use of IEC materials. A substantial number of organizations were visited based on the list prepared according to literature review and DRRO. Their institutional strength, weaknesses and further opportunities were also collected for a SWOT Analysis. More than 150 organizations working with different disasters at different districts and the district wise name of organizations and their activities are described in Section 6.4 of this chapter. From available and collected data major disasters were identified in seven districts and are presented in Table 6.3.1.

Table 6.3.1: Major Disasters in Seven Districts

District	Major Disasters
Cox's Bazaar	Cyclones, Droughts, Earthquakes, Floods Hail storms, Landslides, Tidal surges, Tornadoes, Tsunami
Faridpur	Arsenic, Erosion, Floods
Lalmonirhat	Cold, Droughts, Floods, Erosion, Tornadoes
Rajshahi	Arsenic, Cold, Droughts, Erosion, Floods, Hail storms, Tornadoes
Satkhira	Arsenic, Cold, Cyclones, Droughts, Floods, Salinity, Water Logging
Sirajganj	Droughts, Erosion, Floods, Hail storms, Tornadoes
Sunamganj	Arsenic, Cold, Earthquakes, Erosion, Floods, Heavy storms, High Rainfall, Thunder storms, Tornadoes

Table 6.3.2: Types of District Level Organizations

Organization Type	No of Organization
GO	25
International NGO	9
National NGO	41
Regional NGO	5
Local NGO	68
Others	3
Total	**151**

The number of organizations in different districts has been calculated and presented in Table 6.3.2. There are 151 organizations working in 7 districts. Out of these 25 are governmental organization, 9 are international NGOs, 41 are national NGOs, 5 regional and 68 local NGOs and 3 organizations are of other types like Public Trusts, Statutory Bodies, etc.

Different types of organization active in these 7 districts are also calculated and presented in Table 6.3.3.

Table 6.3.3: No. of Organizations in Different Districts

Organization Type	No. of Organizations						
	Cox's Bazar	Faridpur	Lalmonirhat	Rajshahi	Satkhira	Sirajganj	Sunamganj
GO	19	8	12	8	8	14	15
International NGO	4	1	1	2	3	4	2
National NGO	11	1	18	5	3	11	4
Regional NGO	1		2		1	1	
Local NGO	1	12	12	8	15	13	7
Others	3	1	2	1	1	1	1
Total	39	23	47	24	31	44	29

The total number of organizations working with different disasters in 7 districts has also been calculated, and summarized in Table 6.3.4 and presented in Fig 6.3.1.

Table 6.3.4: No. of organizations working with disasters in 7 districts

Hazard	No of Org. Working	%
Arsenic	40	26%
Cold	43	28%
Cyclone	50	33%
Draughts	24	16%
Earthquake	15	10%
Erosion	69	46%
Flood	131	87%

Hazard	No of Org. Working	%
Hail storm	8	5%
Heavy Rainfall	1	1%
Landslide	1	1%
Salinity	15	10%
Sedimentation	3	2%
Thunder Storm	5	3%
Tidal surge	21	14%
Tornado	48	32%
Tsunami	11	7.28%
Water Logging	8	5.30%

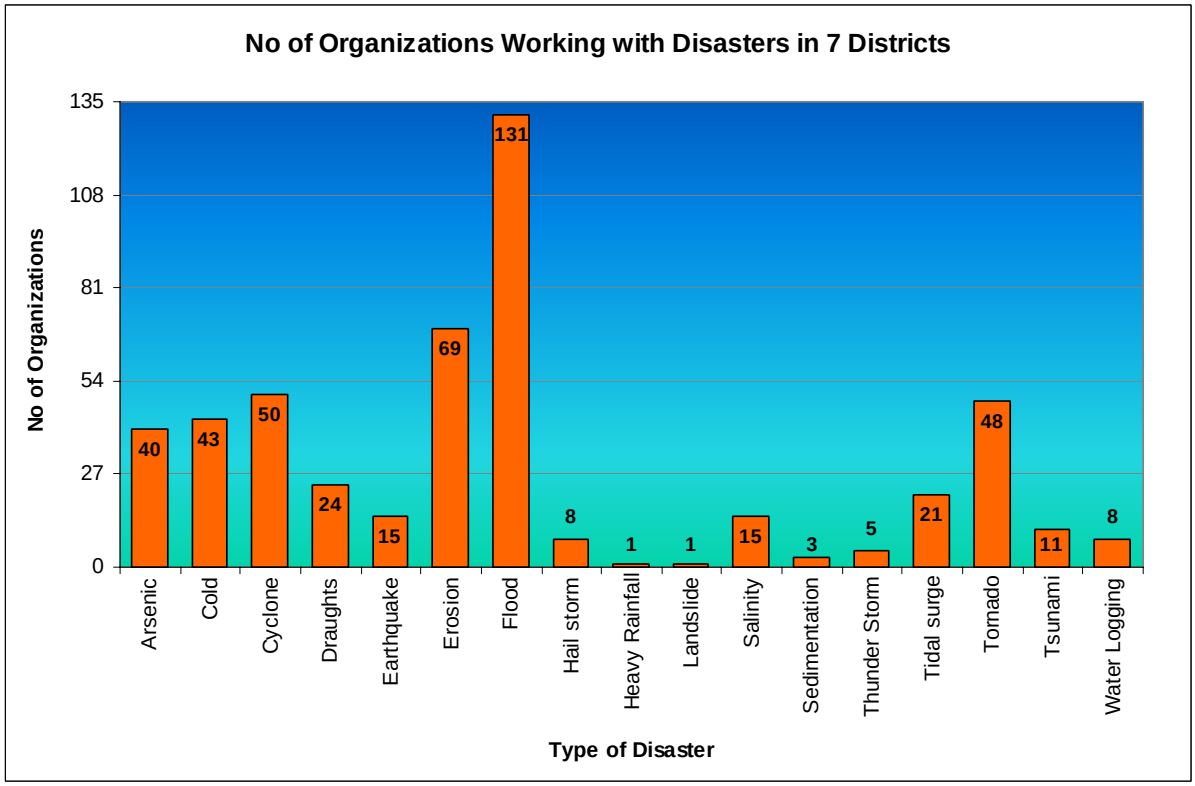


Figure 6.3.1: No. of organizations working with disasters in 7 districts

6.4 Institutions and Programs in Seven Districts:

It has been mentioned earlier that for risk reduction inventory data was collected from seven CDMP pilot districts. The district wise different institutions, programs and related activities have been described in the following sub sections.

6.4.1 Cox's Bazaar

The major disasters of Cox's Bazaar District are cyclones, earthquakes, hail storms, landslide, tidal surges and tsunami. Other disasters like droughts and tornadoes also affect some upazilas. The list of major organizations working with disaster related activities is presented in Table B1 (Appendix B). Table 6.3.3 shows that out of 39, there are 20 non-government and 19 government organizations that are actively involved with disaster related activities.

The disaster wise involvement of organizations in this area was also analyzed and is presented in Figure: 6.4.1.1. Table 6.4.1.1 shows that out of 39 organizations 37 work with cyclones, 22 work with tornado and flood, 15 work with tidal surges, 11 work with earthquakes, 10 work with tsunami and a very few organizations work with arsenic and droughts.

Table 6.4.1.1: Hazard-wise agency matrix of Cox's Bazaar District

Hazard	No of Org. Working	%
Cyclone	37	95%
Flood	22	56%
Tornado	22	56%
Tidal surge	15	38%
Earthquake	11	28%
Tsunami	11	28%
Draughts	3	8%
Arsenic	1	3%
Hail storm	1	3%
Landslide	1	3%

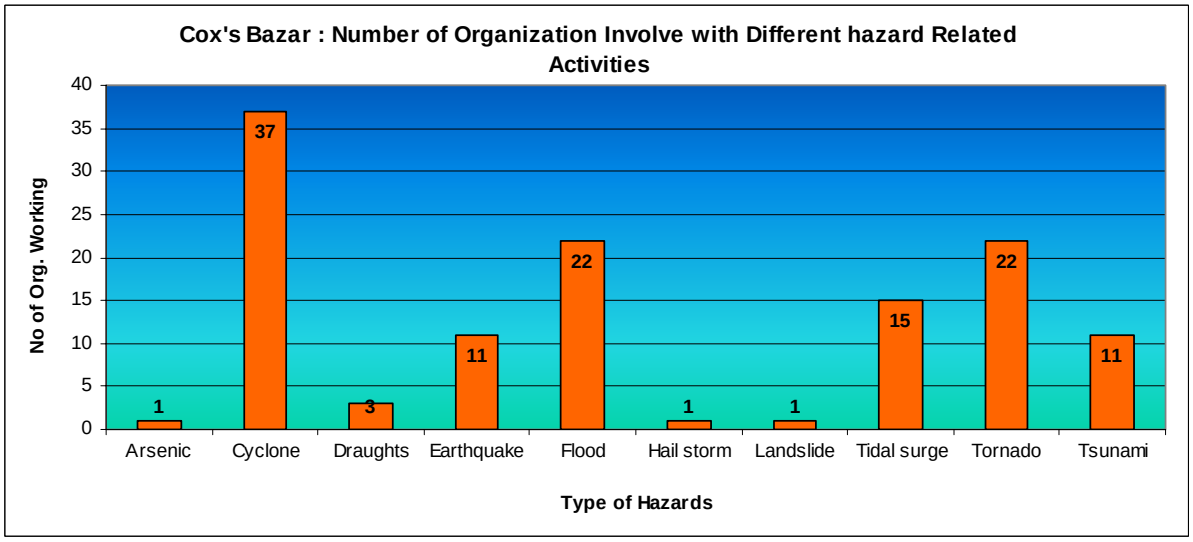


Figure 6.4.1.1: Number of organizations involved with different hazard related activities in Cox's Bazaar District

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. The organization wise programs or projects of Cox's Bazaar District are presented in detail in Table B2 of Appendix-B. The number of programs funded by different donor agencies is given in Table 6.4.1.2.

Table 6.4.1.2: No. of programs funded by different donor agencies in Cox's Bazaar

Funding Agency	No of Programme
BDRCS	1
Canadian International Development Agency (CIDA)	1
Care Bangladesh	1
Department For International Development (UK) DFID	1
GoB	2
Hope Hiroshima Japan	2
JICA	1
Kinésithérapeutes du Monde (KDM)	1
NATZ Garmany	1
NGO Forum	1
Polli Karma Sahayak Foundation (PKSF)	1
Personal Donation	1
Royal Embassy of Netherlands	1
Tehama Foundation Hiroshima Japan	1
United States Agency for International Development (USAID)	1
World Bank	1
World Vision –Australia	1

Risk reduction activities (PPRR) were also analyzed based on available local level data and are presented in Figure 6.4.1.2. Table 6.4.1.3 shows that only 2 organizations work with prevention, 32 work with preparedness, 21 work with response and relief and 11 organizations work with rehabilitation. The PPRR activities of each organization of Cox's Bazar district are given in Table B3 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.1.3: Summary of risk reduction activities (PPRR) of Cox's Bazaar District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	2					
Preparedness	16	3	8	1	1	3
Response	13	1	6	1		1
Rehabilitation	10	1				

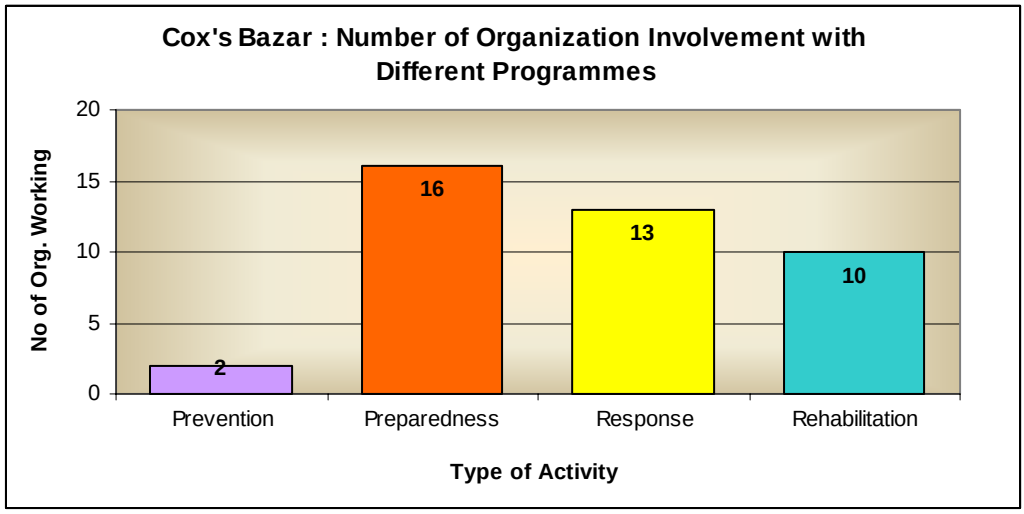


Figure 6.4.1.2: Number of organizations involved with different programs in Cox's Bazaar District

*6.4.2 **Faridpur***

The major disasters of Faridpur District are floods, erosion, and arsenic. Other disasters like droughts, cyclones, tornadoes and water logging also affect some upazilas. Table 6.3.3 shows that out of 23, there are 15 non-government and 8 government organizations that are actively involved with disaster related activities. Disaster wise involvement of organizations in this area has also been analyzed and presented in Figure 6.4.2.1. Table 6.4.2.1 shows that 21 organizations work with floods, 19 work with erosion, 13 work with arsenic and very few organizations work with cyclones and droughts. A detailed hazard wise organizational matrix is also presented in Table B4 of Appendix-B.

Table 6.4.2.1: Hazard-wise agency matrix of Faridpur District

Hazard	No of Org. Working	%
Flood	22	96%
Erosion	20	87%
Arsenic	14	61%
Tornado	4	17%
Draughts	3	13%
Water Logging	1	4%

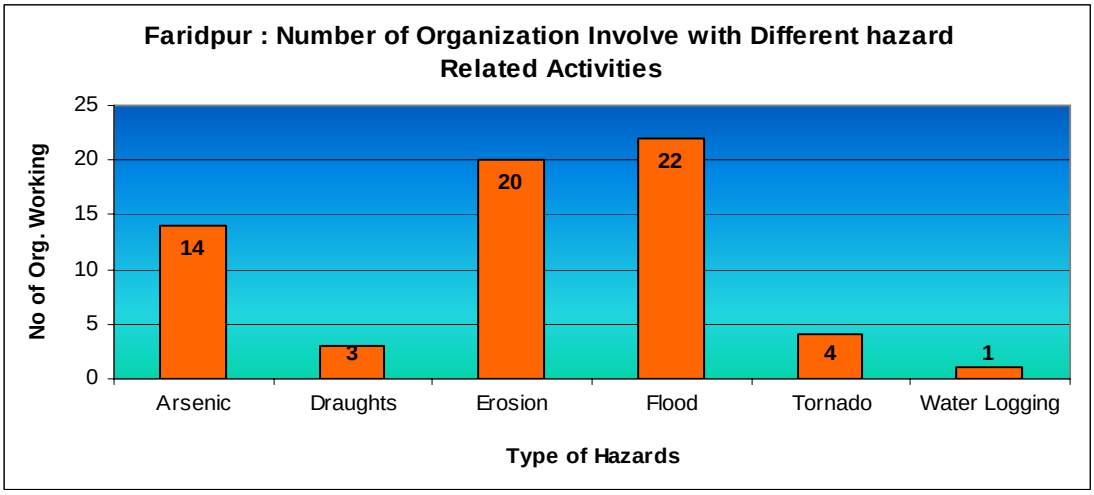


Figure 6.4.2.1: Number of organizations involved with different hazard related activities in Faridpur District

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. Organization wise programs or projects of Faridpur District are presented in Table B5 of Appendix-B. The number of programs funded by different organizations is presented in Table 6.2.2.2.

Table 6.4.2.2: No. of programs funded by different donor agencies in Faridpur District

Funding Agency	No. of Programs
Action Aid Bangladesh	2
ARD - Bangladesh (USAID)	1
Bangladesh Agricultural Development Corporation (BADC)	1
BRAC	1
Canadian International Development Agency (CIDA)	1
Concern Bangladesh	2
Department For International Development (UK) DFID	1
European Commission (EC)	2
GOB	4
International Fund for Agricultural Development (IFAD)	1
Islamic Relief	6
Mennonite Central Committee (MCC).	1
MoEF (Ministry of Environment and Forest)	1
NGO Forum	6
Oxfam Bangladesh	2
Personal Donation	18
Practical Action	1
Proshika	1
Samata	2
United Nation Development Programme (UNDP)	1
World Fish Center	1
World Food Programme (W F P)	2
World Vision Bangladesh	1

The risk reduction activities (PPRR) have also been analyzed based on available local level data and presented in Figure 6.4.2.2. Table 6.4.2.3 shows that 10 organizations work with prevention, 19 work with preparedness, 17 work with response and relief and 19 work with rehabilitation. The PPRR activities of each organization of Faridpur district are given in Table B6 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.2.3: Summary of Risk Reduction Activities (PPRR) in Faridpur District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	4	1			5	
Preparedness	5	1			12	1
Response	3	1	1		11	1
Rehabilitation	7	1	1		10	

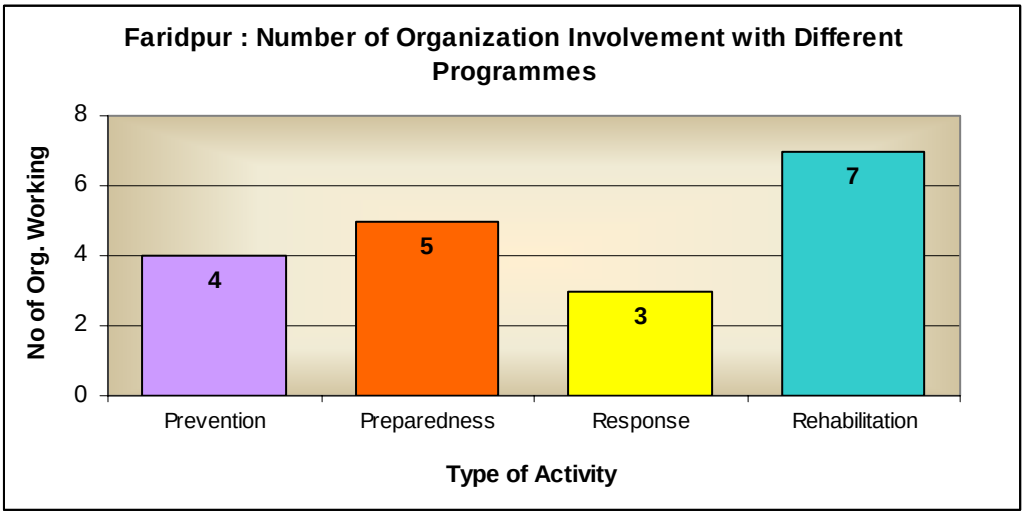


Figure 6.4.2.2: Number of organizations involved with different programs in Faridpur District

6.4.3 Lalmonirhat

The major disasters of Lalmonirhat district are floods, earthquakes, erosion, landslide, cold, droughts and tornadoes. Other disasters like arsenic water logging and sedimentation also affect some upazilas. The no of organizations working with disaster related activities is presented in Table 6.3.3. The table shows that out of 47, there are 35 non-government and 12 government organizations that are actively involved with disaster related activities. The detailed list of organizations and their working area is presented in Table B7 (Appendix B)

Disaster wise involvement of organizations in this area has also been analyzed and presented in Figure 6.4.3.1. Table 6.4.3.1 shows that 47 organizations work with floods, 38 work with erosion, 28 work with cold, 13 work with tornadoes and 7 work with droughts.

Table 6.4.3.1: Hazard wise agency matrix of Lalmonirhat District

Hazard	No of Org. Working	%
Flood	47	100%
Erosion	39	83%
Cold	28	60%

Hazard	No of Org. Working	%
Tornado	15	32%
Draughts	7	15%
Arsenic	2	4%
Earthquake	1	2%
Sedimentation	1	2%
Water Logging	1	2%

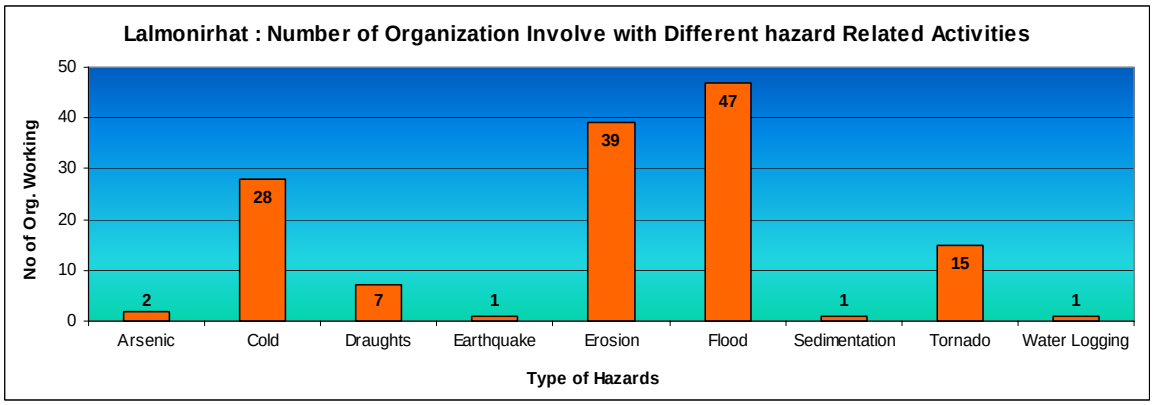


Figure 6.4.3.1: Number of organizations involved with different hazard related activities in Lalmonirhat District.

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. Organization wise programs or projects of Lalmonirhat District are presented in Table B8 (Appendix-B). The number of programs funded by different organizations is presented in Table 6.4.3.2.

Table 6.4.3.2: No. of programs funded by different agencies in Lalmonirhat District

Funding Agency	No. of Programs
Asian Development Bank (ADB)	2
AZEECON	1
BAPTIST CHURCH UK	1
BRAC	2
Canadian International Development Agency (CIDA)	1
CARITAS	1
Concern Bangladesh	2
European Commission (EC)	7
GOB	8
Help Age International (USA)	1
Inter-Cooperation	1
International Federation of Red cross and Red Crescent (IFRC)	1
Koinonia-TR Australia	1
Lutheran World Federation (LWF)	4
Ministries of Indiana	1
OXFAM- HK	1
Polli Karma Sahayak Foundation (PKSF)	3

Funding Agency	No. of Programs
Personal Donation	2
PLAN Bangladesh	4
UNICEF	1
United States Agency for International Development (USAID)	1
Water Aid	1
World Bank	1
World Food Programme (WFP)	5

The risk reduction activities (PPRR) have also been analyzed based on available local level data and presented in Figure 6.4.3.2. Table 6.4.3.3 shows that only 4 organizations work with prevention, 41 work with preparedness, 39 work with response and relief and 26 work with rehabilitation. The PPRR activities of each organization of this district are given in Table B9 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.3.3: Summary of Risk Reduction Activities (PPRR) in Lalmonirhat

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	3		1			
Preparedness	9	1	16	2	11	2
Response	11		15		11	1
Rehabilitation	8		11	1	6	

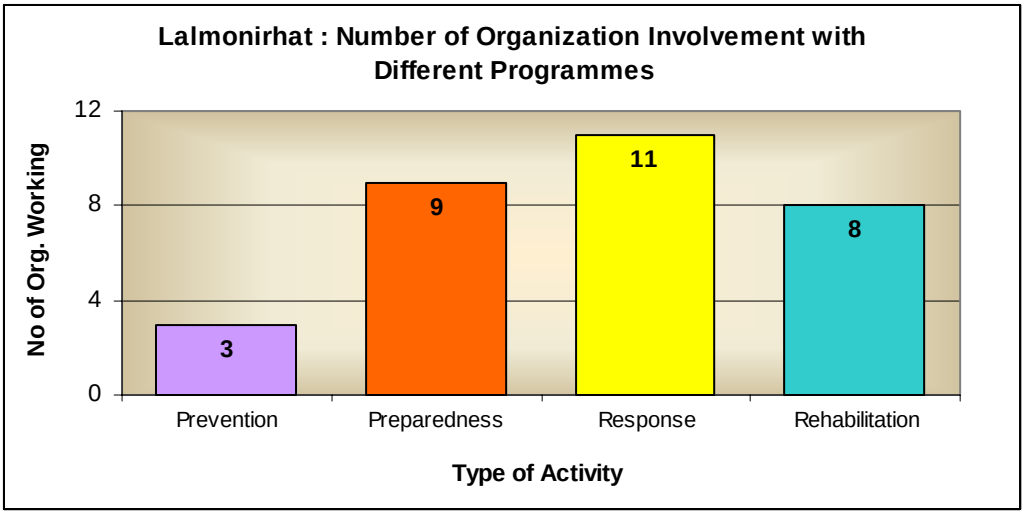


Figure 6.4.3.2: Number of organizations involved with different programs in Lalmonirhat District

*6.4.4 **Rajshahi***

The major disasters of Rajshahi District are floods, droughts, erosion, cold, and arsenic. Other disasters like earthquakes and tornadoes also affect some upazilas. The no of organizations working with disaster related activities is presented in Table 6.3.3. The table shows that out of 24, there are 16 non-government and 8 government organizations that are actively involved with disaster related

activities. The detailed list of organizations and hazard wise organizational matrix is presented in Table B10 of Appendix-B.

Disaster wise involvement of organizations in this area has also been analyzed and presented in Figure-6.4.4.1. Table 6.4.4.1 shows that 10 organizations work with arsenic, 19 work with flood, 14 work with droughts, 9 work with cold, 7 are involved with erosion related work and very few organizations work with earthquakes.

Table 6.4.4.1: Hazard wise agency matrix of Rajshahi District

Hazard	No. of Org. Working	%
Flood	19	79%
Draughts	14	58%
Arsenic	10	42%
Cold	10	42%
Erosion	7	29%
Tornado	7	29%
Earthquake	1	4%
Hail storm	1	4%

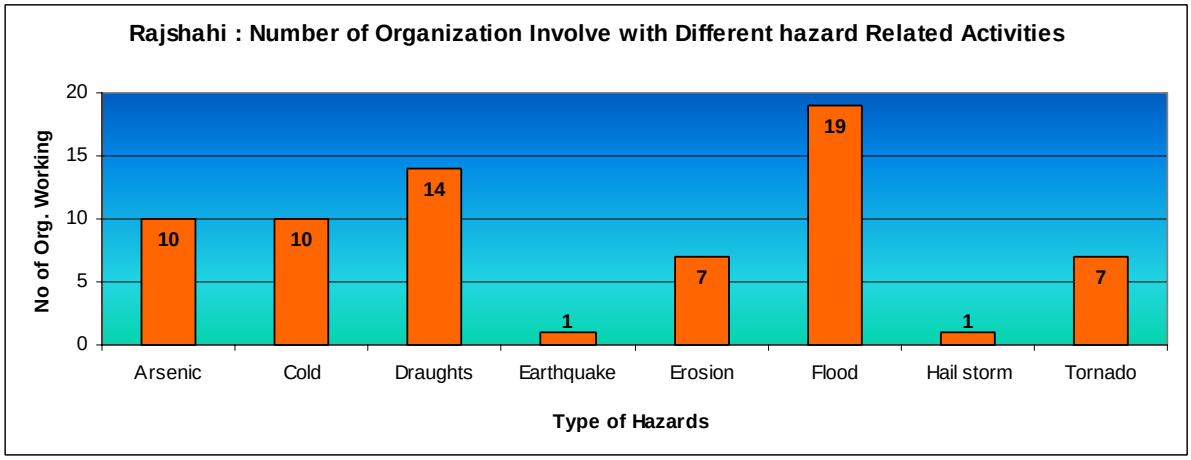


Figure 6.4.4.1: Number of organizations involved with different hazard related activities in Rajshahi District.

During local level data inventory, different disaster related programs or projects carried out by different organization were collected and processed. Organization wise programs or projects of Rajshahi District are presented in Table B11 (Appendix – B). The number of programs funded by different donor agencies is presented in Table 6.4.4.2

Table 6.4.4.2: Number of programs funded by different donor agencies in Rajshahi District

Funding Agency	No. of Programs
Bangladesh Bank	1
Bangladesh Freedom Foundation (BFF)	1
BRAC	1
CARITAS-Australia	1

Funding Agency	No. of Programs
CARITAS-Switzerland	1
Concern Bangladesh	1
Department For International Development (UK) DFID	2
Development Association for Self-Reliance Communication and Health (DASCOH)	2
European Commission (EC)	1
Misereor - Germany	1
NGO Forum	1
Swiss Development Corporation (SDC)	1
Trocaire (Ireland)	1
UNICEF	1
United Nation Development Programme (UNDP)	1
World Food Programme (WFP)	2

The risk reduction activities (PPRR) have also been analyzed based on available local level data and presented in Figure 6.4.4.2. Table 6.4.4.3 shows that 12 organizations work with prevention, 17 work with preparedness, 18 work with response and relief and 18 organizations work with rehabilitation. The PPRR activities of each organization of this district are given in Table B12 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.4.3: Summary of Risk Reduction Activities (PPRR) in Rajshahi District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	6	1	2		3	
Preparedness	4	2	4		6	1
Response	7	1	2		7	1
Rehabilitation	8	1	3		6	

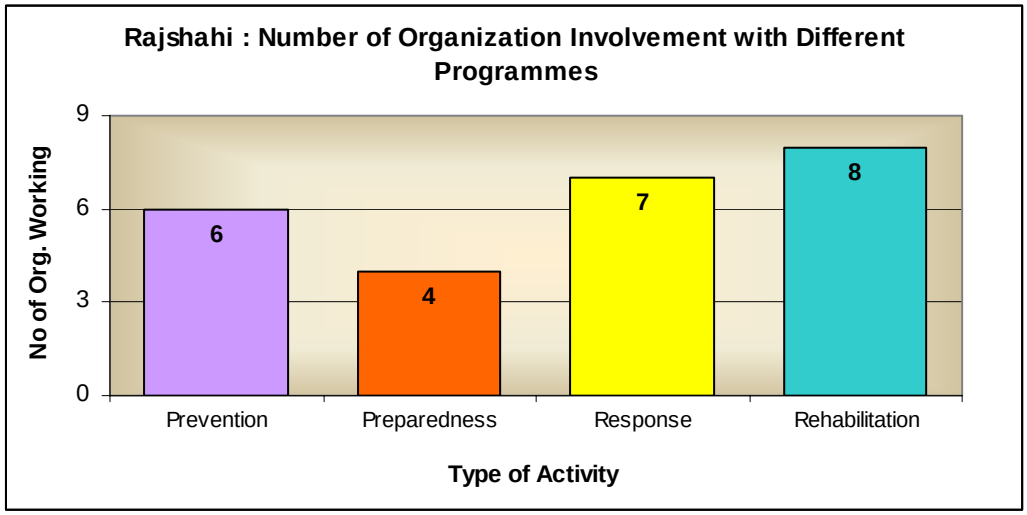


Figure 6.4.4.2: Number of organizations involved with different programs in Rajshahi District.

*6.4.5 **Satkhira***

The major disasters of Satkhira District are floods, tidal surges, cyclones, erosion, salinity, and tornadoes. Other disasters like droughts and water logging also affect some upazilas. The no of organizations working with disaster related activities is presented in Table 6.3.3. The table shows that out of 31, there are 23 non-government and 8 government organizations that are actively involved with disaster related activities. The detailed list of organizations and hazard wise organizational matrix is presented in Table B13 of Appendix-B.

Figure 6.4.5.1 and Table 6.4.5.1 show that 30 organizations work with floods, 15 work with salinity and arsenic, 17 work with cyclones, 7 work with tidal surges, and a few organizations work with cold, droughts, water logging and erosion

Table 6.4.5.1: Hazard wise agency matrix of Satkhira District

Hazard	No of Org. Working	%
Flood	30	97%
Cyclone	17	55%
Arsenic	15	48%
Salinity	15	48%
Tidal surge	7	23%
Water Logging	6	19%
Cold	4	13%
Erosion	4	13%
Draughts	3	10%
Thunder Storm	2	6%
Tornado	2	6%

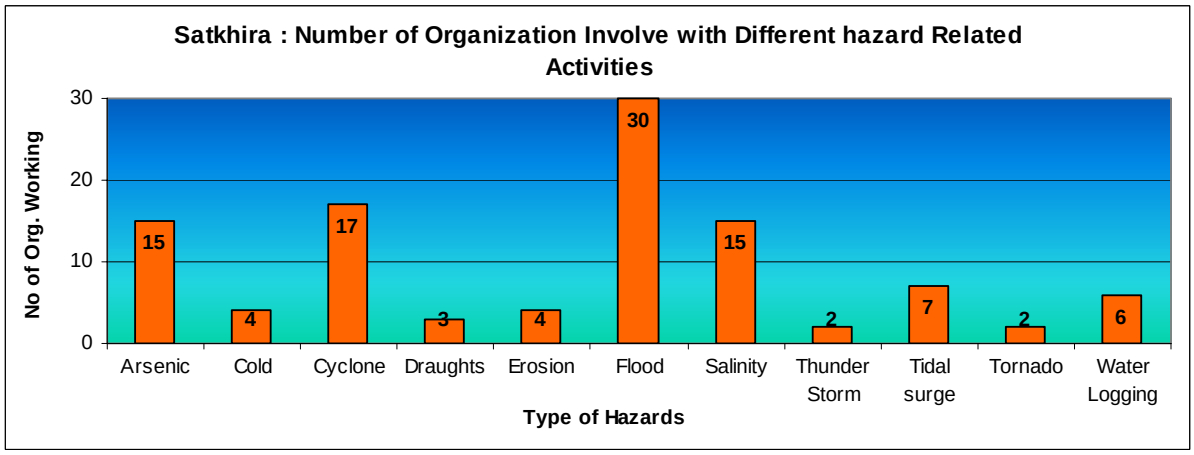


Figure 6.4.5.1: Number of organizations involved with different hazard related activities in Satkhira District

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. The organization wise programs or projects of Satkhira District are presented in Appendix B (Table B14). The number of programs funded by different donor agencies is presented in Table 6.4.5.2.

Table 6.4.5.2: No. of programs funded by different donor agencies in Satkhira District

Funding Agency	No. of Programs
Action Aid Bangladesh	2
BRAC	1
Care Bangladesh	4
CDMP	1
COFRD-England	1
Concern Bangladesh	3
Cordaid The Netherlands	1
Dhaka Ahsania Mission	1
GOB	1
Islamic Relief	3
Mesereor-Germany	1
Misereor - Germany	2
NGO Forum	10
Oxfam - GB	6
Rishilpi Development Project - Italy	2
Royal Embassy of Netherlands	1
SPACE	1
Stromme Memorial Foundation	1
Swiss Agency for Development Cooperation	1
Trocaire (Ireland)	1
UNICEF	1
World Food Programme (WFP)	2
World Vision –Australia	1
World Vision- UK	1

The risk reduction activities (PPRR) have also been analyzed based on available local level data and presented in Figure: 6.4.5.2. Table 6.4.5.3 shows that 13 organizations work with prevention, 23 work with preparedness, 26 work with response and relief and 28 organizations work with rehabilitation. The PPRR activities of each organization of this district are given in Table B15 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.5.3: Summary of Risk Reduction Activities (PPRR) in Satkhira District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	2	3	1	1	6	
Preparedness	7	3	3	1	9	
Response	4	3	3	1	15	1
Rehabilitation	8	3	3	1	13	1

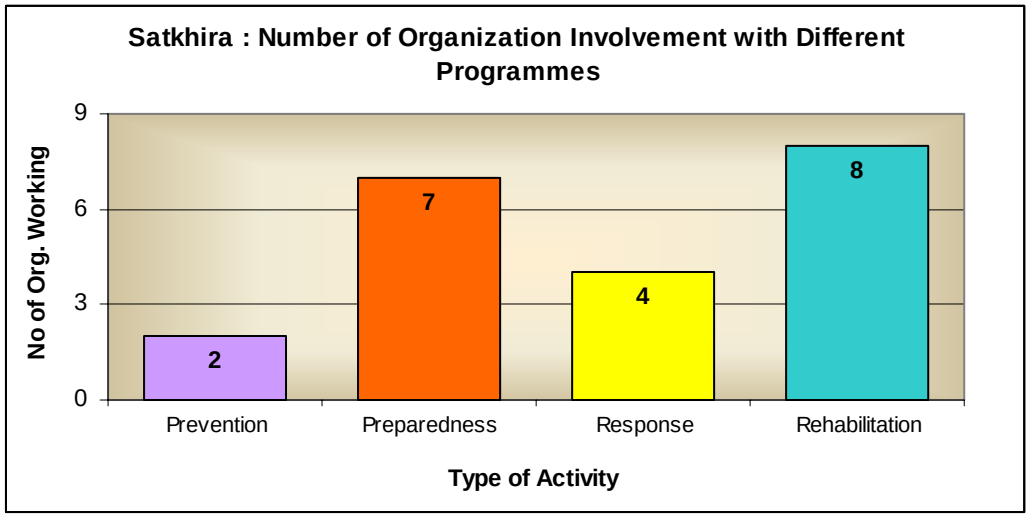


Figure 6.4.5.2: Number of organizations involved with different programs in Satkhira District

*6.4.6 **Sirajganj***

The major disasters of Sirajganj District are floods, erosion, tornadoes and arsenic. Droughts cold, tornadoes and hail storms also affect some upazilas. The total no of organizations working with disaster related activities is presented in Table 6.3.3. The table shows that out of 44, there are 30 non-government and 14 government organizations that are actively involved with disaster related activities. The detailed list of organizations and hazard wise organizational matrix of Sirajganj District is presented in Table B16 of Appendix-B.

Disaster wise involvement of organizations in this area has also been analyzed and presented in Figure-6.4.6.1. Table-6.4.6.1 shows that 42 organizations work with floods, 23 work with erosion, 8 work with tornadoes, and a very few organizations work with arsenic, cold, hail storms, landslides and droughts.

Table 6.4.6.1: Hazard wise agency matrix of Sirajganj District

Hazard	No of Org. Working	%
Flood	43	98%
Erosion	23	52%
Tornado	7	16%
Draughts	4	9%
Arsenic	3	7%
Cold	3	7%
Hail storm	2	5%
Cyclone	1	2%
Thunder Storm	1	2%

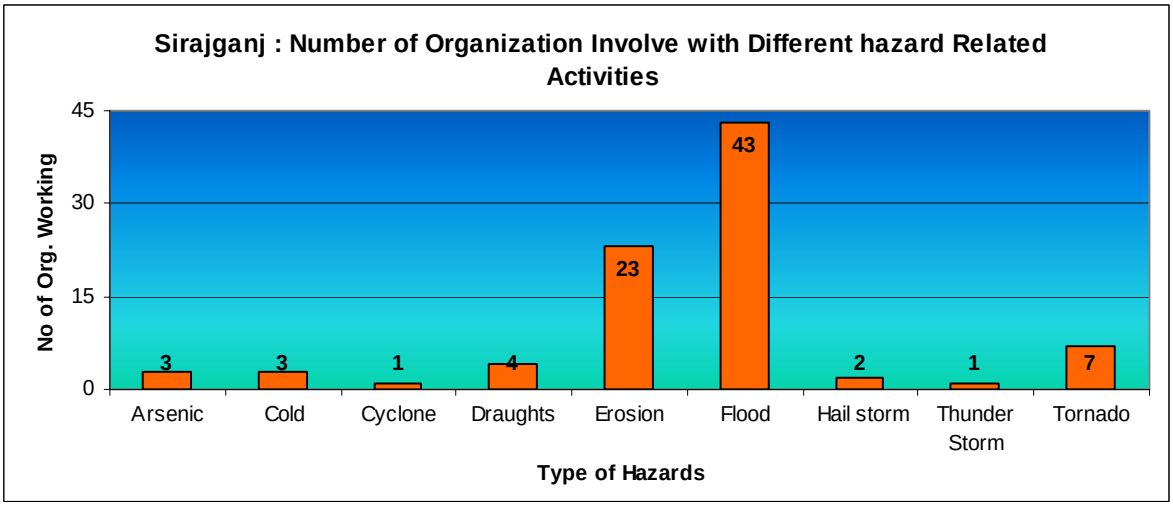


Figure 6.4.6.1: Number of organizations involved with different hazard related activities in Sirajganj District

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. Organization wise programs or projects of Sirajganj District are presented in Table B17 (Appendix – B). The number of programs funded by different donor agencies is presented in Table 6.4.6.2.

Table 6.4.6.2: Number of programs funded by different donor agencies in Sirajganj District

Funding Agency	No. of Programs
Action Aid Bangladesh	2
Asian Partnership for Human Development APHD (UNDP)	1
Bangladesh Agricultural Development Corporation (BADC)	1
BRAC	4
British Red Cross	1
Canadian International Development Agency (CIDA)	1
Care Bangladesh	2
CARITAS	1
CDMP	1
Christian Commission Development in Bangladesh (CCDB)	2
Concern Bangladesh	1
Department For International Development (UK) DFID	3
DFID	1
Dutch Bangla Trading.	1
Echo and Handicap- International	1
Helen Keller International	1
Hong Kong Red Cross	1
Hope Hiroshima Japan	1
Islamic Relief	1
Islamic Relief (UK)	1
Kindermissionswerk (PMK) Germany	1
Koinonia-TR Australia	1
Mennonite Central Committee (MCC).	5

Funding Agency	No. of Programs
NGO Forum	3
Oxfam - GB	1
Polli Karma Sahayak Foundation (PKSF)	1
Personal Donation	6
Practical Action	1
Proshika	1
Shanti	2
UNDP	1
UNICEF	5
United Nation Development Programme (UNDP)	3
UNOPS	1
World Food Programme (WFP)	2
World Vision Bangladesh	1

The risk reduction activities (PPRR) have also been based on analyzed based on available local level data and presented in Figure 6.4.6.2. Table 6.4.6.3 shows that 8 organizations work with prevention, 35 work with preparedness, 35 work with response and relief and 29 work with rehabilitation. The PPRR activities of each organization of this district are given in Table B18 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.6.3: Summary of Risk Reduction Activities (PPRR) in Sirajganj District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	4		2		2	
Preparedness	10	4	7	1	12	1
Response	13	2	9		10	1
Rehabilitation	11	1	6	1	10	

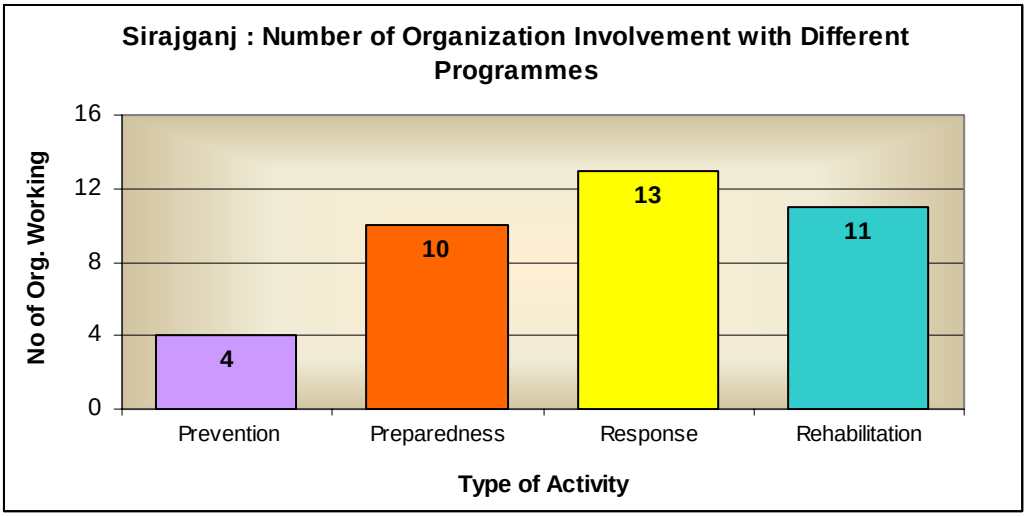


Figure 6.4.6.2: Number of organizations involved with different programs in Sirajganj District.

*6.4.7 **Sunamganj***

The major disasters of Sunamganj District are flash floods, earthquakes, sedimentation, tornadoes, erosion and haor waves. Other disasters like cold and arsenic also affect some upazilas. Table 6.3.3 shows that out of 29, there are 14 non-government and 15 government organizations that are actively involved with disaster related activities. The list of major organization working with disasters and hazard wise organizational matrix of Sunamganj District is presented in Table B19 (Appendix – B).

Disaster wise involvement of organizations in this area has also been analyzed and presented in Figure 6.4.7.1. Table 6.4.7.1 shows that 28 organizations work with floods, 5 work with erosion, 4 work with earthquakes and 7 work with hail storms and a very few work with sedimentation, cold or arsenic.

Table 6.4.7.1: Hazard wise agency matrix of Sunamganj District

Hazard	No of Org. Working	%
Flood	28	97%
Tornado	15	52%
Hail storm	7	24%
Erosion	5	17%
Earthquake	4	14%
Arsenic	3	10%
Cold	3	10%
Sedimentation	2	7%
Thunder storm	2	7%
Heavy Rainfall	1	3%

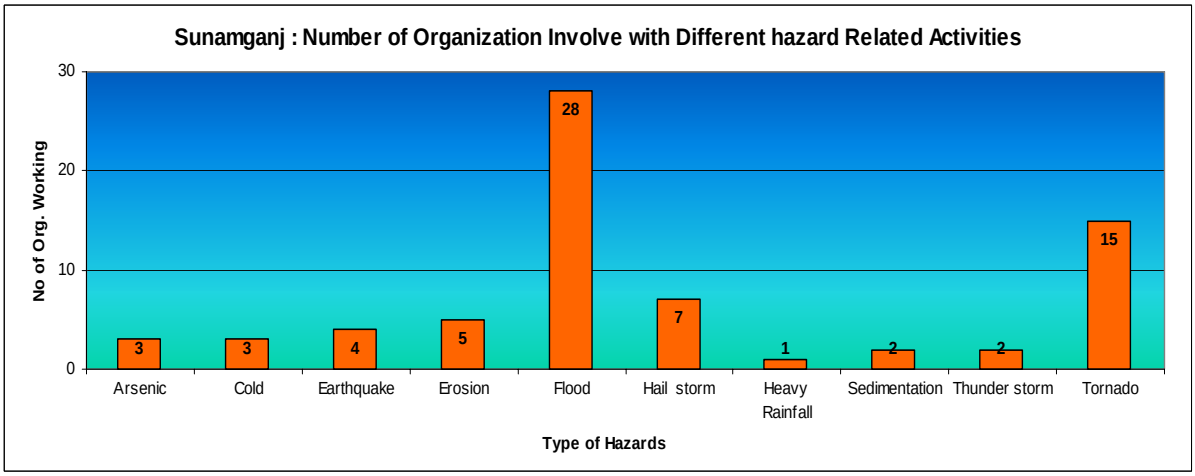


Figure 6.4.7.1: Number of organizations involved with different hazard related activities in Sunamganj District

During local level data inventory, different disaster related programs or projects carried out by different organizations were collected and processed. Organization wise programs or projects of Sunamganj District are presented in Table B20 of Appendix-B. The number of programs funded by different donor agencies at Sunamganj District is presented in Table 6.4.7.2.

Table 6.4.7.2: No. of programs funded by different donor agencies at Sunamganj

Funding Agency	No. of Programs
Action Aid Bangladesh	1
BRAC	2
Care Bangladesh	3
Christian Aid (CA)	1
Concern Bangladesh	1
Cordaid The Netherlands	1
Department For International Development (UK) DFID	1
DIPECHO, European Commission	1
GOB	1
International Federation of Red cross and Red Crescent (IFRC)	1
Islamic Relief	2
IUCN Netherlands (The World Conservation Union)	1
NORMISJON (Norway)	1
NOVIB Denmark	1
Oxfam - GB	3
Swiss Development Corporation (SDC)	3
UNICEF	2
United Nation Development Programme (UNDP)	2
United States Agency for International Development (USAID)	1
World Food Programme (WFP)	1

The risk reduction activities (PPRR) have also been analyzed based on available local level data and presented in Figure 6.4.7.2. Table 6.4.7.3 shows that 14 organizations work with prevention, 18 work with preparedness, 22 work with response and relief and 27 work with rehabilitation. The PPRR activities of each organization of this district are given in Table B21 of Appendix B. A detailed description of the PPRR activities of this district is presented in Appendix H and I.

Table 6.4.7.3: Summary of Risk Reduction Activities (PPRR) of Sunamganj District

Type of Activity	No of Organization					
	GO	International NGO	National NGO	Regional NGO	Local NGO	Others
Prevention	7	1	2		4	
Preparedness	8	2	2		6	1
Response	15	2	3		6	1
Rehabilitation	12	2	3		5	

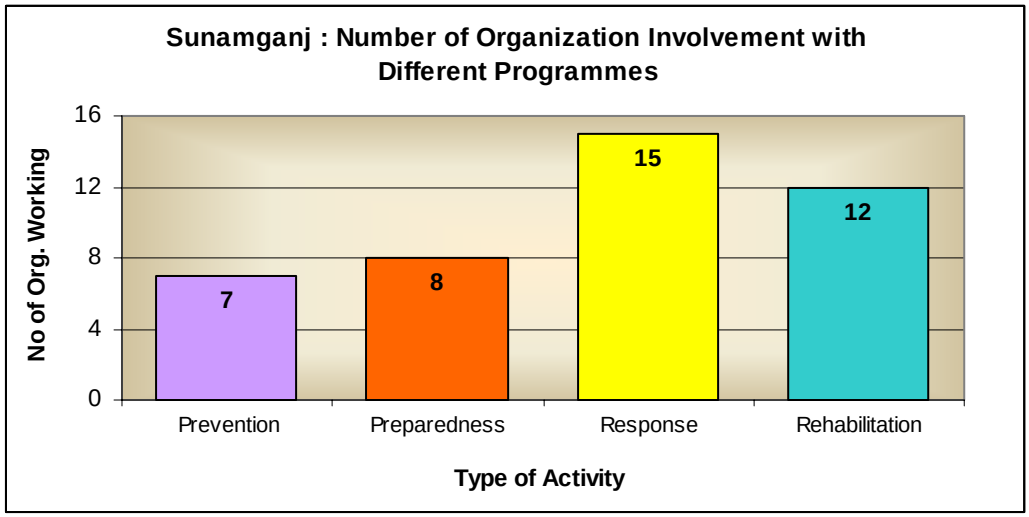


Figure 6.4.7.2: Number of organizations involved with different programs in Sunamganj District

6.5 Institutional Capacity

The institutional capacity of organizations working with disasters was assessed at national and district levels. The technical capabilities of different organizations assessed under this study were (i) skilled persons, (ii) coordination with other organizations, (iii) dissemination/communication equipment, (iv) IEC materials they produced and/or their facility of data handling and (v) partnership with DRRO, etc. The technical capabilities of these organizations are described in the different sub sections of this chapter.

6.5.1 Technical Capabilities of National Level Institutions

At the national level a total of 50 organizations were inventoried of which 15 are government, 22 are non-government and 13 are donor organizations.

Skilled People at organization level

The technical professionals of different organizations have been summarized by organization type from the collected data and presented in Table 6.5.1.1. Table 6.5.1.1 shows that the highest number of technical people belongs to government organization comprising more than 2500 such people and the least number of technical people belong to national NGOs comprising less than 700 such people.

Table 6.5.1.1: No. of skilled people at national level

Organization Type	Total Employees	No. of Skilled People	% Of skilled people
Government Organization	4154	2530	61
International NGO	880	755	86
National NGO	740	645	87
Others	296	191	65

Detailed information on the professional skills of the surveyed organizations is presented in Table C1 of Appendix - C. Table C1 shows that about 4100 skilled professionals were found among 38

organizations. Table C1 also shows that the highest number of skilled people (800) belong to BMD, and DPHE, the lowest (3) to NIRAPAD. Furthermore, DRR and BRAC also have a substantial number skilled people (518 and 450) with Concern Bangladesh having 232 skilled professionals. From available data, the percentage of skilled people within the organizations concerned was also analyzed. The results of the analysis of percentage of skilled people reveals that most of the agencies have more than 50% skilled people while some organizations (e.g. Caritas, DPHE, BDPC, FFWC etc.) have more than 80% skilled professionals. Some organizations (e.g. BRAC, IUCN, Oxfam etc.) have 90% skilled professionals in their organizations.

Partnership Information

The available partnership information on national level organizations is presented in Table C2 of Appendix – C. Furthermore, partnerships among different organizations were also processed by organization type and are presented in Table 6.5.1.2. Table 6.5.1.2 shows that only 11 organizations have partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, local government and district administration, water resource, fisheries department and local NGOs as well as other organizations.

Table 6.5.1.2: Partnerships of national level organizations with other organizations

Organization Type	Agriculture sector	Comprehensive Disaster Management Programme (CDMP)	Department For International Department (DFID)	Disaster management burro (DMB)	District admin	DRRO	Educational Institute	Fisheries	Forestry	Geological Society of Bangladesh_	Industrial	Local government	National agencies	NGOs	Red crescent	Research Institute	Water Resources	World Food Program (WFP)
International NGO	7	2	1	1	6	2		5	1		3	7	6	7	5		2	1
National NGO	4				4	5		3	2			6	3	6	1		4	
Others	7				4	4	1	2	2	1	2	5	6	8	5	1	6	

IEC material

Information about IEC was processed based on the organization type and is presented in Table 6.5.1.3. Table 6.5.1.3 shows that out of 38 organizations, 22 have posters and leaflets and more than 16 organizations have films and movies.

Table 6.5.1.3: List of IEC materials of national level organizations

Organization Type	Banner	Baul song/Pot song	Booklets	Brochure	Caption	Emergency guidelines	Fact sheet of arsenic	Film/movie	Flag	Flipchart	Hazard map	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Publication	Puppet show	Training material CD	Video show	Writing notebook for school students with disaster related aware
GO	3	1			3			6	2		1	1	6	3	3	1	6	1				
International NGO	4	2	1	1	2	1		3	2	1		3	6	2	1		6		1	1	1	1
National NGO	2	3	1					3		1		3	3	1	3		4					
Others	4	1			1		1	4	2			1	6	2	2	1	6					

The details of the IEC materials are presented in Table C3 of Appendix C. Table C3 shows that different organizations produce different types of IEC materials for information dissemination. The general types of IEC material are posters, leaflets and banners etc. and they are produced by most of the organizations. Baul songs/pot songs and films/movies are the special types of IEC tools used by some organizations like BCAS, BDPC, CARE - Bangladesh, CCDB, DoE, Oxfam-GB, Action Aid Bangladesh and RDRS-Bangladesh.

Training related Information

Information about the trained people was summarized by organization type and is presented in Table 6.5.1.4. The results of the analysis of available data (Table 6.5.1.4) reveal that international NGOs have the highest number of trainers (more than 100) and they provide training to more than 26600 people.

Table 6.5.1.4: Training related Information of national level organizations

Organization Type	Total No. of Trainers	Total No. of Trained People	Total No. of Recently Trained People
International NGO	102	26610	7952
National NGO	80	24132	3769
Others	78	5650	1650

Different types of training programs are organized to train staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations are analyzed and presented in Table C4 of Appendix - C. Table C4 shows that CARE Bangladesh has the maximum number of trainers (50) and among the organizations, BDPC trained the maximum number of people (10,000). The table also shows that most of the training is related to preparedness programs for disasters.

Technical Capabilities

Processing, storage and dissemination related data was also summarized by organization type and is presented in Table 6.5.1.5. Table 6.5.1.5 shows that out of 23 surveyed NGOs, all 19 organizations have dissemination, processing, storage and transportation facilities.

Table 6.5.1.5: Technical capability of the agencies of national level organizations

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	6	6	6	6
National NGO	5	5	5	5
Others	8	8	8	8

The technical capability of an organization is the facilities for processing, storage and dissemination of information. The facilities or tools used by different organizations were also analyzed and are presented in Table C5 of Appendix – C. Table C5 shows that computers, MS Office program and Photoshop are the main processing facilities of the organizations. Some research organizations like IWM use MIKE-11 and MIKE-SHE for data analysis. Manual Ledger-books/files and CDs are their main storage facilities. Most of the organizations use phones and fax for communication and dissemination purposes.

6.5.2 Technical Capabilities of District Level Institutions

It has already been mentioned earlier that local level data collection was carried out for seven districts. The institutional capacity including technical capabilities and other associated information of different organizations working in those districts are described below:

District: Cox's Bazaar

In Cox's Bazaar District a total of 39 organizations was inventoried of which 20 were GOs and 19 NGOs. The technical professionals of the different types of organizations were calculated and are summarized in Table 6.5.2.1. The table shows that the national NGOs have the maximum number of skilled people.

Information on the technical professionals of the different organization working in this district was also processed from collected data and is presented in Table D1 (Appendix – D). The table shows that there are about 1400 skilled professionals in the 39 organizations. The table also shows that the highest number of skilled people belong to BRAC (318) and the lowest to CCDB (1). CARE Bangladesh also has a substantial number of skilled people (245) and MUKTI Cox's bazar has 170 skilled people. Based on available data, the percentage of skilled people within the organizations was also analyzed. The results of the percentage analysis reveal that most of the agencies have more than 50% and some organizations (e.g. Anando, BASTOB, COAST, BRAC etc.) have more than 80% skilled professionals.

Table 6.5.2.1: No. and percentage of skilled people in Cox's Bazaar District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	588	159	27
International NGO	351	265	75
National NGO	1149	856	74
Regional NGO	141	108	77
Local NGO	56	6	11
Others	46	22	48

The partnerships among different organizations were also assessed from available data and are presented in Appendix – D. Table D2 shows that out of 39 organizations, only 8 have active partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, local administration, local NGOs and other organizations. The summary of the partnerships of the different types of organizations is presented in Table 6.5.2.2.

Table 6.5.2.2: Partnerships with Other Organizations of Cox's Bazaar District

Sectors/ Organization	No. of Organization in Partnership				
	International NGO	National NGO	Regional NGO	Local NGO	Others
Agriculture sector	4	8	1	1	2
Civil surgeon					
Department of Youth Development					
District Administration	4	4	1		2
DPHE					
DRRO	3	3	1		2
Educational Institute					1
Fisheries	2	5	1	1	2
Food & Disaster Management Ministry					
Forestry		2		1	2
Health					
Home ministry					
Industrial	1				1
Livestock Department					
Local government	3	9	1	1	2
Local Newspaper					
National agencies	2				2
NGOs	4	8	1	1	1
Nibsom					
Red crescent	4	9	1	1	2
Social welfare					
Water Resources	1	2		1	1
Women and child affairs					
World Food Programme and CDMP					

Information about IEC materials was processed from the collected data and summarized by organization types, which is presented in Table 6.5.2.3.

Table 6.5.2.3: List of the IEC materials of Cox's Bazaar District

Organization Type	Banner	Song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	5	2						2	2	2	7	5	5		6					
International NGO								1	1				1							
National NGO	1	2				1		3	4	1	3	2	6		3					
Others	2	1						1	2		1	3	1		2					

The IEC materials produced by different organizations are presented in Table D3 (Appendix D). It is observed that different organizations produce different types of IEC materials for information dissemination. The general types of IEC material/tools such as flags, miking and posters etc. are produced by most of the organizations. Baul songs/pot songs and films/movies are the special types of IEC materials/tools used by some organizations like Anando, Bastob, World Vision, DAE and Civil Surgeon Office of the district.

Different types of training programs are organized to train the staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations is presented in Table 6.5.2.4.

Table 6.5.2.4: Training Related Information of Cox's Bazaar District

Organization Type	Total No. of Trainers	Total No. of Trained People	Total No. of Recently Trained People
International NGO	37	2400	250
National NGO	652	8578	860
Others	19	5300	685

Detailed information about the training programs in Cox's Bazaar District is presented in Table D4 (Appendix –D). The table shows that CARE Bangladesh has the maximum number of trainers (30) and the Cyclone Preparedness Programme (CPP) trained the maximum no. of people (3000) among the organizations. The table also shows that the maximum number of training is related to disaster preparedness programs.

The technical capability of an organization is the facility for processing, storage and dissemination of information, which is also analyzed and presented in Table 6.5.2.5 in a summarized form.

Table 6.5.2.5: Technical capability of the agencies in Cox's Bazaar District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	3	3	4	1
National NGO	8	10	11	8
Regional NGO		1	1	
Local NGO	1		1	
Others	2	1	2	

Detailed information about the technical capabilities of the organizations is presented in Table D5 (Appendix D). The table shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation.

District: Faridpur

In Faridpur District a total of 22 organizations were inventoried of which there are 8 GOs and 14 NGOs. Information about the technical professionals of the different organizations of this district was processed from collected data and is presented in Table 6.5.2.6.

Table 6.5.2.6: Skilled people in Faridpur District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	311	163	52
International NGO	16	10	63
National NGO	59	42	71
Local NGO	641	426	66
Others	6	4	67

Detailed information about the skilled people in different organizations is presented in Table D6 (Appendix – D). The table shows that there are about 645 skilled professionals in 23 organizations. It also shows that the highest number of skilled people belong to the FDA (109) and the lowest to the DPHE (3). The Upazila Porishad also has a substantial number of skilled people (104), while SDC has 84 skilled people. Based on available data, the percentage of skilled professionals within the organizations concerned was analyzed. The percentage estimation of skilled people shows that most of the agencies have more than 50% and some organizations (e.g. DNP, NCDS and AKK etc.) have more than 80% skilled professionals.

The partnerships among different organization were also assessed from available data and presented in Table 6.5.2.7. The table shows that out of 23 organizations, 15 have good interaction with DRRO. Most of the organizations have partnerships with the local administration and local NGOs and other organizations.

Table 6.5.2.7: Partnerships between the different organizations in Faridpur District

Sectors/ Organization	No. of Organization in Partnership			
	International NGO	National NGO	Local NGO	Others
Agriculture sector	1		7	
Civil surgeon				
Department of Youth Development				
District Administration	1	1	11	1
DPHE				
DRRO	1	1	12	1
Educational Institute				
Fisheries	1		6	
Food & Disaster Management Ministry				
Forestry			5	
Health				
Home ministry				
Industrial				
Livestock Department				
Local government	1		8	1
Local Newspaper				
National agencies	1		2	
NGOs	1	1	12	
Nipsom				
Red crescent	1			
Social welfare				
Water Resources	1		5	
Women and child affairs				
World Food Programme Na CDMP			1	

Detailed information about the partnerships among different organizations is presented in Table D7 (Appendix –D). Table D7 shows that the organizations surveyed in Faridpur District all have partnerships with DRRO.

Information about IEC materials was processed from the collected data. The IEC materials produced by the organizations are presented in Table D8 (Appendix-D). It is observed that different organizations produce different types of IEC materials for information dissemination. The general types of IEC materials/tools such as flags, miking and posters etc. are produced by most of the organizations. Baul songs/pot songs and films/movies are the special types of IEC materials/tools used by some organizations like AKK, NCDC, SDC, World Vision and DRRO of the district.

Information about IEC materials was processed from the collected data and is summarized by organization type and presented in Table 6.5.2.8.

Table 6.5.2.8: List of IEC materials/tools of Faridpur District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	2	1									5		3		6					
International NGO		1									1				1					
National NGO	1										1				1					
Local NGO	6	4						2	1	3	11		4		11					
Others	1					1									1					

Different types of training programs are organized to train staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations are summarized and presented in Table 6.5.2.9.

Detailed training information of different organizations is presented in Table D9 (Appendix-D). The table shows that the Poor Welfare Organization (PWO) has the maximum number of trainers (16). Among the organizations, SDC and World Vision Bangladesh trained the maximum number of people (about 7000). The table also shows that most of the training is related to disaster preparedness programs

Table 6.5.2.9: Training Related Information of Faridpur District

Organization Type	Total No. of Trainers	Total No. of Trained People	Total No. of Recently Trained People
International NGO	4	7000	1800
National NGO			
Local NGO	63	11465	6145
Others	2	600	200

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is analyzed and presented in Table 6.5.2.10. The table shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation. The detailed list of agency technical capability of Faridpur district is presented in Table D10 of Appendix – D.

Table 6.5.2.10: Technical Capability of the agencies in Faridpur District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	1	1	1	1
National NGO		1	1	
Local NGO	8	7	12	10
Others	1		1	1

District: Lalmonirhat

In Lalmonirhat District a total of 47 organizations were inventoried of which 12 are GOs and 35 are NGOs. Information about the technical professionals of the different organizations of this district was processed from collected data and is presented in Table D11 (Appendix-D). Table D11 shows that there are about 1660 skilled professionals in 47 organizations. It also shows that the highest number of skilled people belong to BRAC (571) and the lowest to Sonirvor Bangladesh (1). RDRS-Bangladesh also has a substantial number of skilled people (237) and Hitoyshi Bangladesh and CISD has 111 and 84 skilled professionals respectively.

From available data, the percentage of skilled people by organization type was also analyzed and presented in Table 6.5.2.11. The results of the percentage analysis of skilled people shows that most of the agencies have more than 60% and some organizations (e.g. CISD, NAZIR, POPI, RDRS – Bangladesh etc.) have more than 90 % skilled professionals.

Table 6.5.2.11: Skilled people in Lalmonirhat District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	301	110	37
International NGO	16	14	88
National NGO	2887	1292	45
Regional NGO	13	9	69
Local NGO	281	228	81
Others	12	2	17

Partnerships among different organizations were also assessed from available data and presented in Table D12 of Appendix D. Table D12 shows that out of 47 organizations only 22 have active partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, district administration and local NGOs and other organizations. Partnership information has been processed by organization type and presented in Table 6.5.2.12. Table 6.5.2.12 shows that the national level organizations that are working in Lalmonirhat have partnerships with major organizations.

Table 6.5.2.12: Partnerships among different organizations of Lalmonirhat District

Sectors/ Organization	No. of Organization in Partnership				
	International NGO	National NGO	Regional NGO	Local NGO	Others
Agriculture sector	1	11	2	10	1
Civil surgeon					
Department of Youth Development					
District Administration		18	2	11	2
DPHE					1
DRRO		11	2	7	2
Educational Institute					
Fisheries		4	2	7	1
Food & Disaster Management Ministry					
Forestry	1	10	1	6	1
Health				1	
Home ministry					
Industrial		1			1
Livestock Department		2	1		
Local government	1	16	2	11	1
Local Newspaper					
National agencies	1	4	1	2	1
NGOs	1	14	1	9	1
Nipsom					
Red crescent		1		3	1
Social welfare				2	
Water Resources		1		2	1
Women and child affairs					
World Food Programme Na CDMP					

IEC information was processed from collected data. The IEC materials produced by the organizations are presented in Table D13. It is observed that different organizations produce different types of IEC materials/tools for information dissemination. The general types of IEC materials/tools are flags, miking/megaphones, messengers and posters which are produced by the maximum number of organizations. Baul songs/pot songs and films/movies, and jatras/dramas are the special types of IEC materials/tools organized by some organizations like RDRS-Bangladesh, Plan-Bangladesh, Matribhumi, Chinno Mukul, ESKS, Dishari and Bangladesh Read Crescent Society.

Table 6.5.2.13: List of IEC materials/tools used in Lalmonirhat District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	5		2		1	1					5	5	5		10					
International NGO	1									1	1				1		1			
National NGO	12	2	2			6		2	3	6	12	8	6		14					
Local NGO	7	1							1	3	4	6	6		8		1	1		
Regional NGO										1		1	1		1					
Others	2	1						1		1	1	1	2		1					

Different types of training programs are organized to train the staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations were processed and are presented in the D14 of Appendix D. Table D14 shows that BRAC and RDRS has the maximum number of trainers (101 and 92) and BRAC and RDRS trained the maximum (about 29500) people among the organizations. The table also shows that most of the training is related to disaster preparedness programs. Training related information has been summarized by organization types and presented in Table 6.5.2.14. Table 6.5.2.14 shows that national level organizations have the highest number of trainers (more than 400) and have also provided training to the highest number of trainees which is more than 1,15,000.

Table 6.5.2.14: Training related Information of Lalmonirhat District

Organization Type	Total No of Trainer	Total No of Trained People	Total No of Recently Trained People
International NGO	14	125	25
National NGO	353	118277	65737
Regional NGO	9	3660	1030
Local NGO	69	38220	9439
Others	5	0	0

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is analyzed and presented in Table D15 of Appendix-D. The table shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles and bicycles for transportation.

The technical capabilities of different organizations are also summarized by organization type and presented in Table 6.5.2.15 which shows that national level NGOs have better dissemination, processing, storage and transportation facilities than international and other organizations.

Table 6.5.2.15: Technical Capability of the different agencies in Lalmonirhat District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	1	1	1	1
National NGO	8	12	18	16
Regional NGO	1	1	2	1
Local NGO	7	10	12	11
Others	1	2	2	1

District: Rajshahi

In Rajshahi District a total of 24 organizations were inventoried out of which 8 are government organizations and 16 are NGOs. The technical professionals of the different organizations of this district is processed from collected data and presented in Table D16 (Appendix – D). Table D16 shows that there are about 460 skilled professionals in the 24 organizations. The table also shows that the highest number skilled people belong to TMSS which is 95 and the lowest to Shaw-Unnayan and BRAC, which is only 2. The Village Education Resources Center (VERC) (63) and LGED (60) also has a substantial number of skilled people. The percentage of skilled people within the organizations was also analyzed from available data. The results of the percentage analysis of skilled persons show that most of the agencies have more than 60% and some organizations (e.g. ACD, RULFAO, WDC, Sachetan etc.) have more than 80% skilled professionals. Data on skilled people were analyzed based on the organization type and is presented in Table 6.5.2.16. Based on the surveyed data (Table 6.5.2.16) it is found that in Rajshahi District the government organizations have the highest percentage of technical people (more than 60%).

Table 6.5.2.16: Skilled people in Rajshahi District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	214	144	67
International NGO	70	41	59
National NGO	363	177	49
Local NGO	136	100	74
Others	2	0	0

The partnerships among different organizations were also assessed from available data and are presented in Table D17 of appendix D. The table shows that out of 24 organizations only 10 have partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, local administration and local NGOs and other organizations. Partnership data is organized by organization type and presented in Table 6.5.2.17. Table 6.5.2.17 shows that national NGOs have partnerships with most of the organizations.

Table 6.5.2.17: Partnerships between different organizations in Rajshahi District

Sectors/ Organization	No. of Organization in Partnership			
	International NGO	National NGO	Local NGO	Others
Agriculture sector		2	6	
Civil surgeon				
Department of Youth Development			1	
District Administration		3	4	1
DPHE	1	1		
DRRO	1	3	6	
Educational Institute				
Fisheries			4	
Food & Disaster Management Ministry				
Forestry			4	1
Health			1	
Home ministry			1	
Industrial				
Livestock Department				
Local government		1	6	
Local Newspaper				
National agencies		1	4	
NGOs		4	6	
Nibsom	1			
Red crescent				
Social welfare			1	
Water Resources		1	2	
Women and child affairs		1	2	
World Food Programme Na CDMP				

IEC information has been processed from collected data. The IEC materials produced by the organizations are presented in Table D18 of Appendix - D. Table D18 shows that general types of IEC materials/tools are flags, miking, posters etc. and are produced by the maximum number of organizations. Baul songs/pot songs and films/movies are the special types of IEC materials used by the Association for Community Development (ACD). Data on IEC materials has been processed by organization type and presented in Table 6.5.2.18. Table 6.5.2.18 shows that national NGOs mainly use IEC materials for risk reduction and disaster management.

Table 6.5.2.18: List of IEC materials of Rajshahi District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	3								1		3		2		3					
International NGO	1														1					
National NGO	1										2				2					
Local NGO	1	1	1	1				1		1	4	1	1		3					

Different types of training programs are organized to train staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations are summarized and presented in Table D19 of Appendix-D. The table shows that the Association for Community Development (ACD) has the maximum number of trainers (25) and has trained the maximum number of people (25000) among the organizations and after that Caritas and RULFAO trained more than 5,000 people. The table also shows that the maximum number of training is related to disaster preparedness programs. Training information of this district has been processed by organization type and presented in Table 6.5.2.19. Table 6.5.2.19 shows that local NGOs have provided training to the highest number of people (more than 30000) within a 3-year period.

Table 6.5.2.19: Training related information of Rajshahi District

Organization Type	Total No of Trainer	Total No of Trained People	Total No of Recently Trained People
International NGO	28	8000	2500
National NGO	25	300	70
Local NGO	48	31950	6555
Others	2	60	60

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is analyzed and presented in Table D20. The table shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation. Information on technical capabilities was processed by organization type and presented in Table 6.5.2.20. The table shows that the national NGOs working in this district have better technical capabilities.

Table 6.5.2.20: Technical capability of the different agencies working in Rajshahi District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	1	2	2	2
National NGO	2	4	3	3
Local NGO	6	5	5	1
Others		1	1	1

District: Satkhira

In Satkhira District a total of 31 organizations were inventoried of which 8 are government and 23 non-government organizations. Information on the technical professionals of the different organizations in this district is processed from collected data and presented in Table D21 of Appendix-D. Table D21 shows that there are about 1275 skilled professionals in 31 organizations. The table also shows that the highest number of skilled people belong to Shushilan (206) and the lowest to the Bangladesh Red Crescent Society (1). ASA also has a substantial number of skilled people (191) and Uttaran has 143 skilled people.

From available data, the percentage of skilled people within the organizations was also analyzed. The results of the percentage analysis of skilled people reveal that most of the agencies have more 50-60% and some organizations (e.g. CDOW, Polli Chetona, Bhomisto, SUS etc.) have more than 80% skilled professionals (Table D21 of Appendix-D). Table D21 also reveal that percent of skilled person is lowest in the Upazila Parishad (only 6%). Data on skilled people were processed by organization type and are presented in Table 6.5.2.21. Table 6.5.2.21 shows that the national level NGOs working in this district have the highest percentage of skilled people, which is more than 80%.

Table 6.5.2.21: Skilled people of Satkhira District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	277	65	23
International NGO	435	179	41
National NGO	504	414	82
Regional NGO	184	143	78
Local NGO	591	477	81
Others	2	1	50

Partnerships between the different organizations were also assessed from available data and presented in Table D22 (Appendix – D). The table shows that out of 31 organizations only 12 organizations have partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, local Administration and local NGOs and other organizations. The partnership data has been organized by organization type and presented in Table 6.5.2.22. Table 6.5.2.22 shows that the local NGOs working in this district have relationships with most of the organizations.

Table 6.5.2.22: Partnership between the different organizations working in Satkhira District

Sectors/ Organization	No. of Organization in Partnership				
	International NGO	National NGO	Regional NGO	Local NGO	Others
Agriculture sector	3	3	1	6	
Civil surgeon					
Department of Youth Development					
District Administration	3	3	1	11	1
DPHE					
DRRO	2	2	1	6	1
Educational Institute					
Fisheries	1	1	1	1	
Food & Disaster Management Ministry					
Forestry	1	1	1	2	
Health					
Home ministry					
Industrial					
Livestock Department					
Local government	2	2	1	8	
Local Newspaper					
National agencies				2	
NGOs	3	2	1	14	1
Nibsom					
Red crescent					
Social welfare					
Water Resources	1	2	1	2	
Women and child affairs					
World Food Programme Na CDMP					

IEC information was processed from collected data. The IEC materials produced by the organizations are presented in Table D23. Table D23 shows that general types of IEC materials/tools such as flags, miking and posters etc. are produced by the maximum number of organizations. Baul songs/pot songs and films/movies, jatras/dramas are the special types of IEC tools used by some organizations like Shushilan, Uttaran, GUS, Rishilpi, Red Crescent Society and Caritas. IEC materials has been organized by organization type and presented in Table 6.5.2.23. Table 6.5.2.23 shows that national NGOs mainly use IEC materials for risk reduction.

Table 6.5.2.23: List of IEC materials/tools of Satkhira District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	5								1		4		3		7					
International NGO	3	1				3		2	1		3		3		3					
National NGO	3	1				1			1	1	2		2		2					
Regional NGO	1	1				1		1	1		1		1		1					
Local NGO	13					5		1			15		6	1	8					
Others	1	1				1		1	1		1		1		1					

Different types of training programs are organized to train staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations are summarized and presented in Table D24 of Appendix D. The table shows that Uttaran has the maximum number of trainers (25) and SUS trained the maximum number of people (16,000) among the organizations. The table also shows that the maximum number of training is related to disaster preparedness programs. Training related information was processed by organization type and is presented in Table 6.5.2.24. Table 6.5.2.24 shows that local NGOs that work in this district provided training to the highest number of people (more than 32,000).

Table 6.5.2.24: Training related information of Satkhira District

Organization Type	Total No. of Trainers	Total No. of Trained People	Total No. of Recently Trained People
International NGO	38	23900	5500
National NGO	27	15500	2500
Regional NGO	25	15000	1500
Local NGO	37	32521	5016
Others	0	0	0

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is also analyzed and presented in Table D25. Table D25 shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation. The technical capabilities of different organizations in terms dissemination, processing, storage and transportation facilities were processed by organization type and are presented in Table 6.5.2.25. Table 6.5.2.25 shows that most of the NGOs working in this district have the facilities for processing, storage and dissemination.

Table 6.5.2.25: Technical capability the different agencies working in Satkhira District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	3	3	3	3
National NGO	3	3	3	3
Regional NGO	1	1	1	1
Local NGO	15	14	15	15
Others	1	1	1	1

District: Sirajganj

In Sirajganj District a total of 44 organizations were inventoried of which 14 are GOs and 30 NGOs. Information on the technical professionals of the different organizations of this district was processed from collected data and is presented in Table D26. Table D26 shows that there are about 1650 skilled professionals in the 44 organizations. The table also shows that the highest number of skilled people belong to BRAC (387) and the lowest belong to the District Livestock Office (2). Furthermore, GKS also has a substantial number of skilled people (151) while PROSHIKA has 173 skilled professionals. From available data, the percentage of skilled people in the organizations was also analyzed. The result shows that most of the agencies have more than 60% and some organizations (e.g. TMSS, LGED, GK, Good Earth etc.) have more than 90% skilled professionals. The information on skilled people was processed by organization type and presented is in Table 6.5.2.26. Table 6.5.2.26 shows that national NGOs have the highest percentage of skilled manpower which more than 80%.

Table 6.5.2.26: Skilled people of Sirajganj District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	277	152	55
International NGO	40	37	93
National NGO	1227	977	80
Regional NGO	224	56	25
Local NGO	623	444	71
Others	5	2	40

Partnerships between the different organizations were also assessed from available data and are presented in Table D27. The table shows that of the 44 organizations only 17 have partnerships with DRRO. But most of the organizations have excellent partnerships with the agriculture sector, local administration and local NGOs and other organizations. The partnership data that was organized by organization type is presented in Table 6.5.2.27. Table 6.5.2.27 shows that the national NGOs working in this district has partnerships with most of the organizations.

Table 6.5.2.27: Partnerships between the different organizations working in Sirajganj District

Sectors/ Organization	No. of Organization in Partnership			
	International NGO	National NGO	Regional NGO	Local NGO
Agriculture sector	2	6	1	6
Civil surgeon				
Department of Youth Development				
District Administration	2	9	1	11
DPHE				
DRRO	2	7	1	7
Educational Institute				
Fisheries		7	1	7
Food & Disaster Management Ministry				
Forestry		3	1	4
Health				
Home ministry				
Industrial				
Livestock Department				
Local government	3	10	1	12
Local Newspaper		1		
National agencies		6		7
NGOs	3	9		11
Nibsom				
Red crescent	1	2	1	1
Social welfare				
Water Resources		2	1	3
Women and child affairs				
World Food Programme Na CDMP				

IEC information was processed from collected data. The IEC materials produced by the organizations are presented in Table D28 of Appendix-D. The table shows that different organizations produce different types of IEC materials for information dissemination. The general types of IEC materials/tools such as flags, miking and posters etc. are produced by the maximum number of organizations. Baul songs/pot songs and films/movies are the special types of IEC tools used by some organizations like the Bangladesh Red Crescent Society, BRAC, GK, SFF, SHARP. The IEC materials/tools were organized as by organization type and are presented in Table 6.5.2.28. Table 6.5.2.28 shows that national NGOs mainly use IEC materials for risk reduction.

Table 6.5.2.28: List of IEC materials/tools of Sirajganj District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	5										5	3	3		7					
International NGO	1									1					3				1	
National NGO	6	1	1							4	5	2	4		5					
Regional NGO	1										1	1	1		1					
Local NGO	10	7						1	1	5	1		9		6	1				
Others	1	1									1		1		1					

Different types of training programs are organized to train staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training programs of different organizations are summarized and presented in the Table D29 of Appendix - D. Table D29 shows that PROSHIKA has the maximum number of trainers (30) and Thangamara Mohila Sobuj Sanga (TMSS) trained the maximum number of people (11323) among the organizations. The table shows that the maximum number of training is related to disaster preparedness programs. Training related information was processed by organization type and is presented in Table 6.5.2.29 which shows that the national NGOs working in this district provided training to the highest number of peoples (more than 26,000).

Table 6.5.2.29: Training related information of Sirajganj District

Organization Type	Total No. of Trainers	Total No. of Trained People	Total No. of Recently Trained People
International NGO	11	11300	5498
National NGO	74	26052	4043
Regional NGO	4	3460	320
Local NGO	55	23750	3370
Others	0	0	0

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is analyzed and presented in Table D30 of appendix-D. Table D30 shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation. The information on technical capabilities was processed as organization type and is presented in Table 6.5.2.30. The table shows that the local NGOs have better technical capabilities than the international NGOs working in this district.

Table 6.5.2.30: Technical capability of the different agencies working in Sirajganj District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	3	3	4	4
National NGO	10	10	11	11
Regional NGO	1	1	1	1
Local NGO	13	10	13	13

District: Sunamganj

In Sunamganj District a total of 29 organizations were inventoried of which 15 are GOs and 14 NGOs. Information on the technical professionals of the different organization of this district was processed from collected data and is presented in Table D31 of Appendix-D. The table also shows that the highest number of skilled people belong to ERA (64) and the lowest belong to FIVDB (2). BRAC and SARCRED also has a substantial number of skilled people (10 and 11). From available data, the percentage of skilled people within the organizations was also analyzed. Table D31 shows that the organizations have low to very low percentage of skilled people with most of them having less than 30% skilled people except 4-5 organizations where the percentage ranges from 30% to 50%. Among the organizations ERA and Islamic Relief have more than 80% skilled manpower. Information on skilled people was processed by organization type and is presented in Table 6.5.2.31 which shows that international NGOs have the highest percentage of skilled manpower, which is more than 50%.

Table 6.5.2.31: Skilled people in Sunamganj District

Type of Organization	Total Employees	No. of Skilled People	% of Skilled People
GO	310	56	18
International NGO	16	9	56
National NGO	326	14	4
Local NGO	177	80	45
Others	5	1	20

The partnerships between the different organizations were also assessed from available data and are presented in Table D32 of Appendix-D. The table shows that of the 29 organizations only 10 have partnerships with DRRO. But most of the organizations have partnerships with the agriculture sector, local administration and local NGOs and other organizations. The partnership data was organized by organization type and is presented in Table 6.5.2.32. Table 6.5.2.32 shows that the local NGOs working in this district have partnerships with most of the organizations.

Table 6.5.2.32: Partnerships between the different organizations working in Sunamganj District

Organization Type	Agriculture sector	Civil surgeon	Department of Youth Development	District Administration	DPHE	DRRO	Educational Institute	Fisheries	Food & Disaster Management Ministry	Forestry	Health	Home ministry	Industrial	Livestock Department	Local government	Local Newspaper	National agencies	NGOs	Nibsom	Red crescent	Social welfare	Water Resources	Women and child affairs	World Food Programme Na CDMP
International NGO	1			2		2		1		1	1	1			2		1	2	1			2	1	
National NGO	2	1		3		3		2		3					3			3				3		
Local NGO	6	1	1	6	1	4	1	3	1	3				1	4		2	6			1	3		
Others				1		1									1			1				1		

IEC information was processed from collected data. The IEC materials produced by the organizations are presented in Table D33 of appendix-D which shows that different organizations produce different types of IEC materials for information dissemination. The general types of IEC materials/tools such as flags, miking and posters etc. are produced by maximum number of organizations. Baul songs/pot songs and films/movies are the special types of IEC tools used by some organizations like BDRCS, FIVDB, GJKS, Islamic Relief and Civil Surgeon Office. IEC materials/tools were organized by organization type and are presented in Table 6.5.2.33. Table 6.5.2.33 shows that national NGOs mainly use IEC materials for risk reduction.

Table 6.5.2.33: List of IEC materials/tools of Sunamganj District

Organization Type	Banner	Baul song/Pot song	Billboard	Brochure	Calendar	Caption	Cinema advertise	Film/movie	Flag	Jatra/Drama	Leaflet	Local news paper	Miking	Newsletter	Poster	Puppet show	Rally	Relief work picture and news	Training material CD	Video show
GO	2	1						1	1		4	2	3		5					
International NGO	1	1					1	1		1	1		1		1					1
National NGO	2	2						1		2	1	1	1		1		1			
Local NGO	4	2	2					1		1	2	1	5		4					
Others	1							1		1	1		1		1					

Different types of training programs are organized to train the staff and community people to increase their disaster related coping capacity. The number of trainers and trained people and training

programs of different organizations are summarized and presented in the Table D34 of Appendix-D. The table shows that Voluntary Association for Development (VARD) has the maximum number of trainers (12) and trained the maximum number of people (1375) among the organizations. The table shows that the maximum number of training is related to disaster preparedness programs. Training related information was processed by organization type and is presented in Table 6.5.2.34. Table 6.5.2.34 shows that the national NGOs working in this district provided training to the highest number of people (more than 1700).

Table 6.5.2.34: Training related information of Sunamganj District

Organization Type	Total No of Trainer	Total No of Trained People	Total No of Recently Trained People
International NGO	7	1325	1250
National NGO	14	1725	1500
Local NGO	6	893	693
Others	2	110	60

The technical capability of an organization is the facility for processing, storage and dissemination of information. This is analyzed and presented in Table D35 of Appendix-D. The table shows that computers and the MS Access program are the main processing facilities for the organizations. Manual Ledger Books and computers are the storage facilities of the different organizations. Most of the organizations use mobile phones for communication and dissemination purposes. Some organizations have motorcycles for transportation. Information on technical capabilities was processed by organization type and is presented in Table 6.5.2.35. The table shows that the local NGOs have better technical capabilities than the international NGOs that are working in this district.

Table 6.5.2.35: Technical capability of different agencies working in Sunamganj District

Organization Type	Dissemination & Communication	Processing	Storage	Transportation and Others
International NGO	2	2	2	2
National NGO	3	3	3	3
Local NGO	3	7	7	3
Others		1	1	

6.6 Institutional Capacity for Early Warning System (EWS)

Institutional capacity for Early Warning System (EWS) of different organizations was analyzed based on the parameter of data or information generation, use and dissemination capacity and the problems faced by the organizations.

Data generation, use and dissemination of national and district level organizations are discussed in Section 6.6.1 and Section 6.6.2 respectively.

Bottlenecks or problems with EWS were assessed during the risk reduction inventory. Different types of problems with some suggestions were provided by different organizations, which are discussed in brief in sections 6.6.3 and 6.6.4 for national level and district level organizations.

6.6.1 Institutional Capacity (EWS) at National level

The information about EWS of national level organizations are presented in Table 6.6.1 and Fig 6.6.1, from which it is observed that out of 23 NGOs only 11 organizations generate data and 12 and 13 organizations disseminate and use information of other organizations. The detailed information is presented in Table E1 of Appendix E.

Table 6.6.1: Data Generation, Use and Dissemination of NGOs at National Level.

No. of Total Organization	No. of NGO involved	No. of NGO Generate Data	No. of NGO Disseminate Data	No. of NGO Use Data	Data not Available
52	23	11	12	13	

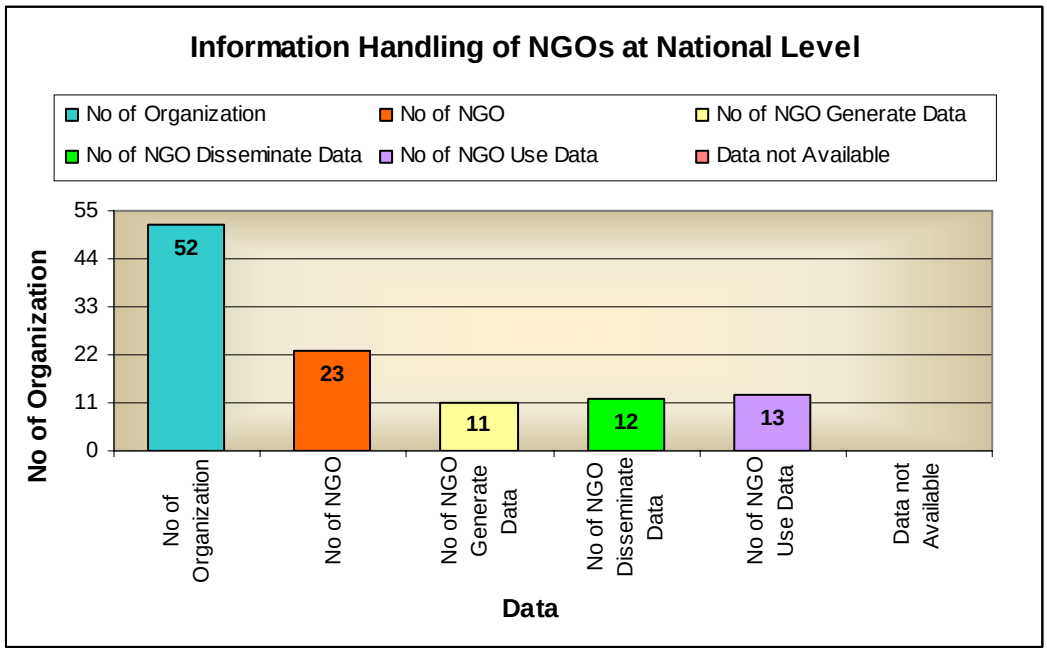


Figure 6.6.1: Handling of Information of NGOs at National Level

6.6.2 Institutional Capacity (EWS) at District Level

Data generation, use and dissemination of different organizations were collected from different organizations and are presented in Table 6.6.2 and Fig 6.6.2. Data of some organizations are not available. Among the organizations 95% and 79% use and disseminate information respectively. Only 12% of the organizations generate disaster related information.

Table 6.6.2: Data Generation, Use and Dissemination of NGOs of Different Districts.

District	No. of Organization	No. of NGO	No. of NGO Generate Data	No. of NGO Disseminate Data	No. of NGO Use Data	Data not Available
Cox's bazaar	39	20		16	18	
Faridpur	23	15		14	15	
Lalmonirhat	47	35		32	32	3

District	No. of Organization	No. of NGO	No. of NGO Generate Data	No. of NGO Disseminate Data	No. of NGO Use Data	Data not Available
Rajshahi	24	16	15	16	16	
Satkhira	31	23	2	22	23	
Sirajganj	44	30		13	29	1
Sunamganj	29	14	1	8	12	2

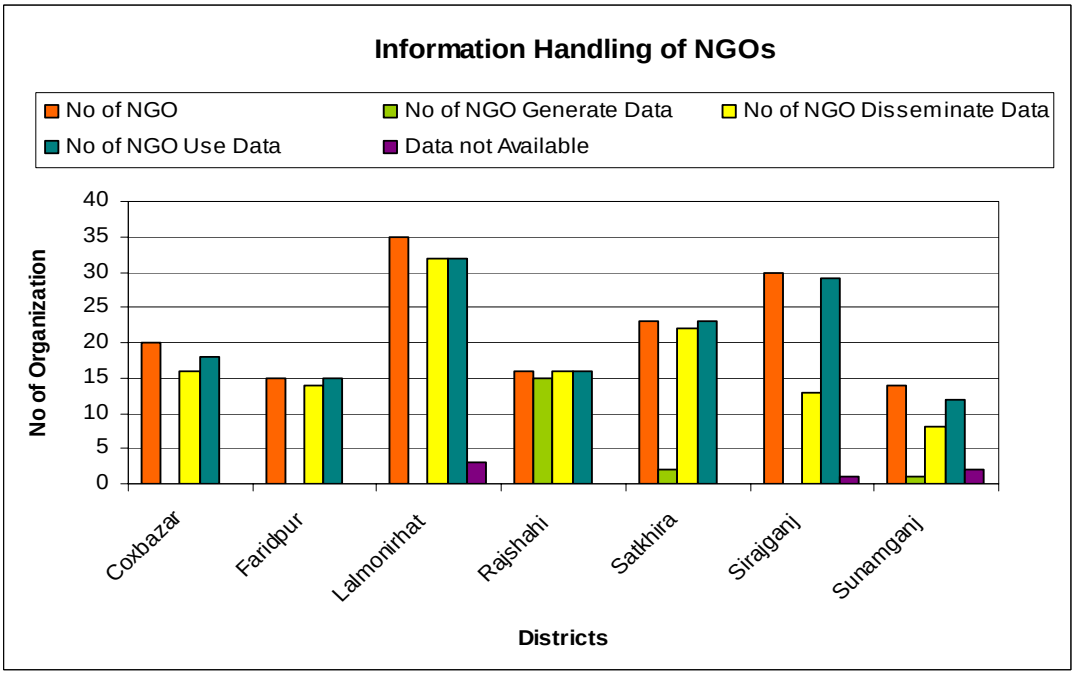


Figure 6.6.2: Handling of Information of NGOs at District Level

Cox's Bazaar

Table 6.6.2 and Fig 6.6.3 show that in Cox's Bazaar district 20 NGOs operate disaster related programs. Among the 20 organizations, 18 use data of other institutions and 16 NGOs disseminate the data received from other organizations, but none of the organizations generate any data of their own. The detailed information about information handling in Cox's Bazaar District is presented in Table F1 (Appendix F).

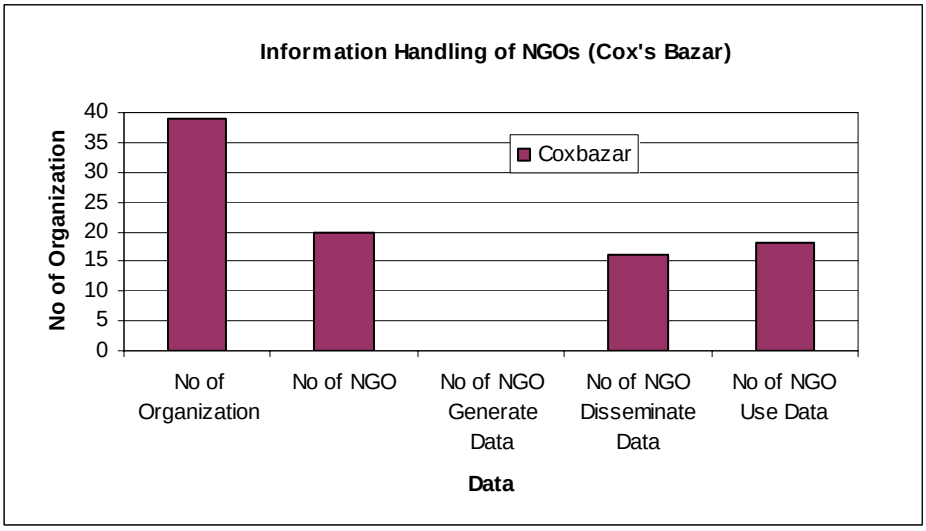


Figure 6.6.3 Handling of Information of NGOs of Cox's Bazaar District

Faridpur

The data about information handling of Faridpur District is presented in Fig 6.6.4. Table 6.6.2 and Fig 6.6.4 show that 15 NGOs are working on disasters in Faridpur District. Among the organizations all use data from different sources and 14 organizations disseminate data. None of the NGOs are working on data generation. The detailed information about information handling of Faridpur District is presented in Table F3 (Appendix F).

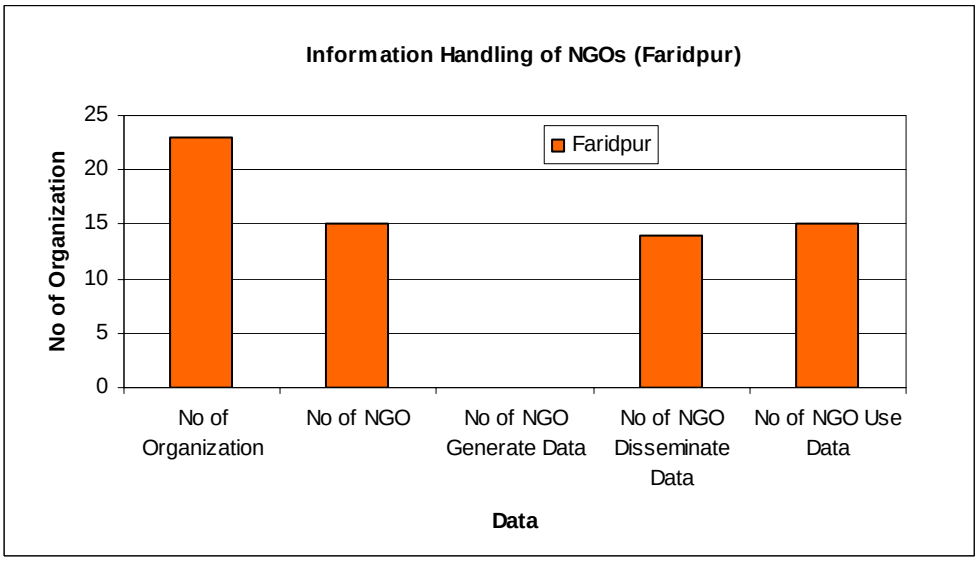


Figure 6.6.4 Handling of Information of NGOs of Faridpur District

Lalmonirhat

The different organizations of Lalmonirhat District working on information handling are presented in Table 6.6.2 and Figure 6.6.5 which show that none of them are working on information generation. Among the 35 NGOs, data of 3 organizations are not available. Other than those 3 organizations 32 NGOs use and disseminate data of others. The detailed information about information handling of Lalmonirhat District is presented in Table F5 (Appendix F)

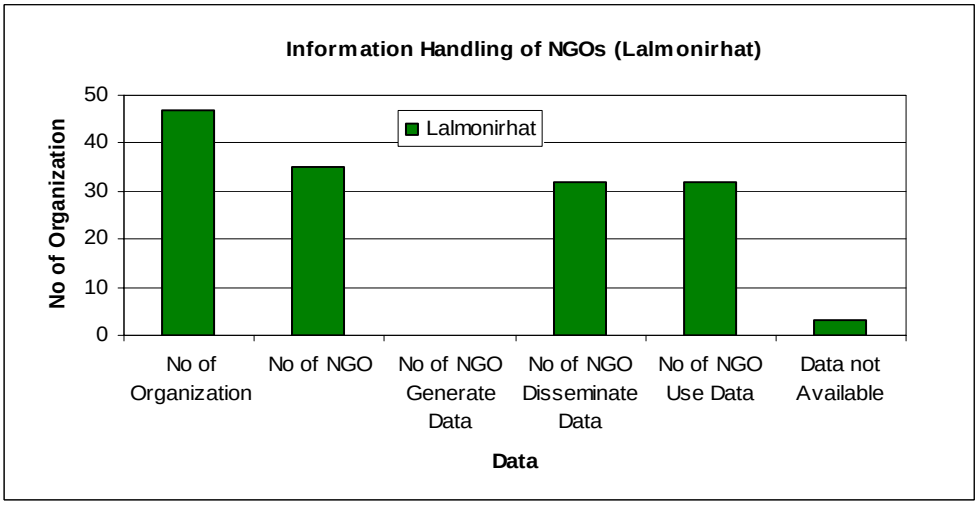


Figure 6.6.5 Handling of Information of NGOs of Lalmonirhat District

Rajshahi

Table 6.6.2 and Fig 6.6.6 show that 15 NGOs out of 16 NGOs generate information related to disasters and all of these organizations also use and disseminate information. The detailed information about information handling of Rajshahi District is presented in Table F7 (Appendix F)

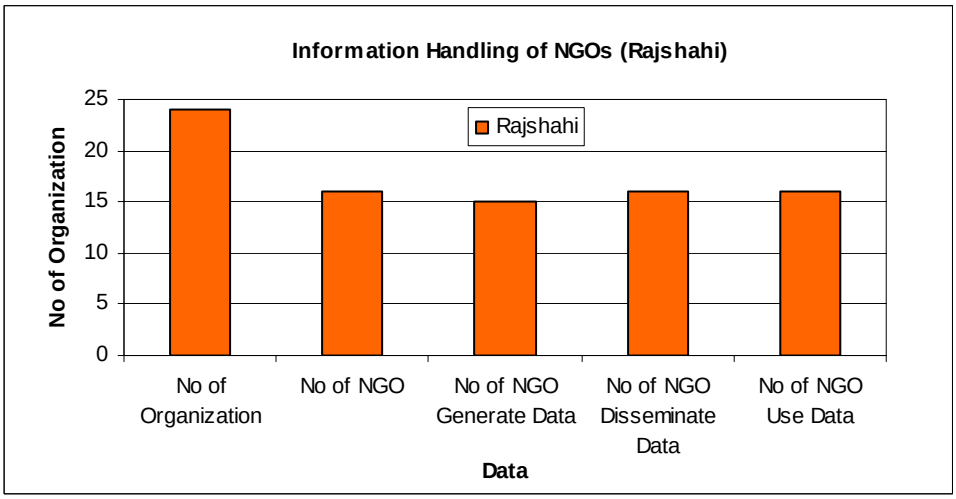


Figure 6.6.6 Handling of Information of NGOs of Rajshahi District

Satkhira

The number of NGOs active in Satkhira district is 23 (from Table 6.6.2 and Fig 6.6.7). Among these 23 NGOs only 2 organizations generate disaster related information. Out of 23 organizations 22 disseminate information and all of them use information. The detailed information about information handling of Satkhira District is presented in Table F9 (Appendix F)

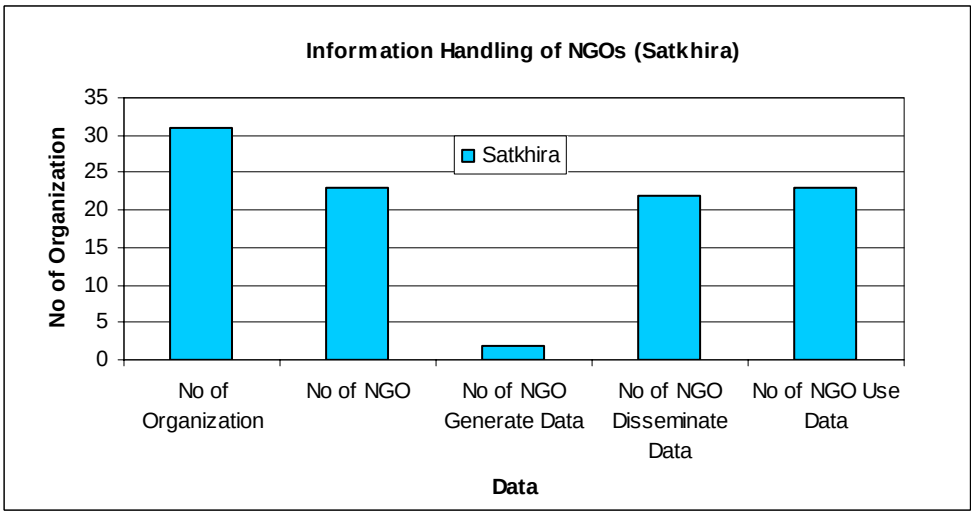


Figure 6.6.7 Handling of Information of NGOs of Satkhira District

Sirajganj`

Table 6.6.2 and Fig 6.6.8 show that there are 30 NGOs active in the district. Information of one organization is not available. Out of 30 organizations no organization generates information and among them 29 organizations use information and only 13 disseminate information. The detailed information about information handling of Sirajganj District is presented in Table F11 (Appendix F)

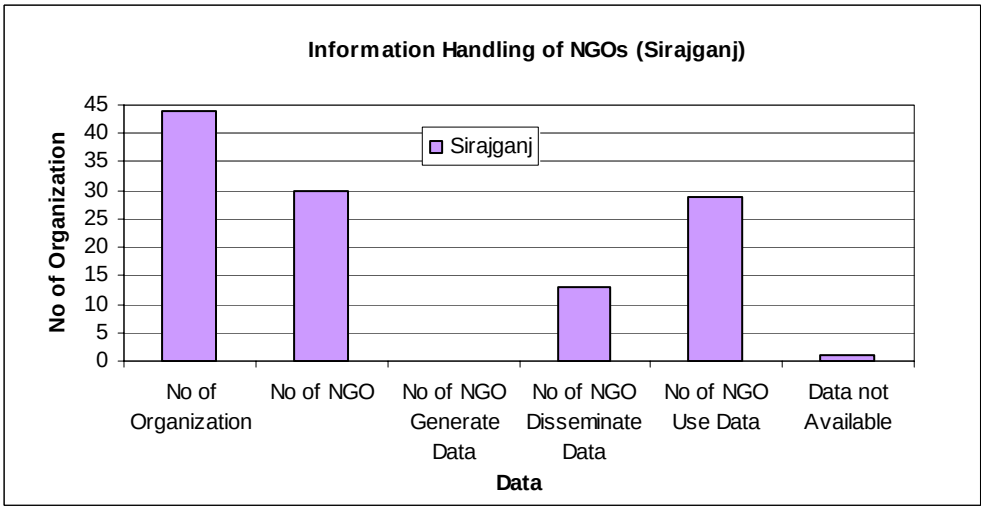


Figure 6.6.8 Handling of Information of NGOs of Sirajganj District

Sunamganj

In Sunamganj District information about 2 out of 14 NGOs is not available (Table 6.6.2 and Fig 6.6.9). Among these 14 organizations only 1 organization is working on information generation. Information is used by all 12 organizations and disseminated by 8 organizations. The detailed information about information handling of Sunamganj District is presented in Table F13 (Appendix F)

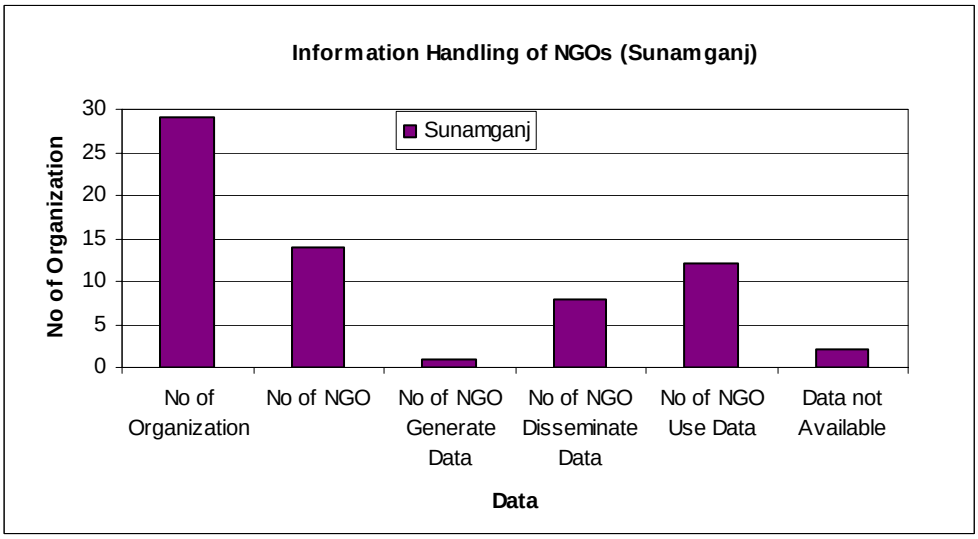


Figure 6.6.9 Handling of Information of NGOs of Sunamganj District

6.6.3 Bottlenecks of EWS at national level

The national level organizations have problems only in information use. The problems described by them are: (i) lack of authenticity in data, (ii) incompleteness and (iii) timeliness. Some organizations also complain about erroneous information given by the newspapers.

The national level organizations gave suggestions for a people oriented simplified forecast system for the local community, which is presented in Table E2 of Appendix E. The number of different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.3.

Table 6.6.3: Problem Faced by Different Types of Organizations at National Level

Organization Type	Generation	Dissemination	Use
International NGO	1	1	1
National NGO		1	1
Others	1	1	3

6.6.4 Bottlenecks of EWS at District Level

Cox's Bazaar:

The main problems of organizations working on disaster in Cox's Bazaar District is in the use and dissemination of information collected from other organizations. The problems described by the organizations are (i) lack of advanced/updated information, (ii) difficulties in communication with affected areas, (iii) non-cooperation of organizations during data acquisition and (iv) lack of equipment at field level.

Some suggestions were given by the organizations facing such problems. The suggestions were (i) improve transportation and communication network, (ii) establish a central information center for collecting up-to-date data from any area, (iii) provide modern transportation and communication equipment at field level.

Training for staff and community to build awareness was also suggested by some organizations.

The bottlenecks of different organizations of Cox's Bazaar District are presented in Table F2 (Appendix F). The number of different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.1.

Table 6.6.4.1: Problems Faced by Different Types of Organizations at Cox's Bazaar District

Organization Type	Generation	Dissemination	Use
International NGO		3	4
National NGO		9	10
Regional NGO		1	1
Local NGO			1
Others		2	2

Faridpur:

The problems are being faced by the organizations in this district are (i) information (water level, rainfall, damage list etc.) is not available on time, (ii) administrative complexity of information sharing/lack of coordination, (iii) accurate information is not available from the field and (iv) lack of skilled manpower.

The organizations offered some suggestion to mitigate these problems (i) establishment of an information center for availability of disaster related data, (ii) modern communication and transportation facility and (iii) increase in availability of funds for training.

The bottlenecks/problems of different organizations of Faridpur District are presented in Table F4 (Appendix F). The number of different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.2.

Table 6.6.4.2: Problems Faced by Different Types of Organizations at Faridpur District

Organization Type	Generation	Dissemination	Use
International NGO		1	1
National NGO		1	1
Local NGO		11	12
Others		1	1

Lalmonirhat:

The 35 NGOs working in Lalmonirhat District face the following problems during the operation of their programs (i) the difference between and accuracy of GoB data and their own, (ii) poor communication (road, telephone, internet) network (iii) data is not available on time, (iv) relief distribution is hampered due to pressure from local government and (v) lack of manpower/volunteers.

The bottlenecks/problems of different organizations of Lalmonirhat District are presented in Table F6 (Appendix F). The number of different types of organizations that face problems in information generation, use and dissemination is given in Table 6.6.4.3.

Table 6.6.4.3: Problems Faced by Different Types of Organizations at Lalmonirhat District

Organization Type	Generation	Dissemination	Use
International NGO		1	1
National NGO		15	15
Regional NGO		2	2
Local NGO		12	12
Others		2	2

Rajshahi:

The problems faced by the organizations working in Rajshahi District are: (i) the difference between and accuracy of GoB data and their own, (ii) administrative complexity of information sharing/lack of coordination, (iii) accurate information is not available from the field and (iv) lack of skilled manpower.

The organizations offered some suggestions to address these problems: (i) improve coordination between GOs and NGOs, (ii) provide training for self-sufficiency and build morals and (iii) regular training and idea exchange with Govt agencies.

The bottlenecks/problems of the different organizations working in Rajshahi District are presented in Table F8 (Appendix F). The number of different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.4.

Table 6.6.4.4: Problems Faced by Different Types of Organizations at Rajshahi District

Organization Type	Generation	Dissemination	Use
International NGO	1		1
National NGO			1
Local NGO	4	3	3
Others			

Satkhira:

The main problems of organizations working on disasters in Satkhira District is in the use and dissemination of information collected from other organizations. The problems described by the organizations are: (i) getting accurate information from the field, (ii) difficulties in communication with affected areas and inadequate transport facilities, (iii) data is not available on time and (iv) lack of manpower and skilled people.

Some suggestions were given by the organizations: (i) improve transportation and communication network, (ii) establish a central information center for collecting up-to-date data from any area, (iii) modern transportation and communication equipment should be provided at field level, (iv) train skilled manpower and (v) modern technology for risk reduction.

Training for staff and community to build awareness was also suggested by some organizations.

The bottlenecks/problems of the different organizations working in Satkhira District are presented in Table F10 (Appendix F). The number of different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.5.

Table 6.6.4.5: Problems Faced by Different Types of Organizations at Satkhira District

Organization Type	Generation	Dissemination	Use
International NGO	2	3	2
National NGO		2	3
Regional NGO		1	1
Local NGO		14	14
Others		1	1

Sirajganj:

The problems faced by the organizations are: (i) difference between GoB data and their own data/field data, (ii) administrative complexity of information sharing/lack of coordination, (iii) accurate information is not available from the field, (iv) lack of time to crosscheck field data and (v) lack of manpower.

The organizations offer some suggestions to mitigate these problems: (i) improve coordination between GOs and NGOs, (ii) modern communication and transportation facilities and (iii) increase in availability of funds for training for manpower development.

Some organizations also suggested that the local community should be involved in the Disaster Management Committee.

The bottlenecks/problems of the different organizations working in Sirajganj District are presented in Table F12 (Appendix F). The number of the different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.6.

Table 6.6.4.6: Problems Faced by Different Types of Organizations at Sirajganj District

Organization Type	Generation	Dissemination	Use
International NGO		2	3
National NGO		4	11
Regional NGO		1	1
Local NGO		6	13
Others			

Sunamganj:

The 14 NGOs working in Sunamganj District are facing the following problems in operating their programs: (i) information (water level, rainfall, damage list) is not available on time, (ii) no information is available from India (Rainfall information) (iii) poor communication (road, telephone, internet etc.) network, (iv) administrative complexity in information sharing and (v) accurate information is not available from the field.

The suggestions offered by the organizations are: (i) rainfall information of India must be available in Bangladesh (ii) assurance of water level and rainfall data availability from government, (iii) coordination between GOs and NGOs, (iv) improved road network for immediate information dissemination, (v) an information center needs to be established and (vi) advanced communication and transportation facilities.

The bottlenecks/problems of the different organizations working in Sunamganj District is presented in Table F14 (Appendix F). The number of the different types of organizations facing problems in information generation, use and dissemination is given in Table 6.6.4.7.

Table 6.6.4.7: Problems Faced by Different Types of Organizations at Sunamganj District

Organization Type	Generation	Dissemination	Use
International NGO			1
National NGO		3	3
Local NGO	1	4	7
Others		1	1

From the above discussion it is clear that most of the NGOs complain about coordination between GO and NGO, accuracy of data, poor communication and transportation system and lack of skilled manpower.

Chapter 7

SWOT and GAP Analysis

7.1 SWOT Analysis

National and local organizations implementing community risk reduction programs in different districts have some strengths, weaknesses, opportunities and risk/ threats (SWOT). The strengths, weaknesses, opportunities and risk/ threats for an organization could be examined in terms of financial, institutional, technical, human resources, policy/ programs and acceptance to the community. SWOT analysis provides a framework for identifying critical issues and helps isolate key issues in order to facilitate a strategic planning to resolve issues.

In this study, SWOT analysis is carried out for individual organizations. A summary of the analysis is presented in the following sections. The strengths and weaknesses of organizations are viewed as pros and cons of the same criteria. For example, some organizations have financial strengths and some have not. Therefore, financial matters come as strengths as well as weaknesses. All other criteria are evaluated similarly.

The SWOT analysis of district level and national level organizations is presented in the following sections.

7.1.1 SWOT Analysis of Organizations in Pilot Districts

A. Strengths

The strengths of organizations, identified in this study, are classified into broad categories as Financial /Fund, Policy/ Programme, Networking, Technology capacity, Management & skilled Resources, Property / Assets and Acceptance of the community (Table 7.1).

Table 7.1: Strengths of Organizations

Major Category	Detail Elements
Acceptance of the community	Goodwill Good personal relation Local People Support Popularity Good relation with Union Parisad
Financial / Fund	Own fund /emergency Fund Credit support Fund raising Liquid Money (Arrange emergency fund)

Major Category	Detail Elements
Management & Skilled Resources	• Skilled stuff / manpower/ trainer • Transparency • Experienced person • Management Capacity • Well Expert Doctor • Commitment to the local community as well as donors • Information collection capability • Organization commitment • Good governance • Strong Managing Committee • Foreign Trainer • Team sprit • Trained and strong volunteer network • Training in Army • Work in Pearle Approach
Networking	• Good network • Beneficiaries participation involvement • Better co-ordination between GOB and NGO • Collaboration with different organizations dealing with disaster • Network with government agencies • NGO and GoB Support • Peoples participatory Approach
Policy / Programme	• Dedication to Community • Planning • Policy Category Plan • Root level development activity
Property/ Assets	• Better logistic support • Cyclone shelter • Local Transport • Medical support • Office available • Organizational assets and Infrastructure/ shelter • Organizational Setup • Water Transportation Material (Boat,Boya, Speed Boat, Life Jacket etc.) • Wear house/Godown • Wireless set
Technological capacity	• Better Early Warning System • Dedication to Community • Disaster Area Identity frication • Technology and equipments for post flood rehabilitation with tube well & sanitation

The strengths of organizations are separately examined for each district and prioritized. Most of the organizations mentioned that they have skilled human resources and management as strength (Fig. 7.1). Therefore, the major strength, found in most of the districts, was skilled human resources and management. Networking, acceptance to the community, property or assets, etc. had the second priority in strengths.

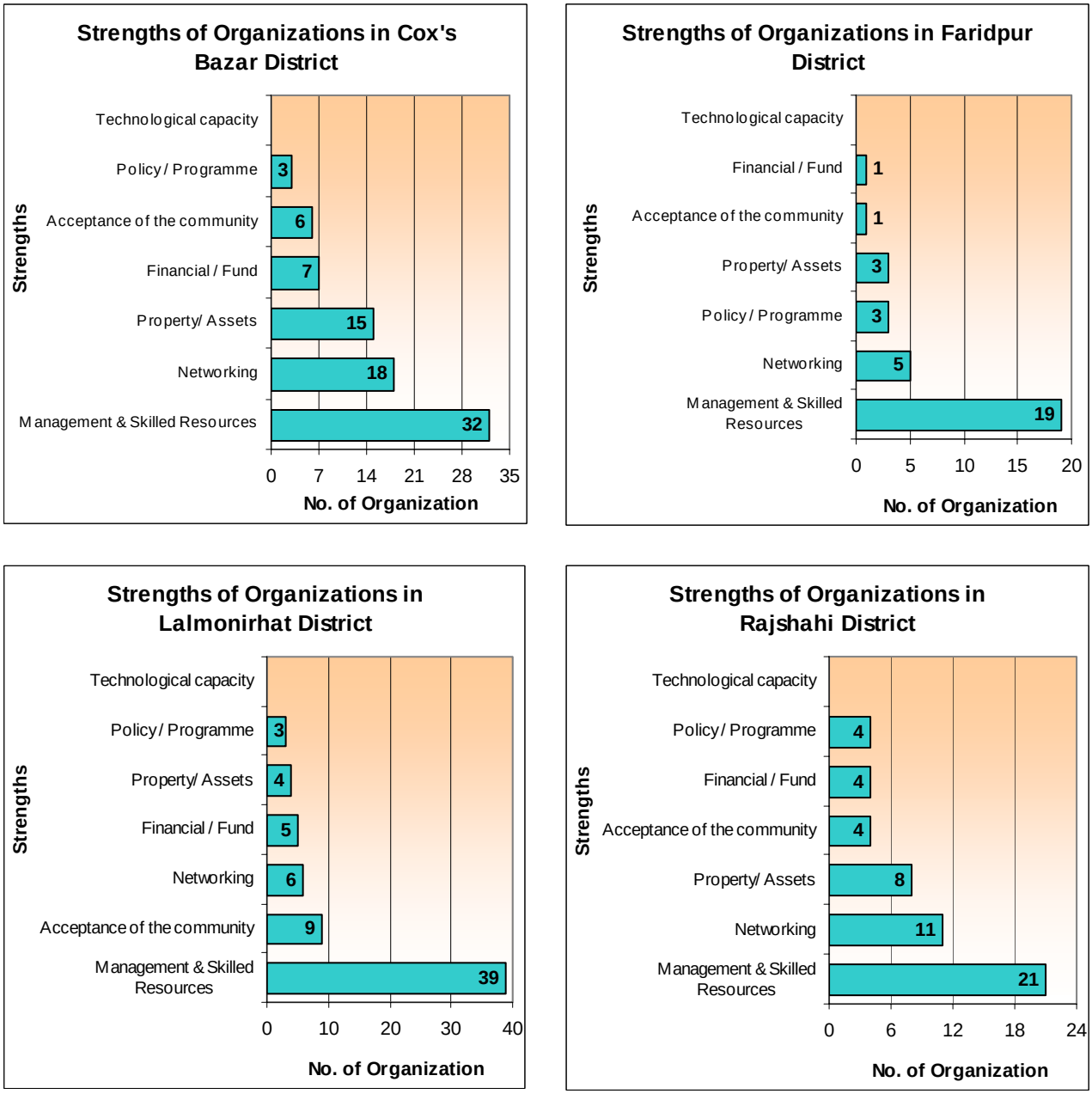
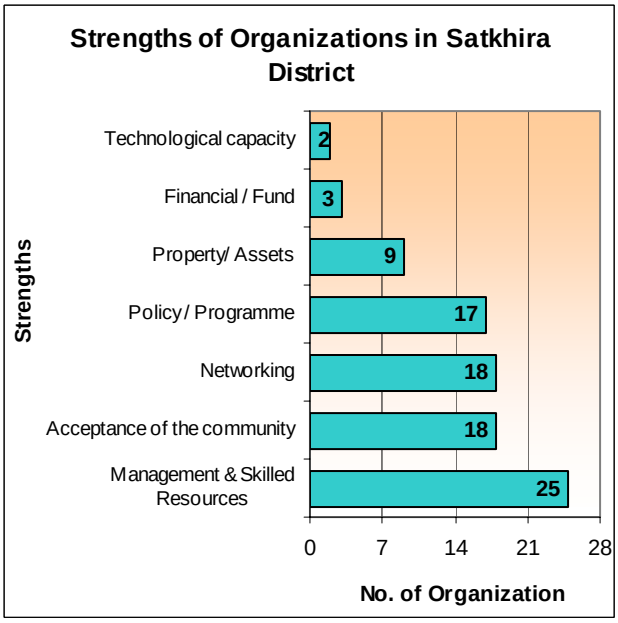
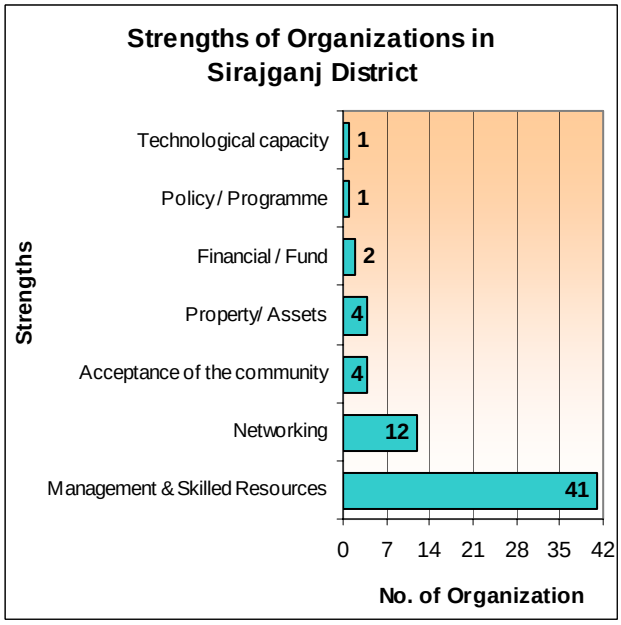


Figure 7.1: Strengths of organizations in each district.





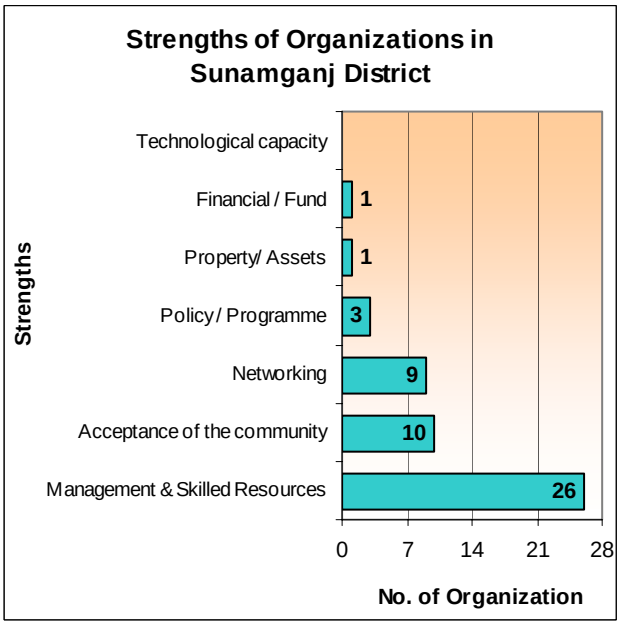


Figure 7.1: Strengths of organizations in each district (continued).

B. Weakness

The weaknesses of the organizations were identified and grouped into major categories, such as Communication, Financial Problems, Lack of modern Technology, Lack of policy, Lack of skilled Resources and Administration, Networking and Property / Assets shortage. The detailed elements under each category are given in Table 7.2.

Table 7.2: Weaknesses of Organizations

Major Category	Detail Elements
Communication	• Lack of Motorcycle / vehicle • Road communication problem • Shortage of equipment • Transport problem • Water Transportation Material (Boat, Speed Boat, Life Jacket etc.)
Financial Problem	• Dependency for Emergency fund • Fund / financial limitation • International donor reduce money • Lack of Donor's
Lack of modern Technology	• Lack of modern Technology for emergency purpose • Arsenic reduction facility is not adequate • Dredging machine is not sufficient • Limitation of modern technological training • Need Wireless System • No information of rainfall in India. • Not available early warning system for flash flood • Problem of computer facilities • Signal System • Tele communication problem • Upgrade of early warning system
Lack of policy	• Lack of Planning • Limitation of meeting • Limitation of project implementation duely • More research need for water Quality • Poor work on Disaster • Weakness of proper Guide Line
Lack of skilled Resources and Administration	• Administrative Support • Disaster specialist lacking • Lack of skilled manpower • Limitation of disaster related training • Limitation of office stuff • No trainer • Not enough person against post • Not enough volunteer • Relief distribution harassment • Weakness of local management
Networking	• Administrative Support • Afraid to talk • Availability of right information • Limitation of meeting on disaster with NGO. • Limitation of inter departmental coordination • Need of Share on the Other Agency

Major Category	Detail Elements
	• Proper Disseminate Data
Property / Assets shortage	• Crop damage • Lack of office building • limitation of khash land • Medical facility is not adequate • No wear house • Spawn limitation • Training Material

It was observed that most of the organizations had weaknesses in the areas of funds, communication infrastructures and technologies (Fig. 7.1). Lack of skilled resources and administration had the second most priority in the weaknesses of organizations whereas policy initiatives were not considered as a significant weakness of the organizations.

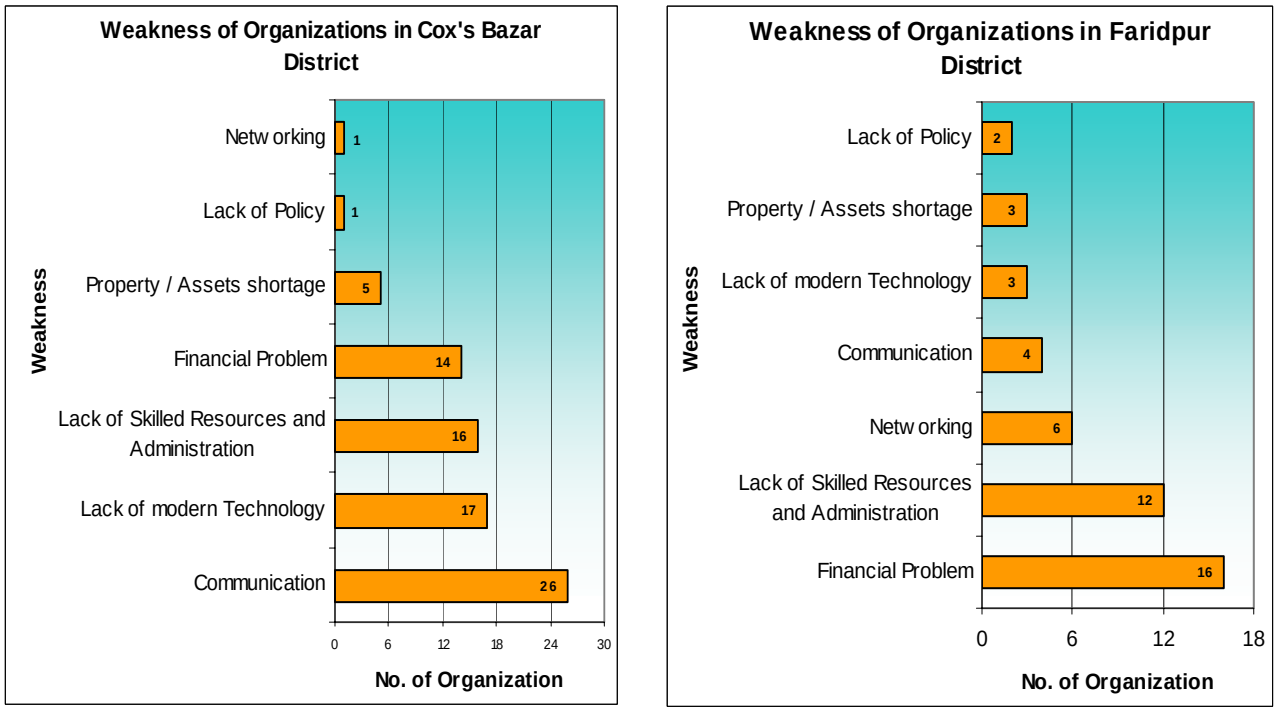
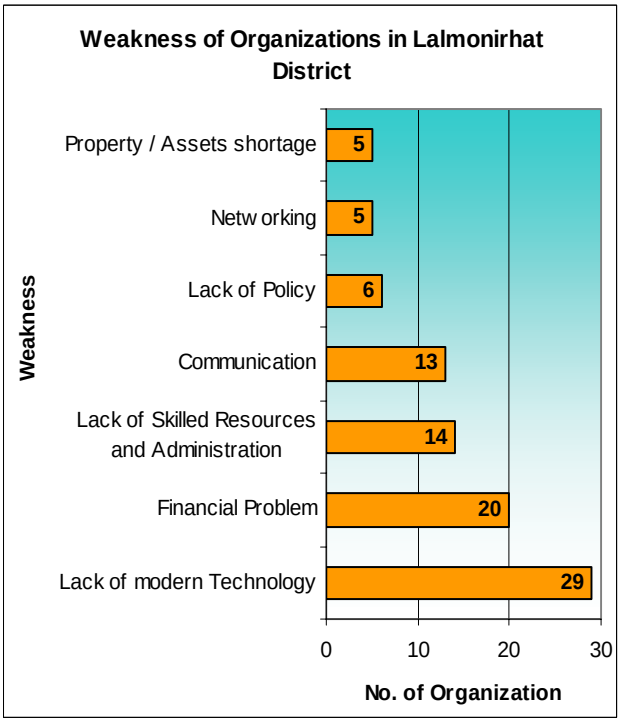
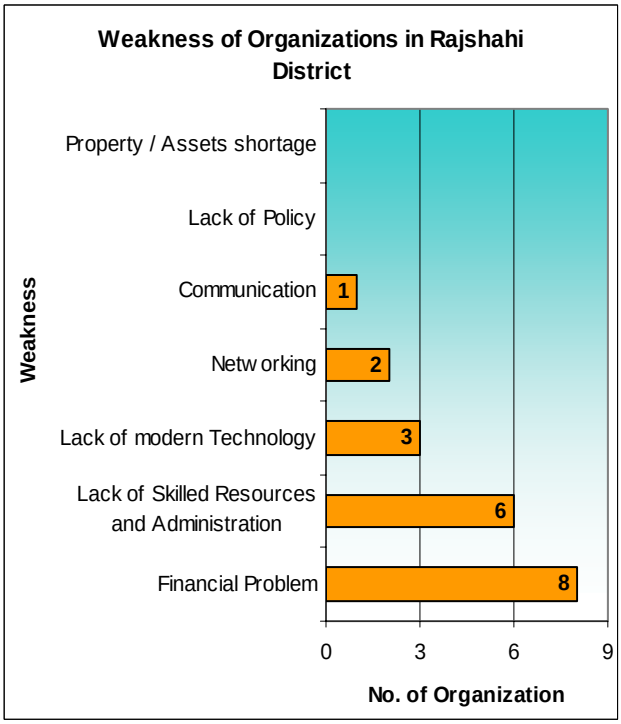
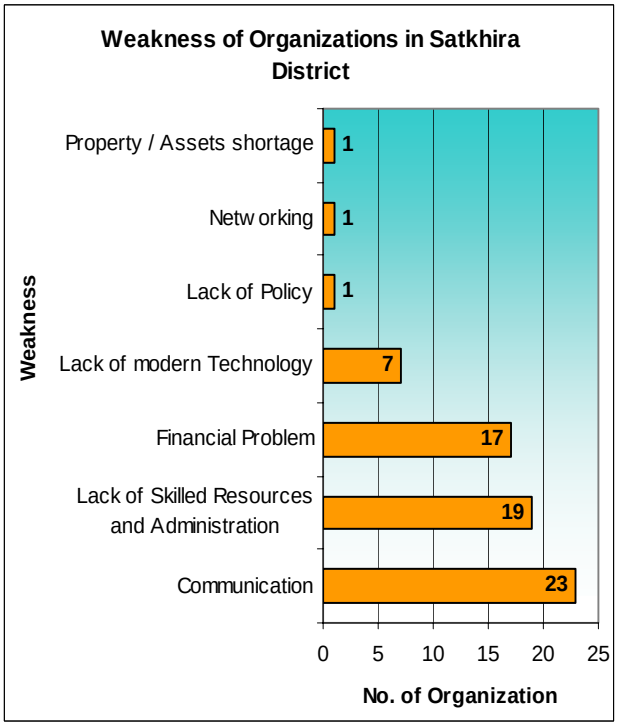


Figure 7.2: Weaknesses of organizations in each district.







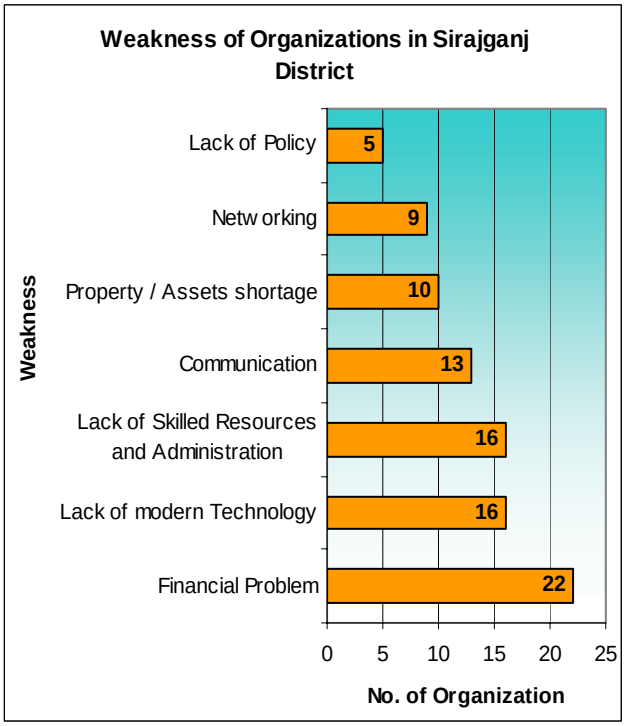


Figure 7.2: Weaknesses of organizations in each district (continued).

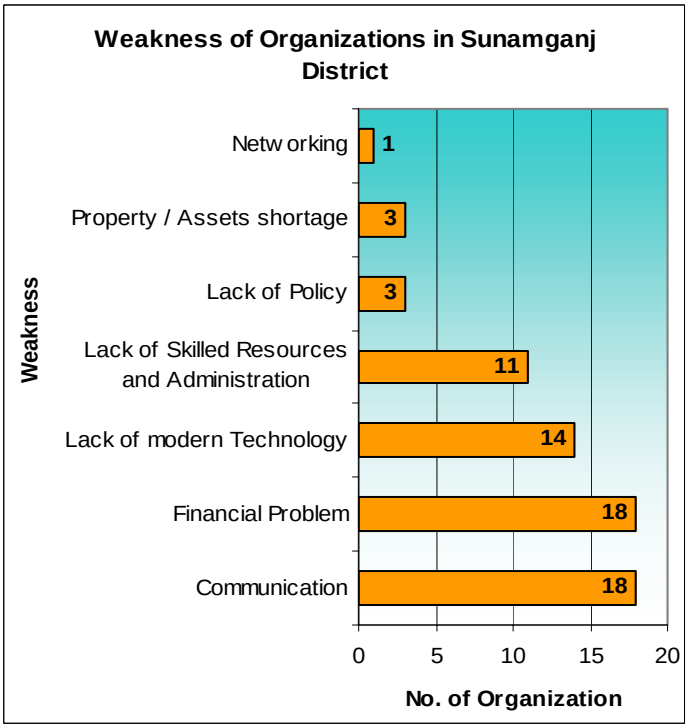


Figure 7.2: Weaknesses of organizations in each district (continued).

C. Opportunities

There are a lot of opportunities to improve the risk reduction programs of respective organizations. The major categories of opportunities identified in the organizations were Improvement of institutional mechanism, Provision of safety net, Rehabilitation Programs, Emergency services and improved preparedness activities. A detailed list of opportunities under each category is given in Table 7.3.

Table 7.3: Opportunities of Organizations

Major Categories	Detail Elements
Improve institutional mechanism	Co-ordination/ networking with community, national and international level. Capacity building at local level. Established Earth quake Information Center Government cooperation Special training for organization stuff Radar Station modification

Major Categories	Detail Elements
Provision of safety net (feedings)	Cash for work (CFW/ KABITA) Food for work / Kabikha VGF, VGD Suggestion and Financial Help School feeding Food Security for Vulnerable Group Development women and the dependence (FSVGD) Scholarship Scholarship for child
Rehabilitation Programs	Seed Bank Interest free credit support Rural Micro credit Emergency fund
Emergency services	Sanitation Blood donor Information House and Health Support Handicrafts Material (Stretcher) Medical Camp Rescue team Early warning center provide safe drinking water
Improved preparedness activities	Emergency fund Emergency Storage of food Disaster related training

Among the suggestions of the organizations, opportunity of improvement of institutional mechanism and rehabilitation programs received the highest priority (Fig. 7.3). It was observed that improved preparedness activities received second priority in the cyclone prone Cox's Bazaar District. In other cases, the provision of safety net programs were chosen as the first opportunity in Lalmonirhat District, where there is a seasonal food crisis every year.

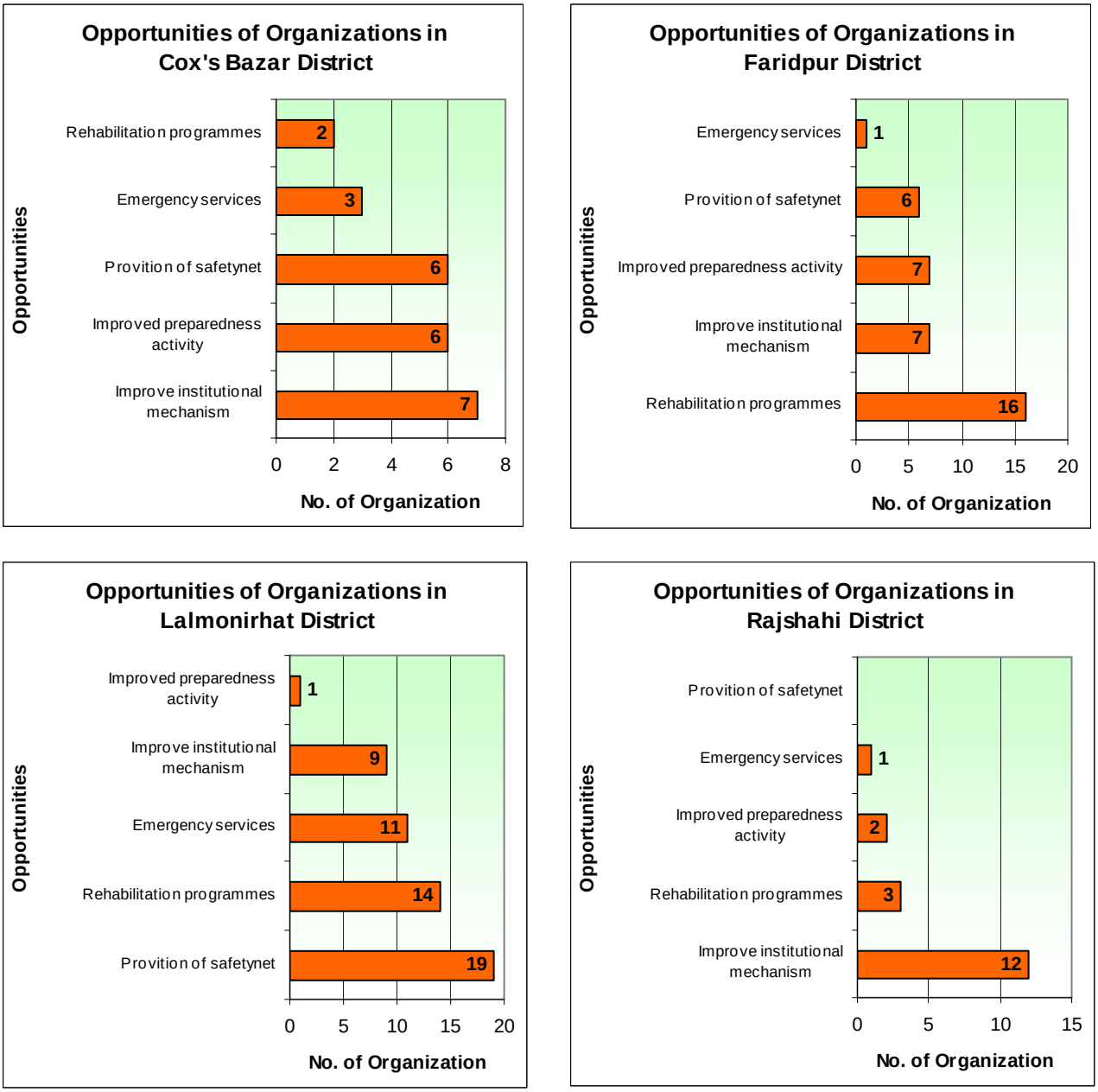


Figure 7.3: Opportunities of organizations in each district.

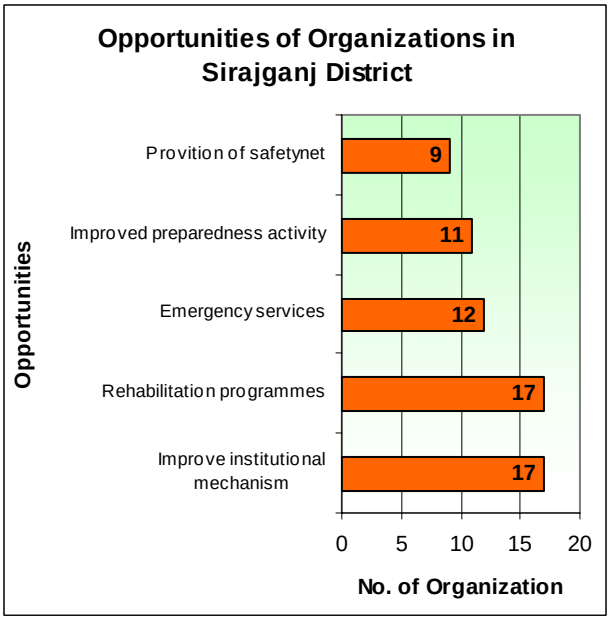


Figure 7.3: Opportunities of organizations in each district (continued).

D. Risk / Threat

Every organization experiences some risks/threats while implementing their programs. The threats may be social, political, financial, policy/legislation, uncertainty of resources, etc. A list of risks/ threats obtained from a field survey is presented in Table 7.4. The major categories of risk/ threats are Uncertainty of fund, Uncertainty of resources, Infrastructure (communication), Social / political conflicts (acceptance), Overlapping, Capital investment / hazard, Trained personal and Mandate/ Legal threat.

Table 7.4: Risk/ Threats of Organizations

Major Categories	Detail Elements
Uncertainty of fund	▪ Limitation of fund ▪ Govt. fund reduced ▪ International agencies reduce fund ▪ Timely fund not available ▪ Credit defaulter (migrated to safe place due to disaster)
Uncertainty of resources	▪ Arsenic free tube well supply is not sufficient ▪ Seed, fertilizer facilities is not always available ▪ Cheap labor is not available due to NGOs high payment of wages
Infrastructure (communication)	▪ Poor road communication ▪ Structural week ▪ Disruption in communicate / disseminate of EWS message (FFWC Information)
Social / political conflicts (acceptance)	▪ Take benefit and credit by others organization ▪ Local Problems (Powerful Man) ▪ Peoples Un-believe NGO ▪ Political Hamper ▪ Life risk ▪ Right based issue /Anti-party threat ▪ Do not countable although they have capabilities to the do project ▪ Union chairman certificate ▪ Stealing in relief time ▪ Frequent strike (hartal)
Overlapping	▪ Same programme under different organization ▪ Same beneficiaries under different organization
Capital investment / hazard	▪ Credit defaulter (migrated to safe place due to disaster) ▪ Crop Damage ▪ River erosion ▪ Natural Climate change
Trained personal	▪ Limitation of better training ▪ Skilled manpower switch to other organization for better financial support ▪ Cannot deploy human resources in different area and different disaster.
Mandate / Legal threat	▪ National policy. ▪ Conditional resources allocation by Donors. ▪ Partner dependency on AAB decision making. ▪ Administrative system(Bureaucratic)

Among the threats, most of the organizations mentioned that the social/ political conflicts are the main threats to their organizations (Fig. 7.4). Uncertainty of funds and capital investment are also threats to most of the organizations. In some cases overlapping of programs and beneficiaries results in redundancy making it difficult to evaluate programs.

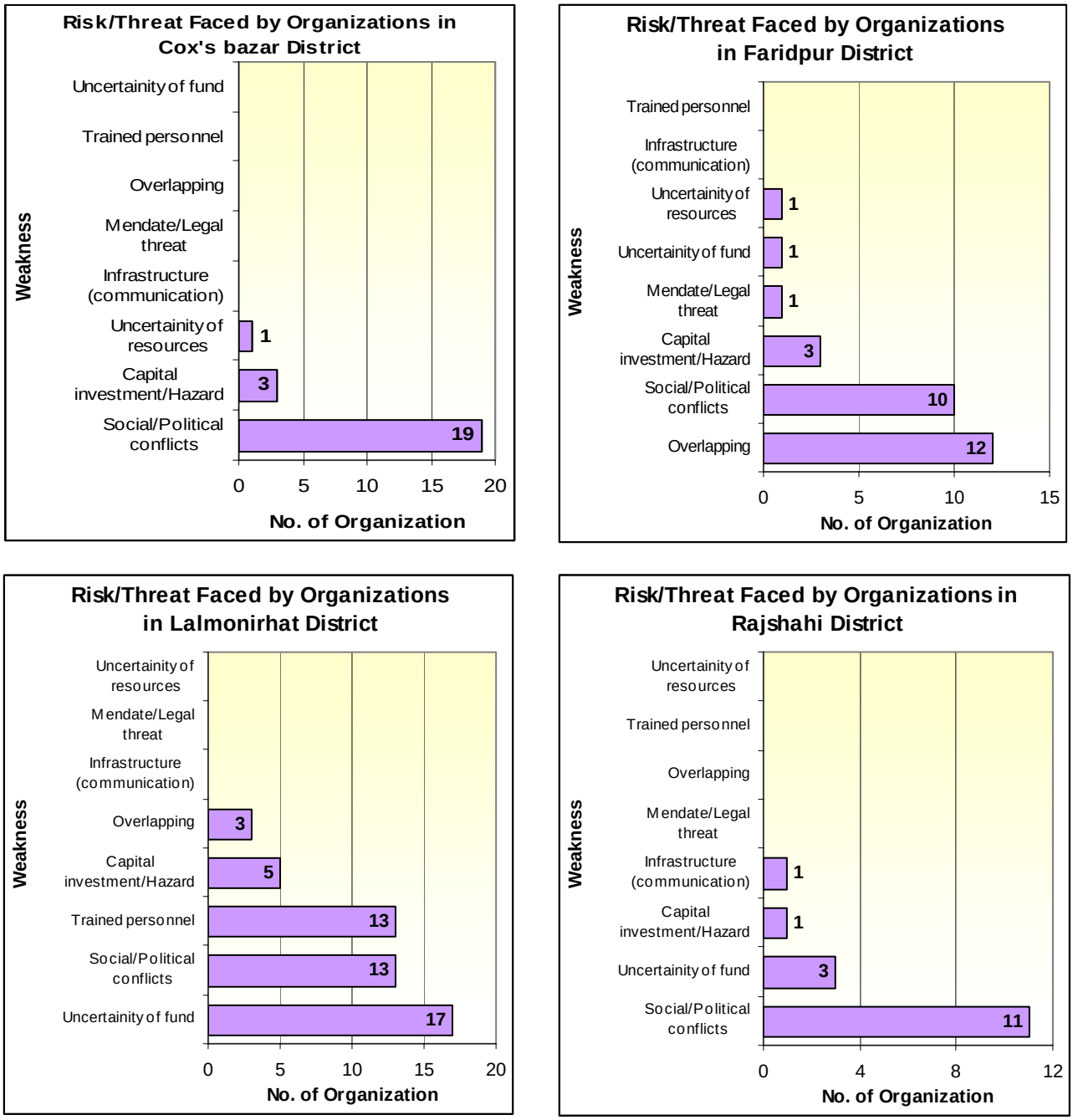
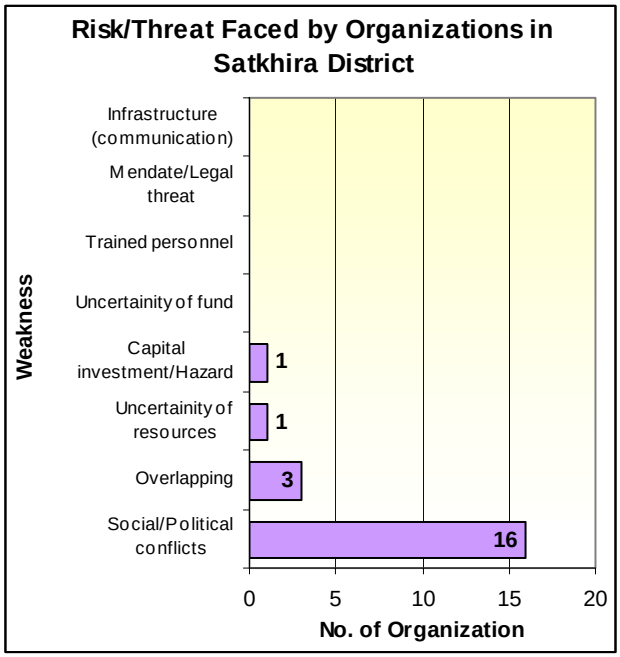
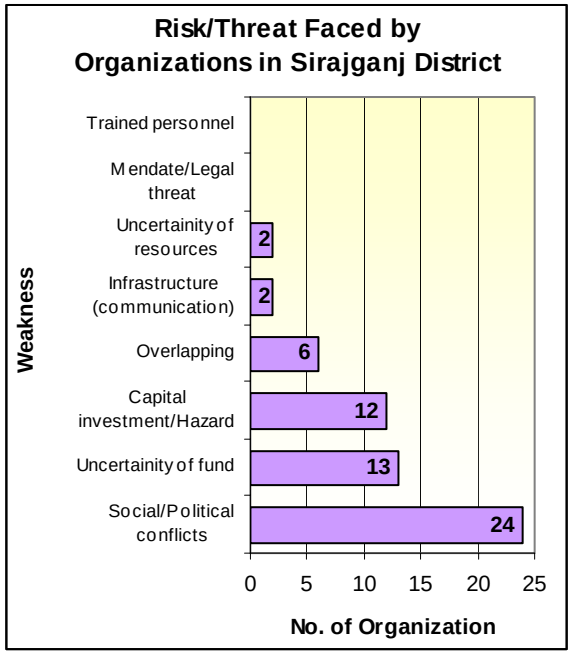


Figure 7.4: Risks/ threats faced by organizations in each district.





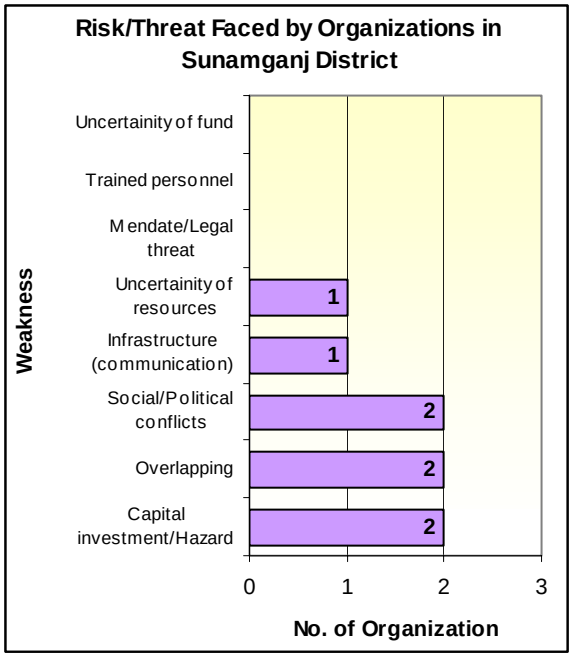


Figure 7.4: Risks/ threats faced by organizations in each district (*Continued*).

7.1.2 SWOT Analysis of National Organizations

National organizations, both government and non-government organizations, which have disaster management related activities, were visited and data on their strengths, weaknesses, opportunities and threats were collected. A total of 52 organizations were visited and a summary of observations are given as follows.

At the national level, some of the organizations are rich in management and skilled manpower whereas some organizations have weaknesses of management and lack of skilled human resources. This observation is based on field data, which is presented in Figure 7.5 and 7.6.

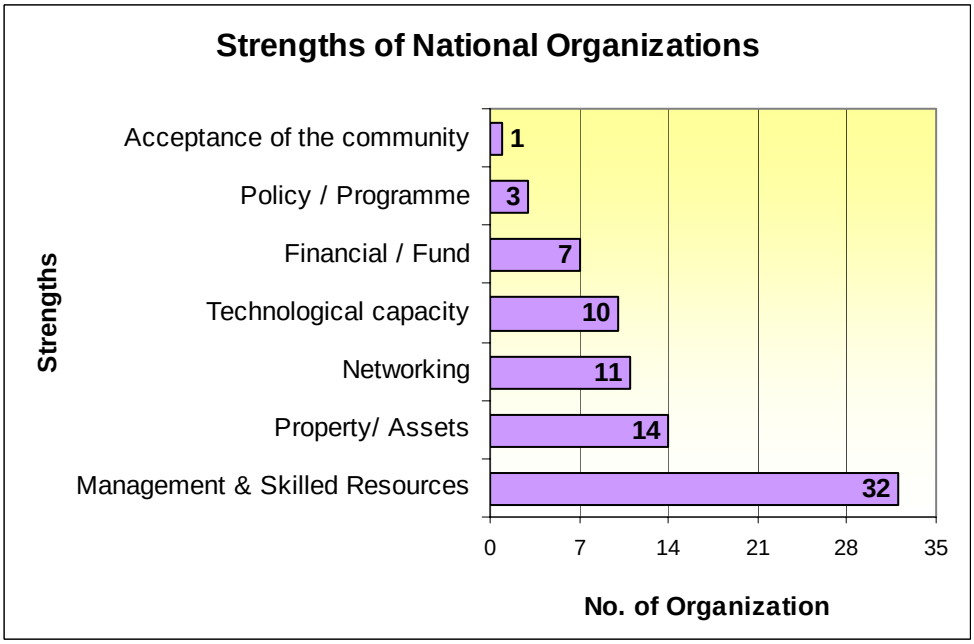


Figure 7.5: Strengths of National Organizations

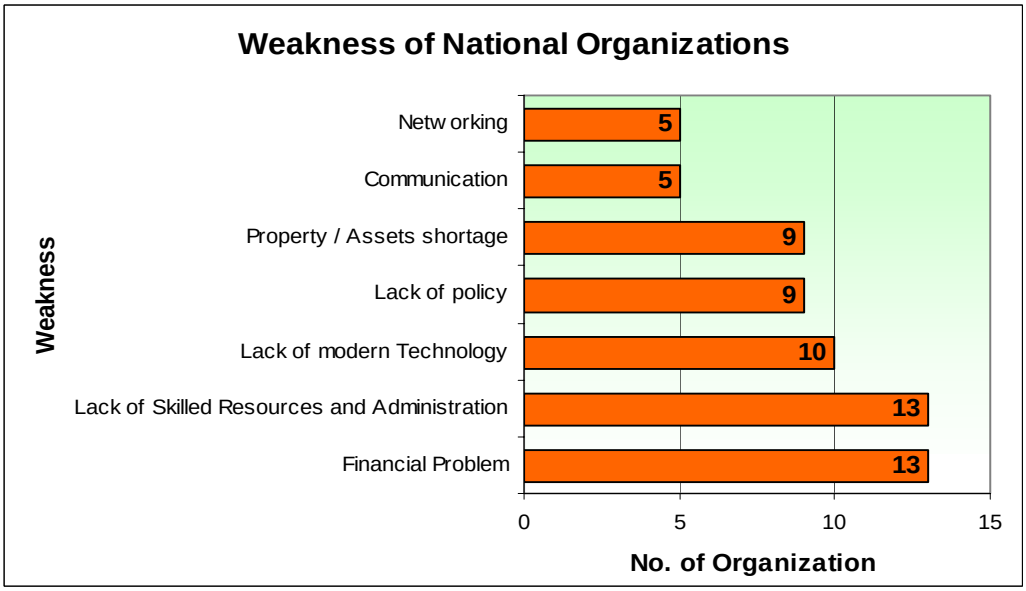


Figure 7.6: Weaknesses of National Organizations

Although some organizations are strong in technologies, properties/ assets and a wide network with national and international agencies, there are some that lack policies, funds and modern technologies.

However, some national organizations have enough opportunities to make them more efficient in preparedness activities (Fig. 7.7). They have the options to develop their institutional set up to expand their programs.

While implementing their programs, some organizations face major threats like social/ political conflicts, legal threat and leaving of trained personnel (Fig. 7.8).

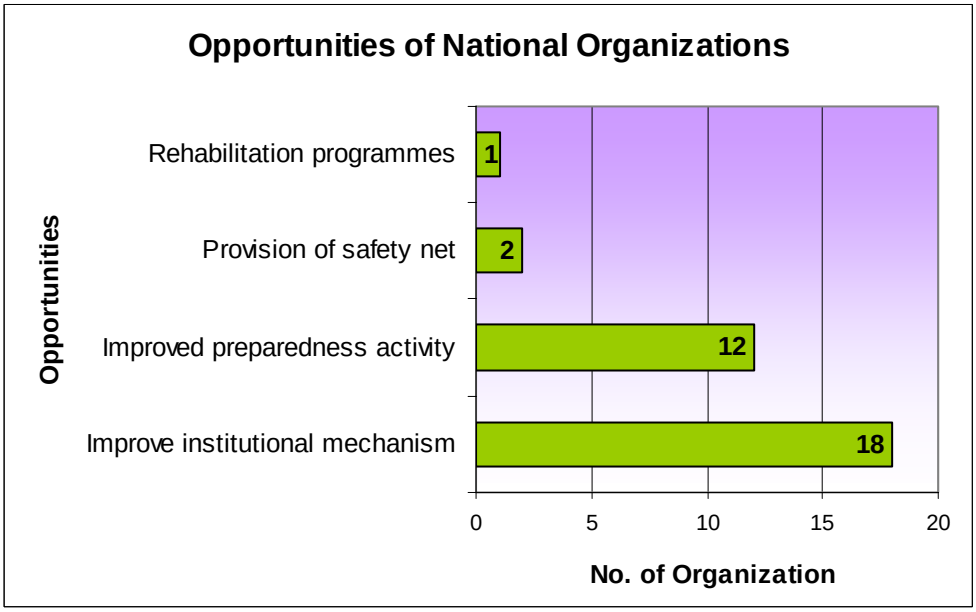


Figure 7.7: Opportunities of National Organizations

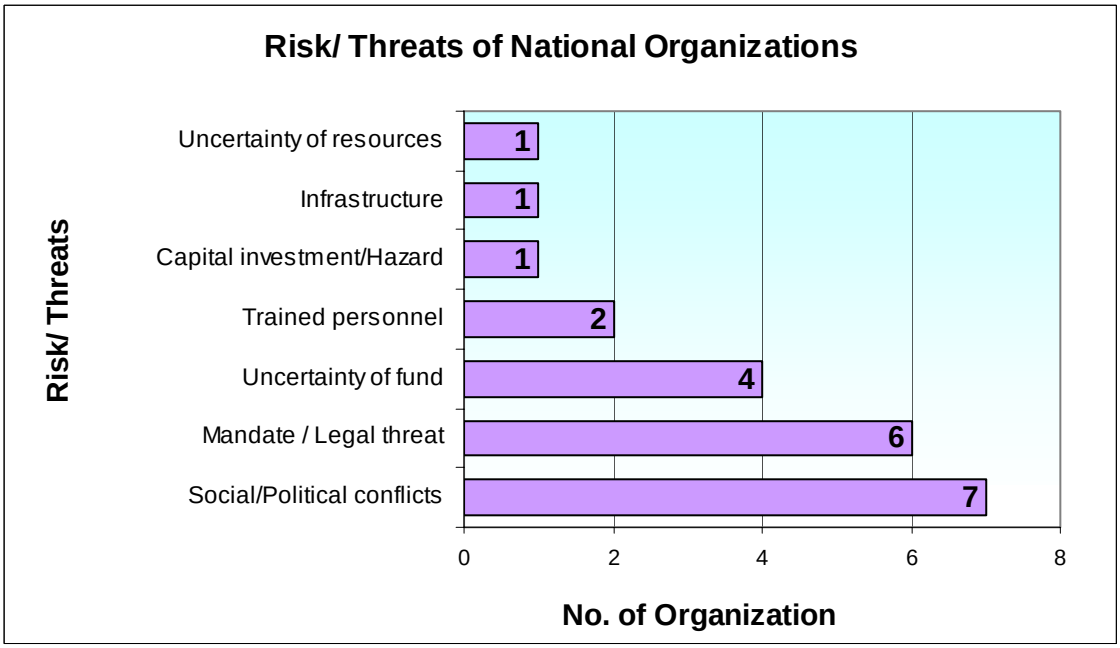


Figure 7.8: Risk/Threats of National Organizations

A detail SWOT analysis of each national and district level organization was carried out. All these records are incorporated in a prototype MIS of this project. A matrix of SWOT analysis for the organizations in each district is given in Appendix G.

7.2 Gap Analysis

Since CDMP follows the internationally accepted risk management framework (Fig. 7.9) to ensure a comprehensive and well coordinated community risk reduction approach, gaps in programs and activities of national and community level organizations are analyzed considering the steps of the risk management framework. Mainly three stages were examined for each organization in this study, such as Hazard Analysis (Identification of risk/ hazard, both in temporal and spatial contexts), Risk Assessment (both in hazards and resource availability contexts) and Risk Treatment (in terms of Prevention, Preparedness, Response and Recovery programs).

Although there are a lot f organizations working in the field of risk and disaster management, the working area and fields are almost the same for a region. Most of the organizations are involved in post-disaster related activities (e.g. relief and rehabilitation programs). Some of the national organizations are involved in hazards and risk analysis. But other type of programs may be more important than the existing programs. Therefore, a gap analysis is important to prepare a comprehensive plan for risk management.

Considering these issues, a gap analysis for three stages of risk management in each district and organization are described in the following sections.

7.2.1 Gaps in Hazard Analysis

A hazard analysis consists of hazard identification and determination of temporal and spatial extent of hazard. National level hazard mapping was done by several organizations. A list of organizations that have carried out national level hazards analysis is given in Table 7.5.

Table 7.5: Hazard analysis by different organizations.

Organization	Hazard	Level of Extent
WAPRO	Flood, Drought, Erosion, Cyclone	National
IWM	Flood, Salinity	Regional
CEGIS	Flood, Drought, Erosion, Cyclone	National, Regional, Local
BARC	Drought	National
CARE	Flood, Cyclone	Regional, Local
DMB		
GSB	Earthquake	National, Regional

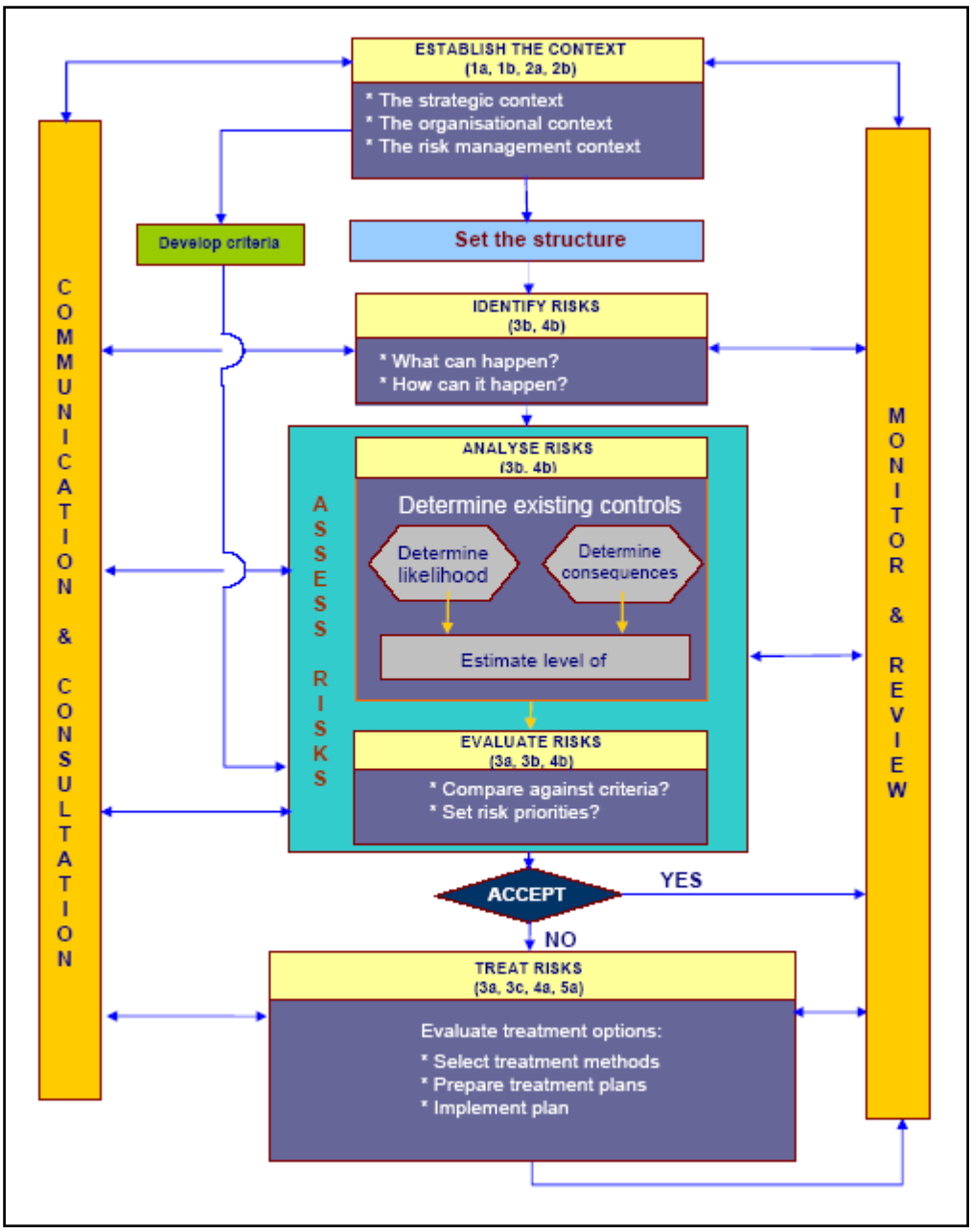


Figure 7.9: Risk Management Framework (Source: CDMP, MoFDM).

Although some national level organizations have carried out hazard mapping up to thana level in a pilot study area, district level organizations have not carried out any hazard mapping or analysis. They use information from national organizations. But local level hazard analysis and mapping is very important to strengthen community level risk reduction programs. The community level hazard analysis will help to update the national level hazards analysis and mapping.

7.2.2 Gaps in Risk Assessment

Risk assessment with respect to single/ multi-hazards is an important task for risk management. After hazard analysis, determination of the magnitude of effects is vital for evaluating the scope of risk reduction programs.

National and district level organizations use several risk assessment methods to assess risk. The overall risk assessment methods are categorized as follows:

- Academic study/Desk study
- Community based assessment

- GIS based assessment
- Indicator based assessment
- Model based assessment
- Vulnerability assessment

It was observed that most of the national organizations carried out risk assessment using community based assessment and vulnerability assessment. Modern technology based approaches like GIS based assessments and Model and Indicator based assessments are applied only for a few hazards (floods, erosion, tidal surges, cyclones, tornadoes, and tsunami). Table 7.6 shows the type of risk assessment methods used for specific hazards by national organizations. The blank cell shows that the risk assessment method was not applied for the respective hazards. Risk from other hazards is not assessed with modern methods as the organizations lack of modern technologies.

Another limitation of these risk assessments was the limited study area. Each risk assessment approach covered a very limited area, whereas a countrywide risk assessment is required for multi-hazard environment.

In the cases of district level organizations, modern technology based risk assessment was very limited. Community based assessments and vulnerability assessments are commonly used in all district for all hazards as shown in Table 7.7. However, risk assessment is not carried out for all hazards. Basically risk assessment was carried out on a project basis and in very few areas, not covering the whole district.

Weaknesses in risk assessment of the community level organizations comprise lack of skilled manpower, policy, technology, network with national organizations and available fund.

Table 7.6: Types of Risk Assessment methods used for specific hazards by national organizations.

Hazards	Risk Assessment Type						
	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment
Arsenic							
Cold							
Cyclone							
Drought							
Earthquake							
Erosion							
Flood							
Hail storm							
Landslide							
Salinity							
Sedimentation							
Thunder Storm							
Tidal surge							
Tornado							
Tsunami							
Water Logging							

Table 7.7: Types of Risk Assessment methods used for specific hazards by district level organizations.

Hazards	Cox's Bazar District							Faridpur District							Lalmonirhat District							Rajshahi District						
	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment
Arsenic																												
Cold																												
Cyclone																												
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Earthquake																												
Erosion																												
Flood																												
Hail storm																												
Landslide																												
Salinity																												
Sedimentation																												
Thunder Storm																												
Tidal surge																												
Tornado																												
Tsunami																												
Water Logging																												

Note: Ash shaded cells represent hazards that do not occur in the district.

Table 7.7: Types of Risk Assessment methods used for specific hazards by district level organizations (continued).

Hazards	Satkhira District							Sirajganj District							Sunamganj District						
	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment	Academic study/Desk study	Community based assessment	GIS based assessment	Hazards assessment	Indicator based assessment	Model based assessment	Vulnerability assessment
Arsenic																					
Cold																					
Cyclone																					
Drought																					
Earthquake																					
Erosion																					
Flood																					
Hail storm																					
Landslide																					
Salinity																					
Sedimentation																					
Thunder Storm																					
Tidal surge																					
Tornado																					
Tsunami																					
Water Logging																					

Note: Ash shaded cells represent hazards that do not occur in the district

7.2.3 Gaps in Risk Treatment

Risk treatment options were categorized into prevention, preparedness, response/ relief and recovery/ rehabilitation activities as described in Chapter 6. With respect to single/ multi-hazard environment, the risk treatment strategies should be multi-dimensional approach and pro-active approach. If prevention and preparedness activities can be taken more then loss of property and loss of national capital can be reduced. But small organization cannot take effective prevention/ preparedness action against any hazards due to lack of information and fund. Therefore, it is found that most of the national NGOs are engaged in awareness building and preparedness activities and GOs are involved in all activities, while most of the organizations in pilot districts are involved in post-disaster activities i.e. response/ relief and recovery/ rehabilitation (Table 7.8).

Among the prevention activities, operation management and planning is not done in most of the districts. In preparedness activities, awareness and training programmes are conducted by most of the organization but vulnerability reduction and regulatory measures are not taken by the organizations frequently. In post-disaster activities, emergency response and financial support are prominent than other activities (Table 7.8).

Table 7.8: Gaps in Risk Treatment Activities in Seven Pilot Districts

Risk Treatment	Service Line/ Broad Categories	Number of activities for each risk treatment category in each district													
		Coxbazar		Faridpur		Lalmonirhat		Rajshahi		Satkhira		Sirajganj		Sunamganj	
		GO	NGO	GO	NGO	GO	NGO	GO	NGO	GO	NGO	GO	NGO	GO	NGO
Prevention (P)	Physical Intervention	2		3	2	2	1	9	1	3	10	4	1	12	7
	Regulatory Measures			5	5			2	14	1	17		4	1	5
	Operation Management & Planning					1		1		1				1	
Preparedness (P)	Awareness Building & Training	24	17	10	29	11	50	4	18	5	18	16	34	20	31
	Empowering Early Warning System	11	6	2	8		1	3		7		2	1	3	
	Reduce Vulnerability	2	5	9	10	9	4	2	5	2	2	3	10	2	12
	Regulatory Measures		1										1		
Response/ Relief (R)	Emergency Response	21	13	9	31	24	66	12	20	14	60	27	46	32	26
	Operation and Maintenance	2		3		9	1	8				1	1	8	1
Recovery/ Rehabilitation (R)	Financial Support	1	1	3	11	1	23	8	2	7	21	6	12	2	5
	Health Assistance	1		2	1	1			3	1	1	3		4	2
	Rehabilitation of Damaged Infrastructure	6		7	6	10	4	10	6	7	22	7	13	17	12
	Resettlement & Rehabilitation of Affected People	5		3	2	3	2	12	2	7	7	6	6	4	1

Note: The blank cells represent that organizations have no activities in that broad category of risk treatment.

Chapter 8
Conclusion and Recommendations

8.1 Conclusion

The inventory of risk reduction program study is the pilot study where a prototype GIS based MIS and Database is developed through inventory of ongoing, recently completed and proposed community risk reduction initiatives of major players active in the field of disaster management and risk reduction in Bangladesh. The study output contain: (i) organizations working with risk reduction at national and local level, (ii) institutions working with risk reduction activities in terms of PPRR (Prevention, Preparedness, Response and Recovery or Rehabilitation), (iii) different programs for PPRR activities in different districts for specific disasters, (iv) institutional capacity in terms of human resources and technical capabilities, (v) list of information, education and communication (IEC) materials, (vi) list of training programs and trained peoples and (v) existing early warning systems (EWS) and bottlenecks. All these information will be useful for disaster risk reduction planning.

Community perception on disaster risk reduction has also been assessed through community level or stakeholder focus groups discussion. Further a draft Service Line for different PPRR activities has been developed discussing with CDMP, which is one of important output for disaster mismanagement issues. The SWOT (Strength, Weakness, Opportunities and Threats) of different organizations was analyzed and this SWOT will be helpful in assessing the overall capacity of individual institutions in risk reduction activities.

From the collected and available data risk, hazard and resources mapping has been done. Another important and new dimensional activity was gap analysis. Gap analysis has been done for different organization in terms of hazard analysis, risk assessment and treatment for the specific gap. Another findings of the study is data accessibility to different organizations specially the government organization. However, the prototype GIS based MIS developed under this study could be considered as the base or platform for future in risk reduction planning activities.

8.2 Recommendations

Based on the experiences and observation from this study the following recommendations are made:

(i) The Prototypes MIS developed under this study need to be extended for whole country. Further, the MIS can be deployed to CDMP and as well as other organization those are working with disasters related activities.

(ii) Service Line for PPRR activities is developed under this study is draft which need to finalized and in an extended forms.

(iii) The CRA methods also draft, need to be finalized for facilitating the risk reduction activities.

(iv) Pilot resources mapping for risk reduction has been done under this study, this could be done for whole country at detail level.

(v) Well-accepted hazard and resources mapping is very urgent for risk reduction in Bangladesh which can done through detailed study on this issues.

(vi) Treatment of gap in hazard and risk analysis can be done through detail PPRR activities, for further detailed studies.

(vii) The inventory and MIS can be extended for all other districts of Bangladesh.

(viii) The Prototype MIS can be a full fledged software and should be made web enabled for wider accessibility through internet

(ix) An institutional mechanism should be developed for co-ordination among local and national organizations is essential to this initiative (software and database) for disaster management.

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