Government of the People's Republic of Bangladesh
Department of Disaster Management
Ministry of Disaster Management and Relief

Multi Hazard
Risk and
Vulnerability
Assessment,
Modeling and Mapping

RISK ATLAS

VOLUME II

Geological and Environmental Hazard, Exposure, Risk Assessment (Earthquake, Tsunami, Tecnological and Health)

MULTI-HAZARD RISK ATLAS

Government of the People's Republic of Bangladesh

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Message from Secretary, MoDMR

Government of the Peoples' Republic of Bangladesh had initiated the 'Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP)' under DDM, LGED & BWDB with the assistance of the World Bank for Disaster Risk Mitigation and Reduction. Multi-hazard Risk and Vulnerability Assessment, Modeling and Mapping (MRVAM) is one of the initiatives under ECRRP, D1(DDM component) to assess risk and vulnerability of 8(eight) major hazards like Flood, Cyclone induced Storm Surge, Landslide, Drought, Earthquake, Tsunami, Technological & Health hazards. Component D1 is designed to contribute towards 'building long-term preparedness by strengthening disaster risk management' through strengthening and enhancement of long-term disaster risk mitigation and reduction ability of the DDM. This study is very important, due to the geographical location and topographical features of Bangladesh exposed the country to almost all kinds of natural disasters and a large-scale disaster in Bangladesh has been observed at a frequency of 5-6 years.

I am very happy to know that ECRRP-D1 project is going to publish comprehensive Risk Atlas on MRVAM with the help of ADPC, Thailand and IWM, Bangladesh. This study will supplement the efforts of the government to incorporate disaster risk reduction issues in all development programmes to build a safe and disaster resilience nation, referring to the SOD-2010, Disaster Management Act-2012, Disaster Management Policy-2015, and National Disaster Management Plan 2010-15. Alongside by the government, all including non- governmental organizations (NGOs) and civil society should come forward to build an effective disaster management infrastructure to reduce the post-disaster losses. District and local level officials who are frequently involved with the disaster damage assessment, management, preparedness and risk & vulnerability reduction activities will be benefitted by using these national level risk assessment map and database from this Risk Atlas as well as MRVAM Reports.

Md. Shah Kamal
Secretary
Ministry of Disaster Management and Relief

Message from DG, DDM

Bangladesh has made a strong commitment to implement Hyogo Framework for Action (HFA) during 2005-2015 for critical guidance in efforts to reduce disaster risk and the Multi-Hazard Risk and Vulnerability Assessment, Modeling and Mapping (MRVAM) project initiated under 'Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP)' as D1 component has advanced Bangladesh's progress in Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning. In continuation of this, outcome of this project "Multi-Hazard Risk Assessment at national level" is in line with Priority 1: 'Understanding disaster risk' of Sendai Framework for Disaster Risk Reduction 2015-2030, adopted in the 3rd World Conference on Disaster Risk Reduction, held from 14 to 18 March 2015 in Sendai, Miyagi, Japan.

The Risk Atlas of MRVAM project has created the basis for "building long term preparedness through strengthening disaster risk management capacity in the country as well as for enhancement of long term disaster risk mitigation and reduction ability of the Department of Disaster Management (DDM)". On the other hand, MRVAM project outcome has created awareness among the district and upazila level officials and will help in contributing towards incorporating appropriate risk-reduction strategies and prioritizing them into the country's development planning process.

In addition to this, the findings of this Atlas 'risk information of population, housing and livelihood at upazila level' will allow decision makers to prioritize risk mitigation investments and measures to strengthen the emergency preparedness and response mechanisms for reducing the losses and damages due to future disaster events.

Last of all, I hope that this Atlas will be actively and frequently consulted by decision-makers, becoming a resource not only to disaster risk reduction professionals, but also to local government officials, development professionals, planners, and researchers across the board.

(Md. Reaz Ahmed)
Director General (Additional Secretary)
Department of Disaster Management

Message from PD, ECRRP-D1, DDM

Multi-Hazard Risk and Vulnerability Assessment, Modeling and Mapping (MRVAM) project implemented as a part of sub-component D1.2 'Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP)', by Department of Disaster Management (DDM) is an effort towards 'building long-term preparedness through strengthened disaster risk management', through the strengthening and enhancement of the long-term disaster risk mitigation and reduction ability of the DDM.

This project has developed enormous quantity of database representing multi-hazards of Flood, Cyclone induced Storm Surge, Landslides, Drought, Earthquake, Tsunami, Technological and Health along with national level database representing population, housing, livelihood, critical facilities, infrastructure which can be used at Union / Upazila level for development planning process.

DDM has established Multi-Hazard Risk and Vulnerability Assessment (MRVA) Cell, in which geo-database of hazard, exposure and risk assessment at upazila level developed in this project and hosted in the state of the hardware & software facilities. I take this opportunity to state that, this Risk Atlas and Report/s produced under the MRVAM project will enhance the capacity of the department to monitor the hazard, exposure and risk assessment, in this way, all the government agencies, professionals and researchers will be benefitted in contributing towards disaster risk reduction in Bangladesh.

Finally, it is important to note that, this Risk Atlas is a living document, and therefore, there is an expectation of further improvement in the Disaster Risk Reduction and Mitigation Strategy based on continuous research in many relevant disciplines.

(M. Khalid Mahmood)
Joint Secretary and Director (Planning & Development)
Project Director, ECRRP-D1
Department of Disaster Management

Preface

A category IV cyclone *SIDR* struck in the south west coast of Bangladesh on November 15, 2007 evening and moved inland, destroying infrastructure, causing numerous deaths, disrupting economic activities, and affecting social conditions. As most all of Bangladesh is considered as a Delta just above sea level, tidal surge of 15-20 feet and gail-force winds of approximately 150 mph creates havoc in most of the area. The aim of the assessment was to identify priority areas to support the Government of Bangladesh in cyclone recovery efforts as well as to recommend priority interventions for a long-term disaster management strategy. The preparation of Multi-Hazard Risk and Vulnerability Assessment, Modelling and Mapping (MRVAM) project has identified the damage needs and quantified financial and technical requirements and established MRVA Cell in DDM, that will facilitate formulating comprehensive early recovery actions, medium-term recovery and reconstruction plans and a long-term disaster risk management and reduction strategy. The main objective to establish MRVA Cell is to strengthen and enhance country capacity in carrying out systematic multi-hazard risk assessments and consolidating and maintaining hazard risk information at central (national) and disaggregated (district) levels. This will contribute towards the realization of the specific priority attached in the country's disaster management strategy of 'defining and redefining the risk environment' of the country. The Asian Disaster Preparedness Center (ADPC), Thailand, in partnership with the Institute of Water Modeling (IWM), the Norwegian Geotechnical Institute (NGI), the Asian Institute of Technology (AIT), Thailand, and the Faculty of Geo-Information Science and Earth Observation of the University of Twente (ITC), the Netherlands had worked together to deliver consulting services on the Multi-Hazard Risk and Vulnerability Assessment, Modeling and Mapping in Bangladesh and finally prepared the Volume I: Hydro-meteorological Hazard Assessment (Flood, Storm Surge, Landslide, Drought), Volume II: Geological and Environmental Hazard Assessment (Earthquake, Tsunami, Technological, Health), Volume III: Elements at risk, Volume IV: Vulnerability and Risk Assessment (Flood, Storm Surge, Landslide, Drought), Volume V: Vulnerability and Risk Assessment (Earthquake, Tsunami, Technological, Health), Volume VI: Summary and Recommendations. Based on the MRVA six volumes, the Risk Atlas produced and organized in 4 volumes representing:

- Volume I [PART-I]: Hydro-meteorological Hazard, Exposure / Risk Assessment
  (Flood and Storm Surge)
- Volume I [PART-II]: Hydro-meteorological Hazard, Exposure / Risk Assessment
  (Drought and Landslide)
- Volume II: Geological and Environmental Hazard, Exposure / Risk Assessment
  (Earthquake, Tsunami, Technological and Health)
- Volume III: Multi Hazard Exposure and Risk Assessment
  (Flood, Storm Surge, Drought, Landslide, Earthquake and Tsunami)

For flood hazard and vulnerability assessment, Flood Modeling used in this study is MIKE11 Hydrodynamic Model developed by DHI, coupled with Geographic Information System (GIS) to capture the hydraulic response of Bangladesh Rivers, in-depth Flood analysis and its floodplains in extreme flooding conditions. Then a frequency analysis was carried out in the river network at 7617 grid points in order to obtain return period-wise flood levels for 25 year, 50 year, 100 year and 150 years. The model used in MRVAM project for Cyclone Induced Storm Surge is called Bay of Bengal Model (BoBM). The model is developed using a MIKE21 FM modelling system, which is a numerical modelling system for the simulation of water levels and flows in estuaries, bays and coastal areas. Storm Surge hazard depth was divided into seven different depth categories in order to find the extent of surge inundation and prepare inundation maps for all return periods: 25, 50 and 100 years for the entire coastal region. The depth categories are <1 m, 1-1.5 m, 1.5-2 m, 2-3 m, 3-4 m, 4-5 m, >5 m. Earthquake hazard maps were developed using the historical data and existing geological setting for 50 year, 100 year, 200 year, 500 year and 1000 years return periods at the sites of investigation derived and interpolated to develop earthquake hazard maps representing spatial variation of Peak Ground Acceleration (PGA) Map in Bangladesh. Simultaneously, to model the tsunamigenic conditions and the possible hazard maps due to Tsunami, have been generated for 50, 100, 200, 500 and 1000 years return period and the SPI (Standardized Precipitation Index)-Return period plots used to calculate the severity of Drought with different return periods such as the SPI values for 10, 50 and 100 years return period.

The purpose of this Multi-Hazard Risk and Vulnerability Assessment (MRVA) Modelling and Mapping study is to develop a hazard and vulnerability framework using the progression of vulnerability model to identify the root causes (problems) and the underlying pressures within coastal belt as well as whole Bangladesh. The information provided in this study was intended to assist in identifying hazards and vulnerabilities thereby building a disaster resilient Districts and Upazilas by sharing local hazards and also establishing community structures. Combining the results of the theoretical framework and research findings with the argument constructed in these MRVA Volumes I-VI and Risk Atlas about the disaster risk reduction and mitigation; it was found that it is possible to reduce hazard risks, and vulnerability to disasters, through the application of the latest GIS & RS tools and Hydrodynamic modeling and the participation of the grass-root level community in disaster risk management activities.

It is a great pleasure to successfully launch this Scientific MRVAM National Risk Atlas, signifying the needs and opportunities for the protection of the coastal environment as well as overall most vulnerable districts of Bangladesh and associated lives and livelihoods. The Department of Disaster Management (DDM), Ministry of Disaster Management and Relief would like to thank all those involved in the preparation and finalization of this document and would like to believe that materialization of these policies and programmes will improve overall catastrophic environment of the country as a whole and coastal environment in particular.

We would like to express our in-depth gratitude to the prominent experts of Technical Advisory Committee (TAC), the well-known and reverend group of professionals of the Country, specially, Dr. A. S. M. Maksud Kamal, Convener-TAC and Dean, Faculty of Earth and Environmental Sciences, Dhaka University; Dr. Umme Kulsum Navera, Professor, Department of Water Resources Engineering, BUET; Dr. Md. Atiqur Rahman, Joint Secretary (Admin.), Ministry of Disaster Management and Relief (MoDMR), Mr. M. A. Rouf Hawlader, Director, Survey of Bangladesh (SOB); Mr. Shamsuddin Ahmed, Director in Charge, Bangladesh Meteorological Department (BMD), Mr. Md. Shahidul Islam, GIS Analyst, CDMP-II; Mr. Mir Ahmed, Member Secretary-TAC & Director-MIM, DDM; Mr. M. Khalid Mahmood, Director (Planning & Development) & PD-ECRRP-D1, DDM; and Mr. Reaz Ahmed, Director General and MRVAM Advisor, DDM & last of all, those associated with MRVA Cell; under whose overall guidance and supervision, this MRVAM Risk Atlas was duly checked and scientifically verified, who had worked relentlessly for years to generate scientific information required for these risk and vulnerability assessments. A special appreciation to the World Bank, ERD and PCMU – Planning Commission Team, whose financial and project extension support from the beginning helped us to reach its ultimate destination.

Last of all, the main objective of the Risk Atlas is to provide decision makers, city planners, engineers, academics and managers with a compiled and handy set of information on the current situation of the respective hazards/ sectors in the districts and upazilas in terms of vulnerability and risk to facilitate more informed and effective development decision making. The Risk Atlas is to form a basis for decision making and mainstreaming disaster risk reduction in the government´s sectoral planning process. It provides recommendations to different institutions on revision or formulation of national policies, laws and regulations for disaster risk reduction and management. Maps presented in this Atlas can be used as reference and further research only, for more details, it is however, recommended to consult main MRVA reports.

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About the Project

The project "Multi-Hazard Risk and Vulnerability Assessment, Modeling and Mapping (MRVAM) was initiated by the Department of Disaster Management (DDM) under the Ministry of Disaster Management and Relief (MoDMR) as a part of sub-component D1.2 'Emergency 2007 Cyclone Recovery and Restoration Project (ECRRP)' with funding support from the World Bank. ECRRP aims to contribute towards 'building long-term preparedness through strengthened disaster risk management', through the strengthening and enhancement of long-term disaster risk mitigation and reduction ability of the DDM. The main purpose of MRVAM is to develop a hazard and vulnerability framework using the progression of vulnerability model to identify the root causes and the underlying pressures within coastal belt as well as whole Bangladesh. The specific objectives of this study are as follows:

- Identify all hazard prone areas of Bangladesh specifically District, City Corporation, Municipality, Upazila and Unions covering geological, hydro-meteorological and technological hazards;
- Assess the exposure of people, property, infrastructure and economic activities to the above mentioned hazards;
- Assess the full range of vulnerabilities of the exposed elements experienced throughout the country with reference to the above hazards; and
- Influence sectoral development strategies towards recognizing the highly dynamic form of vulnerabilities and factoring an understanding into institutional, legislative and organizational systems for preparedness, planning and mitigation.

Project Partners

The MRVAM project was implemented by the Asian Disaster Preparedness Center (ADPC), Thailand, in partnership with the Institute of Water Modeling (IWM), Bangladesh, the Norwegian Geotechnical Institute (NGI), the Asian Institute of Technology (AIT), Thailand, and the Faculty of Geo-Information Science and Earth Observation of the University of Twente (ITC), the Netherlands. The project was also supported by many other departments and institutions, such as Bangladesh Bureau of Statistics (BBS), Directorate General Health Services (DGHS), Geological Survey of Bangladesh (GSB), Local Government Engineering Department (LGED), Water Resources Planning Organization (WARPO), and Deputy Commissioner (DC) Offices.

About the Atlas

The Risk Atlas contains the basic information on the 8 (eight) major hazards, such as Flood, Cyclone induced Storm Surge, Landslide, Drought, Earthquake, Tsunami, Technological & Health hazards in context of the country, and the exposure, vulnerability and risk with regard to population (Gender, Age, Ethnicity, Employment, Education, Disability, Poverty), housing (Housing Types- Pucka, Semi-Pucka, Kutcha, Jhupri), livelihoods (Agriculture, Industries), critical facilities (Healthcare, Educational Institutions, First Responders- Fire and Police stations, Cyclone Shelters), and infrastructure (Road, Bridge, Railway, Air, Sea and River Ports, Power Stations).

The Atlas is presented in 3 Volumes, such as Volume I (Part I): Hydro-meteorological Hazard, Exposure/Risk Assessment (Flood and Storm Surge); Volume I (Part II): Hydro-meteorological Hazard, Exposure/Risk Assessment (Drought and Landslide); Volume II: Geological and Environmental Hazard, Exposure/Risk Assessment (Earthquake, Tsunami, Technological and Health), Volume III: Multi-Hazard Exposure and Risk Assessment (Flood, Storm Surge, Landslide, Drought, Earthquake and Tsunami).

It is now very interesting that the decision makers are aware of National Risk Atlas as a tool that must be applied during planning and programming for preparedness and response to disasters. Given that the disaster management is a cross cutting issue, the Atlas will serve to identify and prioritize hazard prone areas during planning and programming for development activities in various sectors, such as transport, health and education, other critical facilities, essential service, as well as in urban and rural land use planning and in the development of infrastructures.

For flood hazard and vulnerability assessment, MIKE11 Hydrodynamic Model developed by DHI used to obtain return period-wise flood levels for 25 year, 50 year, 100 year and 150 years. For Cyclone, induced Storm Surge, the Bay of Bengal Model (BoBM) was used for the return periods: 25, 50 and 100 years for the entire coastal region. Earthquake hazard maps were developed using the historical data and existing geological setting for 50 year, 100 year, 200 year, 500 year and 1000 years return periods. Simultaneously, Tsunami hazars maps were generated for 50, 100, 200, 500 and 1000 years return period and the Drought hazard maps were generated with different return periods such as the SPI (Standardized Precipitation Index) values for 10, 50 and 100 years return period.

The objective of the Atlas is to facilitate the decision makers with the information on the existing situation of respective sectors in terms multi-hazard risk and vulnerability. It will assist the decision makers and respective government departments to prioritize risk mitigation investments and measures for strengthening the emergency preparedness and response mechanisms to different hazards identified in the study.

Table of Contents

List of Figures

List of Tables

List of Maps

List of Maps

List of Maps

List of Maps

List of Maps

List of Maps

List of Maps

List of Maps (Contd....)

List of Maps (Contd....)

List of Maps (Contd....)

List of Maps (Contd....)

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List of Abbreviations

AFCCL	Ashuganj Fertilizer & Chemical Company Factory Limited
ADPC	Asian Disaster Preparedness Center
AEGL	Acute Exposure Guideline Levels
AFCCL	Ashuganj Fertilizer & Chemical Company Factory Limited
ARCGIS	Aeronautical Reconnaissance Coverage Geographic Information System
BBS	Bangladesh Bureau of Statistics
BoBM	Bay of Bengal Model
CRI	Multi-Hazard Risk Indices
CUFL	Chittagong Urea Fertilizer Limited
CUFL	Chittagong Urea Fertilizer Limited
DAPFCL	DAP Fertilizer Company Ltd.
DAPFCL	DAP Fertilizer Company Ltd.
DEM	Digital Elevation Model
DGHS	Directorate General of Health Services
DHI	Danish Hydraulic Institute
DRR	Disaster Risk Reduction
EM-DAT	Emergency Event Database
GDP	Gross National Product
GIS	Geographic Information System
HFA	Hyogo Framework for Action
JFCL	Jamuna Fertilizer Company
MoHFW	Ministry of Health and Family Welfare
MPO	Master Plan Organization
MRVAM	Multi-Hazard Risk and Vulnerability Assessment Modeling and Mapping
NGFFL	Natural Gas Fertilizer Factory Ltd.
PFFL	Polash Fertilizer Factory Limited
PGA	Peak Ground Acceleration
ToR	Terms of Reference
UNISDR	United Nations International Strategy for Disaster Reduction

1. Multi-Hazard Risk and Vulnerability Assessment Modeling and Mapping (MRVAM)

Bangladesh has made a strong commitment to implementing the Hyogo Framework for Action (HFA) and, in that context, the Project on "Multi-hazard Risk and Vulnerability Assessment Modeling and Mapping for Bangladesh" has advance Bangladesh's progress in Priority Action Area 2: "Identify, assess and monitor disaster risks and enhance early warning". This includes ensuring that "national and local risk assessments based on hazards data and vulnerability information are available and include risk assessments for key sectors. "Bangladesh is considered to be a disaster "hot-spot", facing multiple hazards that threaten lives, property and economic development (UNISDR, 2008).

The project on Multi-hazard Risk and Vulnerability Assessment Modeling and Mapping will have an impact far beyond what its detailed scope might suggest. On a macro level, this project aims to be the catalyst for DRR practice in Bangladesh, helping to achieve the Government's ambitious goal of bringing its policies, institutions, and capabilities for disaster preparation, mitigation, and response up to world-class standards. In a very real sense, it is a pilot effort for activities to be financed by various donor agencies in order to expand efforts further at all levels. Therefore, it absolutely must establish a solid base and ensure that Bangladesh will have the expertise to take maximum advantage of the present and future interventions. At the same time, on a more micro level, outputs of the project are aimed to increase the capacity of Districts, City Corporations, Paurashava, Upazila etc., and individual citizens, including the most vulnerable individuals and groups among them, to deal with all aspects of emergencies. It further aims to help save lives and property, and increase the sense of security for people throughout the country.

1.1 Project Objectives

The main objectives of this study are as follows:

- Identify all hazard prone areas of Bangladesh specifically district, City Corporation, municipality, upazila and unions covering geological, hydro-meteorological and technological hazards;
- Assess the exposure of people, property, infrastructure and economic activities to the above mentioned hazards;
- Assess the full range of vulnerabilities of the exposed elements experienced throughout the country with reference to the above hazards; and
- Influence sectoral development strategies towards recognizing the highly dynamic form of vulnerabilities and factoring an understanding into institutional, legislative and organizational systems for preparedness, planning and mitigation.

1.2 Multi-Hazard, Vulnerability and Risk Assessment

The methodology adopted in this project is summarized in Figure 1.1. The hazards identified for assessment as per the Terms of Reference (ToR) are as follows:

- Flood, Storm surge, Earthquake, Tsunami, Landslide, Drought, Technological, Health

The elements at risk considered in this project for exposure, vulnerability and risk assessment are as follows:

- Population – Gender, Age, Ethnicity, Employment, Education, Disability, Poverty
- Housing – Housing Types (Pucka, Semi-Pucka, Kutcha, Jhupri)
- Livelihoods - Agriculture, Industries
- Critical Facilities – Healthcare, Educational Institutions, First Responders (Fire and Police stations), Cyclone Shelters
- Infrastructure – Road, Bridge, Railway, Air, Sea and River Ports, Power Stations.

Using the individual hazard assessment maps developed for the eight hazards in GIS environment and GIS database developed at the country level, the above elements at risk are combined to assess the exposure. Using the exposure data, vulnerability assessment is carried out by the damage curves developed exclusively for Bangladesh for the first time at the national level. Using the hazard and vulnerability assessment, individual risk of the elements at risk is assessed. The hazard specific risk is combined into a multi-hazard risk assessment to identify the most hazardous prone district/upazila/union in the country.

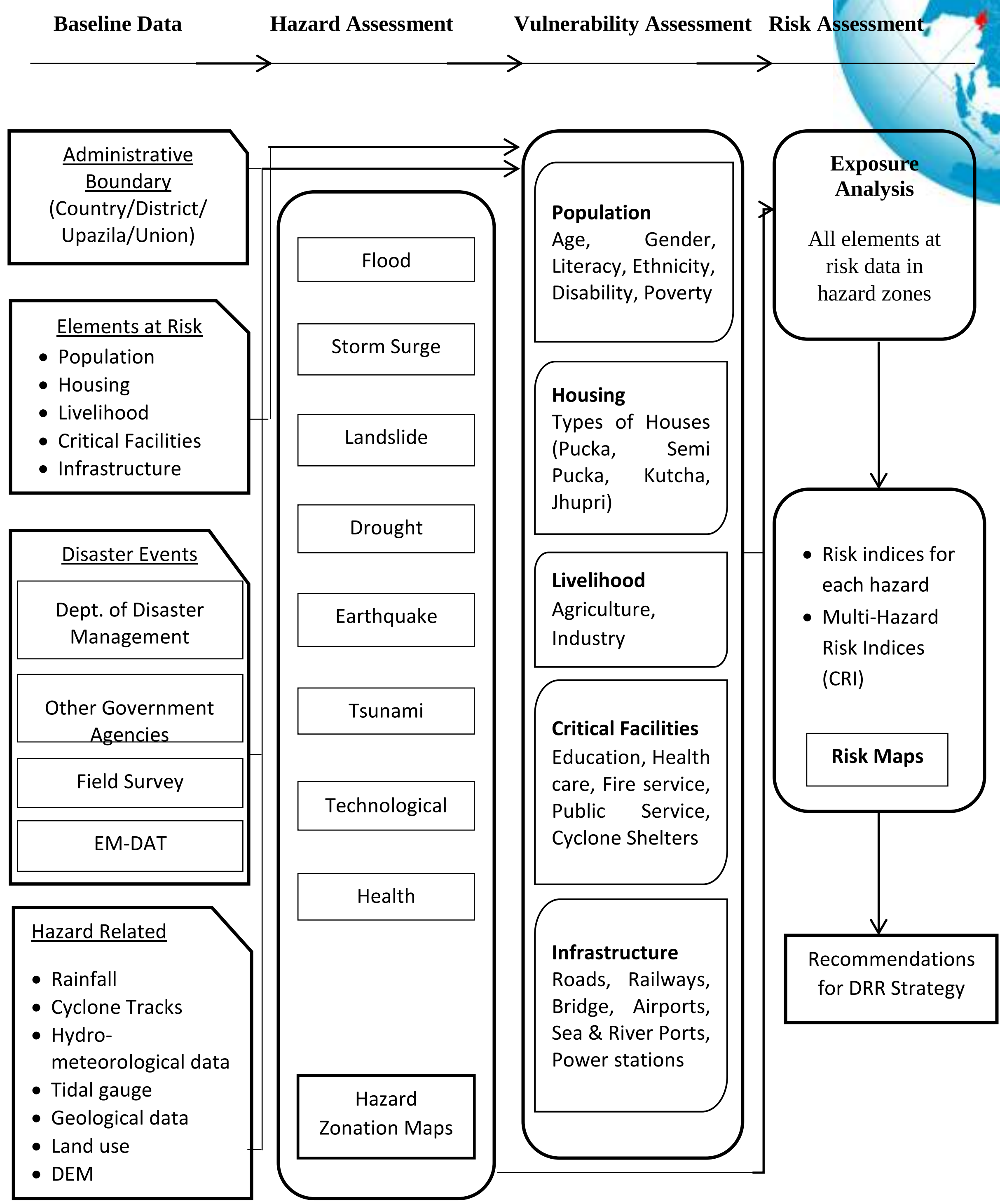


Figure 1.1: Overall Methodology of the MHVRA Project

1.3 Risk Assessment

Components of risk assessment are hazard, elements at risk, exposure, vulnerability. The hazard, exposure, vulnerability and risk Assessment approach adopted in this study is based on definitions from United Nations International Strategy for Disaster Reduction (UNISDR, 2009), given in table 1.1.

Table 1.1: Definition of Hazard, Exposure, Vulnerability and Risk

Hazard	A dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.
Exposure	The degree to which the elements at risk are exposed to a particular hazard.
Vulnerability	The conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Can be subdivided into physical, social, economic and environmental vulnerability.
Risk	The probability of harmful consequences, or expected losses (deaths, injuries, property loss, livelihoods loss, economic activity disruption or environmental damaged) resulting from interactions between (natural and/ or human-induced) hazards and vulnerable conditions in a given area and time period.

Risk can be presented conceptually with the following basic equation:

Risk = Hazard x Vulnerability x Element at risk

1.3.1 Hazard Assessment

Hazard assessment presented in this risk atlas are Flood, Storm Surge, Earthquake, Tsunami, Landslide, Drought, Technological and Health. These hazard maps are prepared for different return periods, as shown in table 1.2.

Table 1.2 : Summary of Hazard maps developed in this study

Hazards	Return Period							
	10	**25**	**50**	**100**	**150**	**200**	**500**	**1000**
Flood		√	√	√	√			
Storm Surge		√	√	√				
Earthquake			√	√		√	√	√
Landslide	Not Applicable as there is no return period							
Tsunami			√	√		√	√	√
Drought	√		√	√				
Technological	Not Applicable as there is no return period							
Health	Not Applicable as there is no return period							

1.3.2 Exposure Assessment

Exposure is assessed for elements at risk of Population, Housing, Livelihoods, Critical Facilities and Infrastructure using the most frequent and damaging hazard maps with relevant return periods (table 1.3) based on indicators of hazard levels for each hazard (table 1.4).

Table 1.3:Summary of exposure assessment and return period of hazards

Hazard	Return Period for Exposure of Elements at Risk				
	Population	**Housing**	**Livelihood**	**Critical Facilities**	**Infrastructure**
Flood	25	25	25	100	100
Storm Surge	25	25	25	100	100
Landslide	Not Applicable (NA)				
Drought	10	NA	50	NA	NA
Earthquake	50	50	NA	50	50
Tsunami	50	50	50	50	50
Technological	Not Applicable (NA)				
Health	Not Applicable (NA)				

Table 1.4: Hazard level indicators considered for exposure assessment

	Indicator of Hazard level considered
Flood	Inundation area with different flood depths at 25 and 100 year return period
Storm Surge	Inundation area with different depth due to Cyclone induced storm surge at 25 and 100 year return period
Landslide	Landslide susceptibility category
Drought	Drought hazard category representing severity of 10 year return period
Earthquake	Peak Ground Acceleration (PGA) zones at 50 year return period
Tsunami	Inundation area with different depth due to tsunami at 50 year return period
Technological	Area of influence (3 zones) due to chemical release
Health	Area representing number of cases reported for each disease at district level

1.3.3 Vulnerability Assessment

Based on exposure assessment, damage curves are developed for all hazards and elements at risk for vulnerability and risk assessment, where ever possible. Damage curves represent the relationship between hazard level and % of physical damage.

Vulnerability of Population: Based on the area of exposure of the settlements in each union, the vulnerability of population is calculated as number of population affected due to a hazard.

Vulnerability of Household structures: Factors affecting vulnerability of household structures are different in each hazard, damage curves are developed accordingly, as indicated in table 1.5.

Table 1.5: Factors affecting used for vulnerability of household structures

Hazard	Factor considered for damage curves	Vulnerability of Household structures
Flood	Inundation depth due to Flood	Damage curves
Cyclone induced Storm surge	Inundation depth due to induced storm surge	Damage curves
Landslide	Landslide susceptible category	Risk matrix
Earthquake	Peak Ground Acceleration (PGA)	Damage curves
Tsunami	Inundation depth due to Tsunami	Damage curves

Vulnerability of Livelihood: Livelihood considered is transplanted Aman crop. Vulnerability of crop is developed using damage curves using the factors affecting a hazard as given in table 1.6.

Table1.6: Factors considered for vulnerability for crops

Hazard	Factor considered for damage curves	Vulnerability
Flood	Inundation depth due to Flood	Risk matrix
Storm surge	Inundation depth due to Storm surge	Risk matrix
Drought	Drought hazard category	Risk matrix
Tsunami	Inundation depth due to Tsunami	Risk matrix

Exposure of Population, Risk of Housing and Livelihood as explained in section 1.3 is assessed at upazila / thana level in Bangladesh and the results are presented in this risk atlas based on the administrative division as given in section 1.4.

1.4 Administrative Division of Bangladesh

Bangladesh is divided into eight administrative divisions, each named after respective divisional headquarters: Barisal, Chittagong, Dhaka, Khulna, Mymensingh, Rajshahi, Rangpur and Sylhet. Divisions are subdivided into 64 districts (zila), which are further subdivided into 544 upazila or thana, and their distribution is given in table 1.7.

Table 1.7: Administrative Division of Bangladesh

Division	Districts	Upazilas / Thanas	City Corporations
Barisal	6	40	1
Chittagong	11	111	1
Dhaka	13	129	4
Khulna	10	64	1
Mymensingh	4	34	
Rajshahi	8	70	1
Rangpur	8	58	1
Sylhet	4	38	1
Country Total	**64**	**544**	**11**

Source: BBS, 2012

1.5 How to use this Risk Atlas?

The main components in this study are Hazard Assessment, Elements at Risk, Exposure / Risk Assessment, Multi-Hazard Risk Assessment. This Atlas is organized in 4 volumes representing,

- Volume I [PART-I]: Hydro-meteorological Hazard, Exposure / Risk Assessment (Flood and Storm Surge)
- Volume I [PART-II]: Hydro-meteorological Hazard, Exposure / Risk Assessment (Drought and Landslide)
- Volume II: Geological and Environmental Hazard, Exposure / Risk Assessment (Earthquake, Tsunami, Technological and Health)
- Volume III: Multi Hazard Exposure and Risk Assessment (Flood, Storm Surge, Drought, Landslide, Earthquake and Tsunami)

In each volume, the relevant text, info graphics and maps representing Hazard, Exposure / Risk are arranged for each division and all districts in the division. However, at upazila / thana level very high and high exposure / risk are only presented.

Volume I [PART-1]: Hydro-meteorological Hazards (Flood and Storm Surge)

Flood

- Flood hazard maps are available for four return periods i.e. 25, 50, 100 and 150 years for all the eight divisions.
- Exposure of Population and Risk levels of Housing and Livelihood to flood hazard are provided at district and upazila / thana level as given in table 1.8

Table 1.8: Population Exposure, Housing and Livelihood at Risk to Flood

Flood	Population Exposure		Housing at Risk (Packa and Semi-Packa)		Housing at Risk (Kutcha and Jhupri)		Livelihood	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Barisal	3	6	3	8	3	8	4	11
Chittagong	5	29	5	30	5	30	5	27
Dhaka	12	67	10	71	10	71	7	31
Khulna	1	2	1	2	1	2	1	1
Mymensingh	4	16	4	19	4	20	4	27
Rajshahi	4	9	3	11	3	12	3	20
Rangpur	2	2	3	3	3	3	3	6
Sylhet	4	31	4	31	4	31	4	29
Total	35	162	33	175	33	177	31	152

Storm Surge

- Storm Surge hazard maps are available for three return periods i.e. 25, 50 and 100 years for Barisal, Chittagong, Dhaka and Khulna divisions.
- Exposure of Population and Risk levels of Housing and Livelihood to storm surge hazard are provided at district and upazila / thana level as given in table 1.9

Table 1.9: Population Exposure, Housing and Livelihood at Risk to Storm Surge

Storm Surge	Population Exposure		Housing at Risk (Packa and Semi-Packa)		Housing at Risk (Kutcha and Jhupri)		Livelihood	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Barisal	2	3	1	2	2	3	6	16
Chittagong	2	2	2	4	2	2	5	13
Khulna	0	0	0	0	0	0	1	1
Total	4	5	3	6	4	5	12	30

Volume I [PART-II]: Hydro-meteorological Hazards (Drought and Landslide)

Drought:

- Drought hazard maps are available for 10, 50 and 100 year return period for all the eight divisions.
- Exposure of Population and Risk levels of Housing and Livelihood to drought hazard are provided at district and upazila / thana level as given in table 1.10

Table 1.10: Population Exposure and Livelihood at Risk to Drought

Drought	Population Exposure		Livelihood	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Barisal	0	0	6	40
Chittagong	0	0	9	73
Dhaka	0	0	11	47
Khulna	0	0	4	33
Mymensingh	0	0	10	56
Rajshahi	5	34	8	61
Rangpur	7	35	8	57
Sylhet	0	0	4	31
Total	12	69	60	398

Landslide:

- Landslide hazard does not have any return period and is presented for Chittagong and Sylhet divisions.
- Exposure of Population and Risk levels of Housing to landslide hazard are provided at district and upazila level as given in table 1.11.

Table 1.11: Population Exposure and Housing at Risk to Landslide

Landslide	Population Exposure		Housing at Risk (Packa and Semi-Packa)		Housing at Risk (Kutcha and Jhupri)	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Chittagong	5	29	5	31	5	34
Sylhet	2	5	2	11	3	14
Total	7	34	7	42	8	48

Volume II: Geological and Environmental Hazards (Earthquake, Tsunami, Technological and Health)

Earthquake:

- Earthquake hazard maps are available for five return periods i.e. 50, 100, 200, 500 and 1000 years for all the eight divisions.
- Exposure of Population and Risk levels of Housing to earthquake hazard (moderate) at district and upazila / thana level as given in table 1.12

Table 1.12: Population Exposure and Housing at risk to Earthquake Hazard

Earthquake	Population Exposure		Housing Exposure (Packa and Semi-Packa)		Housing Exposure (Kutcha and Jhupri)	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Chittagong	10	96	10	62	10	62
Dhaka	4	28	4	28	4	28
Mymensingh	4	34	4	34	4	34
Rajshahi	5	70	5	30	5	30
Rangpur	7	49	7	48	7	48
Sylhet	4	38	4	38	4	38
Total	34	315	34	240	34	240

Tsunami:

- Tsunami hazard maps are available for five return periods i.e. 50, 100, 200, 500 and 1000 years for Barisal, Chittagong and Khulna divisions.
- Exposure of Population and Risk levels of Housing to tsunami hazard are provided at district and upazila level as given in table 1.13.

Table 1.13: Population Exposure, Housing and Livelihood at Risk to Tsunami

Tsunami	Population Exposure		Housing Exposure (Packa and Semi-Packa)		Housing Exposure (Kutcha and Jhupri)		Livelihood	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Barisal	2	2	2	4	2	4	1	1
Chittagong	0	0	0	0	0	0	1	1
Total	2	2	2	4	2	4	2	2

Technological:

- Technological hazard maps are available only for six industries in Chittagong and Dhaka divisions.
- Exposure maps of Population to six industries at upazila level as given in table 1.14.

Table 1.14: Population Exposure due to Technologial Hazard

S.No.	Name of the Industry	Division	District	Number of Upazilas
1	Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL)	Chittagong	Brahmanbaria	3
			Kishoreganj	1
			Narsingdi	2
2	Chittagong Urea Fertilizer Limited (CUFL)	Chittagong	Chittagong	2
3	DAP Fertilizer Company Ltd. (DAPFCL)	Chittagong	Chittagong	2
4	Jamuna Fertilizer Company (JFCL),	Mymensingh	Jamalpur	1
		Dhaka	Tangail	2
		Rajshahi	Sirajganj	1
5	Natural Gas Fertilizer Factory Ltd. (NGFFL)	Sylhet	Maulvibazar	2
			Sylhet	2
6	Polash Fertilizer Factory Limited (PFFL)	Dhaka	Gazipur	2
			Narsigdi	3

Health:

- Health hazard maps represents number of population affected to 9 diseases (Diarrhea, Dengue, Diarrhea, Encephalitis, Filariasis, Kalaazar, Leprosy, Malaria, Tuberculosis (Pulmonary)) are shown at national level and division level for 2011, 2012 and 2013, which represents the exposure of Population to Health hazard.

Volume III: Multi-Hazard Exposure and Risk Assessment (Flood, Storm Surge, Drought, Landslide, Earthquake and Tsunami)

- Population exposed to six multi-hazards (Flood, Storm Surge, Landslide, Drought, Earthquake and Tsunami) at country level are presented along with division and district level maps
- Housing types (Pucka, Semi-Pucka, Kutcha, Jhupri) at Risk to five multi-hazards (Flood, Storm Surge, Landslide, Earthquake and Tsunami) at country level are presented along with division and district level maps
- Livelihood (Transplanted Aman crop) at Risk to four multi-hazards (Flood, Storm Surge, Drought and Tsunami) at country level are presented along with division and district level maps

EARTHQUAKE

2 Earthquake Hazard

Bangladesh is located in the tectonically active Himalayan orogenic belt that developed by the collision among the Indian, Arabian, and Eurasian plates over the last 30-40 million years (Aitchinson et al., 2007). Moderate to large earthquake magnitudes are common in this region and will continue to occur as long as the tectonic deformation continues.Some of these earthquakes caused serious damage to buildings and infrastructures through strong ground shaking and also, in some cases, faults rupturing the ground surface.Therefore, proper understanding of the distribution and level of seismic hazard throughout the country is necessary and hence a probabilistic seismic hazard assessment for Bangladesh has been carried out, using the ground motion parameters which includes horizontal Peak Ground Acceleration (PGA) and Spectral Acceleration (SA) values at 0.2 and 1.0 s for the return periods of 50, 100, 200, 500 and 1000 years.

2.1 Methodology

Earthquake hazard assessment methodology adopted in this study is the one used for developing the latest US National Seismic Hazard Maps (Petersen et al., 2008), using the subduction area sourcesand crustal faults data collected from Geological Survey of Bangladesh (GSB) and ground motion parameters collected from literature. Based on the regional tectonic settings, earthquake sources have been modelled by a combination of smooth gridded seismicity, crustal fault and subduction source models. The identified models have been used to reasonably represent the attenuation characteristics of earthquake ground motion parameters such as Peak Ground Acceleration (PGA) and Spectral Acceleration (SA). The effects of all earthquakes of different magnitudes, occurring at different locations from different seismic sources at difference probabilities of occurrence are integrated into hazard assessment.

2.2 Map Contents

Based on PGA variation, range of PGA values are used to derive hazard category. Table 2.1 shows the hazard zones and colors used in the hazard maps.

Table 2.1: Earthquake hazard zones based on PGA range

Range of PGA values	Earthquake hazard category	Symbology used in maps
< 0.05	Very Low	
0.05 – 0.15	Low	
0.15 – 0.35	Moderate	
0.35 – 0.5	High	
>0.5	Very High	

2.3 Analysis of Earthquake Hazard

Among 50, 100, 200, 500 and 1000 year return period earthquake hazard maps, detailed analysis of a 50 year return period map was carried out and distribution of hazard area among divisions of Bangladesh is shown in Table 2.2.

Table 2.2: Percentage of area distribution in each earthquake intensity category range

Division	Earthquake intensity - PGA (g) range vs Percentage of Area		
	< 0.05	0.05 - 0.15	0.15 - 0.35
Barisal	-	100.00	-
Chittagong	-	13.10	86.90
Dhaka	-	66.69	33.31
Khulna	-	100.00	-
Mymensingh	-	56.18	43.82
Rajshahi	0.03	54.86	45.11
Rangpur	-	16.38	83.62
Sylhet	-	-	100.00

2.4 Earthquake Hazard maps

- Earthquake hazard maps are available for five return periods i.e. 50, 100, 200, 500 and 1000 years and shown at national level.
- Since 50 year return period earthquake hazard map is used for exposure and risk assessment of housing, 50 year return period hazard map is shown for all the eight divisions in this atlas.
- Earthquake hazard maps at district level is shown for all the districts which are exposed to moderate level and above and the number of districts in each division is shown in table 2.3.

Table 2.3: Number of districts with moderate level of earthquake hazard in each division

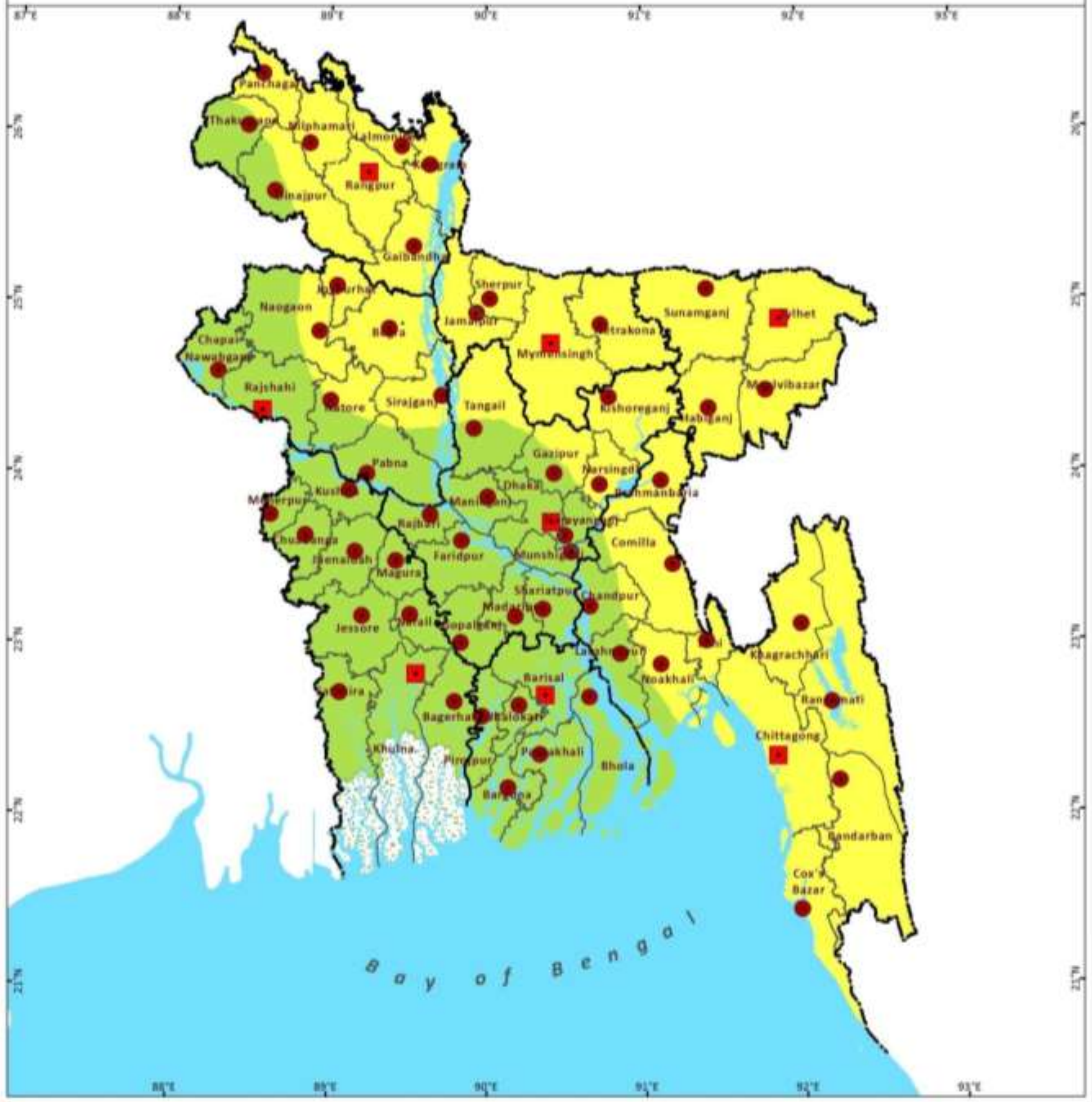
Division	Districts
Chittagong	10
Dhaka	4
Mymensingh	4
Rajshahi	5
Rangpur	7
Sylhet	4
Total	34

- Exposure of Populationand Risk levels of Housingto earthquake hazard (moderate) at district and upazila/ thanalevel as given in table 2.4

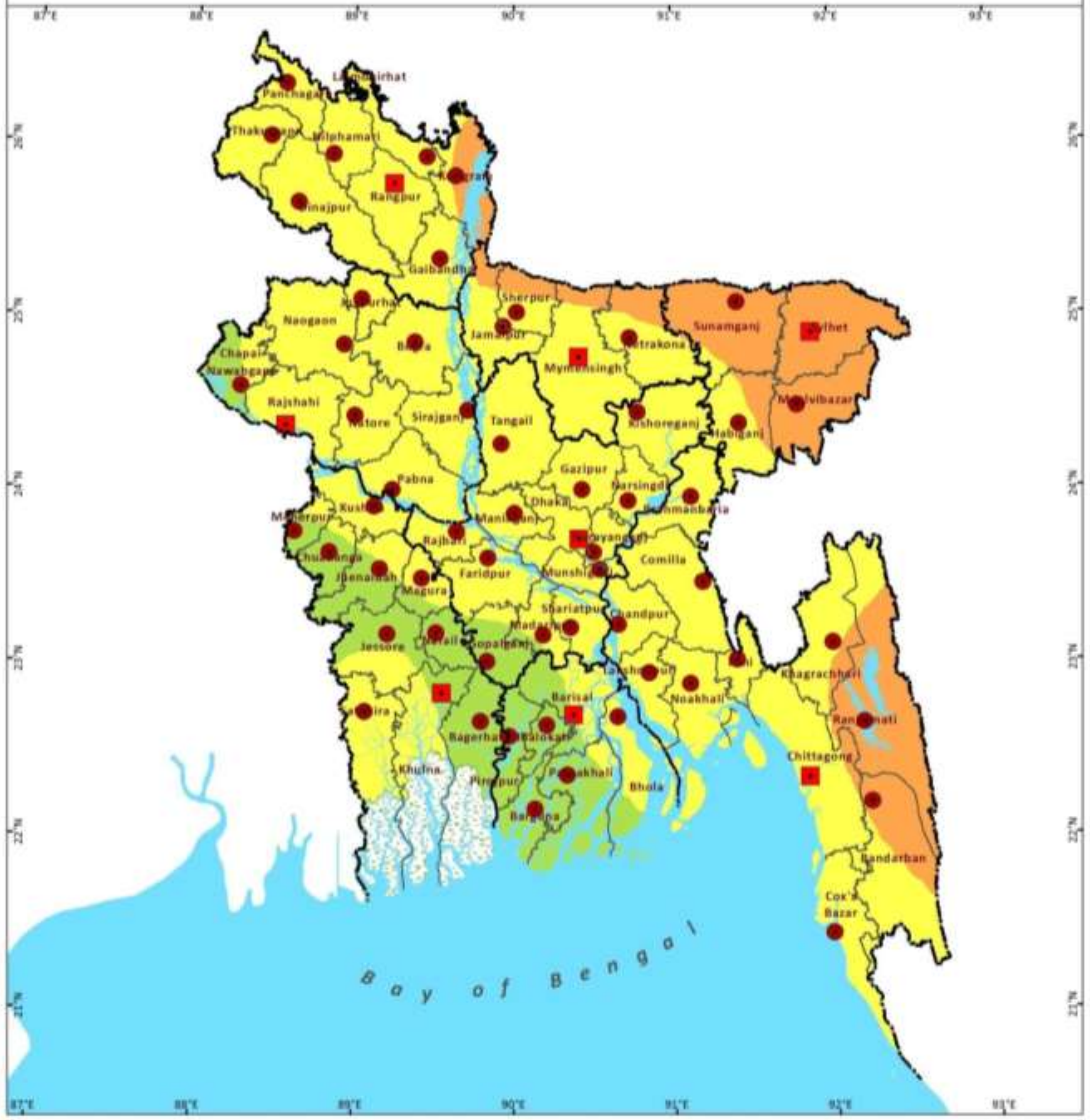
Table 2.4: Population Exposure and Housing at risk to Earthquake Hazard

Division	Population Exposure		Housing Exposure (Packa and Semi-Packa)		Housing Exposure (Kutcha and Jhupri)	
	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Chittagong	10	96	10	62	10	62
Dhaka	4	28	4	28	4	28
Mymensingh	4	34	4	34	4	34
Rajshahi	5	70	5	30	5	30
Rangpur	7	49	7	48	7	48
Sylhet	4	38	4	38	4	38
Total	34	315	34	240	34	240

National Level Earthquake Hazard Map of 50 Year Return Period



National Level Earthquake Hazard Map of 100 Year Return Period



Legend

—·—	Country Boundary	PGA Value (g)	
---·---	Division Boundary		< 0.05
-----	District Boundary		0.05 - 0.15
■	Division Head Quarter		0.15 - 0.35
●	District Head Quarter		0.35 - 0.50
	River/Sea/Lake		> 0.50
	Sundarbans		

Note:

Earthquake hazard map is derived using seismic source modelling of potential faults and seismic energy propagation through surface and sub-surface and hazard potential is represented as Peak Ground Acceleration (PGA) at national level.

Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

N

0 25 50 100 150 200 Km

R. F:1:4,000,000

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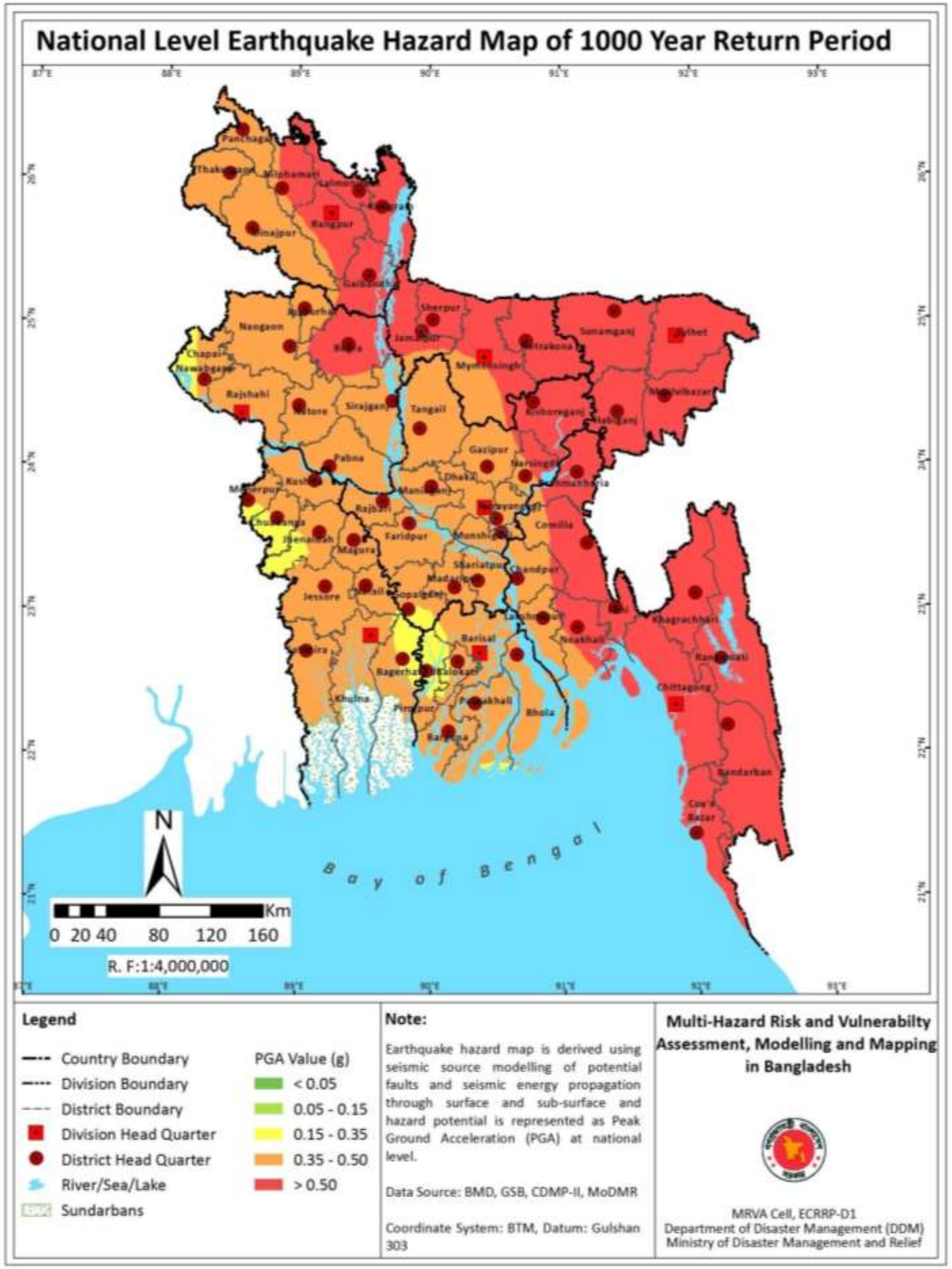

National Level Earthquake Hazard Map of 1000 Year Return Period
Bay of Bengal
N
Km
0 20 40 80 120 160
R. F:1:4,000,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Note:
Earthquake hazard map is derived using seismic source modelling of potential faults and seismic energy propagation through surface and sub-surface and hazard potential is represented as Peak Ground Acceleration (PGA) at national level.
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
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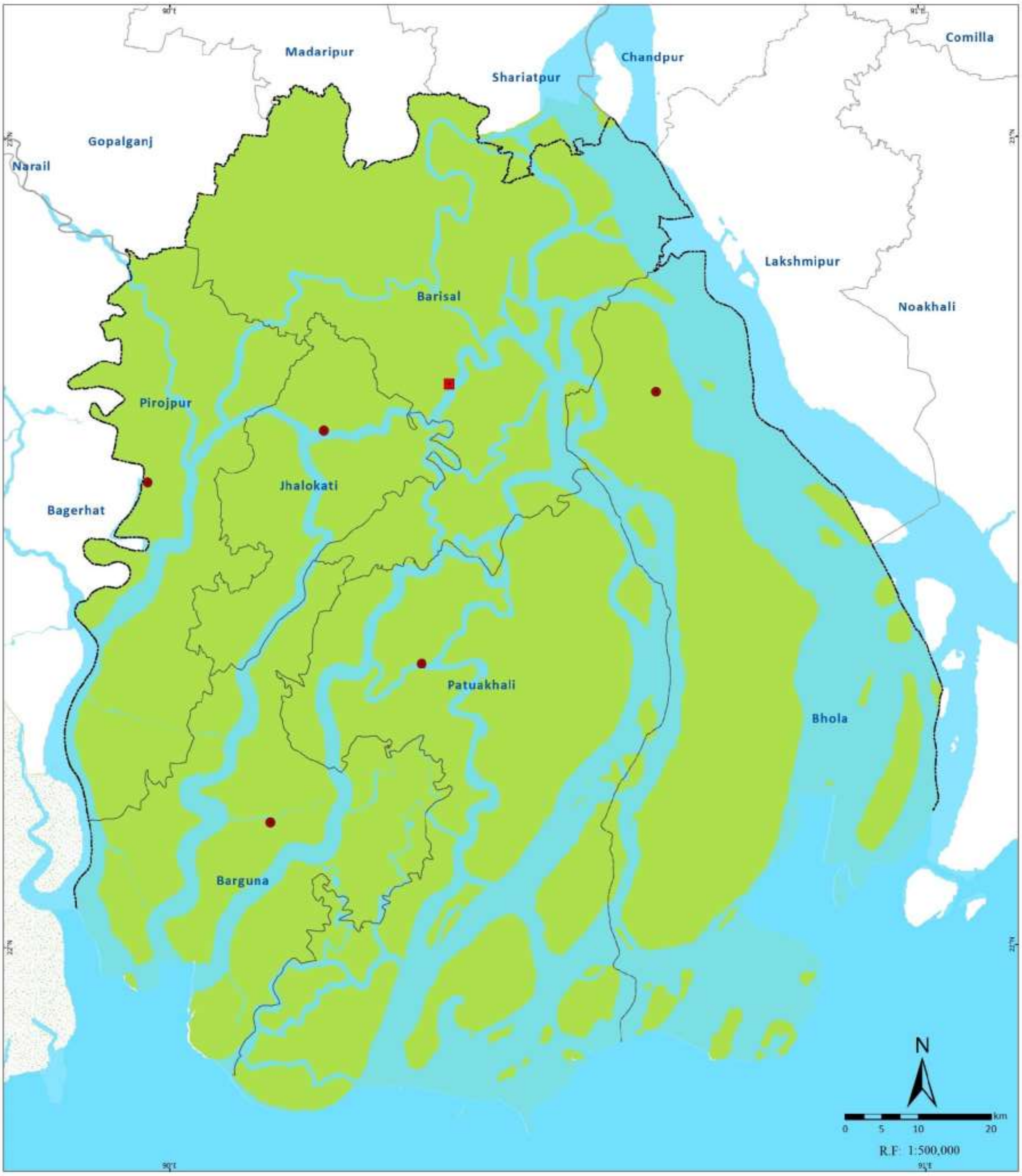
Earthquake Hazard Map of 50 Year Return Period
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50

Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

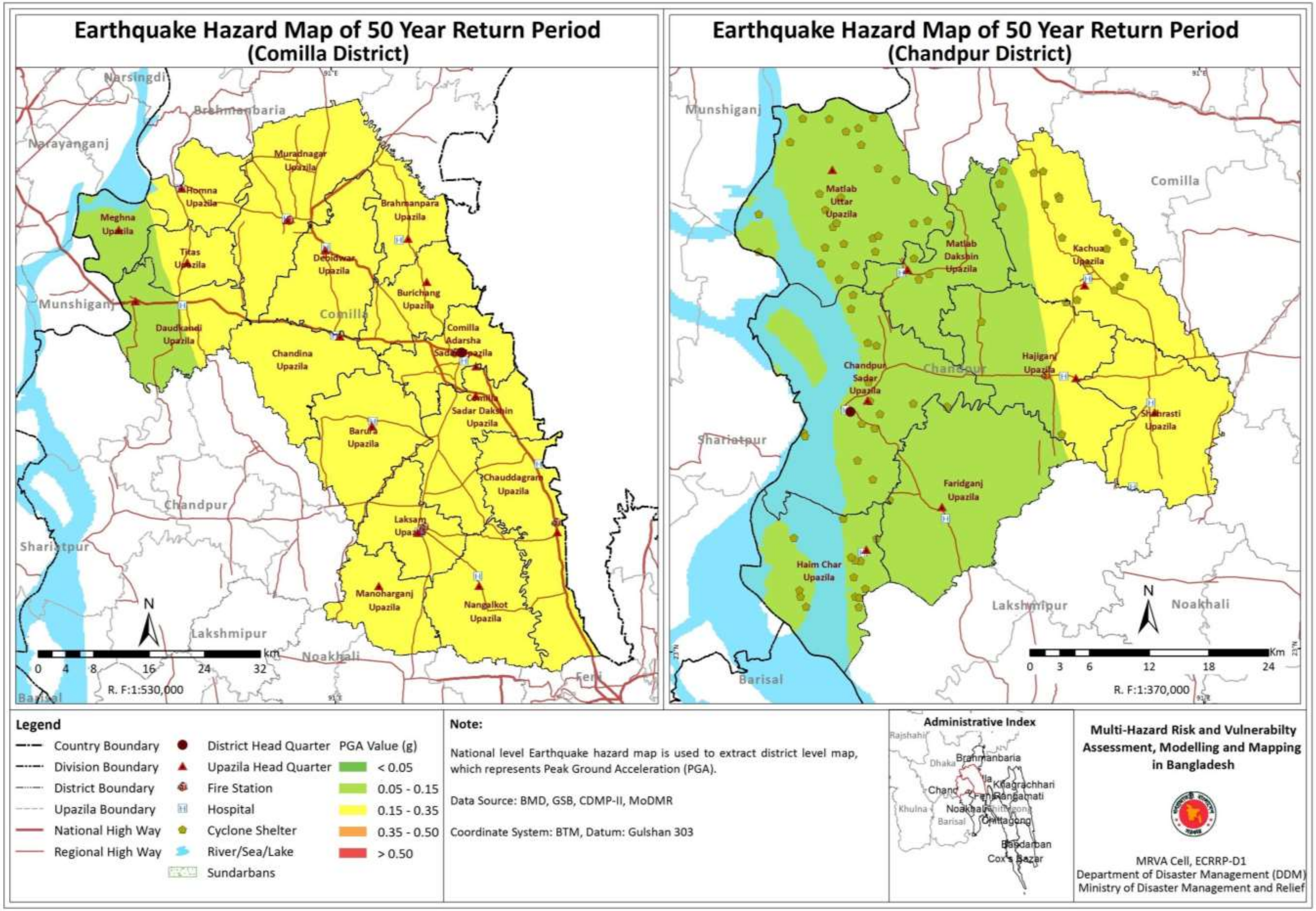
Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Earthquake Hazard Map of 50 Year Return Period
(Comilla District)
Narsingdi
Brahmanbaria
Narayanganj
Muradnagar Upazila
Homna Upazila
Meghna Upazila
Brahmanpara Upazila
Titas Upazila
Debidwar Upazila
Burichang Upazila
Munshiganj
Daudkandi Upazila
Comilla
Comilla Adarsha Sadar Upazila
Chandina Upazila
Comilla Sadar Dakshin Upazila
Barura Upazila
Chauddagram Upazila
Chandpur
Laksam Upazila
Shariatpur
Manoharganj Upazila
Nangalkot Upazila
Lakshmipur
Noakhali
Feni
Barisal
N
0 4 8 16 24 32 km
R. F:1:530,000
Earthquake Hazard Map of 50 Year Return Period
(Chandpur District)
Munshiganj
Comilla
Matlab Uttar Upazila
Matlab Dakshin Upazila
Kachua Upazila
Chandpur Sadar Upazila
Chandpur
Hajiganj Upazila
Shahrasti Upazila
Shariatpur
Faridganj Upazila
Haim Char Upazila
Lakshmipur
Noakhali
Barisal
N
0 3 6 12 18 24 Km
R. F:1:370,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
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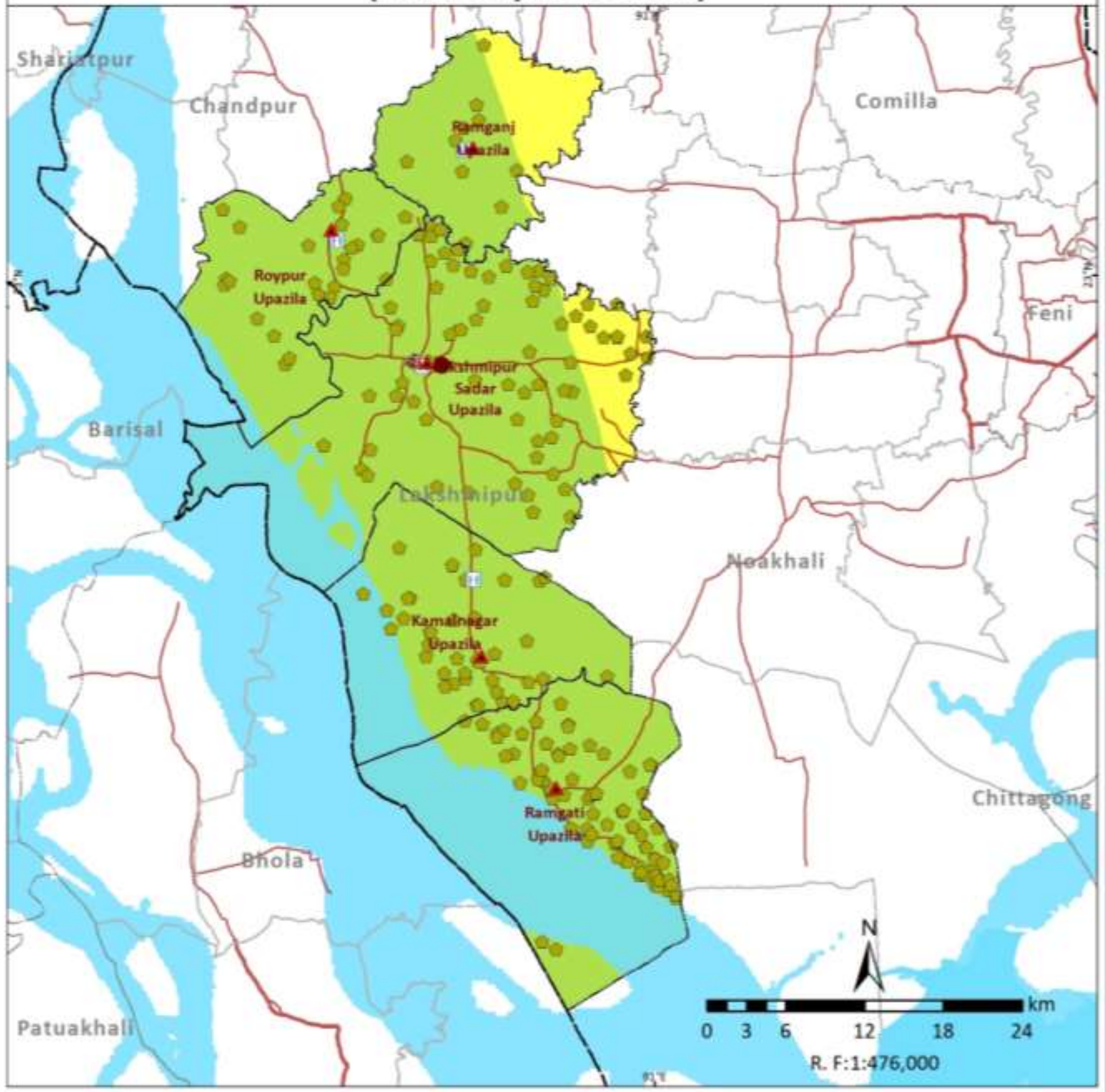
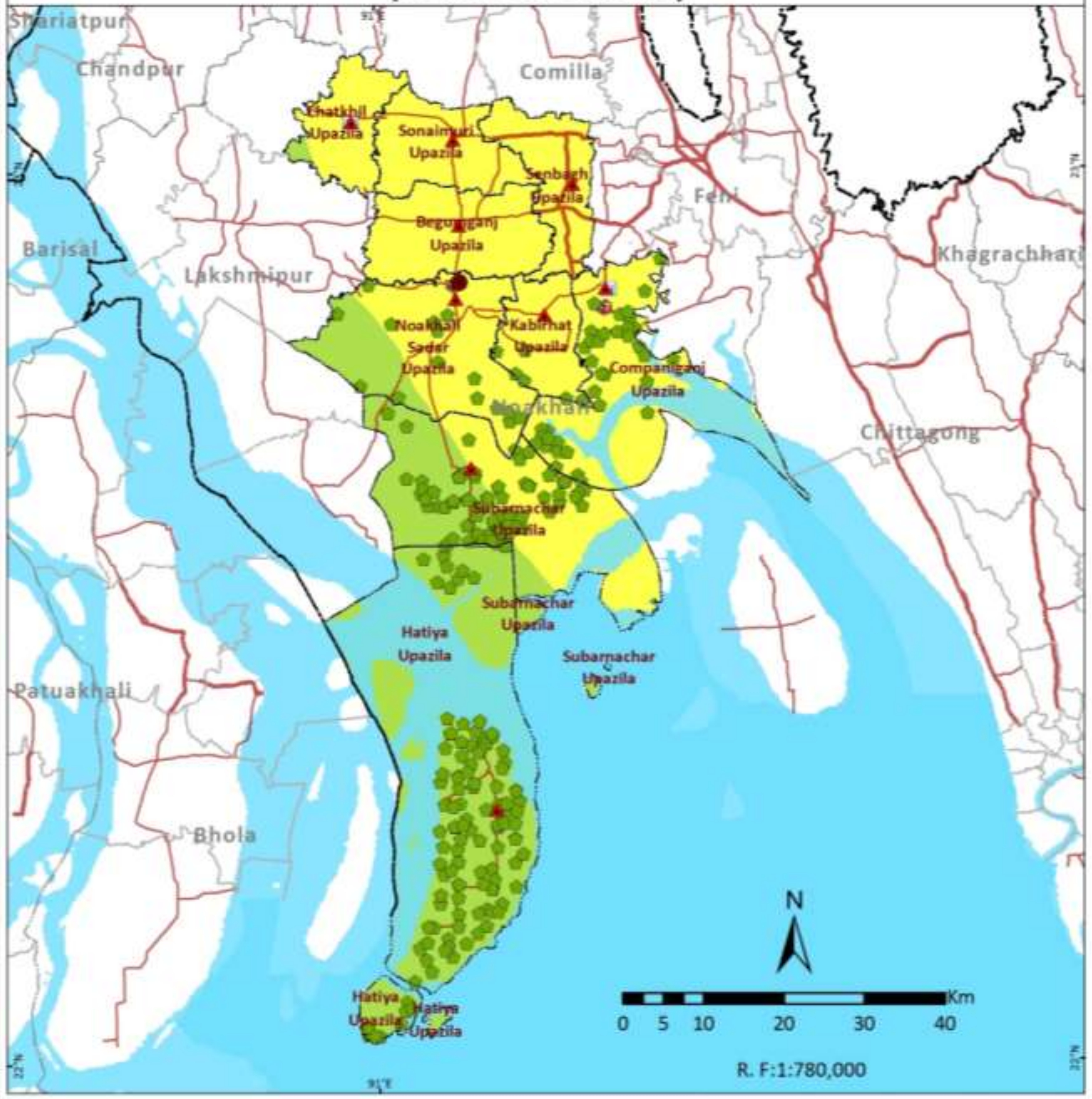
Ministry of Disaster Management and Relief

Earthquake Hazard Map of 50 Year Return Period
(Lakshmipur District)



Earthquake Hazard Map of 50 Year Return Period
(Noakhali District)



Legend

—·—	Country Boundary	●	District Head Quarter	PGA Value (g)	
—···—	Division Boundary	▲	Upazila Head Quarter		< 0.05
—··—	District Boundary		Fire Station		0.05 - 0.15
----	Upazila Boundary		Hospital		0.15 - 0.35
—	National High Way		Cyclone Shelter		0.35 - 0.50
—	Regional High Way		River/Sea/Lake		> 0.50
			Sundarbans		

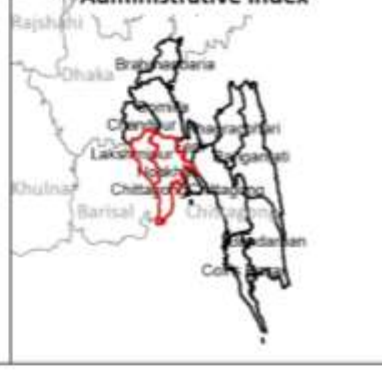
Note:

National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index



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MRVA Cell, ECRRP-D1
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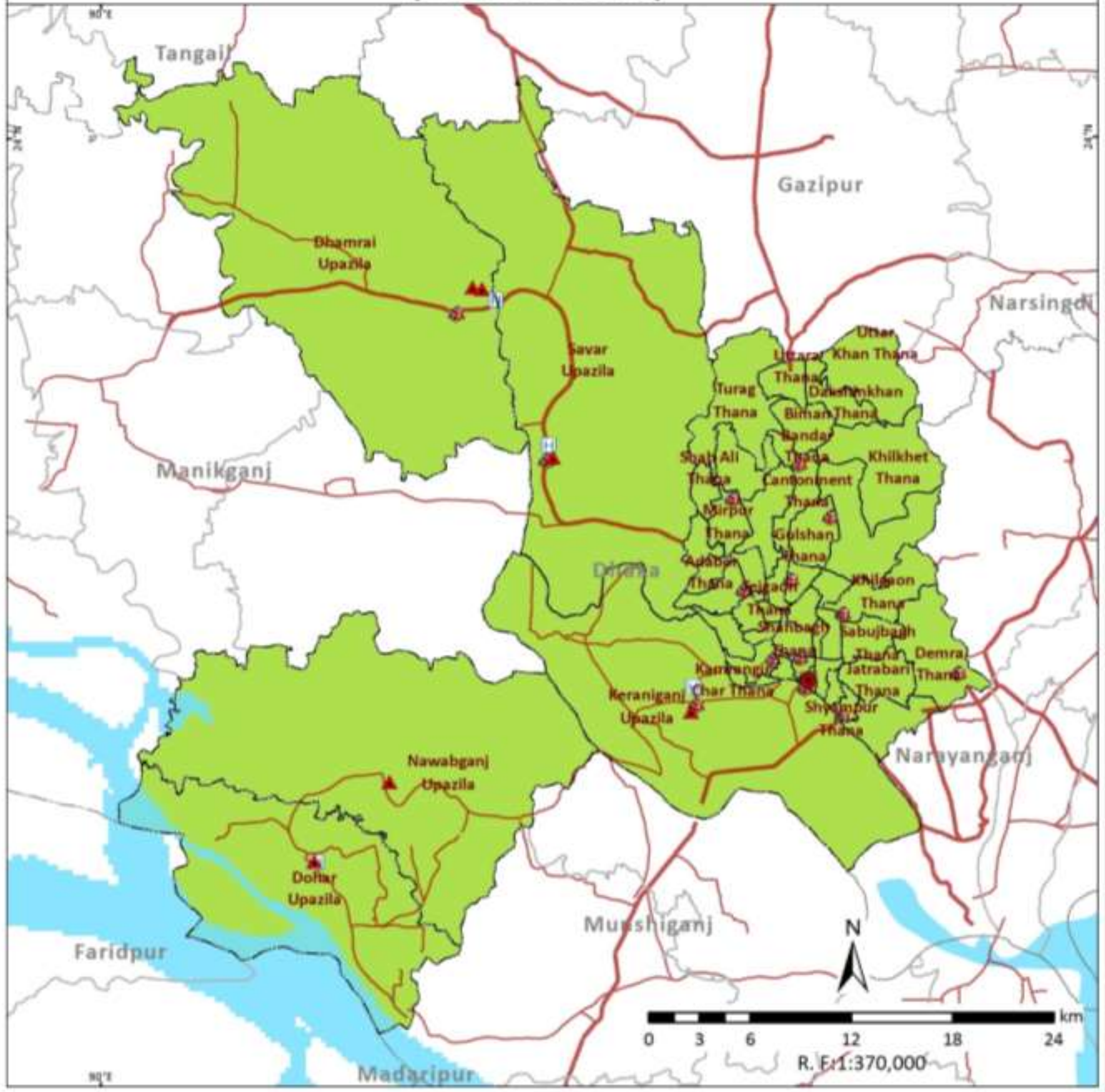
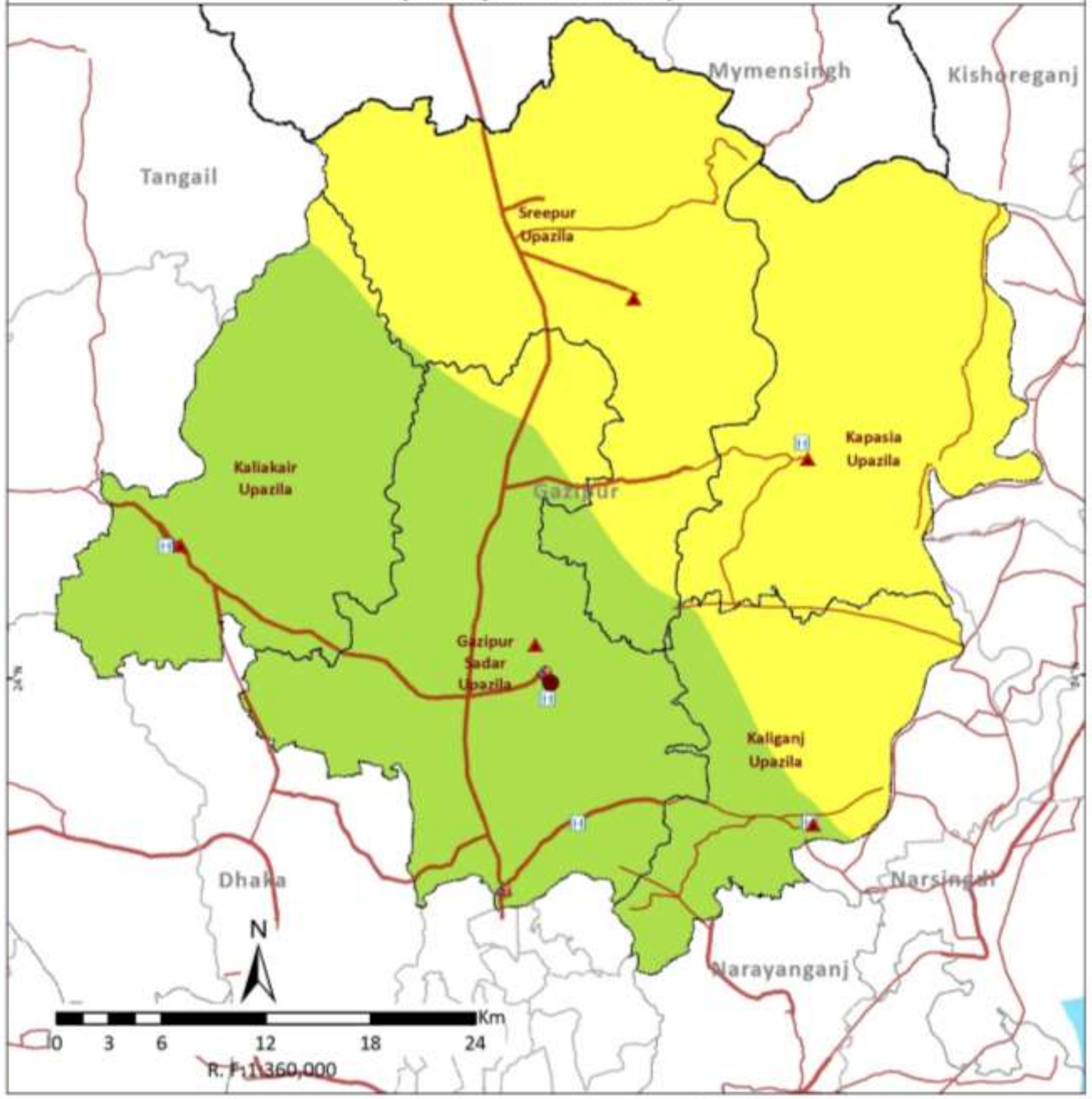
Ministry of Disaster Management and Relief

Earthquake Hazard Map of 50 Year Return Period
(Dhaka Division)

Earthquake Hazard Map of 50 Year Return Period
(Dhaka District)



Earthquake Hazard Map of 50 Year Return Period
(Gazipur District)



Legend

Country Boundary	Division Head Quarter	PGA Value (g)	
Division Boundary	District Head Quarter	< 0.05	
District Boundary	Upazila Head Quarter	0.05 - 0.15	
Upazila Boundary	Fire Station	0.15 - 0.35	
National High Way	Hospital	0.35 - 0.50	
Regional High Way	Cyclone Shelter	> 0.50	
	River/Sea/Lake		
	Sundarbans		

Note:

National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

Data Source: BMD, GSB, CDMP-II, MoDMR

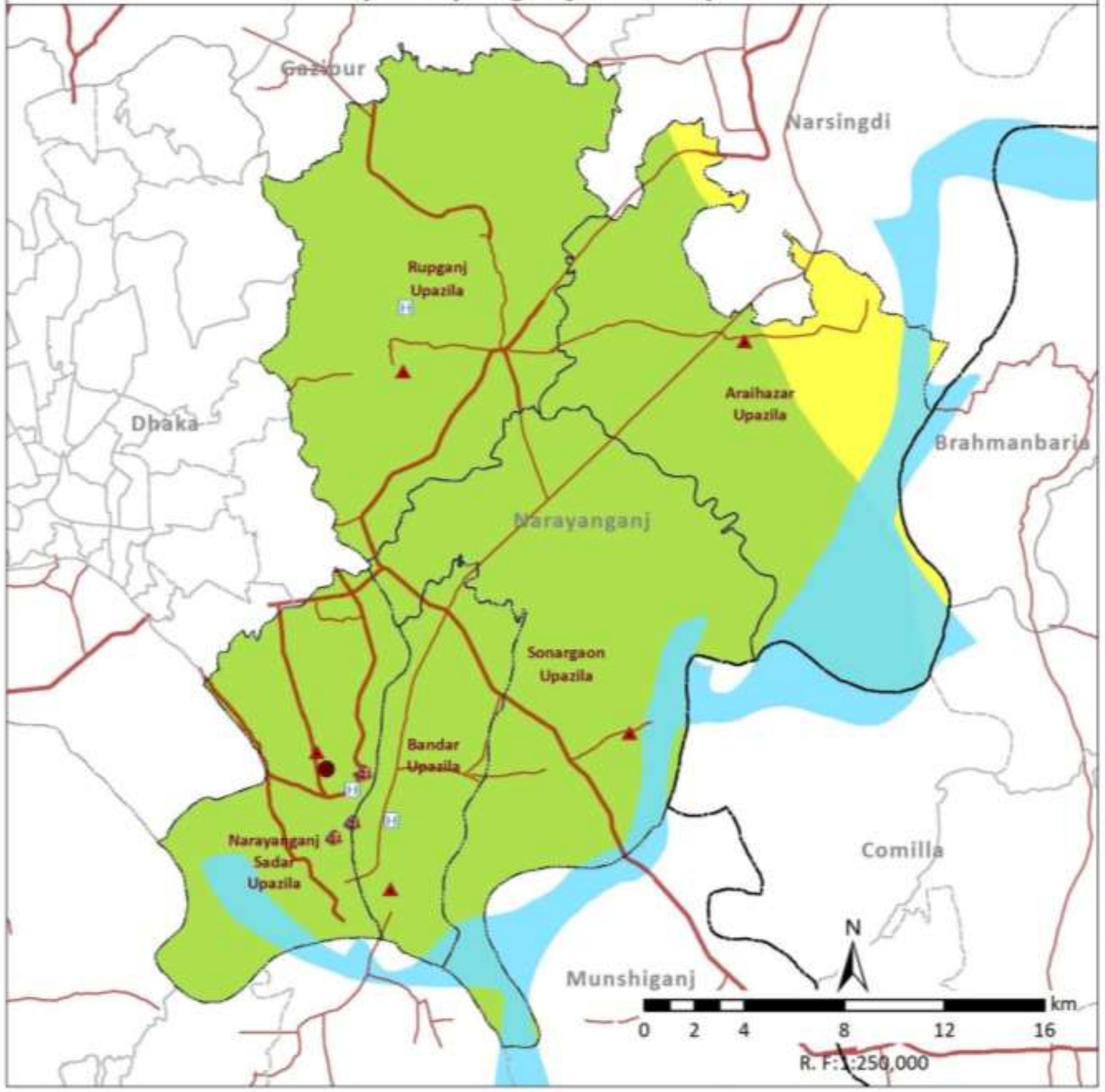
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

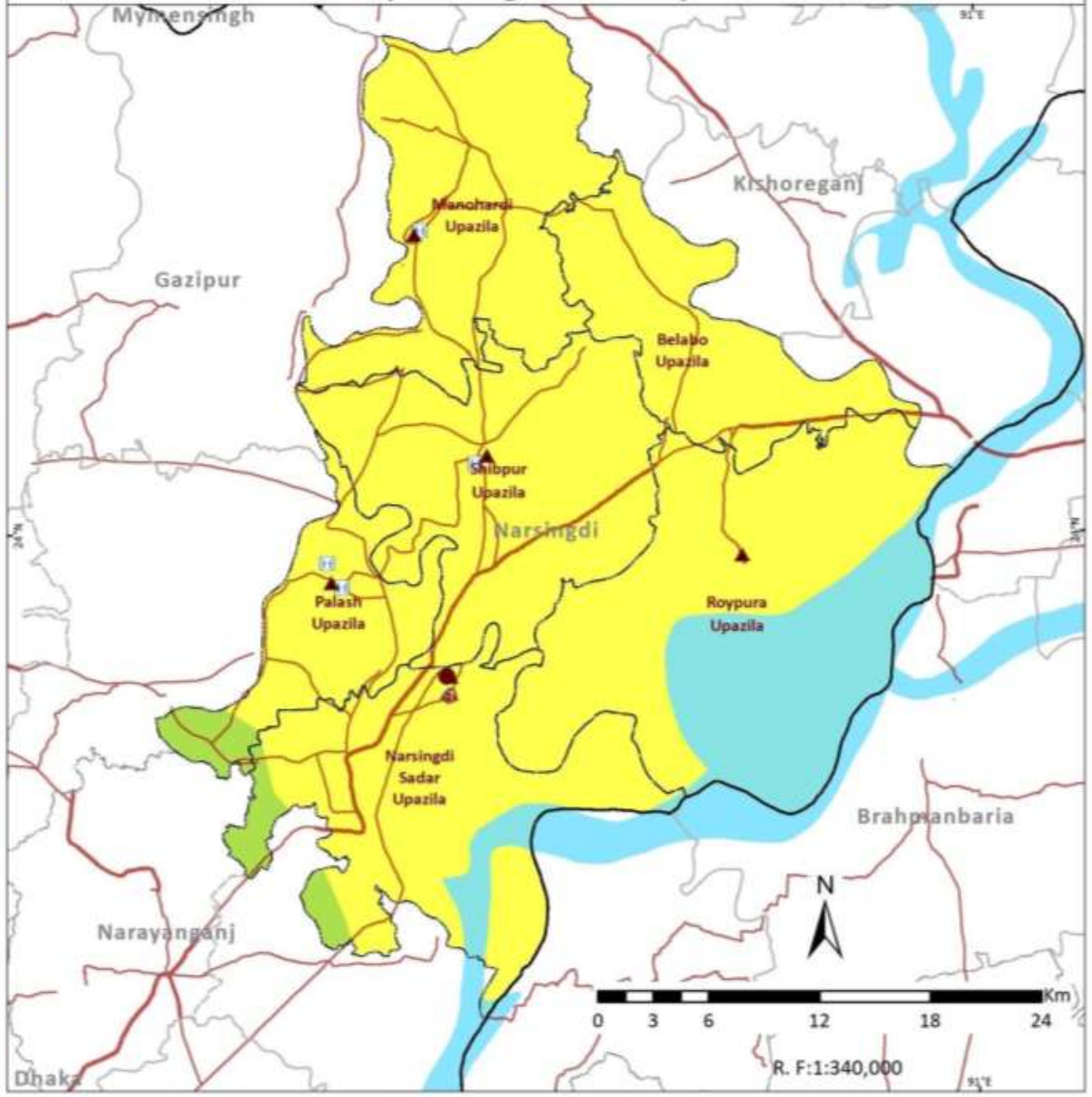
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Earthquake Hazard Map of 50 Year Return Period
(Narayanganj District)



Earthquake Hazard Map of 50 Year Return Period
(Narsingdi District)



Legend

Country Boundary	District Head Quarter	PGA Value (g)	
Division Boundary	Upazila Head Quarter		< 0.05
District Boundary	Fire Station		0.05 - 0.15
Upazila Boundary	Hospital		0.15 - 0.35
National High Way	Cyclone Shelter		0.35 - 0.50
Regional High Way	River/Sea/Lake		> 0.50
	Sundarbans		

Note:

National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

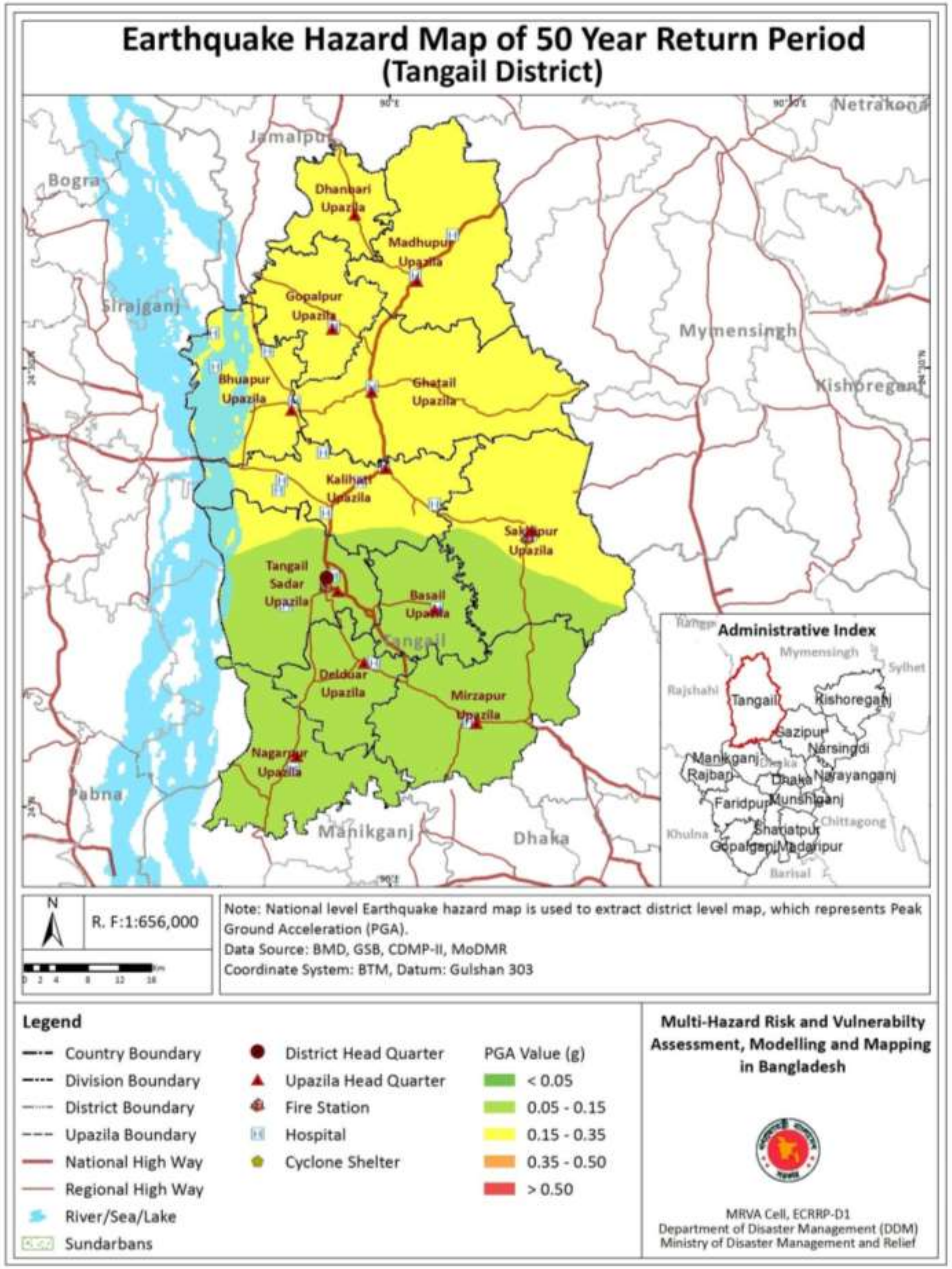
Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Earthquake Hazard Map of 50 Year Return Period
(Tangail District)
Jamalpur
Netrakona
Bogra
Sirajganj
Mymensingh
Kishoreganj
Pabna
Manikganj
Dhaka
Dhanbari Upazila
Madhupur Upazila
Gopalpur Upazila
Bhuapur Upazila
Ghatail Upazila
Kalihati Upazila
Sakhipur Upazila
Tangail Sadar Upazila
Basail Upazila
Delduar Upazila
Mirzapur Upazila
Nagarpur Upazila
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Rajbari
Dhaka
Narayanganj
Faridpur
Munshiganj
Chittagong
Khulna
Shariatpur
Gopalganj
Madaripur
Barisal
N
R. F:1:656,000
Note: National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Earthquake Hazard Map of 50 Year Return Period

(Khulna Division)

Legend		PGA Value (g)	
	Country Boundary		< 0.05
	Division Boundary		0.05 - 0.15
	District Boundary		0.15 - 0.35
	Division Head Quarter		0.35 - 0.50
	District Head Quarter		> 0.50
	River/Sea/Lake		
	Sundarbans		

Note:

National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

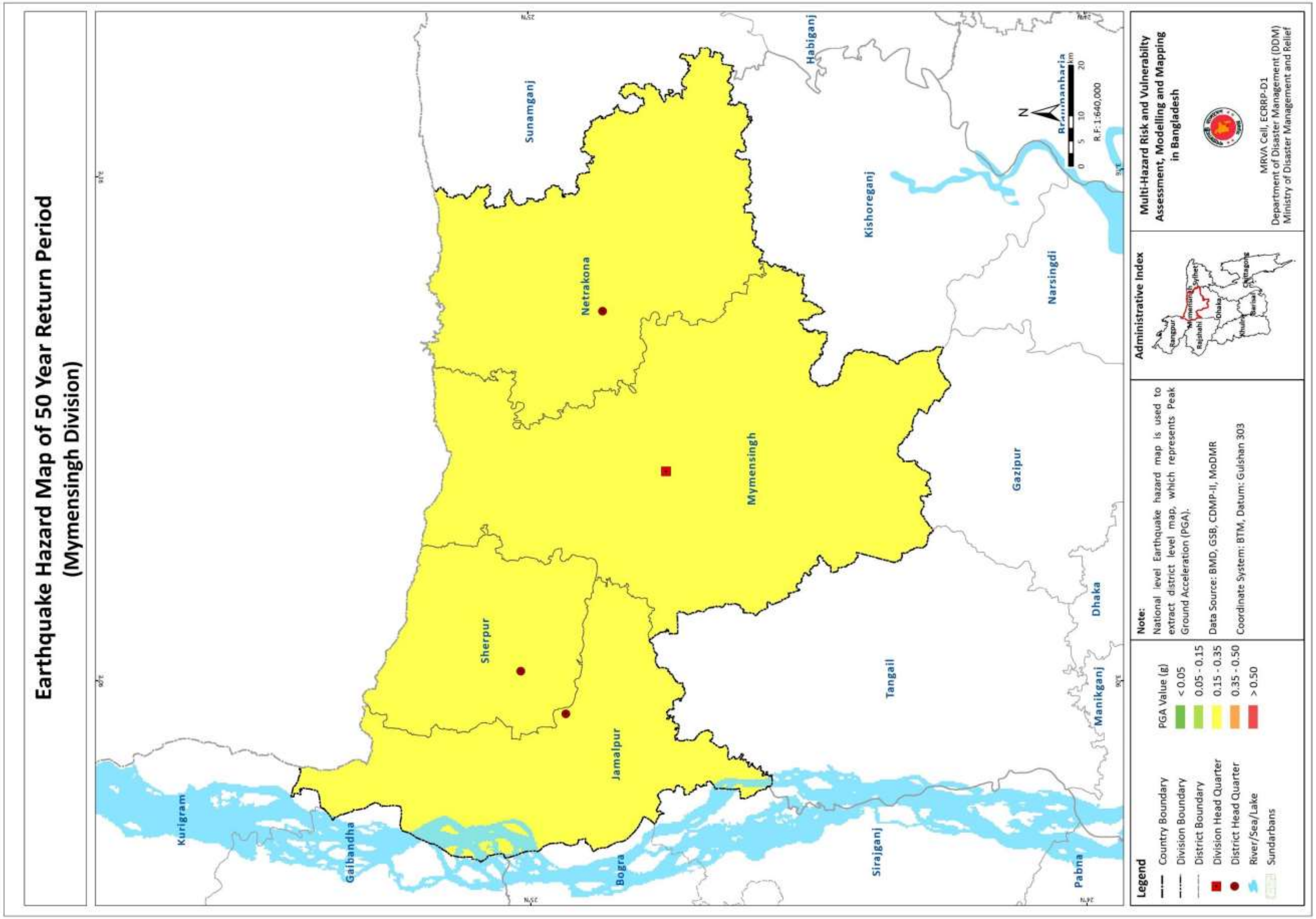
Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

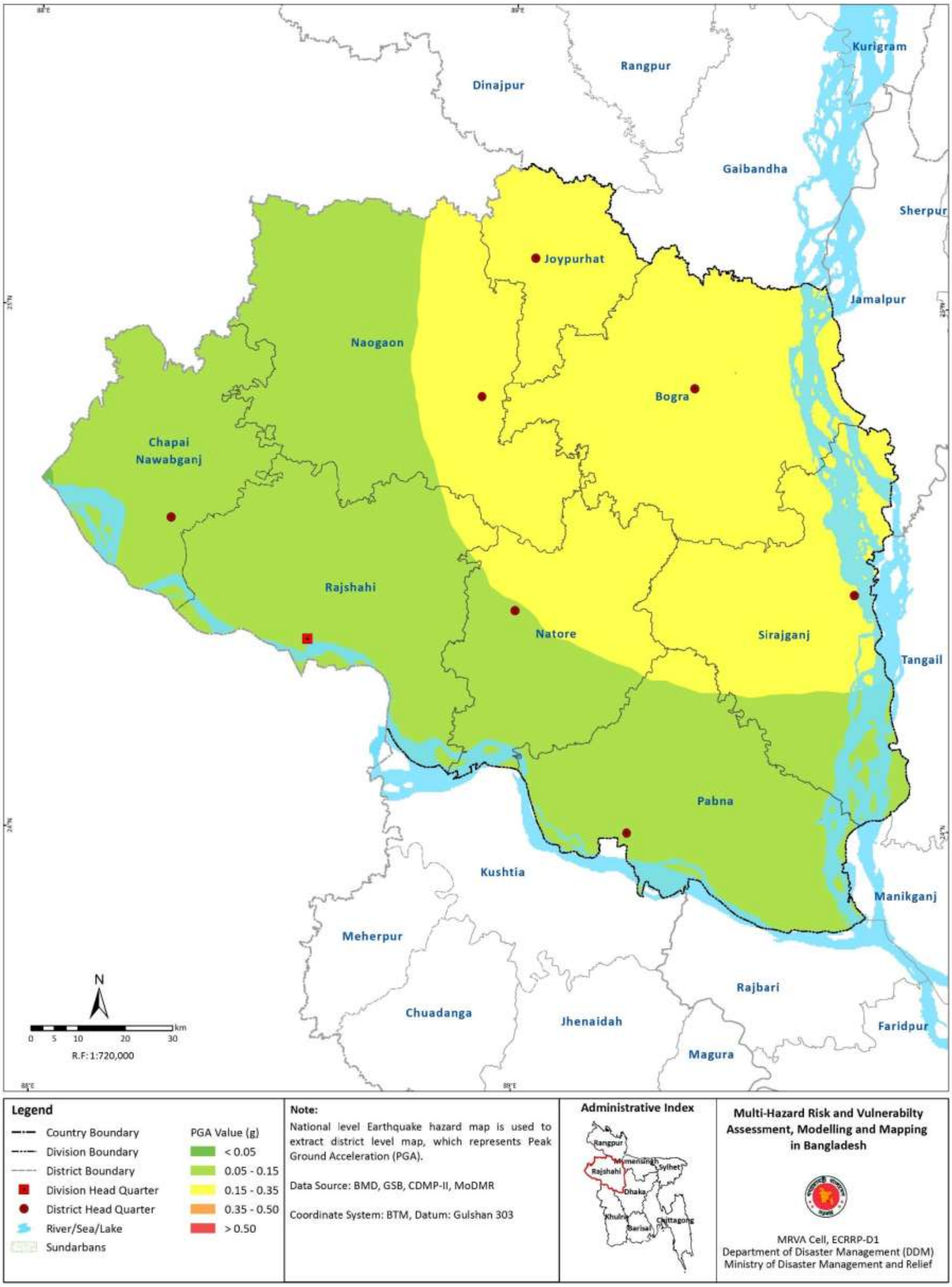
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

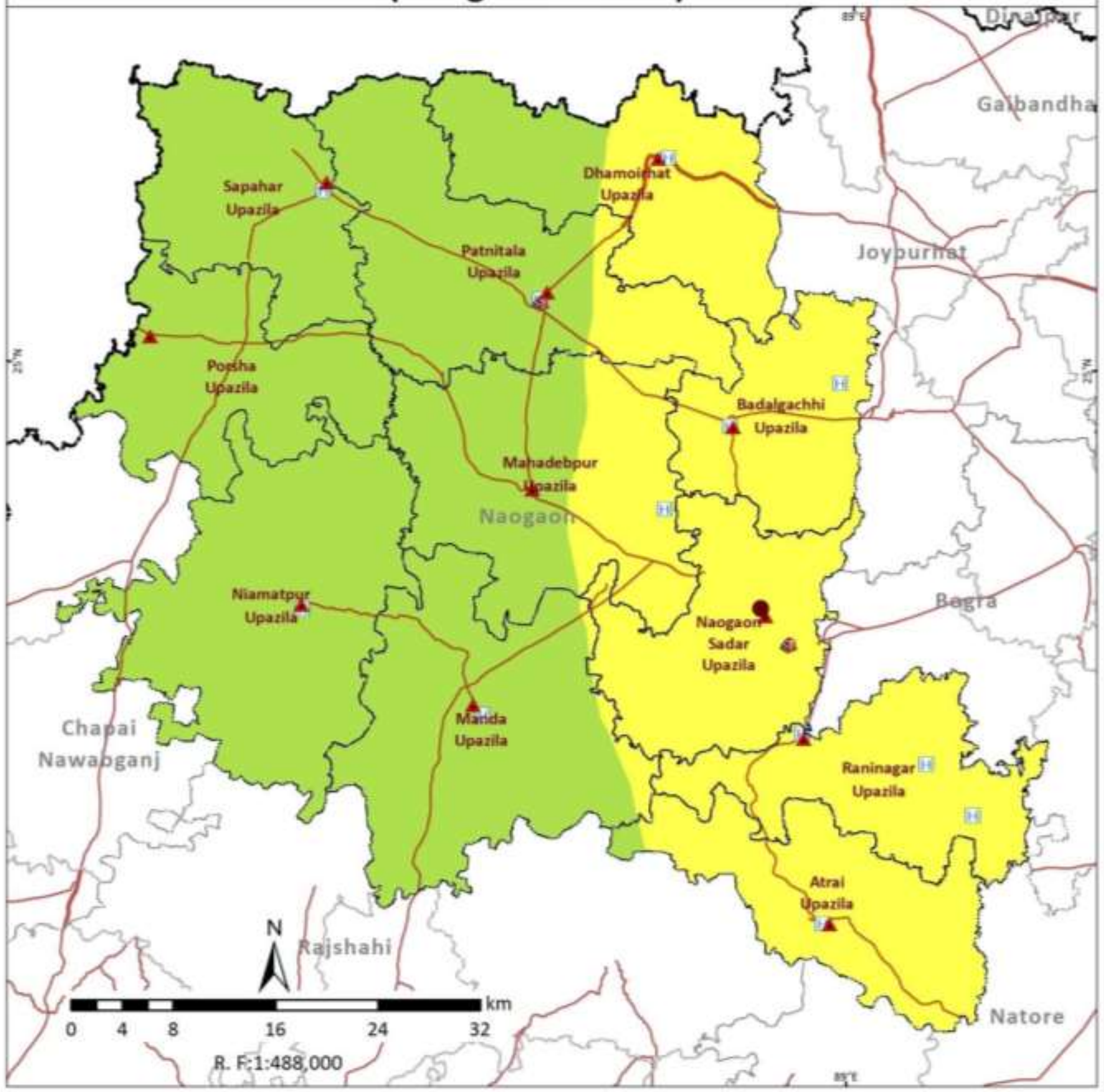


Earthquake Hazard Map of 50 Year Return Period
(Mymensingh Division)
Sunamganj
Habiganj
Kishoreganj
Netrakona
Mymensingh
Narsingdi
Gazipur
Sherpur
Jamalpur
Tangail
Dhaka
Manikganj
Kurigram
Gaibandha
Bogra
Sirajganj
Pabna
Brahmanbaria
R.F: 1:640,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerability Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

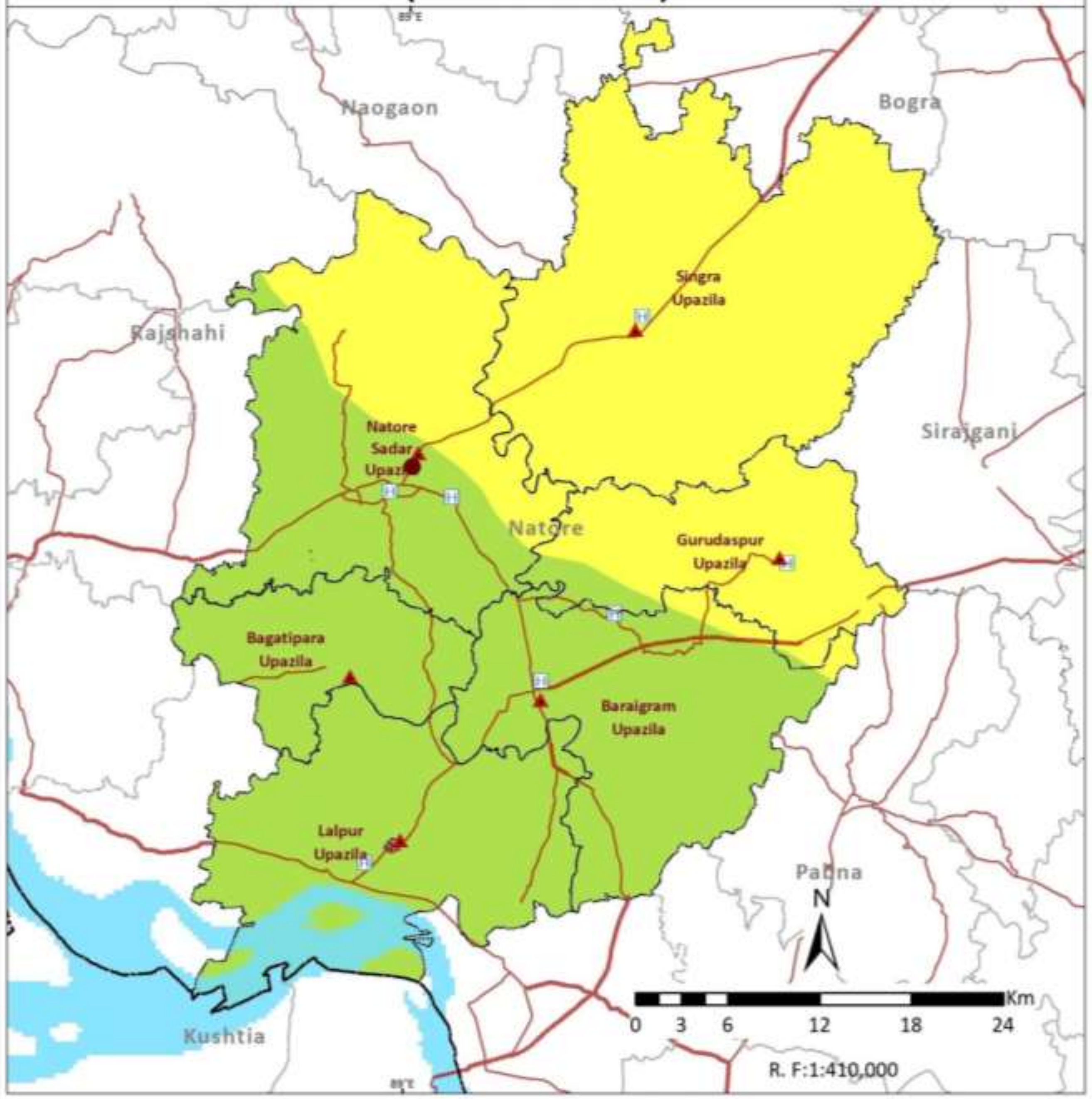
Earthquake Hazard Map of 50 Year Return Period
(Rajshahi Division)



Earthquake Hazard Map of 50 Year Return Period
(Naogaon District)



Earthquake Hazard Map of 50 Year Return Period
(Natore District)



Legend

Country Boundary	District Head Quarter	PGA Value (g)	
Division Boundary	Upazila Head Quarter		< 0.05
District Boundary	Fire Station		0.05 - 0.15
Upazila Boundary	Hospital		0.15 - 0.35
National High Way	Cyclone Shelter		0.35 - 0.50
Regional High Way	River/Sea/Lake		> 0.50
	Sundarbans		

Note:

National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

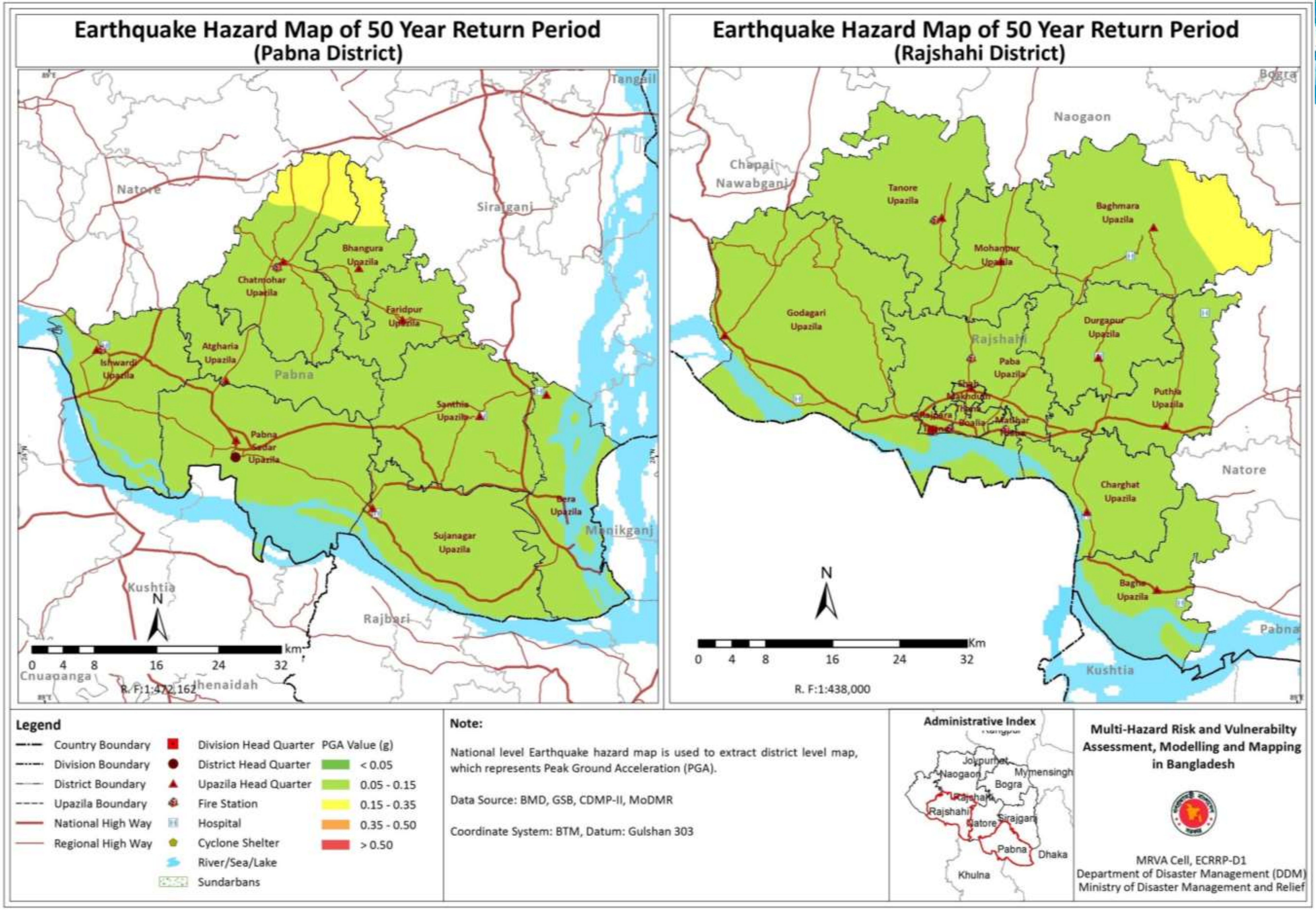
Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

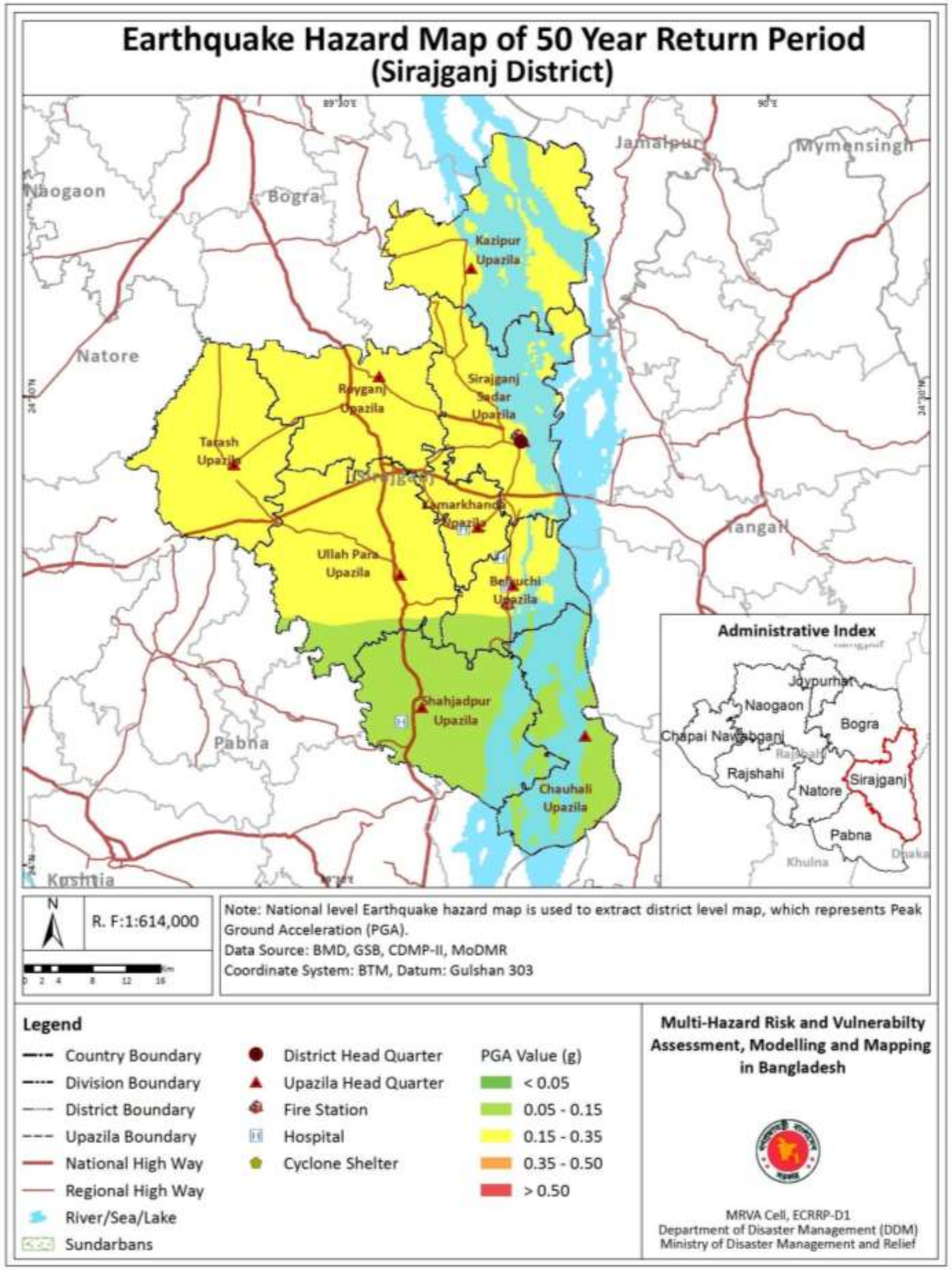
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Earthquake Hazard Map of 50 Year Return Period
(Pabna District)
Tangail
Natore
Sirajganj
Bhangura Upazila
Chatmohar Upazila
Faridpur Upazila
Atgharia Upazila
Pabna
Ishwardi Upazila
Santhia Upazila
Pabna Sadar Upazila
Bera Upazila
Sujanagar Upazila
Manikganj
Kushtia
Rajbari
N
km
0 4 8 16 24 32
Chuadanga
R. F:1:472,162
Jhenaidah
Earthquake Hazard Map of 50 Year Return Period
(Rajshahi District)
Bogra
Naogaon
Chapai Nawabganj
Tanore Upazila
Baghmara Upazila
Mohanpur Upazila
Godagari Upazila
Durgapur Upazila
Rajshahi
Paba Upazila
Puthia Upazila
Boalia
Matihar
Charghat Upazila
Natore
Bagha Upazila
N
Km
0 4 8 16 24 32
R. F:1:438,000
Kushtia
Pabna
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Mymensingh
Bogra
Rajshahi
Natore
Sirajganj
Pabna
Dhaka
Khulna
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Earthquake Hazard Map of 50 Year Return Period
(Sirajganj District)
Jamalpur
Mymensingh
Naogaon
Bogra
Kazipur Upazila
Natore
Sirajganj Sadar Upazila
Royganj Upazila
Tarash Upazila
Kamarkhanda Upazila
Tangail
Ullah Para Upazila
Belkuchi Upazila
Shahjadpur Upazila
Pabna
Chauhali Upazila
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
R. F:1:614,000
Note: National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Earthquake Hazard Map of 50 Year Return Period
(Rangpur Division)

Legend

Country Boundary		PGA Value (g)	
Division Boundary		< 0.05	
District Boundary		0.05 - 0.15	
Division Head Quarter		0.15 - 0.35	
District Head Quarter		0.35 - 0.50	
River/Sea/Lake		> 0.50	
Sundarbans			

Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).

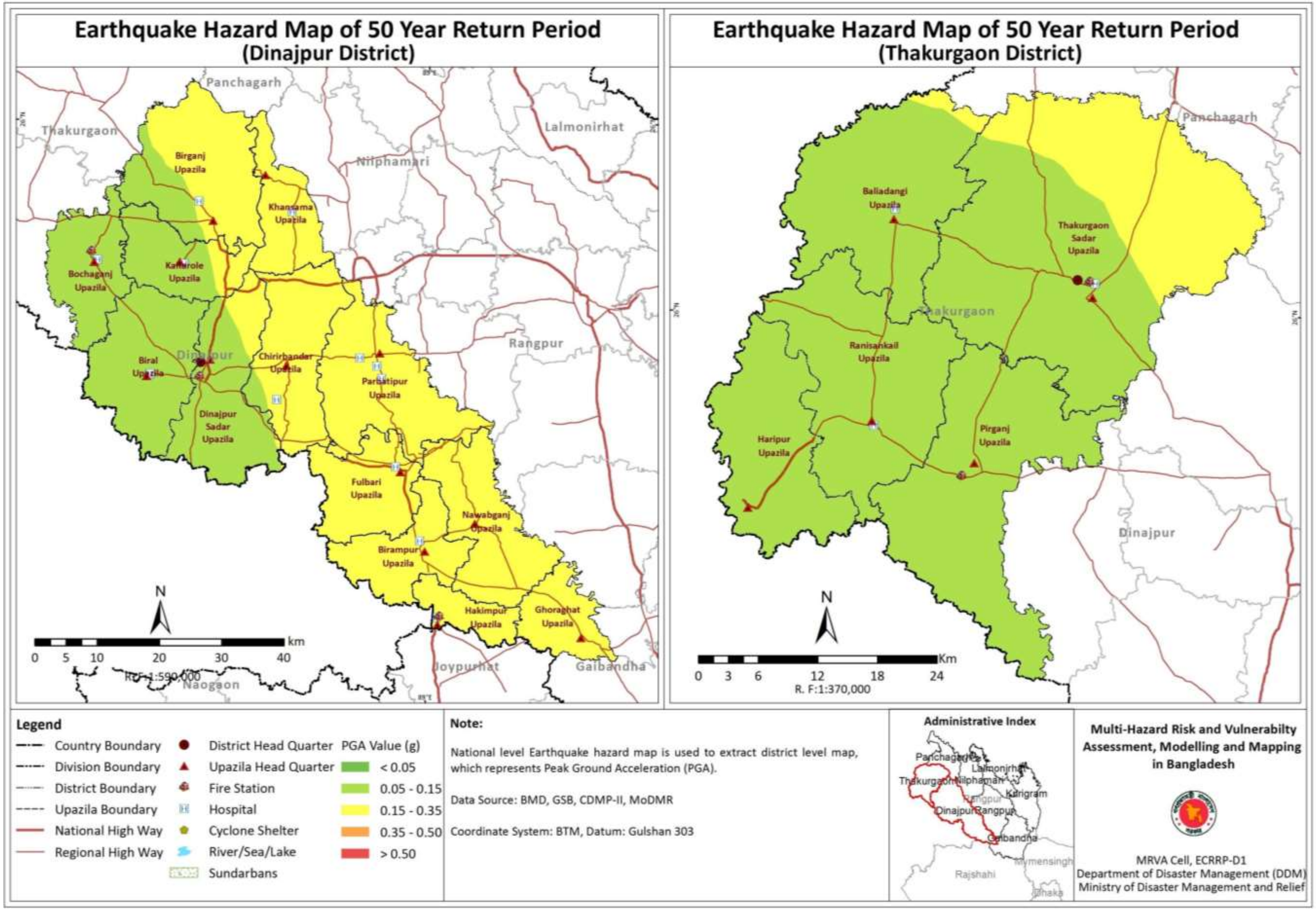
Data Source: BMD, GSB, CDMP-II, MoDMR

Coordinate System: BTM, Datum: Gulshan 303

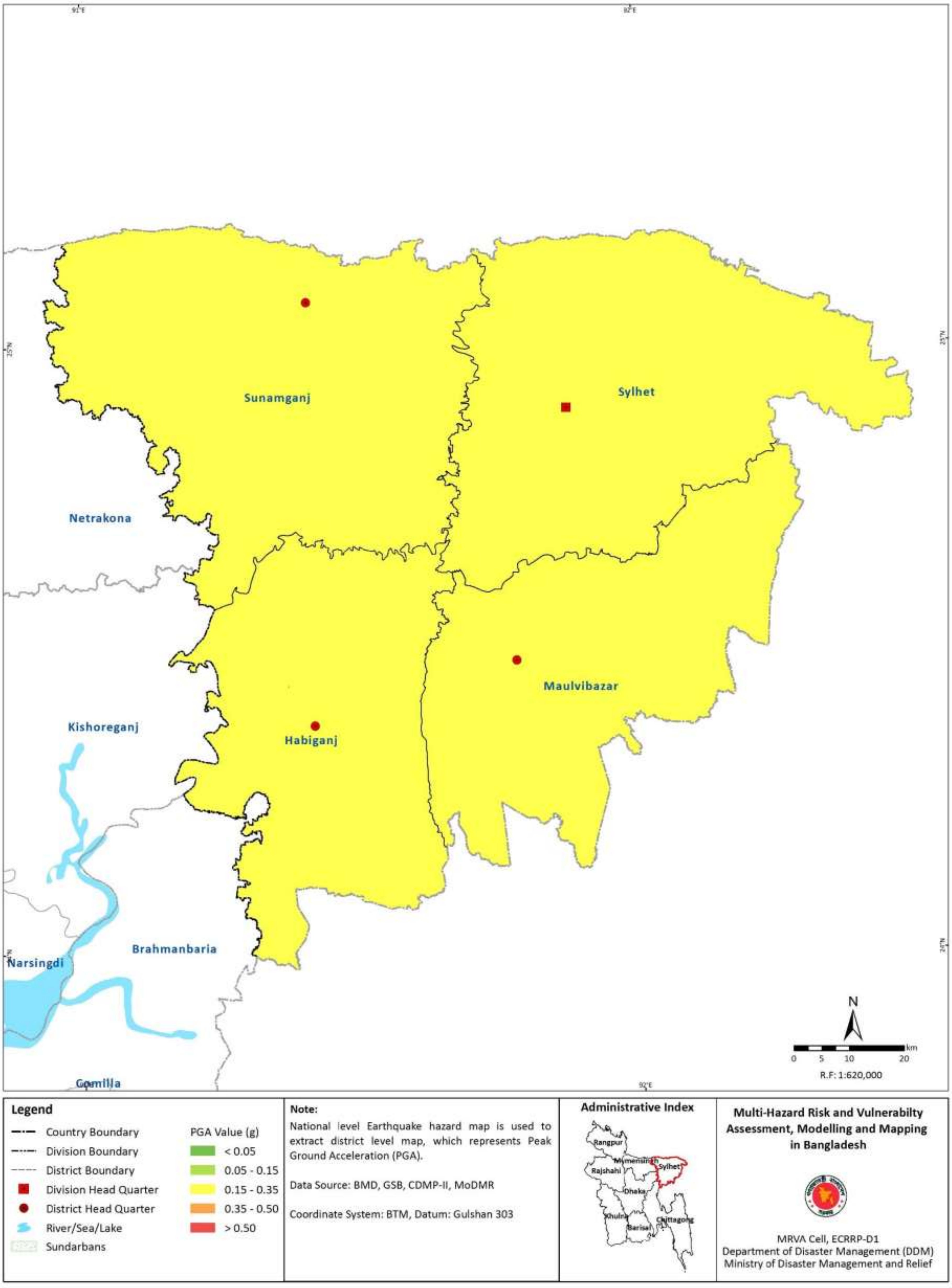
Administrative Index

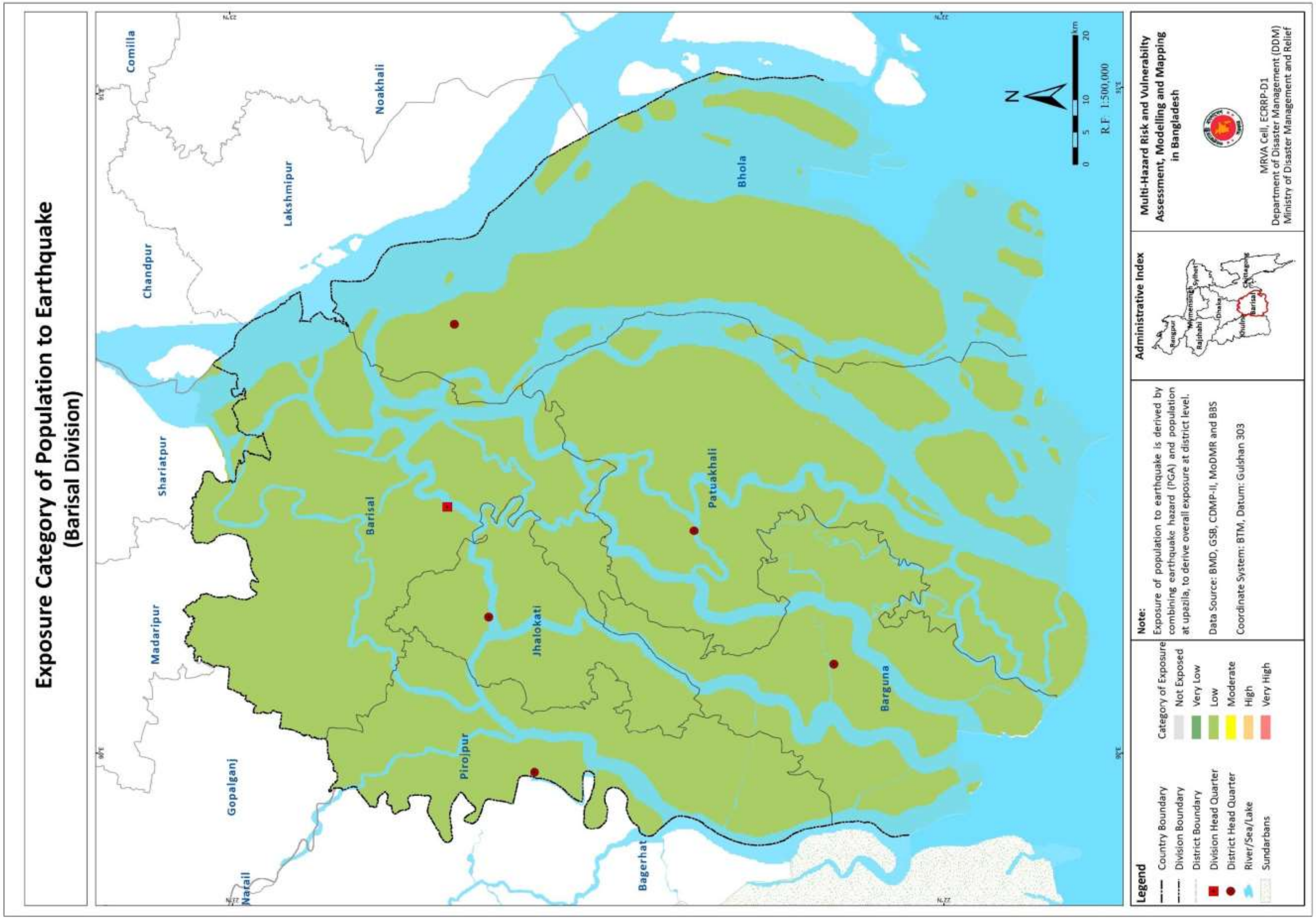
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

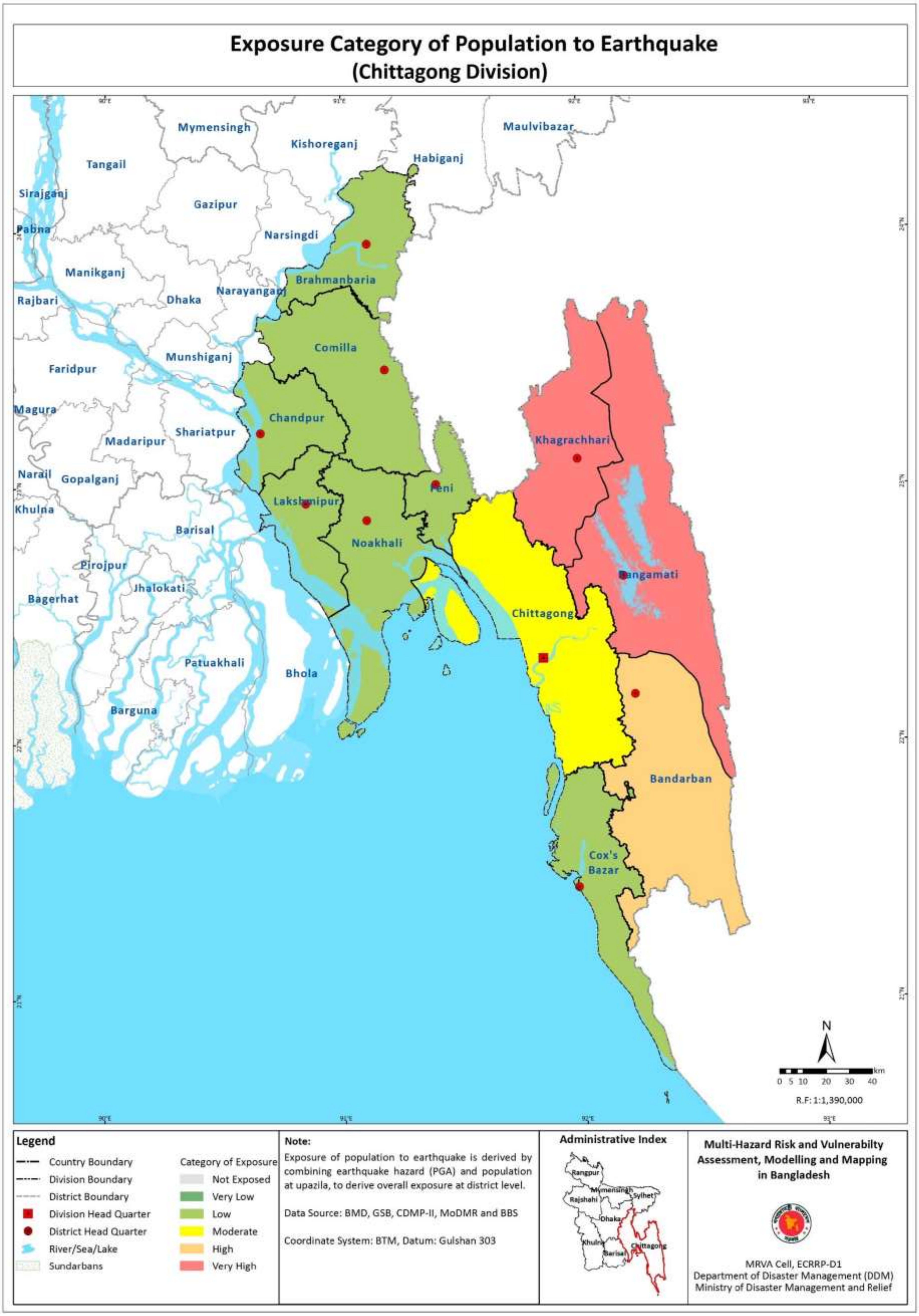
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Earthquake Hazard Map of 50 Year Return Period
(Dinajpur District)
Panchagarh
Thakurgaon
Lalmonirhat
Nilphamari
Birganj Upazila
Khansama Upazila
Bochaganj Upazila
Kaharole Upazila
Rangpur
Dinajpur
Biral Upazila
Chirirbandar Upazila
Parbatipur Upazila
Dinajpur Sadar Upazila
Fulbari Upazila
Nawabganj Upazila
Birampur Upazila
Hakimpur Upazila
Ghoraghat Upazila
Joypurhat
Gaibandha
Naogaon
N
km
0 5 10 20 30 40
R.F-1:590,000
Earthquake Hazard Map of 50 Year Return Period
(Thakurgaon District)
Panchagarh
Baliadangi Upazila
Thakurgaon Sadar Upazila
Thakurgaon
Ranisankail Upazila
Pirganj Upazila
Haripur Upazila
Dinajpur
N
Km
0 3 6 12 18 24
R. F:1:370,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
PGA Value (g)
< 0.05
0.05 - 0.15
0.15 - 0.35
0.35 - 0.50
> 0.50
Note:
National level Earthquake hazard map is used to extract district level map, which represents Peak Ground Acceleration (PGA).
Data Source: BMD, GSB, CDMP-II, MoDMR
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Panchagarh
Lalmonirhat
Thakurgaon
Nilphamari
Kurigram
Dinajpur
Rangpur
Gaibandha
Rajshahi
Mymensingh
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

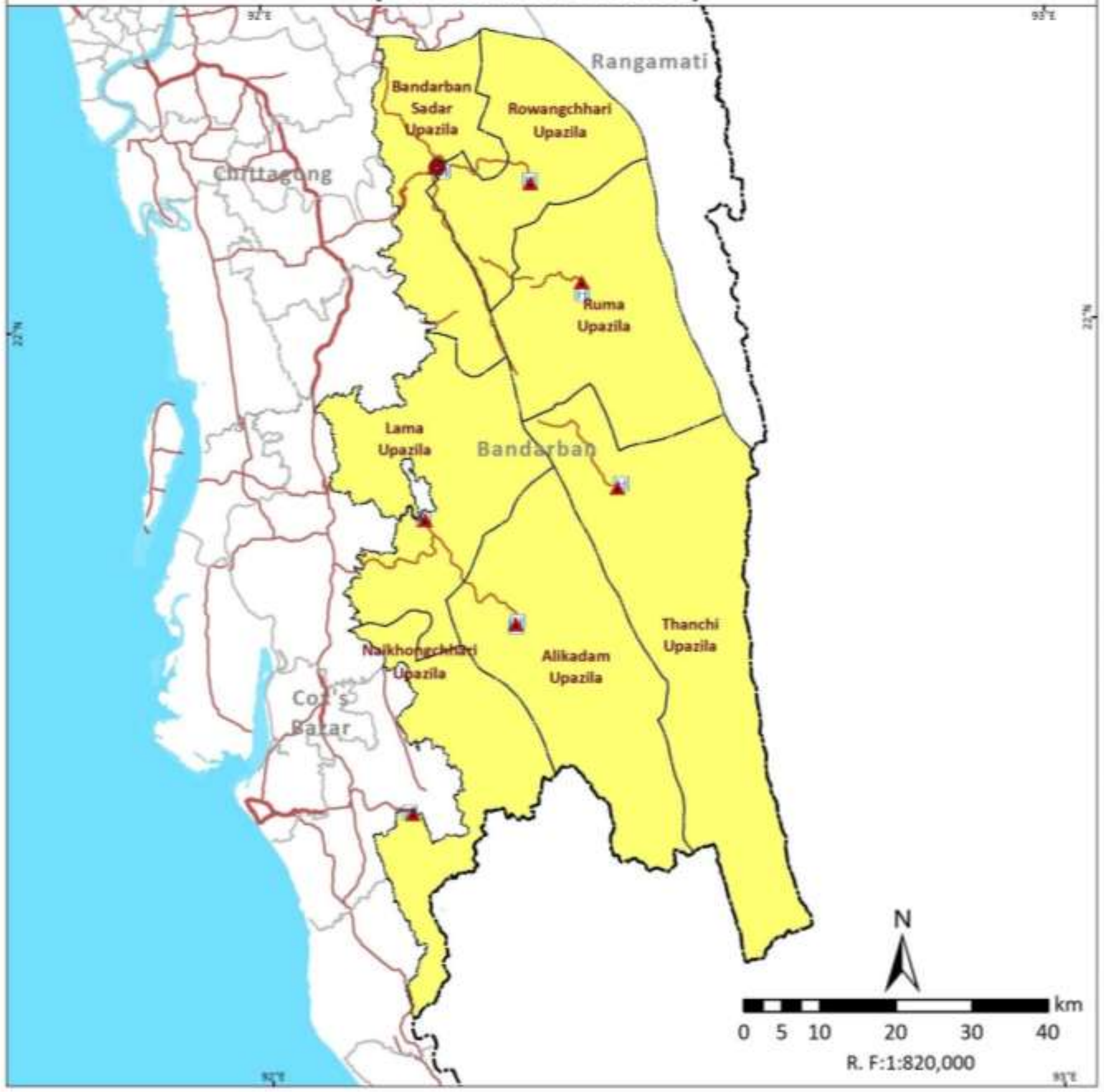
Earthquake Hazard Map of 50 Year Return Period
(Sylhet Division)



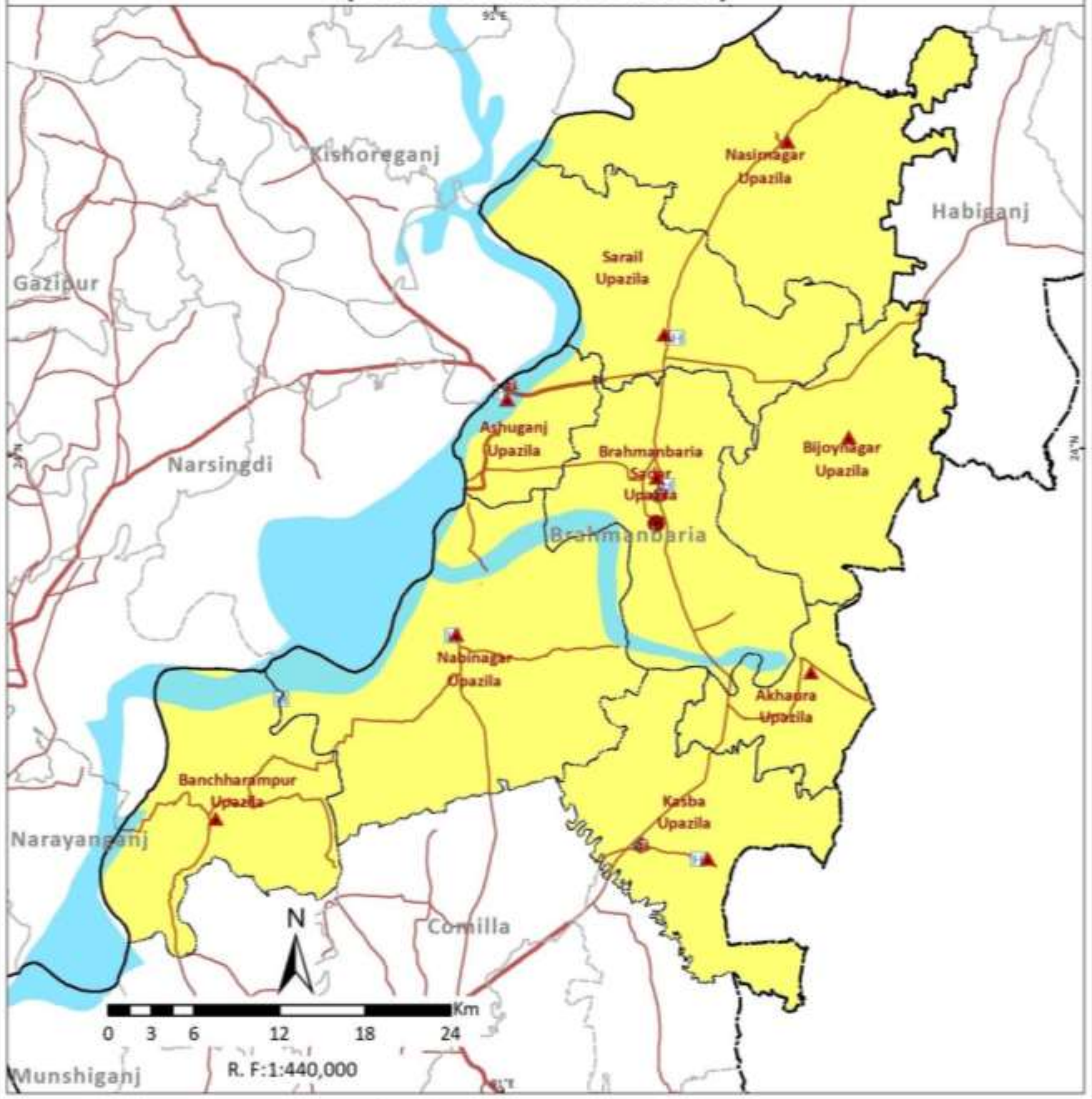

Exposure Category of Population to Earthquake
(Barisal Division)
Comilla
Noakhali
Chandpur
Lakshmipur
Shariatpur
Madaripur
Gopalganj
Narail
Bagerhat
Bhola
Barisal
Patuakhali
Jhalokati
Pirojpur
Barguna
R.F 1:500,000
0 5 10 20 km
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief
Administrative Index
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303


Exposure Category of Population to Earthquake
(Chittagong Division)
Mymensingh
Kishoreganj
Habiganj
Maulvibazar
Tangail
Sirajganj
Pabna
Gazipur
Narsingdi
Manikganj
Brahmanbaria
Rajbari
Dhaka
Narayanganj
Comilla
Munshiganj
Faridpur
Magura
Chandpur
Shariatpur
Madaripur
Khagrachhari
Narail
Gopalganj
Feni
Khulna
Lakshmipur
Noakhali
Barisal
Pirojpur
Rangamati
Jhalokati
Bagerhat
Chittagong
Patuakhali
Bhola
Barguna
Bandarban
Cox's Bazar
N
0 5 10 20 30 40 km
R.F: 1:1,390,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Bandarban District)



Exposure Category of Population to Earthquake
(Brahmanbaria District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

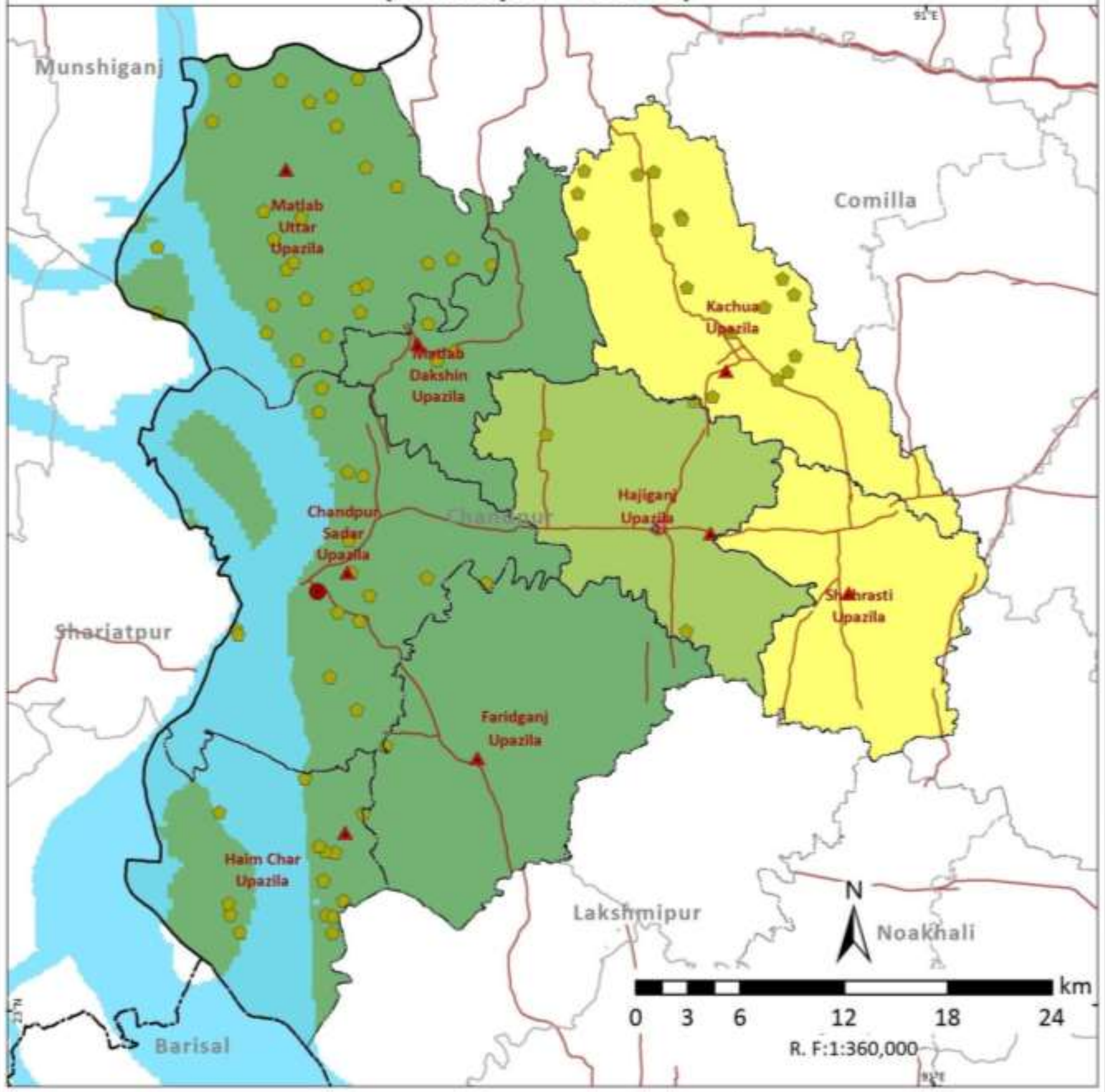
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Chandpur District)



Exposure Category of Population to Earthquake
(Chittagong District)

Legend

Country Boundary	Division Head Quarter	**Category of Exposure**
Division Boundary	District Head Quarter	Not Exposed
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

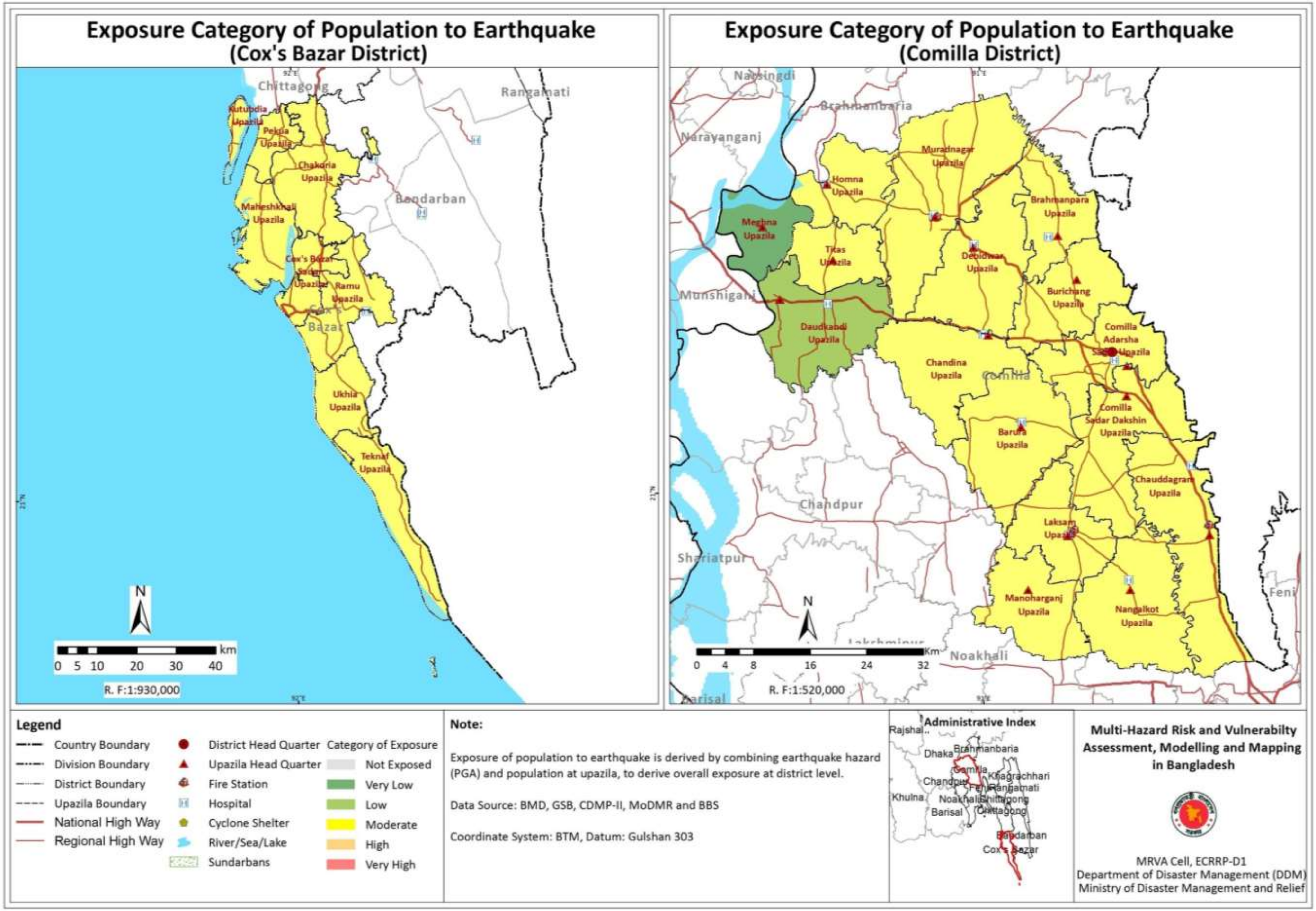
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

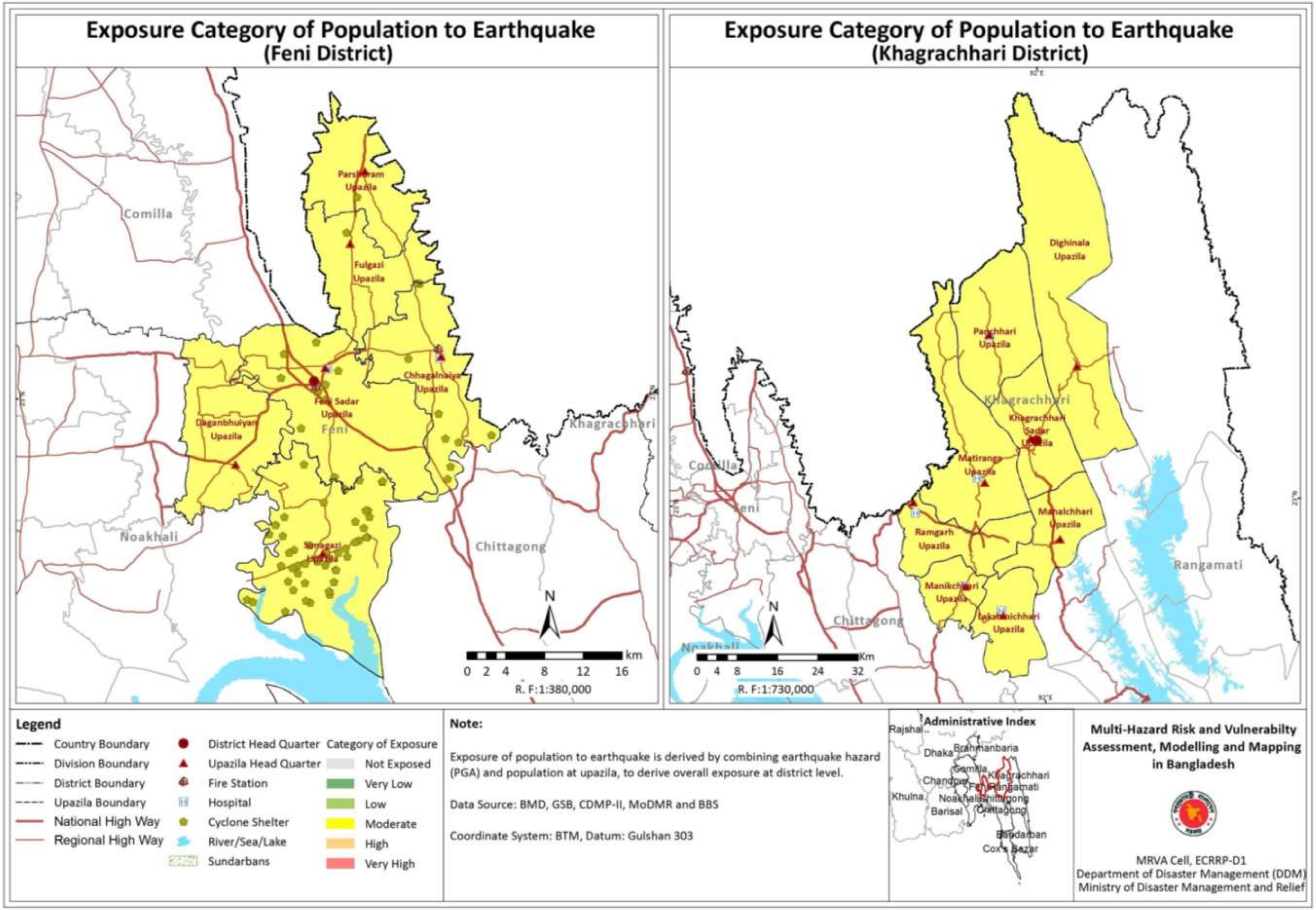
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

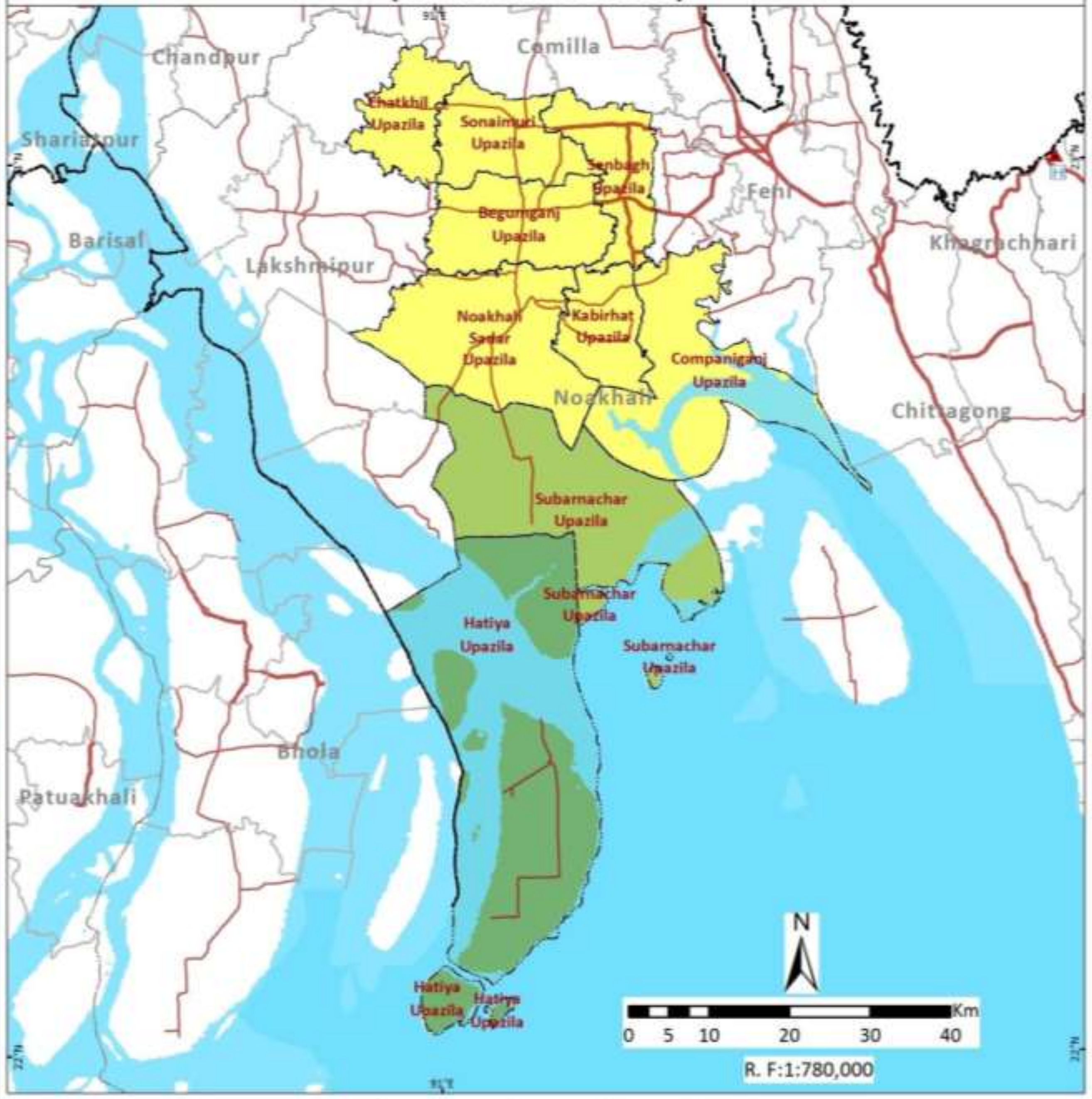


Exposure Category of Population to Earthquake
(Cox's Bazar District)
Chittagong
Rangamati
Bandarban
Cox's Bazar
Kutubdia Upazila
Pekua Upazila
Chakoria Upazila
Maheshkhali Upazila
Cox's Bazar Sadar Upazila
Ramu Upazila
Ukhia Upazila
Teknaf Upazila
0 5 10 20 30 40 km
R. F:1:930,000
Exposure Category of Population to Earthquake
(Comilla District)
Narsingdi
Brahmanbaria
Narayanganj
Munshiganj
Shariatpur
Chandpur
Comilla
Noakhali
Feni
Meghna Upazila
Homna Upazila
Muradnagar Upazila
Titas Upazila
Brahmanpara Upazila
Debidwar Upazila
Burichang Upazila
Daudkandi Upazila
Comilla Adarsha Sadar Upazila
Chandina Upazila
Barura Upazila
Comilla Sadar Dakshin Upazila
Chauddagram Upazila
Laksam Upazila
Manoharganj Upazila
Nangalkot Upazila
0 4 8 16 24 32 Km
R. F:1:520,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Feni District)
Comilla
Parshuram Upazila
Fulgazi Upazila
Chhagalnaiya Upazila
Feni Sadar Upazila
Daganbhuiyan Upazila
Feni
Khagrachhari
Noakhali
Chittagong
Sonagazi Upazila
N
0 2 4 8 12 16 km
R. F:1:380,000
Exposure Category of Population to Earthquake
(Khagrachhari District)
Dighinala Upazila
Panchhari Upazila
Khagrachhari
Khagrachhari Sadar Upazila
Matiranga Upazila
Mahalchhari Upazila
Ramgarh Upazila
Manikchhari Upazila
Lakshmichhari Upazila
Comilla
Feni
Rangamati
Chittagong
N
0 4 8 16 24 32 Km
R. F:1:730,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake (Lakshmipur District)

Exposure Category of Population to Earthquake (Noakhali District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

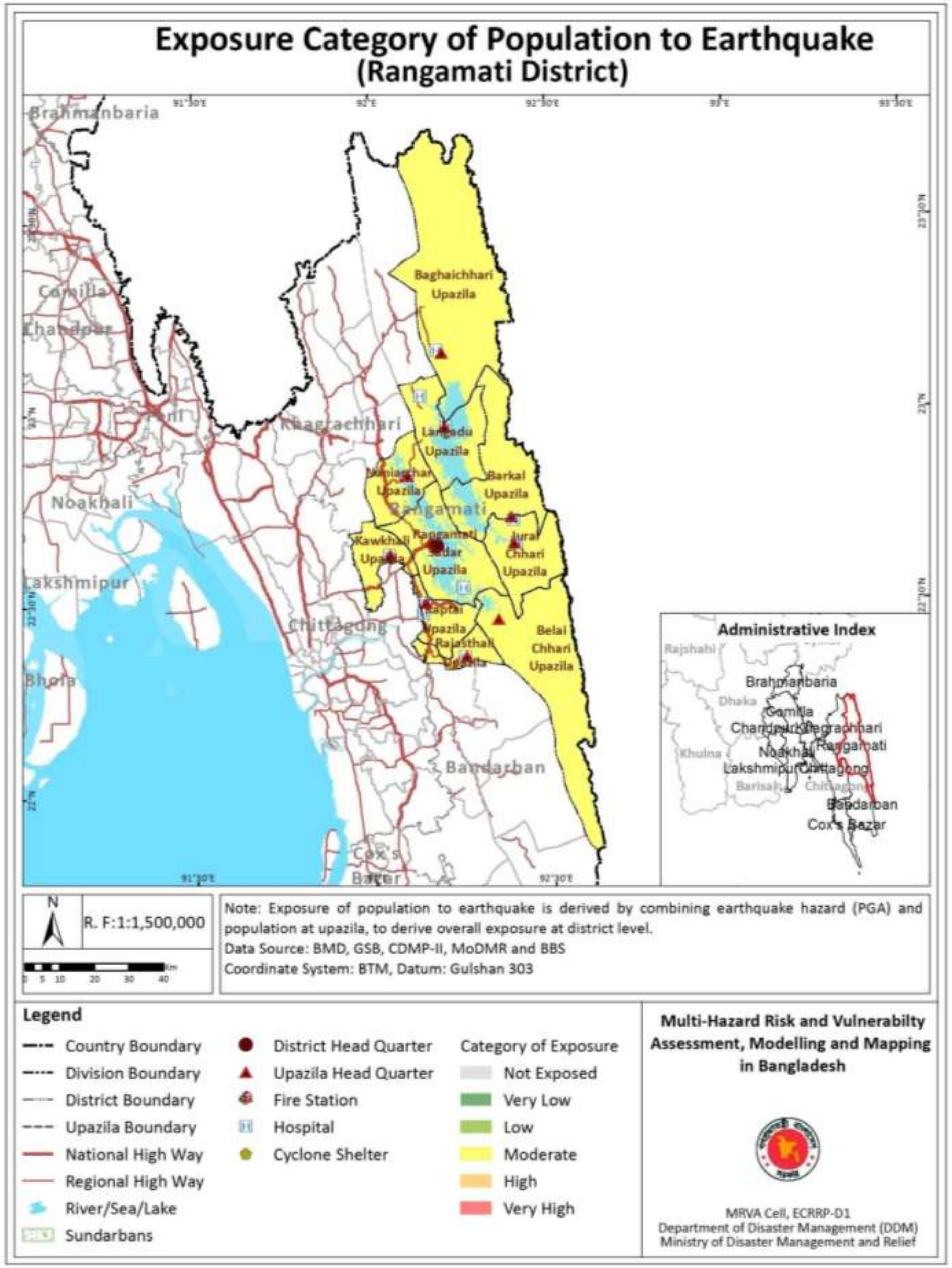
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

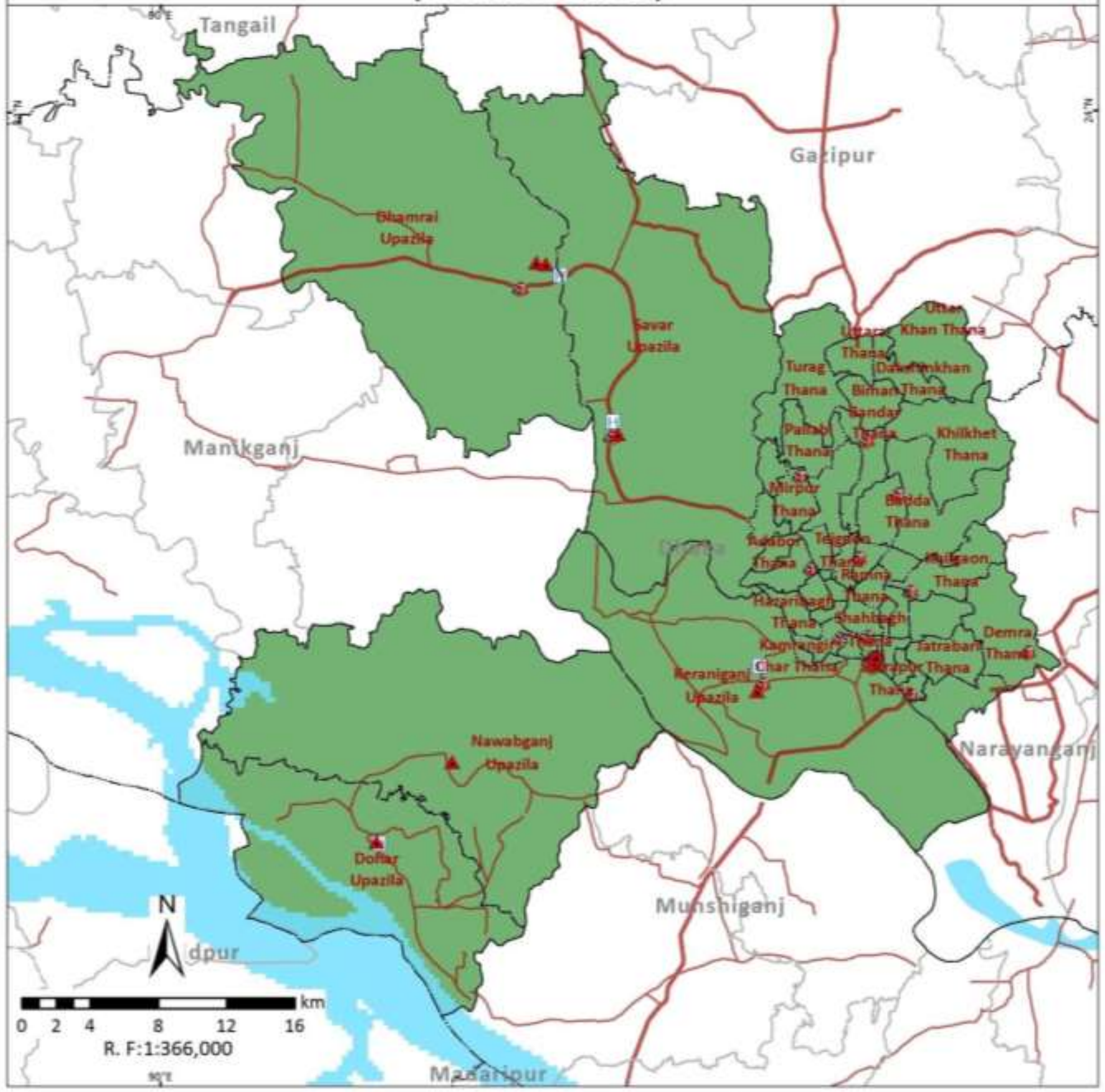
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

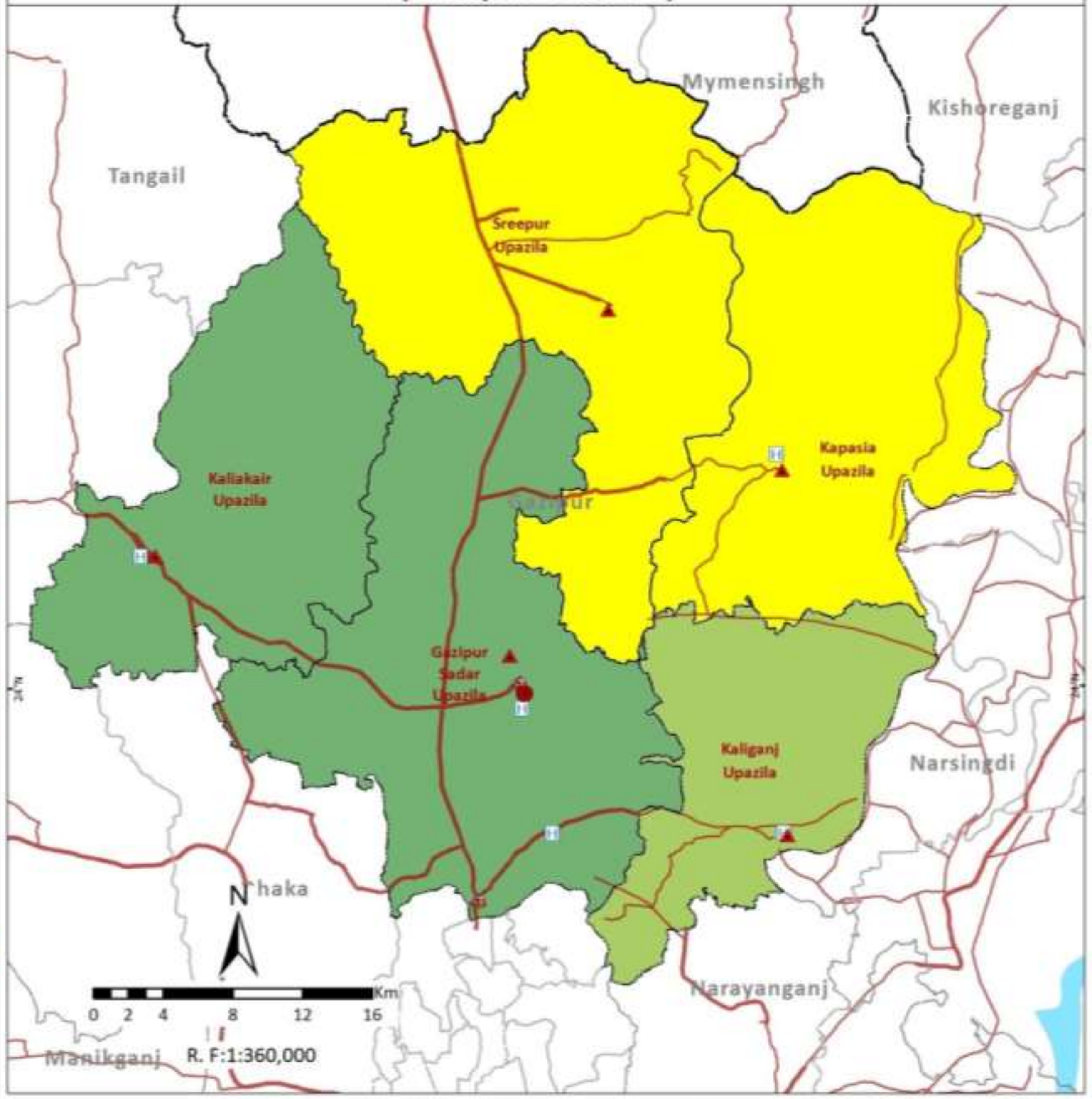

Exposure Category of Population to Earthquake
(Rangamati District)
Brahmanbaria
Comilla
Chandpur
Khagrachhari
Noakhali
Lakshmipur
Chittagong
Bhola
Bandarban
Cox's Bazar
Baghaichhari Upazila
Langadu Upazila
Naniarchar Upazila
Barkal Upazila
Rangamati
Kawkhali Upazila
Rangamati Sadar Upazila
Jurai Chhari Upazila
Kaptai Upazila
Rajasthali Upazila
Belai Chhari Upazila
Administrative Index
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
R. F:1:1,500,000
N
Note: Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Dhaka Division)
Sherpur
Jamalpur
Sunamganj
Netrakona
Bogra
Mymensingh
Natore
Habiganj
Kishoreganj
Sirajganj
Tangail
Gazipur
Pabna
Narsingdi
Brahmanbaria
Kushtia
Manikganj
Dhaka
Narayanganj
Rajbari
Jhenaidah
Faridpur
Munshiganj
Comilla
Magura
Chandpur
Madaripur
Shariatpur
Narail
Jessore
Gopalganj
Feni
Lakshmipur
Barisal
Noakhali
Khulna
Bagerhat
Pirojpur
Bhola
Satkhira
Jhalokati
N
0 5 10 20 30 km
R.F: 1:780,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake (Dhaka District)



Exposure Category of Population to Earthquake (Gazipur District)



Legend

Country Boundary	Division Head Quarter	**Category of Exposure**
Division Boundary	District Head Quarter	Not Exposed
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

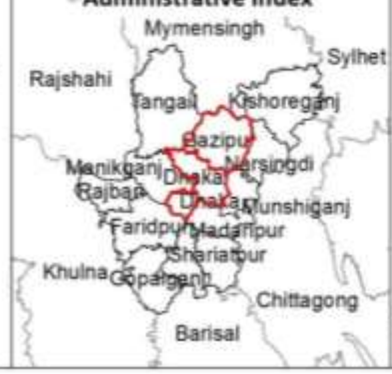
Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

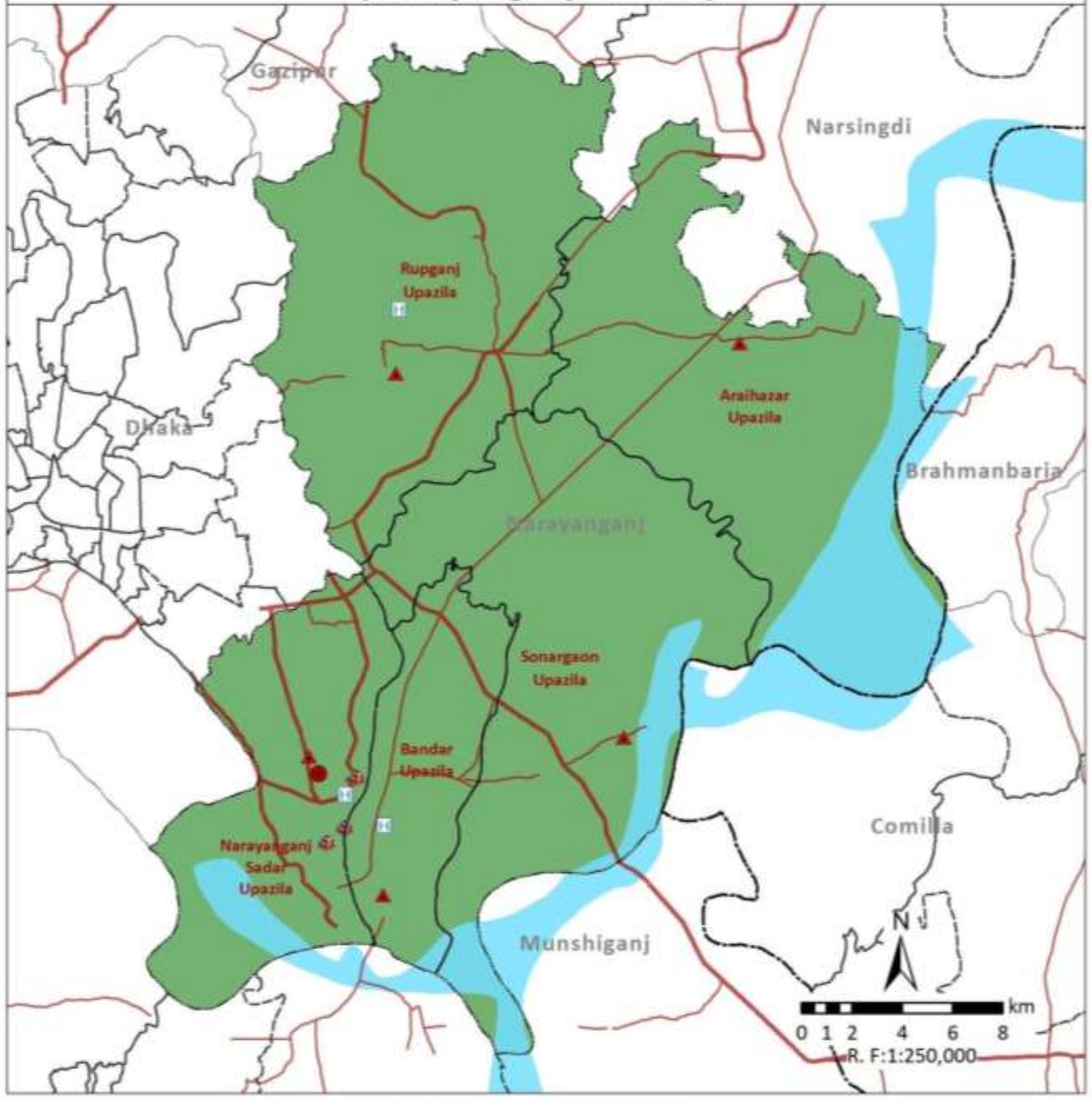


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Kishoreganj District)

Exposure Category of Population to Earthquake
(Narayanganj District)



Legend

Country Boundary	District Head Quarter	Category of Exposure	
Division Boundary	Upazila Head Quarter		Not Exposed
District Boundary	Fire Station		Very Low
Upazila Boundary	Hospital		Low
National High Way	Cyclone Shelter		Moderate
Regional High Way	River/Sea/Lake		High
	Sundarbans		Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

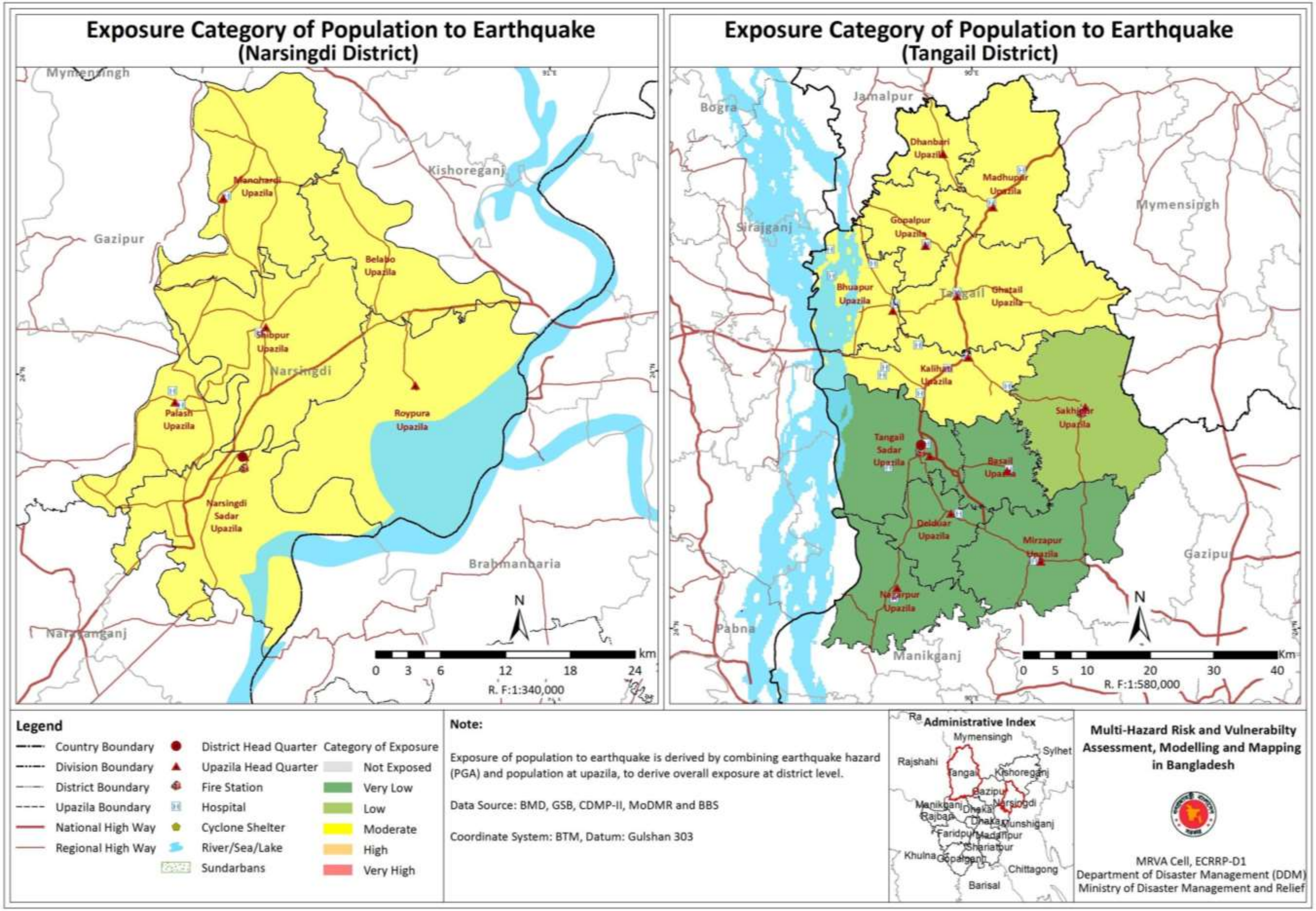
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

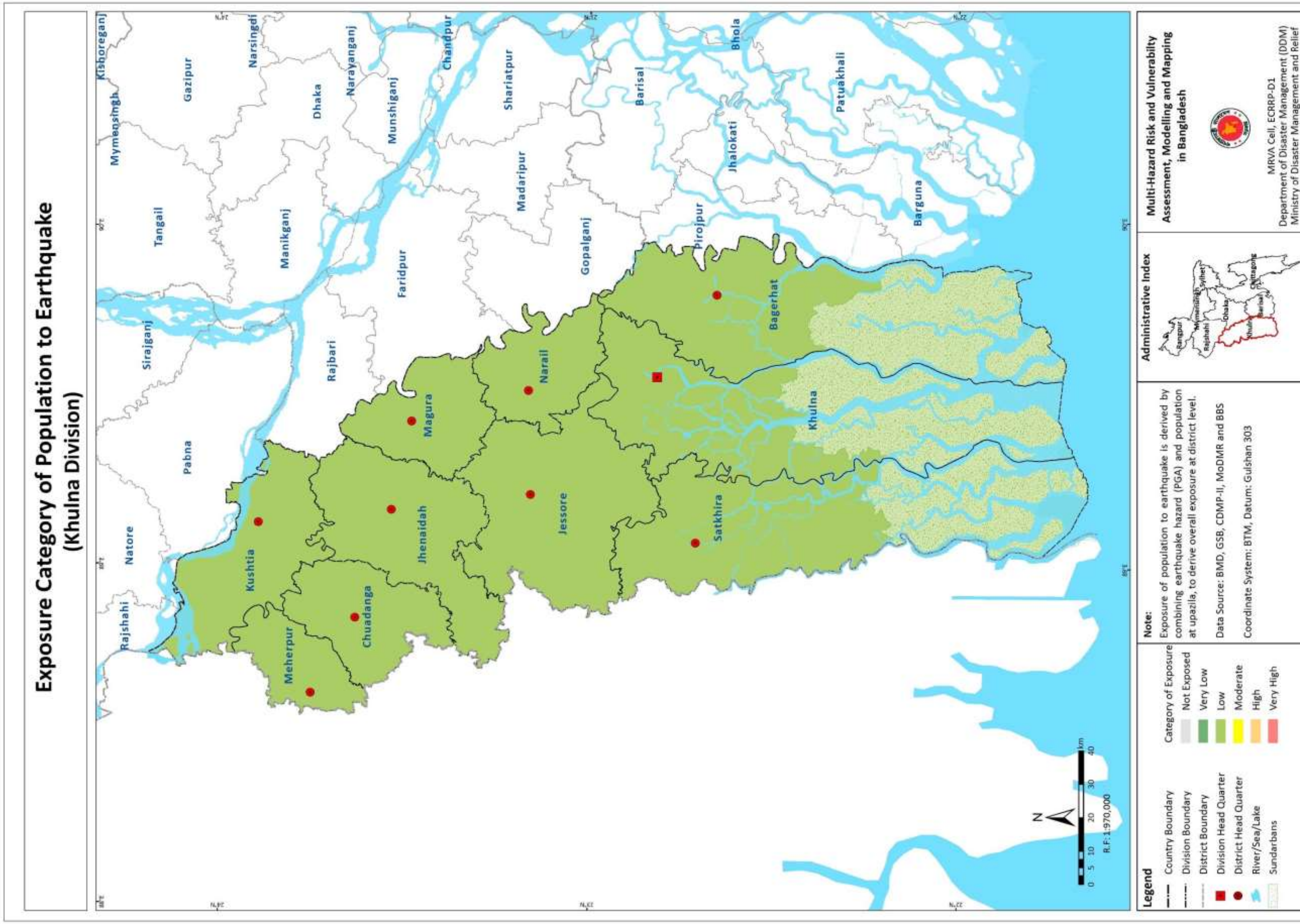
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Exposure Category of Population to Earthquake
(Narsingdi District)
Mymensingh
Gazipur
Kishoreganj
Brahmanbaria
Narayanganj
Manohardi Upazila
Belabo Upazila
Shibpur Upazila
Narsingdi
Palash Upazila
Roypura Upazila
Narsingdi Sadar Upazila
N
0 3 6 12 18 24 km
R. F:1:340,000
Exposure Category of Population to Earthquake
(Tangail District)
Bogra
Jamalpur
Sirajganj
Mymensingh
Pabna
Manikganj
Gazipur
Dhanbari Upazila
Madhupur Upazila
Gopalpur Upazila
Bhuapur Upazila
Tangail
Ghatail Upazila
Kalihati Upazila
Sakhipur Upazila
Tangail Sadar Upazila
Basail Upazila
Delduar Upazila
Mirzapur Upazila
Nagarpur Upazila
N
0 5 10 20 30 40 Km
R. F:1:580,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Rajshahi
Sylhet
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Dhaka
Rajbari
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Exposure Category of Population to Earthquake
(Khulna Division)
Rajshahi
Natore
Pabna
Sirajganj
Tangail
Mymensingh
Kishoreganj
Gazipur
Narsingdi
Dhaka
Narayanganj
Munshiganj
Manikganj
Rajbari
Faridpur
Chandpur
Shariatpur
Madaripur
Gopalganj
Barisal
Bhola
Jhalokati
Pirojpur
Patuakhali
Barguna
Kushtia
Meherpur
Chuadanga
Jhenaidah
Magura
Narail
Jessore
Khulna
Bagerhat
Satkhira
N
0 5 10 20 30 40 km
R.F: 1:970,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Mymensingh Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

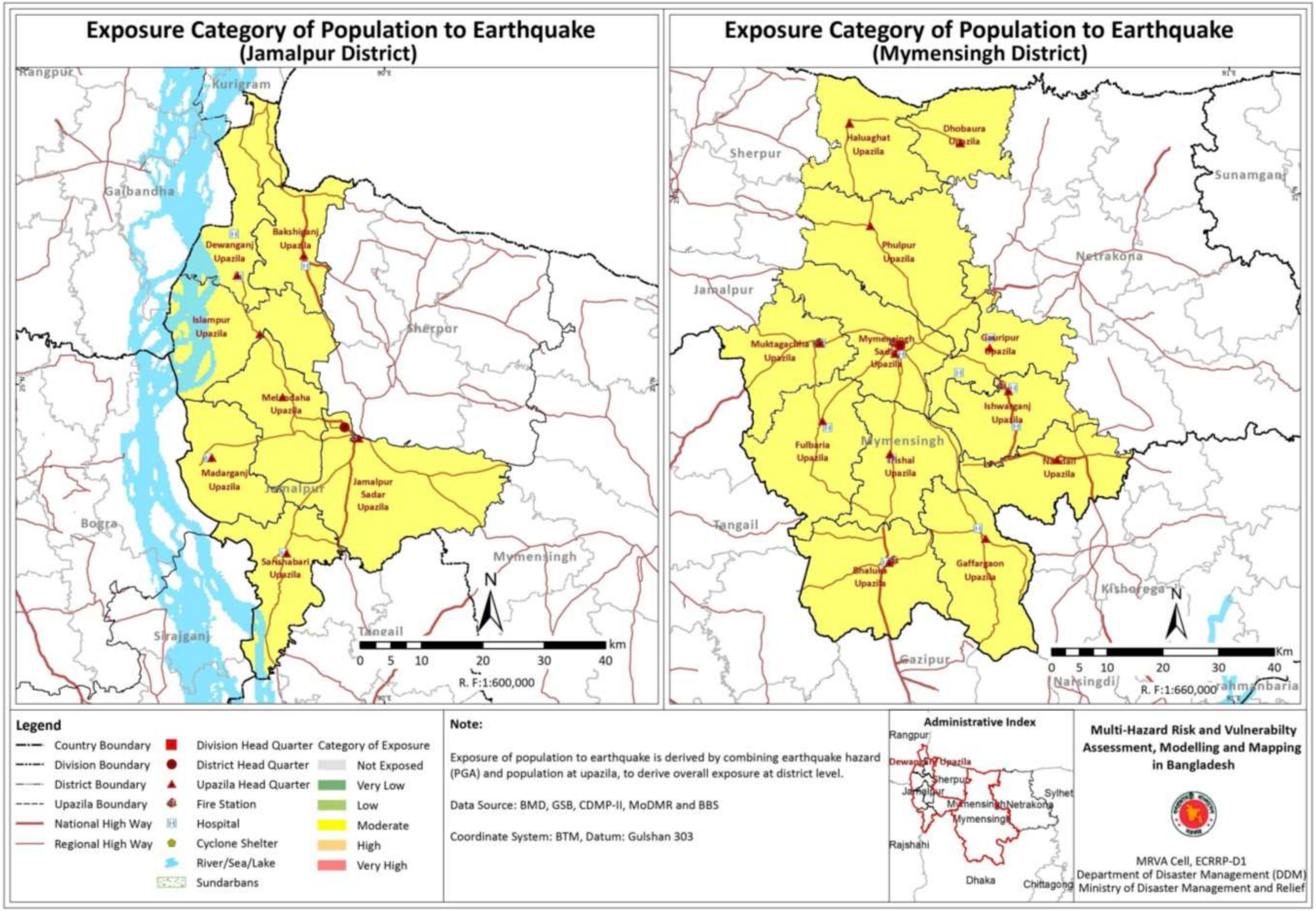
Coordinate System: BTM, Datum: Gulshan 303

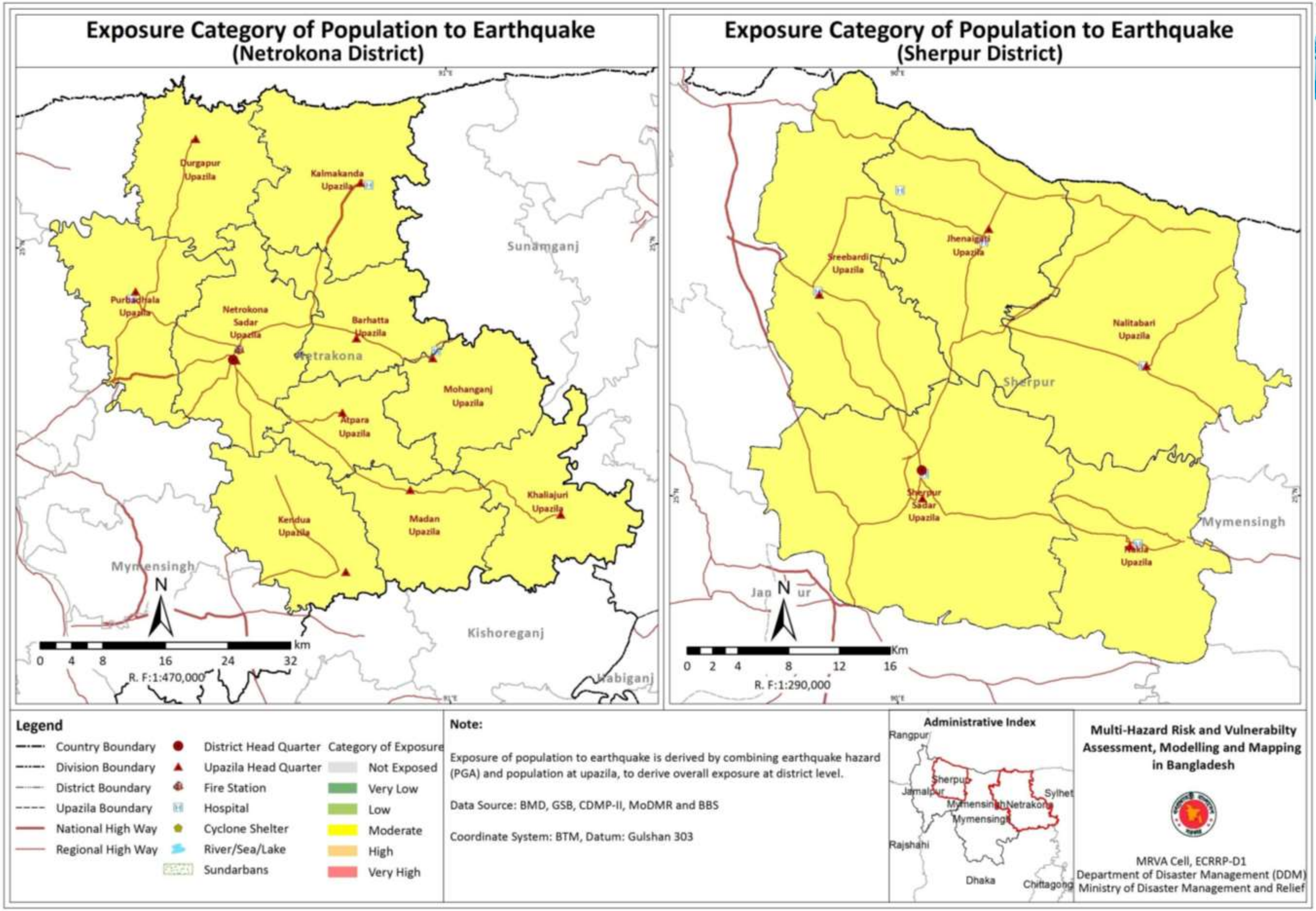
Administrative Index

Rangpur, Rajshahi, Mymensingh, Sylhet, Dhaka, Khulna, Barisal, Chittagong

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Jamalpur District)
Exposure Category of Population to Earthquake
(Mymensingh District)
Rangpur
Kurigram
Gaibandha
Dewanganj Upazila
Bakshiganj Upazila
Islampur Upazila
Melandaha Upazila
Madarganj Upazila
Jamalpur
Jamalpur Sadar Upazila
Sarishabari Upazila
Sherpur
Bogra
Sirajganj
Tangail
Mymensingh
0 5 10 20 30 40 km
R. F:1:600,000
Haluaghat Upazila
Dhobaura Upazila
Sherpur
Sunamganj
Phulpur Upazila
Netrakona
Jamalpur
Muktagachha Upazila
Mymensingh Sadar Upazila
Gauripur Upazila
Ishwarganj Upazila
Fulbaria Upazila
Trishal Upazila
Nandail Upazila
Tangail
Bhaluka Upazila
Gaffargaon Upazila
Kishoreganj
Gazipur
Narsingdi
Brahmanbaria
0 5 10 20 30 40 Km
R. F:1:660,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sylhet
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Netrokona District)
Durgapur Upazila
Kalmakanda Upazila
Purbadhala Upazila
Netrokona Sadar Upazila
Barhatta Upazila
Netrakona
Mohanganj Upazila
Atpara Upazila
Khaliajuri Upazila
Kendua Upazila
Madan Upazila
Sunamganj
Mymensingh
Kishoreganj
Habiganj
N
km
0 4 8 16 24 32
R. F:1:470,000
Exposure Category of Population to Earthquake
(Sherpur District)
Sreebardi Upazila
Jhenaigati Upazila
Nalitabari Upazila
Sherpur
Sherpur Sadar Upazila
Nakla Upazila
Mymensingh
Km
0 2 4 8 12 16
R. F:1:290,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sherpur
Jamalpur
Mymensingh
Netrakona
Sylhet
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Rajshahi Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

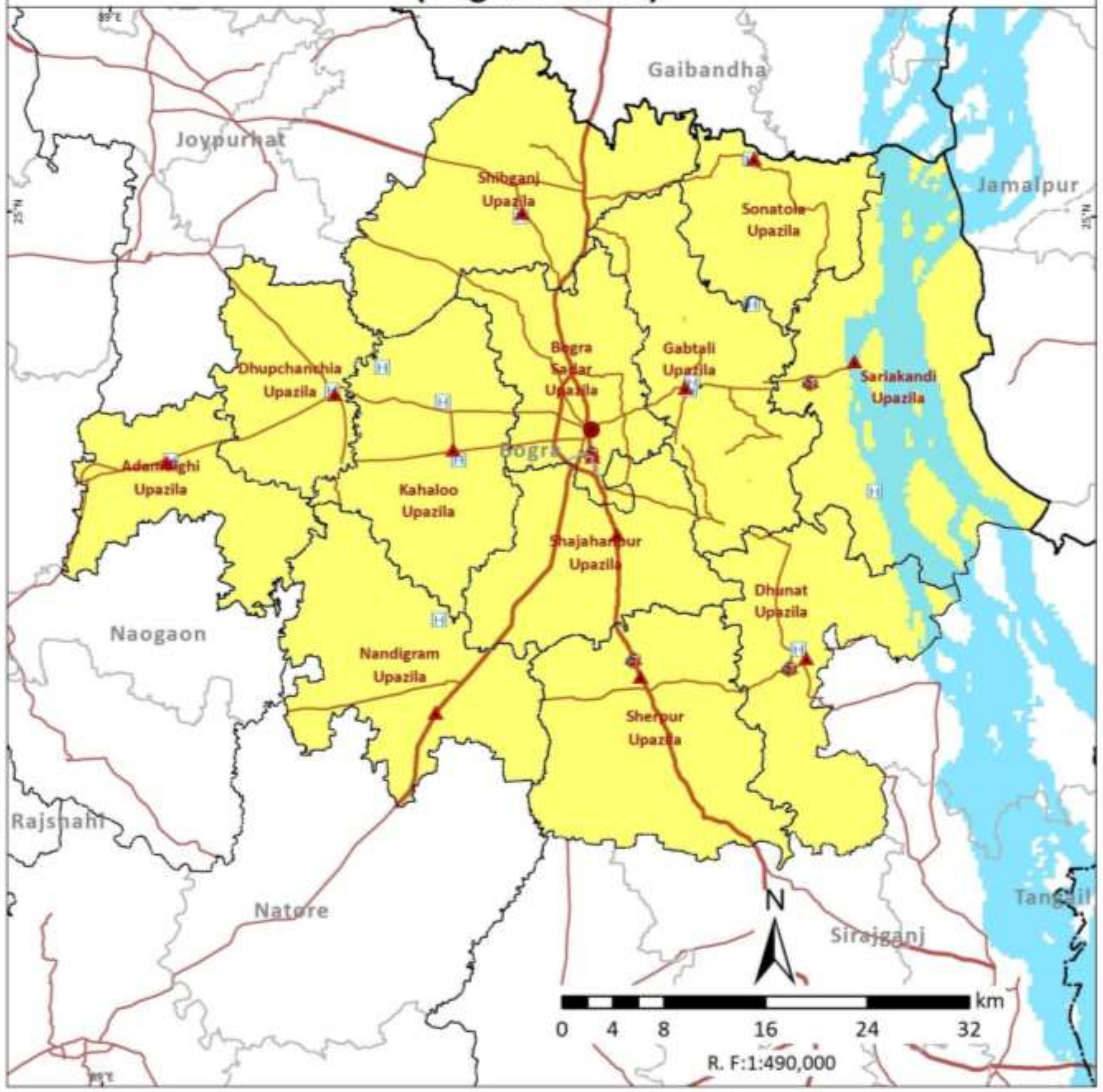
Administrative Index

Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

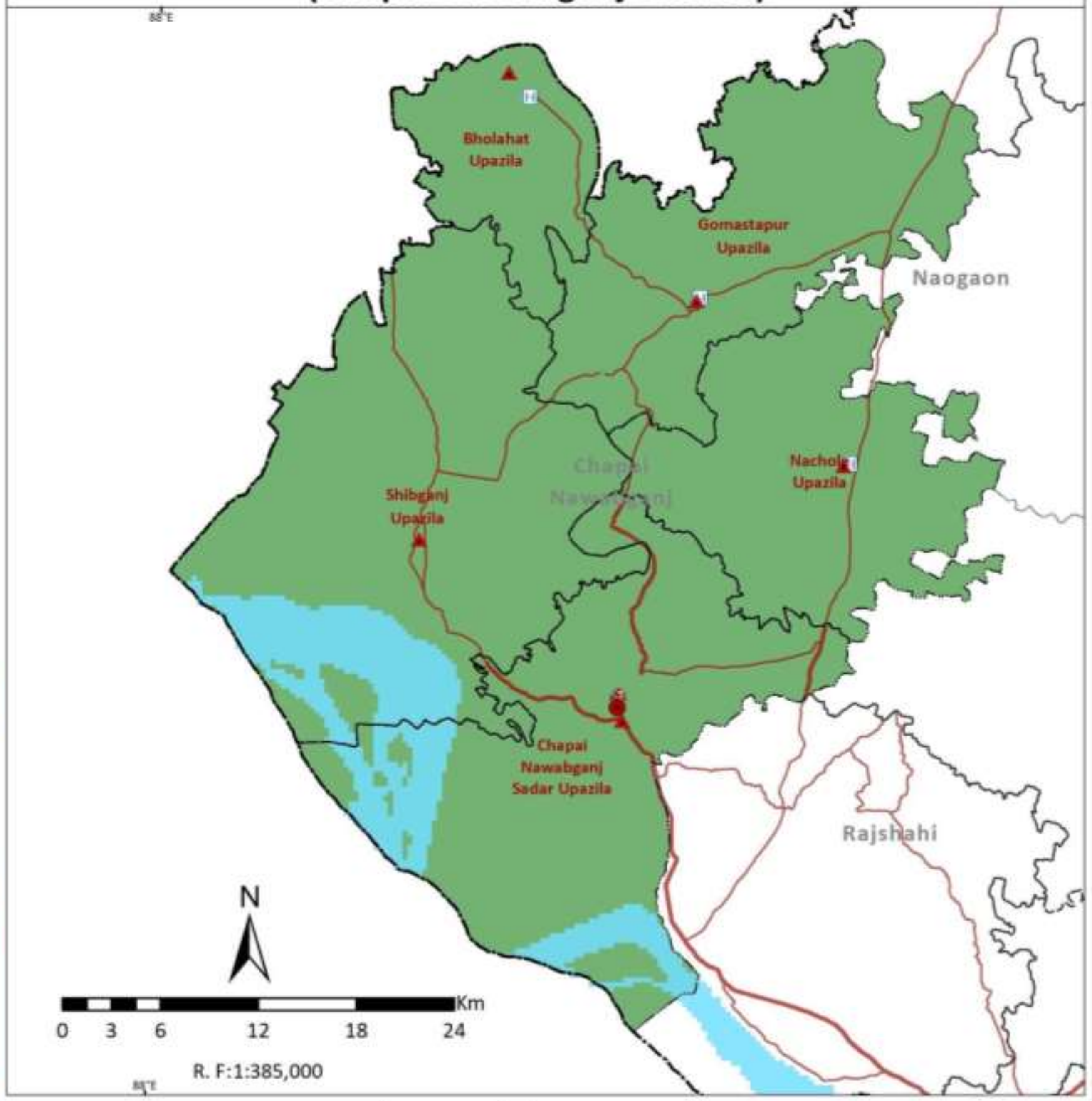
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Bogra District)



Exposure Category of Population to Earthquake
(Chapai Nawabganj District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

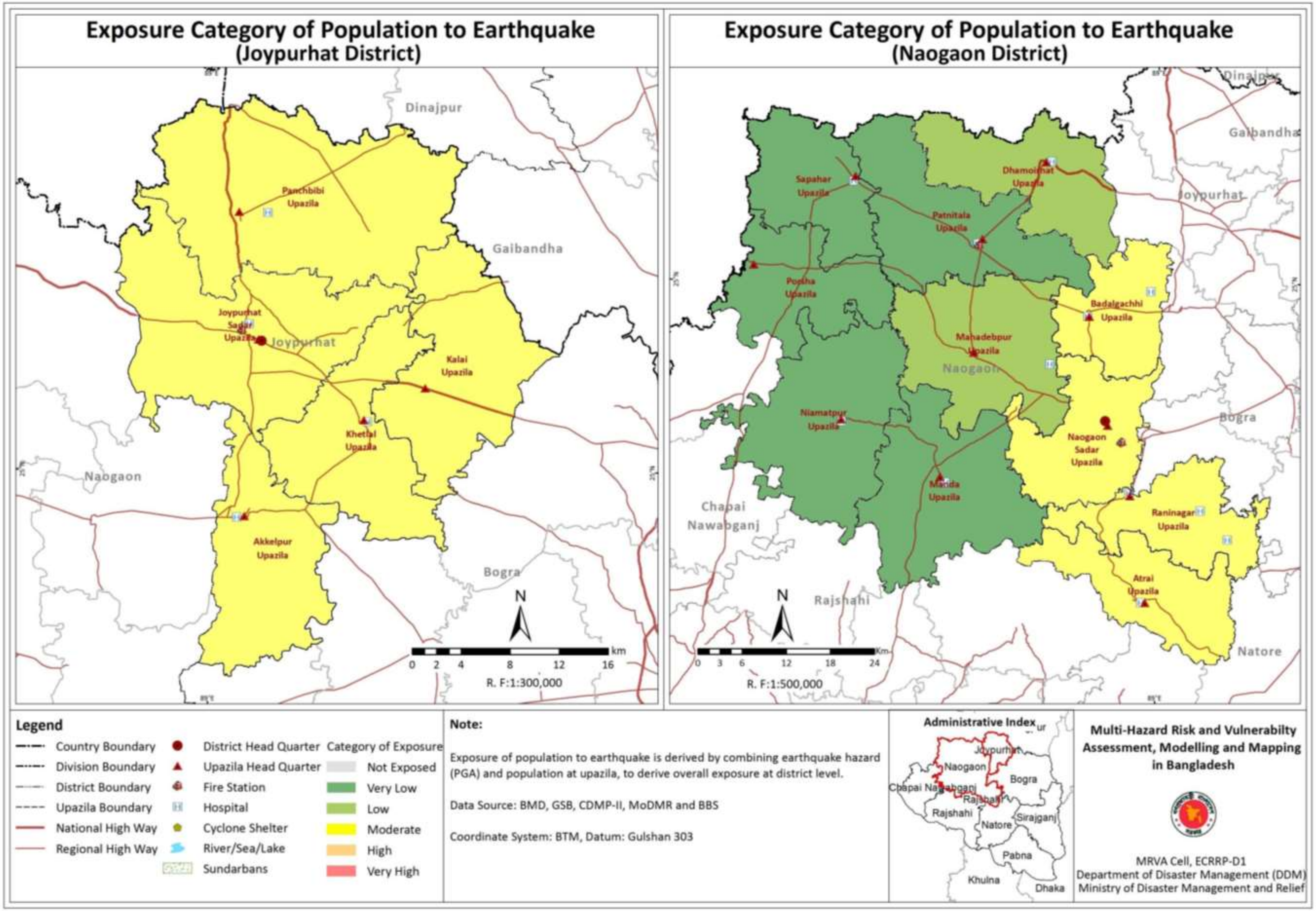
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

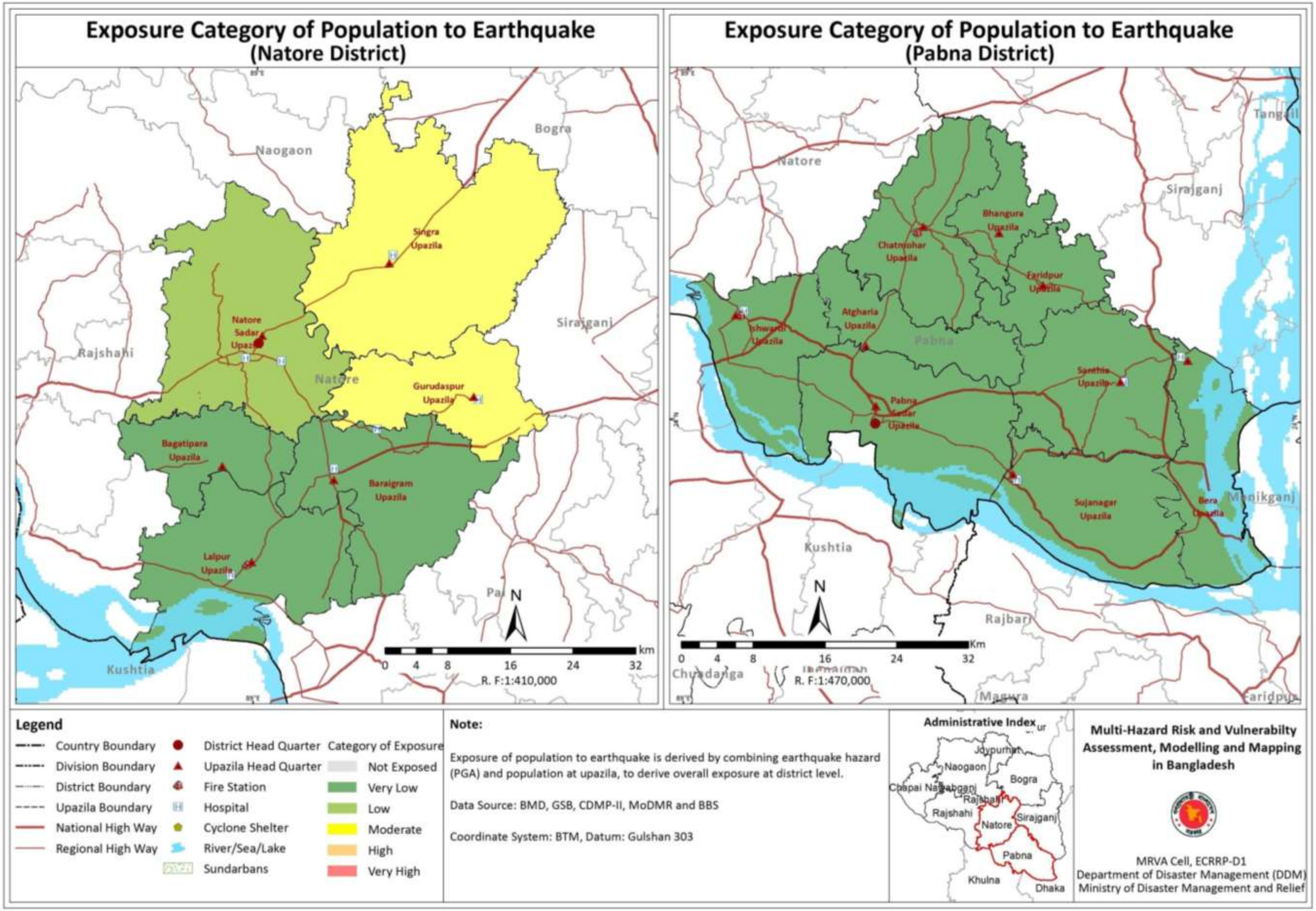
Administrative Index

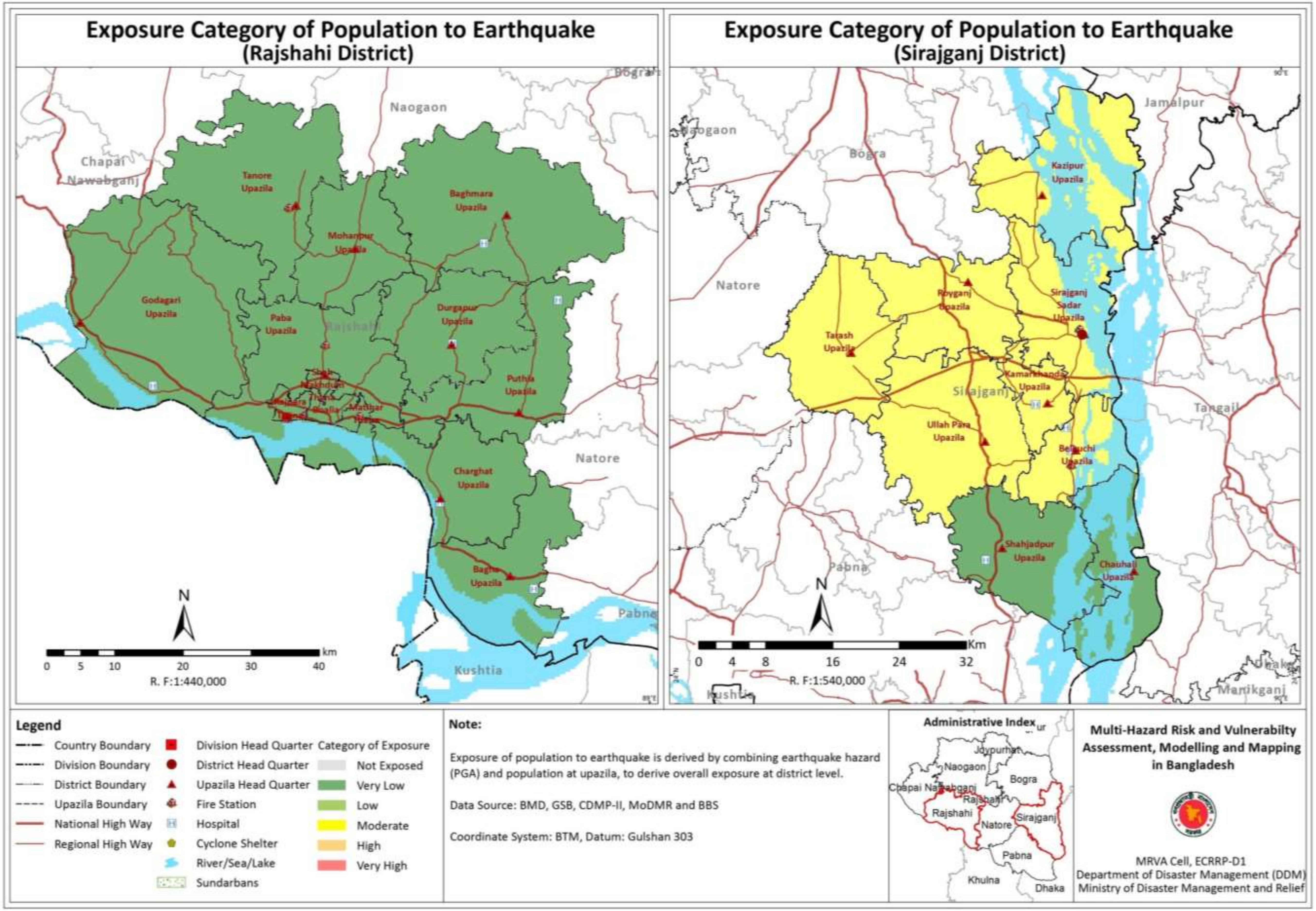
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

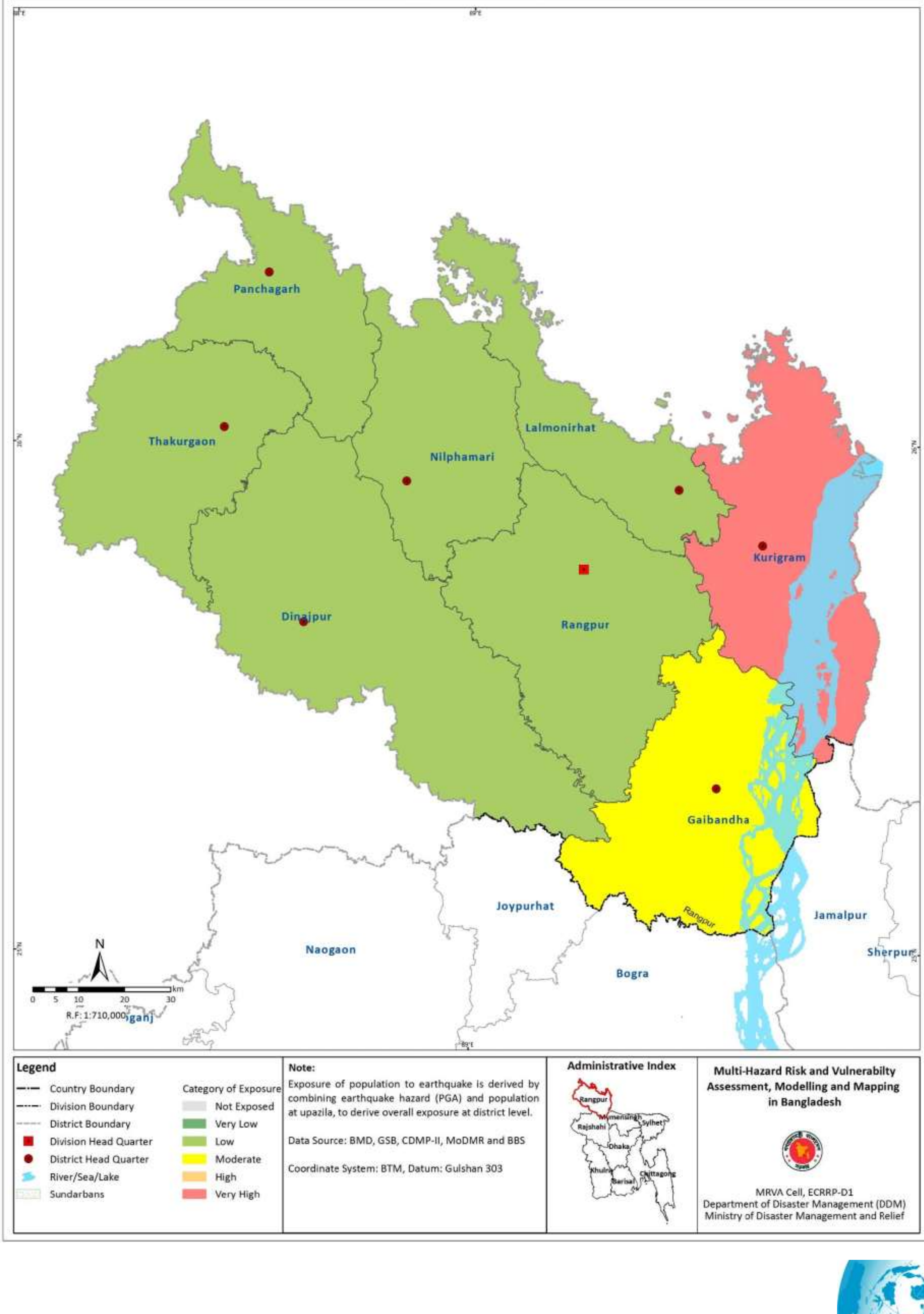


Exposure Category of Population to Earthquake
(Joypurhat District)
Dinajpur
Gaibandha
Naogaon
Bogra
Panchbibi Upazila
Joypurhat Sadar Upazila
Joypurhat
Kalai Upazila
Khetlal Upazila
Akkelpur Upazila
0 2 4 8 12 16 km
R. F:1:300,000
Exposure Category of Population to Earthquake
(Naogaon District)
Dinajpur
Gaibandha
Joypurhat
Bogra
Natore
Rajshahi
Chapai Nawabganj
Sapahar Upazila
Dhamoirhat Upazila
Patnitala Upazila
Porsha Upazila
Badalgachhi Upazila
Mahadebpur Upazila
Naogaon
Niamatpur Upazila
Naogaon Sadar Upazila
Manda Upazila
Raninagar Upazila
Atrai Upazila
0 3 6 12 18 24 Km
R. F:1:500,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

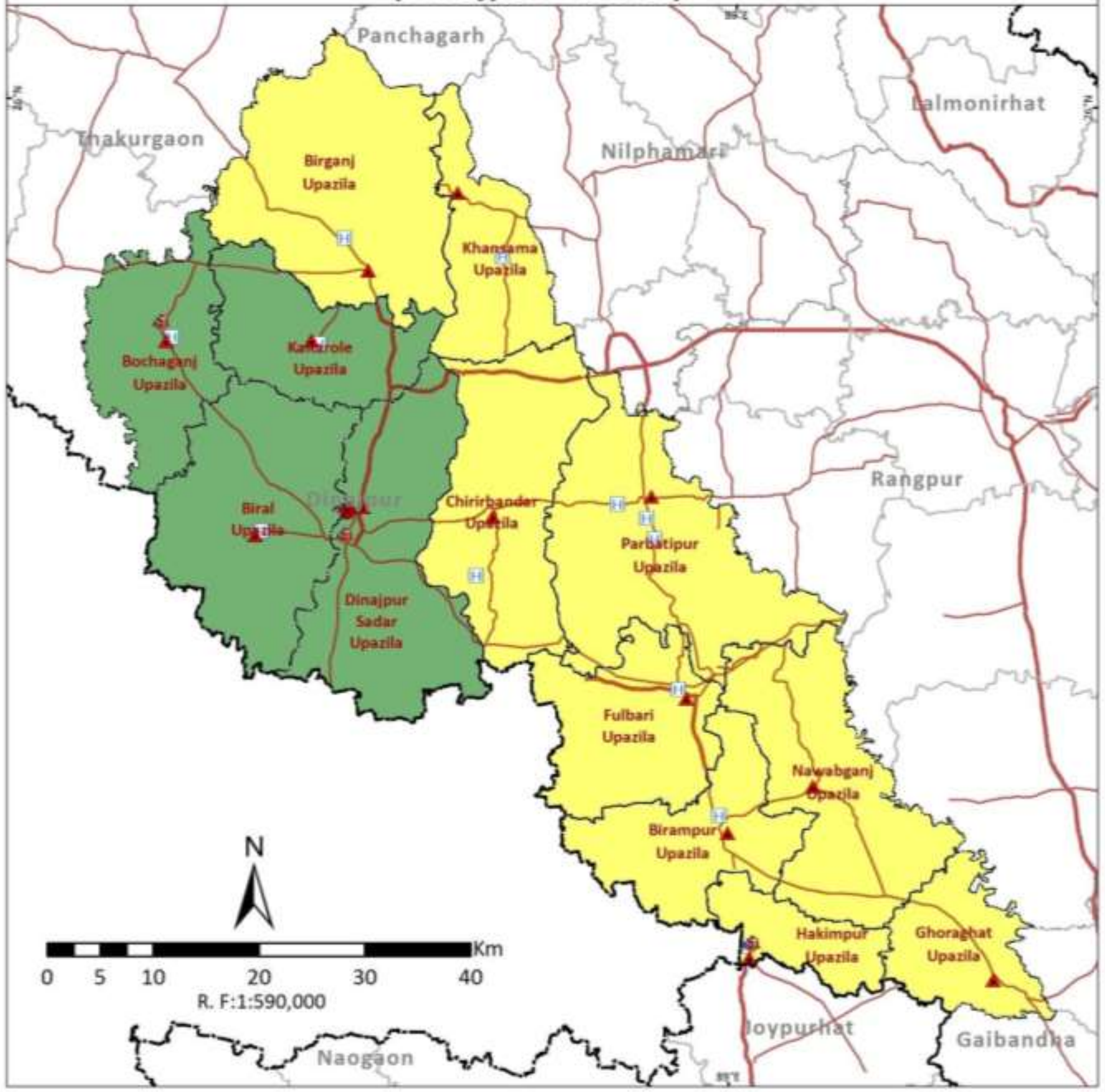

Exposure Category of Population to Earthquake
(Natore District)
Exposure Category of Population to Earthquake
(Pabna District)
Naogaon
Bogra
Rajshahi
Natore
Sirajganj
Kushtia
Singra Upazila
Natore Sadar Upazila
Gurudaspur Upazila
Bagatipara Upazila
Baraigram Upazila
Lalpur Upazila
Tangail
Chatmohar Upazila
Bhangura Upazila
Faridpur Upazila
Atgharia Upazila
Ishwardi Upazila
Pabna
Santhia Upazila
Pabna Sadar Upazila
Sujanagar Upazila
Bera Upazila
Manikganj
Rajbari
Chuadanga
Magura
N
0 4 8 16 24 32 km
R. F:1:410,000
0 4 8 16 24 32 Km
R. F:1:470,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Rajshahi District)
Exposure Category of Population to Earthquake
(Sirajganj District)
Naogaon
Chapai Nawabganj
Bogra
Tanore Upazila
Baghmara Upazila
Mohanpur Upazila
Godagari Upazila
Paba Upazila
Durgapur Upazila
Puthia Upazila
Charghat Upazila
Bagha Upazila
Natore
Pabna
Kushtia
Rajshahi
N
km
0 5 10 20 30 40
R. F:1:440,000
Jamalpur
Naogaon
Bogra
Natore
Kazipur Upazila
Royganj Upazila
Sirajganj Sadar Upazila
Tarash Upazila
Kamarkhanda Upazila
Sirajganj
Tangail
Ullah Para Upazila
Belkuchi Upazila
Shahjadpur Upazila
Chauhali Upazila
Pabna
Manikganj
Km
0 4 8 16 24 32
R. F:1:540,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

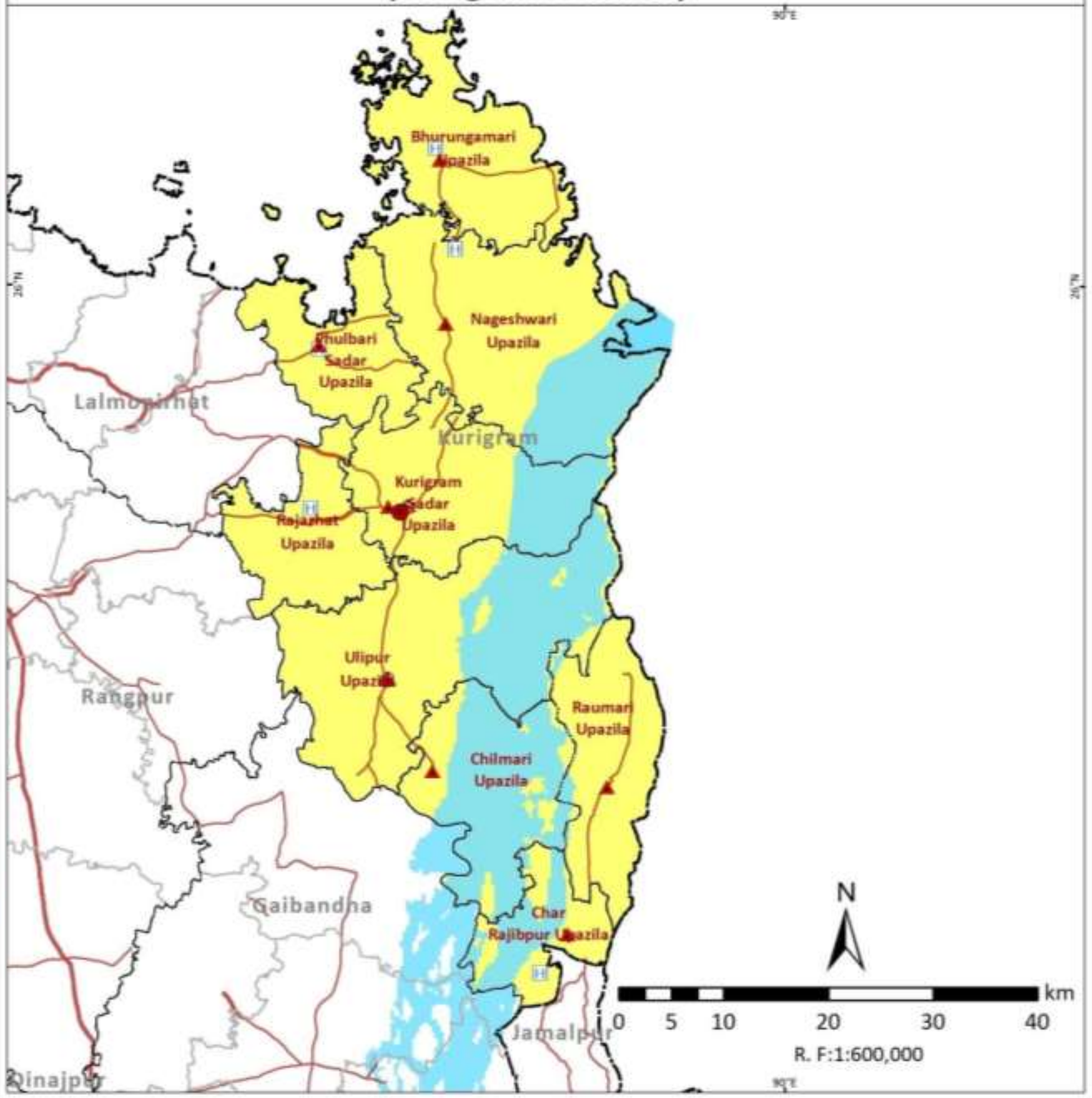
Exposure Category of Population to Earthquake
(Rangpur Division)



Exposure Category of Population to Earthquake (Dinajpur District)



Exposure Category of Population to Earthquake (Kurigram District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

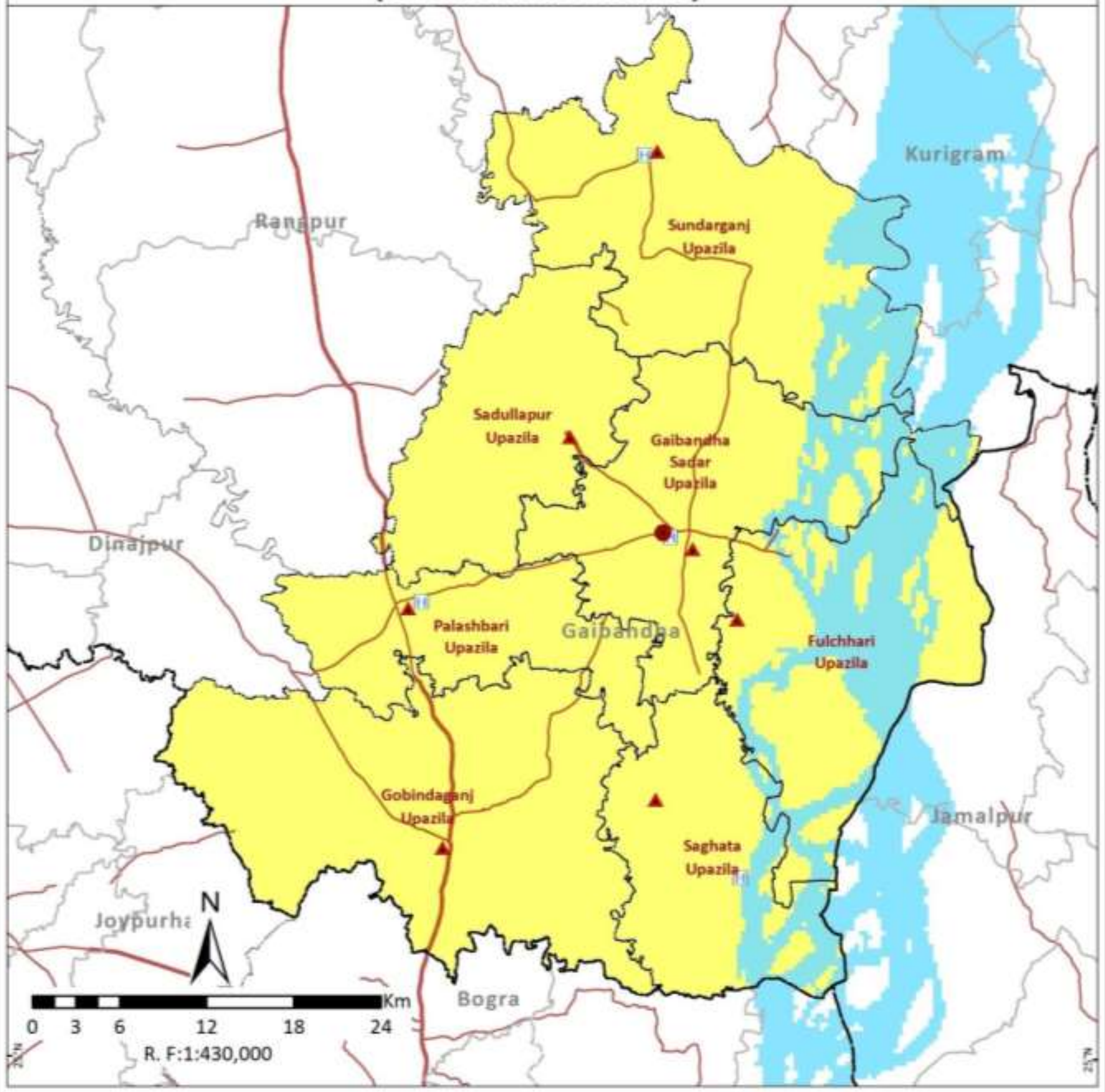
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

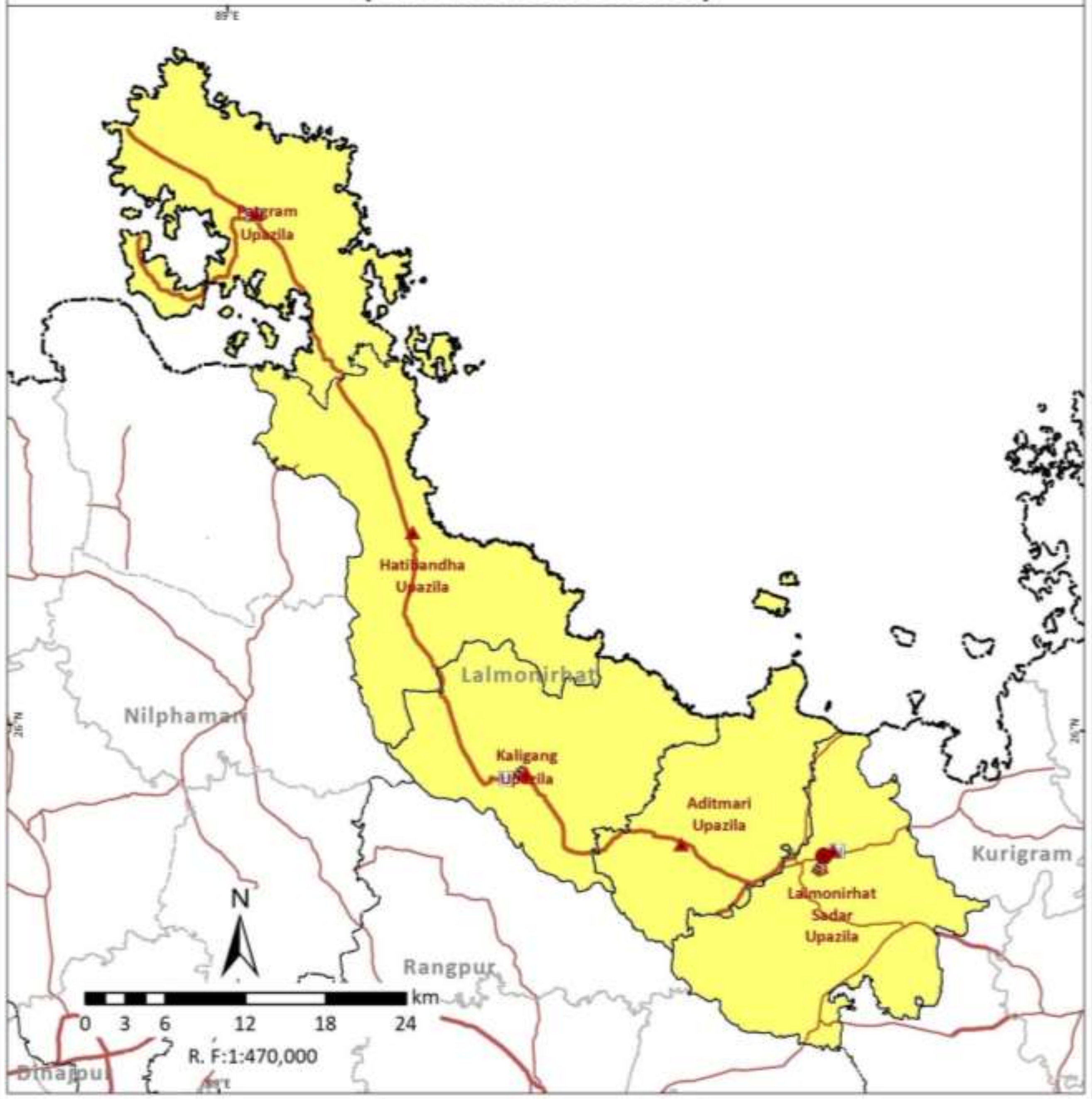
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Gaibandha District)



Exposure Category of Population to Earthquake
(Lalmonirhat District)



Legend

Country Boundary	District Head Quarter	Category of Exposure	
Division Boundary	Upazila Head Quarter		Not Exposed
District Boundary	Fire Station		Very Low
Upazila Boundary	Hospital		Low
National High Way	Cyclone Shelter		Moderate
Regional High Way	River/Sea/Lake		High
	Sundarbans		Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

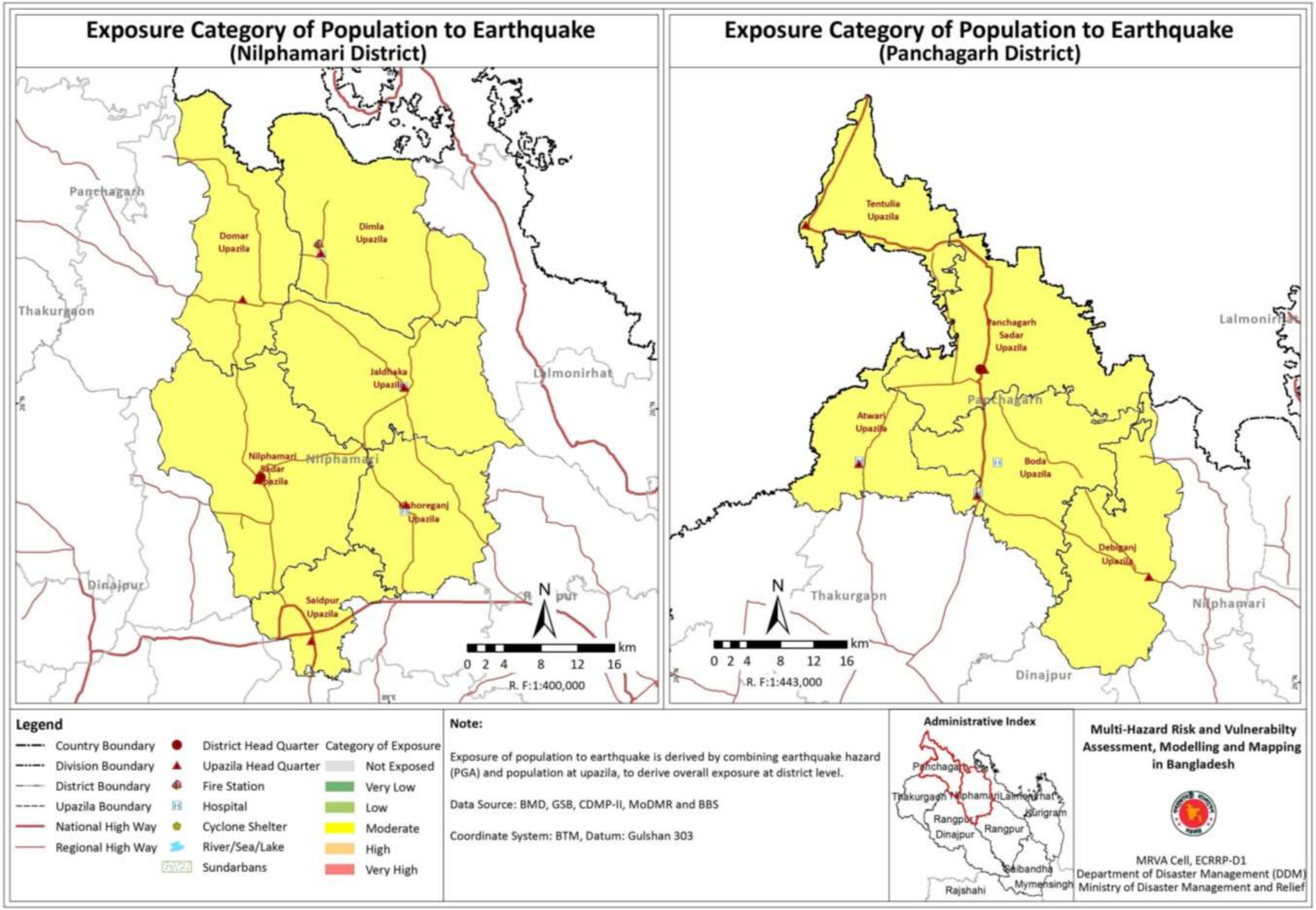
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

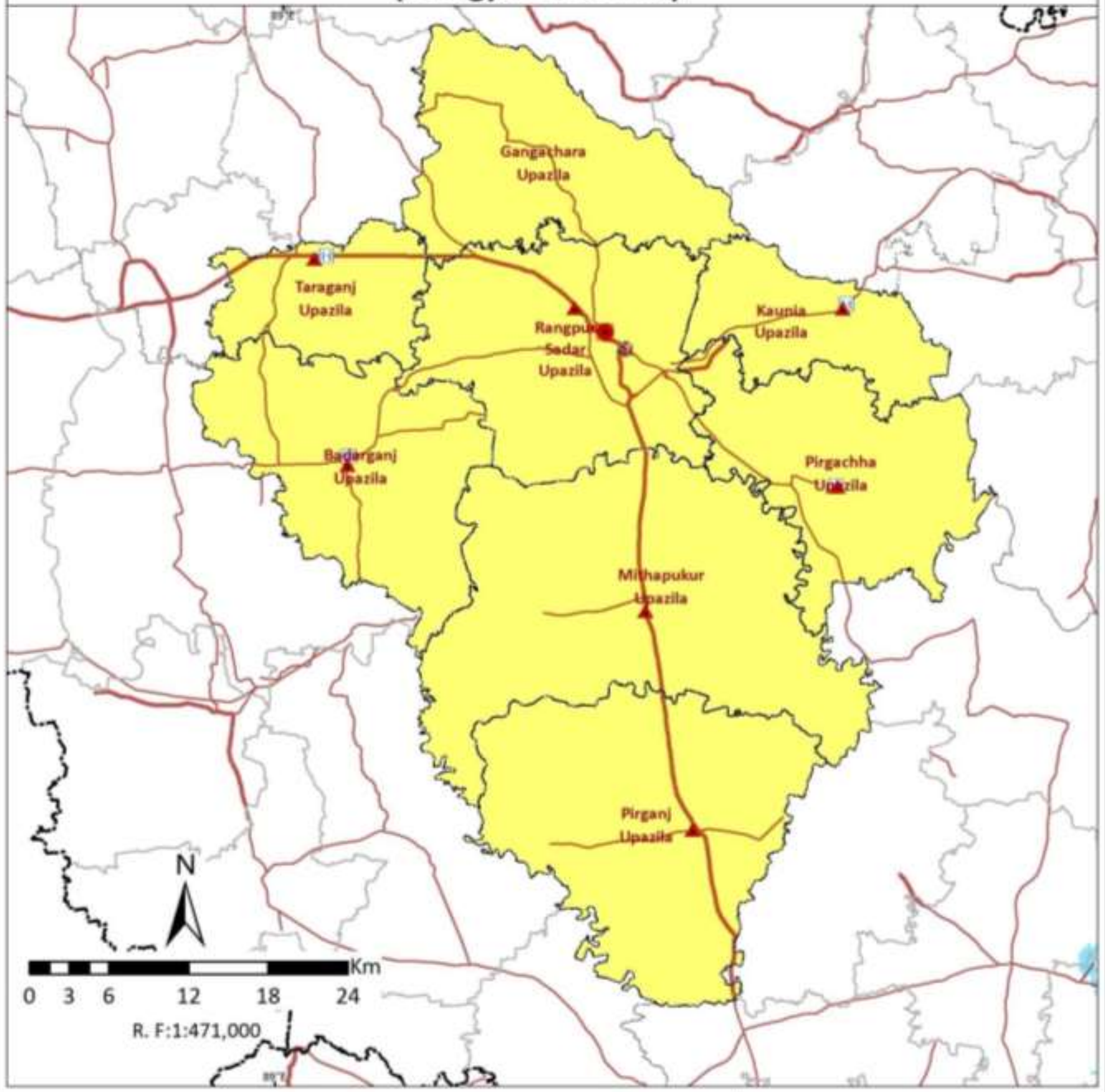
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

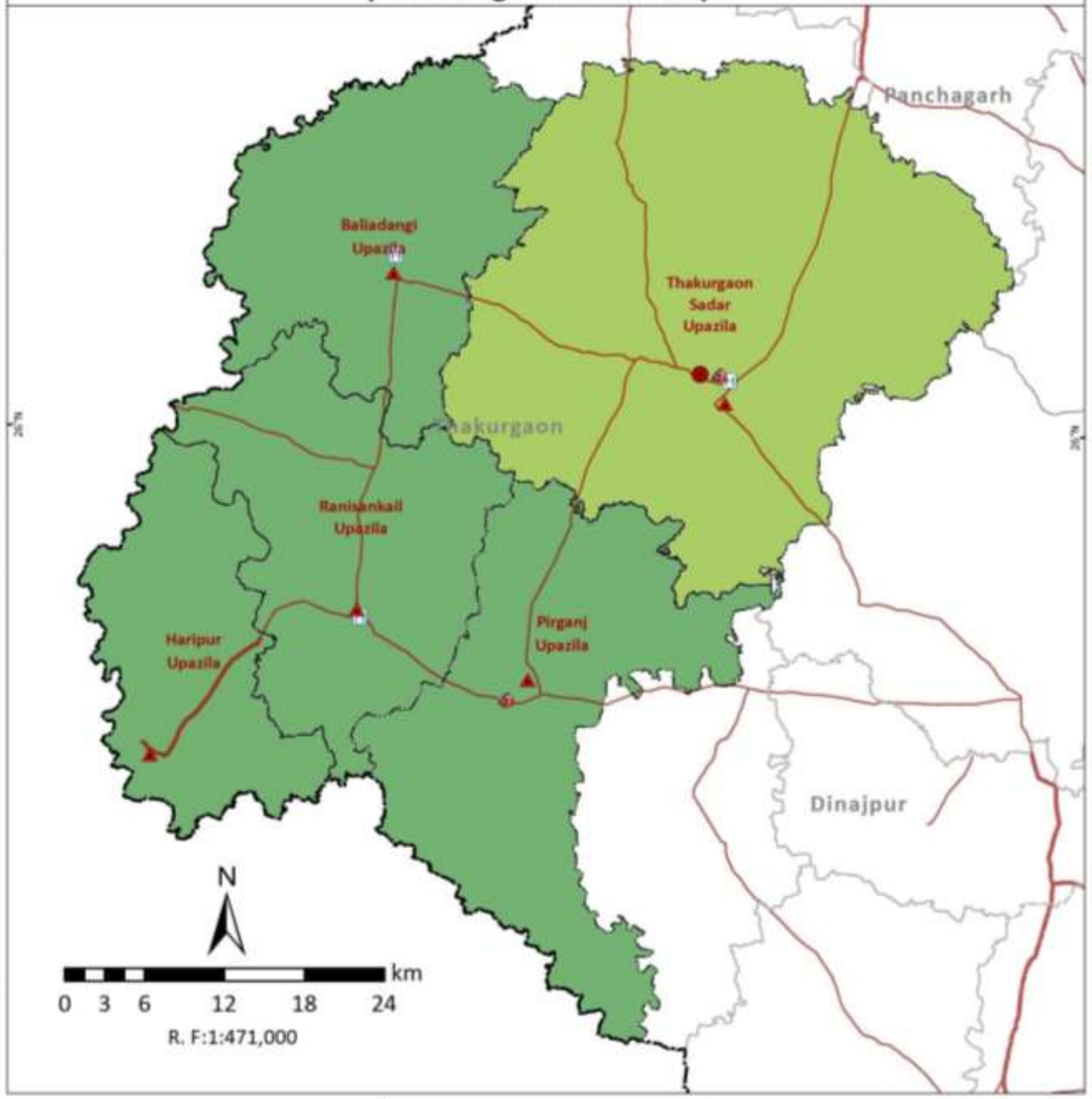
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Nilphamari District)
Domar Upazila
Dimla Upazila
Jaldhaka Upazila
Nilphamari Sadar Upazila
Saidpur Upazila
Panchagarh
Thakurgaon
Lalmonirhat
Dinajpur
Nilphamari
0 2 4 8 12 16 km
R. F:1:400,000
Exposure Category of Population to Earthquake
(Panchagarh District)
Tentulia Upazila
Panchagarh Sadar Upazila
Atwari Upazila
Boda Upazila
Debiganj Upazila
Panchagarh
Lalmonirhat
Thakurgaon
Nilphamari
Dinajpur
0 2 4 8 12 16 km
R. F:1:443,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Rangpur
Dinajpur
Gaibandha
Rajshahi
Mymensingh
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake (Rangpur District)



Exposure Category of Population to Earthquake (Thakurgaon District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- Division Head Quarter
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

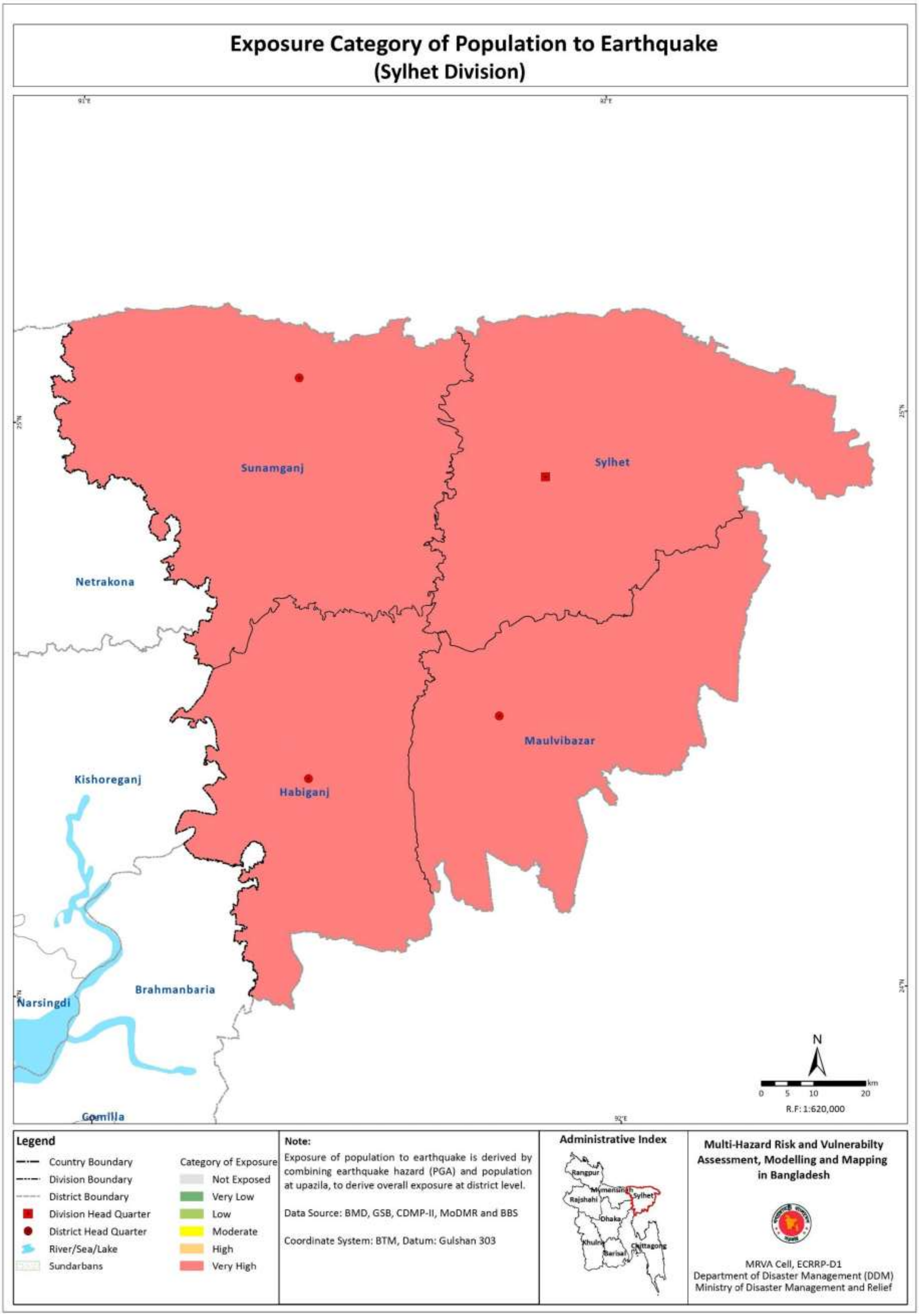
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

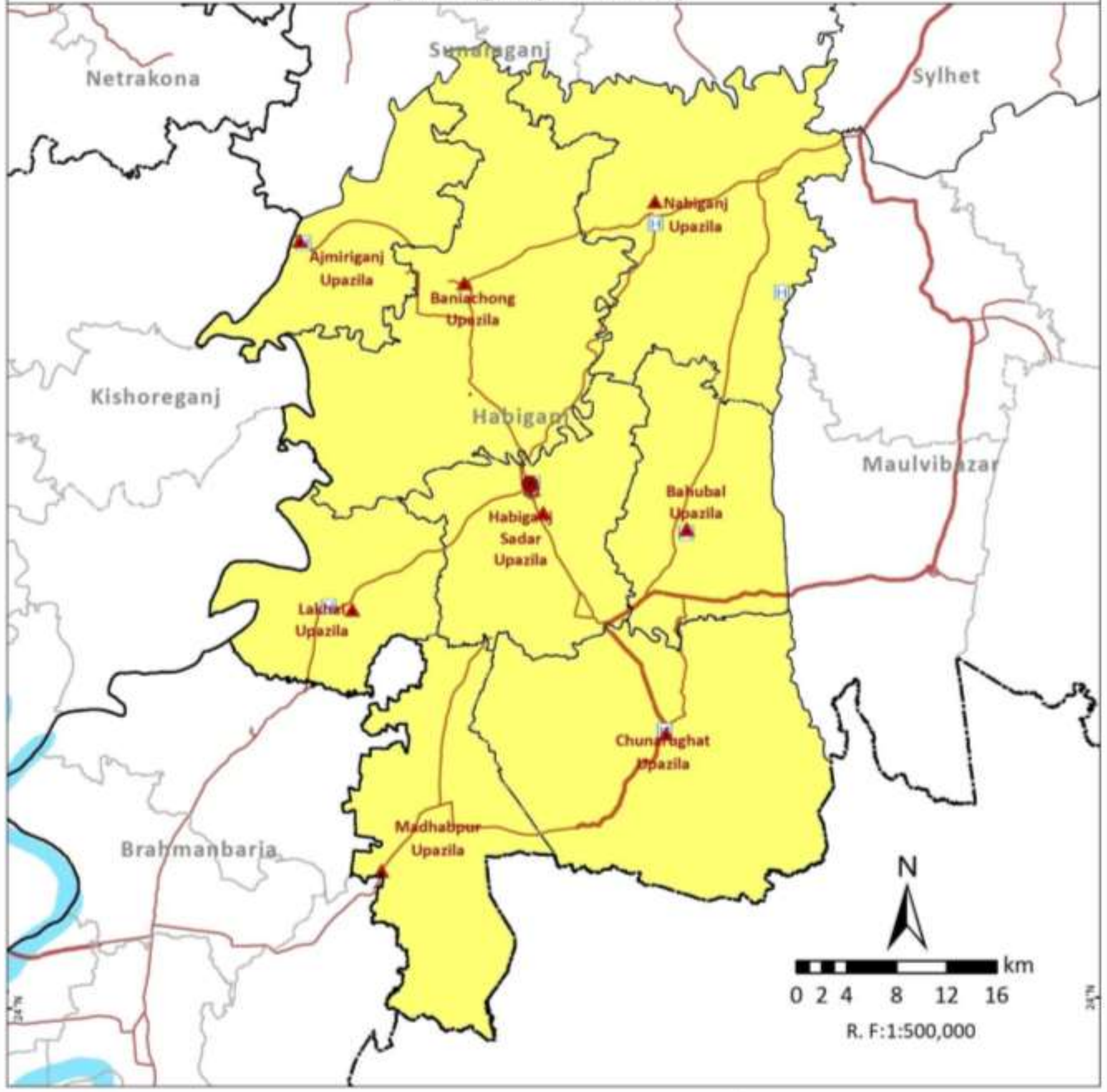
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

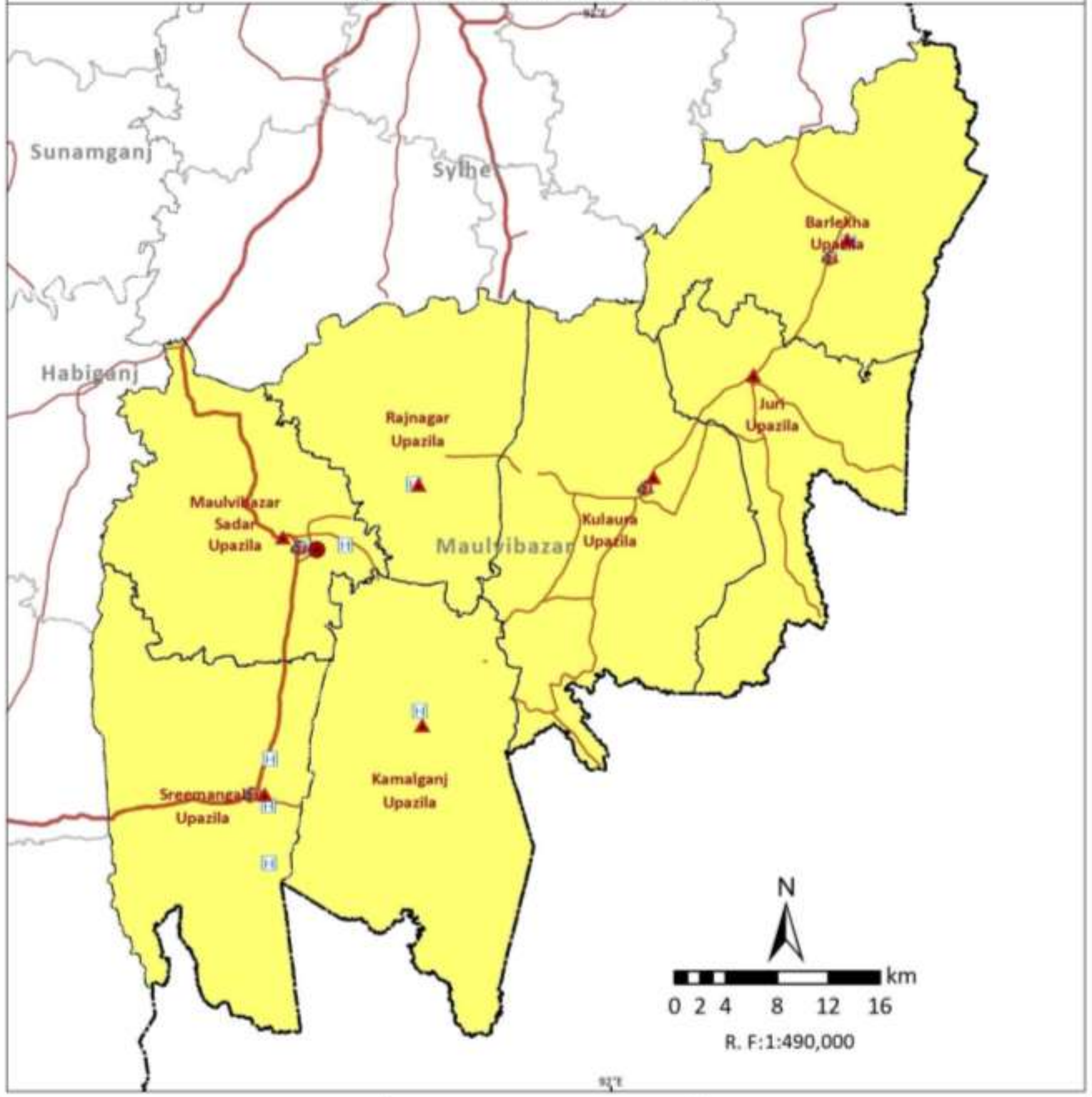
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Habiganj
Maulvibazar
Kishoreganj
Brahmanbaria
Narsingdi
Comilla
N
0 5 10 20 km
R.F: 1:620,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population to Earthquake
(Habiganj District)



Exposure Category of Population to Earthquake
(Maulvibazar District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.

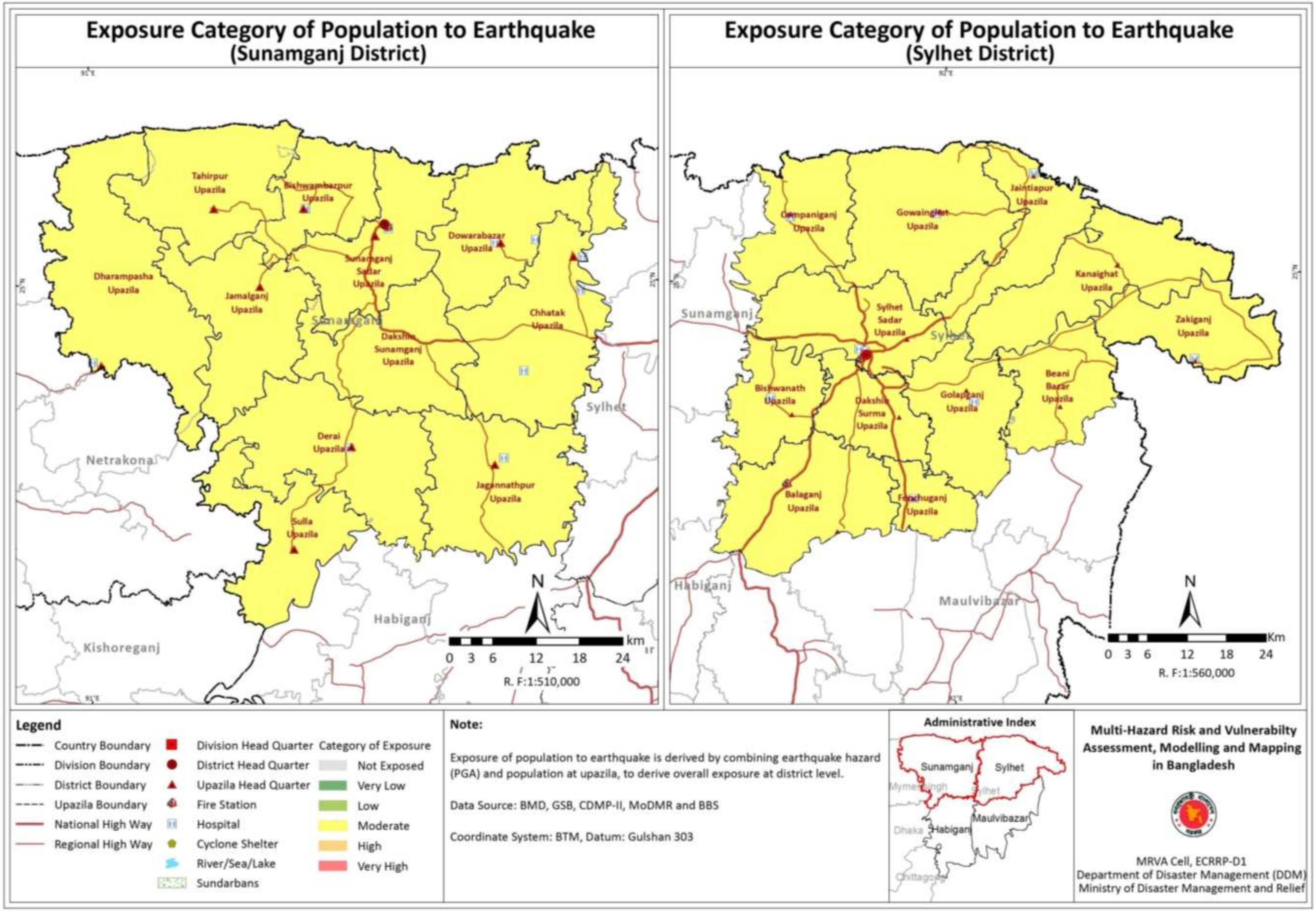
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

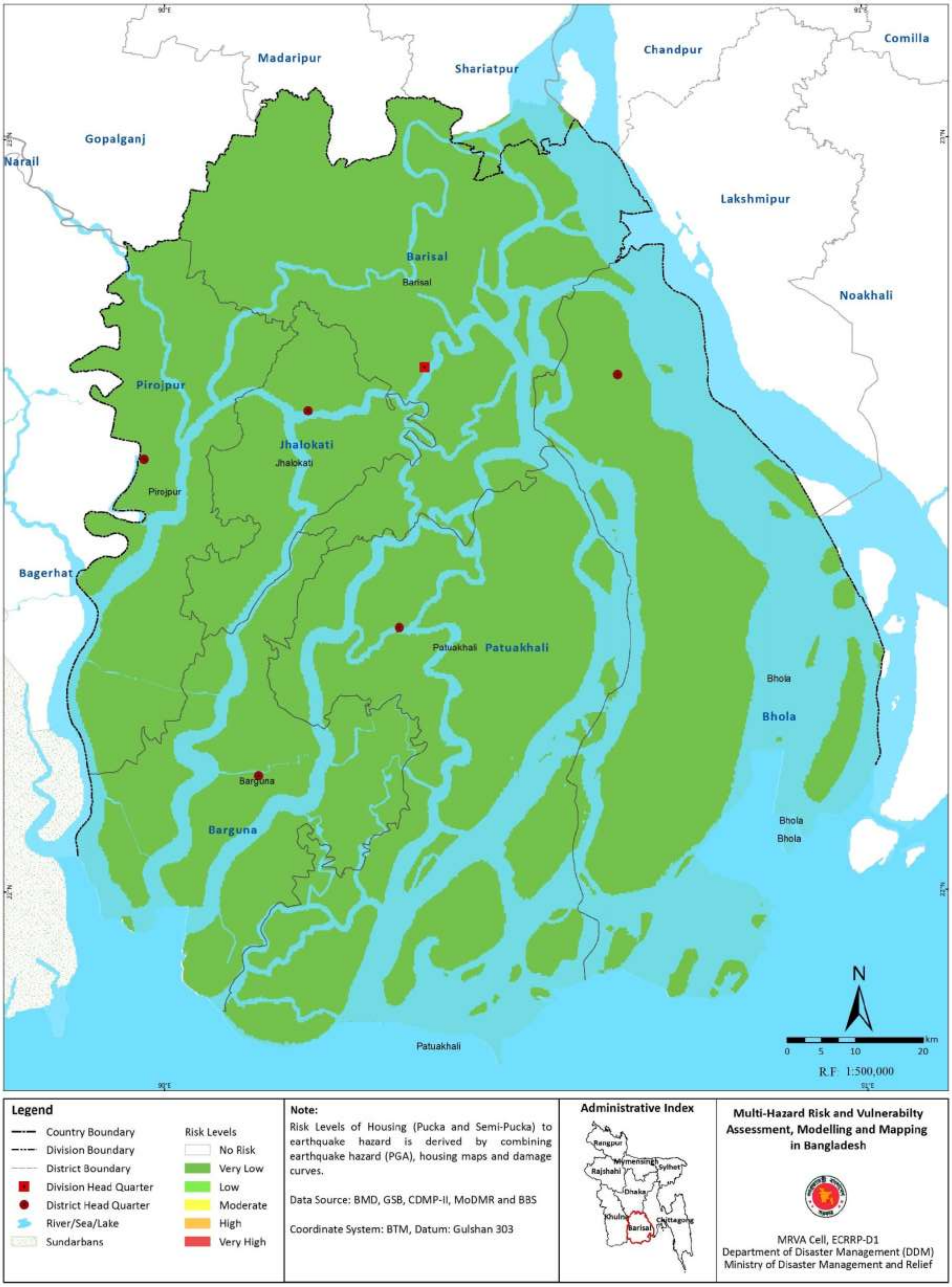
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population to Earthquake
(Sunamganj District)
Tahirpur Upazila
Bishwambarpur Upazila
Dharampasha Upazila
Jamalganj Upazila
Sunamganj Sadar Upazila
Dowarabazar Upazila
Chhatak Upazila
Dakshin Sunamganj Upazila
Derai Upazila
Jagannathpur Upazila
Sulla Upazila
Netrakona
Kishoreganj
Habiganj
Sylhet
N
km
0 3 6 12 18 24
R. F:1:510,000
Exposure Category of Population to Earthquake
(Sylhet District)
Companiganj Upazila
Gowainghat Upazila
Jaintiapur Upazila
Kanaighat Upazila
Zakiganj Upazila
Sylhet Sadar Upazila
Bishwanath Upazila
Dakshin Surma Upazila
Golapganj Upazila
Beani Bazar Upazila
Balaganj Upazila
Fenchuganj Upazila
Sunamganj
Habiganj
Maulvibazar
N
Km
0 3 6 12 18 24
R. F:1:560,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to earthquake is derived by combining earthquake hazard (PGA) and population at upazila, to derive overall exposure at district level.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Sunamganj
Sylhet
Mymensingh
Maulvibazar
Habiganj
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Barisal Division)



Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Barguna District)

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Barisal District)

Legend

Country Boundary	Division Head Quarter	**Risk of HH Structures**
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

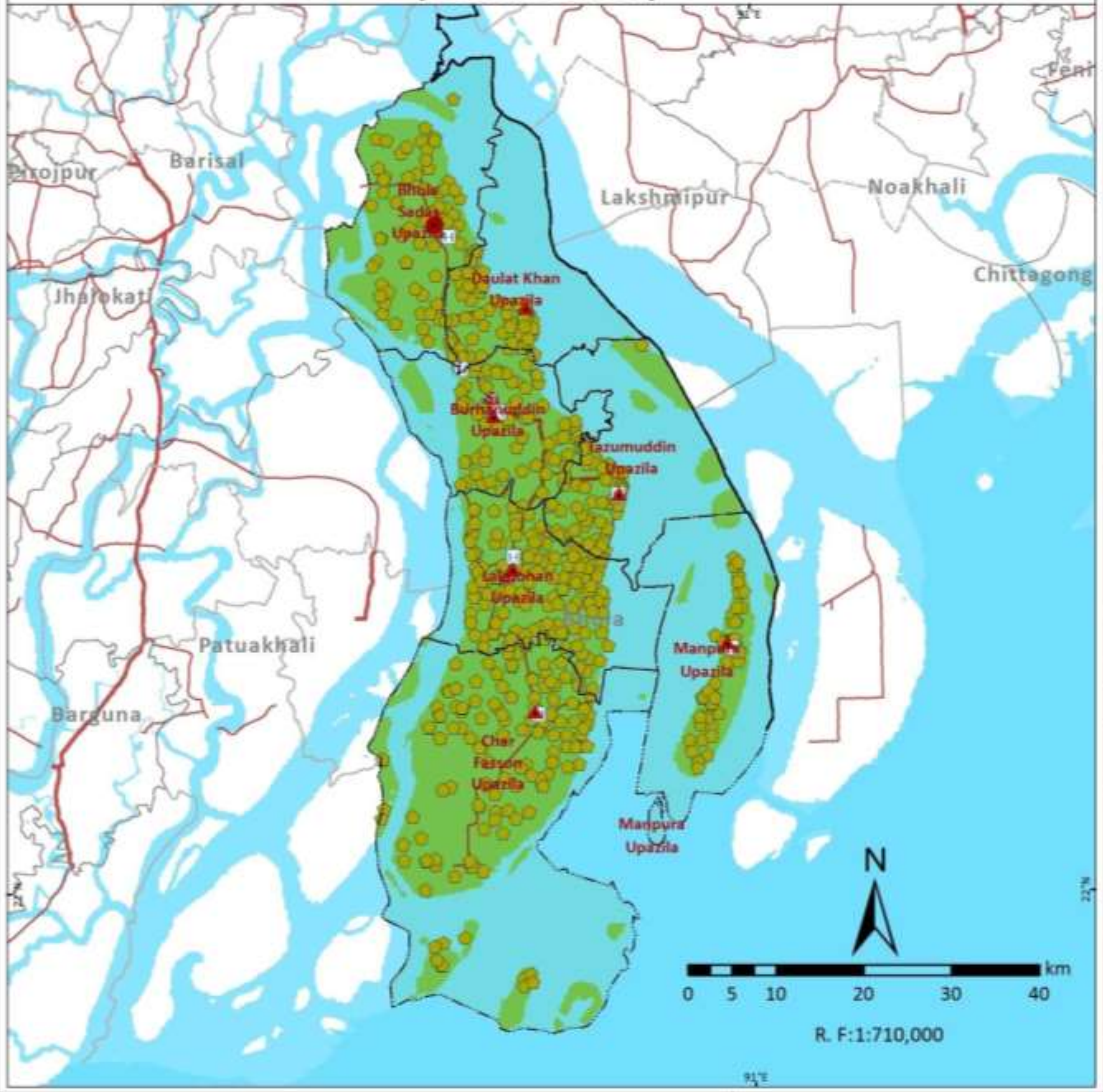
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

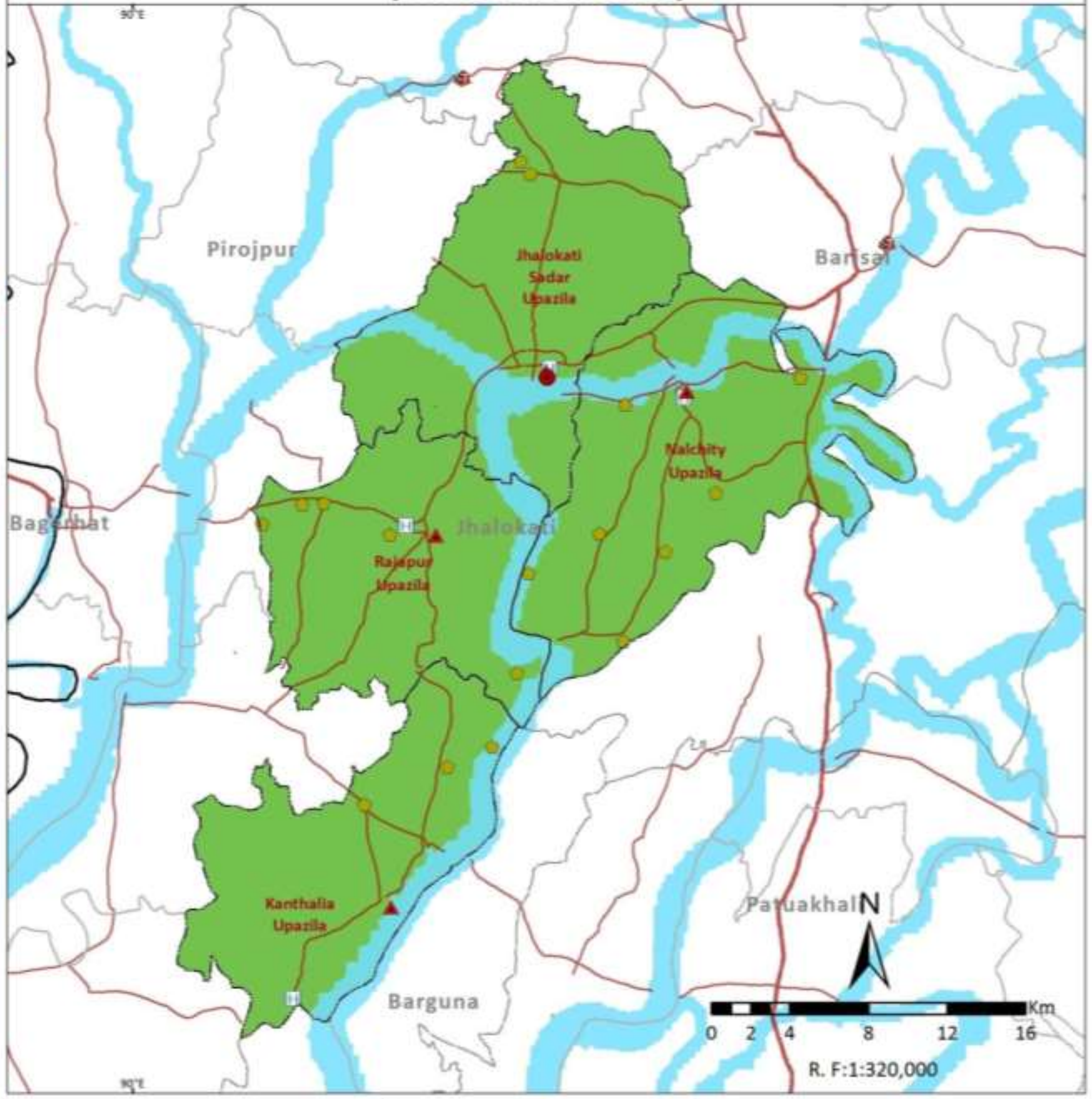
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Bhola District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Jhalokati District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

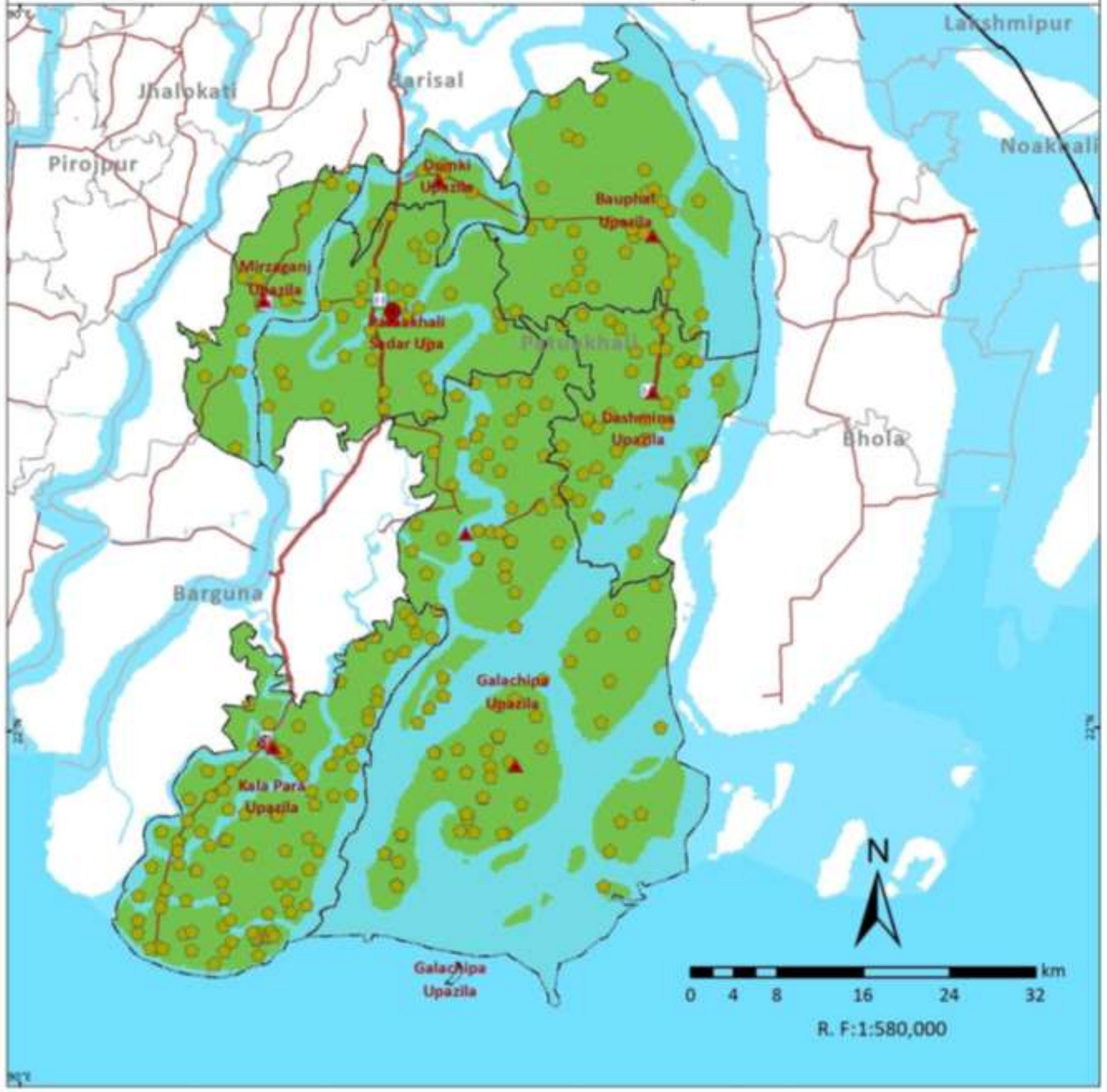
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

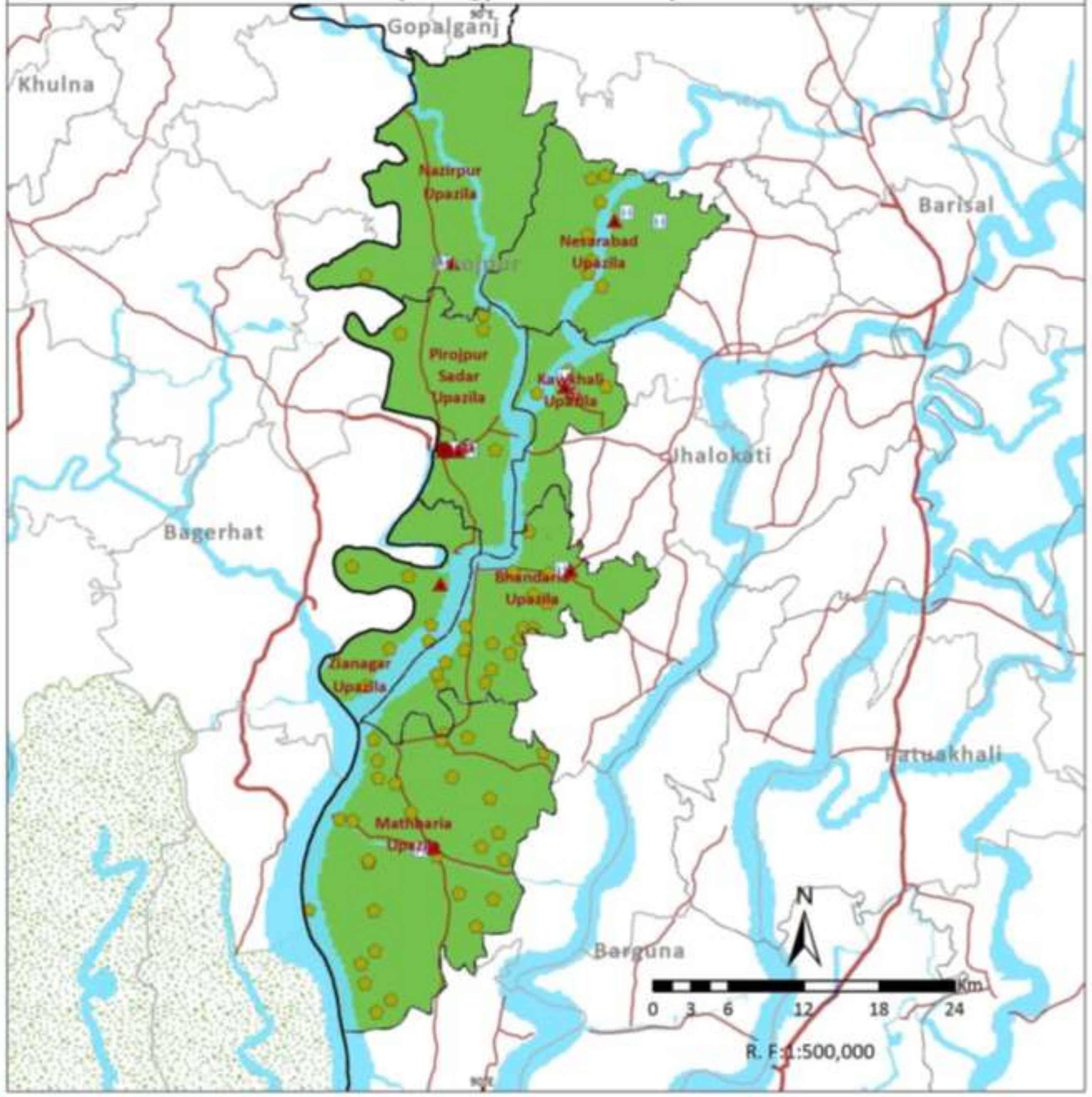
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Patuakhali District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Pirojpur District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

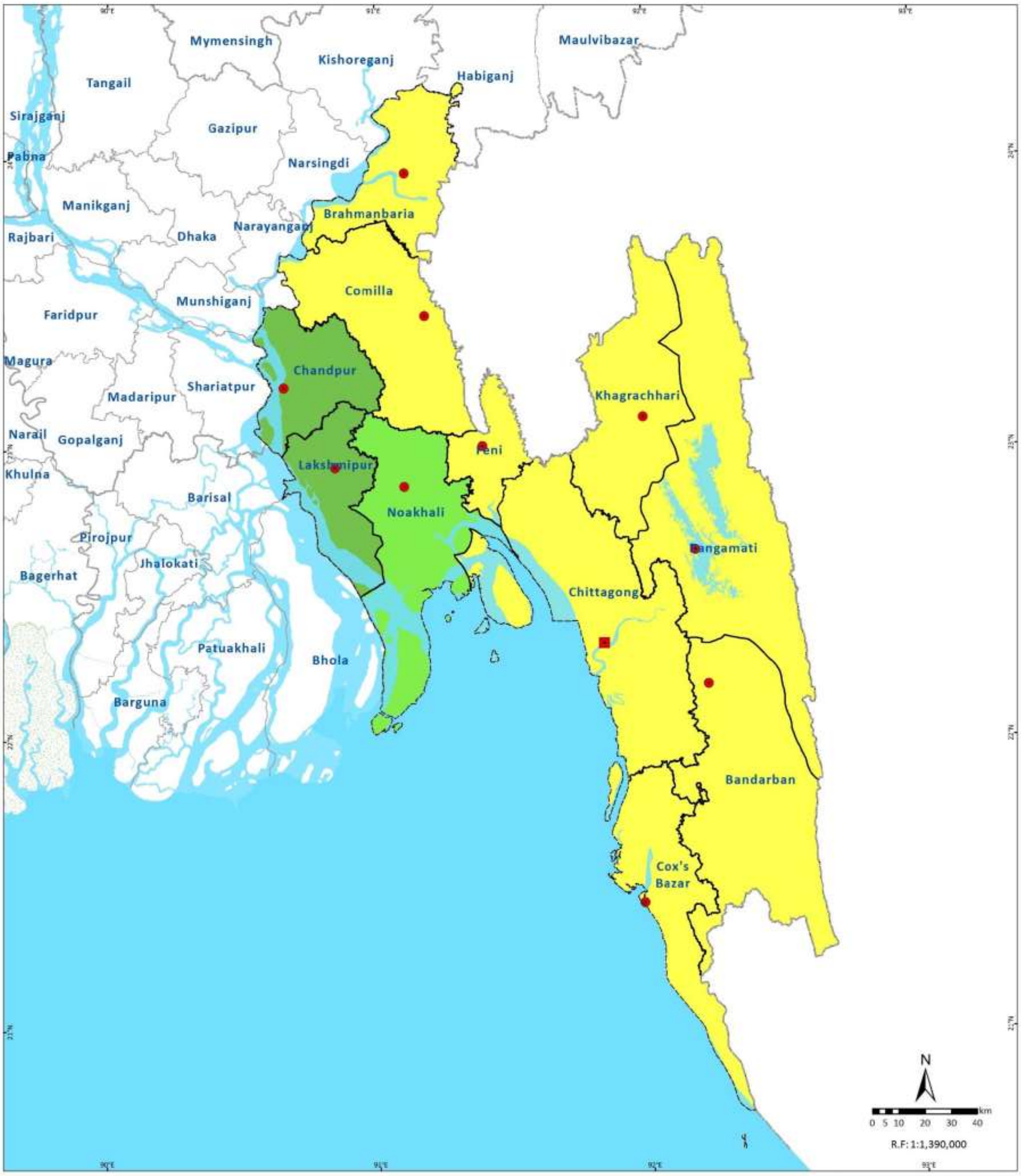
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Chittagong Division)



Legend

	Country Boundary	Risk Levels	
	Division Boundary		No Risk
	District Boundary		Very Low
	Division Head Quarter		Low
	District Head Quarter		Moderate
	River/Sea/Lake		High
	Sundarbans		Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

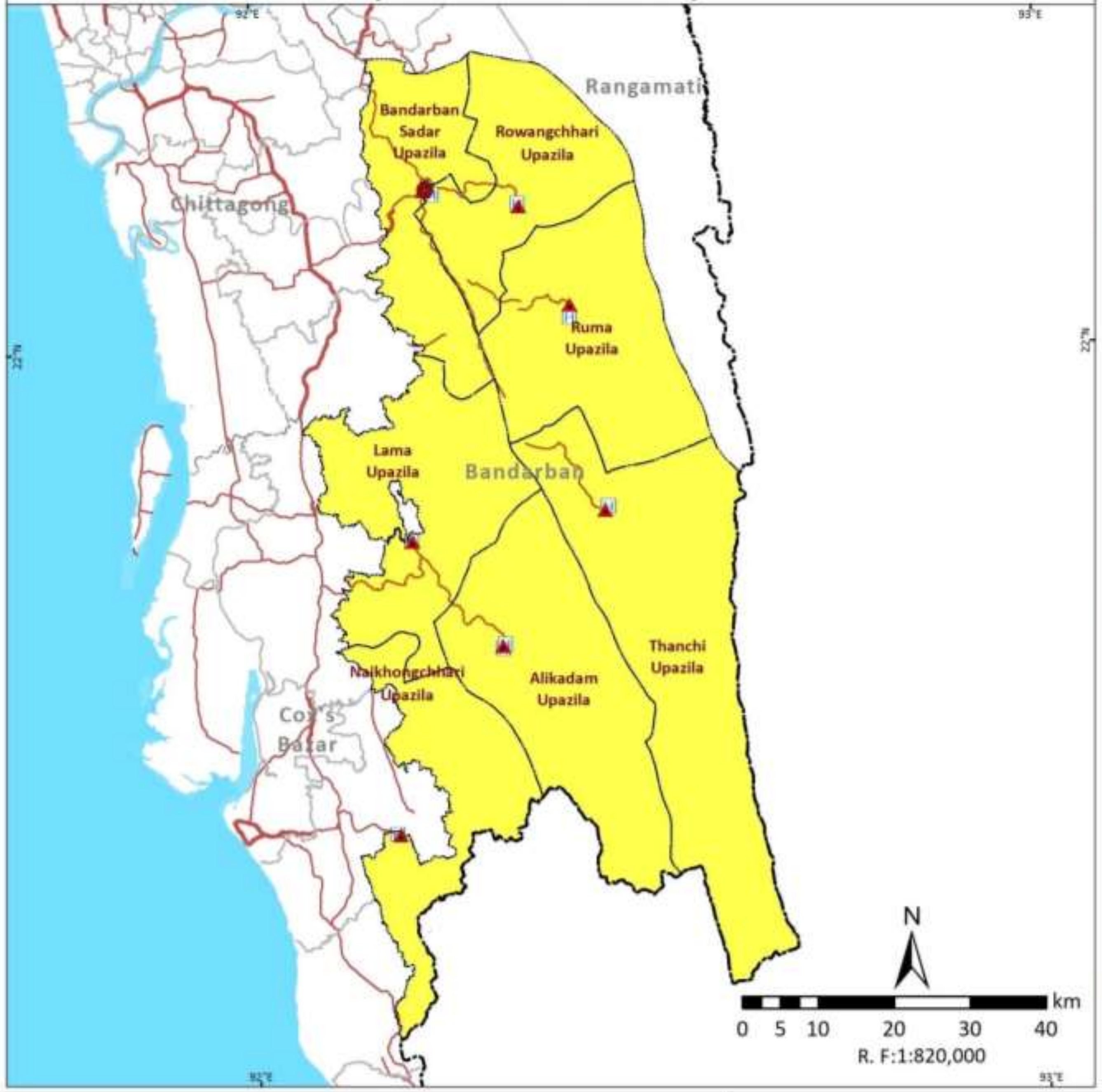
Administrative Index

Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

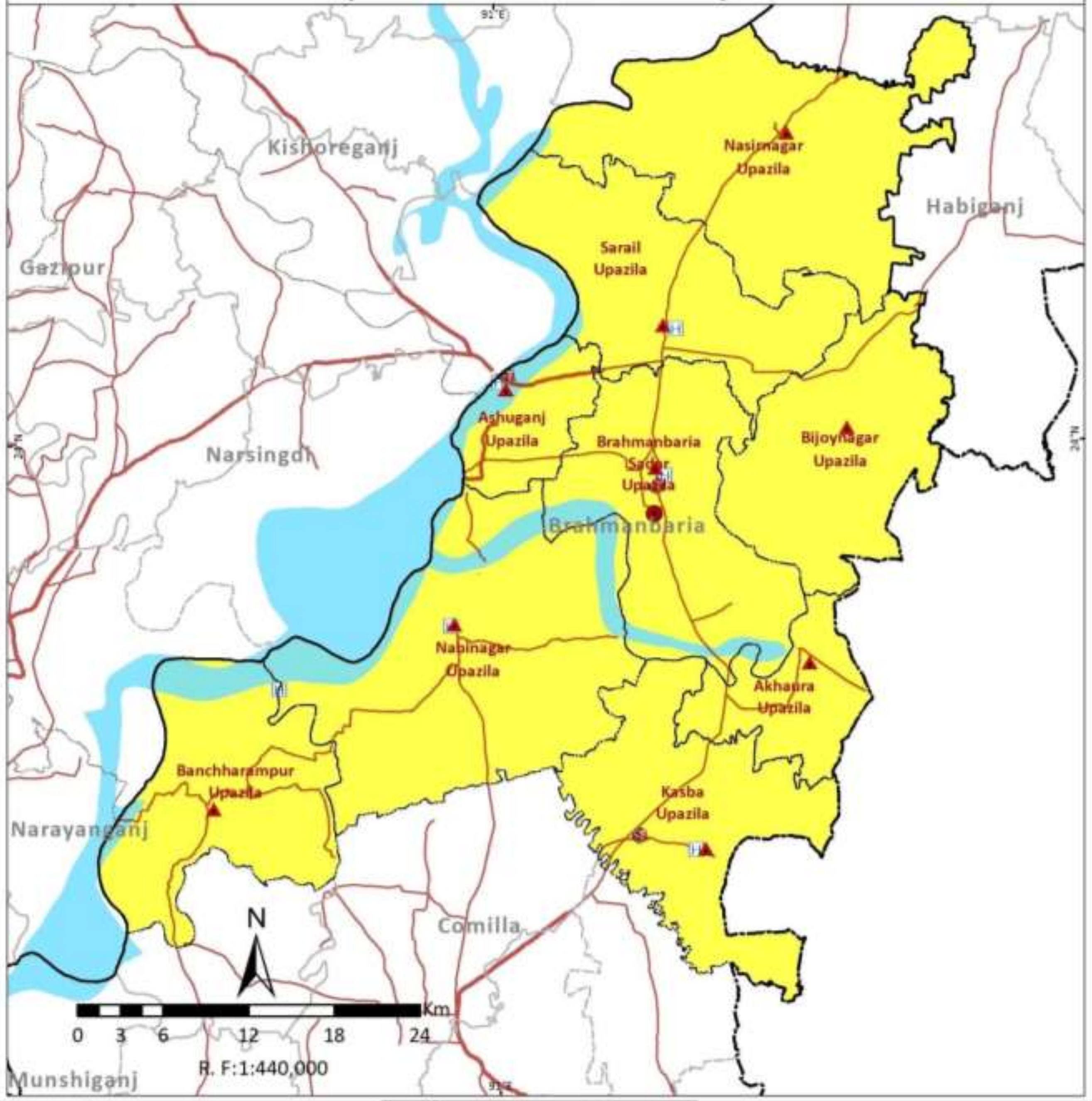
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Bandarban District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Brahmanbaria District)



Legend

Country Boundary		District Head Quarter		Risk of HH structures	
Division Boundary		Upazila Head Quarter			No Risk
District Boundary		Fire Station			Very Low
Upazila Boundary		Hospital			Low
National High Way		Cyclone Shelter			Moderate
Regional High Way		River/Sea/Lake			High
		Sundarbans			Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

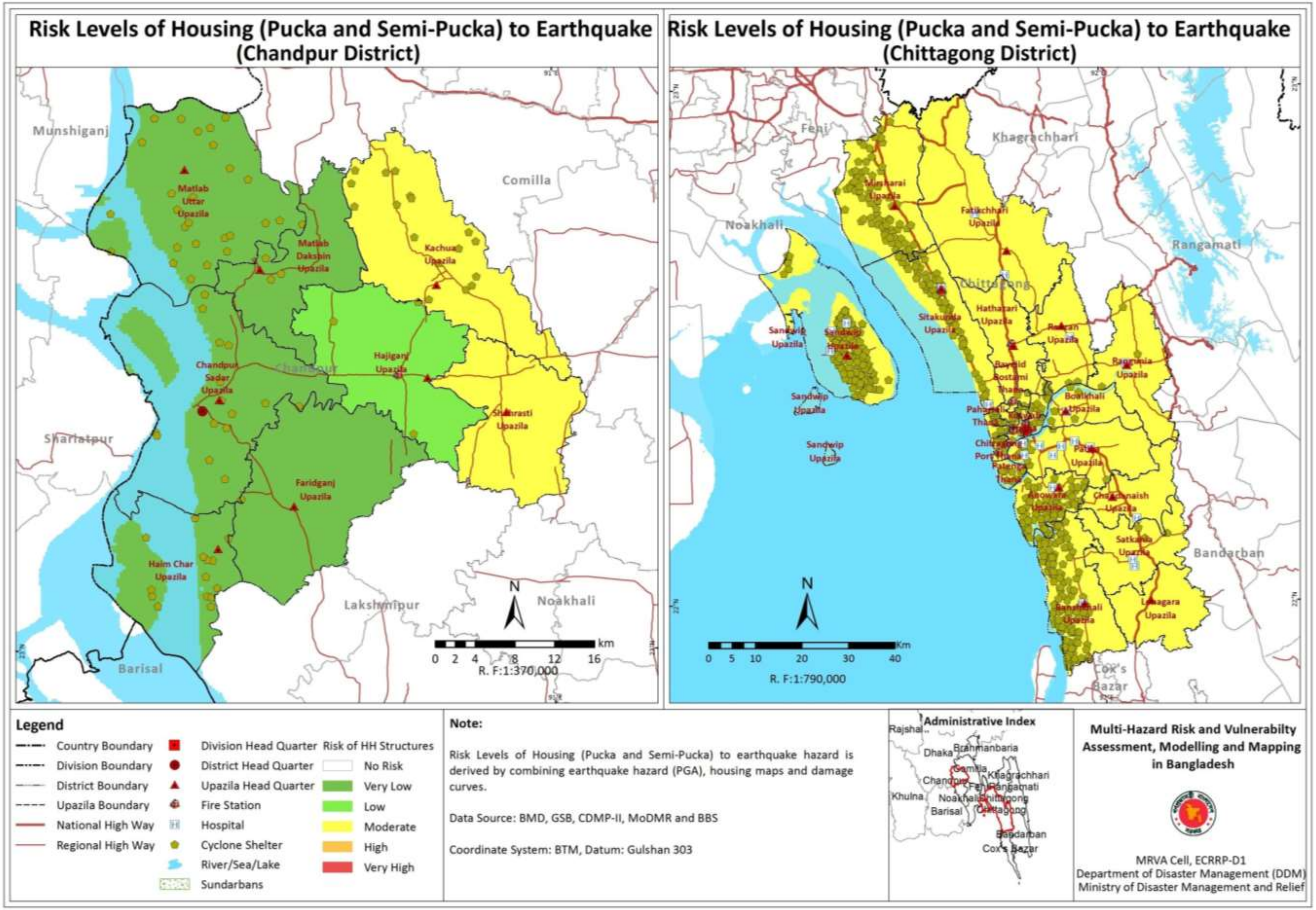
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

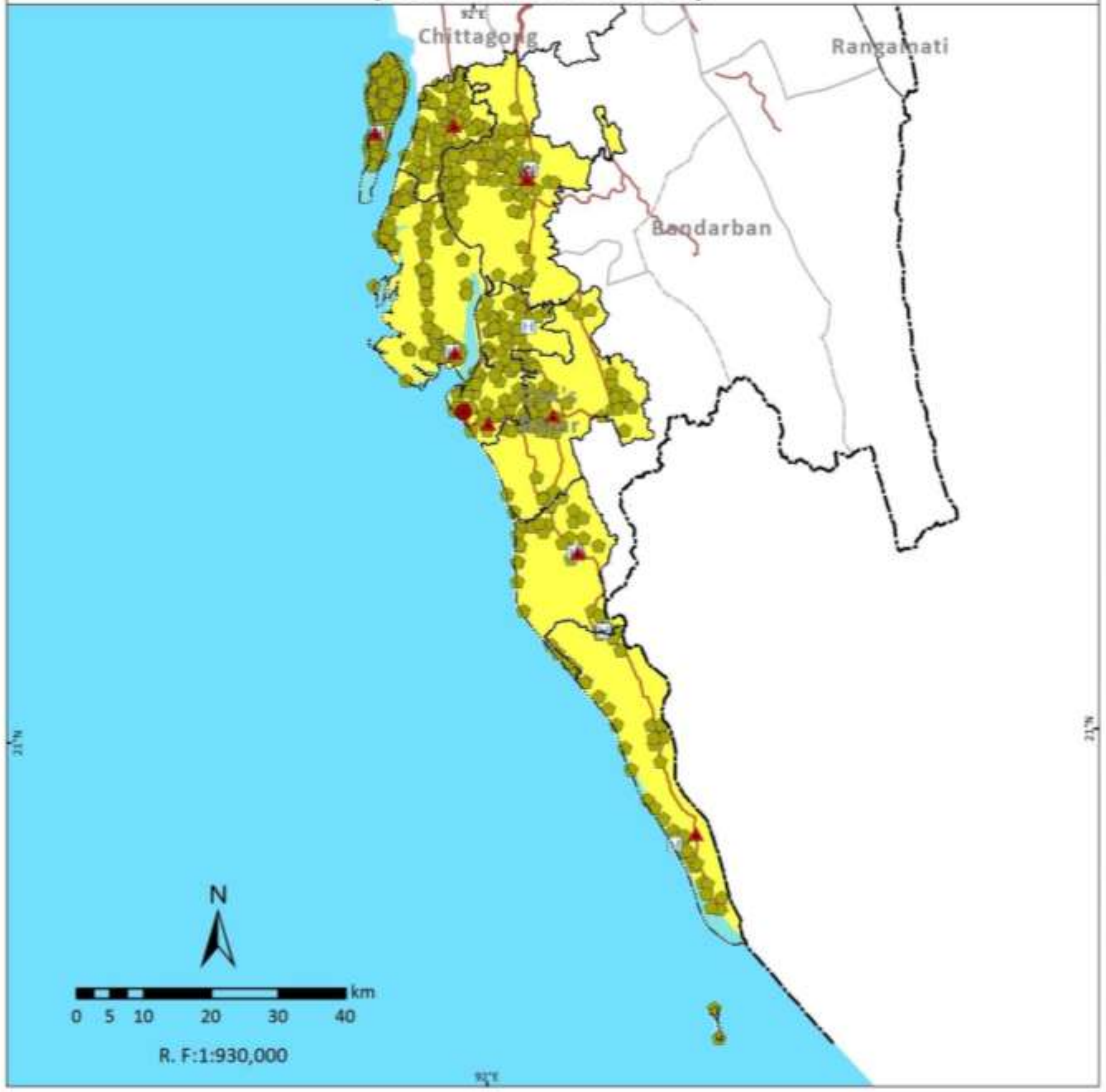
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

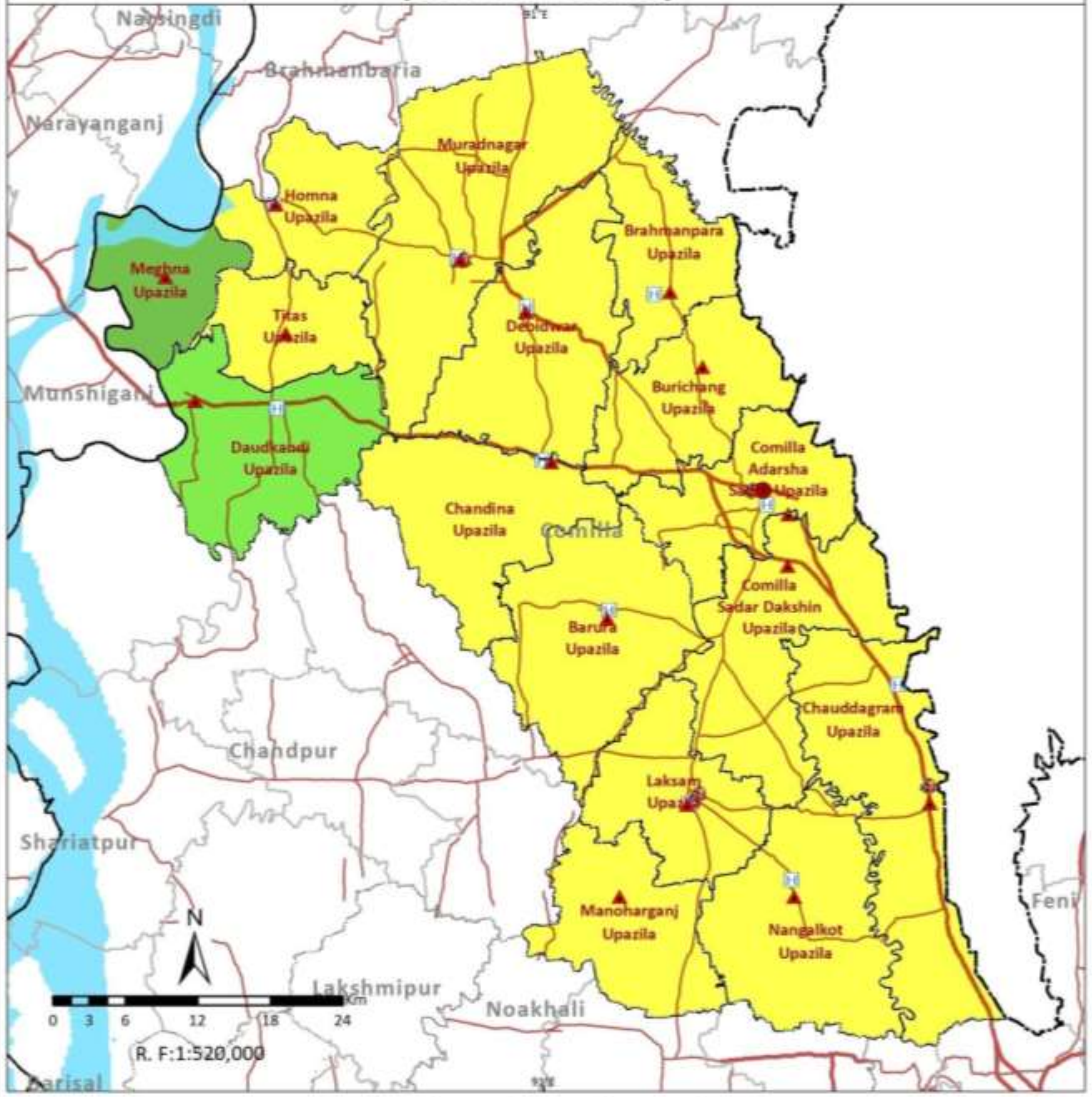


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Chandpur District)
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Chittagong District)
Munshiganj
Comilla
Shariatpur
Barisal
Lakshmipur
Noakhali
Matlab Uttar Upazila
Matlab Dakshin Upazila
Kachua Upazila
Hajiganj Upazila
Chandpur Sadar Upazila
Shahrasti Upazila
Faridganj Upazila
Haim Char Upazila
R. F:1:370,000
R. F:1:790,000
Feni
Khagrachhari
Noakhali
Rangamati
Bandarban
Cox's Bazar
Mirsharai Upazila
Fatikchhari Upazila
Sitakunda Upazila
Hathazari Upazila
Raozan Upazila
Rangunia Upazila
Sandwip Upazila
Boalkhali Upazila
Patiya Upazila
Anowara Upazila
Chandanaish Upazila
Satkania Upazila
Banshkhali Upazila
Lohagara Upazila
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Level of Housing (Pucka and Semi-Pucka) to Earthquake (Cox's Bazar District)



Risk Level of Housing (Pucka and Semi-Pucka) to Earthquake (Comilla District)



Legend

	Country Boundary		District Head Quarter	**Risk of HH Structures**	
	Division Boundary		Upazila Head Quarter		No Risk
	District Boundary		Fire Station		Very Low
	Upazila Boundary		Hospital		Low
	National High Way		Cyclone Shelter		Moderate
	Regional High Way		River/Sea/Lake		High
			Sundarbans		Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

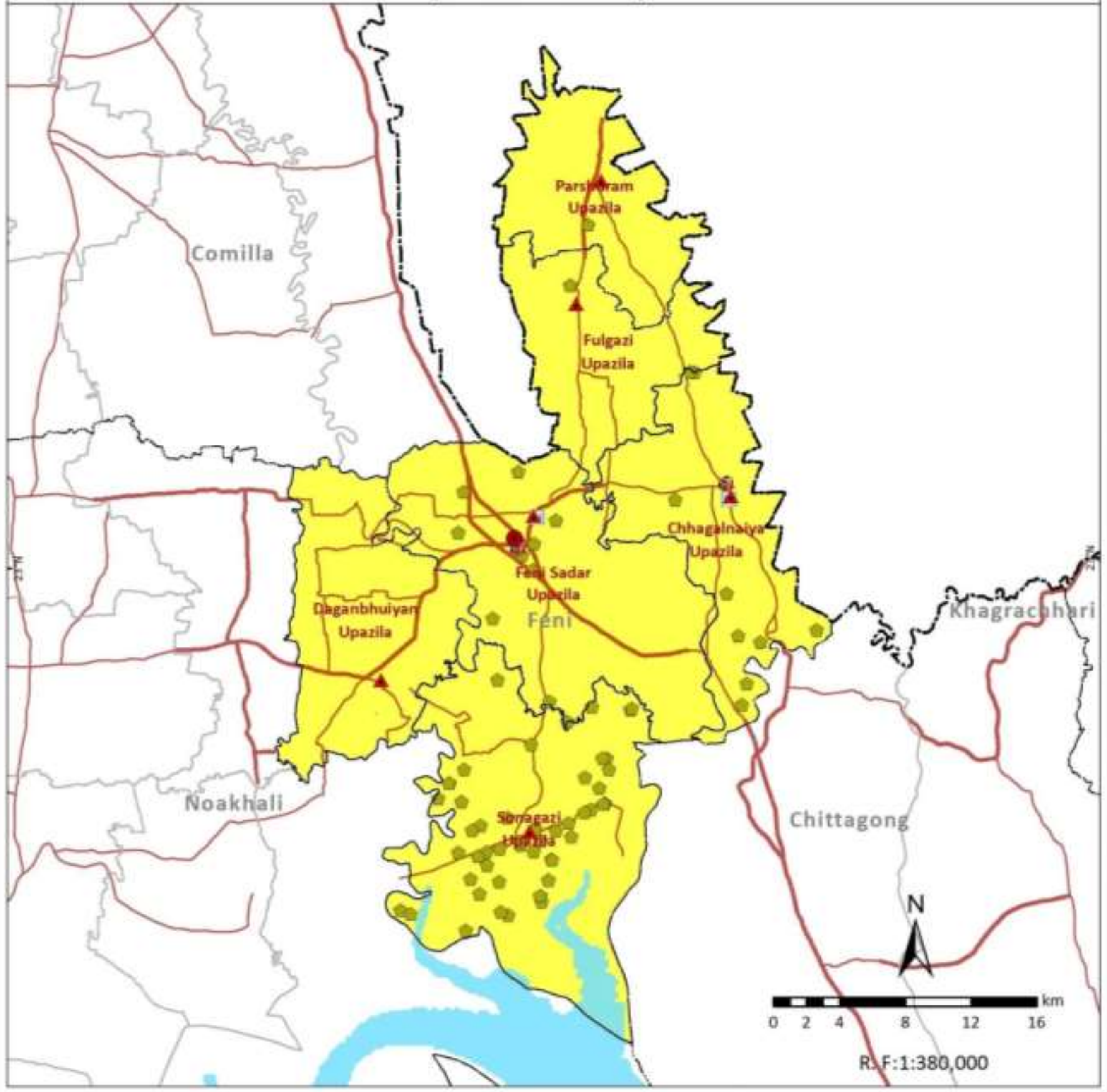
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

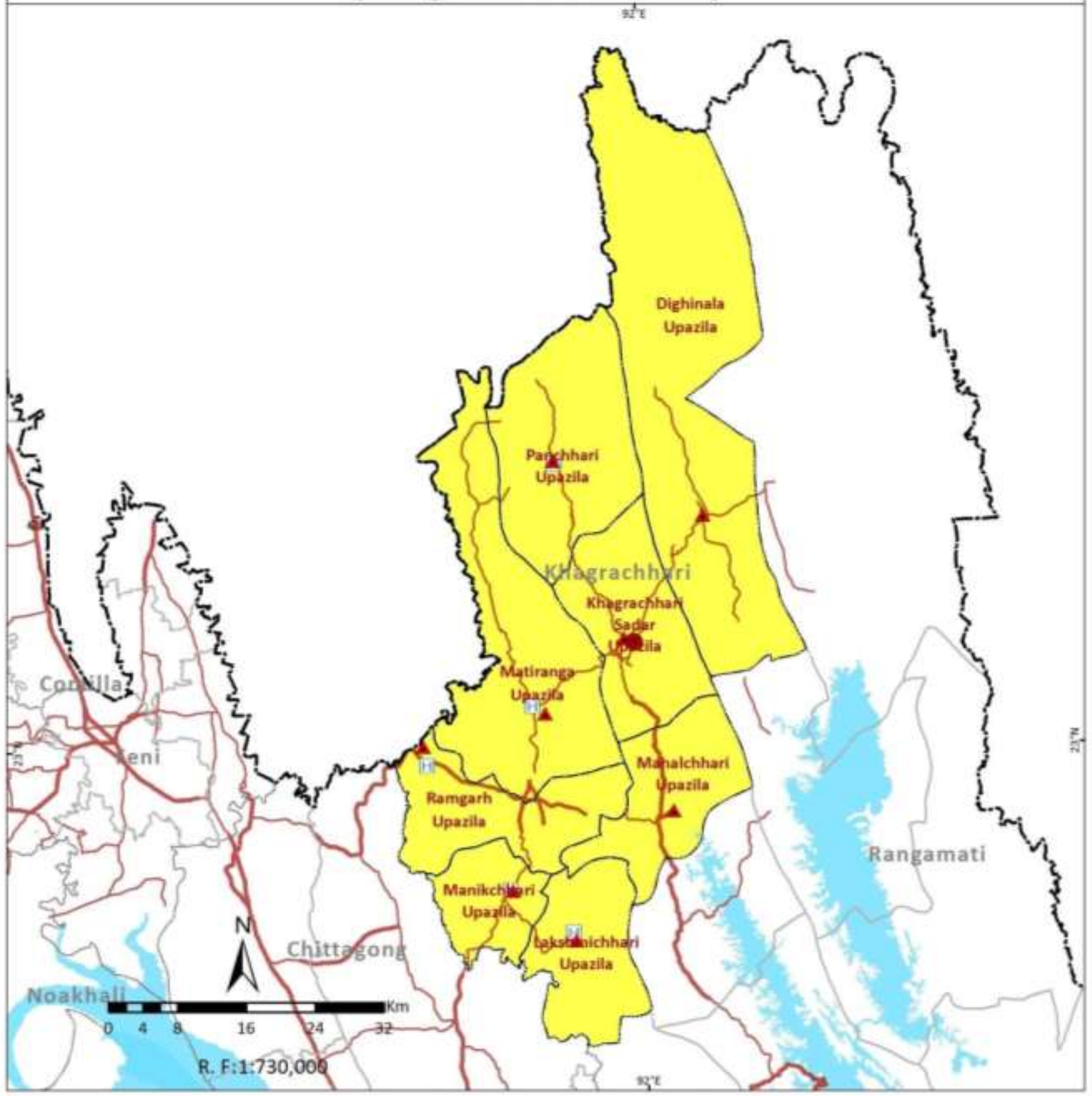
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Feni District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Khagrachhari District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

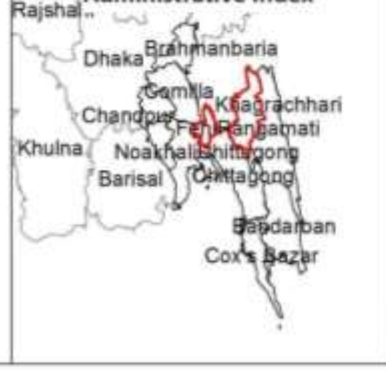
Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

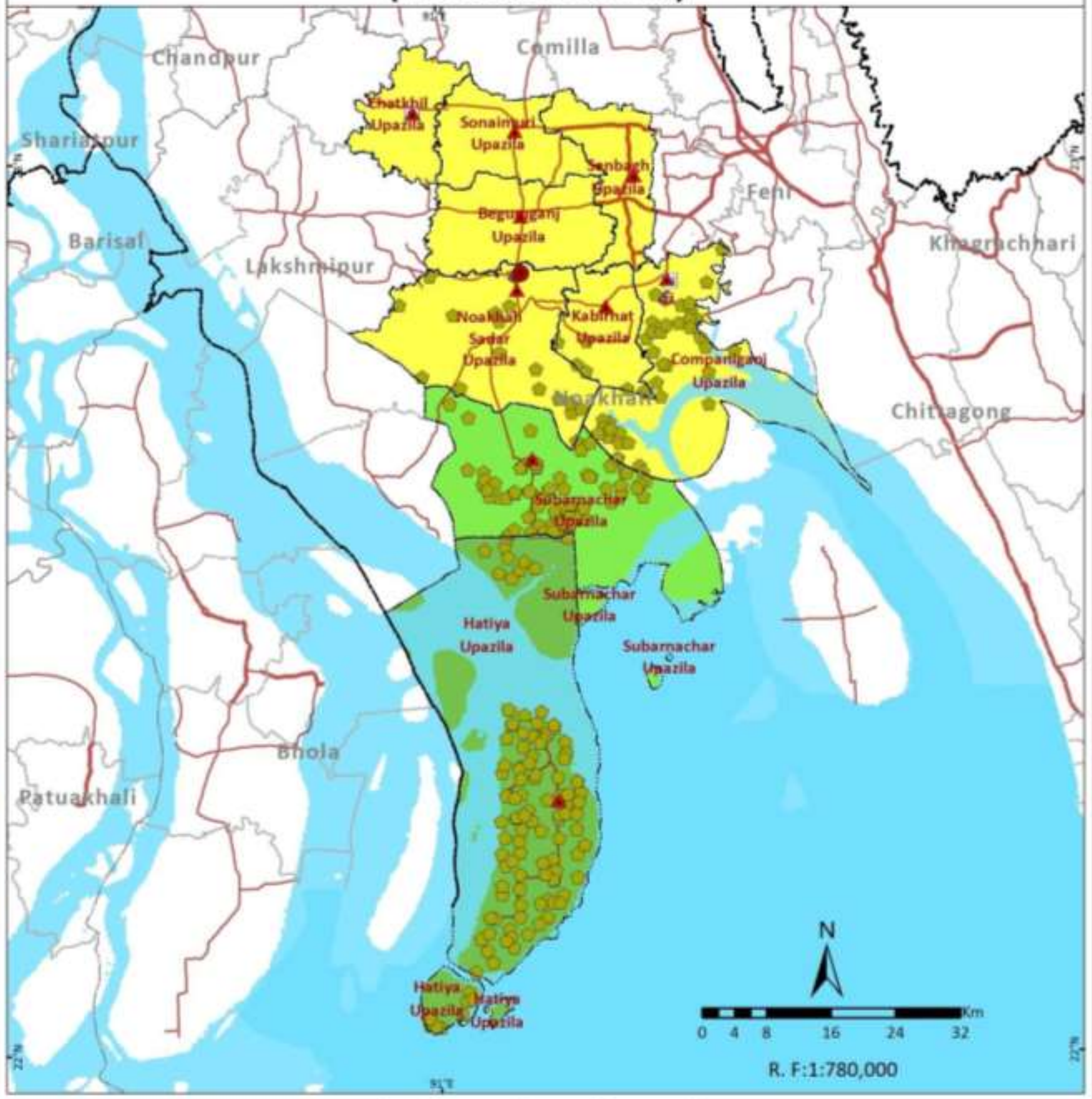


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Lakshmipur District)

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Noakhali District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

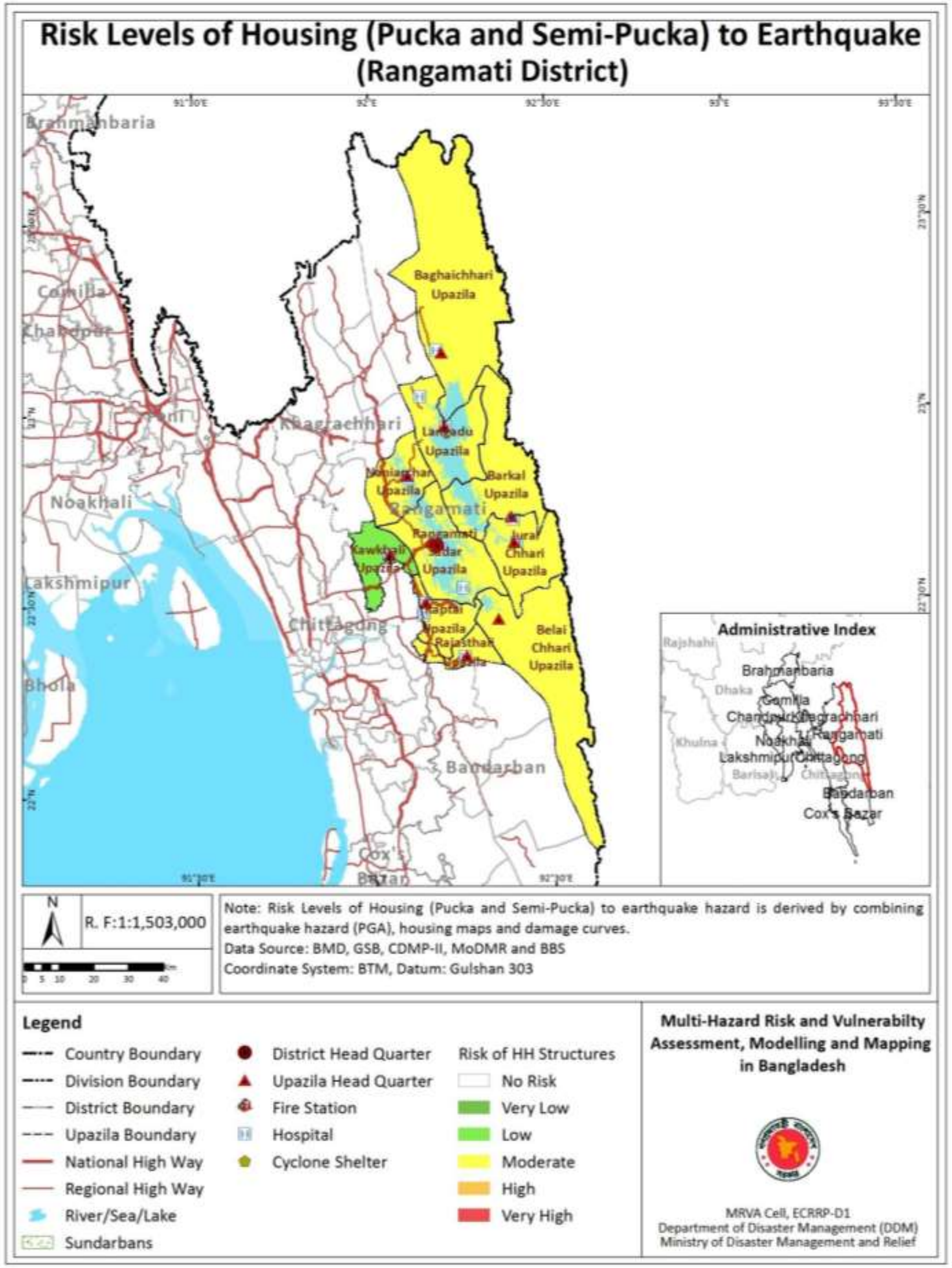
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

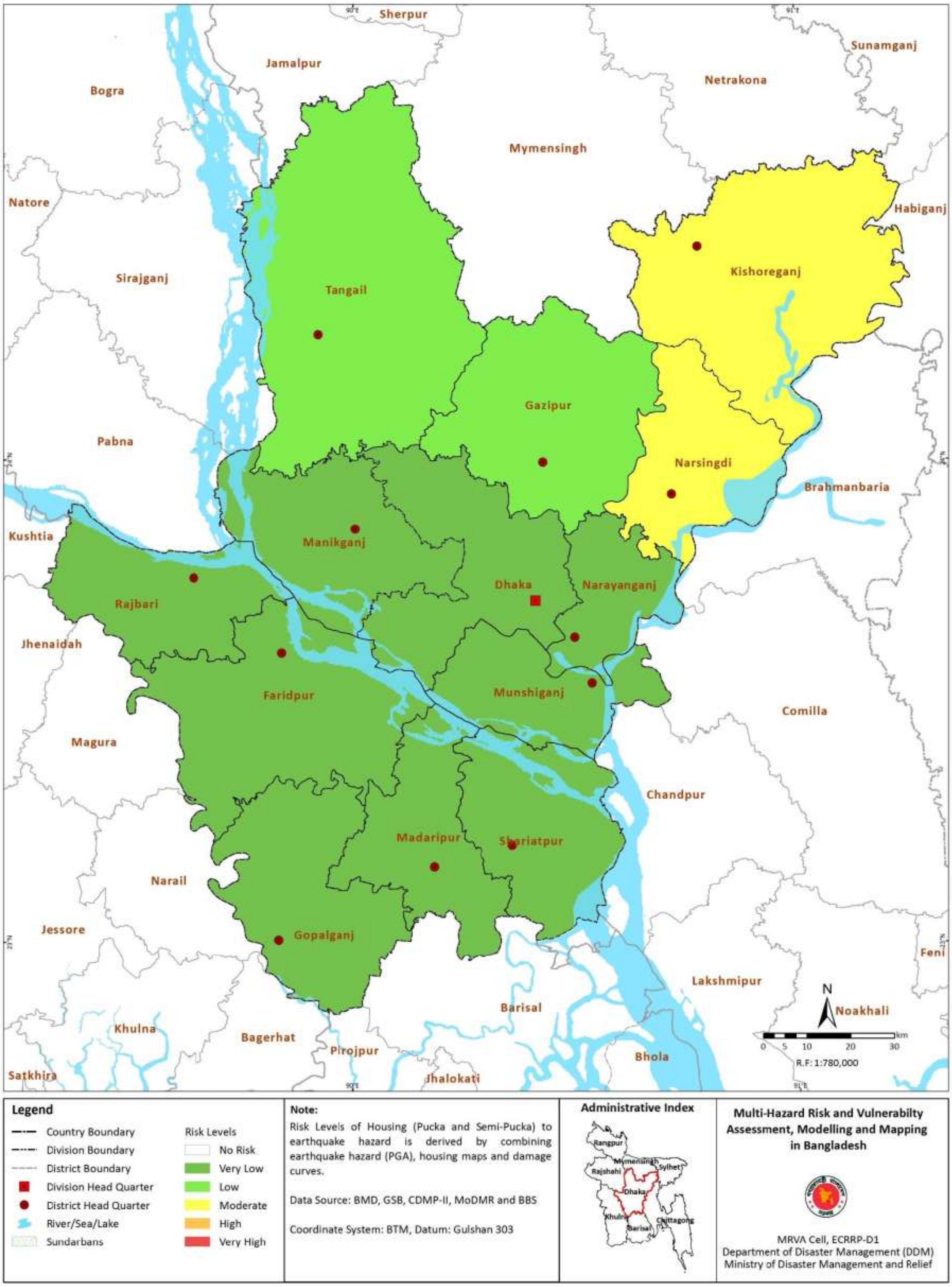
Administrative Index

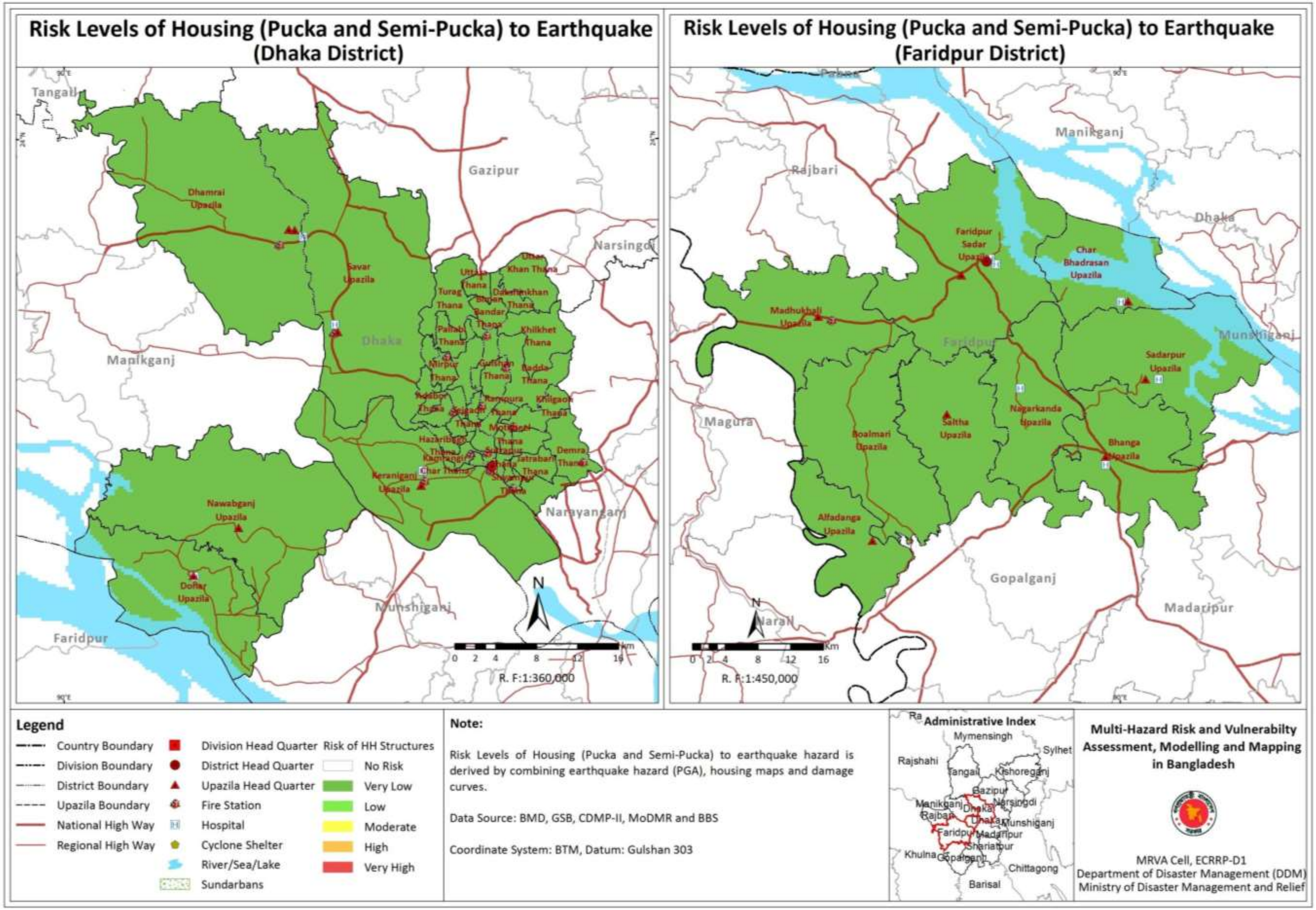
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Rangamati District)
Brahmanbaria
Comilla
Chandpur
Khagrachhari
Noakhali
Lakshmipur
Chittagong
Bhola
Bandarban
Cox's Bazar
Baghaichhari Upazila
Langadu Upazila
Naniarchar Upazila
Barkal Upazila
Rangamati
Rangamati Sadar Upazila
Kawkhali Upazila
Jurai Chhari Upazila
Kaptai Upazila
Rajasthali Upazila
Belai Chhari Upazila
Administrative Index
Rajshahi
Dhaka
Khulna
Barisal
R. F:1:1,503,000
Note: Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

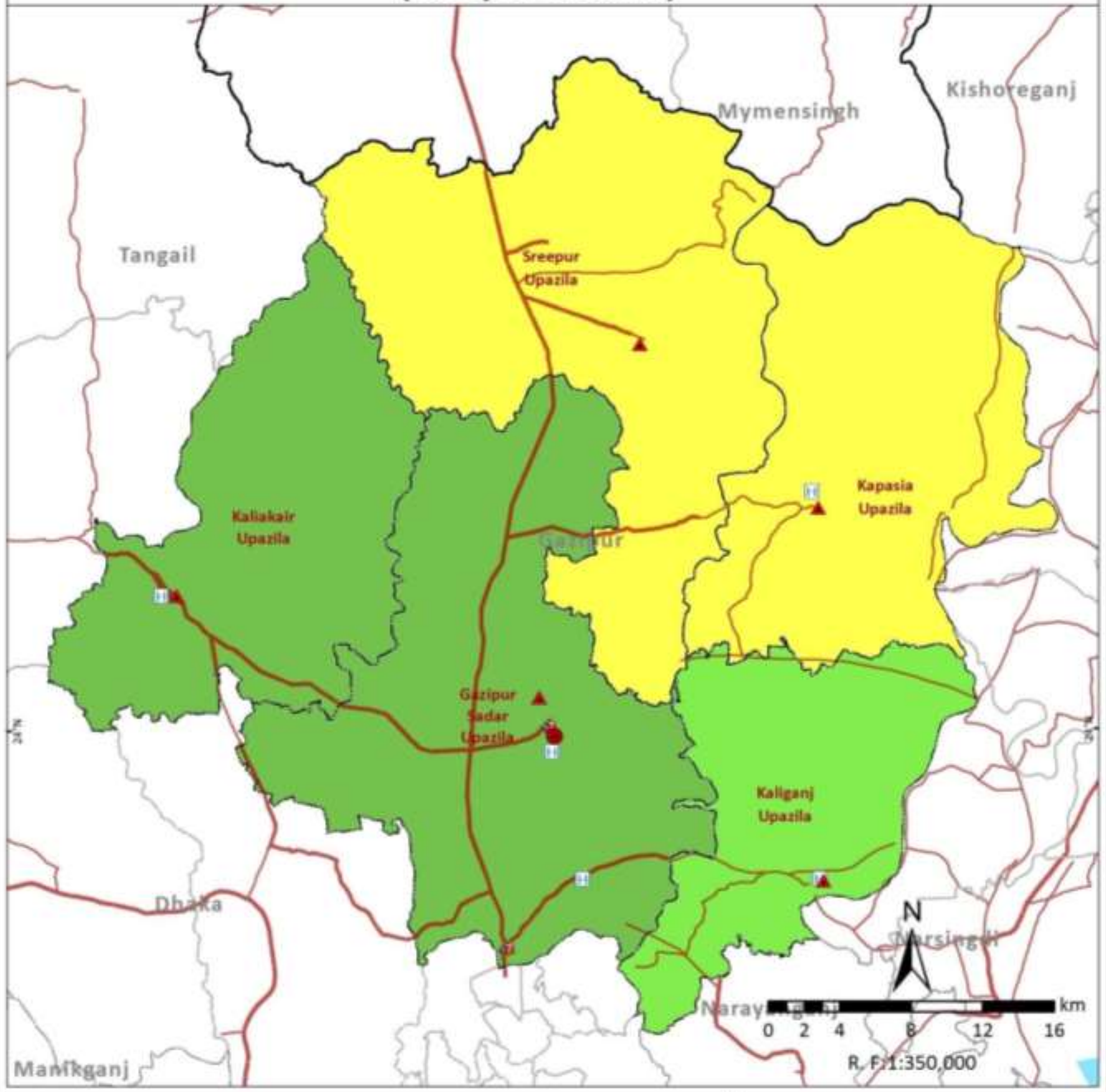
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Dhaka Division)



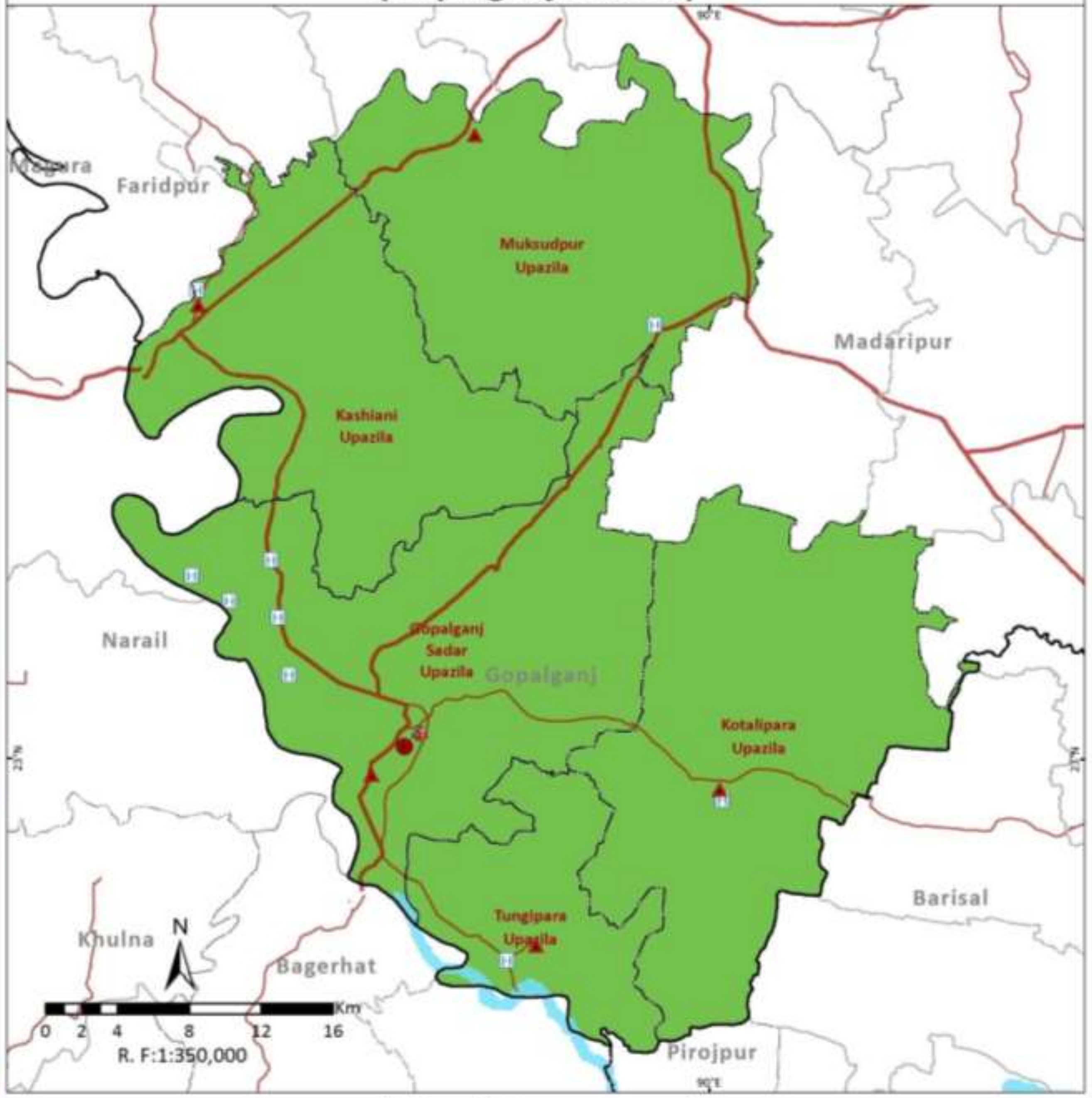


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Dhaka District)
Tangail
Gazipur
Narsingdi
Manikganj
Dhaka
Narayanganj
Munshiganj
Faridpur
Dhamrai Upazila
Savar Upazila
Keraniganj Upazila
Nawabganj Upazila
Dohar Upazila
0 2 4 8 12 16 Km
R. F:1:360,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Faridpur District)
Padma
Manikganj
Rajbari
Dhaka
Munshiganj
Magura
Gopalganj
Madaripur
Narail
Faridpur
Faridpur Sadar Upazila
Char Bhadrasan Upazila
Madhukhali Upazila
Sadarpur Upazila
Boalmari Upazila
Saltha Upazila
Nagarkanda Upazila
Bhanga Upazila
Alfadanga Upazila
0 2 4 8 12 16 Km
R. F:1:450,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Rajbari
Dhaka
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Gazipur District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Gopalganj District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures	
Division Boundary	Upazila Head Quarter		No Risk
District Boundary	Fire Station		Very Low
Upazila Boundary	Hospital		Low
National High Way	Cyclone Shelter		Moderate
Regional High Way	River/Sea/Lake		High
	Sundarbans		Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

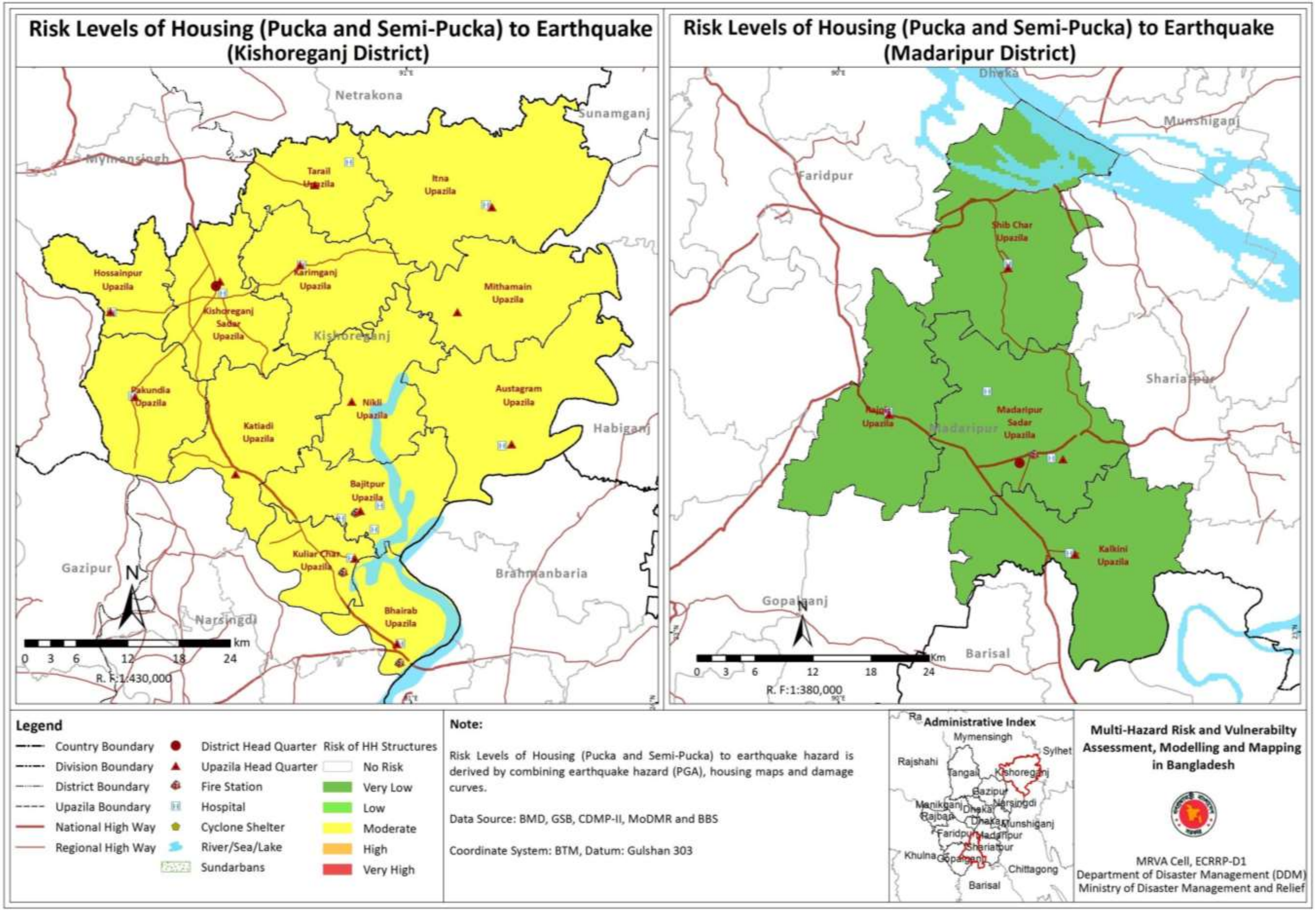
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

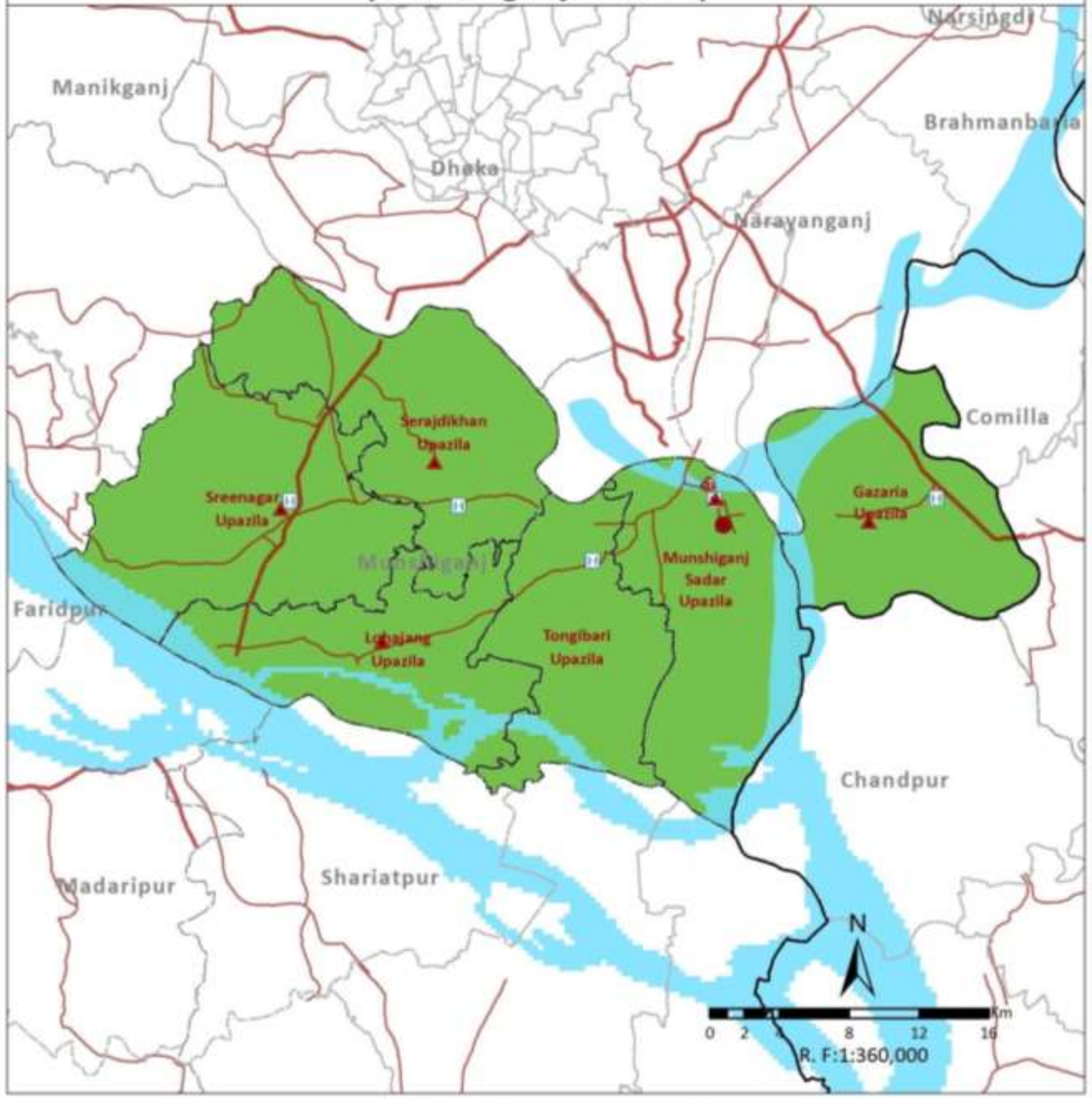
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Kishoreganj District)
Netrakona
Sunamganj
Mymensingh
Tarail Upazila
Itna Upazila
Hossainpur Upazila
Karimganj Upazila
Kishoreganj Sadar Upazila
Mithamain Upazila
Kishoreganj
Pakundia Upazila
Katiadi Upazila
Nikli Upazila
Austagram Upazila
Habiganj
Bajitpur Upazila
Kuliar Char Upazila
Gazipur
Narsingdi
Brahmanbaria
Bhairab Upazila
km
0 3 6 12 18 24
R. F:1:430,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Madaripur District)
Dhaka
Munshiganj
Faridpur
Shib Char Upazila
Shariatpur
Rajoir Upazila
Madaripur
Madaripur Sadar Upazila
Kalkini Upazila
Gopalganj
Barisal
Km
0 3 6 12 18 24
R. F:1:380,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Manikganj
Narsingdi
Rajbari
Dhaka
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Manikganj District)

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Munshiganj District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

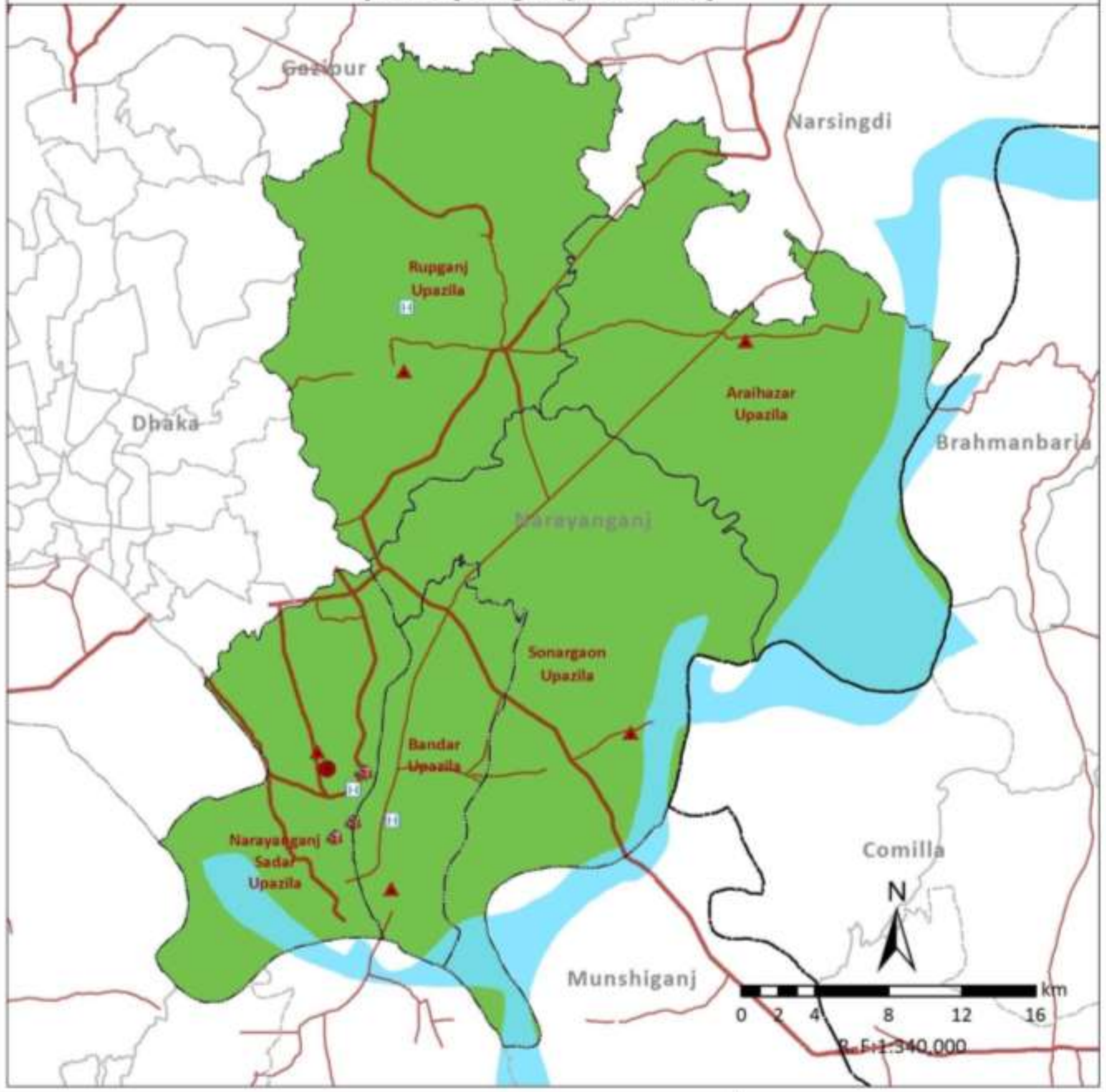
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

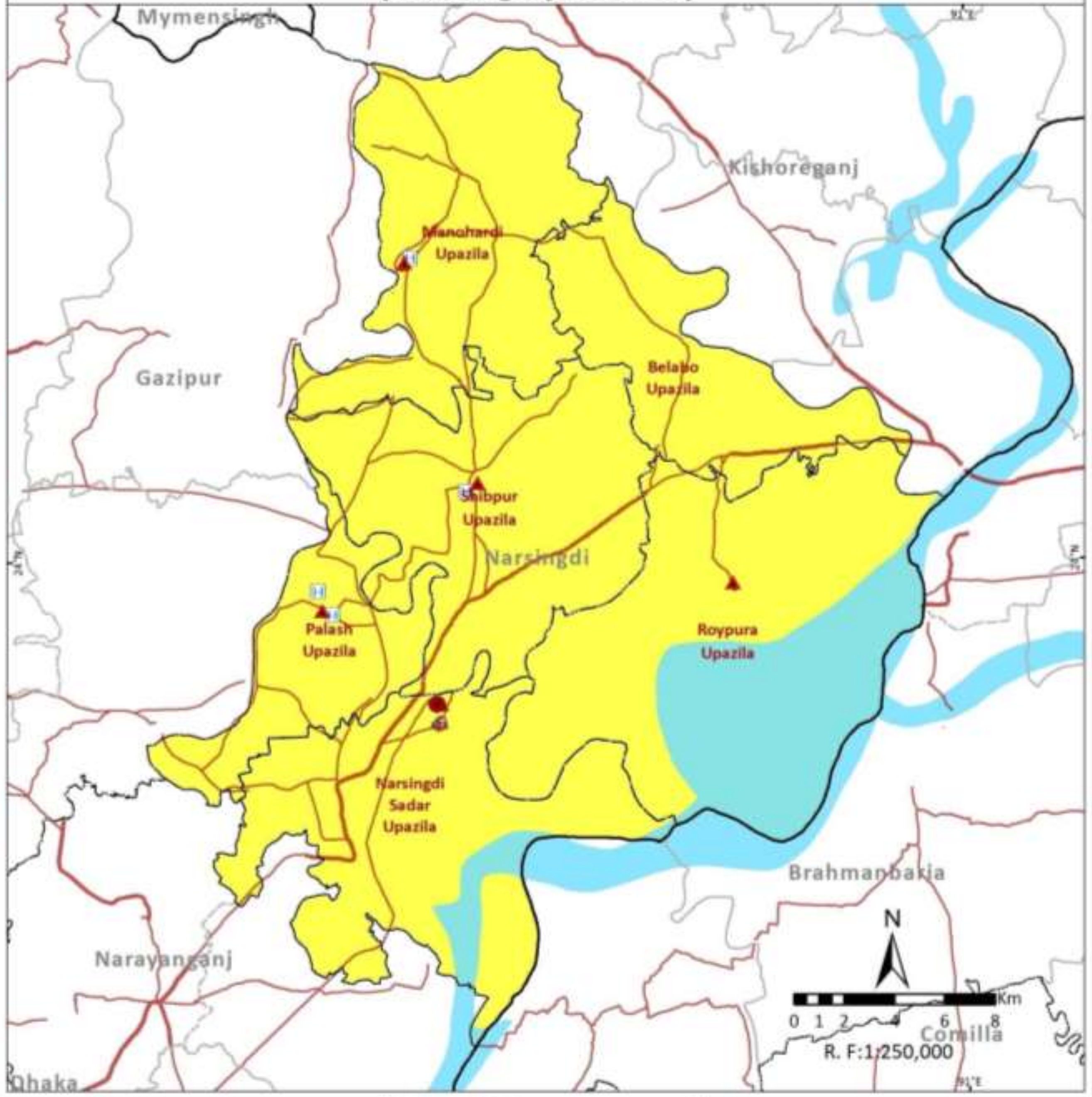
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Narayanganj District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Narsingdij District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

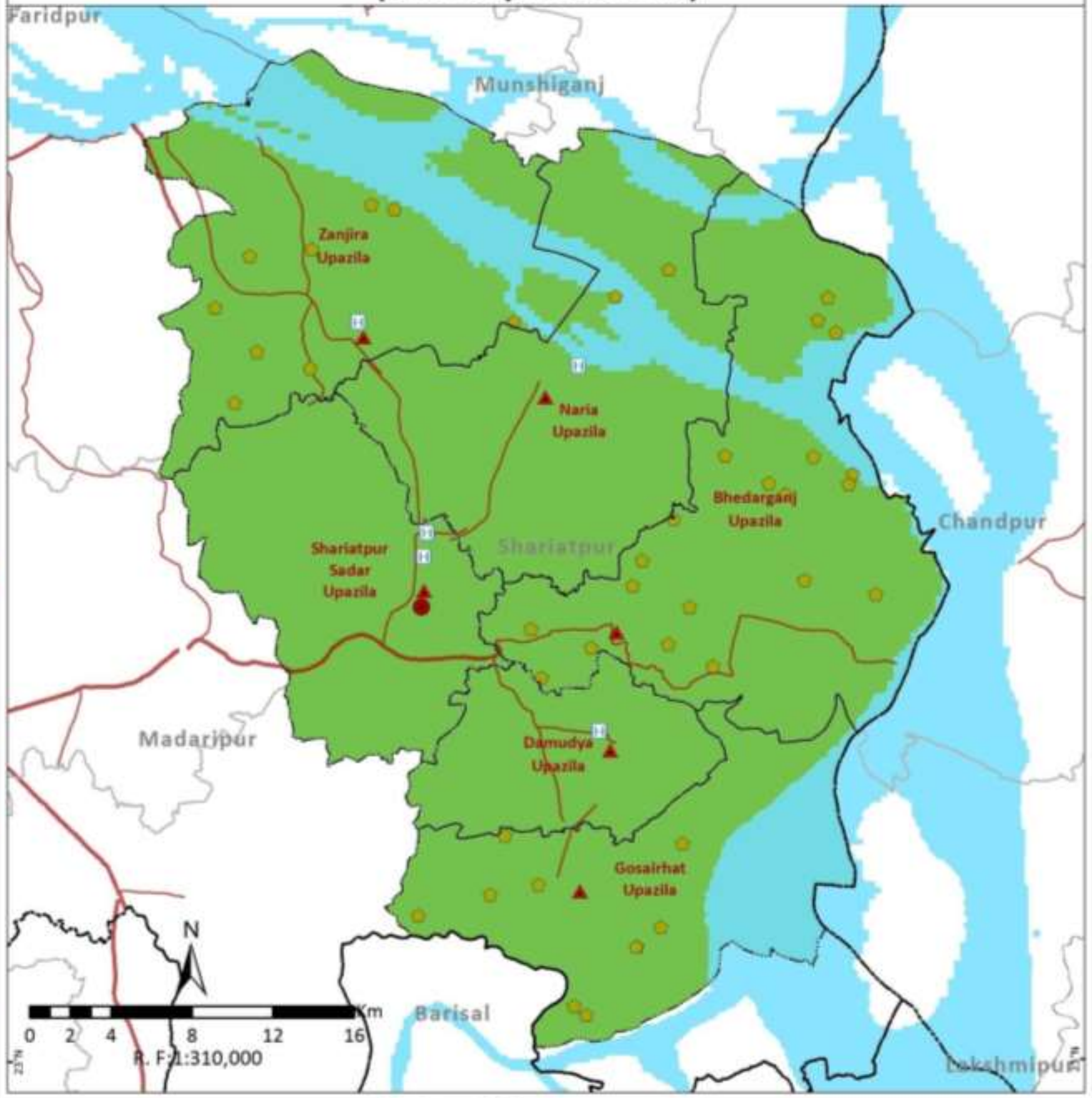
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Rajbari District)

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Shariatpur District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

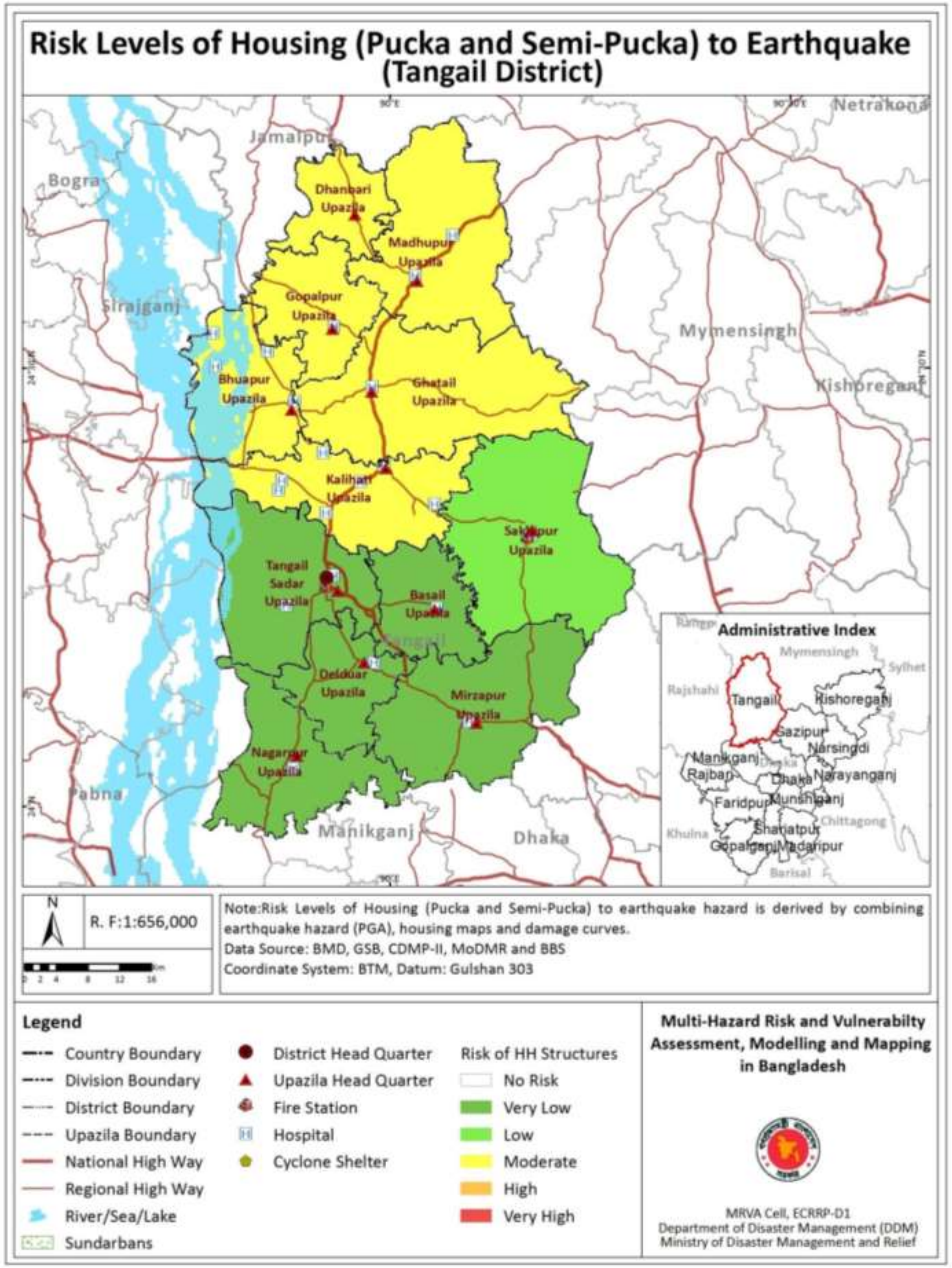
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Tangail District)
Jamalpur
Bogra
Netrakona
Sirajganj
Mymensingh
Kishoreganj
Dhanbari Upazila
Madhupur Upazila
Gopalpur Upazila
Bhuapur Upazila
Ghatail Upazila
Kalihati Upazila
Sakhipur Upazila
Tangail Sadar Upazila
Basail Upazila
Delduar Upazila
Mirzapur Upazila
Nagarpur Upazila
Pabna
Manikganj
Dhaka
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Rajbari
Dhaka
Narayanganj
Faridpur
Munshiganj
Khulna
Shariatpur
Chittagong
Gopalganj
Madaripur
Barisal
N
R. F:1:656,000
Note:Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Khulna Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk Levels

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

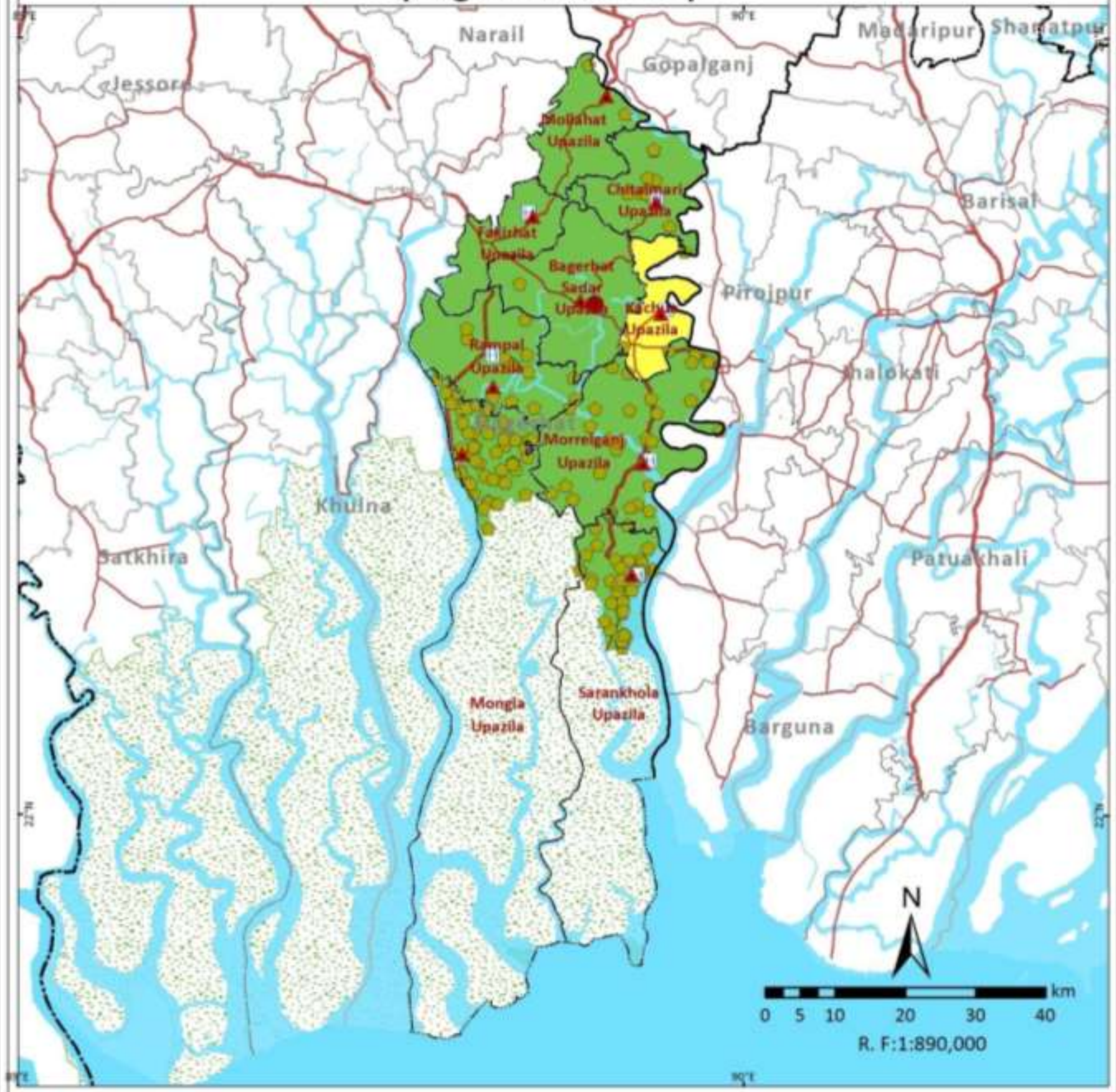
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

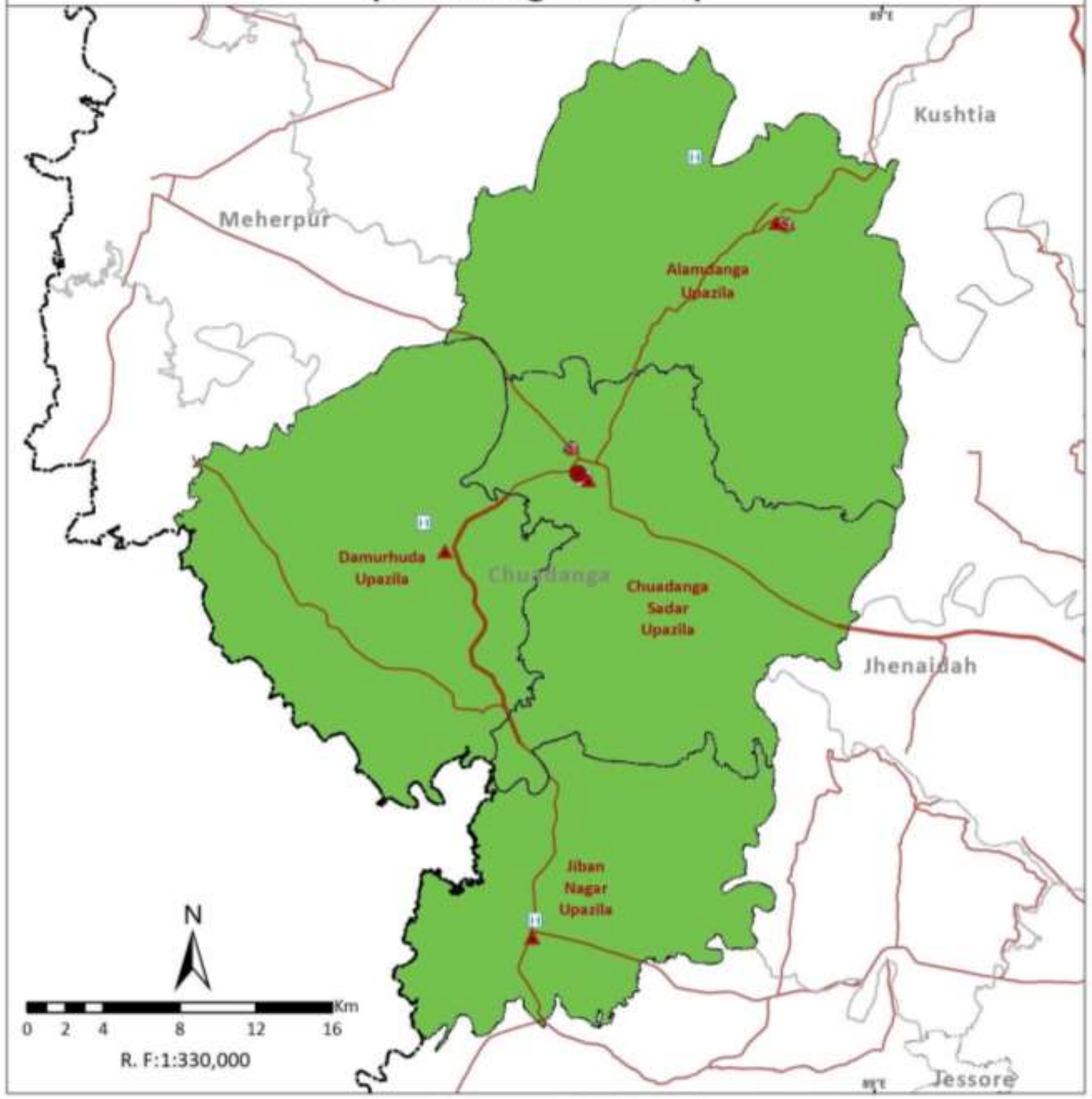
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Bagerhat District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Chuadanga District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

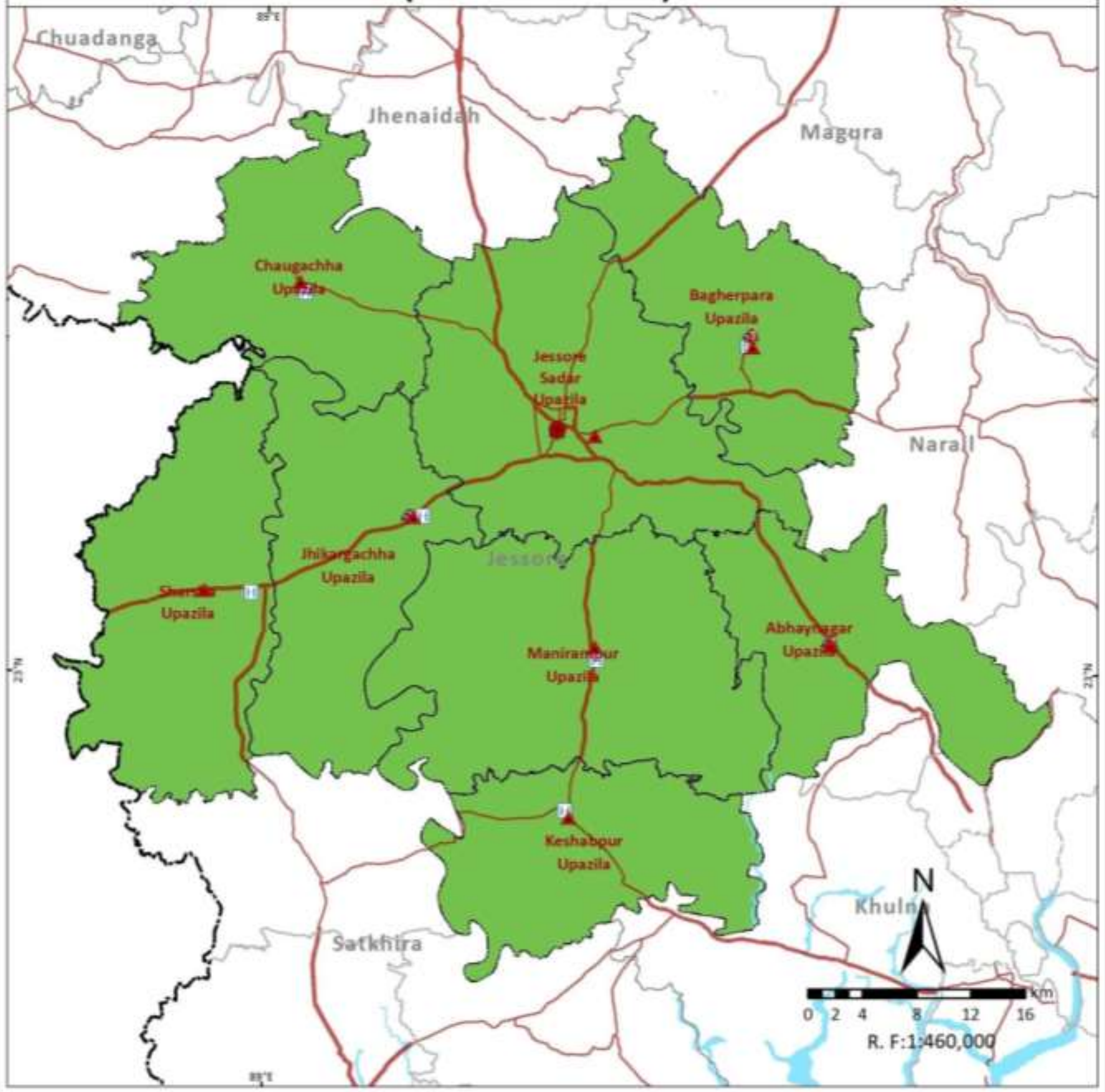
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

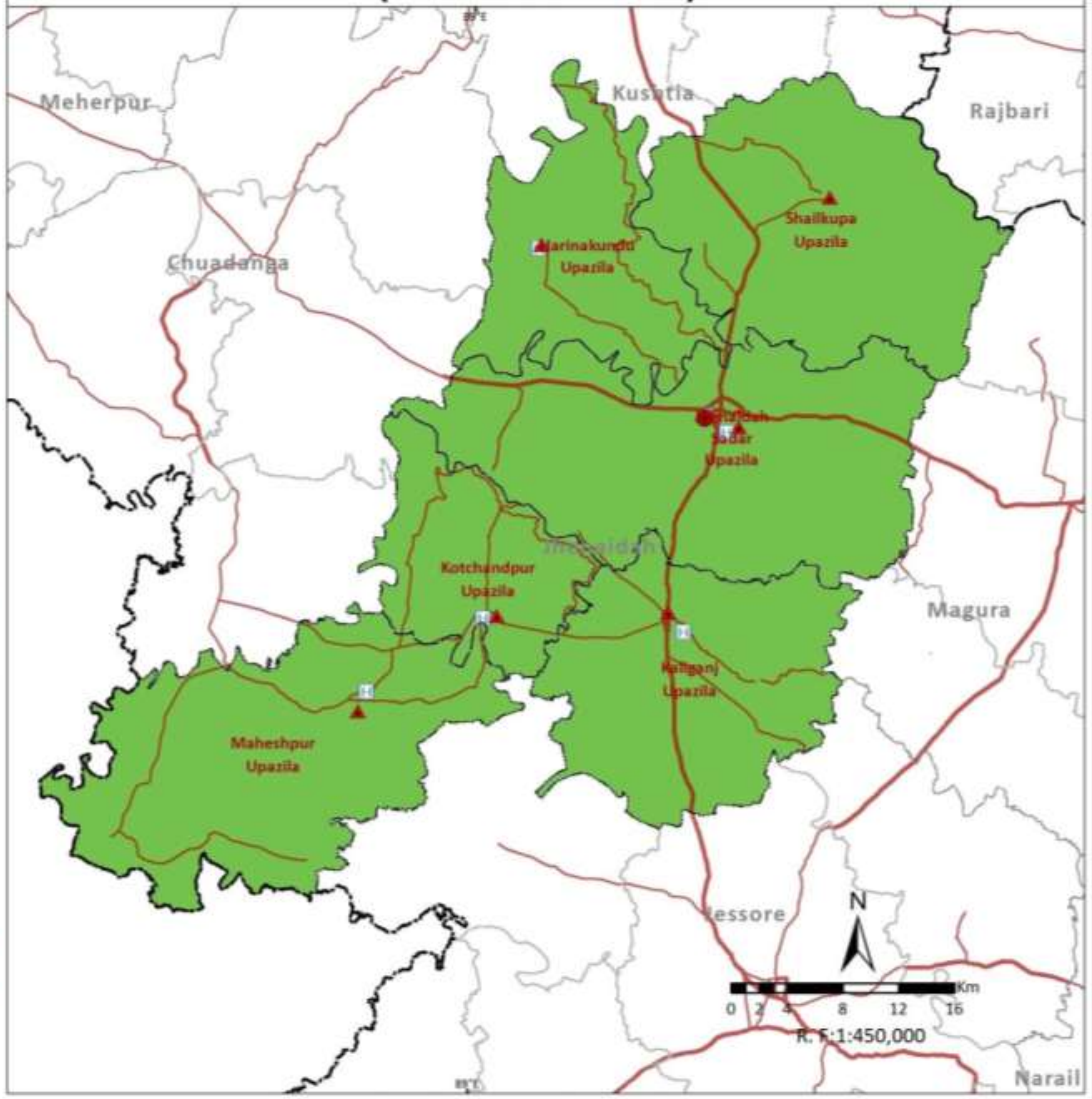
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Jessore District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Jhenaidah District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

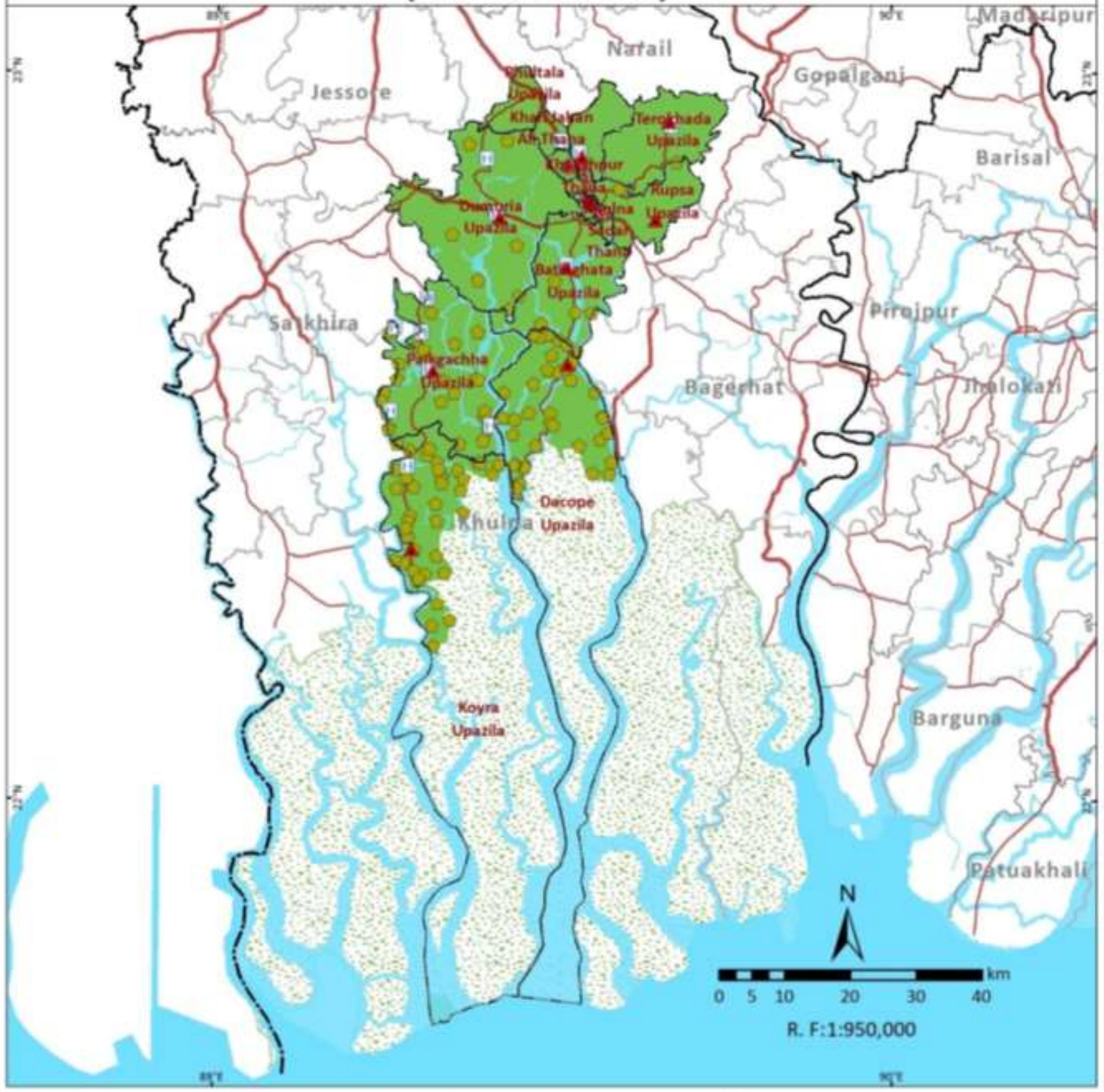
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

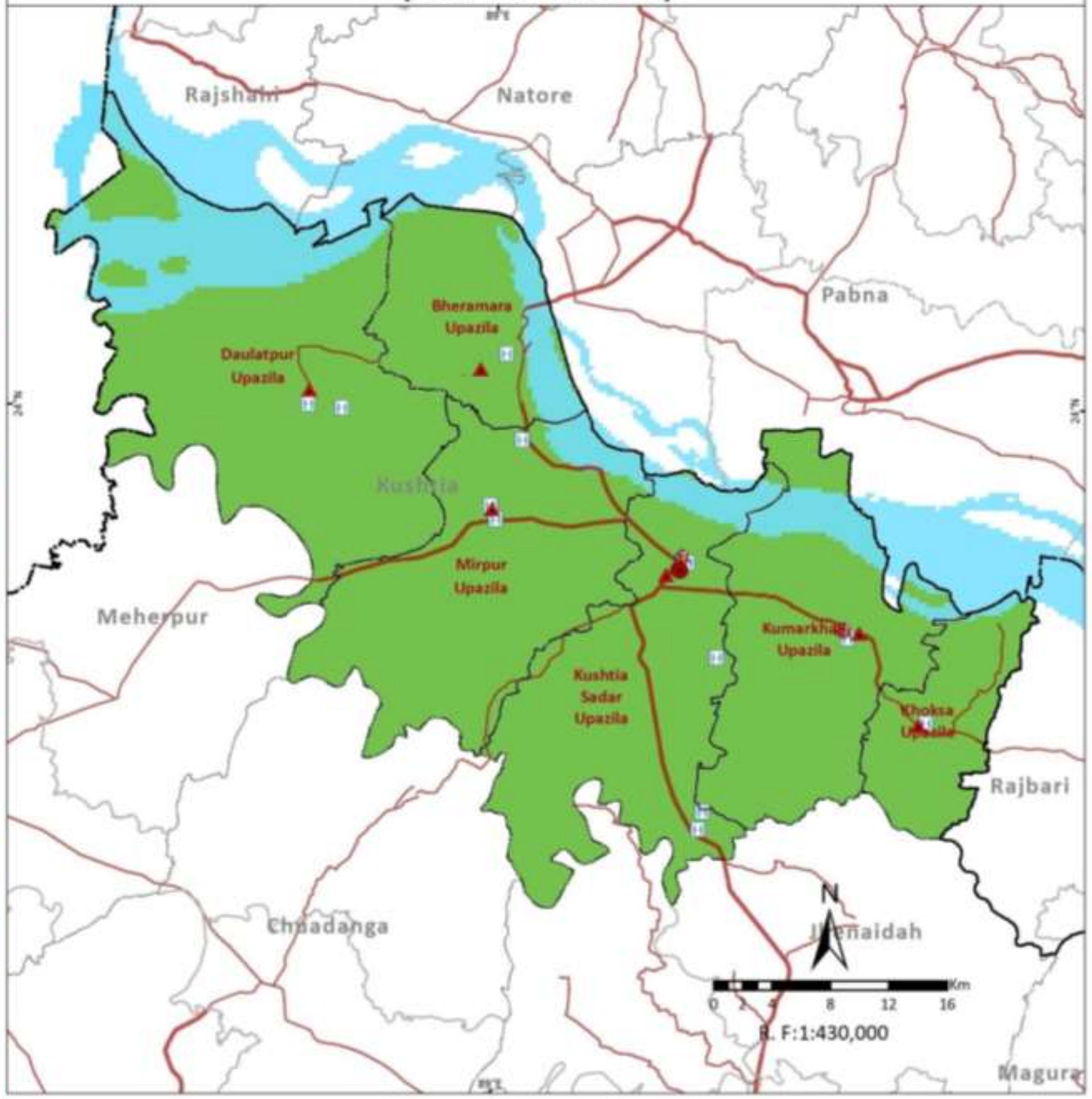
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Khulna District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Kushtia District)



Legend

Country Boundary		District Head Quarter		Risk of HH Structures	
Division Boundary		Upazila Head Quarter		No Risk	
District Boundary		Fire Station		Very Low	
Upazila Boundary		Hospital		Low	
National High Way		Cyclone Shelter		Moderate	
Regional High Way		River/Sea/Lake		High	
		Sundarbans		Very High	

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

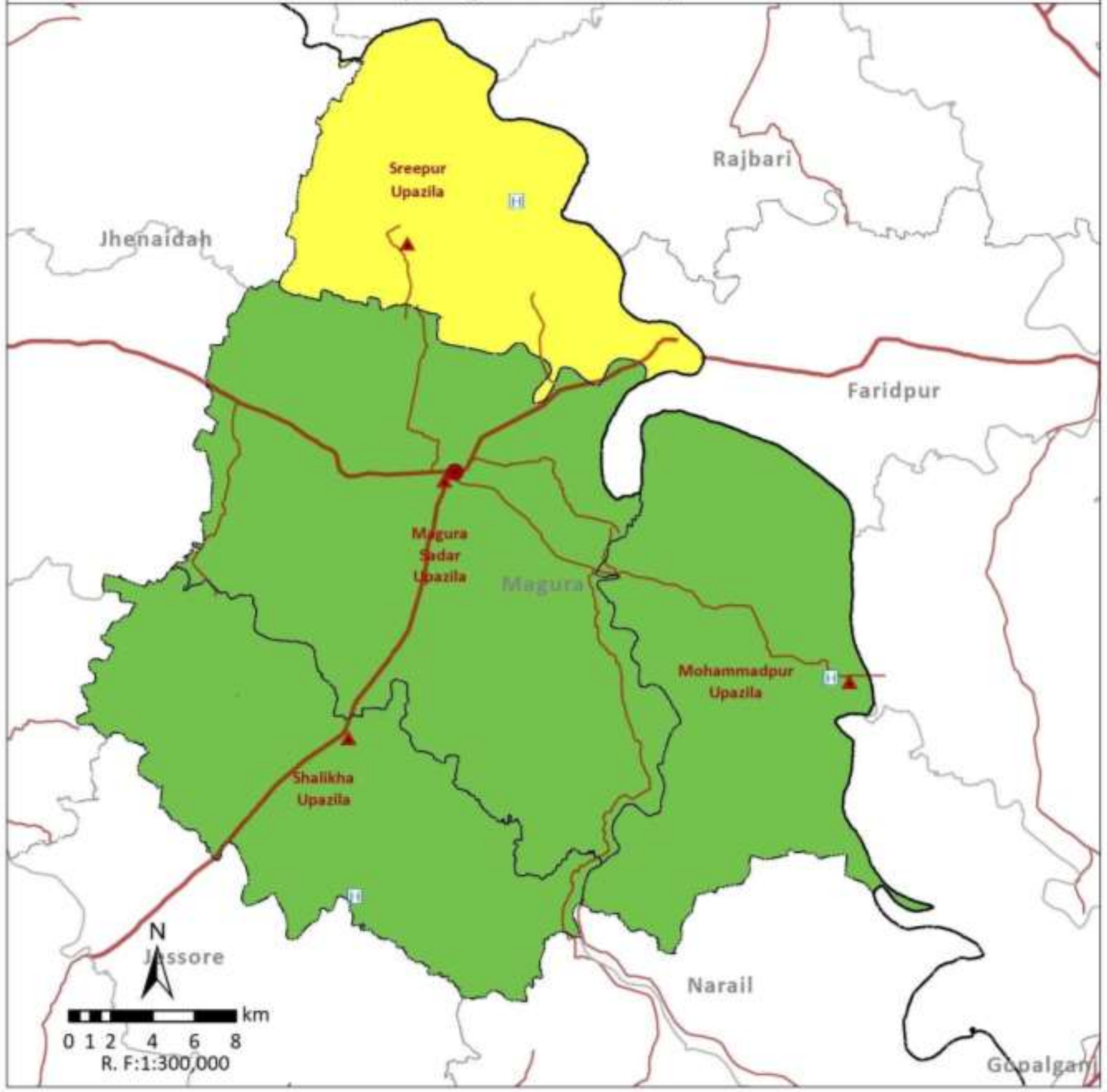
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

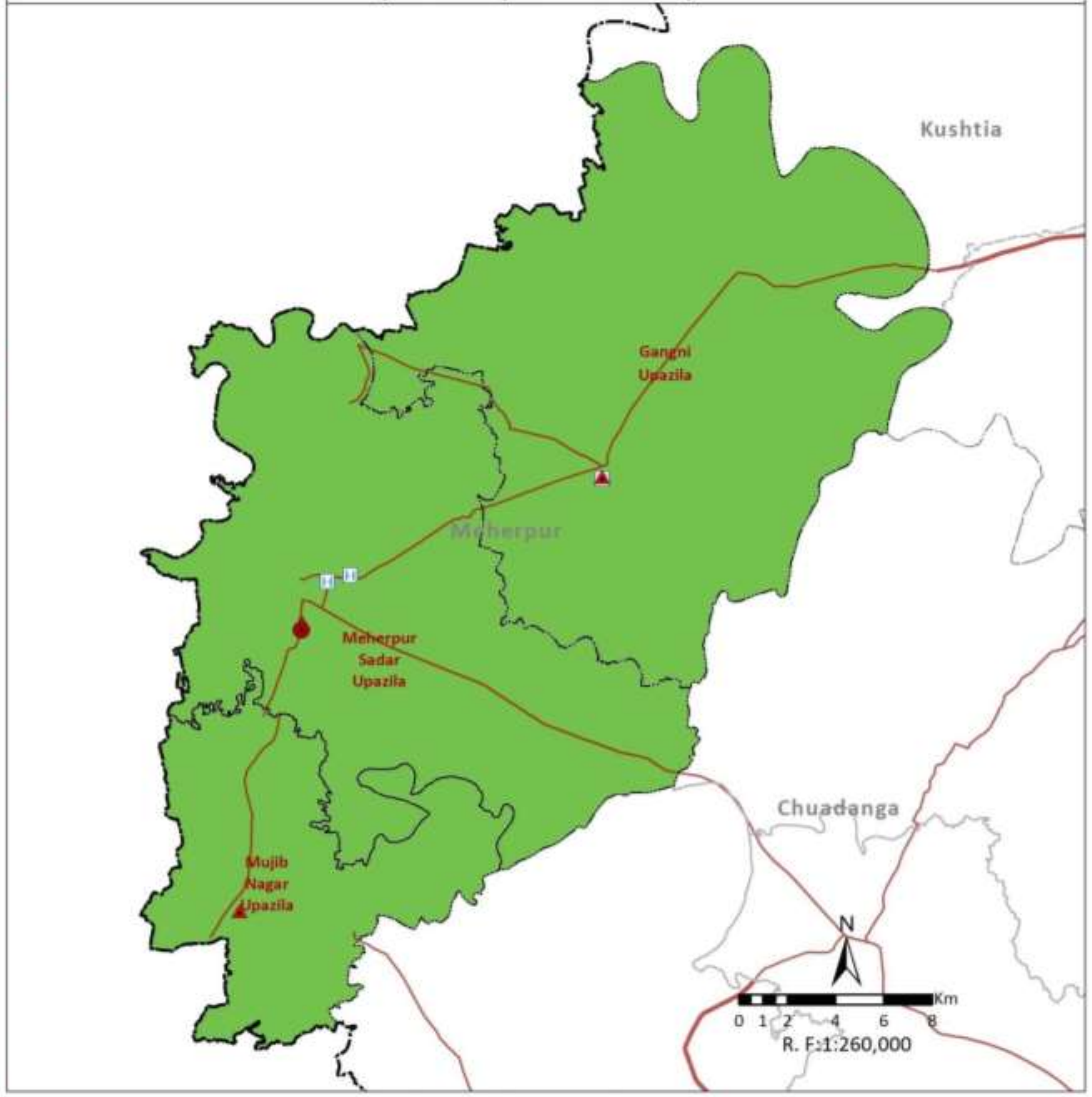
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Magura District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Meherpur District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures
- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

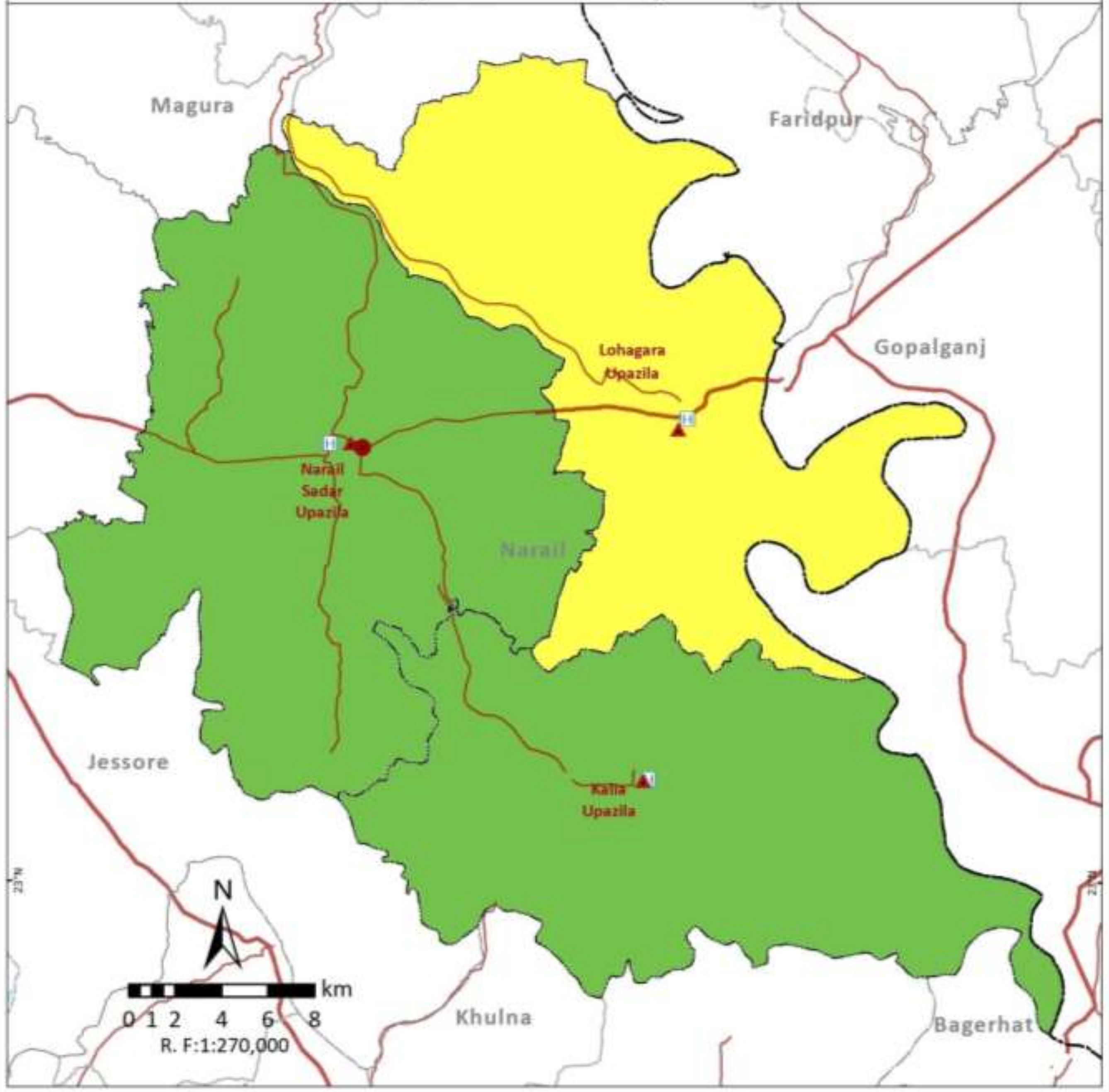
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

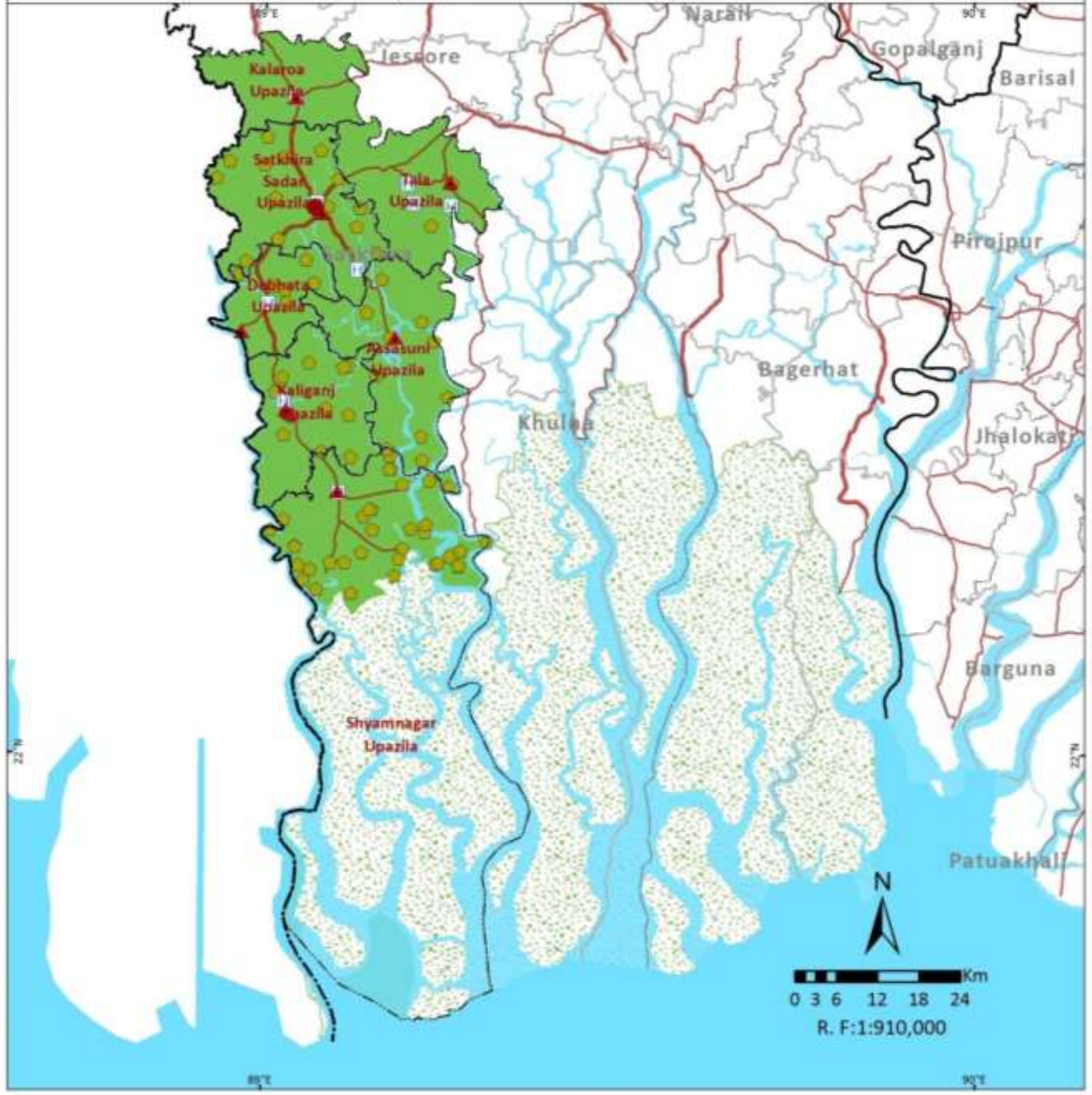
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Narail District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Satkhira District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Mymensingh Division)

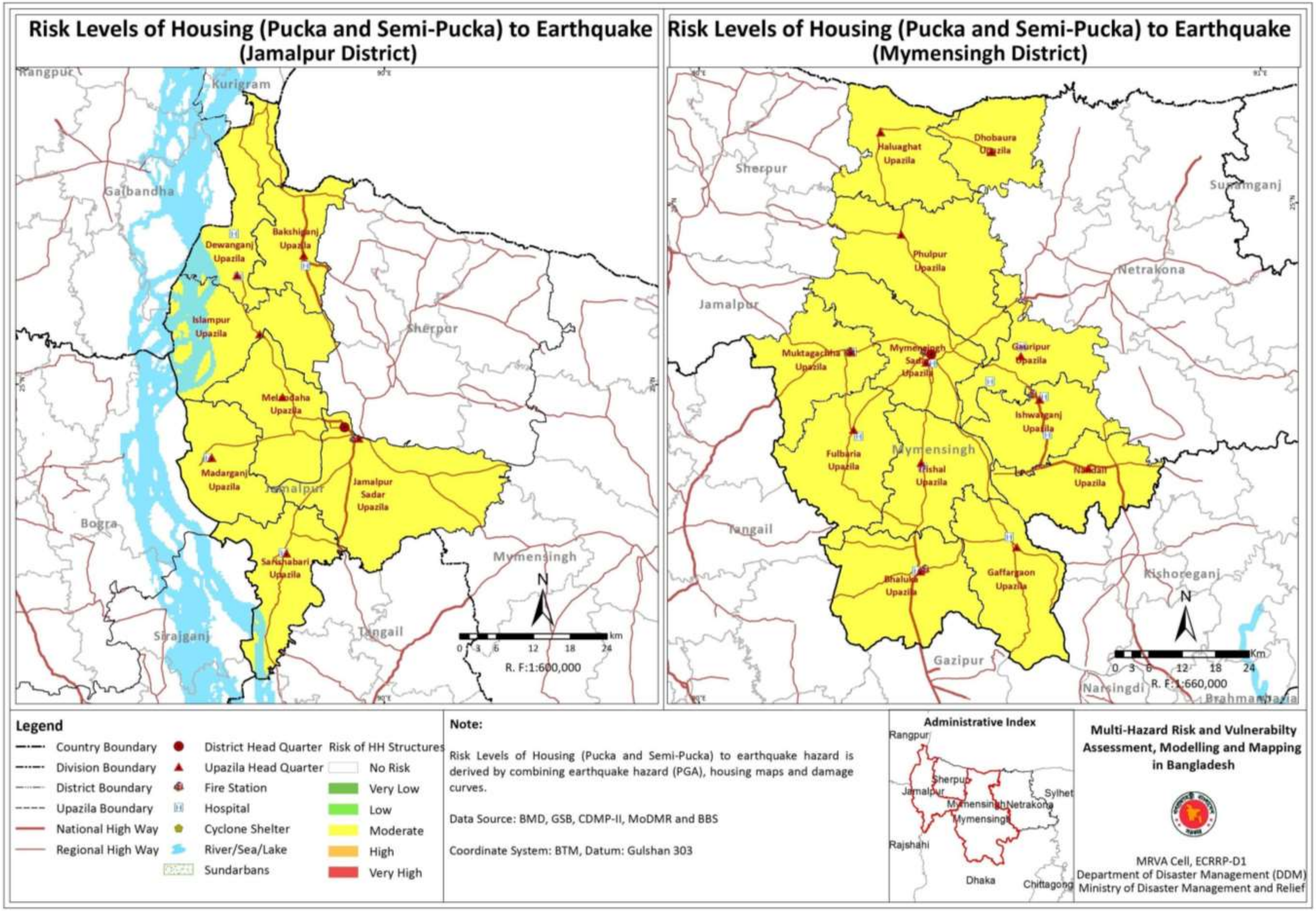
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

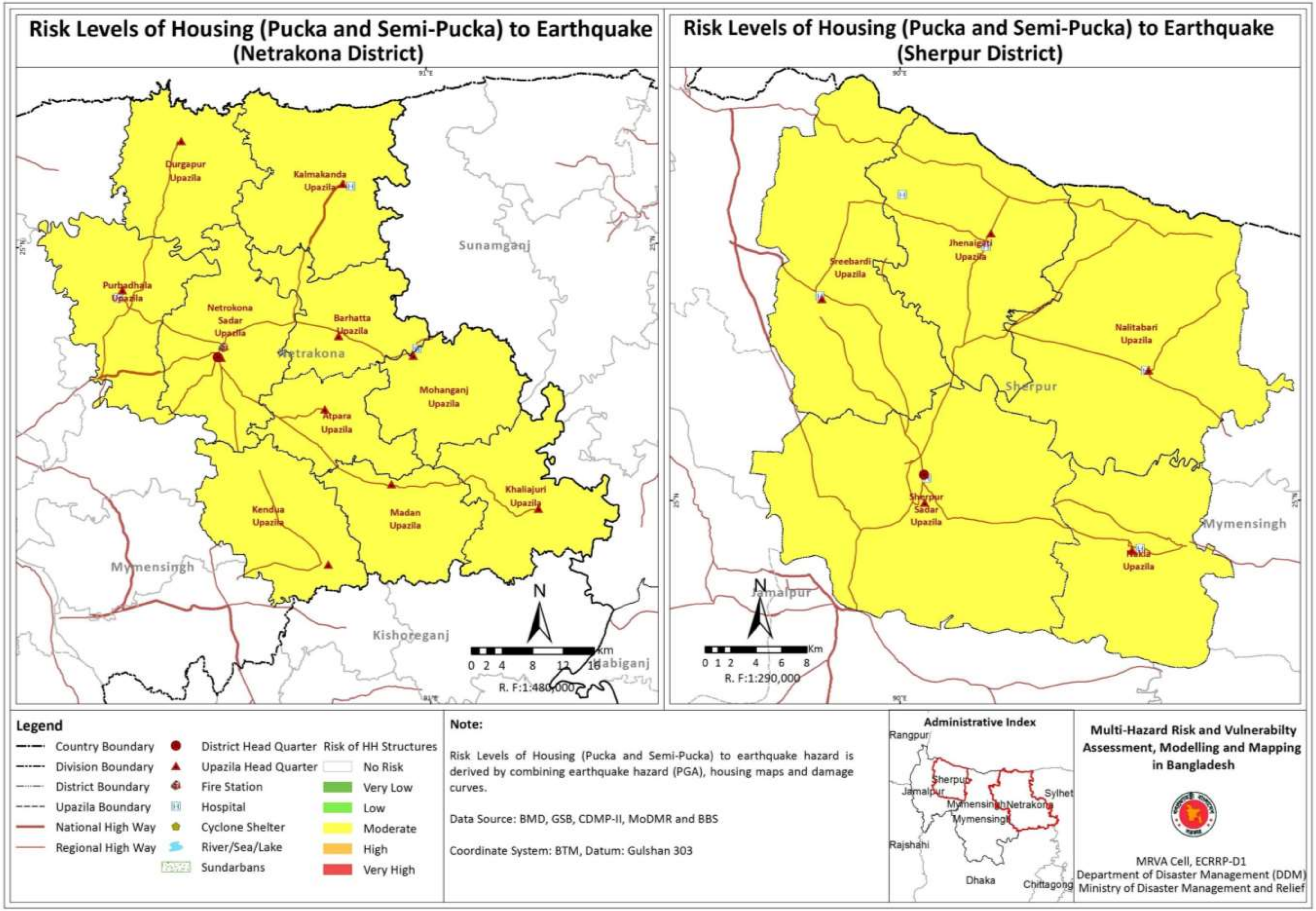
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

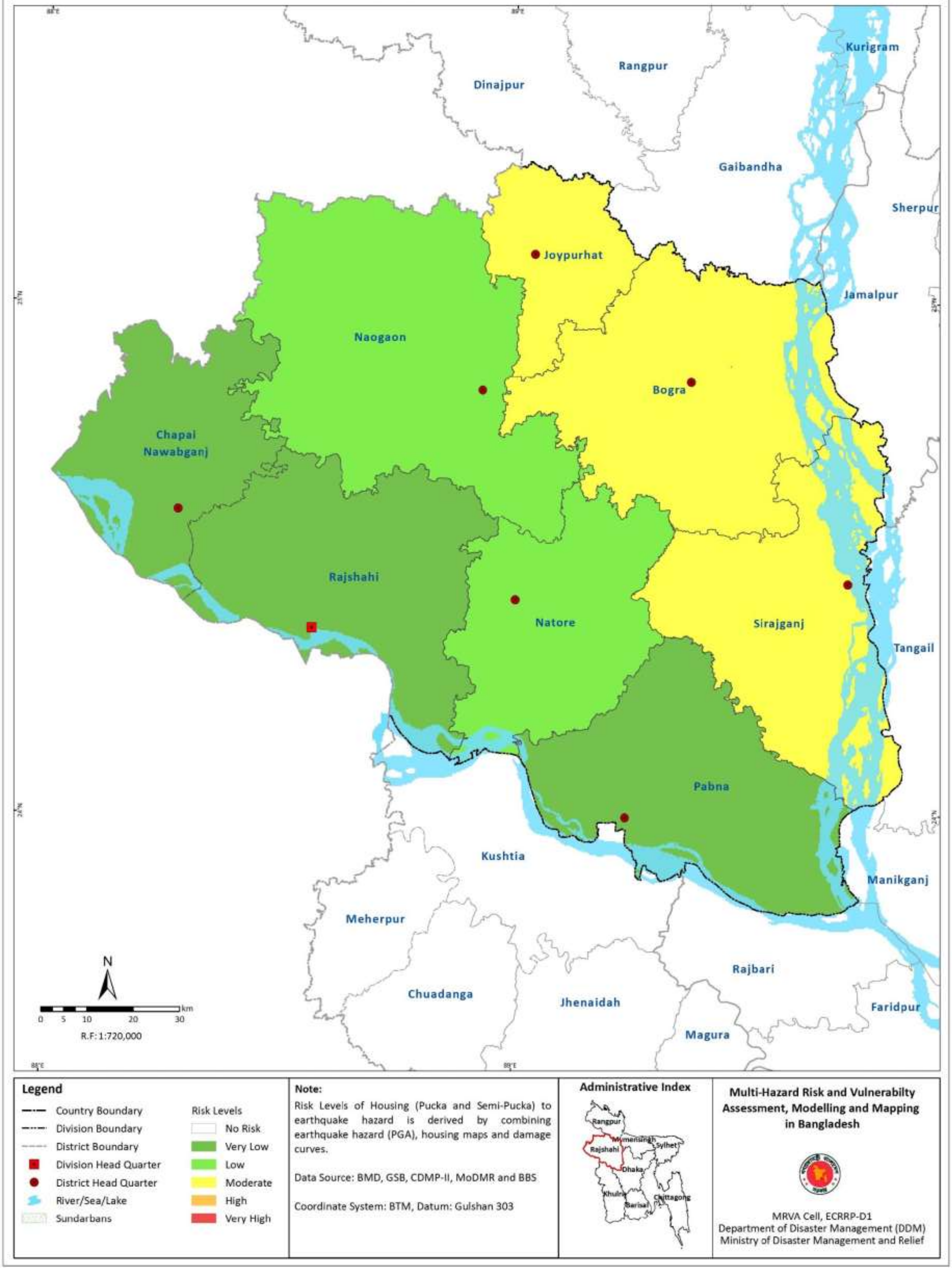
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

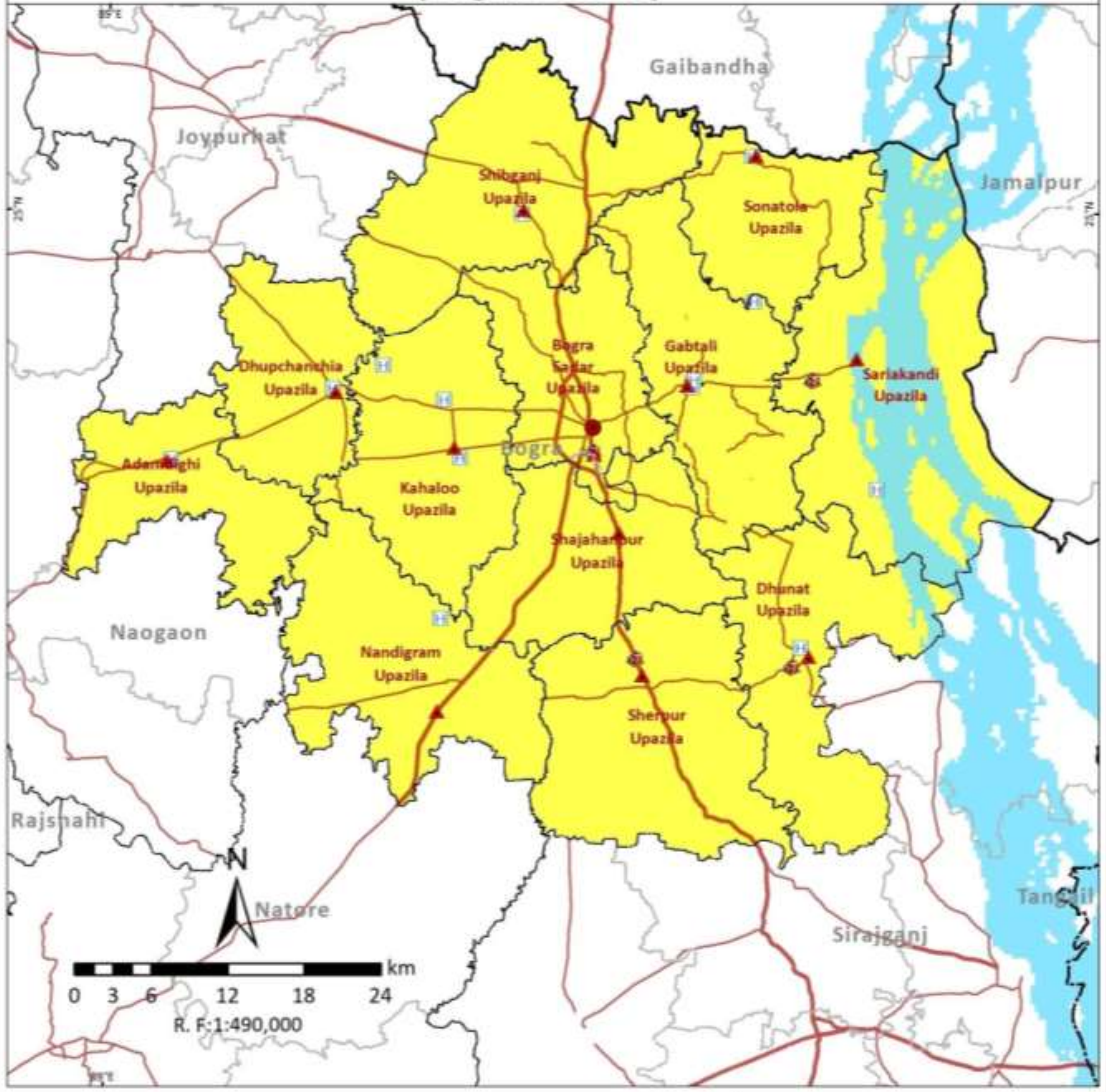

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Jamalpur District)
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Mymensingh District)
Rangpur
Kurigram
Gaibandha
Dewanganj Upazila
Bakshiganj Upazila
Islampur Upazila
Melandaha Upazila
Madarganj Upazila
Jamalpur
Jamalpur Sadar Upazila
Sarishabari Upazila
Sherpur
Bogra
Sirajganj
Tangail
Mymensingh
R. F:1:600,000
0 3 6 12 18 24 km
Haluaghat Upazila
Dhobaura Upazila
Phulpur Upazila
Sunamganj
Netrakona
Muktagachha Upazila
Mymensingh Sadar Upazila
Gauripur Upazila
Ishwarganj Upazila
Fulbaria Upazila
Trishal Upazila
Nandail Upazila
Bhaluka Upazila
Gaffargaon Upazila
Kishoreganj
Gazipur
Narsingdi
Brahmanbaria
R. F:1:660,000
0 3 6 12 18 24 Km
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sherpur
Jamalpur
Mymensingh
Netrakona
Sylhet
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Netrakona District)
Durgapur Upazila
Kalmakanda Upazila
Sunamganj
Purbadhala Upazila
Netrokona Sadar Upazila
Barhatta Upazila
Netrakona
Mohanganj Upazila
Atpara Upazila
Khaliajuri Upazila
Kendua Upazila
Madan Upazila
Mymensingh
Kishoreganj
Habiganj
N
0 2 4 8 12 16 km
R. F:1:480,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Sherpur District)
Sreebardi Upazila
Jhenaigati Upazila
Nalitabari Upazila
Sherpur
Sherpur Sadar Upazila
Nakla Upazila
Mymensingh
Jamalpur
N
0 1 2 4 6 8 Km
R. F:1:290,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sherpur
Jamalpur
Mymensingh
Netrakona
Sylhet
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

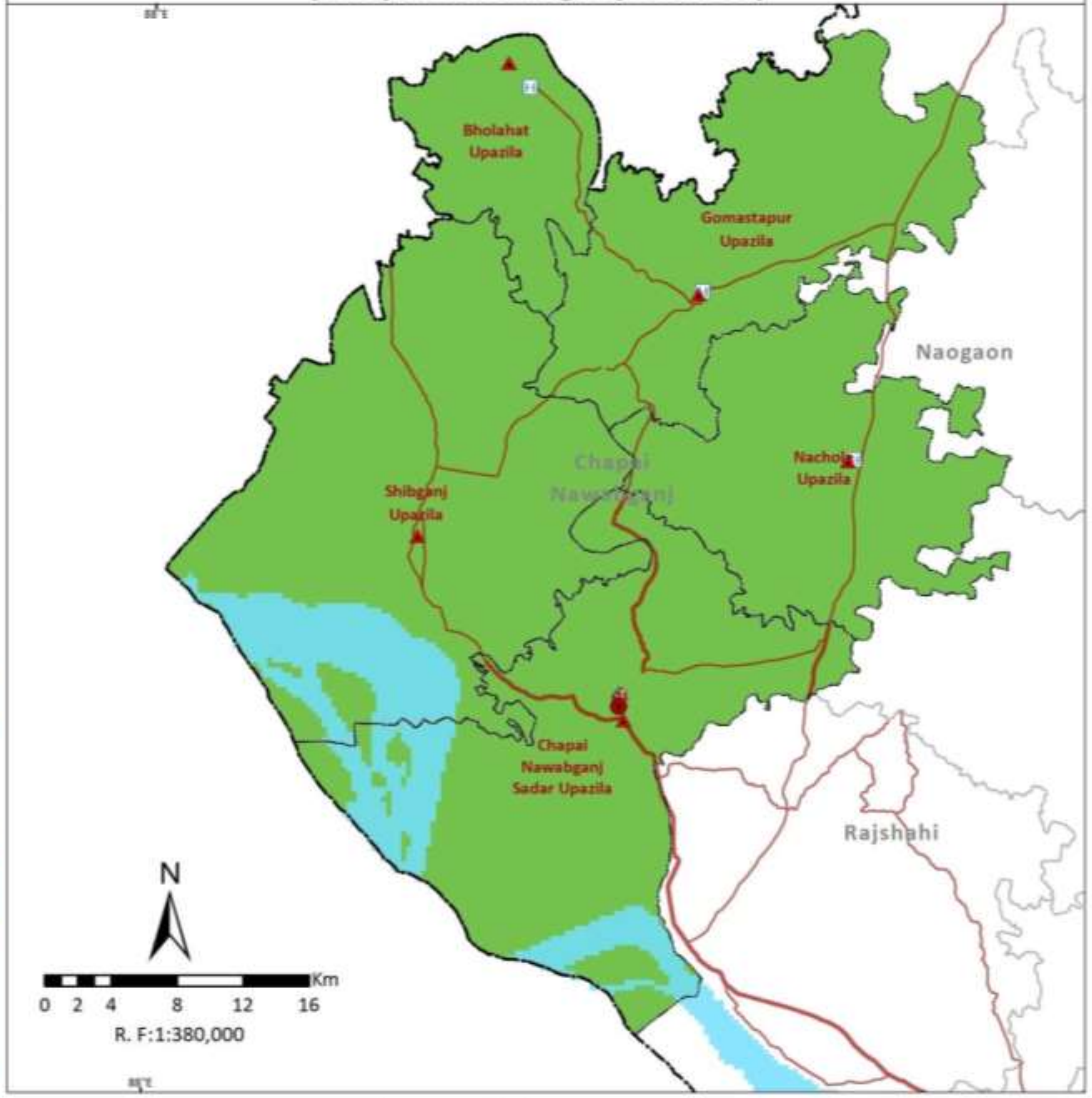
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Rajshahi Division)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Bogra District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Chapai Nawabganj District)



Legend

—·—	Country Boundary	●	District Head Quarter	Risk of HH Structures	
—··—	Division Boundary	▲	Upazila Head Quarter		No Risk
——	District Boundary		Fire Station		Very Low
- - -	Upazila Boundary		Hospital		Low
——	National High Way		Cyclone Shelter		Moderate
——	Regional High Way		River/Sea/Lake		High
			Sundarbans		Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

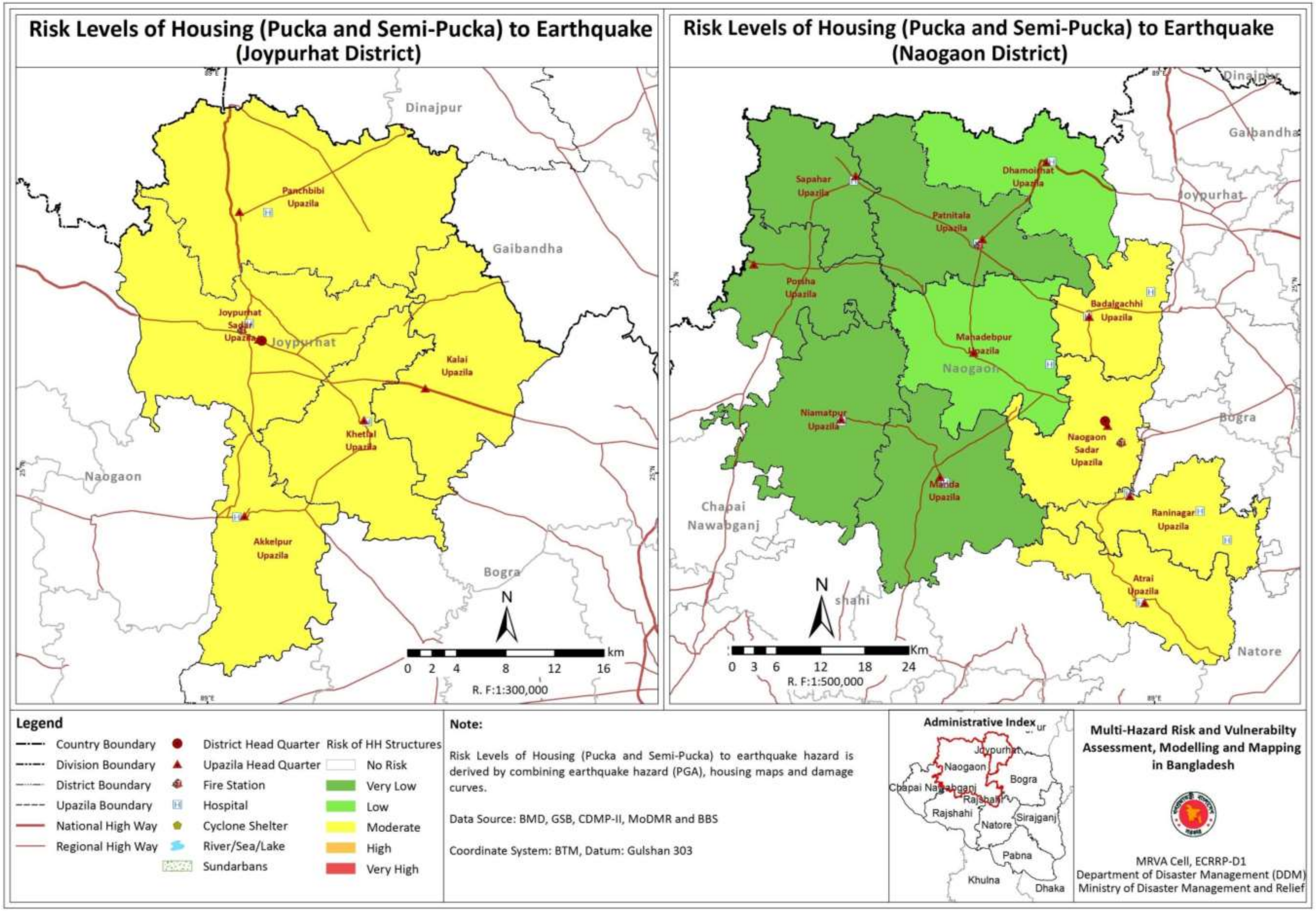
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

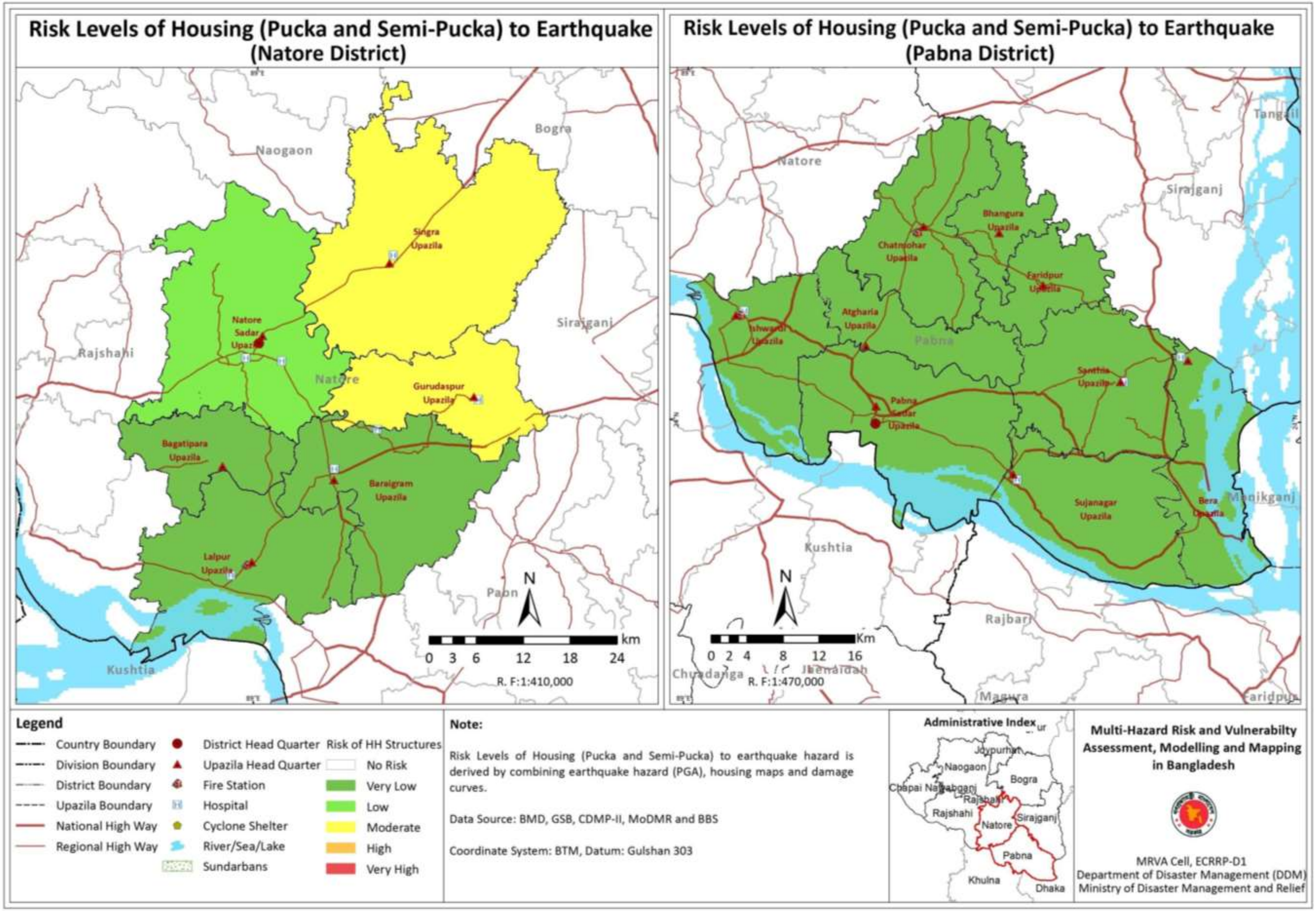
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

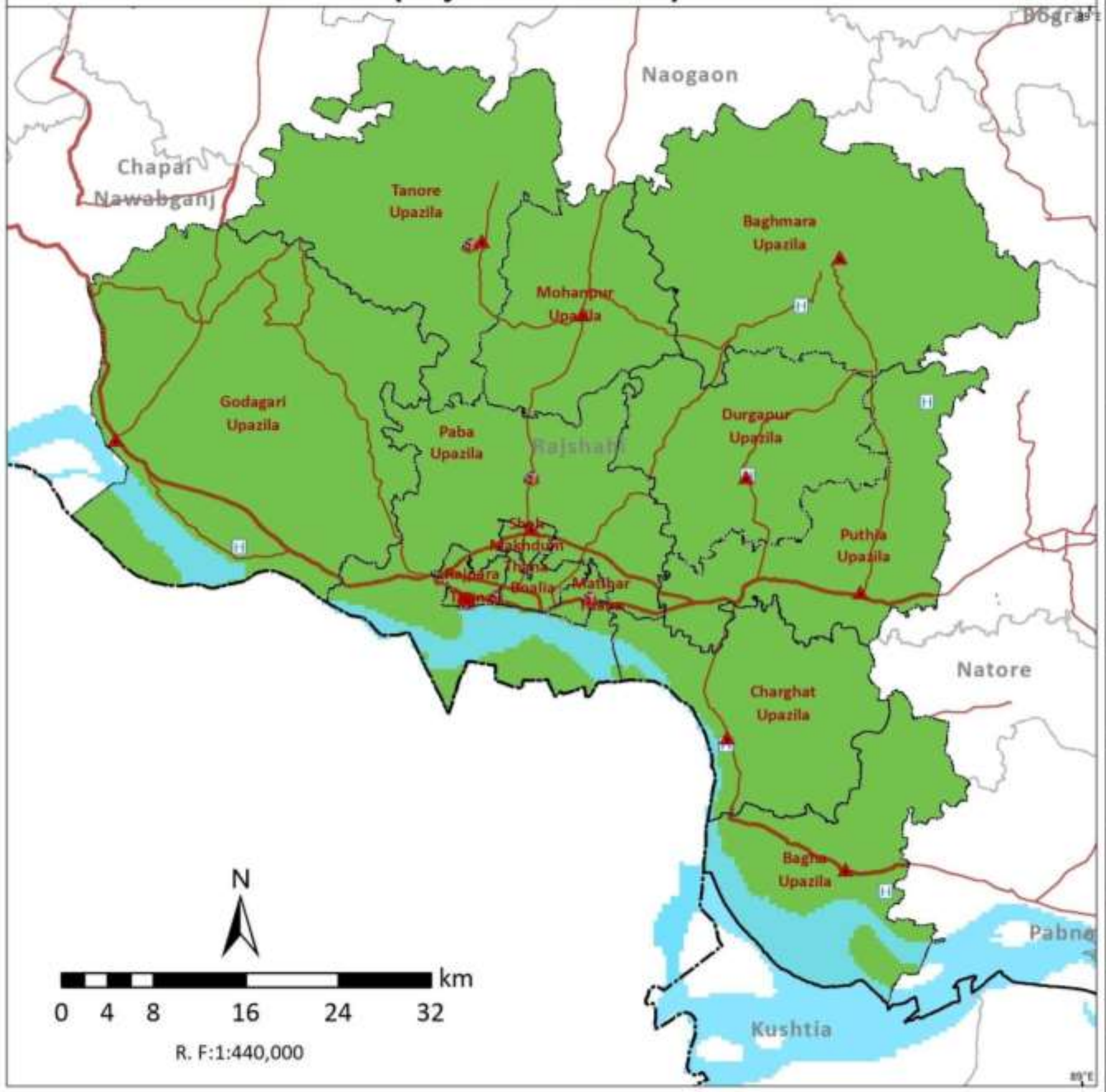
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

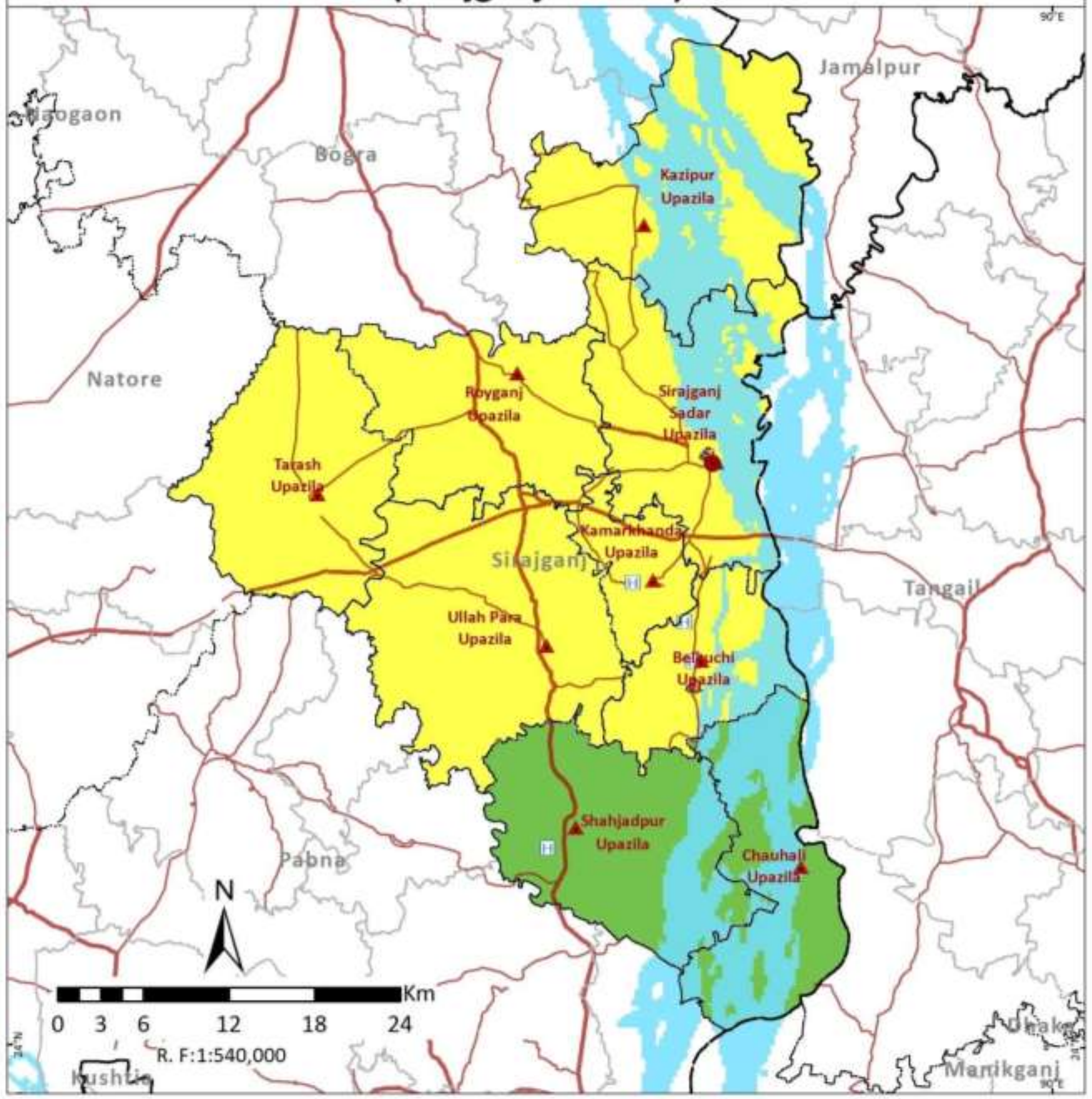

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Joypurhat District)
Dinajpur
Gaibandha
Panchbibi Upazila
Joypurhat Sadar Upazila
Joypurhat
Kalai Upazila
Khetlal Upazila
Akkelpur Upazila
Naogaon
Bogra
N
0 2 4 8 12 16 km
R. F:1:300,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Naogaon District)
Dinajpur
Gaibandha
Joypurhat
Sapahar Upazila
Dhamoirhat Upazila
Patnitala Upazila
Porsha Upazila
Badalgachhi Upazila
Mahadebpur Upazila
Naogaon
Bogra
Niamatpur Upazila
Naogaon Sadar Upazila
Manda Upazila
Raninagar Upazila
Atrai Upazila
Chapai Nawabganj
Natore
N
0 3 6 12 18 24 Km
R. F:1:500,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Natore District)
Naogaon
Bogra
Rajshahi
Sirajganj
Natore
Singra Upazila
Natore Sadar Upazila
Gurudaspur Upazila
Bagatipara Upazila
Baraigram Upazila
Lalpur Upazila
Pabna
Kushtia
N
0 3 6 12 18 24 km
R. F:1:410,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Pabna District)
Tangail
Natore
Sirajganj
Bhangura Upazila
Chatmohar Upazila
Faridpur Upazila
Atgharia Upazila
Ishwardi Upazila
Pabna
Santhia Upazila
Pabna Sadar Upazila
Sujanagar Upazila
Bera Upazila
Manikganj
Kushtia
Rajbari
Chuadanga
Jhenaidah
Magura
Faridpur
N
0 2 4 8 12 16 Km
R. F:1:470,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nababganj
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Rajshahi District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Sirajganj District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- Division Head Quarter
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Rangpur Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk Levels: No Risk, Very Low, Low, Moderate, High, Very High

Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

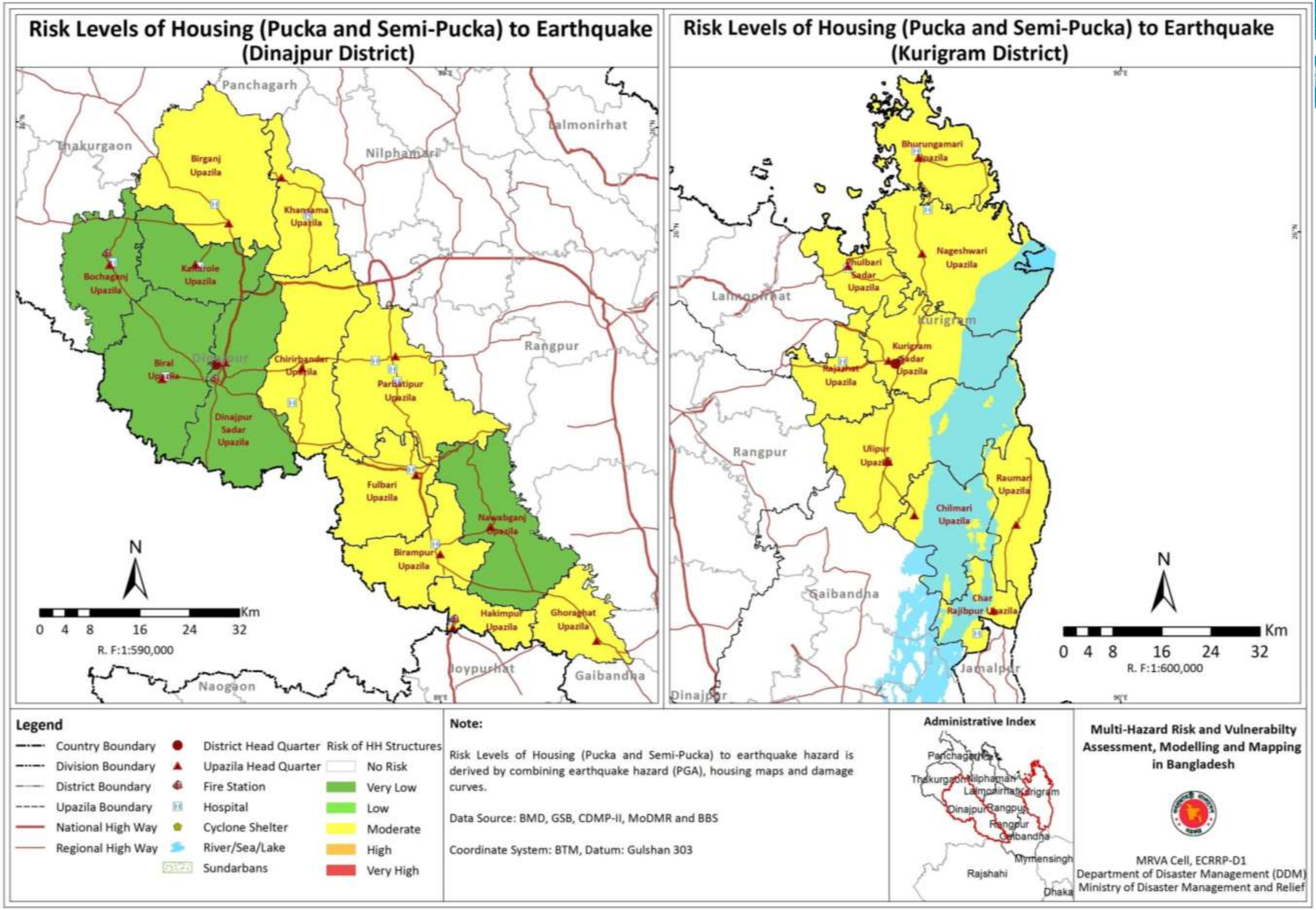
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

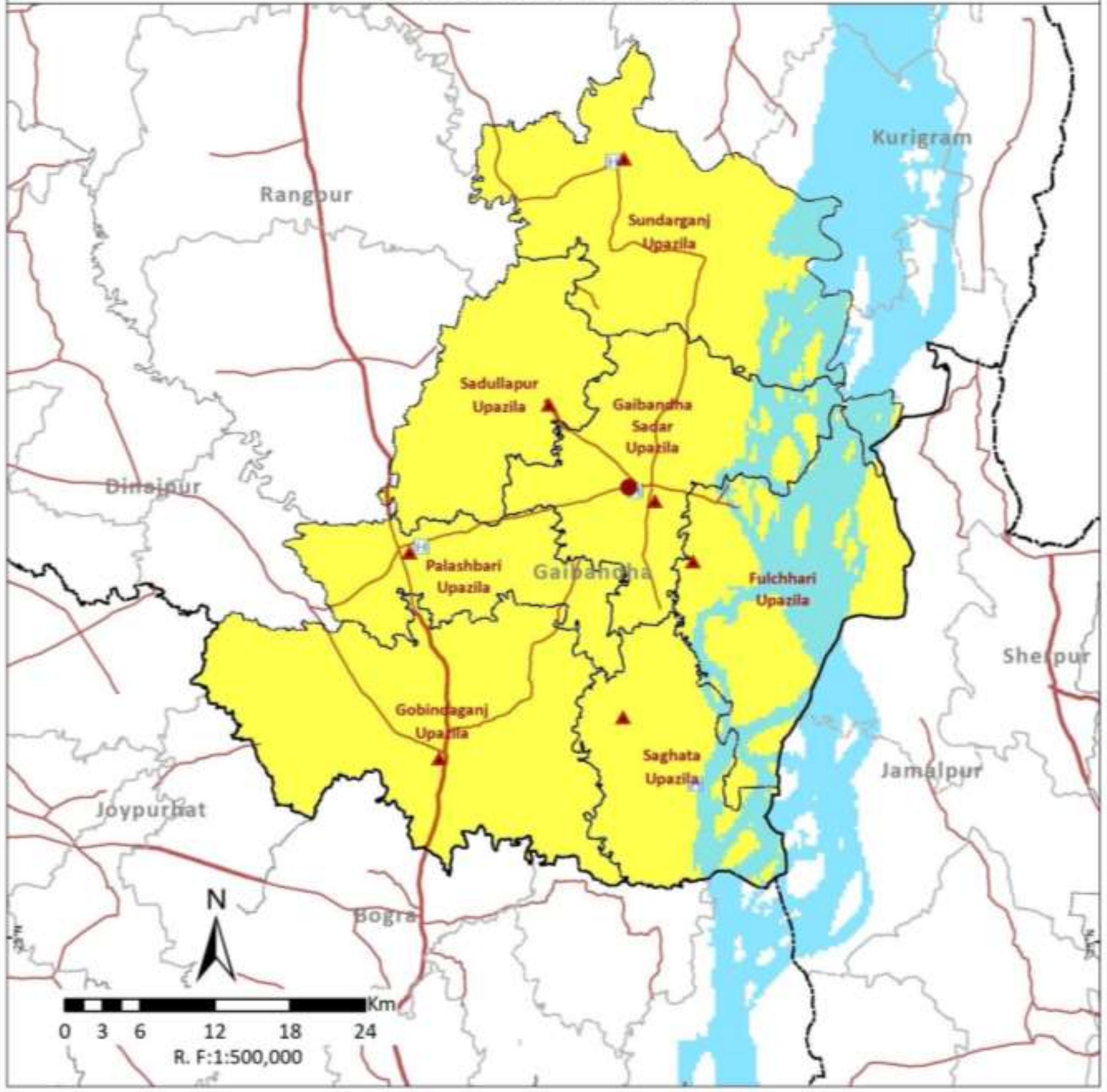
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

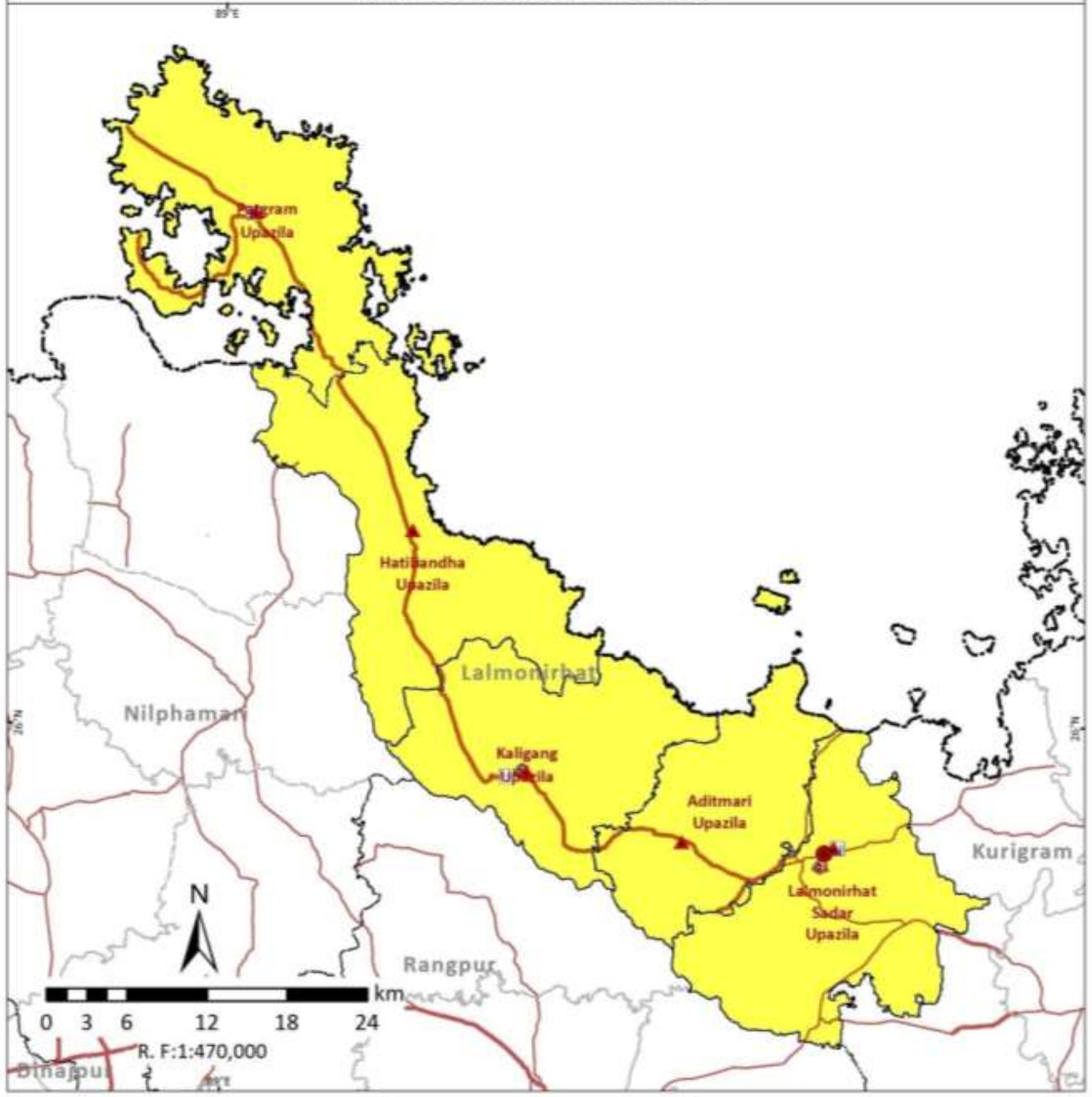
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Dinajpur District)
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Kurigram District)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Rangpur
Gaibandha
Joypurhat
Naogaon
Birganj Upazila
Khansama Upazila
Bochaganj Upazila
Kaharole Upazila
Biral Upazila
Dinajpur Sadar Upazila
Chirirbander Upazila
Parbatipur Upazila
Fulbari Upazila
Nawabganj Upazila
Birampur Upazila
Hakimpur Upazila
Ghoraghat Upazila
Bhurungamari Upazila
Nageshwari Upazila
Phulbari Sadar Upazila
Kurigram Sadar Upazila
Rajarhat Upazila
Ulipur Upazila
Chilmari Upazila
Raumari Upazila
Char Rajibpur Upazila
Jamalpur
N
0 4 8 16 24 32 Km
R. F:1:590,000
R. F:1:600,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rajshahi
Mymensingh
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Gaibandha District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Lalmonirhat District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

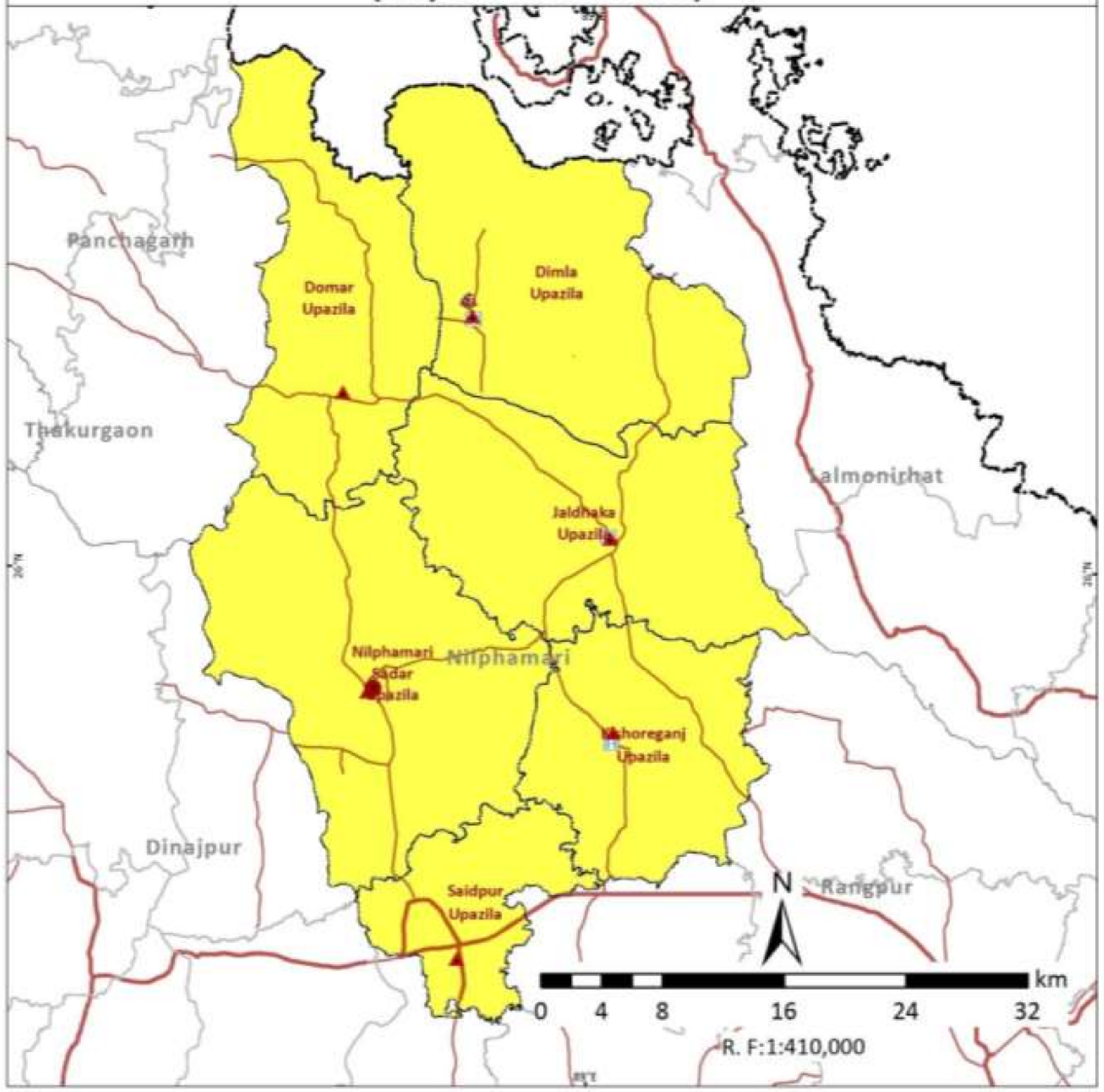
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

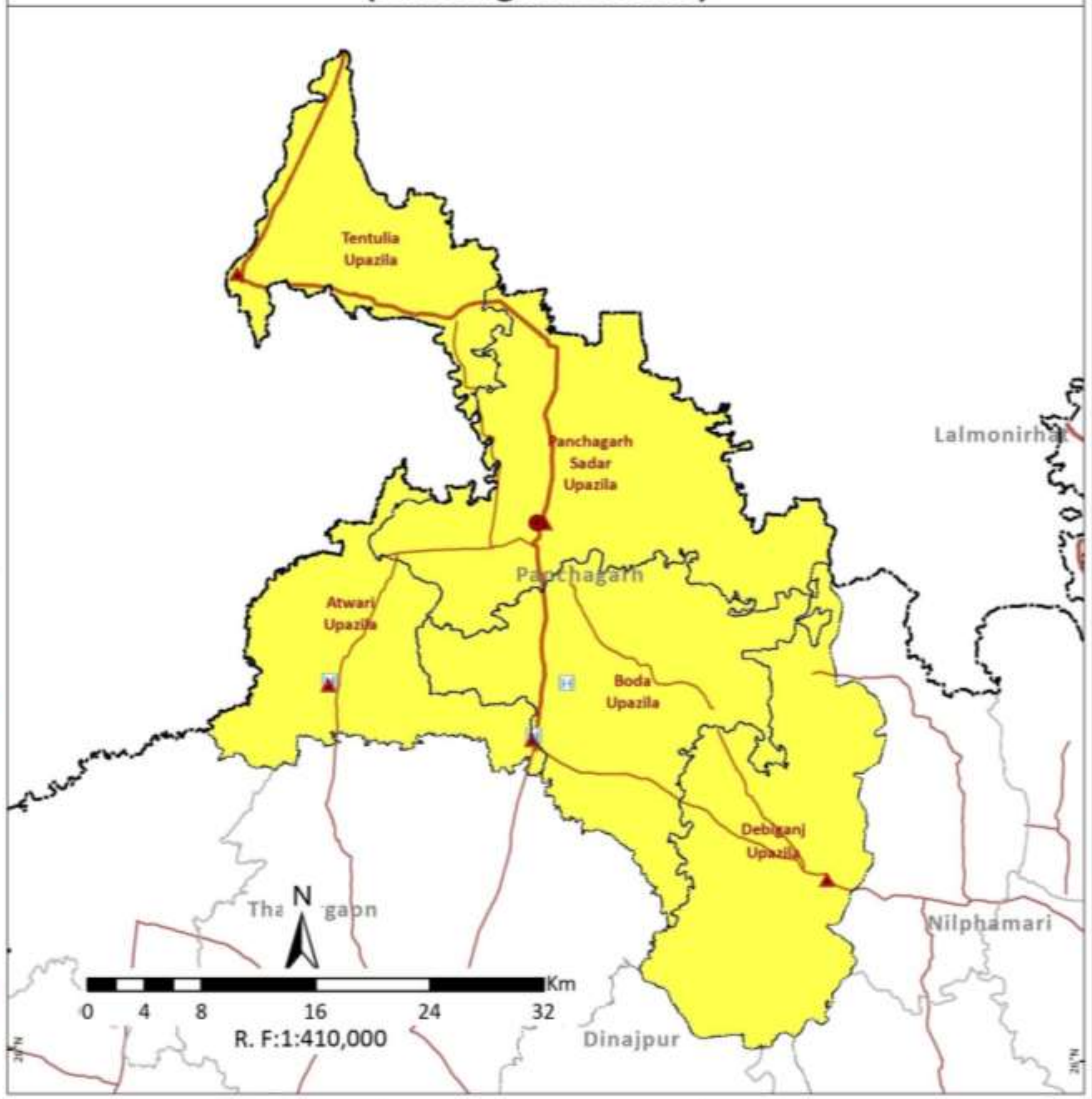
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Nilphamari District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Panchagarh District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

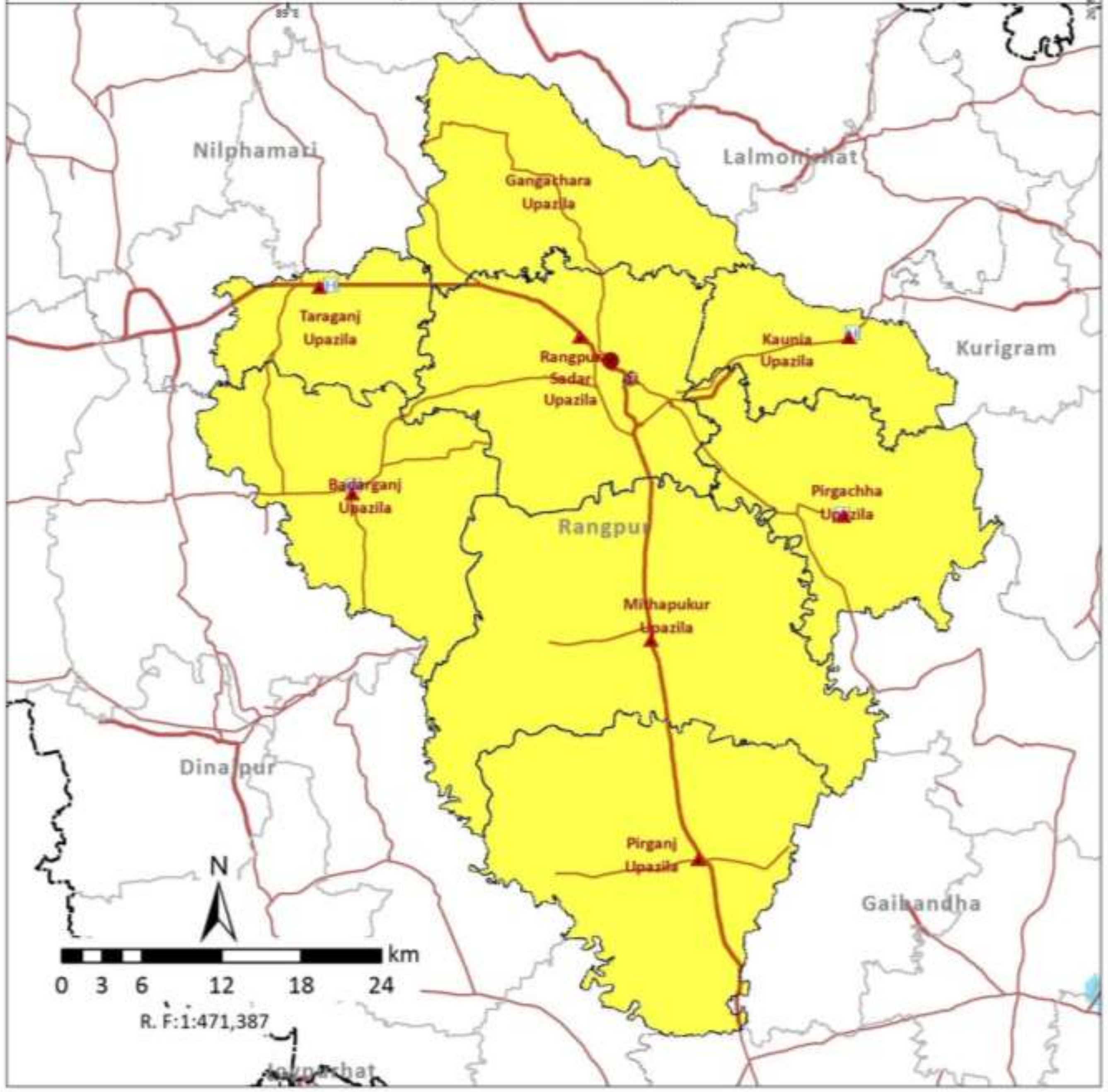
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

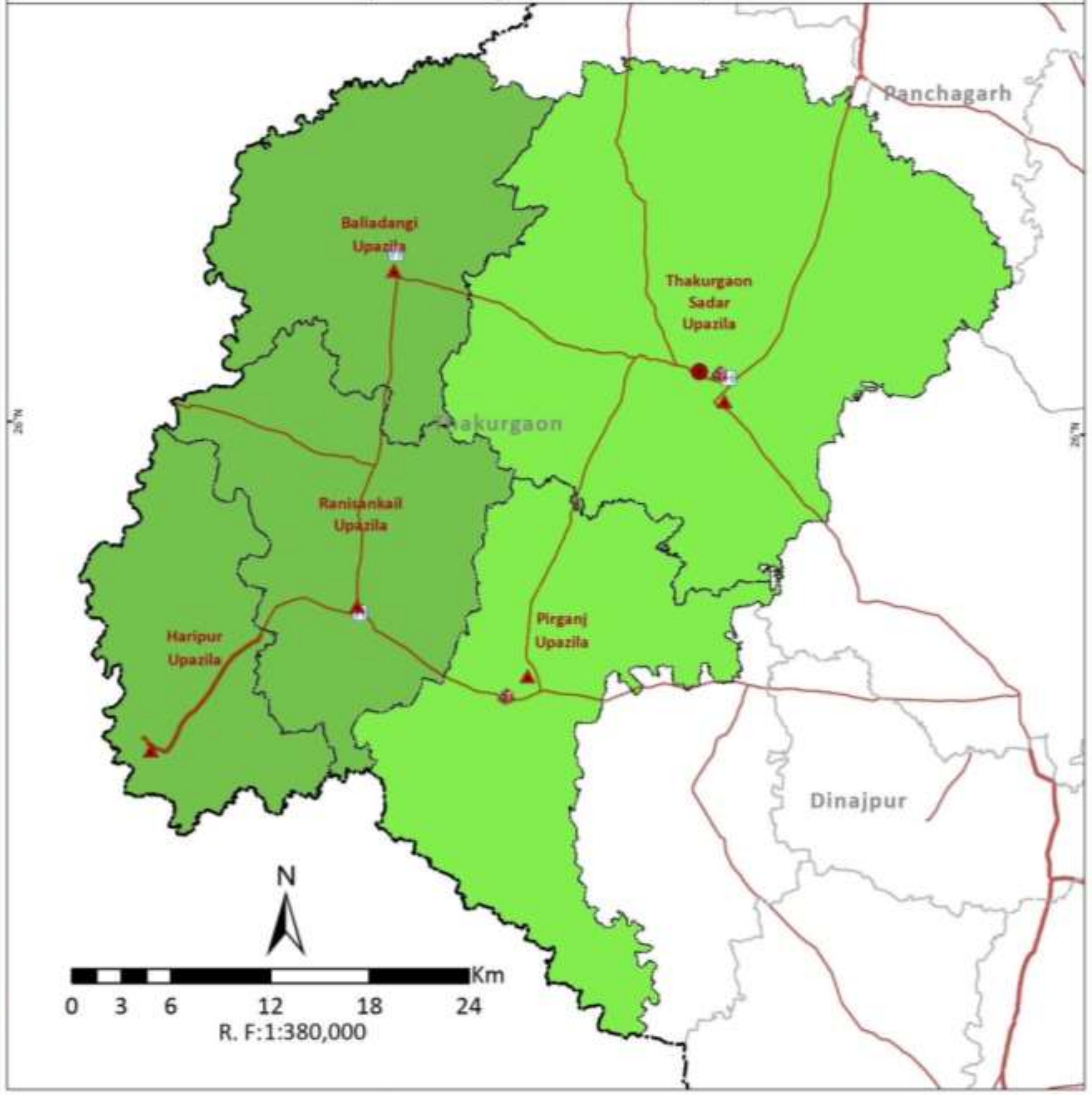
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Rangpur District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Thakurgaon District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Flood inundation map is developed using the MIKE11 Hydrodynamic modeling.

Flood depth categories are adopted from Master Planning Organization (1986). The exposure of population to flood is derived by combining flood depth map and population at upazila level and overall level of exposure at district level is derived.

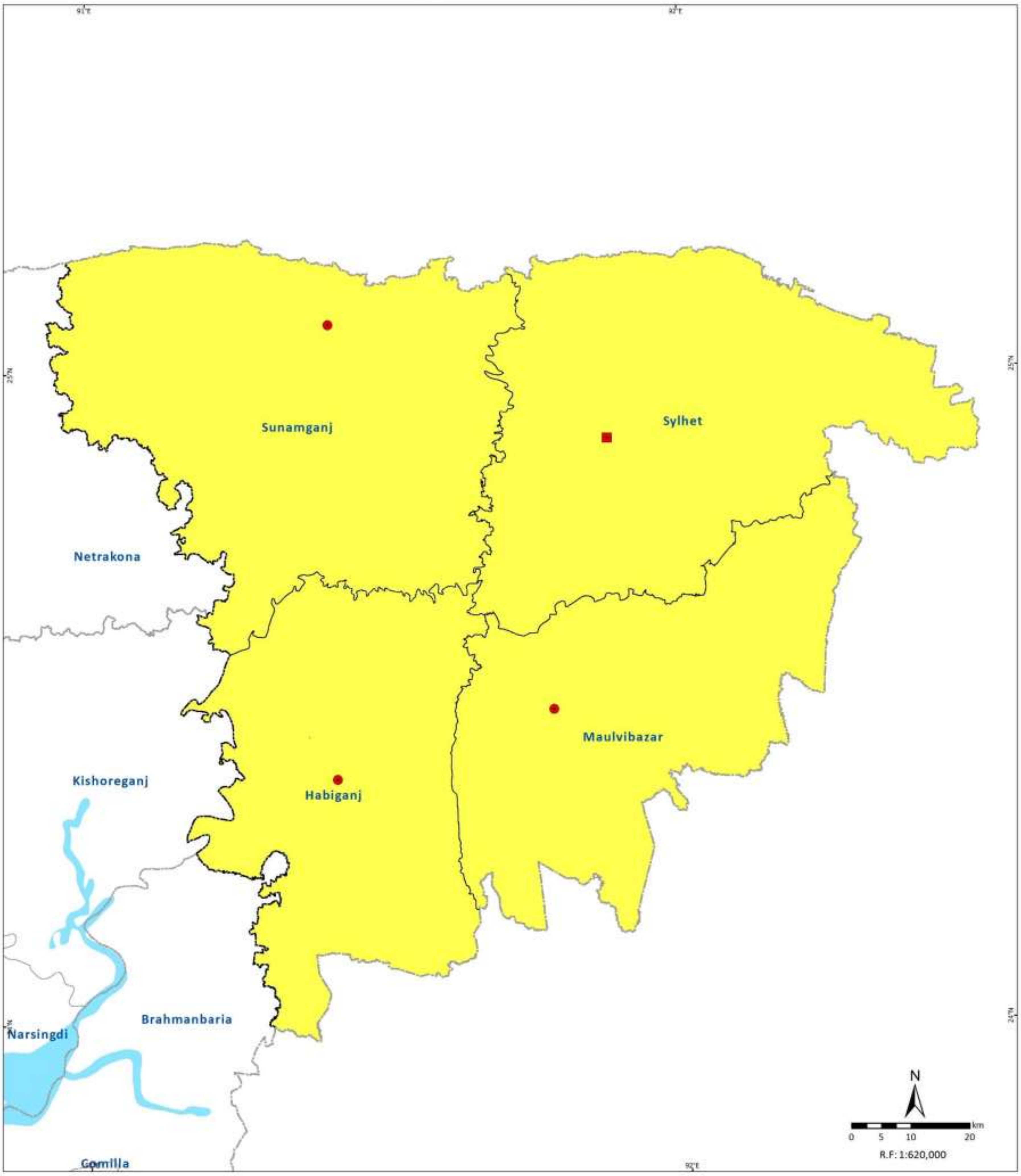
Data Source: BWDB, WARPO, CDMP, DGHS, FSCD and LGED.
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake
(Sylhet Division)



Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

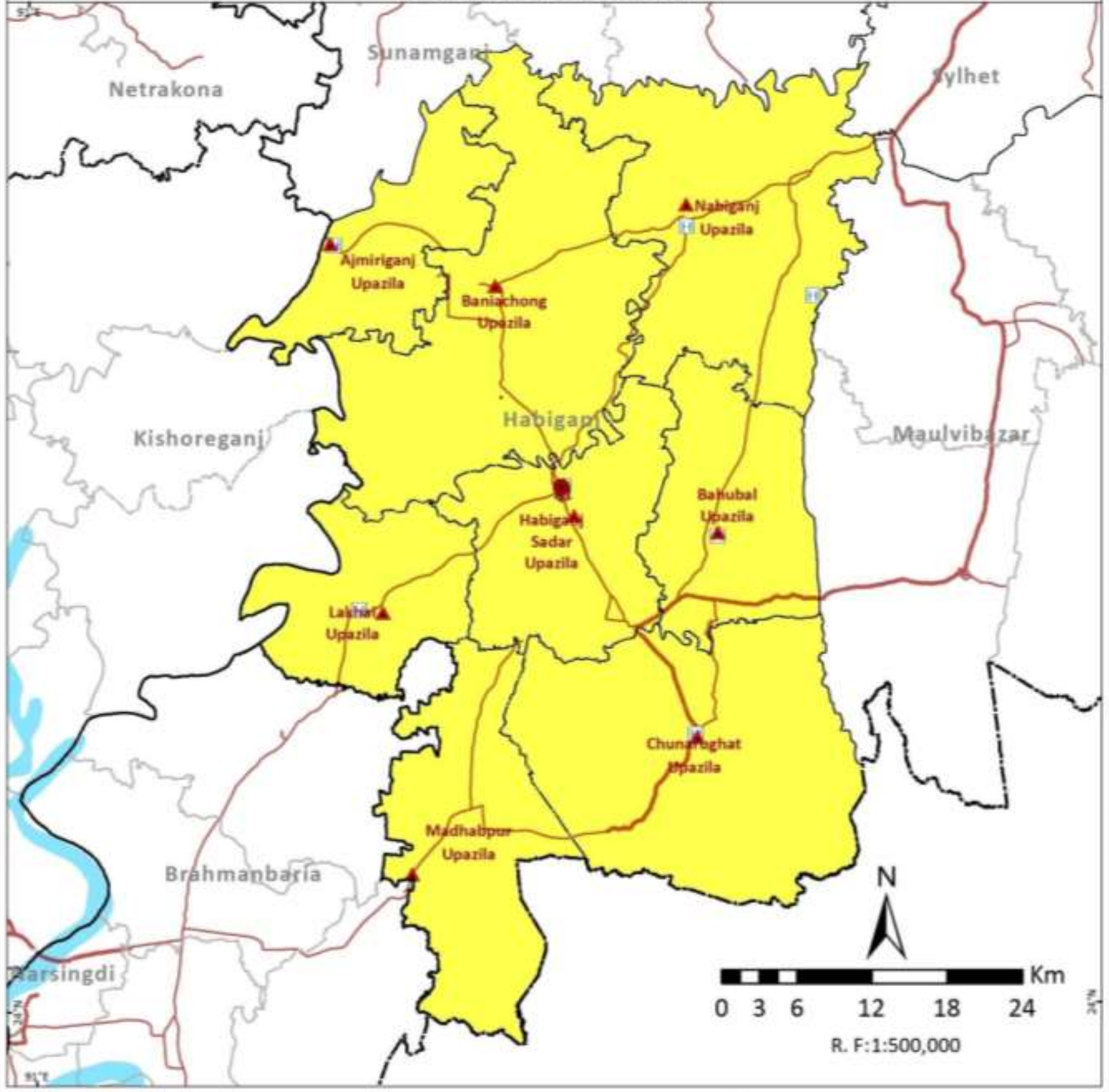
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

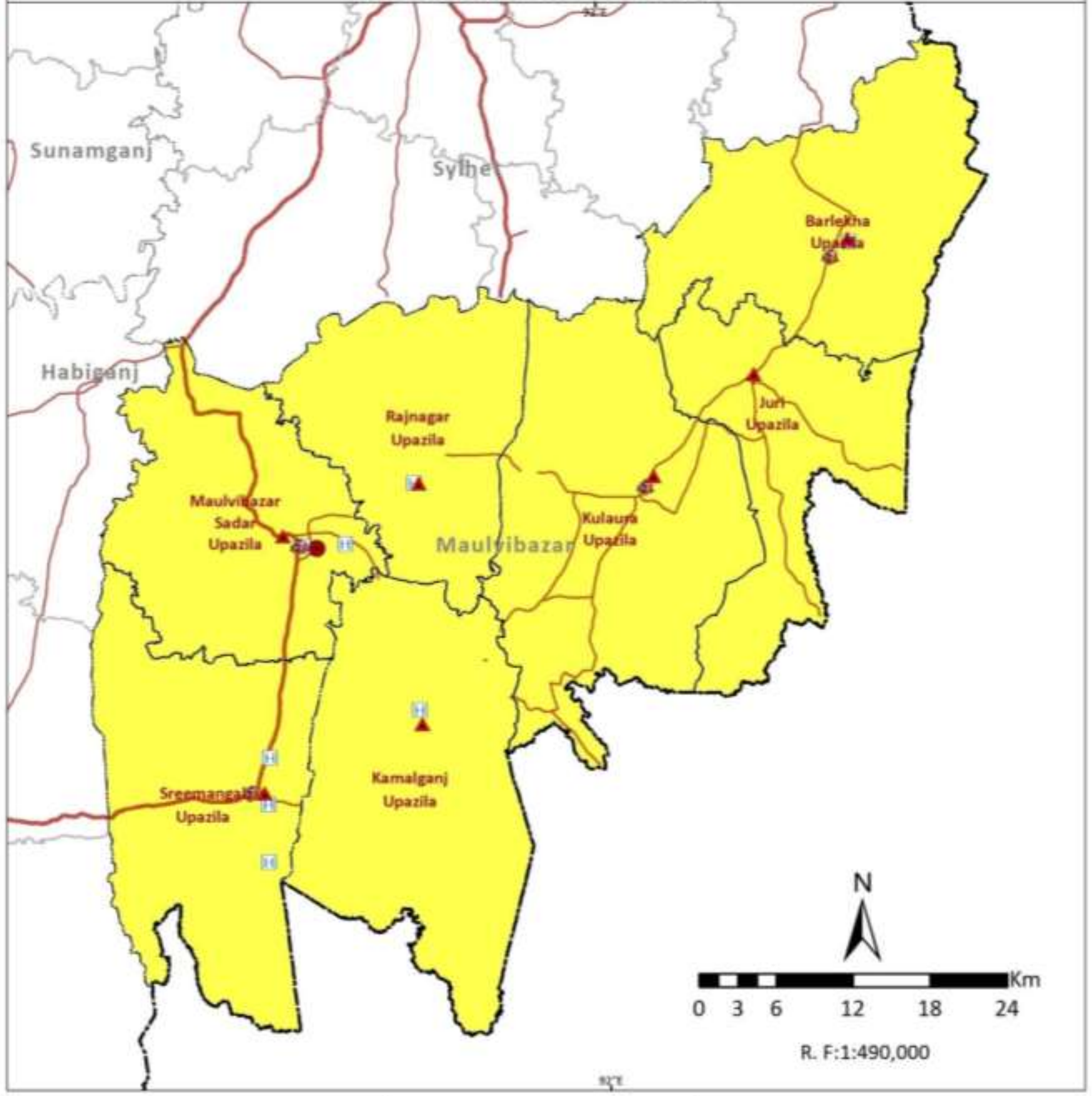
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Habiganj District)



Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Maulvibazar District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

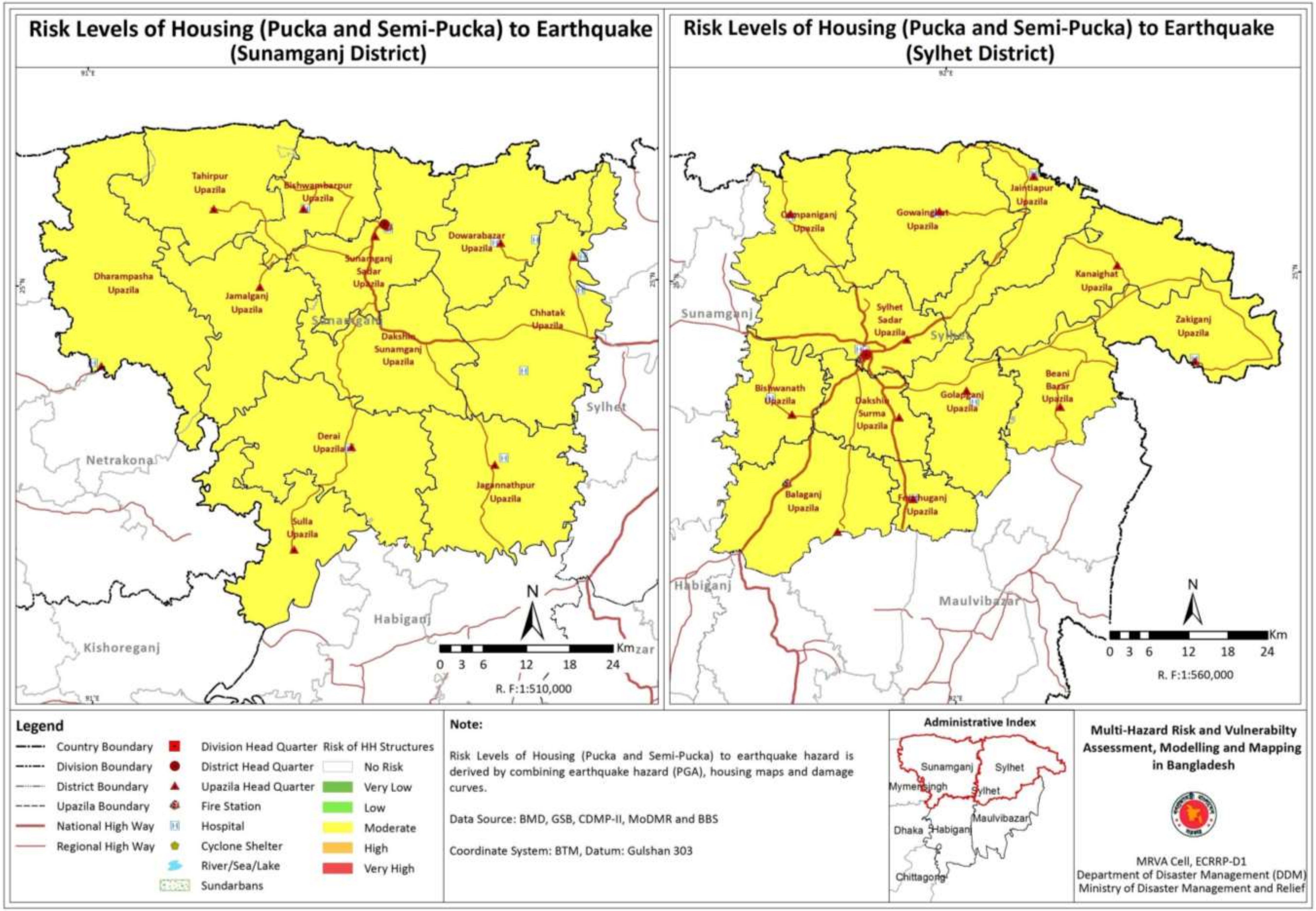
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

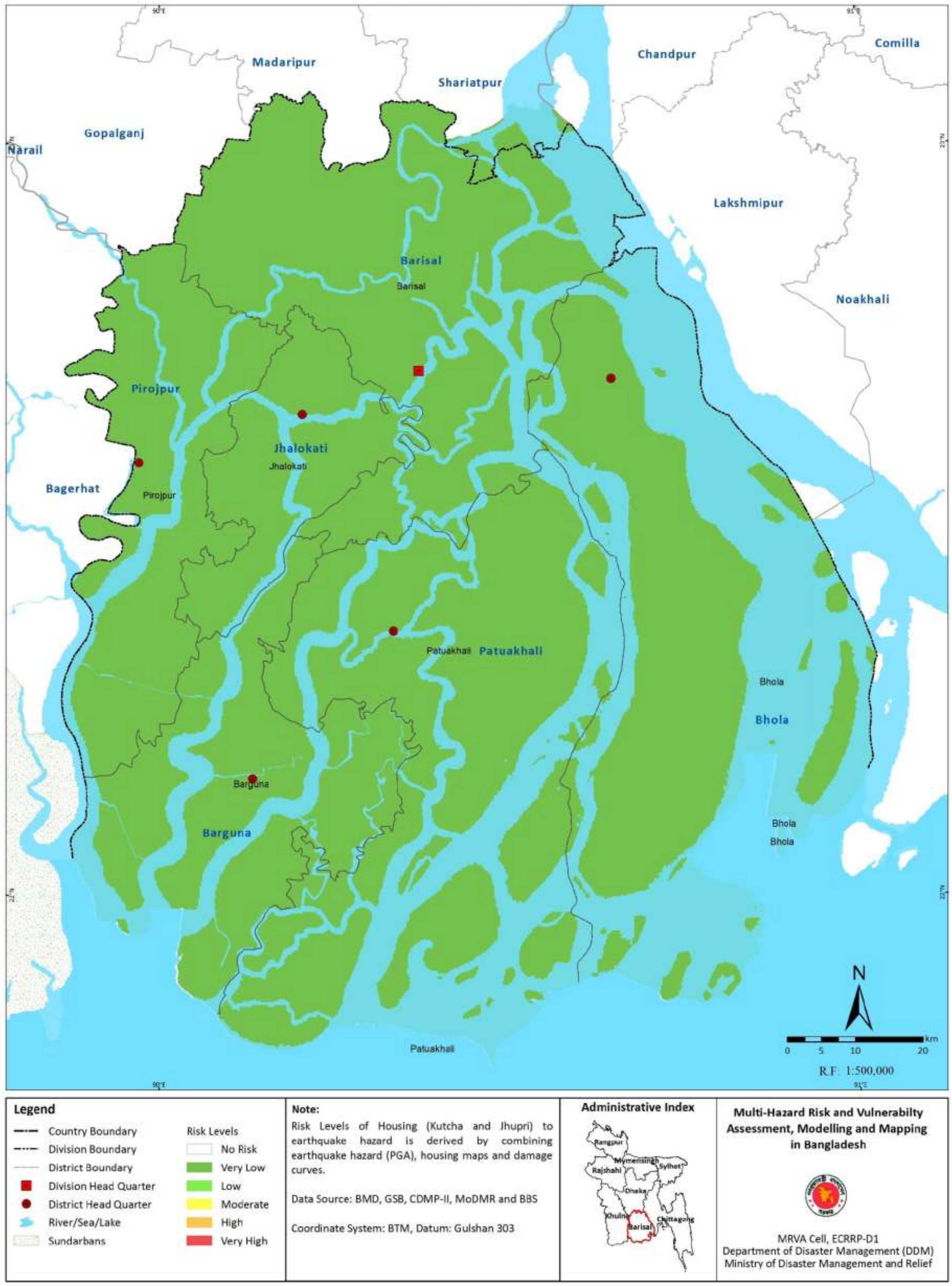
Administrative Index

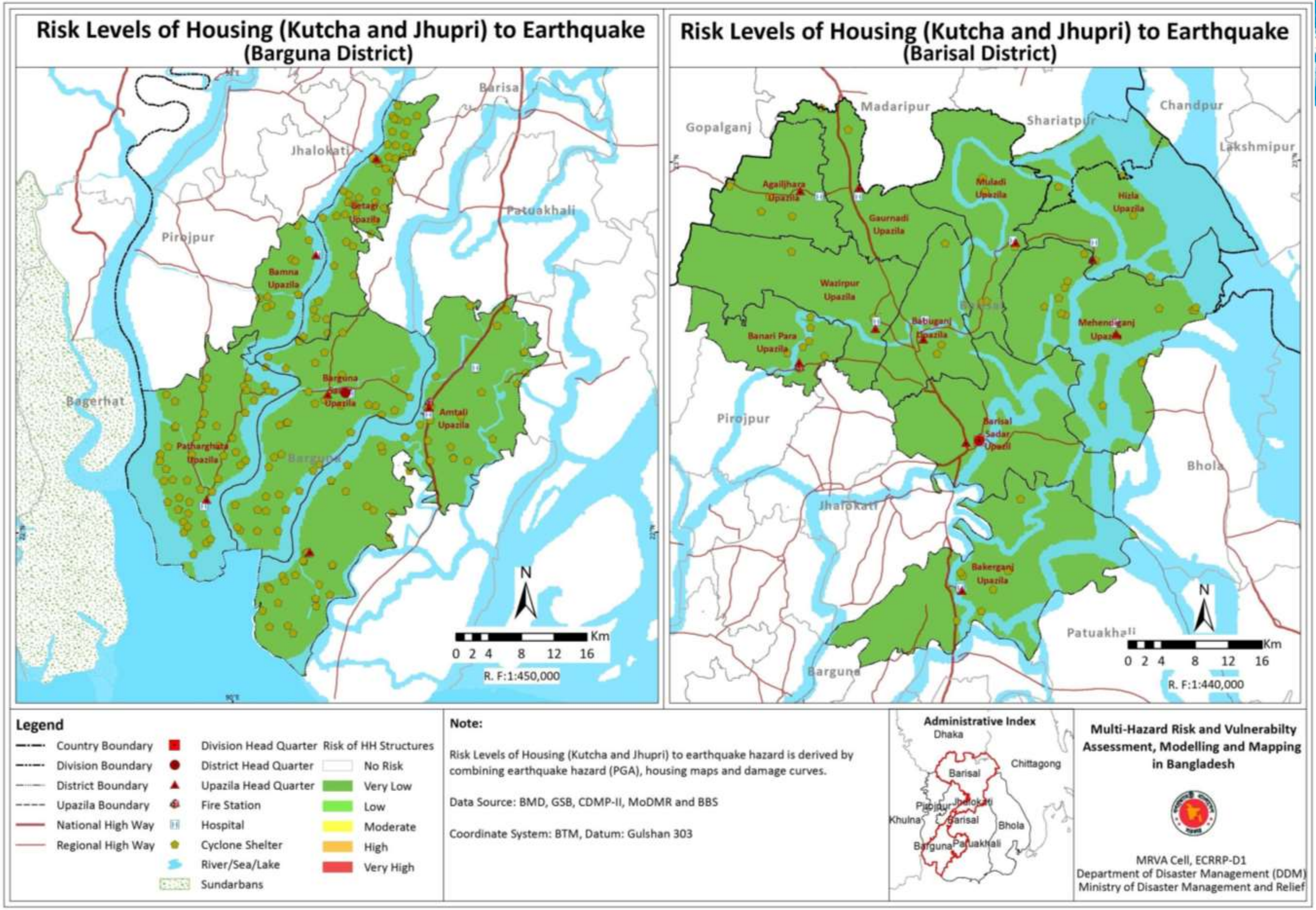
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

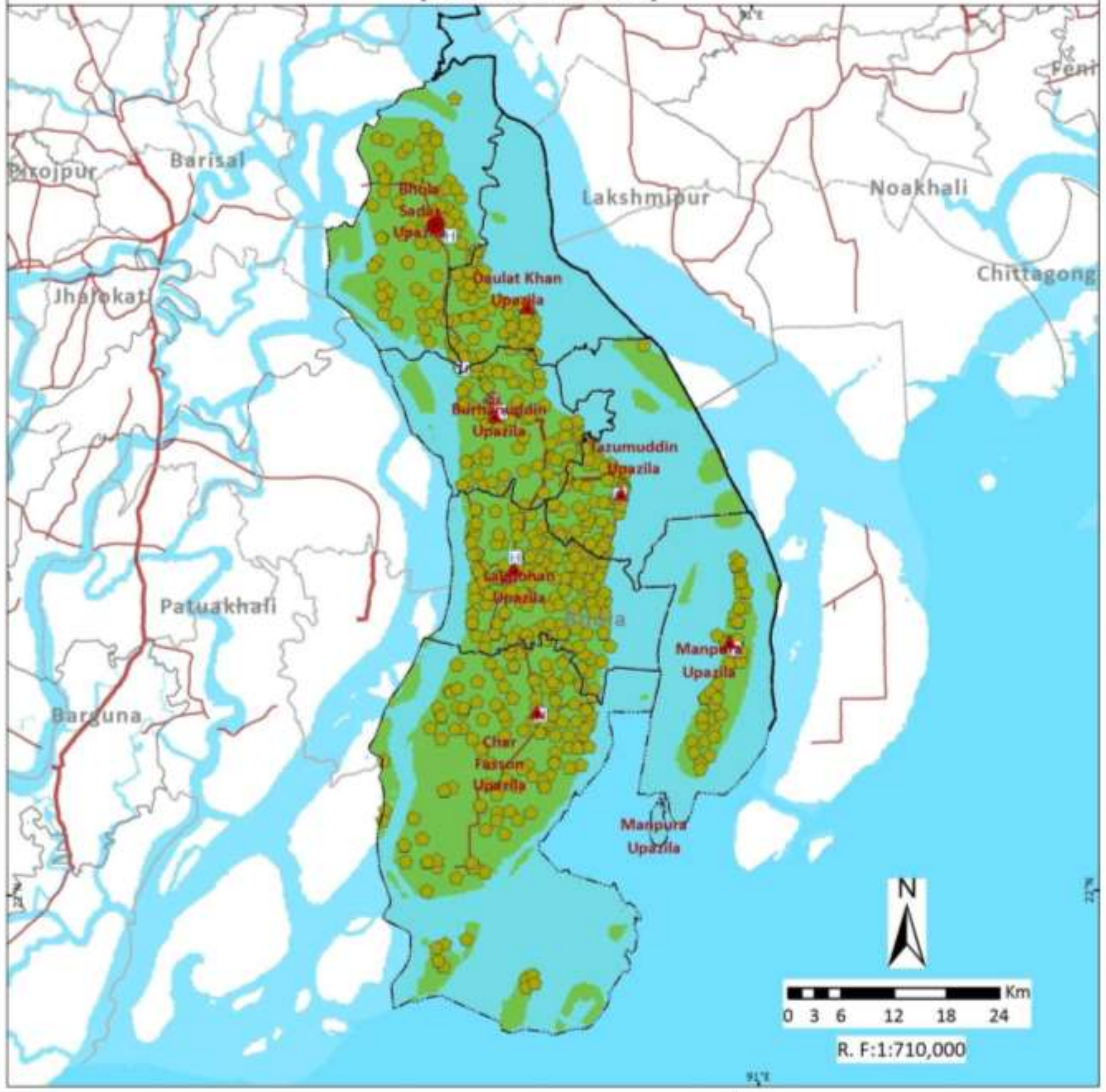

Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Sunamganj District)
Tahirpur Upazila
Bishwambarpur Upazila
Sunamganj Sadar Upazila
Dowarabazar Upazila
Dharampasha Upazila
Jamalganj Upazila
Chhatak Upazila
Dakshin Sunamganj Upazila
Derai Upazila
Jagannathpur Upazila
Sulla Upazila
Netrakona
Kishoreganj
Habiganj
Sylhet
N
0 3 6 12 18 24 Km
R. F:1:510,000
Risk Levels of Housing (Pucka and Semi-Pucka) to Earthquake (Sylhet District)
Companiganj Upazila
Gowainghat Upazila
Jaintiapur Upazila
Kanaighat Upazila
Zakiganj Upazila
Sylhet Sadar Upazila
Bishwanath Upazila
Dakshin Surma Upazila
Golapganj Upazila
Beani Bazar Upazila
Balaganj Upazila
Fenchuganj Upazila
Sunamganj
Habiganj
Maulvibazar
N
0 3 6 12 18 24 Km
R. F:1:560,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Sunamganj
Sylhet
Mymensingh
Dhaka
Habiganj
Maulvibazar
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Barisal Division)

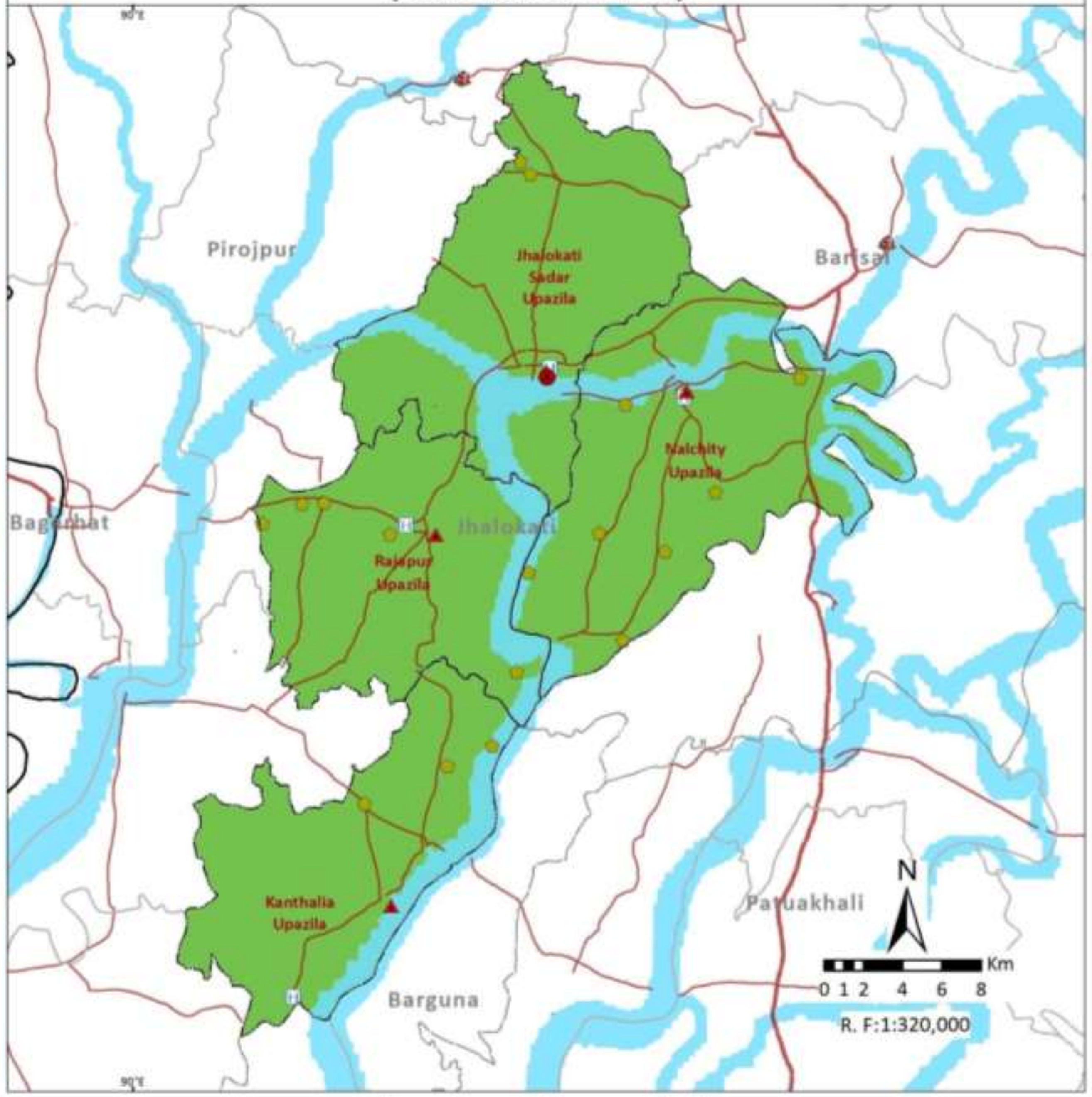



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Barguna District)
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Barisal District)
Jhalokati
Patuakhali
Pirojpur
Bagerhat
Bamna Upazila
Betagi Upazila
Barguna Upazila
Amtali Upazila
Patharghata Upazila
Madaripur
Gopalganj
Shariatpur
Chandpur
Lakshmipur
Agailjhara Upazila
Gaurnadi Upazila
Muladi Upazila
Hizla Upazila
Wazirpur Upazila
Babuganj Upazila
Banari Para Upazila
Mehendiganj Upazila
Barisal Sadar Upazila
Bhola
Bakerganj Upazila
Patuakhali
Barguna
0 2 4 8 12 16 Km
R. F:1:450,000
R. F:1:440,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Dhaka
Chittagong
Barisal
Pirojpur
Jhalokati
Khulna
Barisal
Bhola
Barguna
Patuakhali
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Bhola District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Jhalokati District)



Legend

—·—·	Country Boundary	●	District Head Quarter	**Risk of HH Structures**	
—···—	Division Boundary	▲	Upazila Head Quarter		No Risk
········	District Boundary		Fire Station		Very Low
----	Upazila Boundary		Hospital		Low
—	National High Way		Cyclone Shelter		Moderate
—	Regional High Way		River/Sea/Lake		High
			Sundarbans		Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

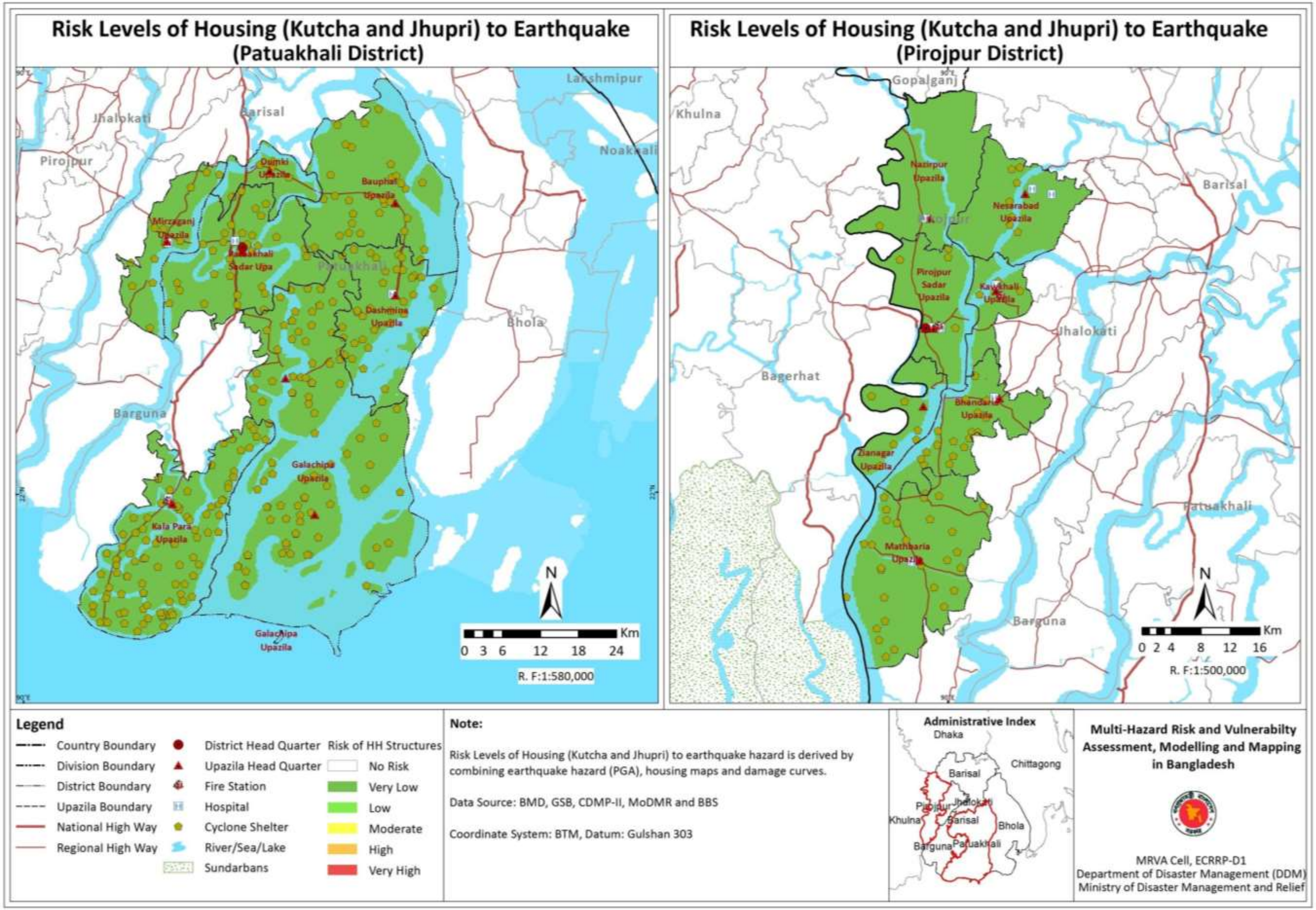
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

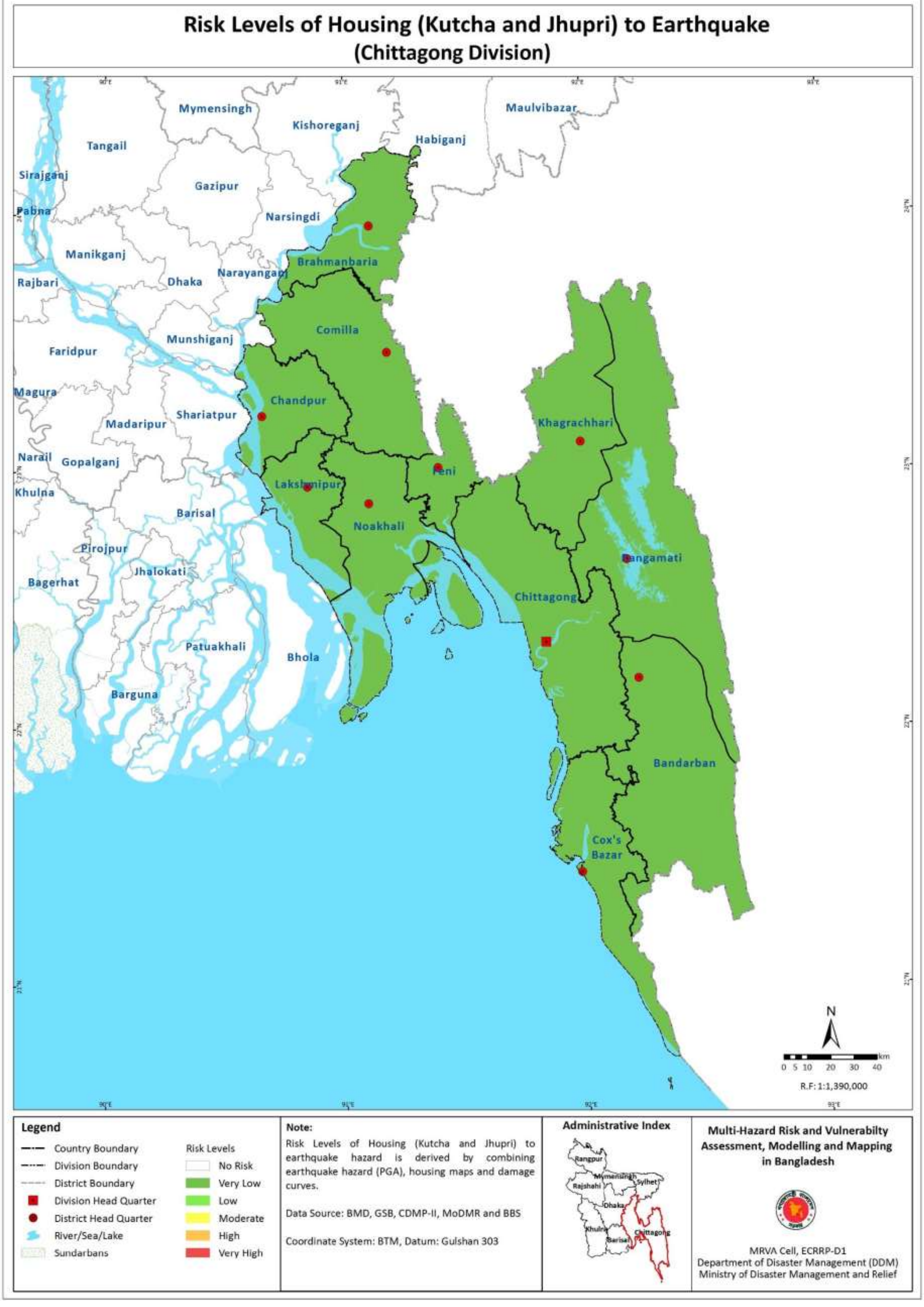
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

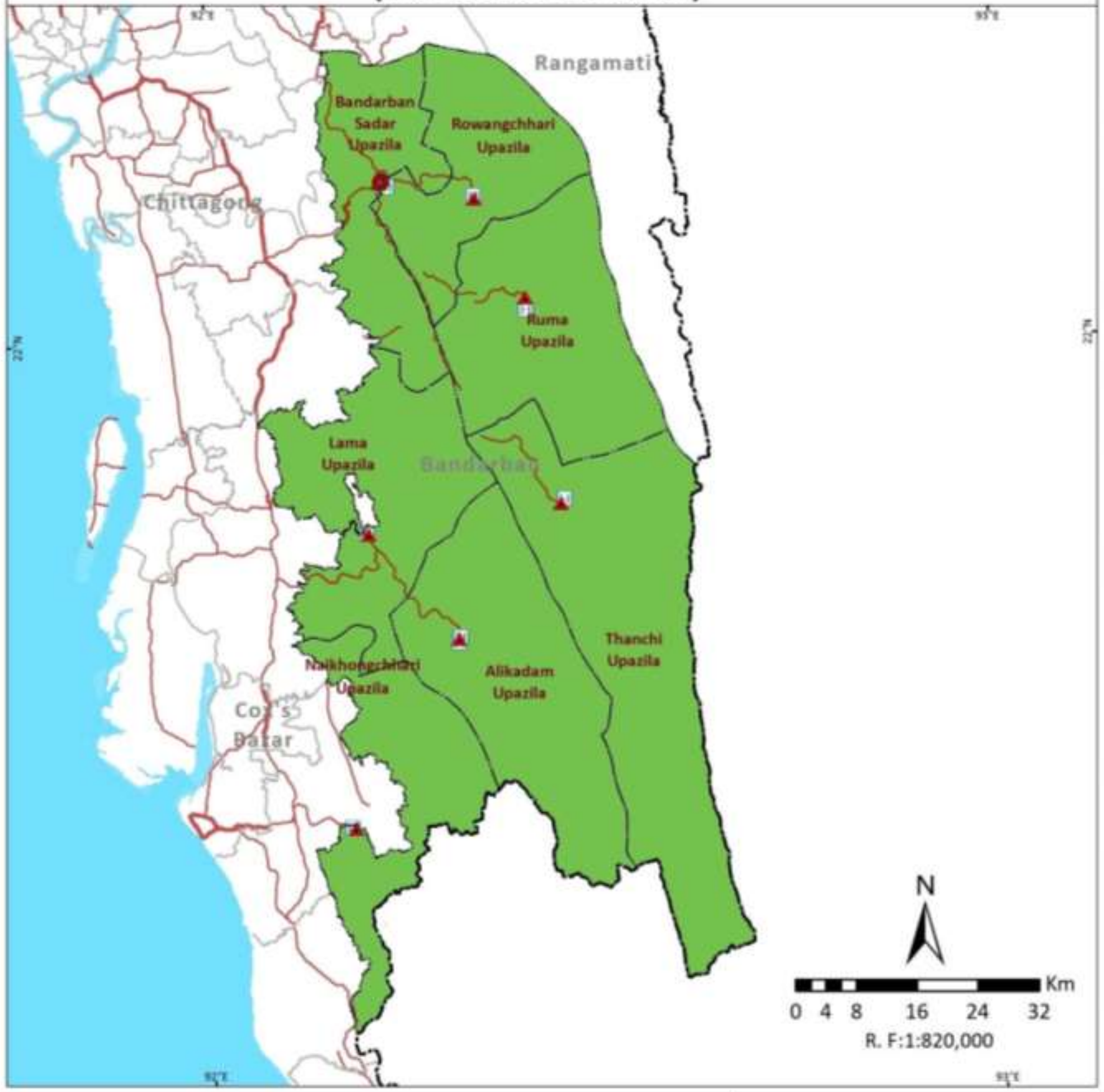
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

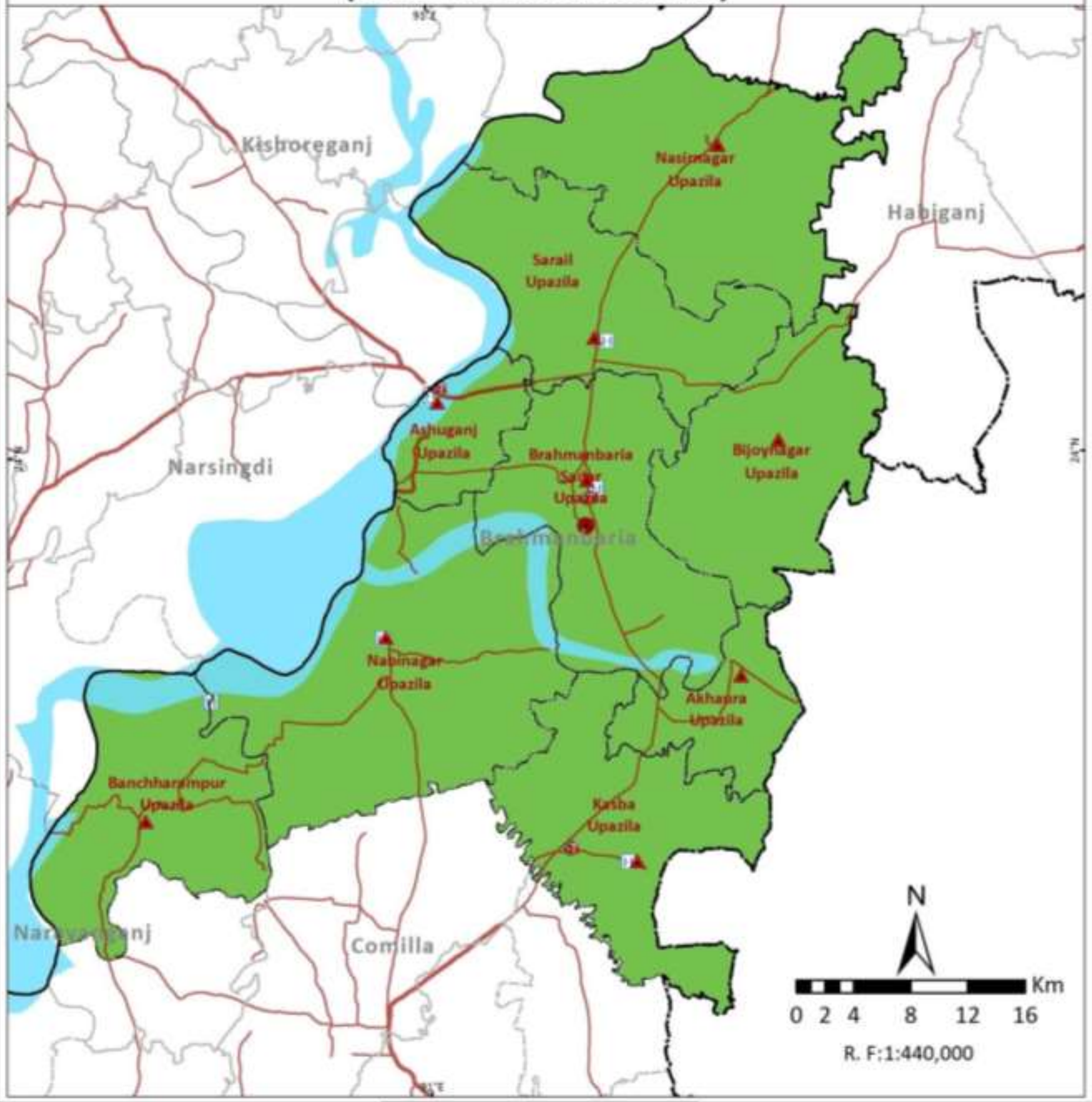

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Patuakhali District)
Jhalokati
Barisal
Pirojpur
Noakhali
Bhola
Barguna
Mirzaganj Upazila
Bauphal Upazila
Dashmina Upazila
Galachipa Upazila
Kala Para Upazila
Galachipa Upazila
0 3 6 12 18 24 Km
R. F:1:580,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Pirojpur District)
Gopalganj
Khulna
Barisal
Nazirpur Upazila
Nesarabad Upazila
Pirojpur Sadar Upazila
Kawkhali Upazila
Jhalokati
Bagerhat
Bhandaria Upazila
Zianagar Upazila
Mathbaria Upazila
Patuakhali
Barguna
0 2 4 8 12 16 Km
R. F:1:500,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Dhaka
Chittagong
Barisal
Khulna
Bhola
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Chittagong Division)
Mymensingh
Kishoreganj
Maulvibazar
Habiganj
Tangail
Sirajganj
Gazipur
Pabna
Narsingdi
Manikganj
Brahmanbaria
Rajbari
Dhaka
Narayanganj
Comilla
Munshiganj
Faridpur
Magura
Chandpur
Shariatpur
Madaripur
Khagrachhari
Narail
Gopalganj
Feni
Khulna
Lakshmipur
Noakhali
Barisal
Rangamati
Pirojpur
Jhalokati
Bagerhat
Chittagong
Patuakhali
Bhola
Barguna
Bandarban
Cox's Bazar
N
0 5 10 20 30 40 km
R.F: 1:1,390,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Risk Levels
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Bandarban District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Brahmanbaria District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

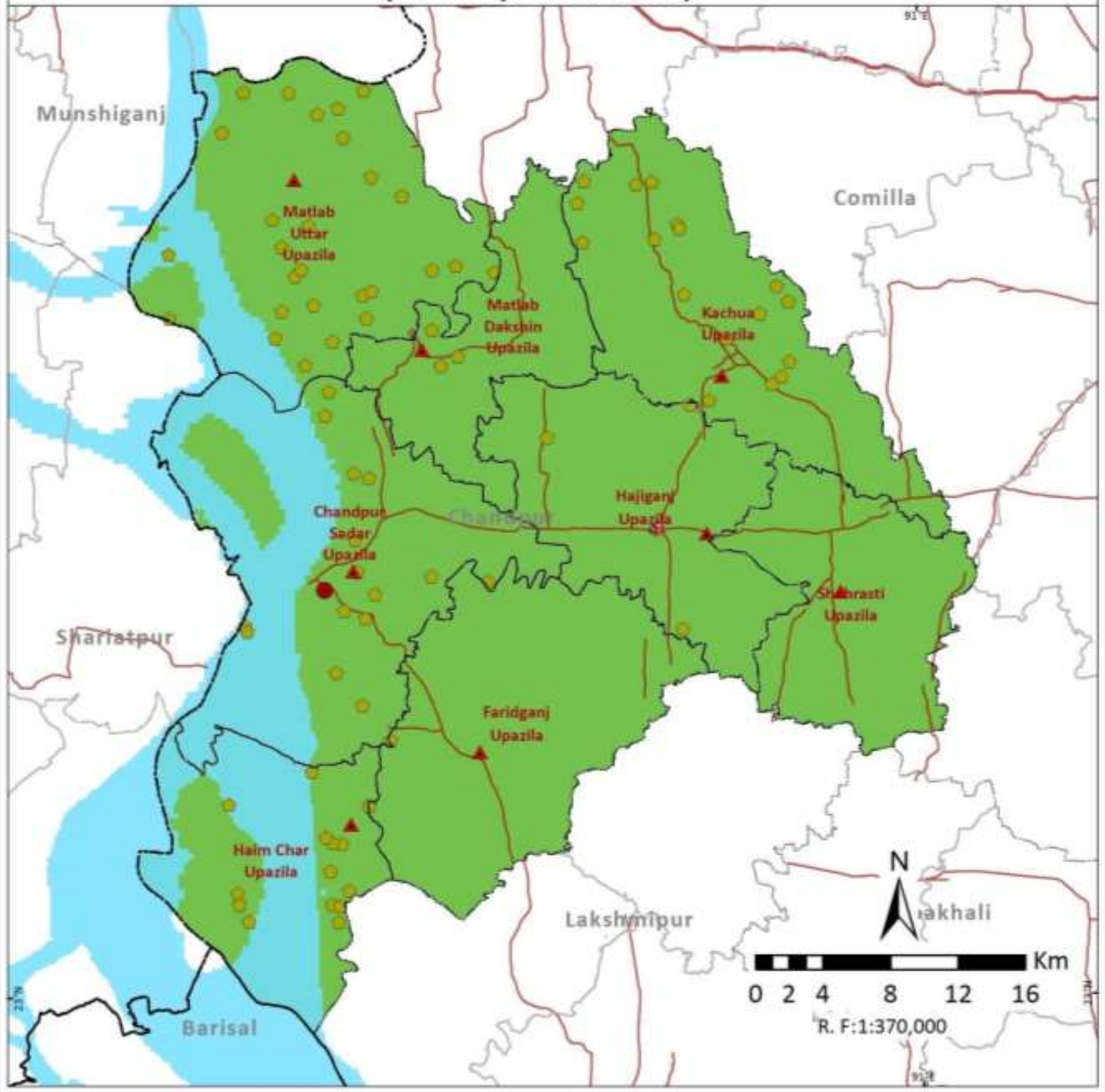
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

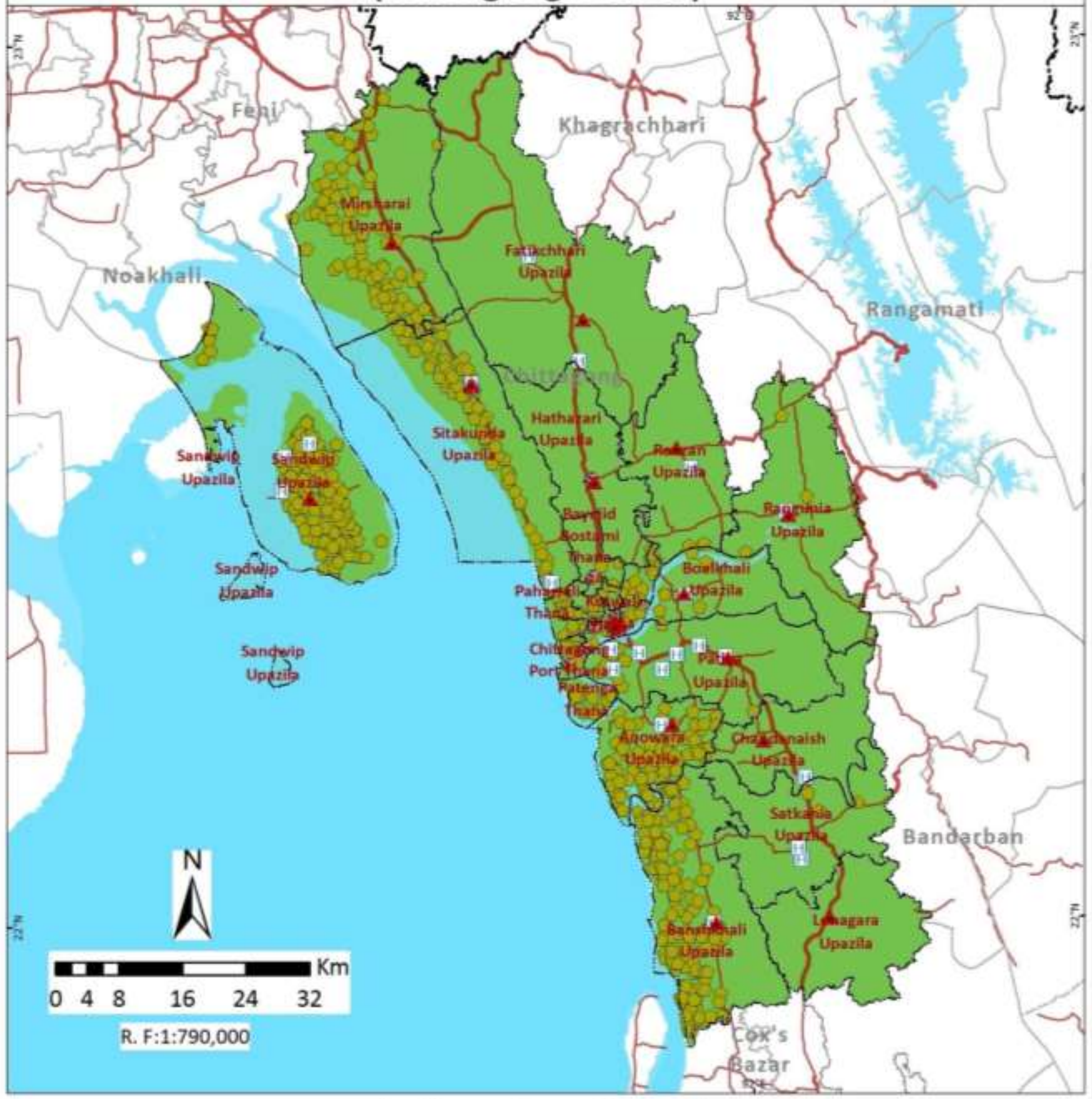
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Chandpur District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Chittagong District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- Division Head Quarter
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures
- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

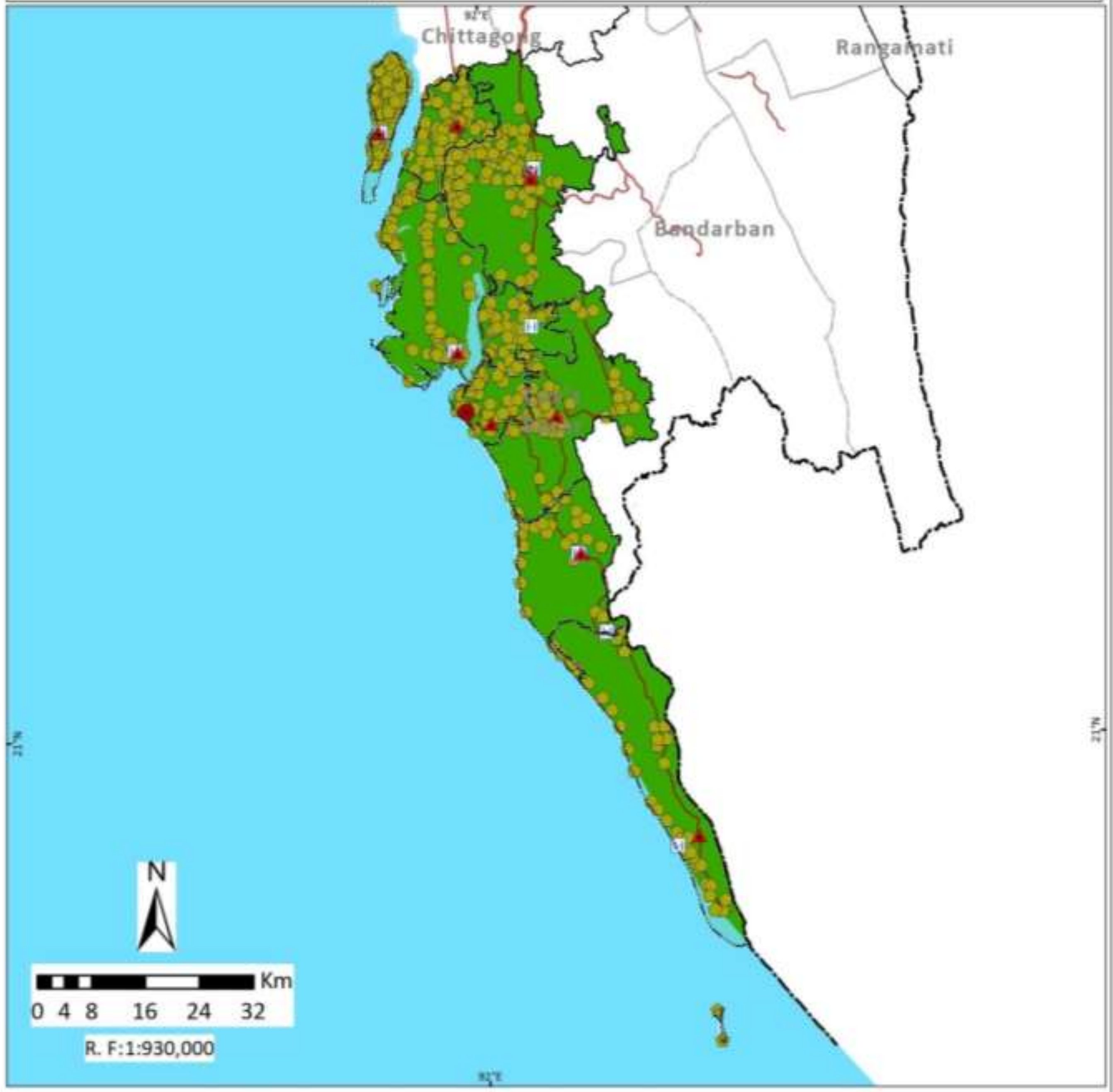
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

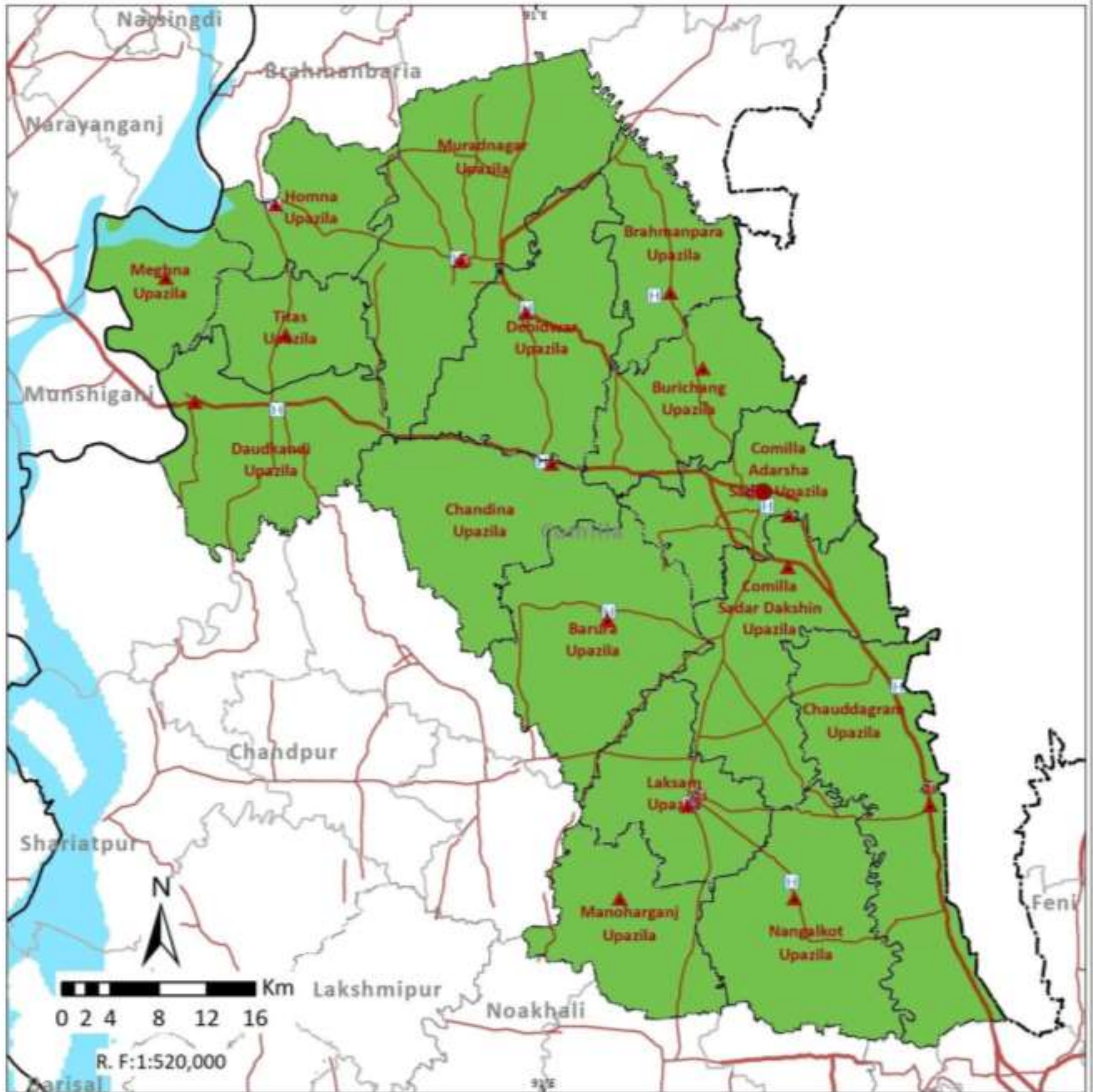
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Cox's Bazar District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Comilla District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**	
Division Boundary	Upazila Head Quarter	No Risk	
District Boundary	Fire Station	Very Low	
Upazila Boundary	Hospital	Low	
National High Way	Cyclone Shelter	Moderate	
Regional High Way	River/Sea/Lake	High	
	Sundarbans	Very High	

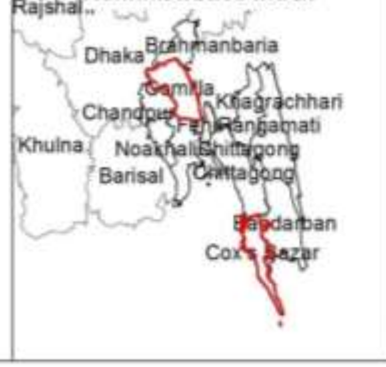
Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

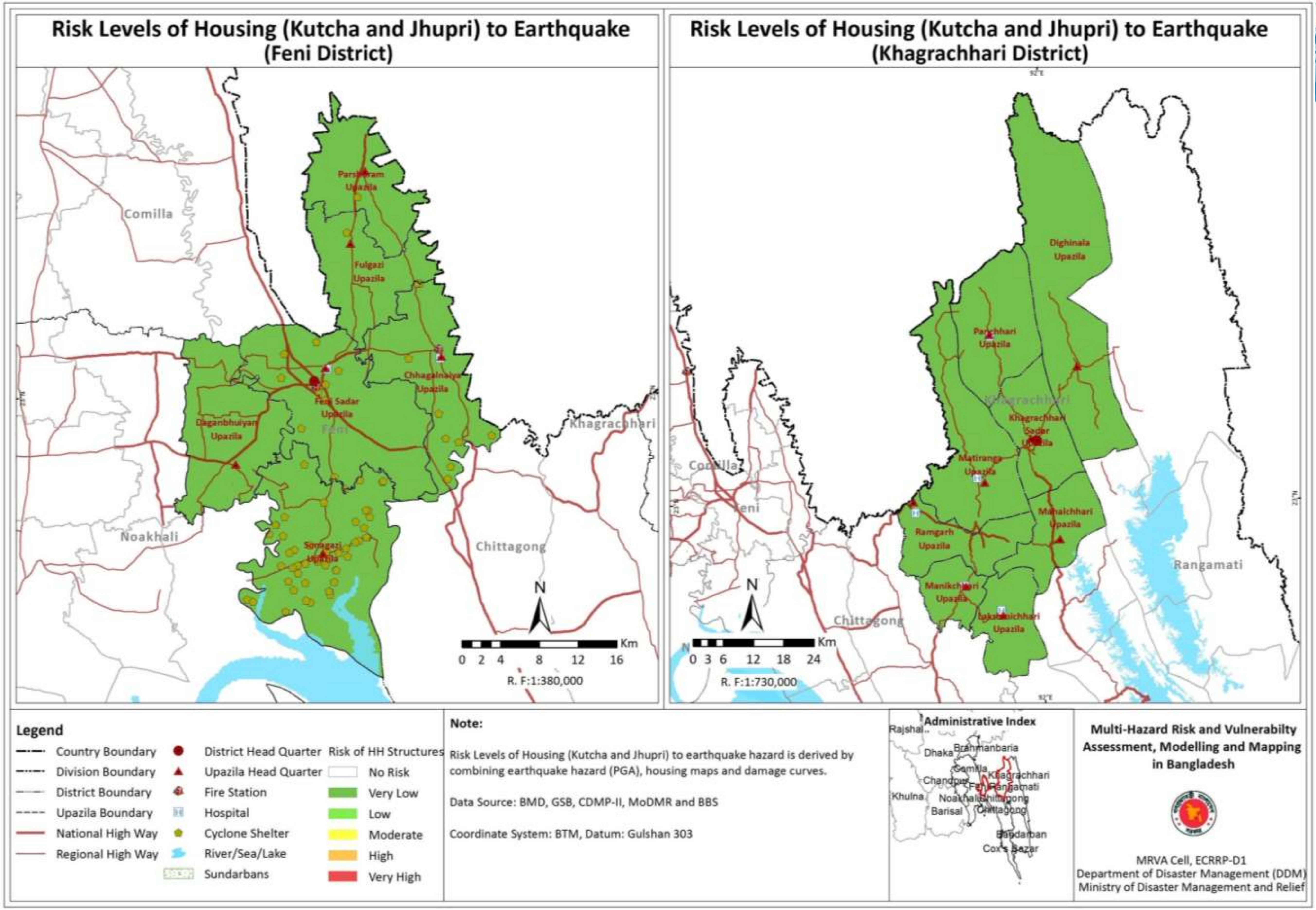
Coordinate System: BTM, Datum: Gulshan 303

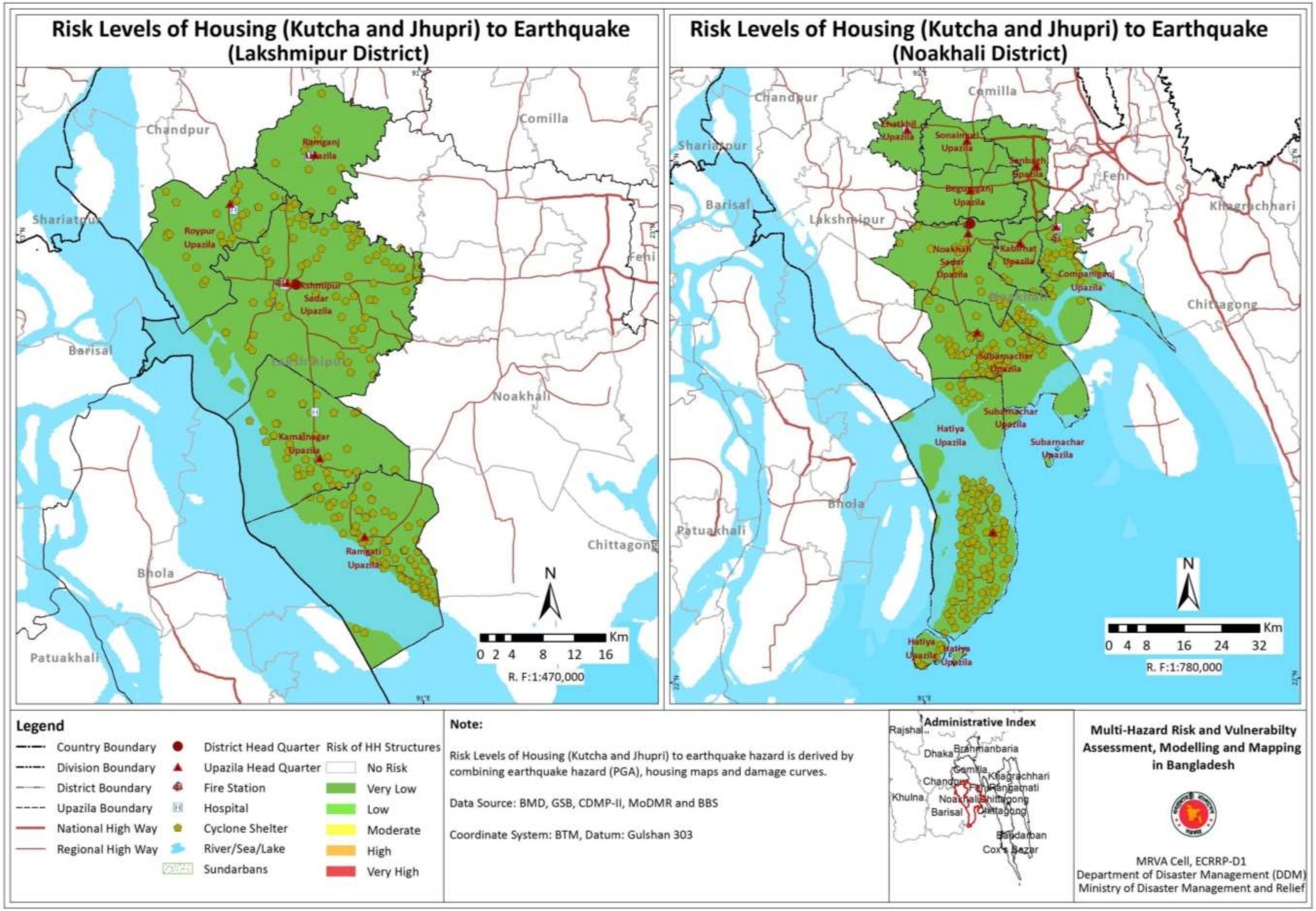
Administrative Index

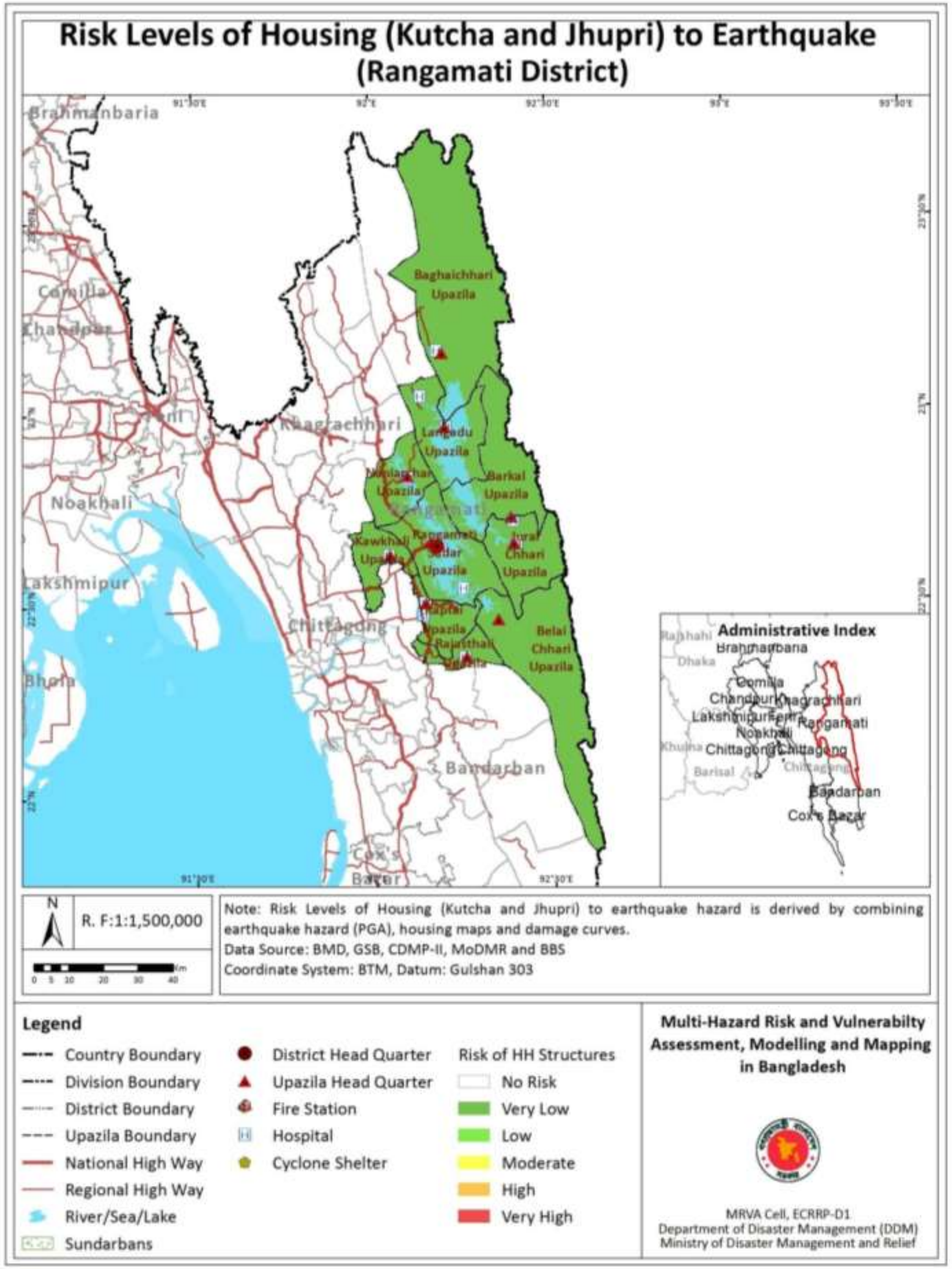


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Feni District)
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Khagrachhari District)
Comilla
Noakhali
Chittagong
Khagrachhari
Feni
Parshuram Upazila
Fulgazi Upazila
Chhagalnaiya Upazila
Feni Sadar Upazila
Daganbhuiyan Upazila
Sonagazi Upazila
Dighinala Upazila
Panchhari Upazila
Khagrachhari Sadar Upazila
Matiranga Upazila
Mahalchhari Upazila
Ramgarh Upazila
Manikchhari Upazila
Lakshmichhari Upazila
Rangamati
N
0 2 4 8 12 16 Km
R. F:1:380,000
0 3 6 12 18 24 Km
R. F:1:730,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Lakshmipur District)
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Noakhali District)
Chandpur
Comilla
Shariatpur
Feni
Barisal
Lakshmipur
Noakhali
Chittagong
Bhola
Patuakhali
Khagrachhari
Ramganj Upazila
Roypur Upazila
Lakshmipur Sadar Upazila
Kamalnagar Upazila
Ramgati Upazila
Chatkhil Upazila
Sonaimuri Upazila
Senbagh Upazila
Begumganj Upazila
Noakhali Sadar Upazila
Kabirhat Upazila
Companiganj Upazila
Subarnachar Upazila
Hatiya Upazila
N
Km
0 2 4 8 12 16
R. F:1:470,000
Km
0 4 8 16 24 32
R. F:1:780,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rajshahi
Dhaka
Brahmanbaria
Comilla
Khagrachhari
Chandpur
Feni
Rangamati
Khulna
Noakhali
Chittagong
Barisal
Bandarban
Cox's Bazar
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Rangamati District)
Brahmanbaria
Comilla
Chandpur
Khagrachhari
Noakhali
Lakshmipur
Chittagong
Bhola
Bandarban
Cox's Bazar
Baghaichhari Upazila
Langadu Upazila
Barkal Upazila
Naniarchar Upazila
Kawkhali Upazila
Rangamati Sadar Upazila
Juraichhari Upazila
Kaptai Upazila
Rajasthali Upazila
Belai Chhari Upazila
91°30'E
92°E
92°30'E
93°E
93°30'E
Administrative Index
Rajshahi
Dhaka
Khulna
Barisal
R. F:1:1,500,000
Note: Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Dhaka Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk Levels

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

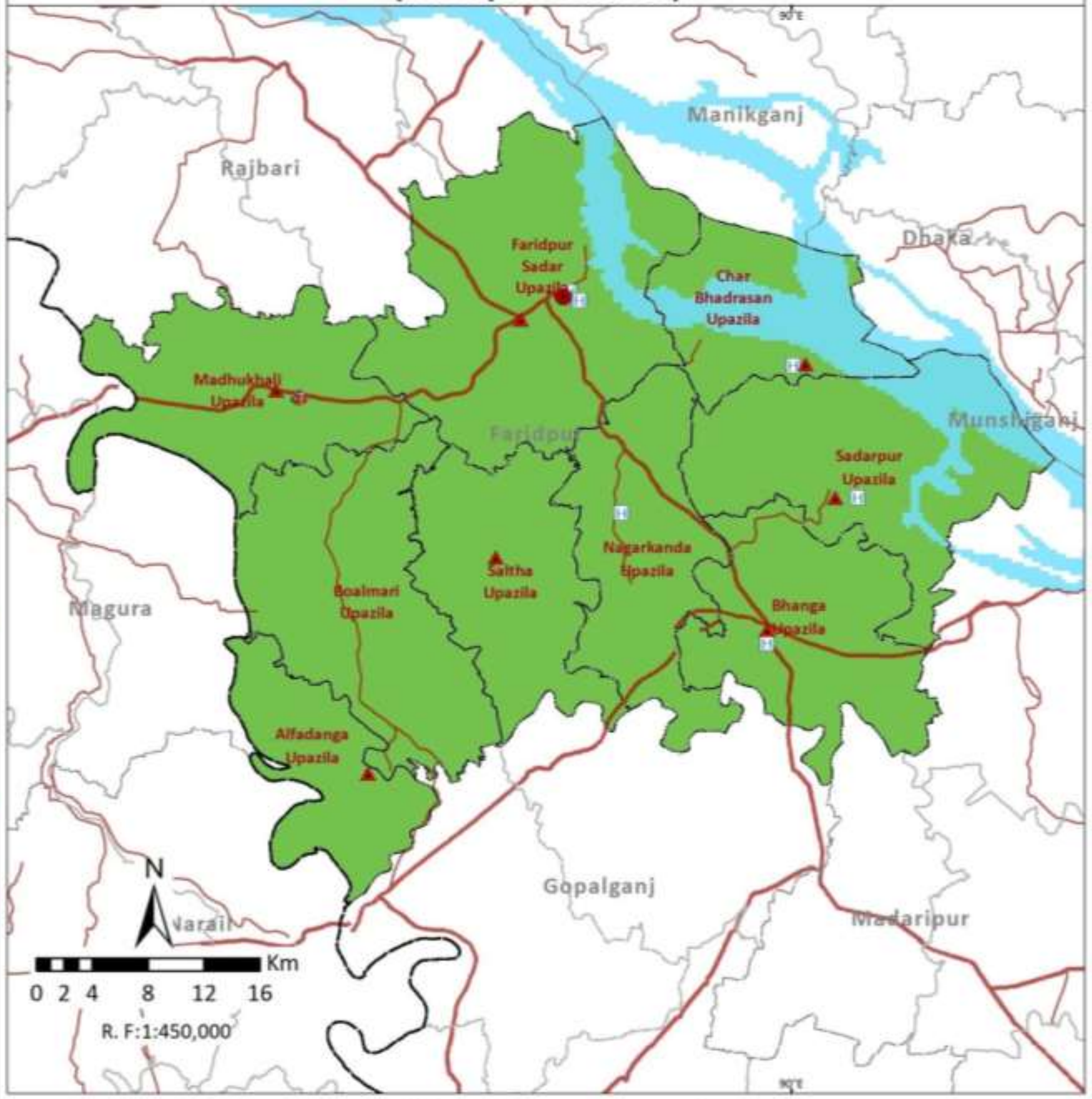
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Dhaka District)

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Faridpur District)



Legend

Country Boundary	Division Head Quarter	**Risk of HH Structures**
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

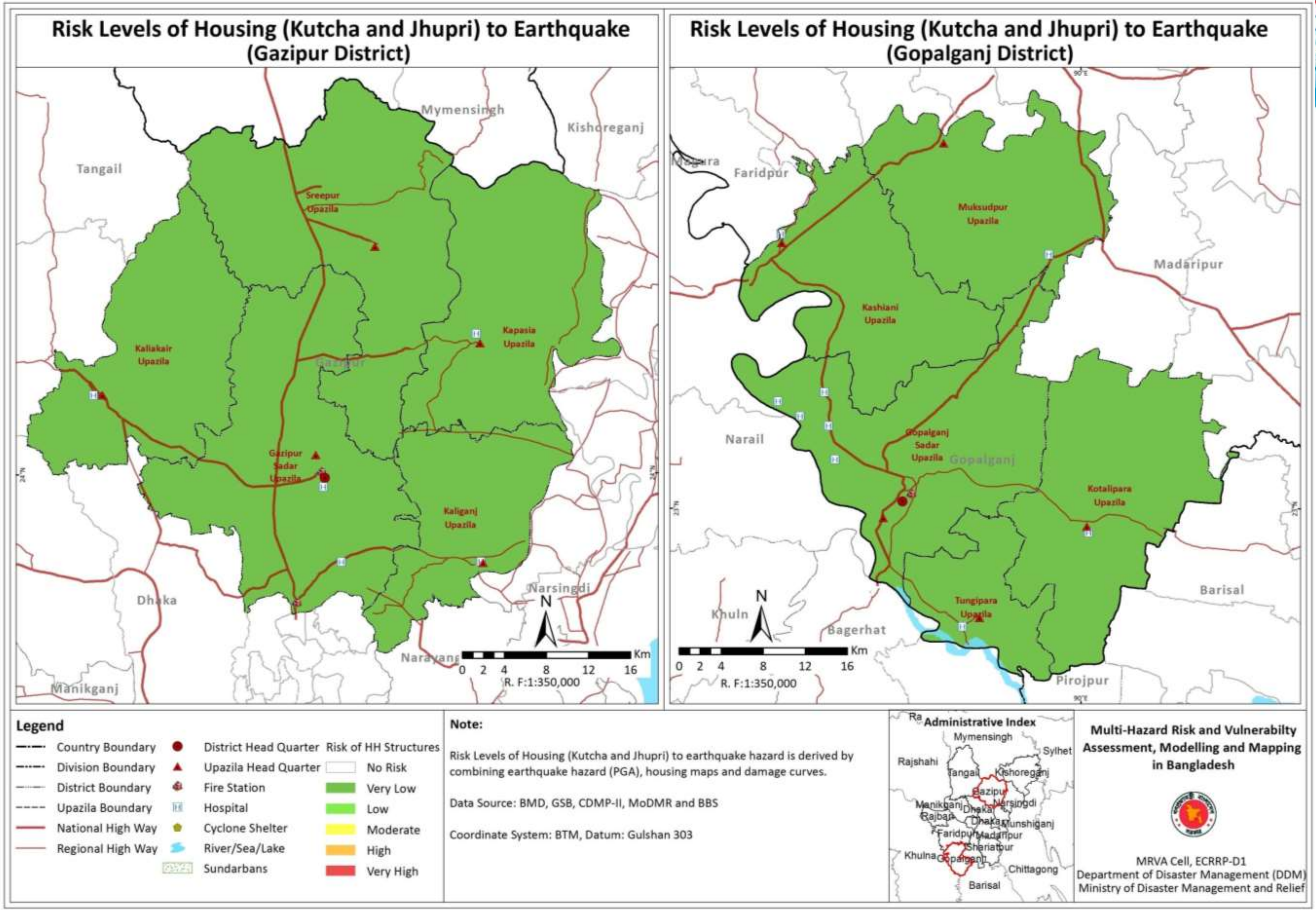
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

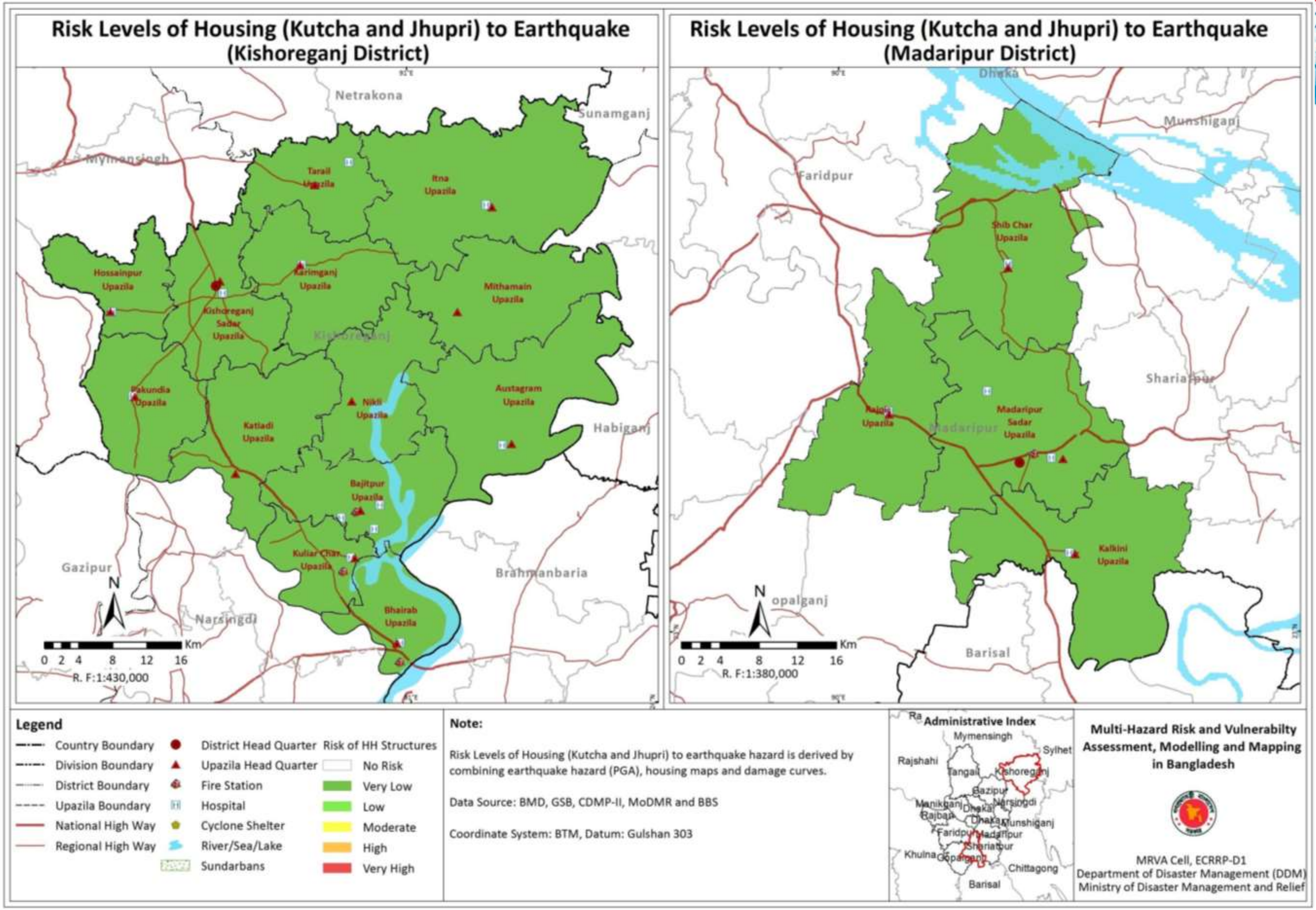
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

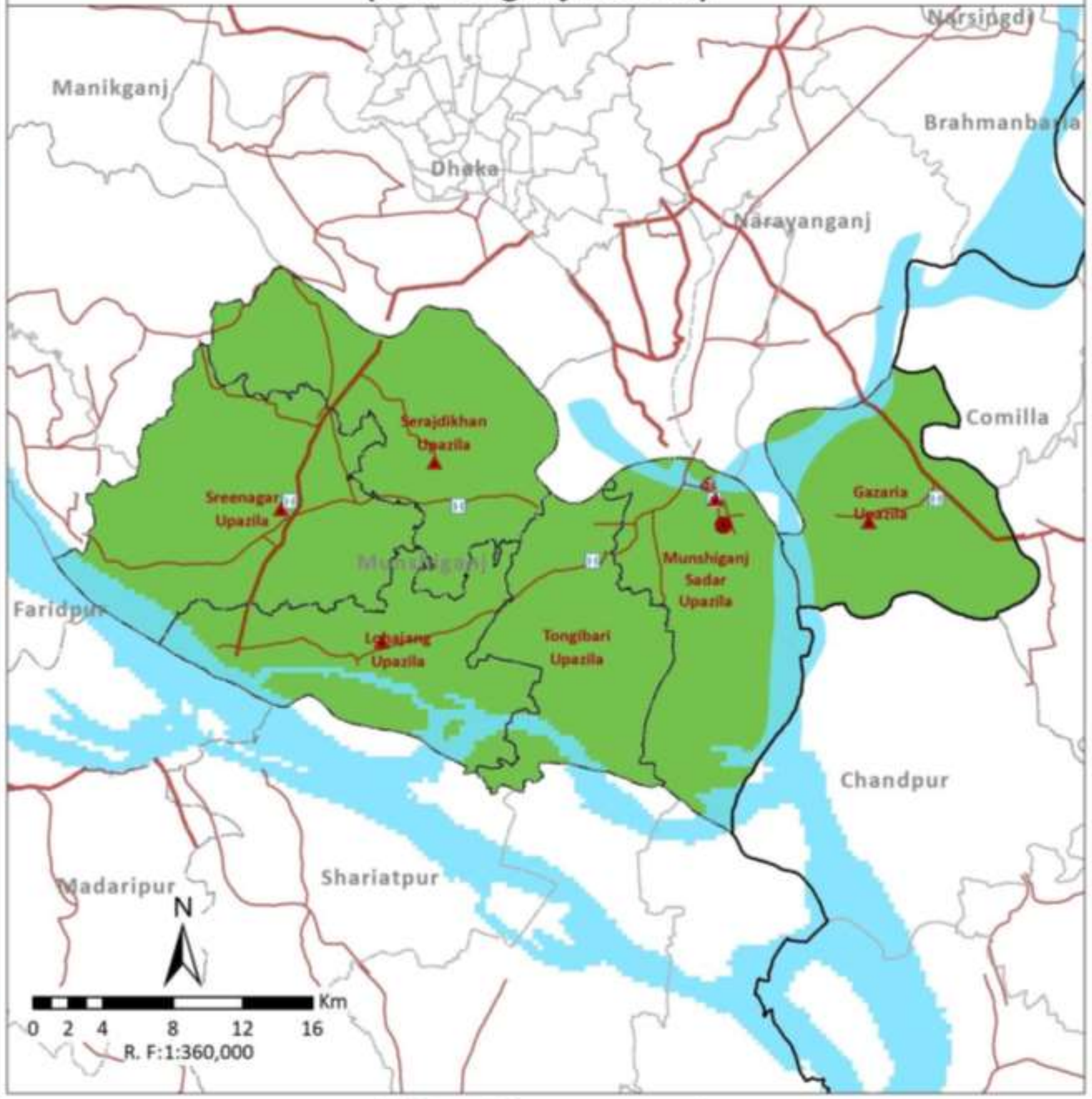
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Gazipur District)
Mymensingh
Kishoreganj
Tangail
Sreepur Upazila
Kaliakair Upazila
Kapasia Upazila
Gazipur
Gazipur Sadar Upazila
Kaliganj Upazila
Narsingdi
Dhaka
Narayang
Manikganj
N
Km
0 2 4 8 12 16
R. F:1:350,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Gopalganj District)
Magura
Faridpur
Muksudpur Upazila
Madaripur
Kashiani Upazila
Narail
Gopalganj Sadar Upazila
Gopalganj
Kotalipara Upazila
Barisal
Khuln
Bagerhat
Tungipara Upazila
Pirojpur
N
Km
0 2 4 8 12 16
R. F:1:350,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Manikganj
Narsingdi
Rajbari
Dhaka
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Kishoreganj District)
Netrakona
Sunamganj
Mymensingh
Tarail Upazila
Itna Upazila
Hossainpur Upazila
Karimganj Upazila
Mithamain Upazila
Kishoreganj Sadar Upazila
Kishoreganj
Pakundia Upazila
Katiadi Upazila
Nikli Upazila
Austagram Upazila
Habiganj
Bajitpur Upazila
Kuliar Char Upazila
Bhairab Upazila
Gazipur
Narsingdi
Brahmanbaria
N
Km
0 2 4 8 12 16
R. F:1:430,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Madaripur District)
Dhaka
Munshiganj
Faridpur
Shib Char Upazila
Shariatpur
Rajoir Upazila
Madaripur
Madaripur Sadar Upazila
Kalkini Upazila
Gopalganj
Barisal
N
Km
0 2 4 8 12 16
R. F:1:380,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Dhaka
Rajbari
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Manikganj District)

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Munshiganj District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

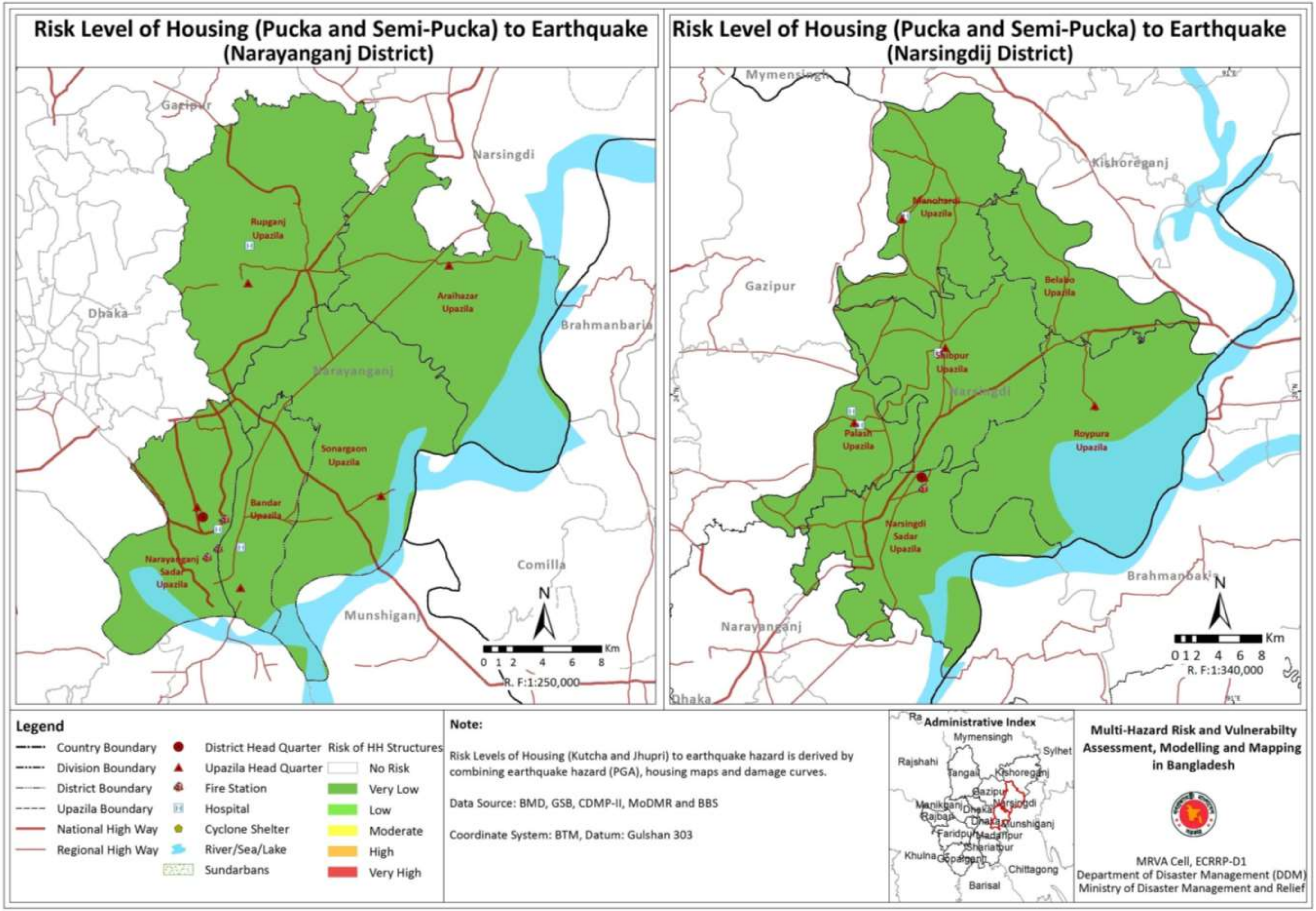
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

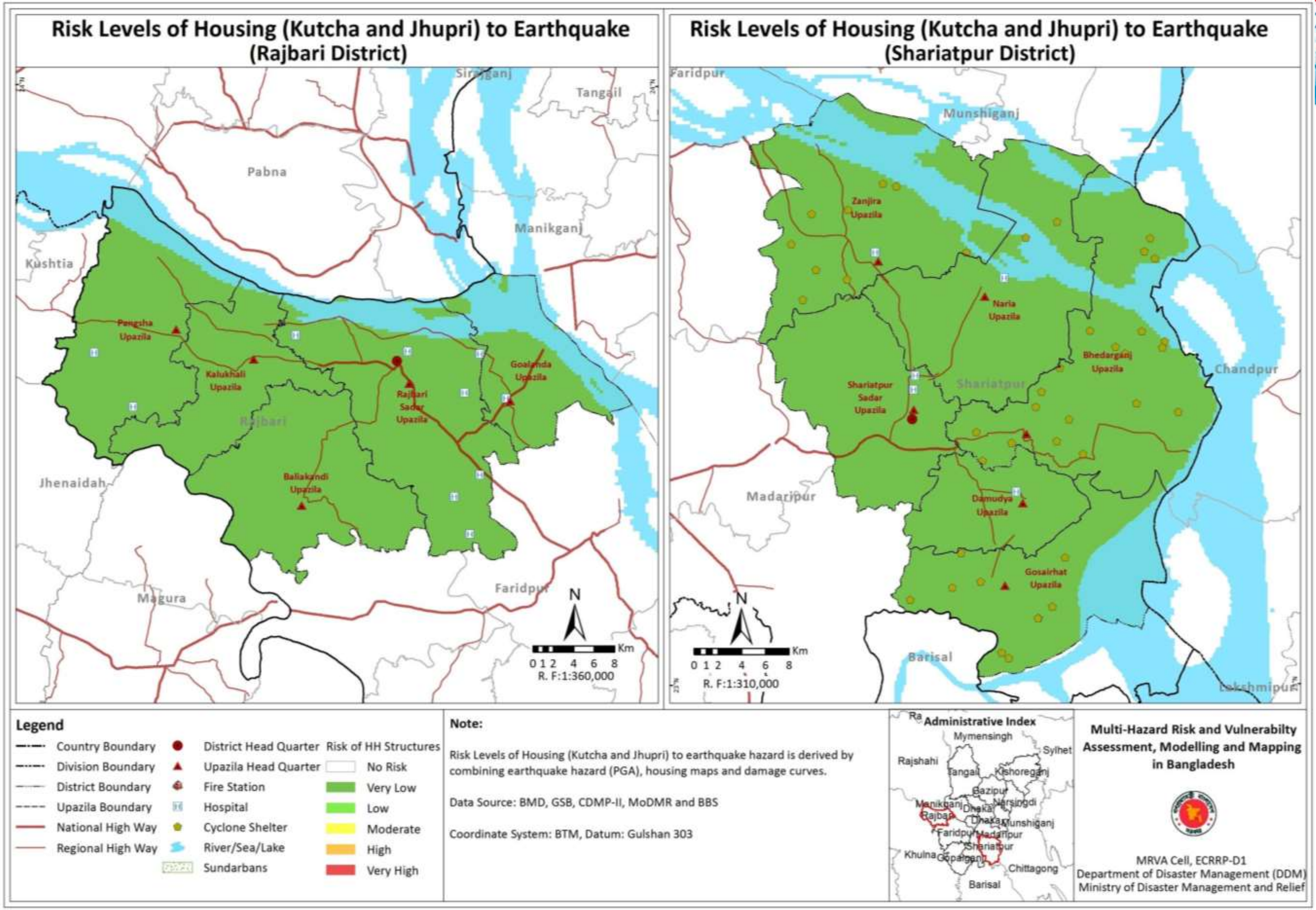
Administrative Index

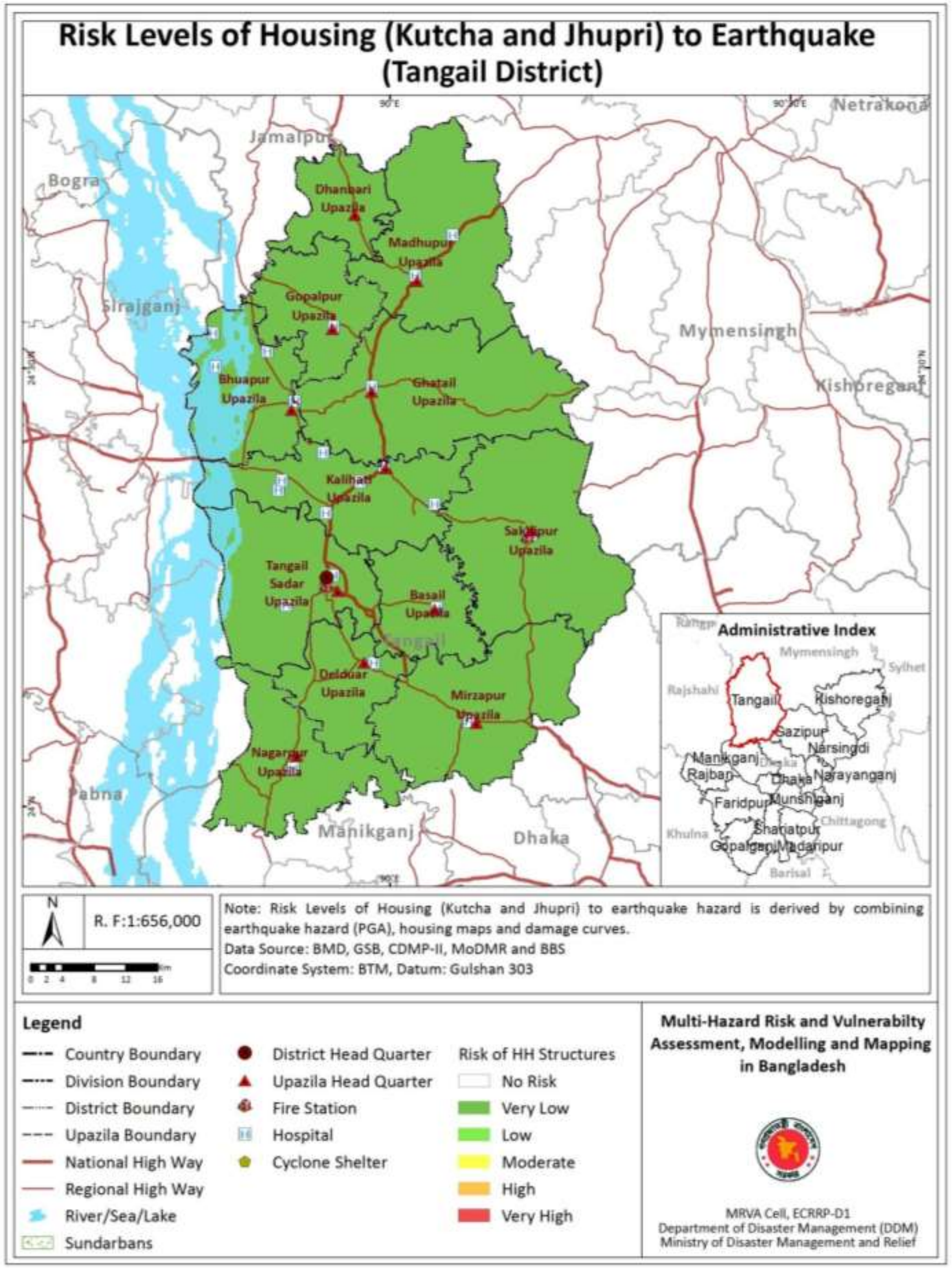
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



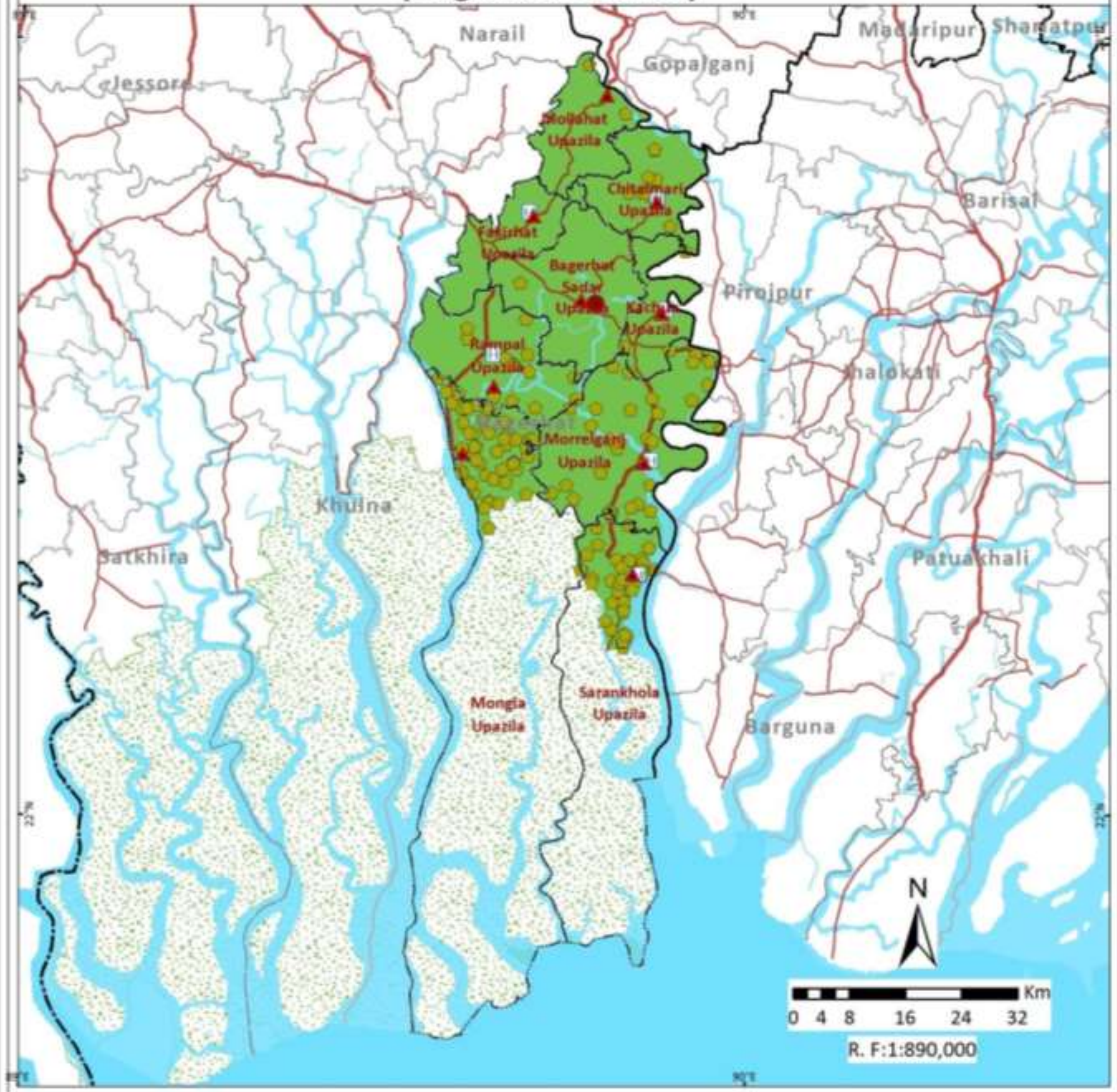
Risk Level of Housing (Pucka and Semi-Pucka) to Earthquake (Narayanganj District)
Risk Level of Housing (Pucka and Semi-Pucka) to Earthquake (Narsingdij District)
Gazipur
Narsingdi
Dhaka
Narayanganj
Brahmanbaria
Comilla
Munshiganj
Rupganj Upazila
Araihazar Upazila
Sonargaon Upazila
Bandar Upazila
Narayanganj Sadar Upazila
0 1 2 4 6 8 Km
R. F:1:250,000
Mymensingh
Kishoreganj
Manohardi Upazila
Belabo Upazila
Shibpur Upazila
Palash Upazila
Roypura Upazila
Narsingdi Sadar Upazila
0 1 2 4 6 8 Km
R. F:1:340,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Rajshahi
Sylhet
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Dhaka
Rajbari
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Rajbari District)
Sirajganj
Tangail
Pabna
Manikganj
Kushtia
Pangsha Upazila
Kalukhali Upazila
Rajbari
Rajbari Sadar Upazila
Goalanda Upazila
Baliakandi Upazila
Jhenaidah
Magura
Faridpur
N
Km
0 1 2 4 6 8
R. F:1:360,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Shariatpur District)
Faridpur
Munshiganj
Zanjira Upazila
Naria Upazila
Shariatpur Sadar Upazila
Shariatpur
Bhedarganj Upazila
Chandpur
Damudya Upazila
Gosairhat Upazila
Madaripur
Barisal
Lakshmipur
N
Km
0 1 2 4 6 8
R. F:1:310,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Rajshahi
Sylhet
Tangail
Kishoreganj
Gazipur
Manikganj
Narsingdi
Dhaka
Rajbari
Munshiganj
Faridpur
Madaripur
Shariatpur
Khulna
Gopalganj
Chittagong
Barisal
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

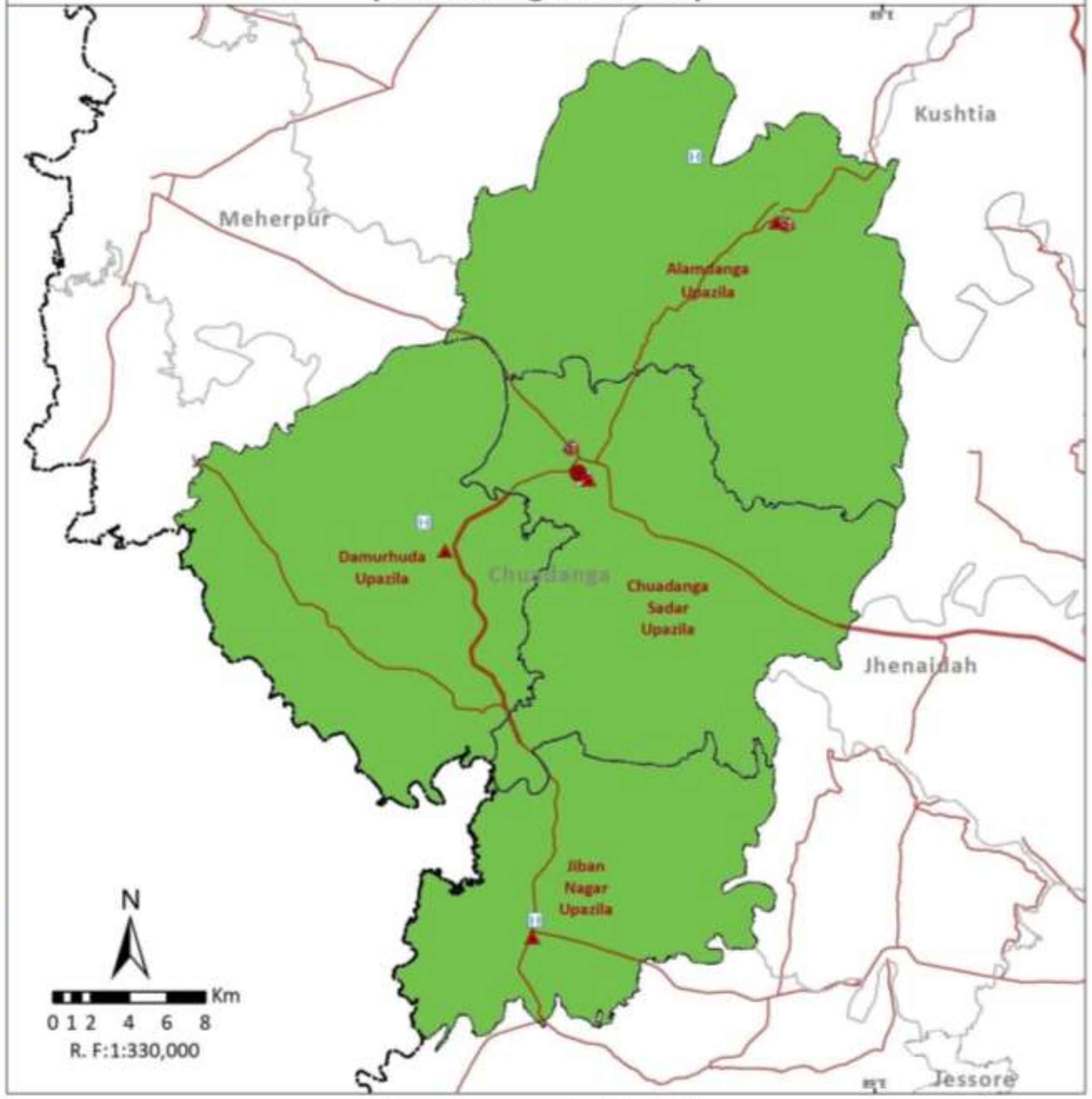

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Tangail District)
Jamalpur
Bogra
Netrakona
Dhanbari Upazila
Madhupur Upazila
Gopalpur Upazila
Sirajganj
Mymensingh
Kishoreganj
Bhuapur Upazila
Ghatail Upazila
Kalihati Upazila
Sakhipur Upazila
Tangail Sadar Upazila
Basail Upazila
Delduar Upazila
Mirzapur Upazila
Nagarpur Upazila
Pabna
Manikganj
Dhaka
Administrative Index
Mymensingh
Sylhet
Rajshahi
Tangail
Kishoreganj
Gazipur
Narsingdi
Manikganj
Rajbari
Dhaka
Narayanganj
Faridpur
Munshiganj
Khulna
Shariatpur
Chittagong
Gopalganj
Madaripur
Barisal
N
R. F:1:656,000
0 2 4 8 12 16
Note: Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
River/Sea/Lake
Sundarbans
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Khulna Division)
Rajshahi
Natore
Pabna
Sirajganj
Tangail
Mymensingh
Kishoreganj
Gazipur
Narsingdi
Manikganj
Dhaka
Narayanganj
Munshiganj
Rajbari
Faridpur
Chandpur
Shariatpur
Madaripur
Gopalganj
Barisal
Bhola
Jhalokati
Pirojpur
Patuakhali
Barguna
Kushtia
Meherpur
Chuadanga
Jhenaidah
Magura
Narail
Jessore
Satkhira
Khulna
Bagerhat
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Risk Levels
No Risk
Very Low
Low
Moderate
High
Very High
N
0 5 10 20 30 40 km
R.F: 1:970,000
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Bagerhat District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Chuadanga District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

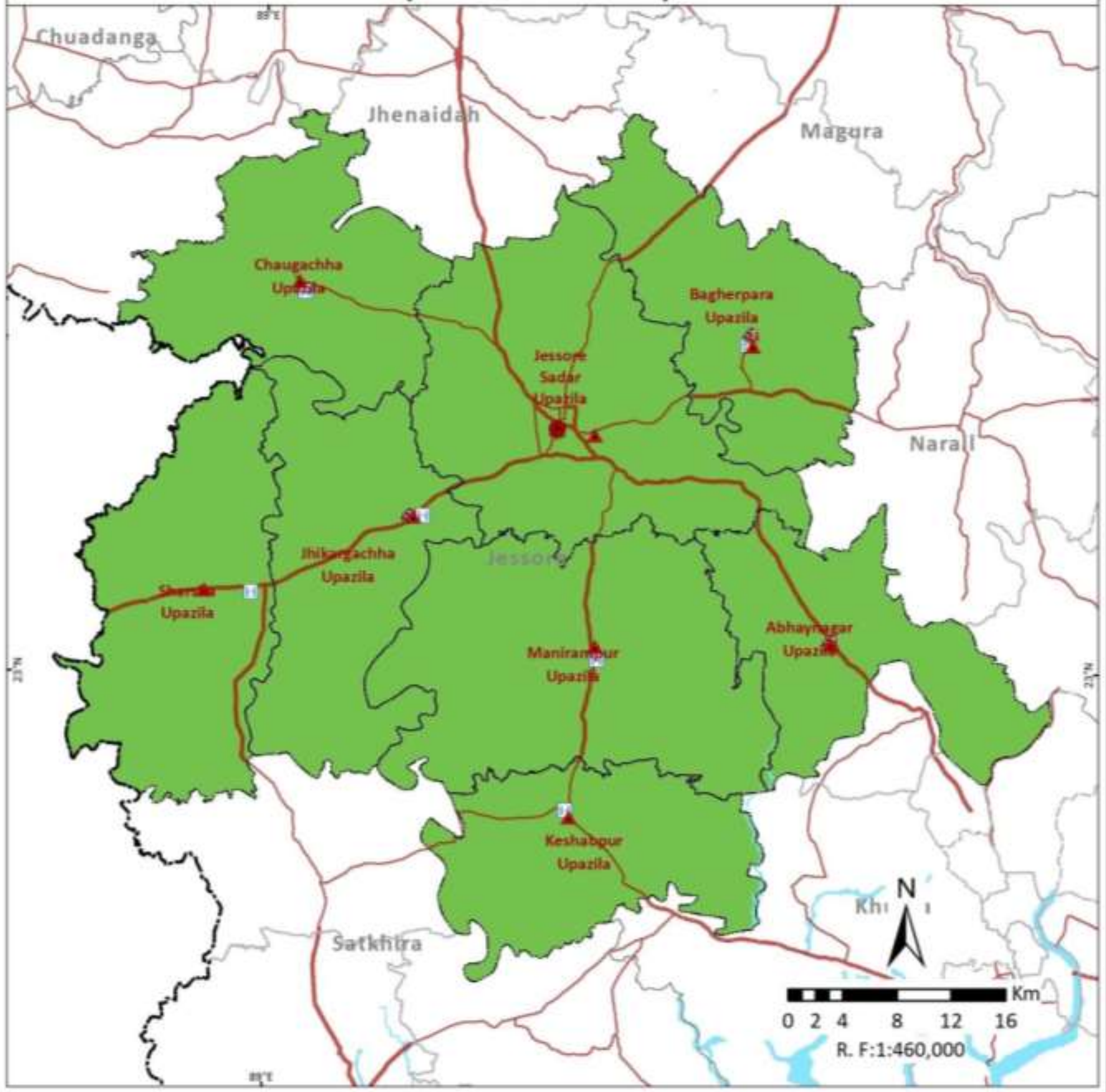
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

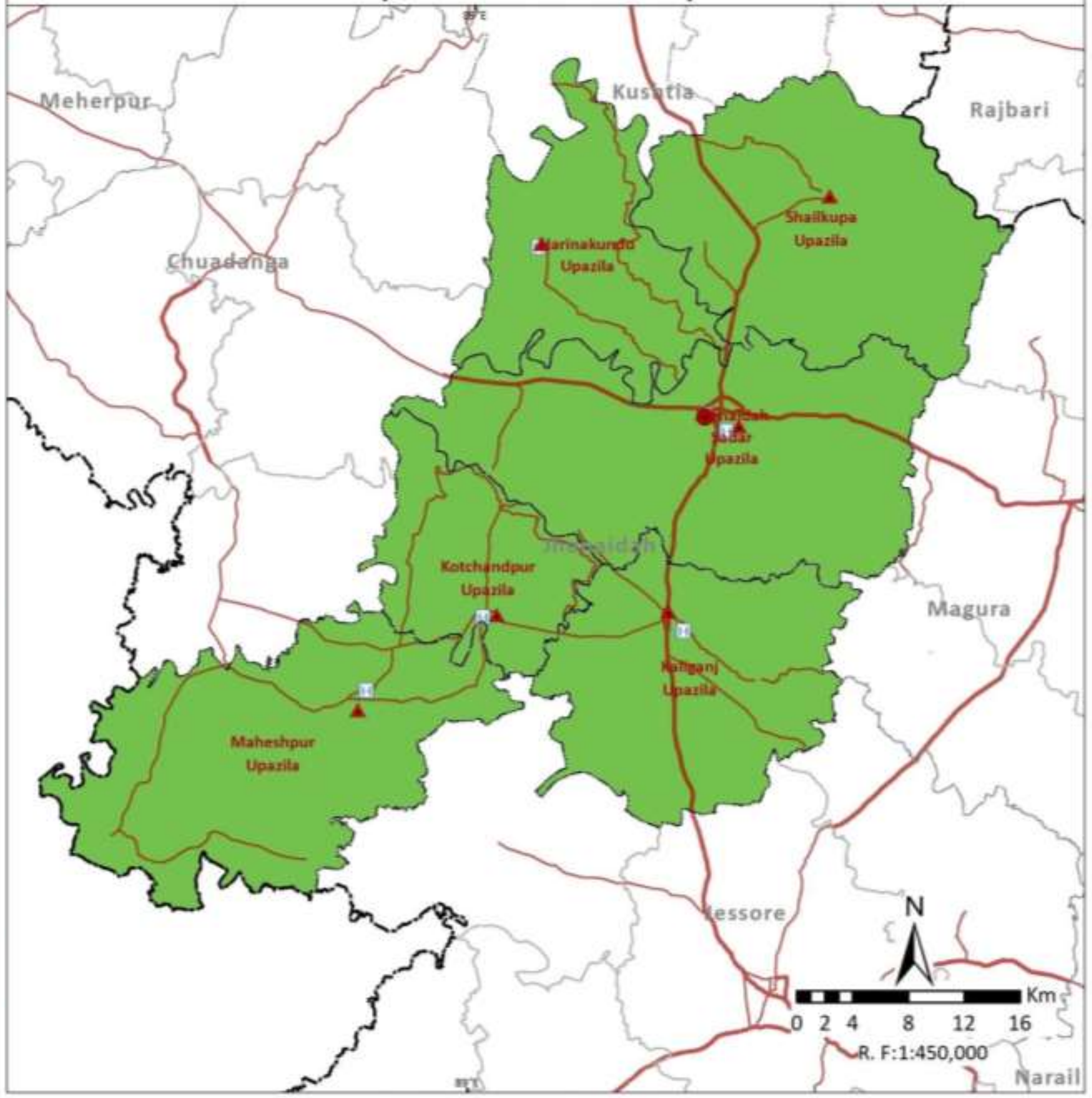
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Jessore District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Jhenaidah District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

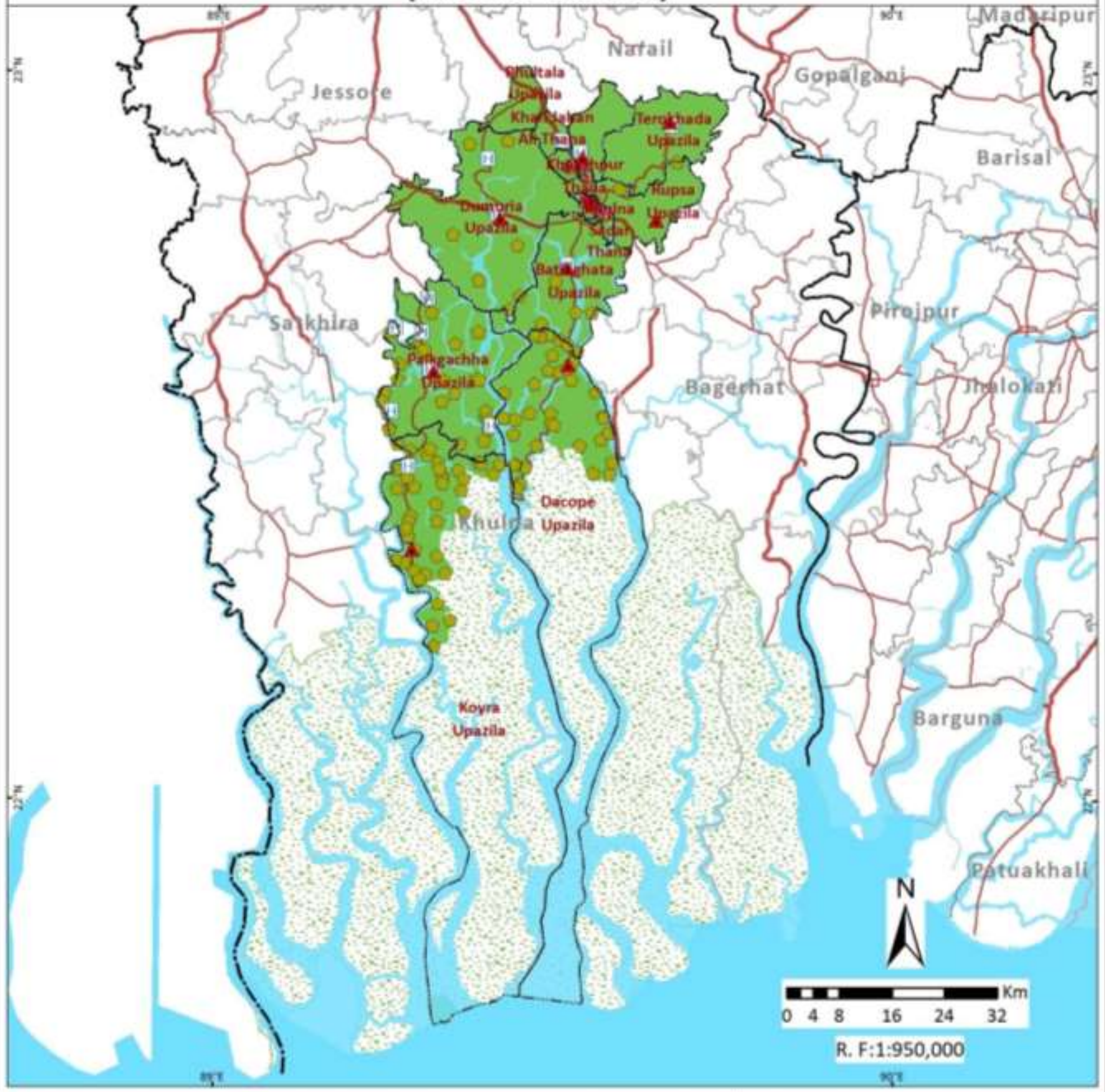
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

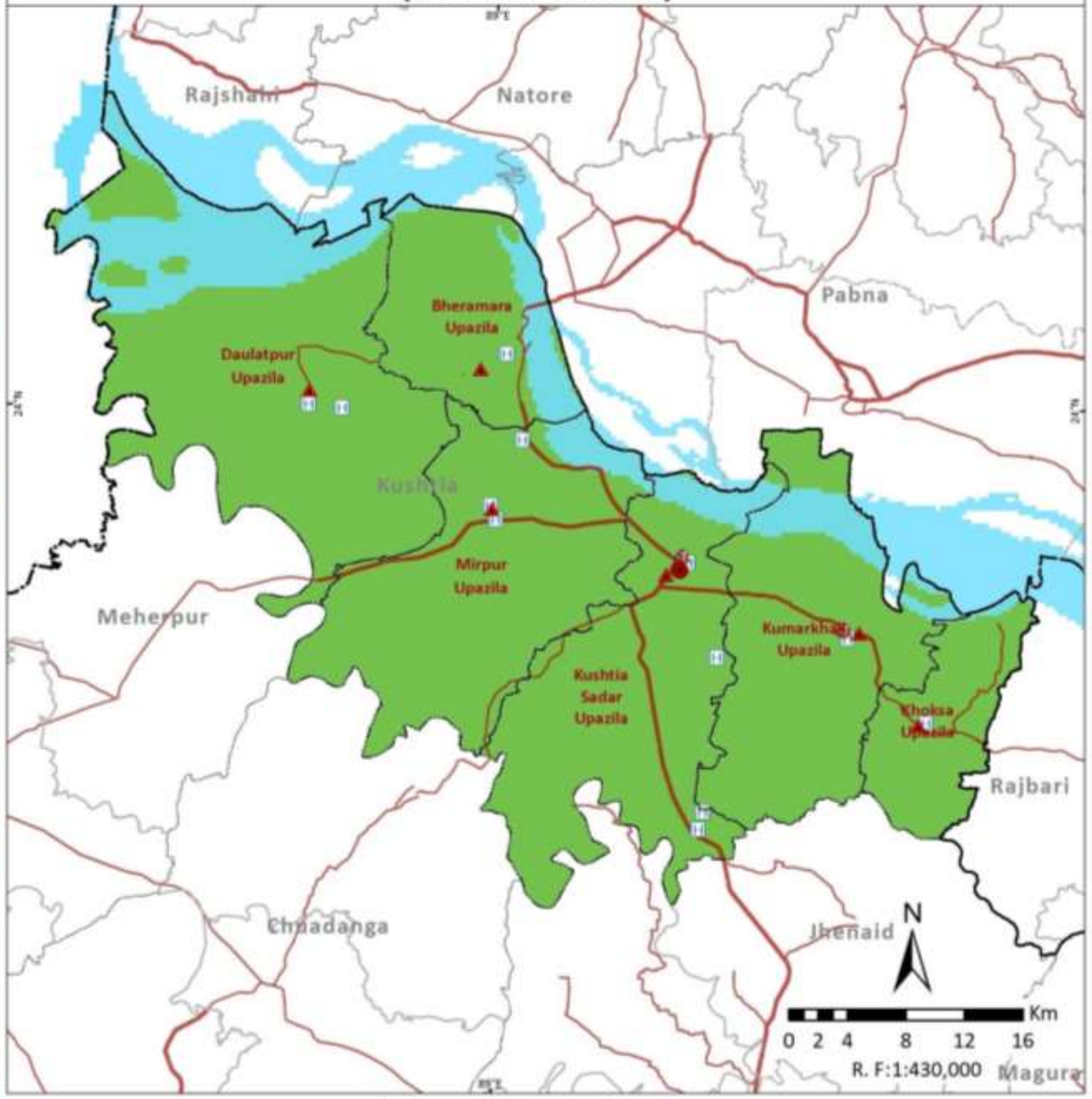
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Khulna District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Kushtia District)



Legend

Country Boundary	Division Head Quarter	**Risk of HH Structures**
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

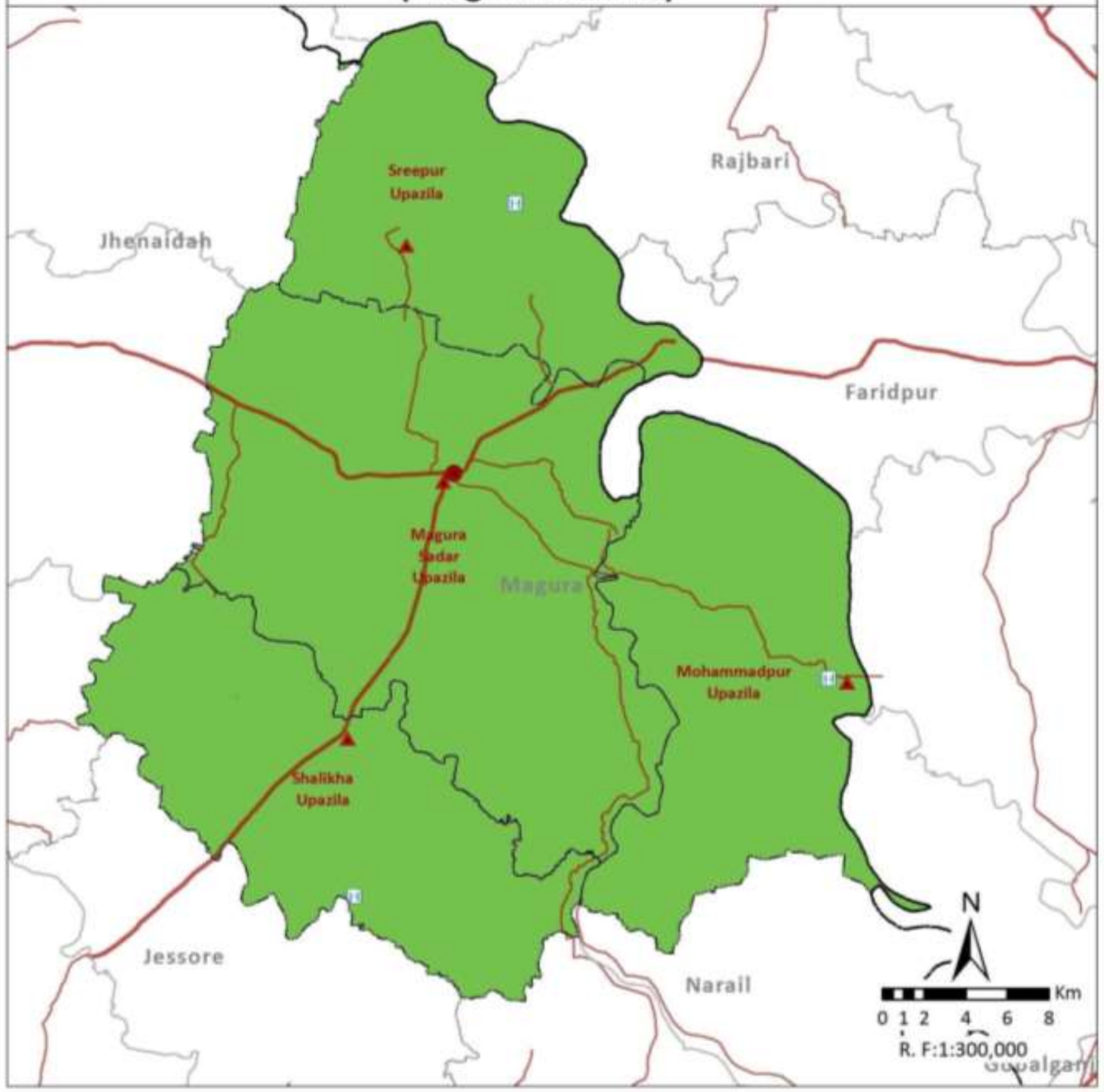
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

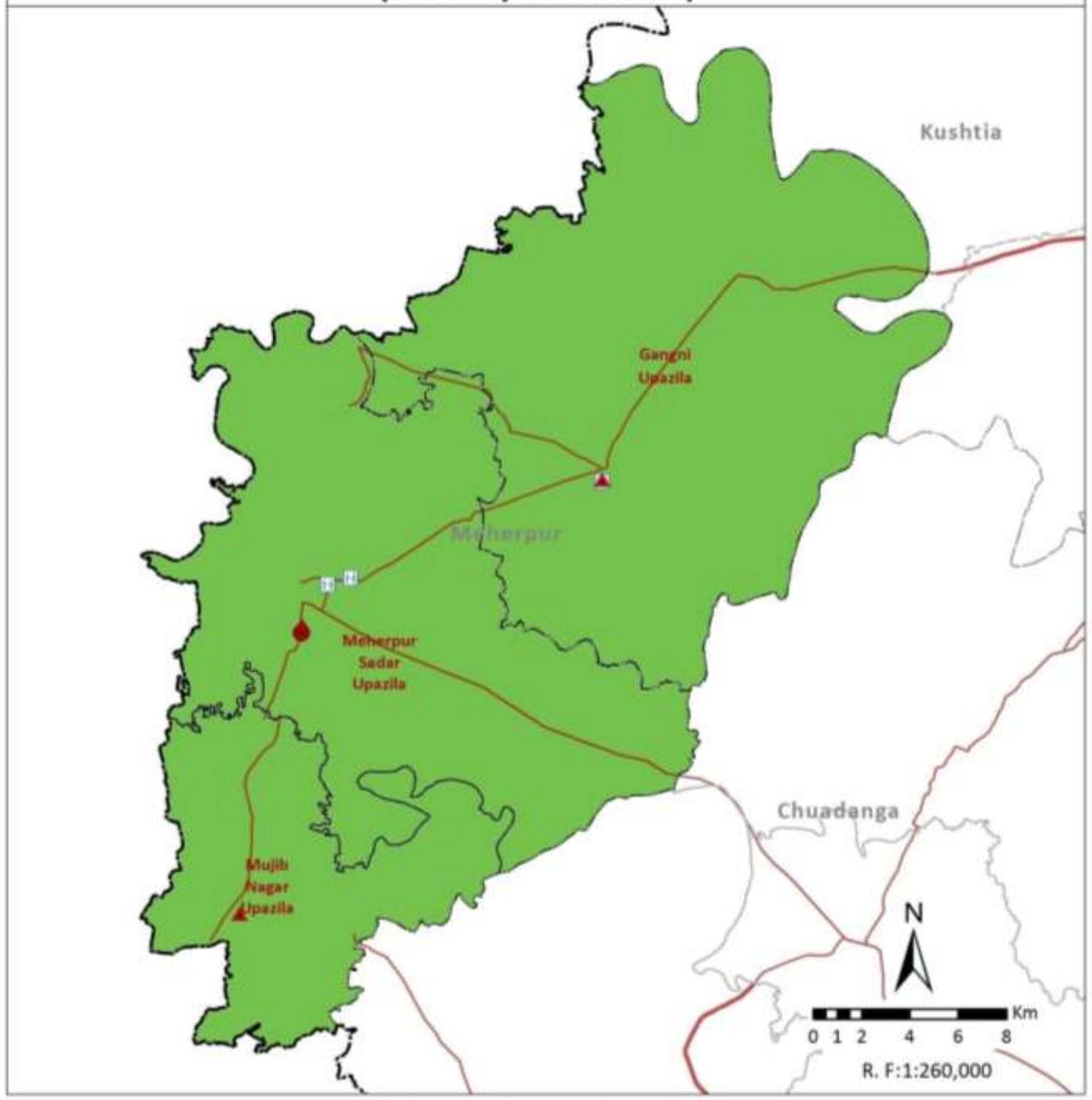
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Magura District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Meherpur District)



Legend

Country Boundary		District Head Quarter	Risk of HH Structures	
Division Boundary		Upazila Head Quarter		No Risk
District Boundary		Fire Station		Very Low
Upazila Boundary		Hospital		Low
National High Way		Cyclone Shelter		Moderate
Regional High Way		River/Sea/Lake		High
		Sundarbans		Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

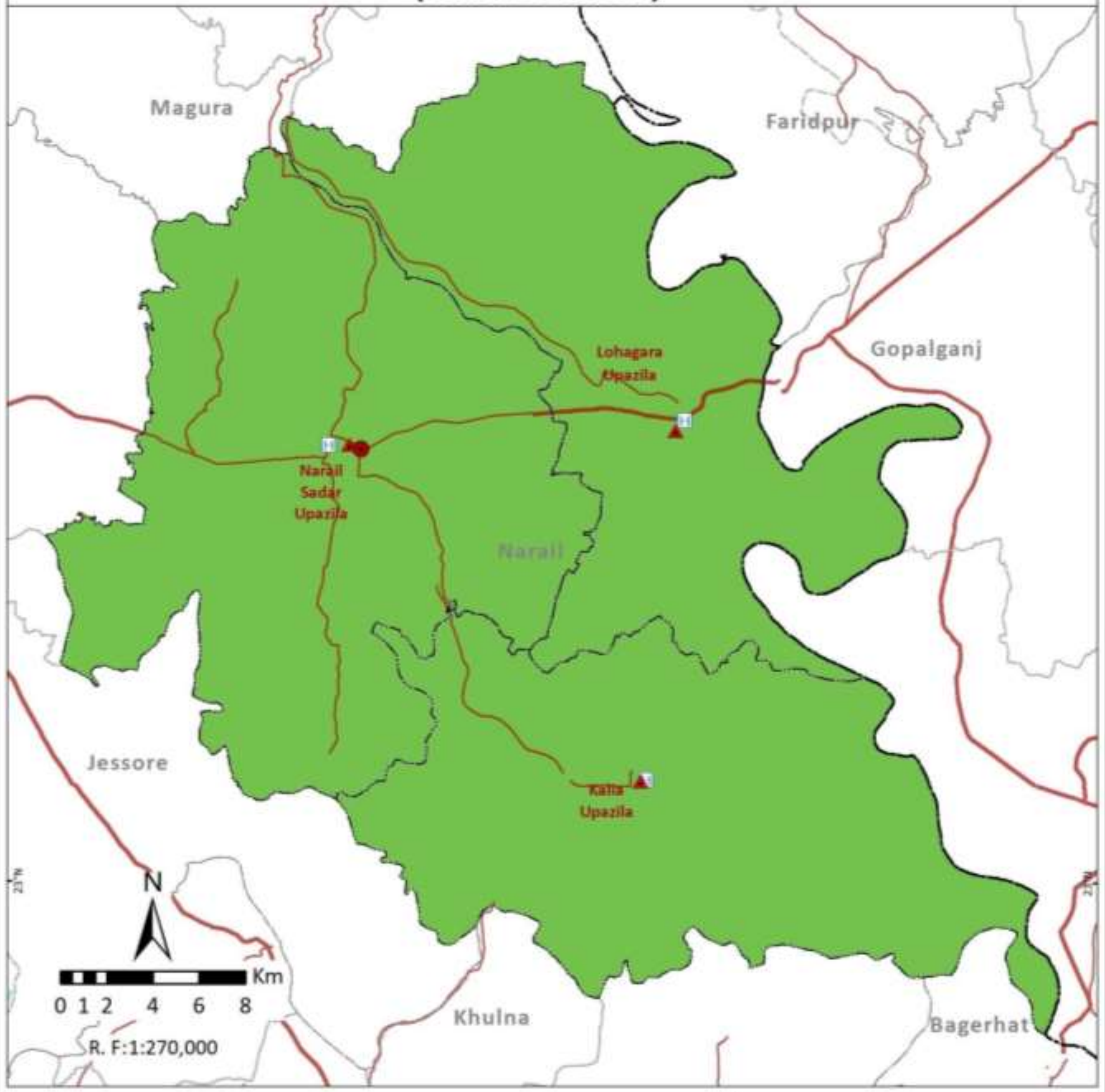
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

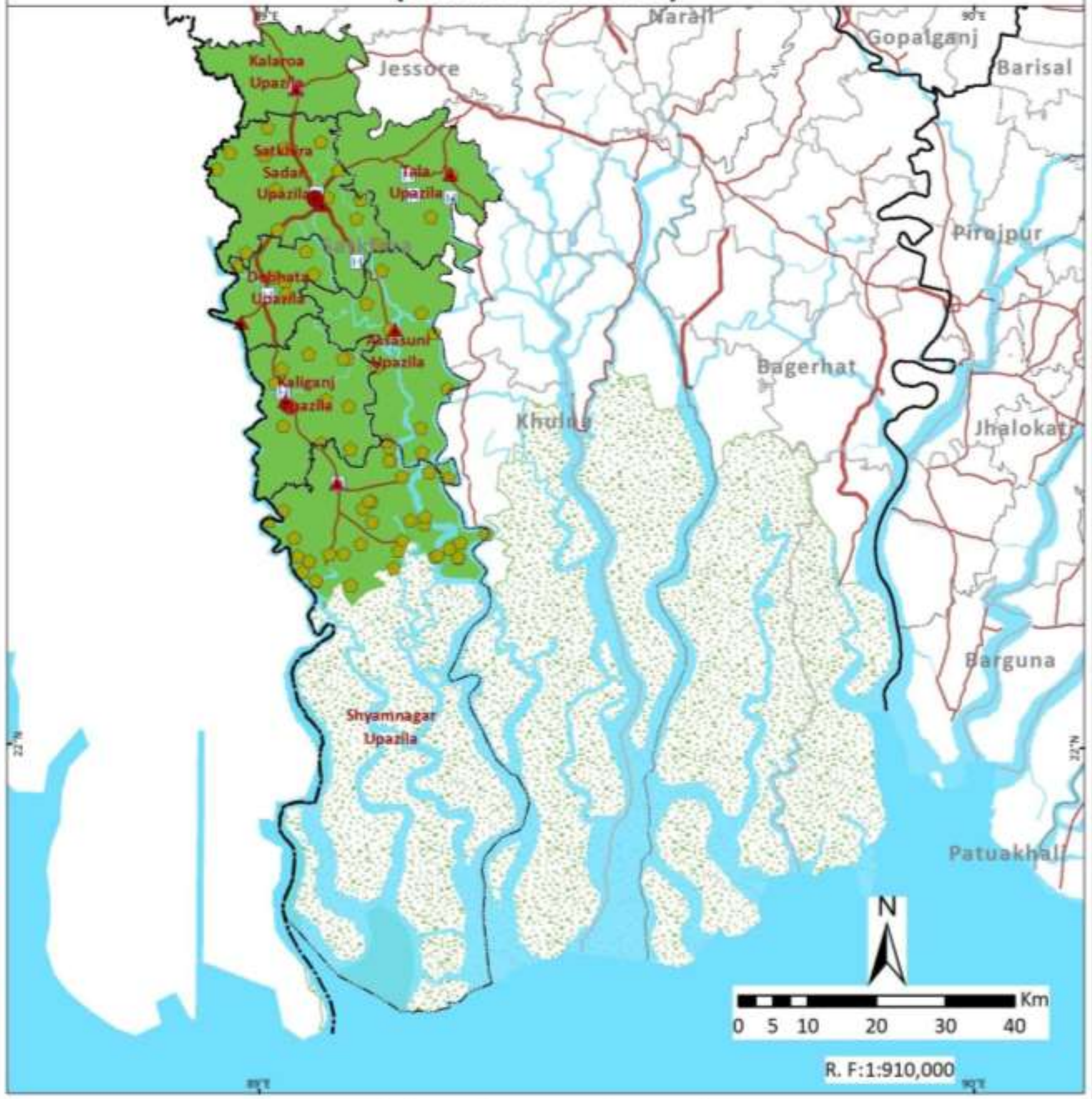
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Narail District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Satkhira District)



Legend

Country Boundary	District Head Quarter	**Risk of HH Structures**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire Station	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Mymensingh Division)

Legend

	Country Boundary	Risk Levels	
	Division Boundary		No Risk
	District Boundary		Very Low
	Division Head Quarter		Low
	District Head Quarter		Moderate
	River/Sea/Lake		High
	Sundarbans		Very High

Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

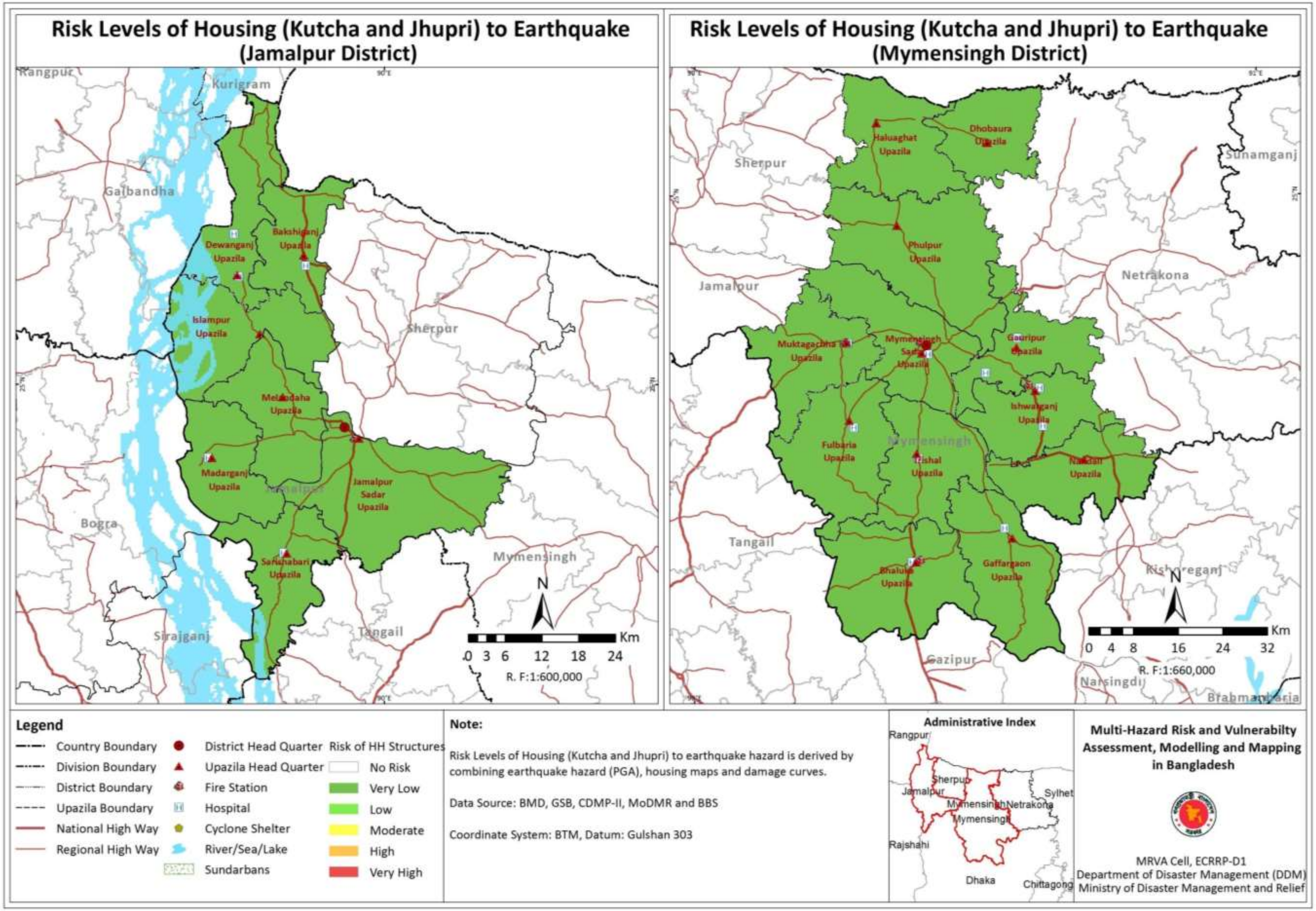
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

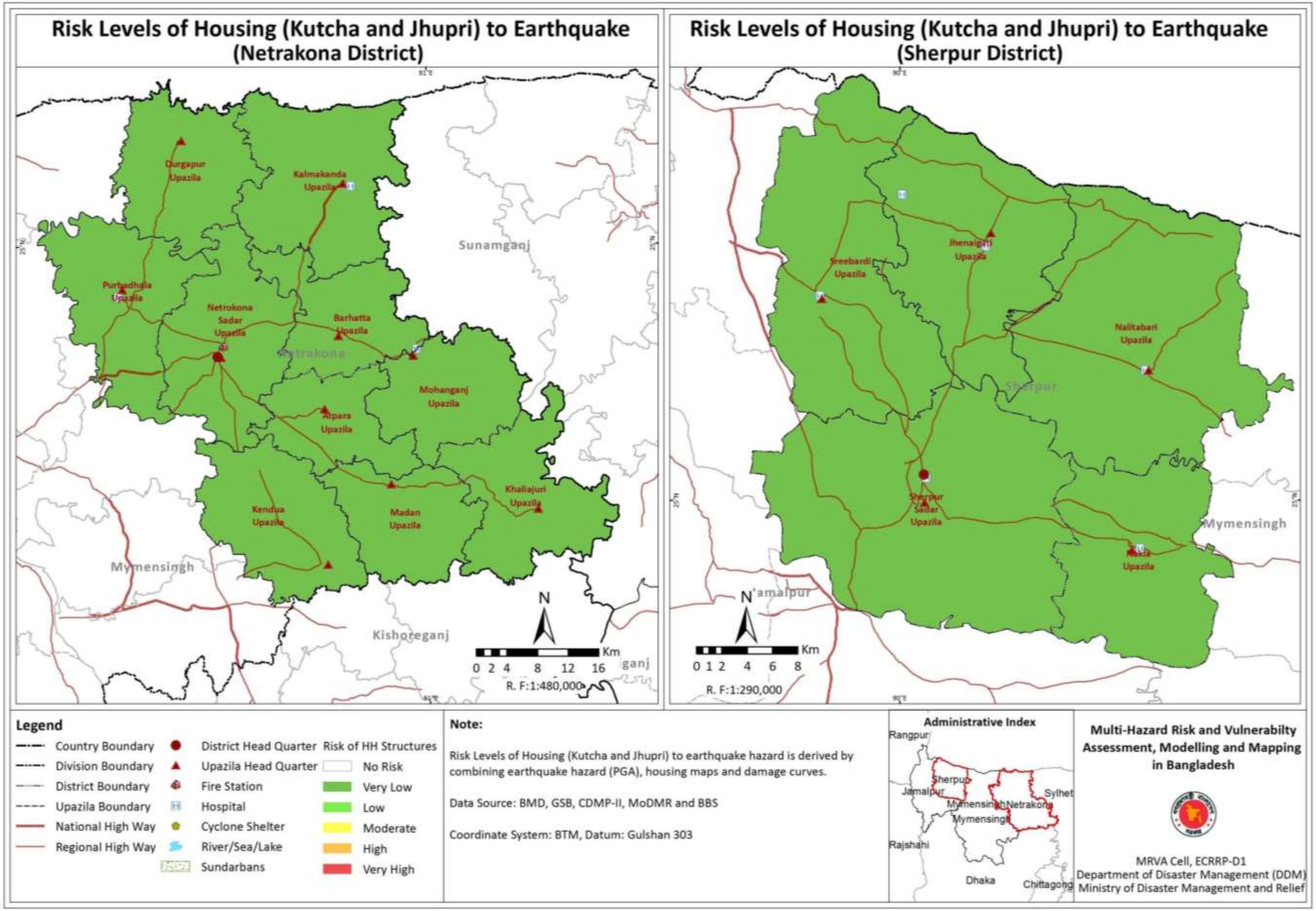
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Jamalpur District)
Rangpur
Kurigram
Gaibandha
Dewanganj Upazila
Bakshiganj Upazila
Islampur Upazila
Sherpur
Melandaha Upazila
Madarganj Upazila
Jamalpur
Jamalpur Sadar Upazila
Bogra
Sarishabari Upazila
Mymensingh
Sirajganj
Tangail
Km
0 3 6 12 18 24
R. F:1:600,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Mymensingh District)
Haluaghat Upazila
Dhobaura Upazila
Sherpur
Sunamganj
Phulpur Upazila
Jamalpur
Netrakona
Muktagachha Upazila
Mymensingh Sadar Upazila
Gauripur Upazila
Ishwarganj Upazila
Fulbaria Upazila
Mymensingh
Trishal Upazila
Nandail Upazila
Tangail
Gaffargaon Upazila
Bhaluka Upazila
Kishoreganj
Gazipur
Narsingdi
Brahmanbaria
Km
0 4 8 16 24 32
R. F:1:660,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sherpur
Jamalpur
Sylhet
Mymensingh
Netrakona
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Netrakona District)
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Sherpur District)
Durgapur Upazila
Kalmakanda Upazila
Purbadhala Upazila
Netrokona Sadar Upazila
Barhatta Upazila
Netrakona
Sunamganj
Mohanganj Upazila
Atpara Upazila
Khaliajuri Upazila
Kendua Upazila
Madan Upazila
Mymensingh
Kishoreganj
R. F:1:480,000
0 2 4 8 12 16 Km
Sreebardi Upazila
Jhenaigati Upazila
Nalitabari Upazila
Sherpur
Sherpur Sadar Upazila
Nakla Upazila
Mymensingh
Jamalpur
R. F:1:290,000
0 1 2 4 6 8 Km
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Sherpur
Jamalpur
Mymensingh
Netrakona
Sylhet
Rajshahi
Dhaka
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Rajshahi Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk Levels: No Risk, Very Low, Low, Moderate, High, Very High

Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

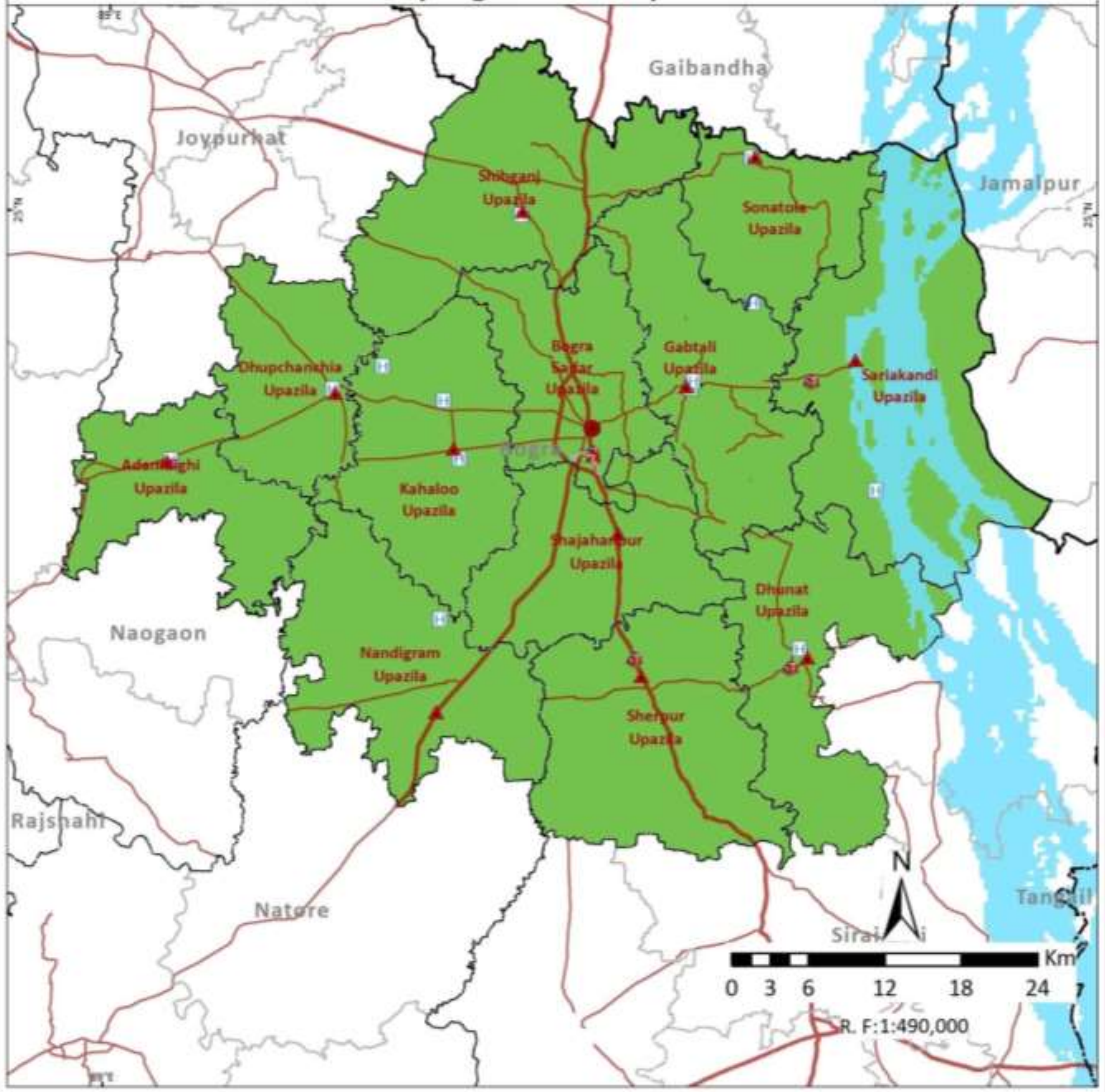
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

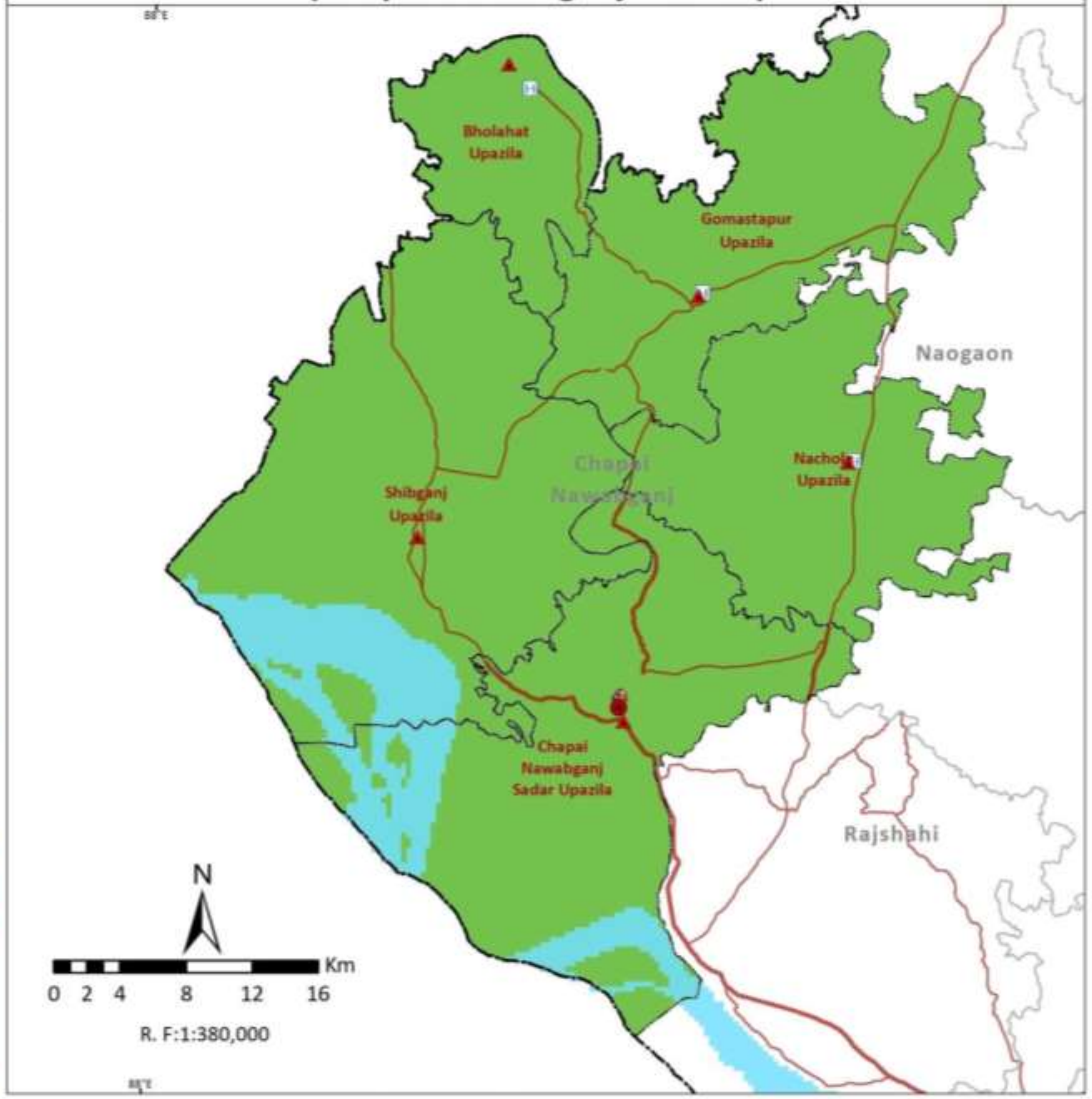
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Bogra District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Chapai Nawabganj District)



Legend

Country Boundary	District Head Quarter	Risk of HH Structures			
Division Boundary	Upazila Head Quarter	No Risk			
District Boundary	Fire Station	Very Low			
Upazila Boundary	Hospital	Low			
National High Way	Cyclone Shelter	Moderate			
Regional High Way	River/Sea/Lake	High			
	Sundarbans	Very High			

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

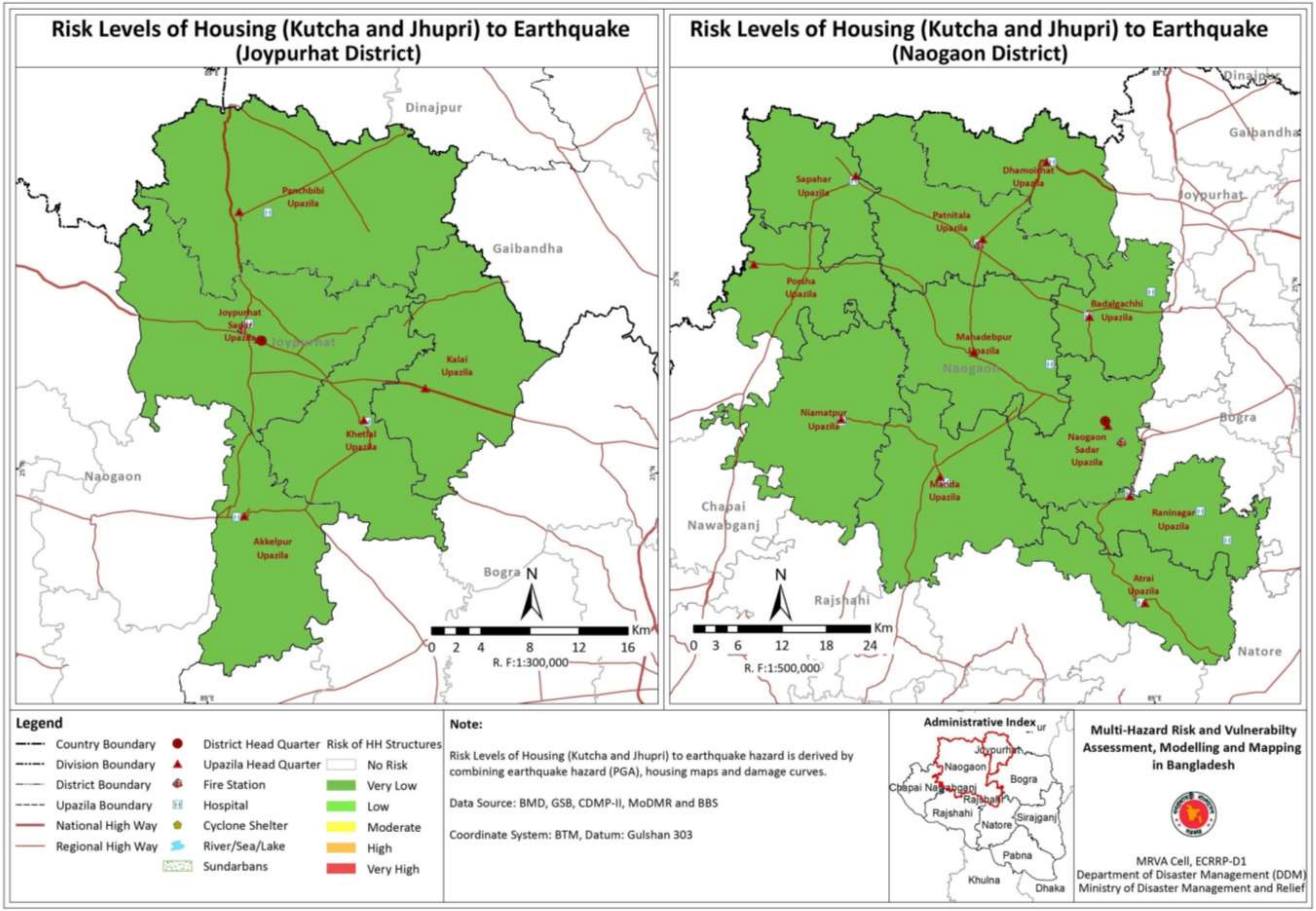
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

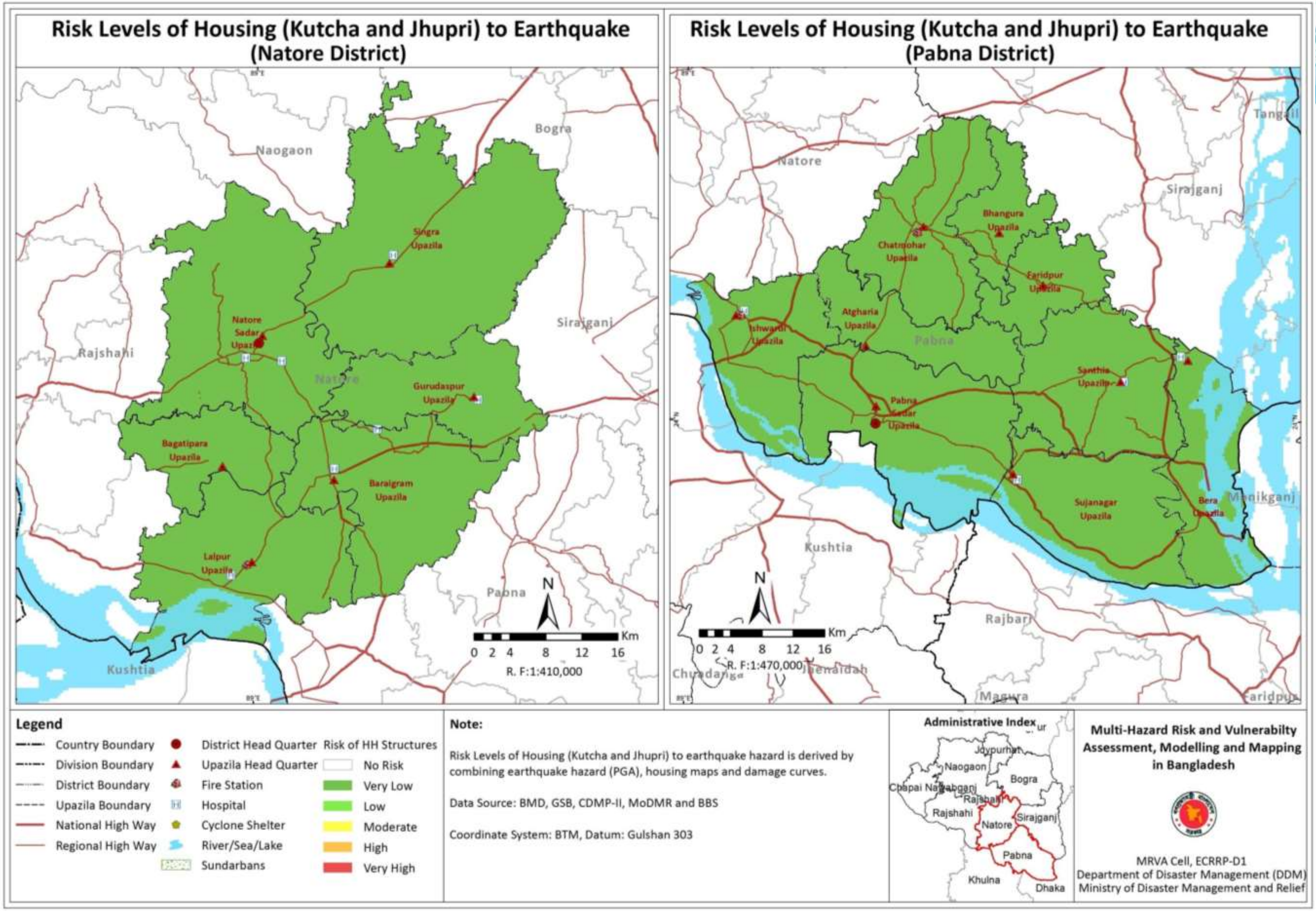
Coordinate System: BTM, Datum: Gulshan 303

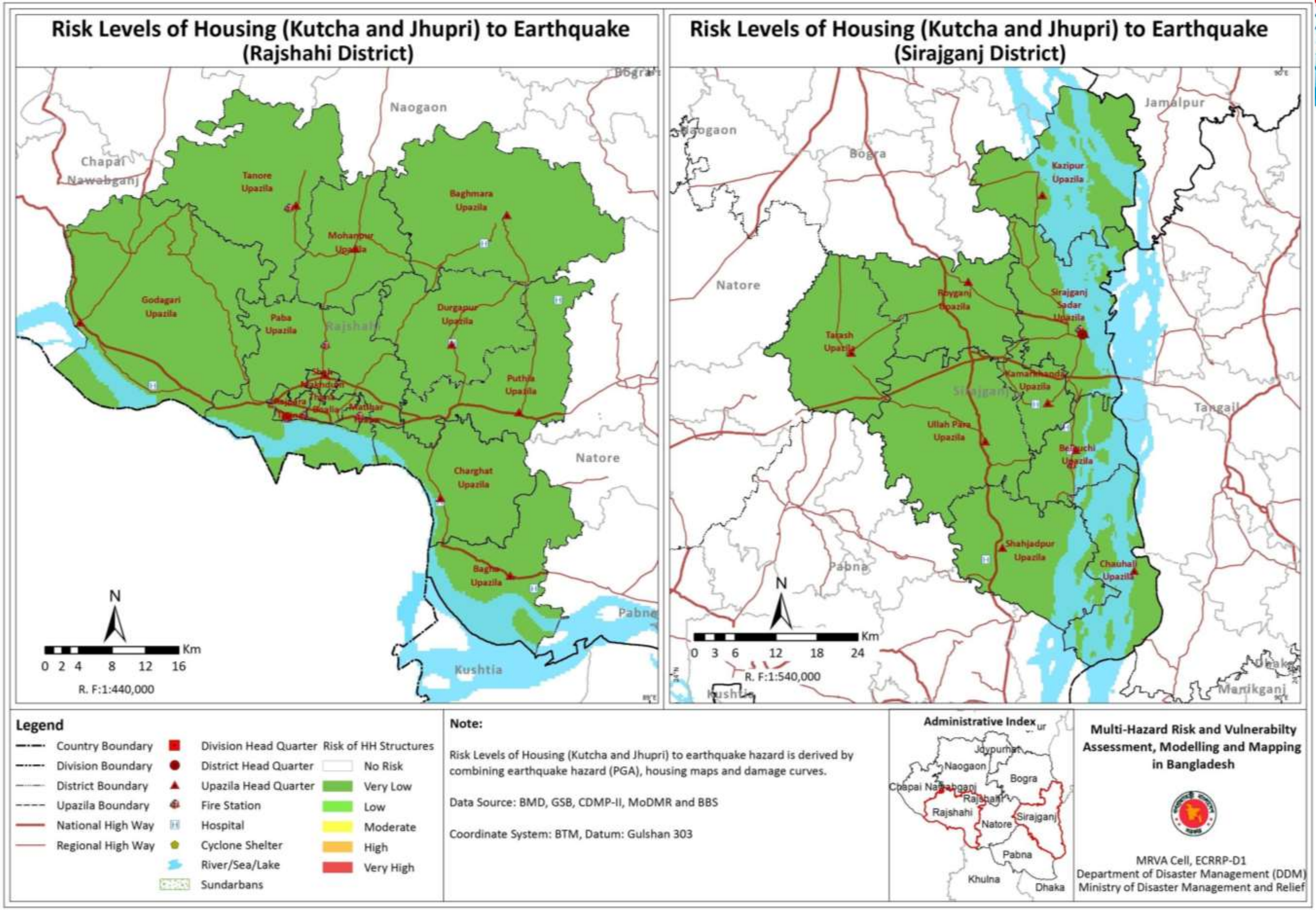
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Joypurhat District)
Dinajpur
Gaibandha
Naogaon
Bogra
Panchbibi Upazila
Joypurhat Sadar Upazila
Joypurhat
Kalai Upazila
Khetlal Upazila
Akkelpur Upazila
N
Km
0 2 4 8 12 16
R. F:1:300,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Naogaon District)
Gaibandha
Joypurhat
Bogra
Natore
Chapai Nawabganj
Rajshahi
Sapahar Upazila
Dhamoirhat Upazila
Patnitala Upazila
Porsha Upazila
Badalgachhi Upazila
Mahadebpur Upazila
Naogaon
Niamatpur Upazila
Naogaon Sadar Upazila
Manda Upazila
Raninagar Upazila
Atrai Upazila
N
Km
0 3 6 12 18 24
R. F:1:500,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Natore District)
Naogaon
Bogra
Rajshahi
Sirajganj
Natore
Singra Upazila
Natore Sadar Upazila
Gurudaspur Upazila
Bagatipara Upazila
Baraigram Upazila
Lalpur Upazila
Pabna
Kushtia
N
Km
0 2 4 8 12 16
R. F:1:410,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Pabna District)
Tangail
Natore
Sirajganj
Bhangura Upazila
Chatmohar Upazila
Faridpur Upazila
Atgharia Upazila
Ishwardi Upazila
Pabna
Santhia Upazila
Pabna Sadar Upazila
Sujanagar Upazila
Bera Upazila
Manikganj
Kushtia
Rajbari
N
Km
0 2 4 8 12 16
R. F:1:470,000
Magura
Faridpur
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Rajshahi District)
Naogaon
Chapai Nawabganj
Bogra
Natore
Pabna
Kushtia
Tanore Upazila
Baghmara Upazila
Mohanpur Upazila
Godagari Upazila
Paba Upazila
Rajshahi
Durgapur Upazila
Puthia Upazila
Charghat Upazila
Bagha Upazila
N
Km
0 2 4 8 12 16
R. F:1:440,000
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Sirajganj District)
Jamalpur
Naogaon
Bogra
Natore
Tangail
Pabna
Manikganj
Kazipur Upazila
Royganj Upazila
Sirajganj Sadar Upazila
Tarash Upazila
Kamarkhanda Upazila
Sirajganj
Ullah Para Upazila
Belkuchi Upazila
Shahjadpur Upazila
Chauhali Upazila
N
Km
0 3 6 12 18 24
R. F:1:540,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Rajshahi
Natore
Sirajganj
Pabna
Khulna
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Rangpur Division)

Legend

Country Boundary		Risk Levels	
Division Boundary			No Risk
District Boundary			Very Low
Division Head Quarter			Low
District Head Quarter			Moderate
River/Sea/Lake			High
Sundarbans			Very High

Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

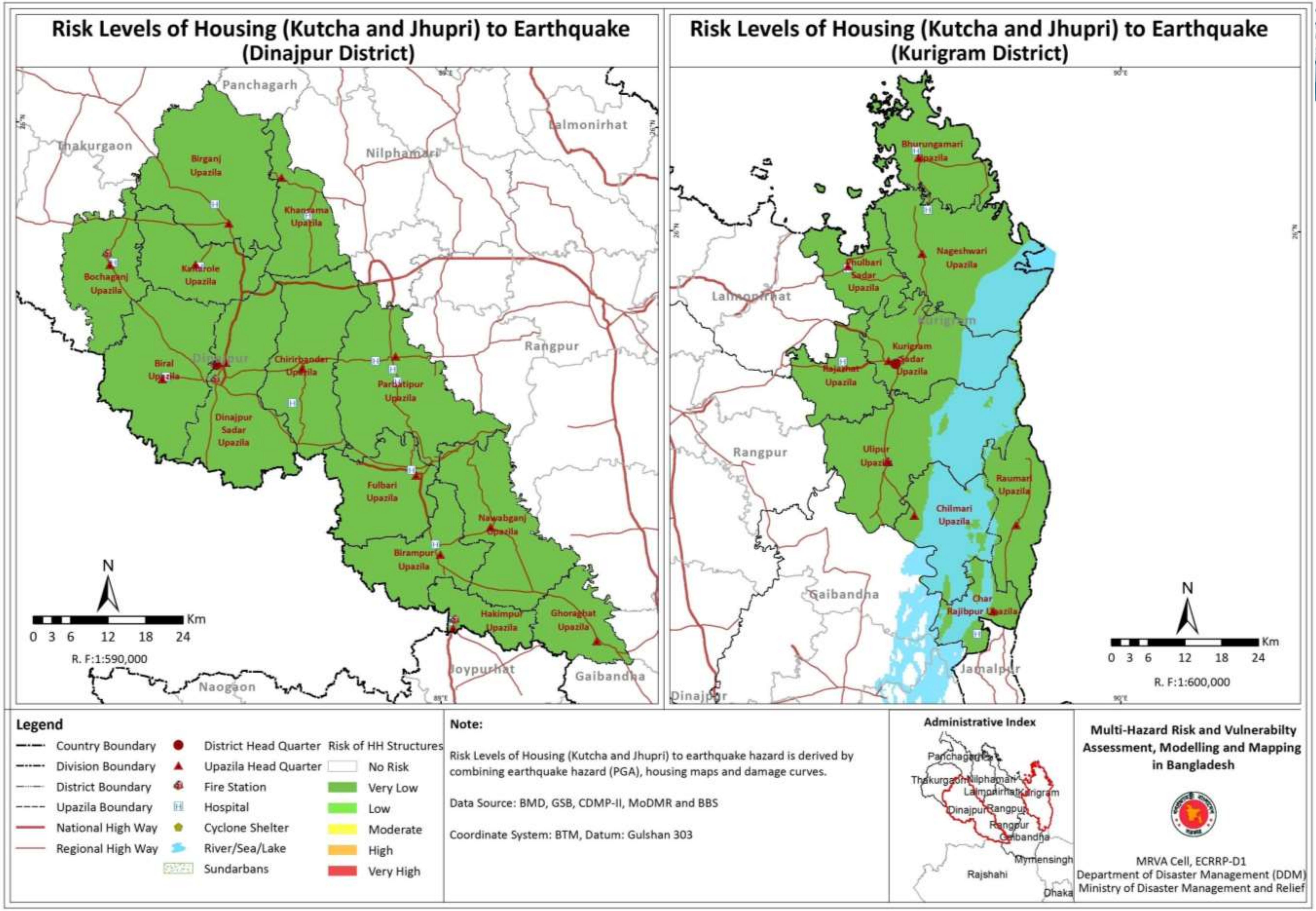
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

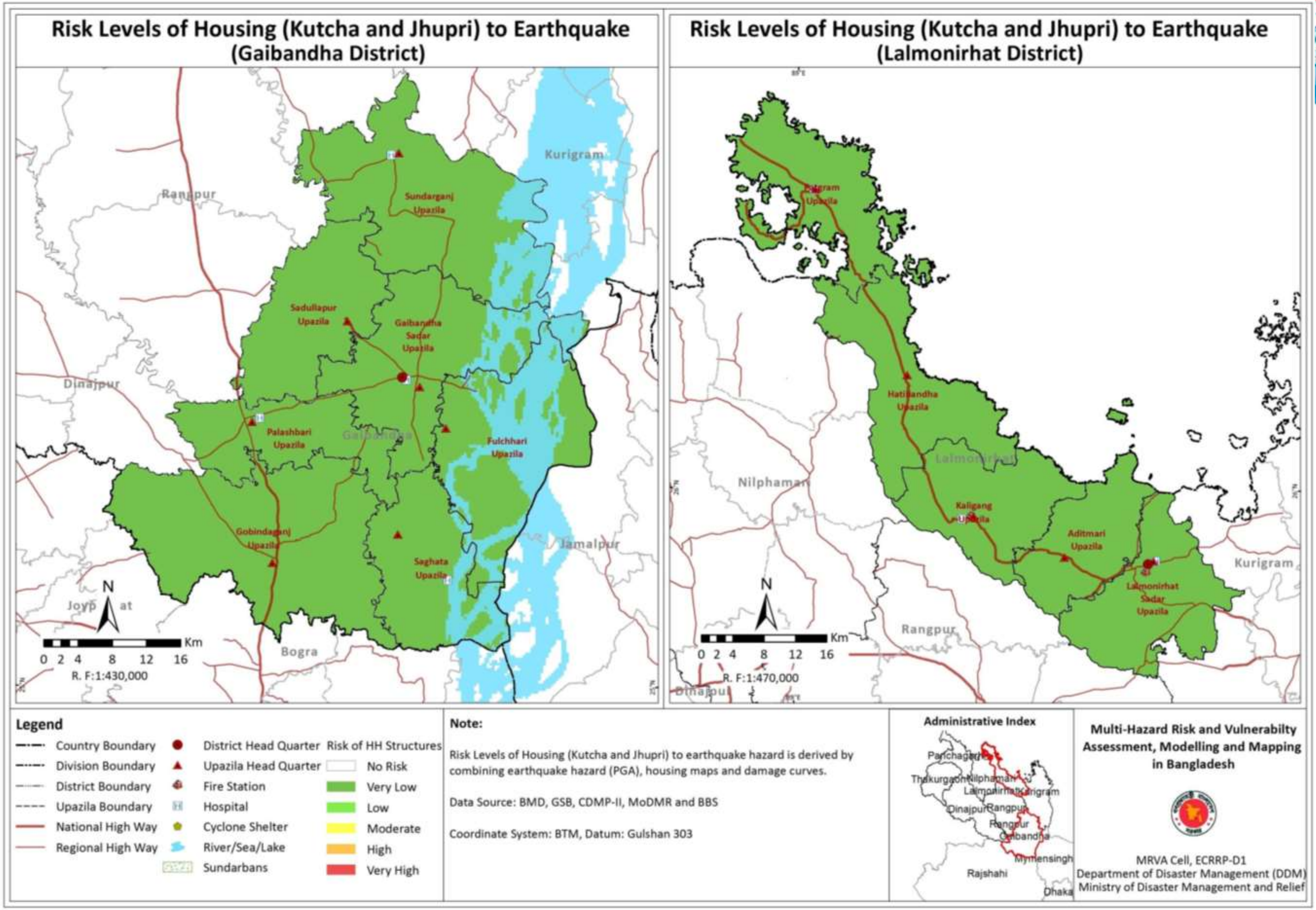
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

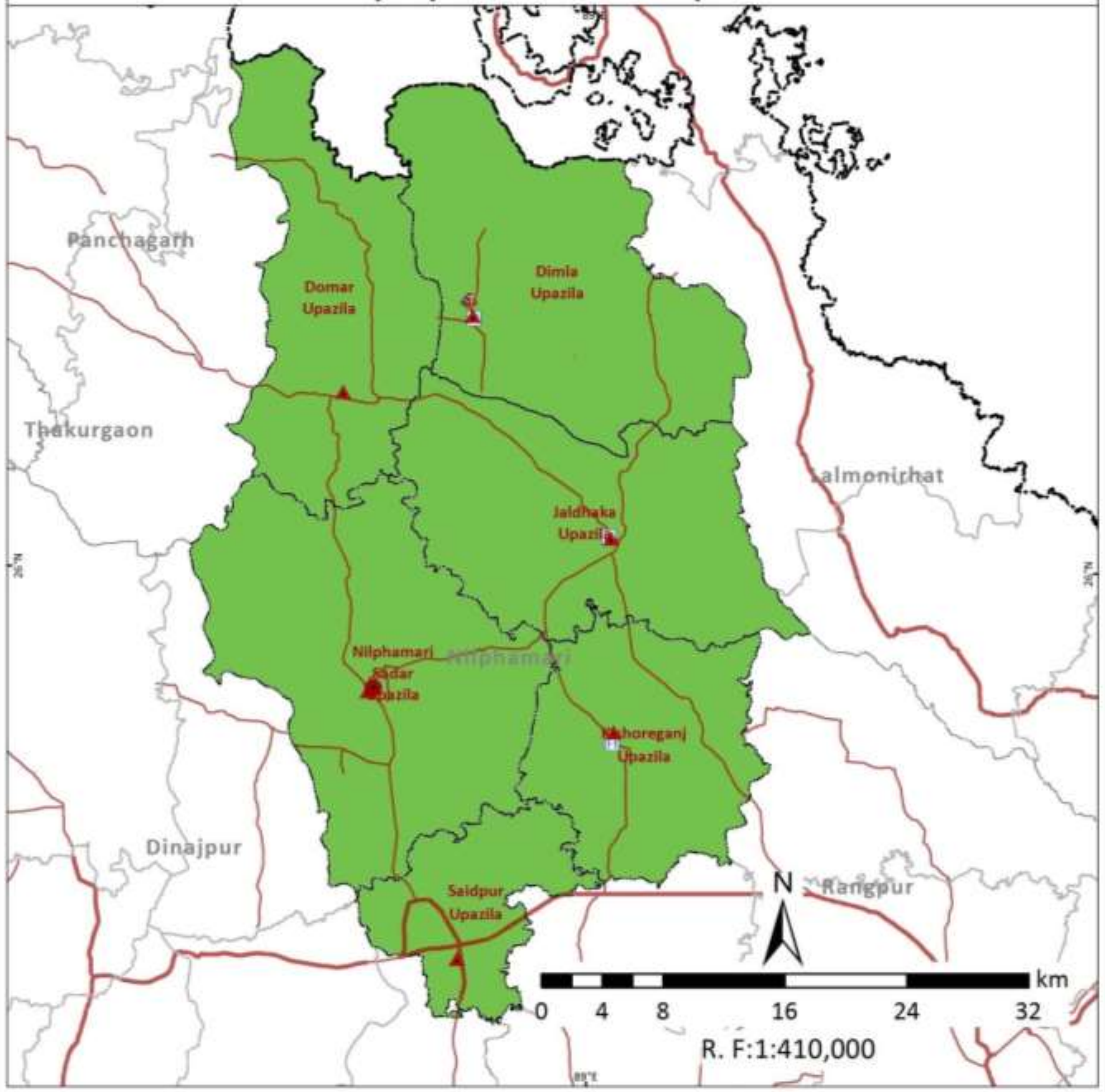
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

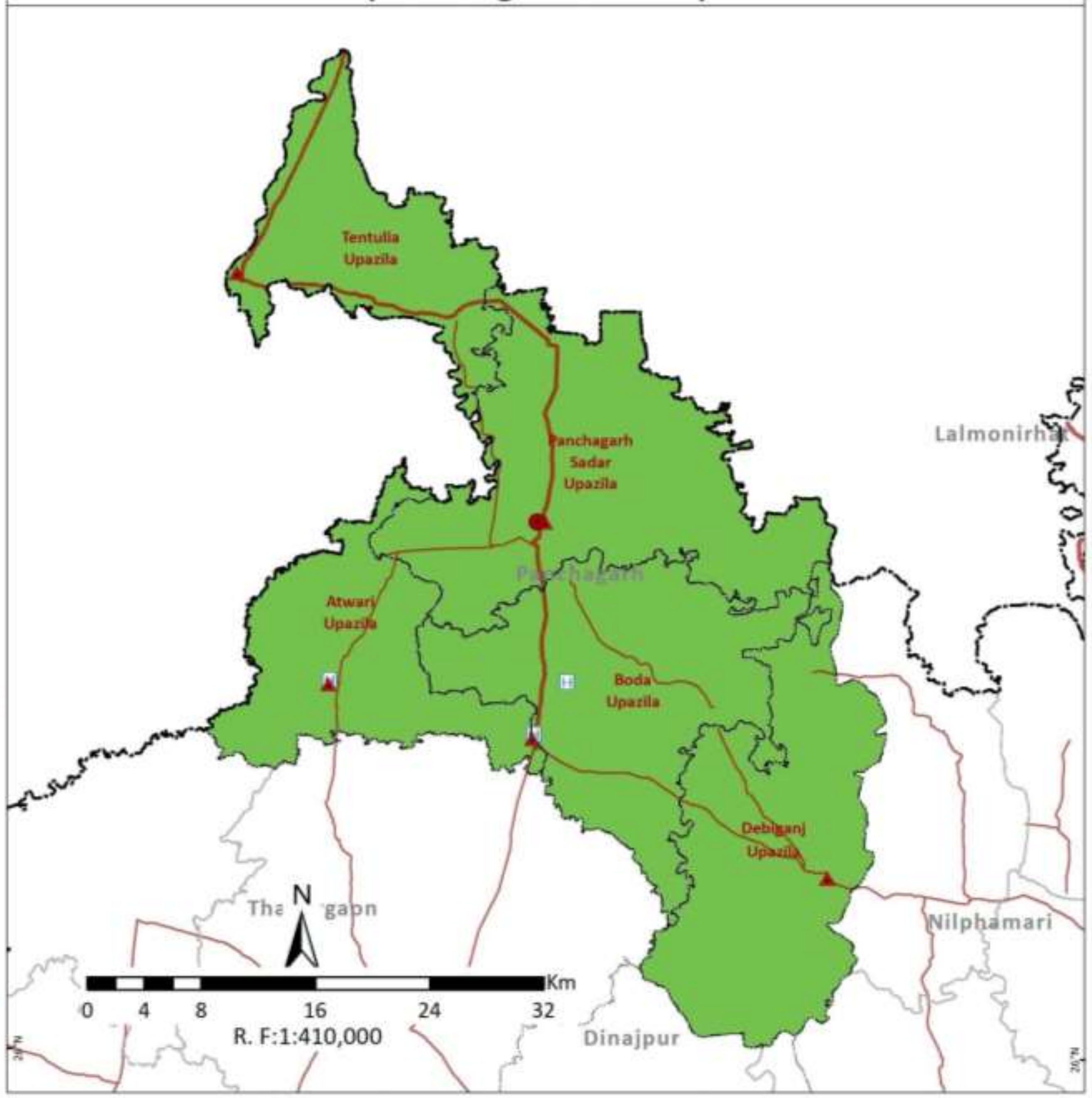

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Dinajpur District)
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Kurigram District)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Rangpur
Naogaon
Joypurhat
Gaibandha
Birganj Upazila
Khansama Upazila
Kaharole Upazila
Bochaganj Upazila
Biral Upazila
Dinajpur
Chirirbandar Upazila
Parbatipur Upazila
Dinajpur Sadar Upazila
Fulbari Upazila
Nawabganj Upazila
Birampur Upazila
Hakimpur Upazila
Ghoraghat Upazila
Bhurungamari Upazila
Nageshwari Upazila
Phulbari Sadar Upazila
Kurigram
Kurigram Sadar Upazila
Rajarhat Upazila
Ulipur Upazila
Raumari Upazila
Chilmari Upazila
Char Rajibpur Upazila
Jamalpur
Dinajpur
N
0 3 6 12 18 24 Km
R. F:1:590,000
R. F:1:600,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Mymensingh
Rajshahi
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Gaibandha District)
Kurigram
Rangpur
Sundarganj Upazila
Sadullapur Upazila
Gaibandha Sadar Upazila
Dinajpur
Palashbari Upazila
Gaibandha
Fulchhari Upazila
Gobindaganj Upazila
Saghata Upazila
Jamalpur
N
Km
0 2 4 8 12 16
R. F:1:430,000
Bogra
Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Lalmonirhat District)
Patgram Upazila
Hatibandha Upazila
Lalmonirhat
Nilphamari
Kaliganj Upazila
Aditmari Upazila
Lalmonirhat Sadar Upazila
Kurigram
Rangpur
N
Km
0 2 4 8 12 16
R. F:1:470,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk of HH Structures
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.
Data Source: BMD, GSB, CDMP-II, MoDMR and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Mymensingh
Rajshahi
Dhaka
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Nilphamari District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Panchagarh District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

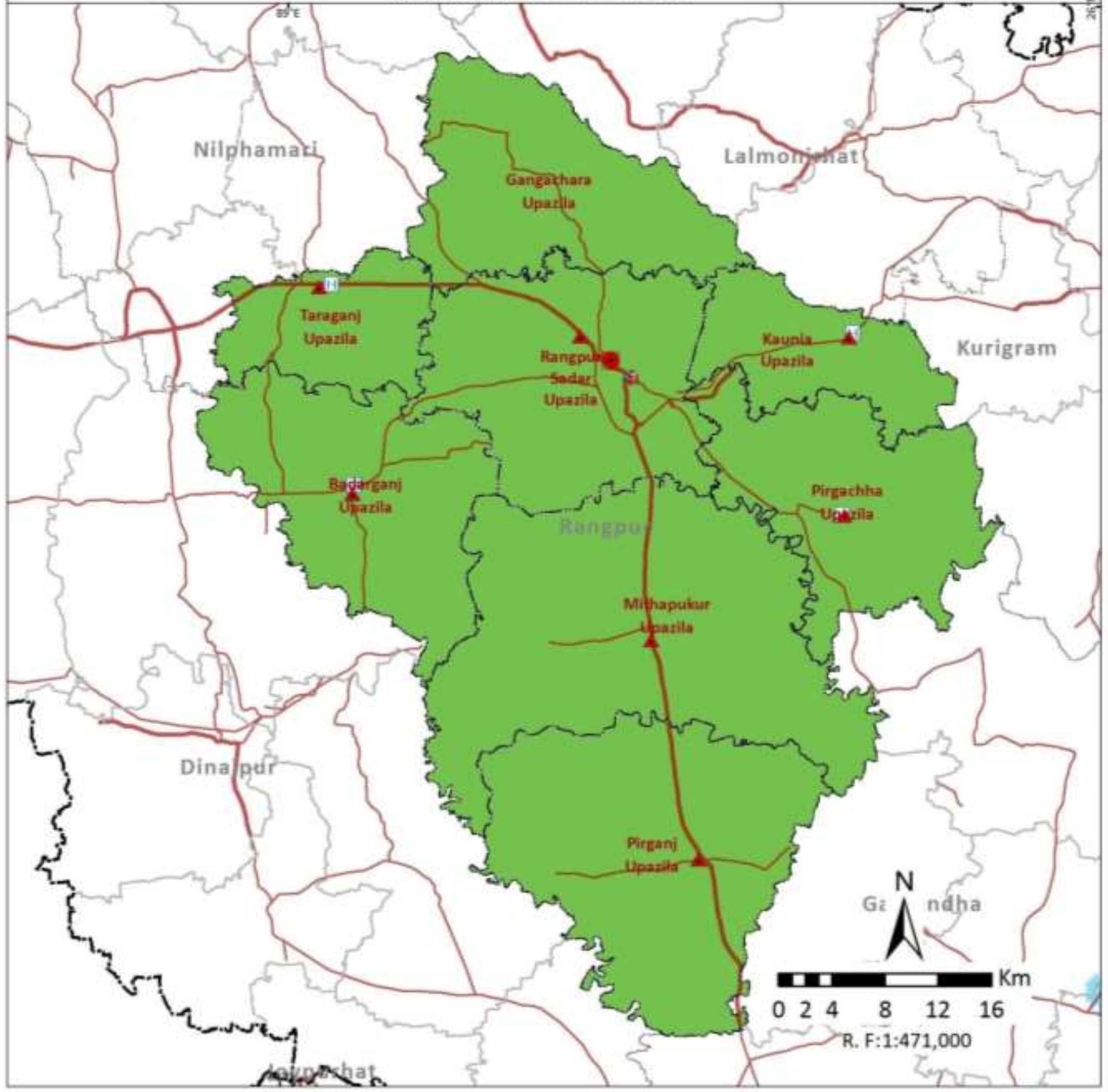
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

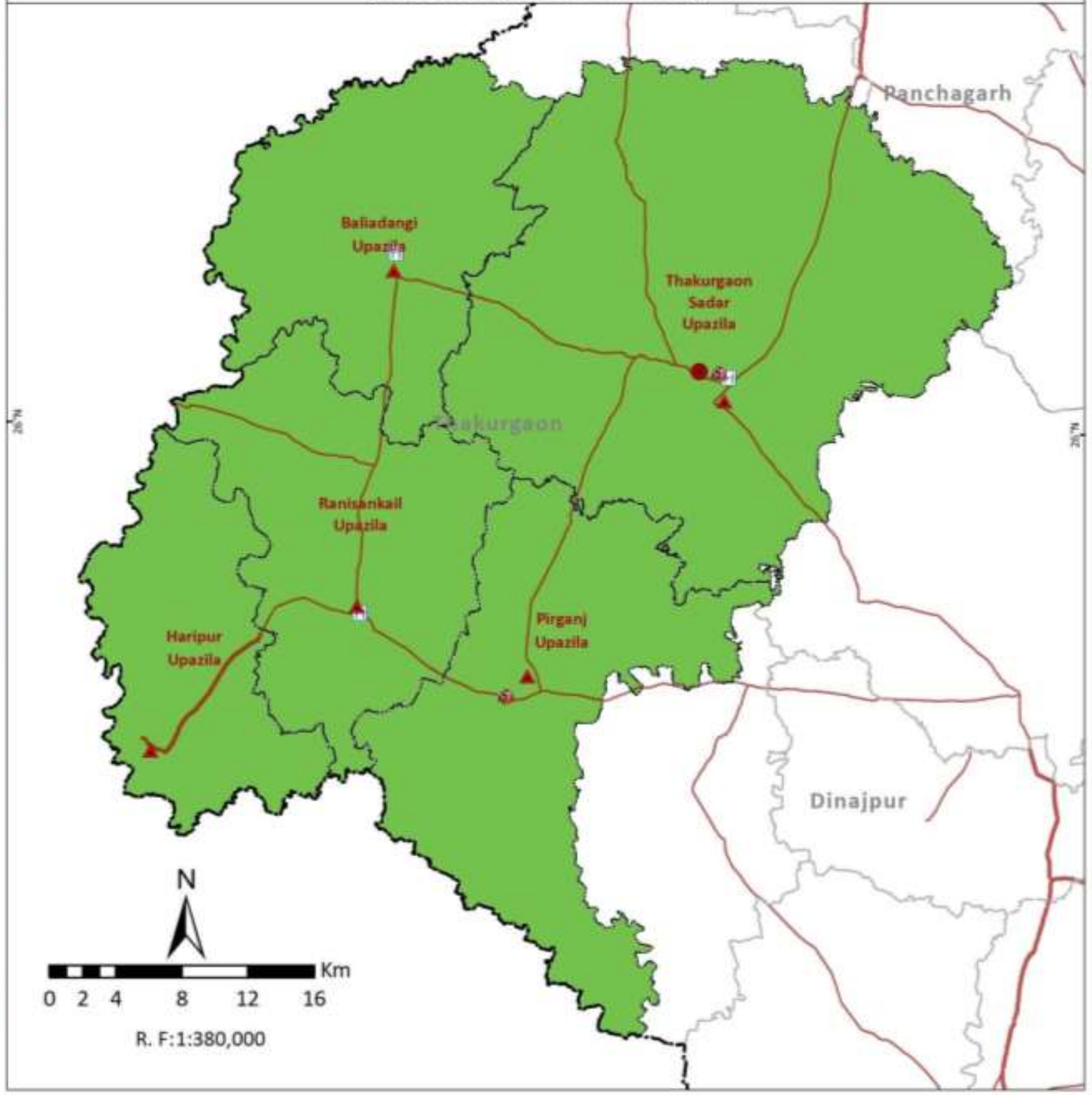
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Rangpur District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Thakurgaon District)



Legend

Country Boundary	Division Head Quarter	**Risk of HH Structures**
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire Station	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

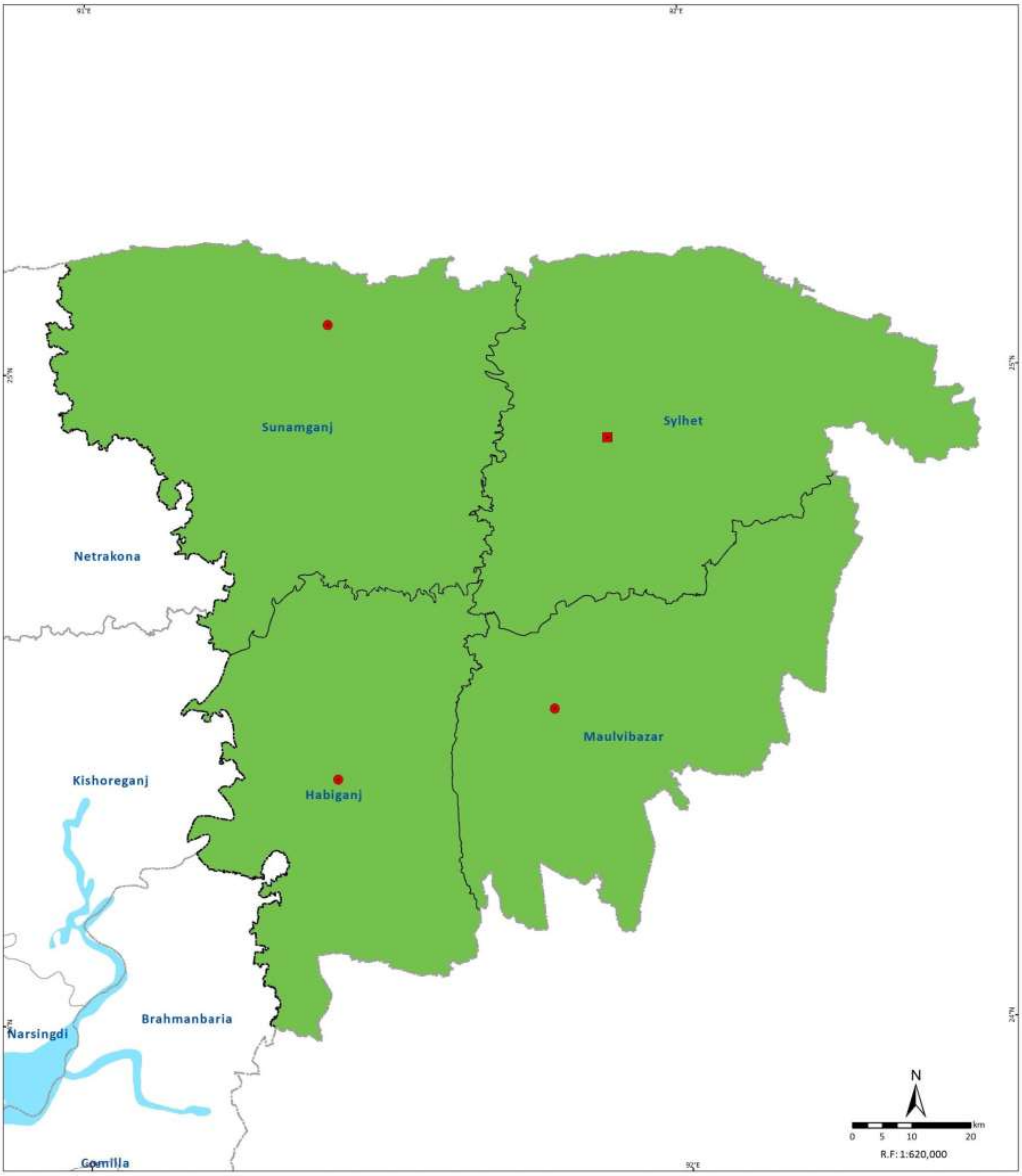
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk Levels
- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:
Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

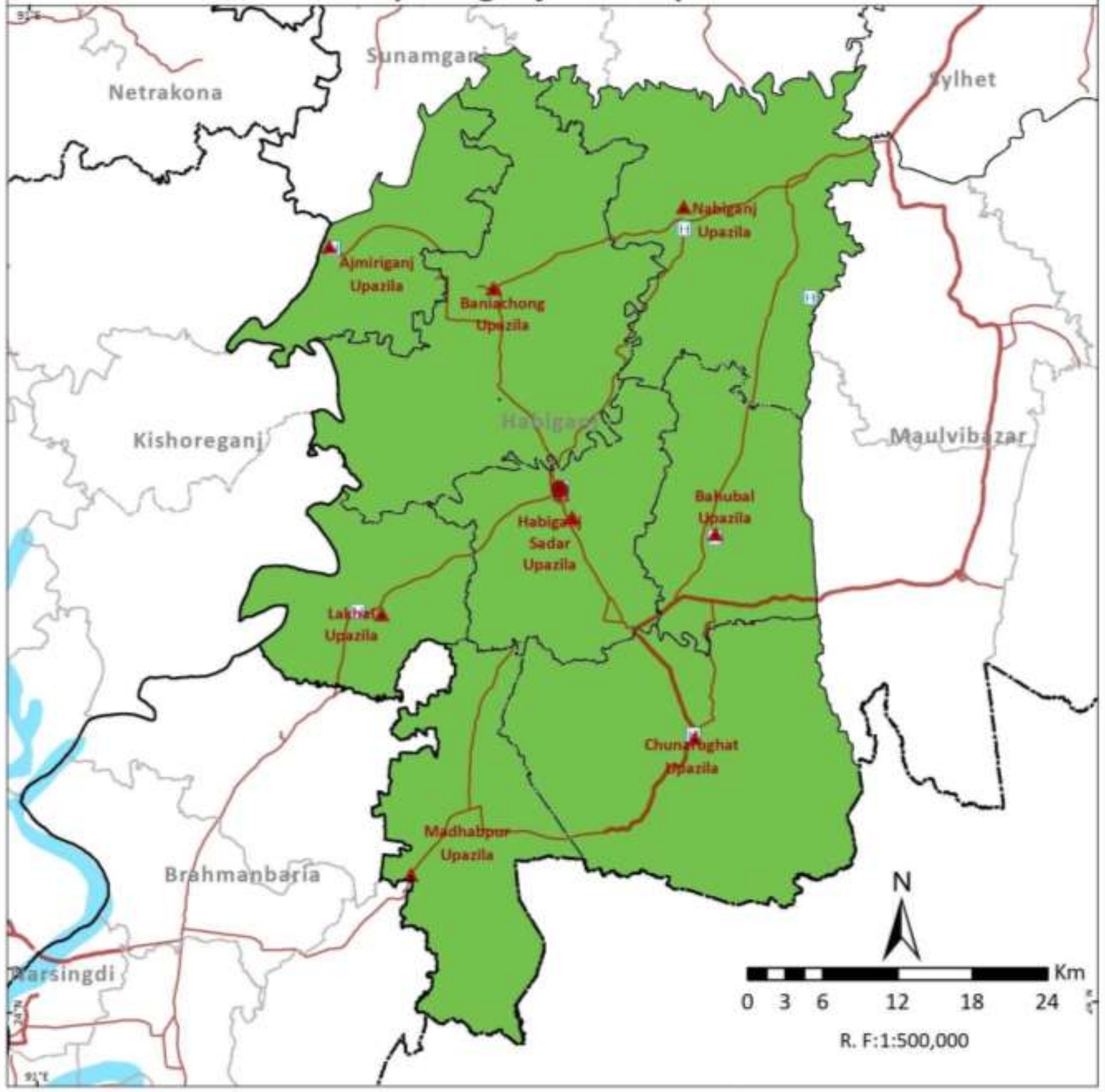
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

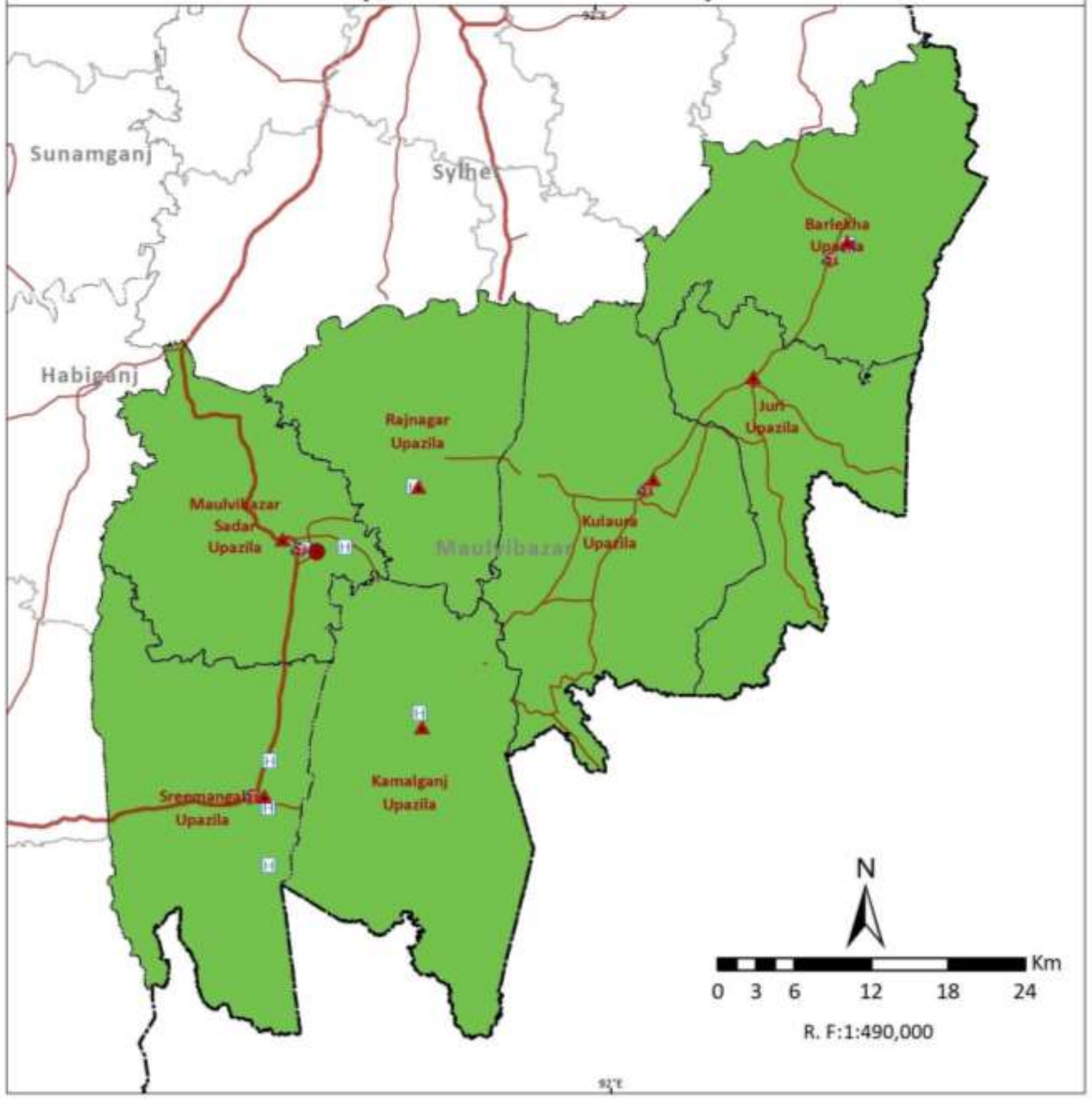
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Habiganj District)



Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Maulvibazar District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire Station
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Risk of HH Structures

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

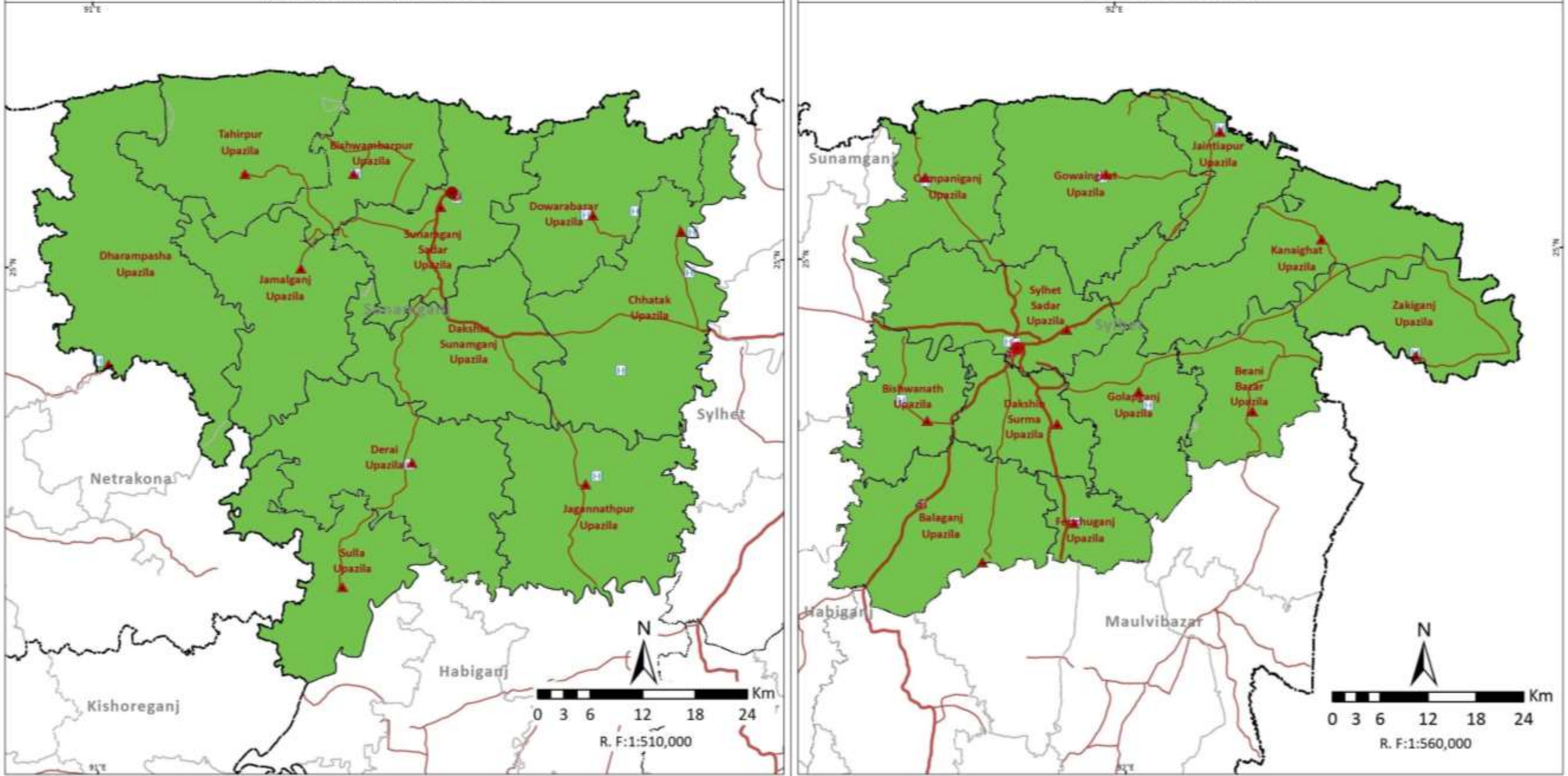
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Sunamganj District)

Risk Levels of Housing (Kutcha and Jhupri) to Earthquake (Sylhet District)



Legend

Country Boundary	Division Head Quarter	Risk of HH Structures	
Division Boundary	District Head Quarter		No Risk
District Boundary	Upazila Head Quarter		Very Low
Upazila Boundary	Fire Station		Low
National High Way	Hospital		Moderate
Regional High Way	Cyclone Shelter		High
	River/Sea/Lake		Very High
	Sundarbans		

Note:

Risk Levels of Housing (Kutcha and Jhupri) to earthquake hazard is derived by combining earthquake hazard (PGA), housing maps and damage curves.

Data Source: BMD, GSB, CDMP-II, MoDMR and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

TSUNAMI

3 Tsunami Hazard

Geologically, Bangladesh is situated in the active plate collision zone and consequently endangered due to large magnitude of earthquakes occurring in the surrounding region. According to Cummins (2007), the tectonic environment in the Bay of Bengal region is conducive for generating tsunami along the coasts of Myanmar and Bangladesh is high due to the presence of a subduction zone, where one part of the Earth's crust is slowly driving under another, which is situated in between the Indian plate and Myanmar plate that stretches up to Sumatra via Andaman-Nicobar zone of severe seismicity. The Sitakundu-Teknaf fault that runs along the Chittagong-Cox's Bazar coastline recommends a seismic gap that is alarming for Bangladesh's coast to tsunami (Sarker, 2008).

The Bangladesh coastline is about 710 kilometers long, comprising of 19 districts and 147 upazilas, out of which 48 upazilas are directly exposed to the sea and remaining 99 upazilas are classified as interior coast. The coastal region is low-lying, with 62 percent of the land has an elevation of up to 3 m, and 86 percent has up to 5 m from mean sea level, which is home to about 36.8 million people (28 percent), with a density of 743 people per square kilometer (Coastal Zone Policy, 2005).

3.1 Methodology

The methodology adopted for tsunami hazard is mathematical modeling and mapping using the identified tsunamigenic sub-duction zones and their seismic history analysis. There are two major sub-duction zones with tsunami genic seismic potential in the Indian Ocean Basin, namely, a portion of the Sunda Arc stretching south from Bangladesh down to Java. Accordingly, only the tsunamigenic seismic scenarios originating from Arakan and Andaman-Northern Sumatra of the Sunda Arc are considered for the purpose of assessing the tsunami hazard to Bangladesh. The tectonics and the seismic history of the Arakan and Andaman-Northern Sumatra subduction segments identified were incorporated in probabilistic measures of the tsunami hazard so far as feasible within the typical constrains of paucity of historical data pertaining to the subduction zones.

Numerical simulations of tsunami propagation and inundation were carried out by employing COMCOT (Cornell Multi-grid Coupled Tsunami Model) for all scenarios. The tsunami propagation model set-up and formulation employed in the present study was further validated by comparing the computed water surface levels due to the Indian Ocean tsunami in 2004 (scenario-8) with available records of measurements.

3.2 Map Contents

Following Walsh et al. (2003), the flow depths depicted in these tsunami hazard maps have been classified and given in table 3.1.

Table 3.1: Classification of tsunami induced inundation depth

Depth of Inundation (m)	Hazard Level	Color code
Not Affected	Not Affected	
< 0.5 m	Low	
0.5 – 1 m	Moderate	
1 – 2 m	High	
> 2 m	Very High	

3.3 Analysis of Tsunami Hazard

The area (km^2) and percentage of inundation due to tsunami hazard of 100 years return period at division level is given in Table 3.2.

Table 3.2: Area and percentage of inundation due to tsunami induced inundation depth in each division

Division	Area and percentage of inundation (km^2) due to Tsunami induced depth											
	< 0.5 m		**0.5 - 1.0 m**		**1.0 - 2.0 m**		**> 2.0 m**		**Not Affected**		**Total affected**	
	Area	**%**	**Area**	**%**	**Area**	**%**	**Area**	**%**	**Area**	**%**	**Area**	**%**
Barisal	81.81	0.62	50.21	0.38	27.43	0.21	88.39	0.67	12977.36	98.13	247.8	1.9
Chittagong	20.97	0.06	49.77	0.15	6.59	0.02	17.46	0.05	33813.76	99.72	94.8	0.3
Khulna	2.01	0.01	0.55	0.00	0.32	0.00	1.32	0.01	22280.02	99.98	4.2	0.02
Total Area (km^2) / %	104.79	0.2	100.5	0.1	34.3	0.0	107.2	0.2	69071.1	99.5	346.8	0.5

3.4 Tsunami Hazard maps

1. Tsunami hazard maps are available for five return periods i.e. 50, 100, 200, 500 and 1000 years and shown for all the costal districts.
2. Since tsunami hazard map of 50 year return period is used for exposure for population and risk assessment of housing and the same is shown for Barisal, Chittagong and Khulna divisions in this atlas.
3. Tsunami hazard maps at district level is shown for all the coastal districts which are exposed to moderate level and above and the number of districts in each division is shown in table 3.3.

Table 3.3: Number of districts with moderate level of tsunami hazard in each division

Division	Districts	Upazilas /Thanas
Barisal	3	2
Chittagong	4	-
Khulna	2	-
Total	9	2

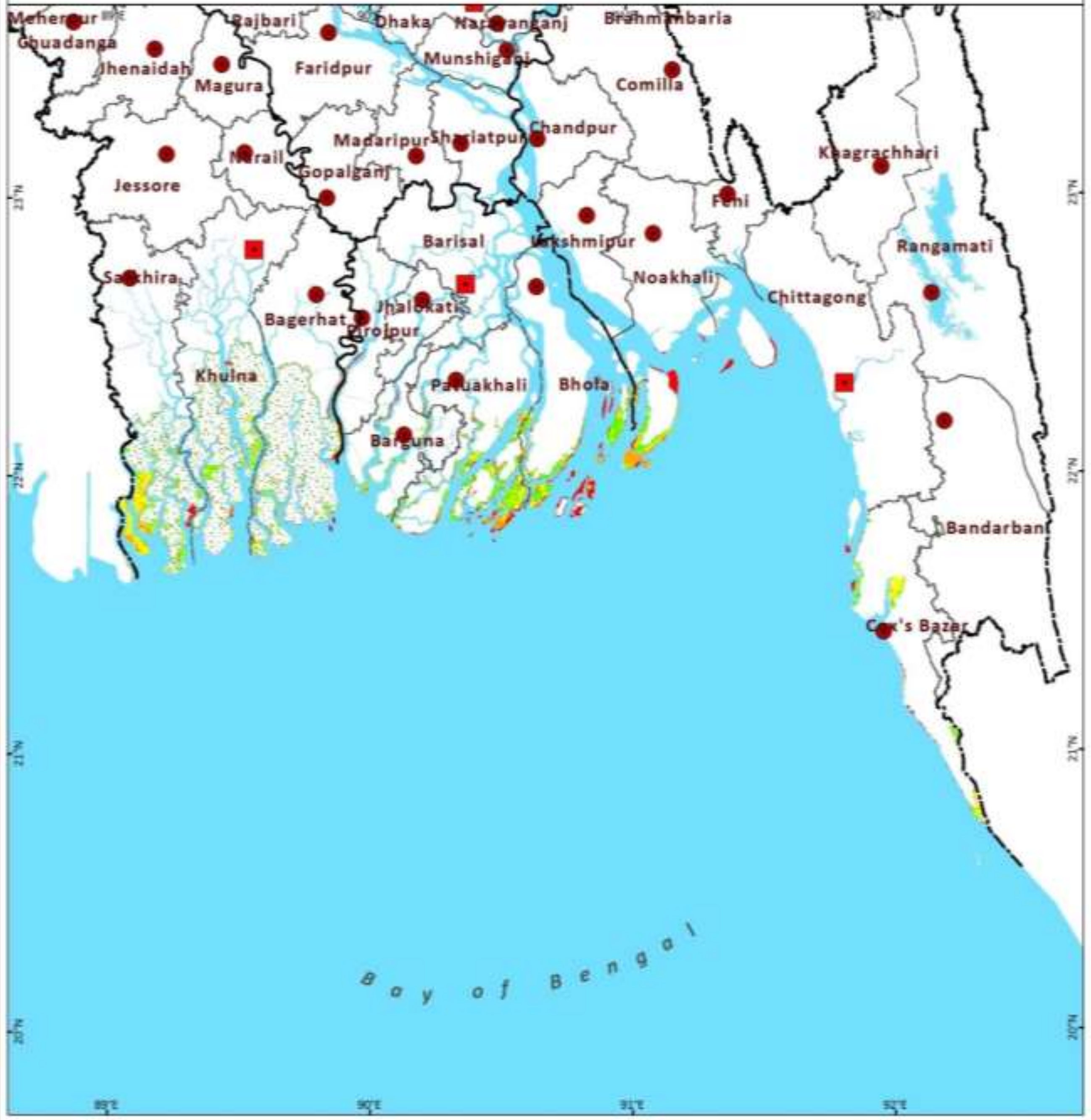
4. Exposure of Population and Risk maps of Housing to tsunami hazard are provided at district and upazila level as given in table 3.4.

Table 3.4: Population Exposure and Housing, Livelihood at Risk to Tsunami

Tsunami	**Population Exposure**		**Housing Exposure (Packa and Semi-Packa)**		**Housing Exposure (Kutcha and Jhupri)**		**Livelihood**	
Division	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas	Districts	Upazilas /Thanas
Barisal	2	2	2	4	2	4	1	1
Chittagong	0	0	0	0	0	0	1	1
Khulna	2	0	2	0	2	0	1	0
Total	4	2	4	4	4	4	3	2

National level Tsunami Hazard map for 50 year return period

National level Tsunami Hazard map for 100 year return period



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Depth of Inundation (m)

- Not affected
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Note:

Tsunami hazard map is derived using tsunamigenic seismic source modelling of potential faults and its energy propagation through Bay of Bengal and Indian Ocean. Hazard potential is represented by inundation depth caused by tsunami along the coast.

Data Source: BWDB, BMD, GSB and WARPOS.

Coordinate System: BTM, Datum: Gulshan 303

N

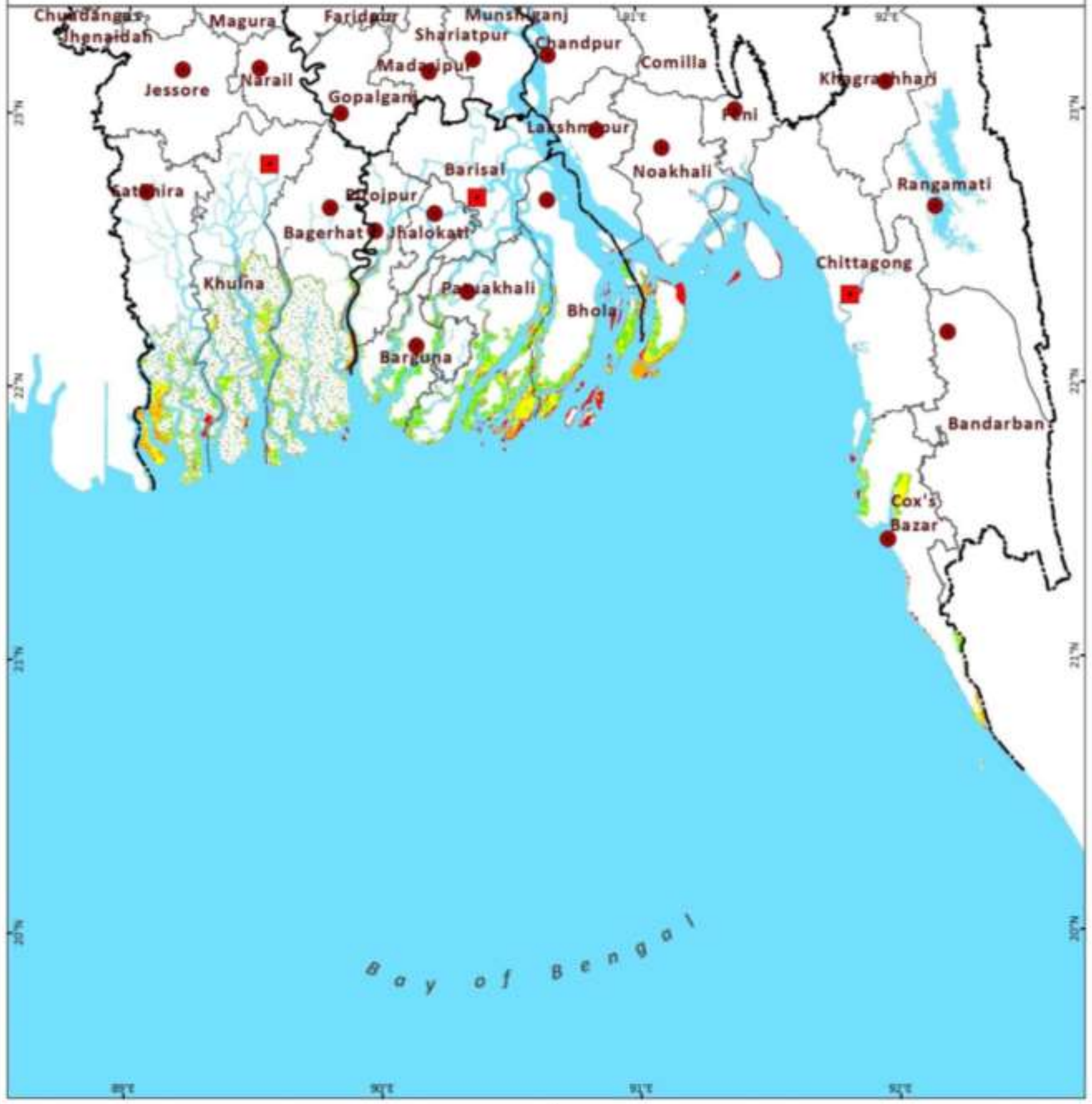
0 15 30 60 90 120 Km

R. F: 1:2,500,000

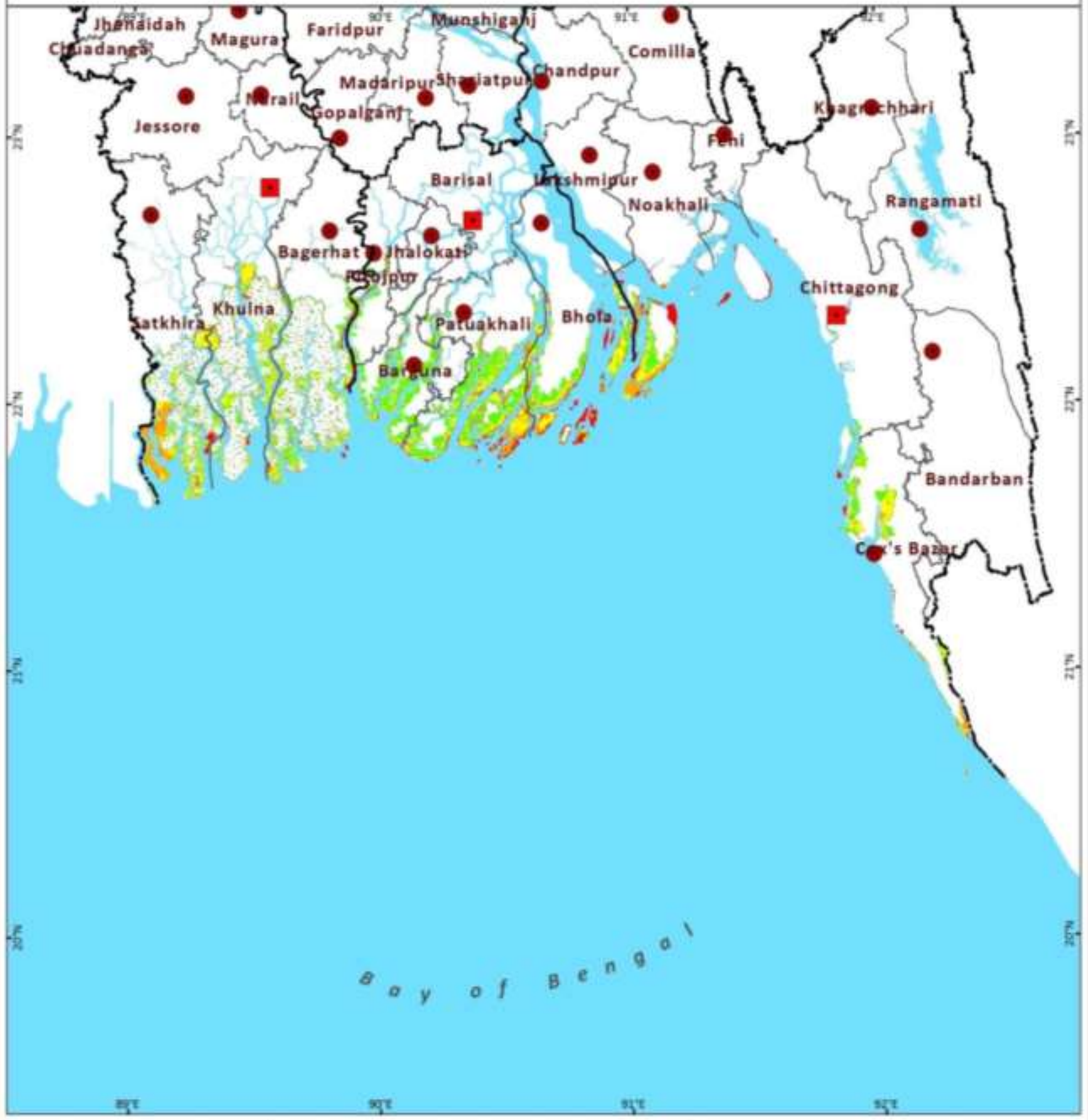
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

National level Tsunami Hazard map for 200 year return period



National level Tsunami Hazard map for 500 year return period



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Depth of Inundation (m)

- Not affected
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Note:

Tsunami hazard map is derived using tsunamigenic seismic source modelling of potential faults and its energy propagation through Bay of Bengal and Indian Ocean. Hazard potential is represented by inundation depth caused by tsunami along the coast.

Data Source: BWDB, BMD, GSB and WARPOS.

Coordinate System: BTM, Datum: Gulshan 303

N

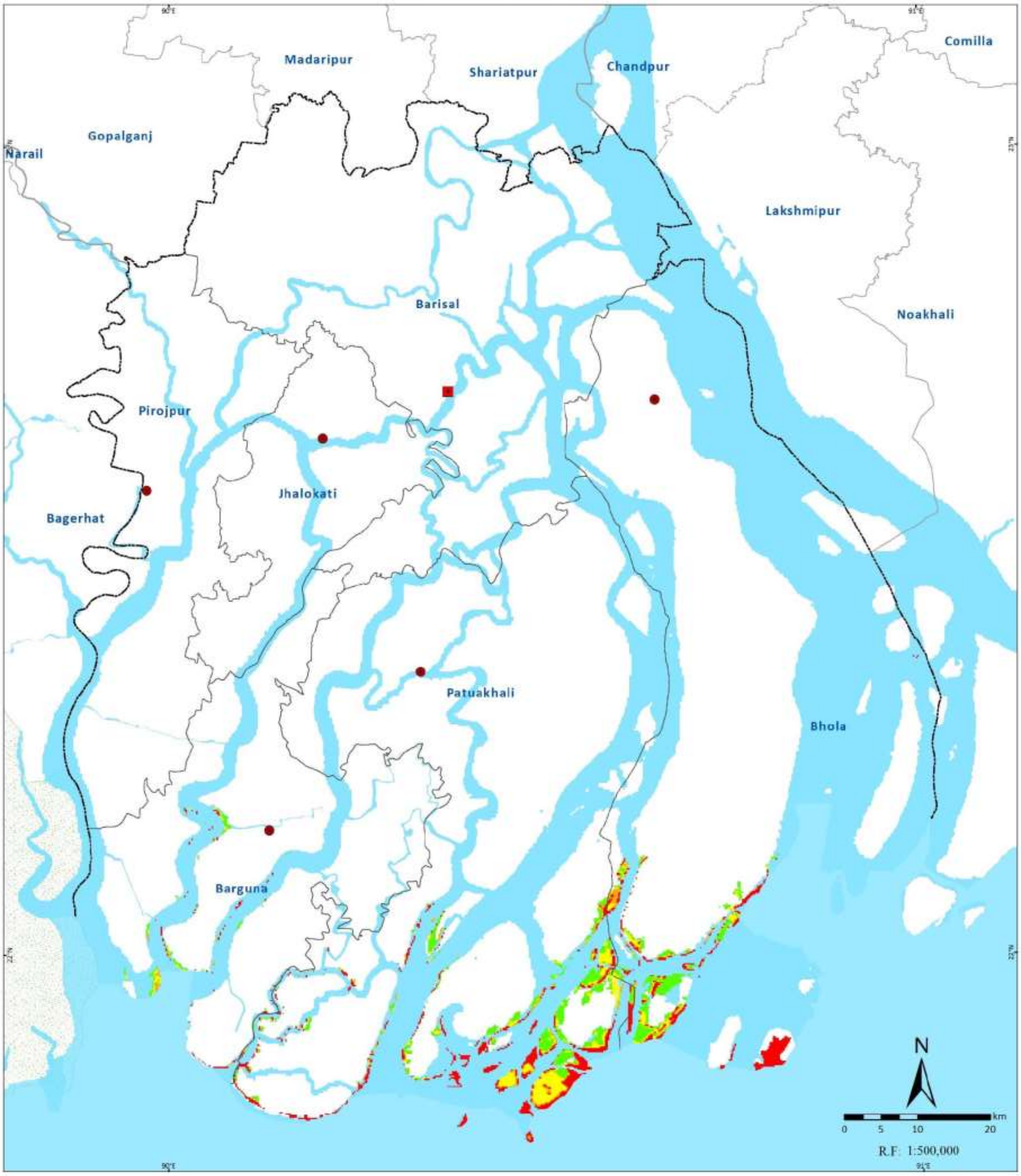
0 15 30 60 90 120 Km

R. F: 1:2,600,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard Map of 50 year return period
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Depth of Inundation (m)

- Not affected
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Note:

Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.

Data Source: BWDB, BMD, GSB and WARPOS.

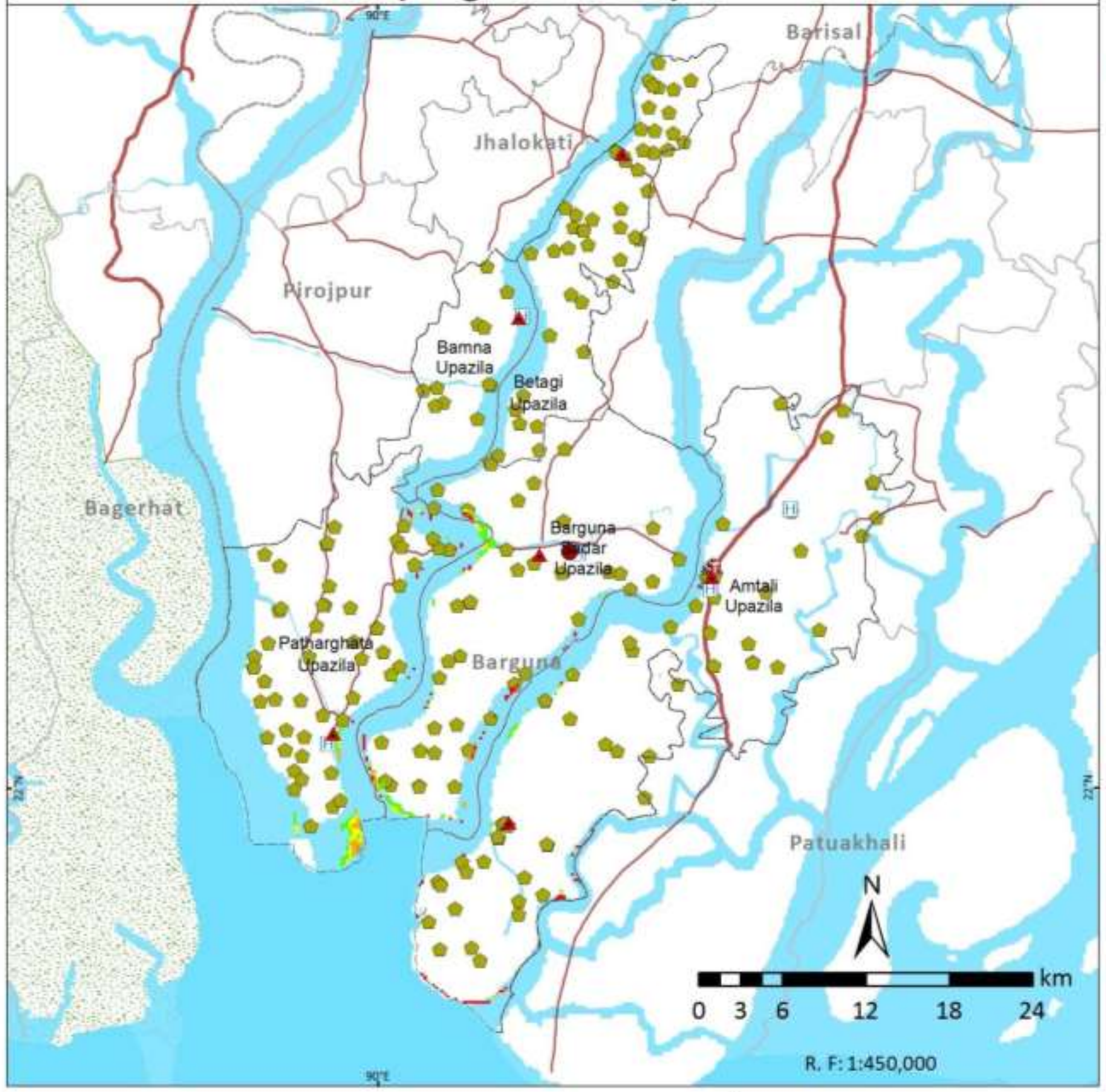
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

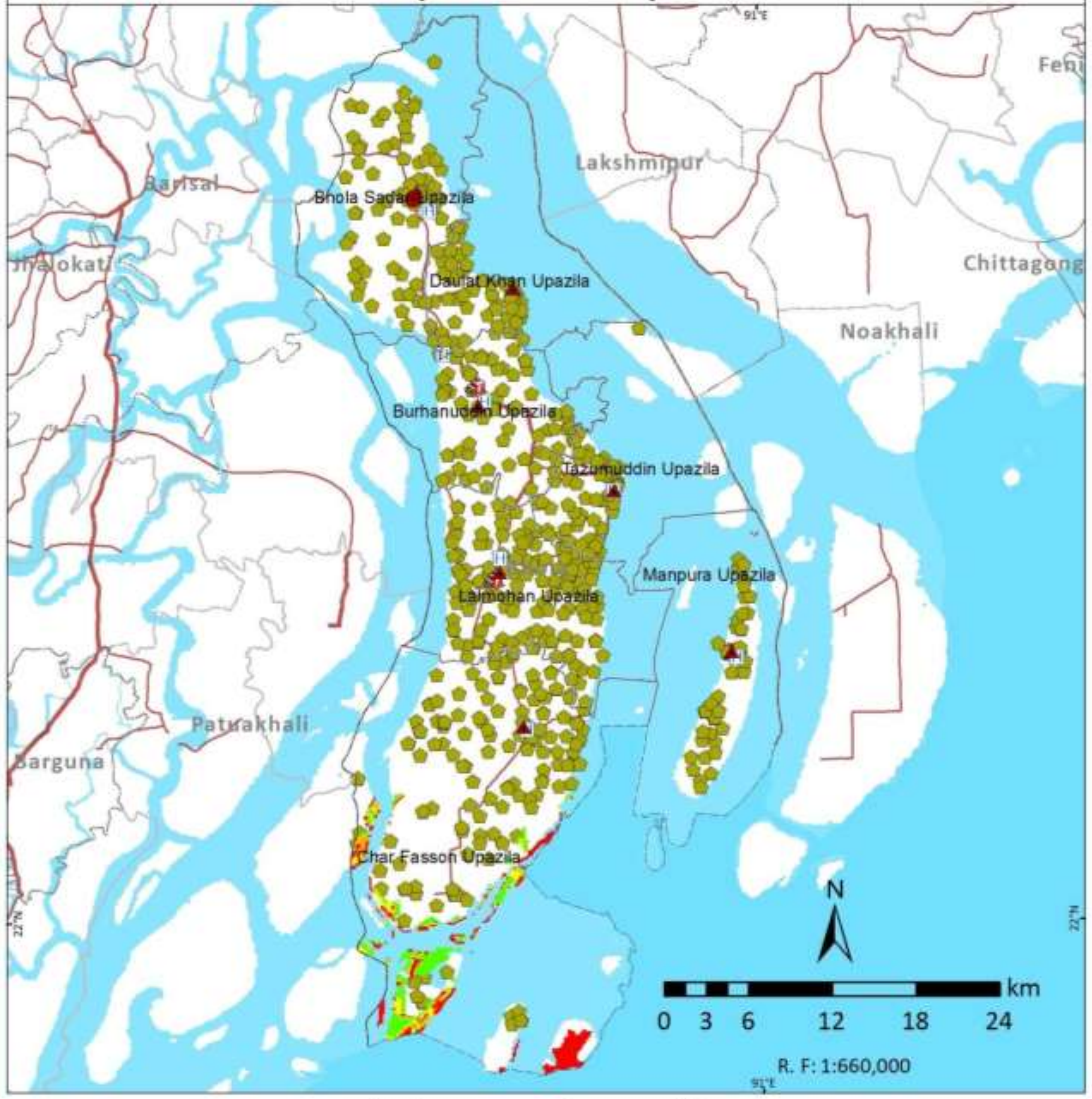
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard map of 50 year return period
(Barguna District)



Tsunami Hazard map of 50 year return period
(Bhola District)



Legend

Country Boundary	District Head Quarter	**Depth of Inundation (m)**
Division Boundary	Upazila Head Quarter	Not affected
District Boundary	Fire stations	< 0.5
Upazila Boundary	Hospital	0.5 - 1.0
National High Way	Cyclone Shelter	1.0 - 2.0
Regional High Way	River/Sea/Lake	> 2.0
	Sundarbans	

Note:

Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.

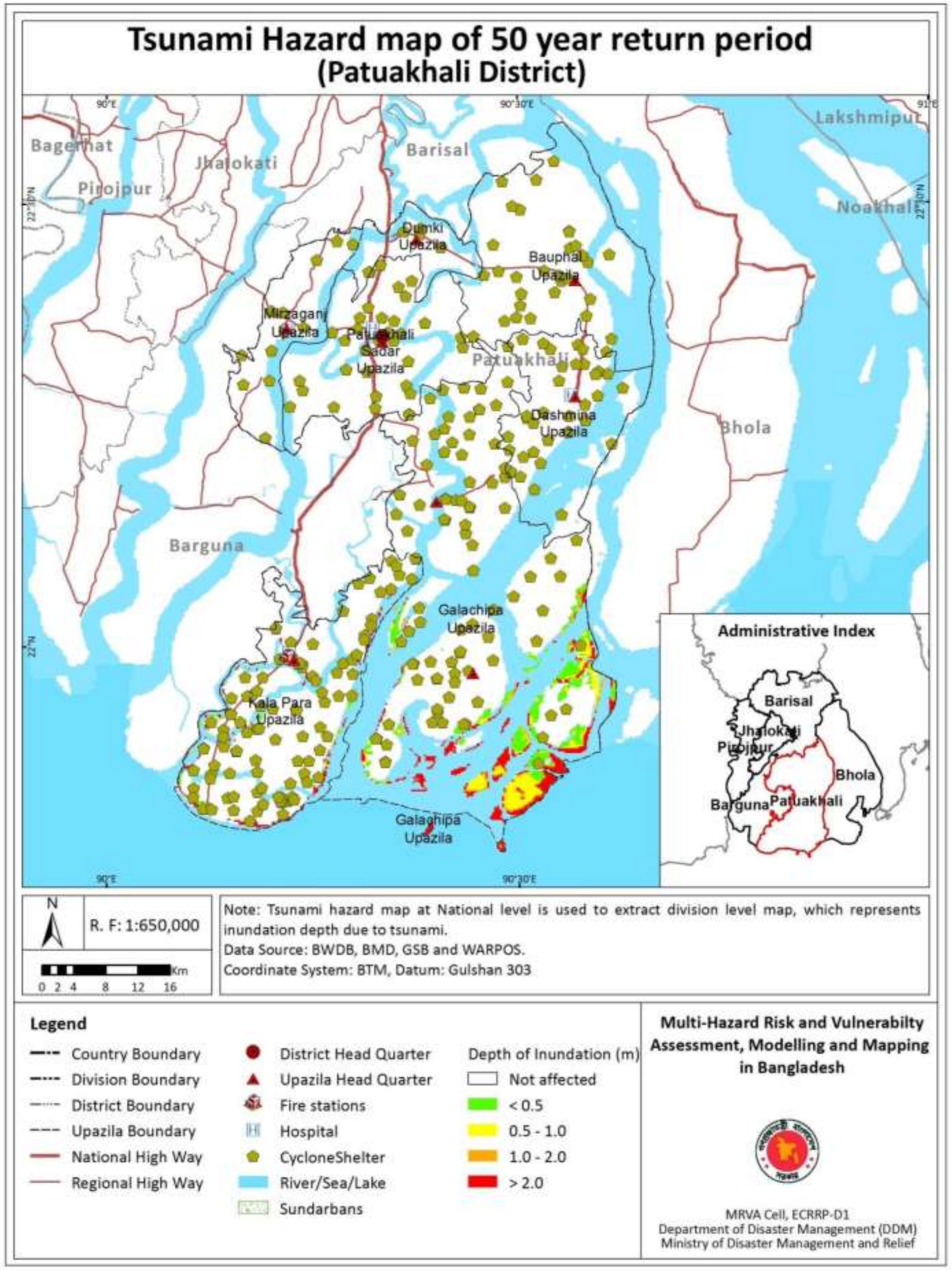
Data Source: BWDB, BMD, GSB and WARPOS.

Coordinate System: BTM, Datum: Gulshan 303

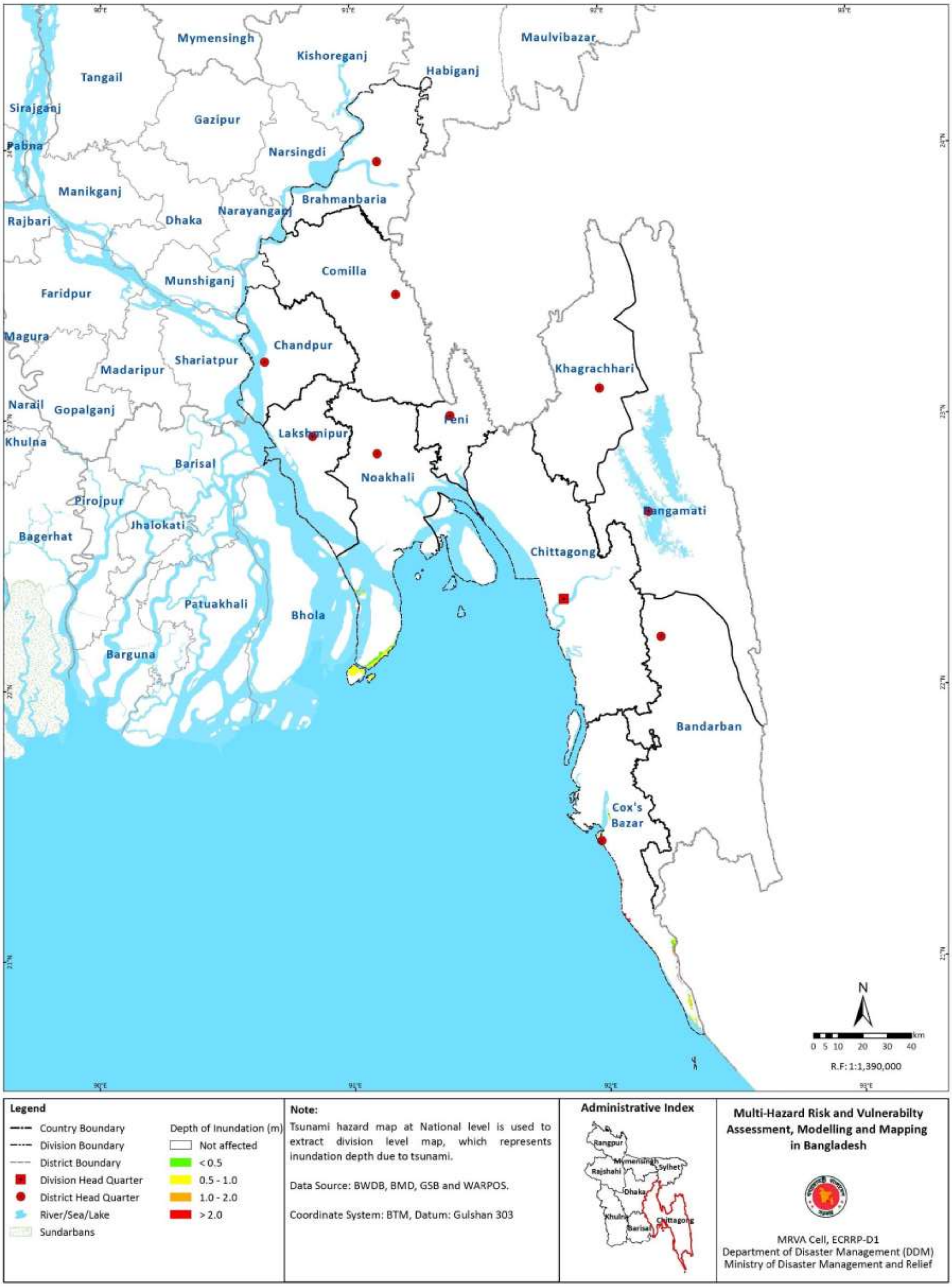
Administrative Index

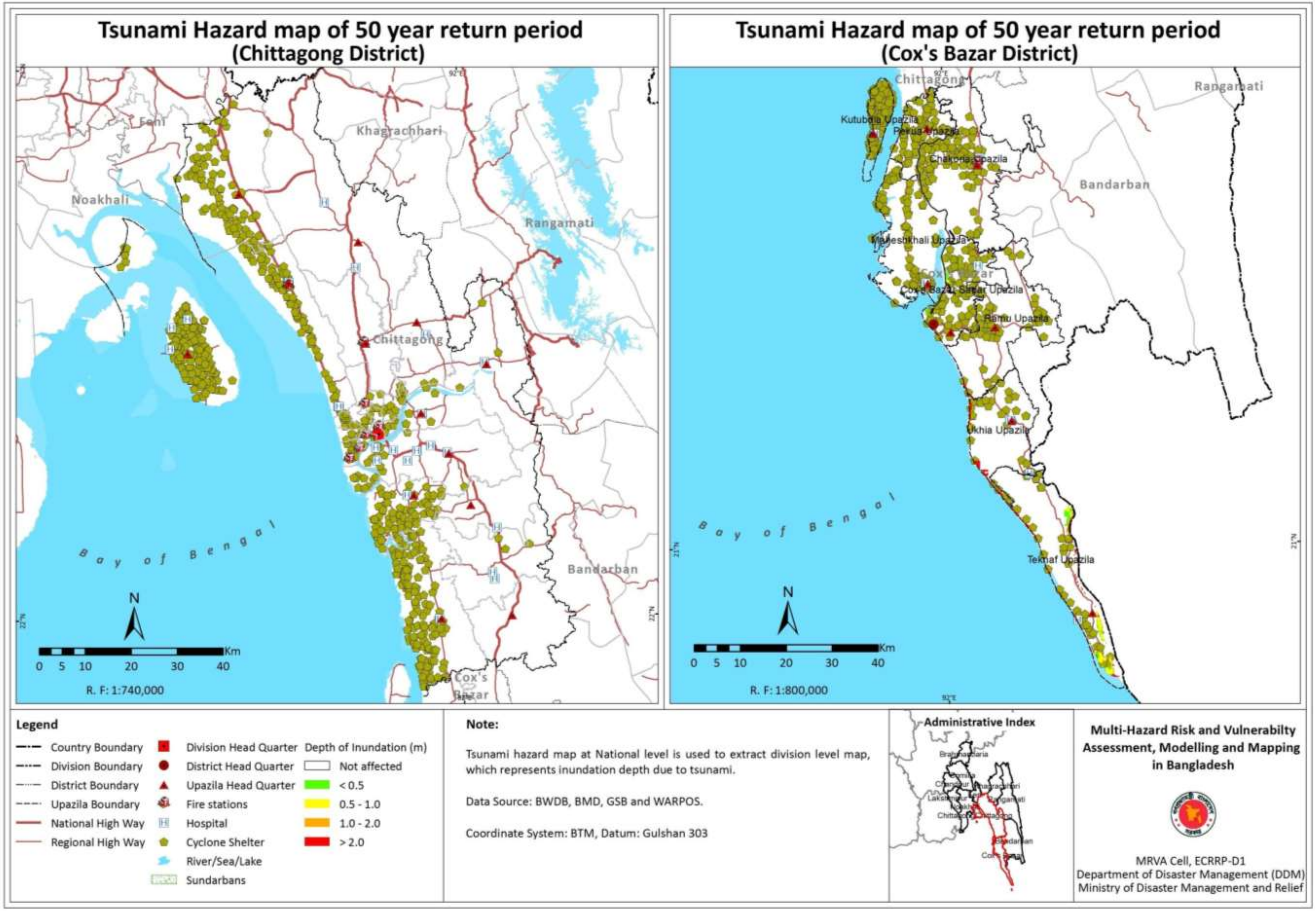
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

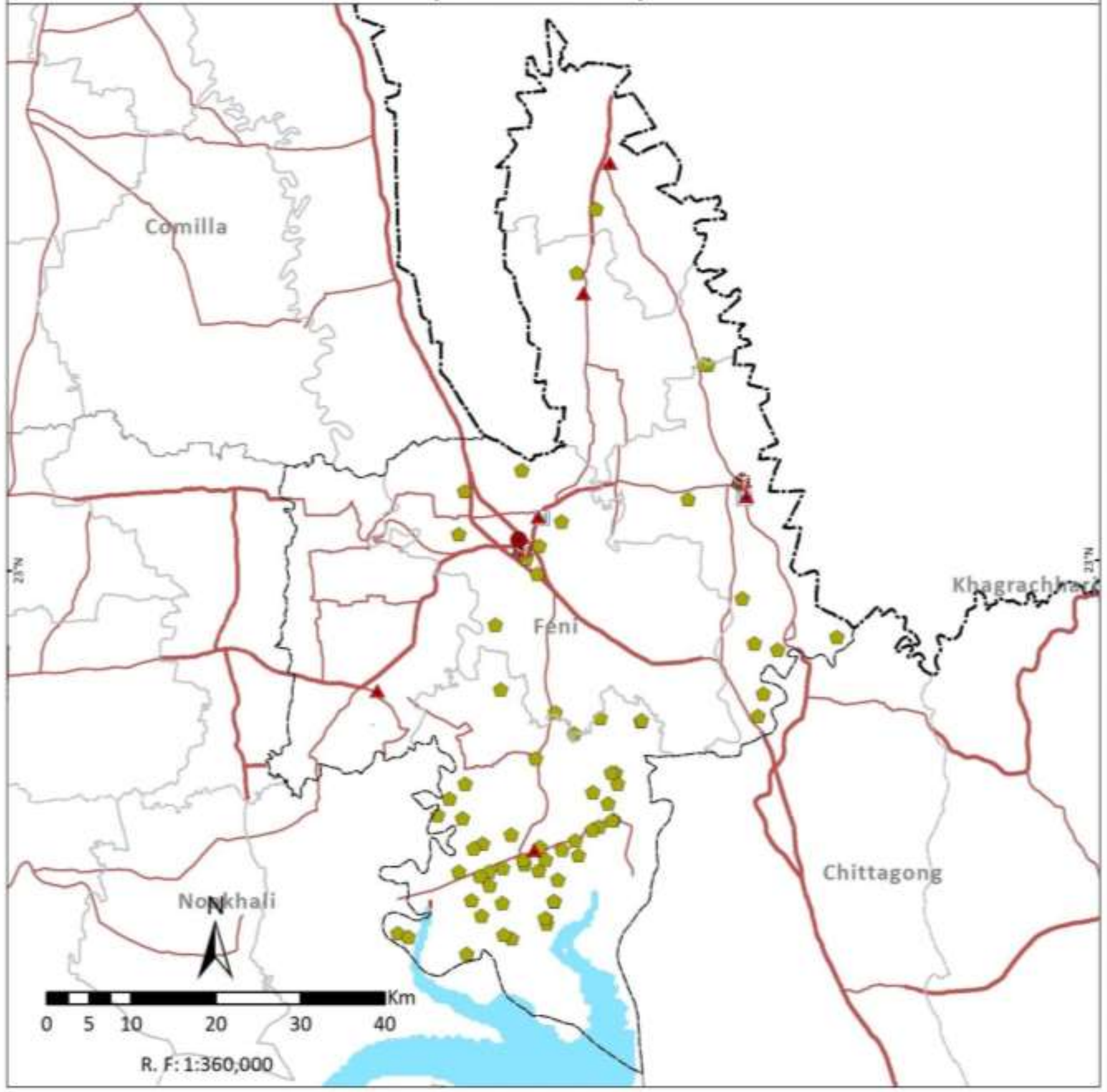

Tsunami Hazard map of 50 year return period
(Patuakhali District)
Bagerhat
Jhalokati
Pirojpur
Barisal
Lakshmipur
Noakhali
Dumki Upazila
Bauphal Upazila
Mirzaganj Upazila
Patuakhali Sadar Upazila
Patuakhali
Dashmina Upazila
Bhola
Barguna
Galachipa Upazila
Kala Para Upazila
Galachipa Upazila
Administrative Index
Barisal
Jhalokati
Pirojpur
Bhola
Barguna
Patuakhali
N
R. F: 1:650,000
Km
0 2 4 8 12 16
Note: Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.
Data Source: BWDB, BMD, GSB and WARPOS.
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
CycloneShelter
River/Sea/Lake
Sundarbans
Depth of Inundation (m)
Not affected
< 0.5
0.5 - 1.0
1.0 - 2.0
> 2.0
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard Map of 50 Year Return Period
(Chittagong Division)

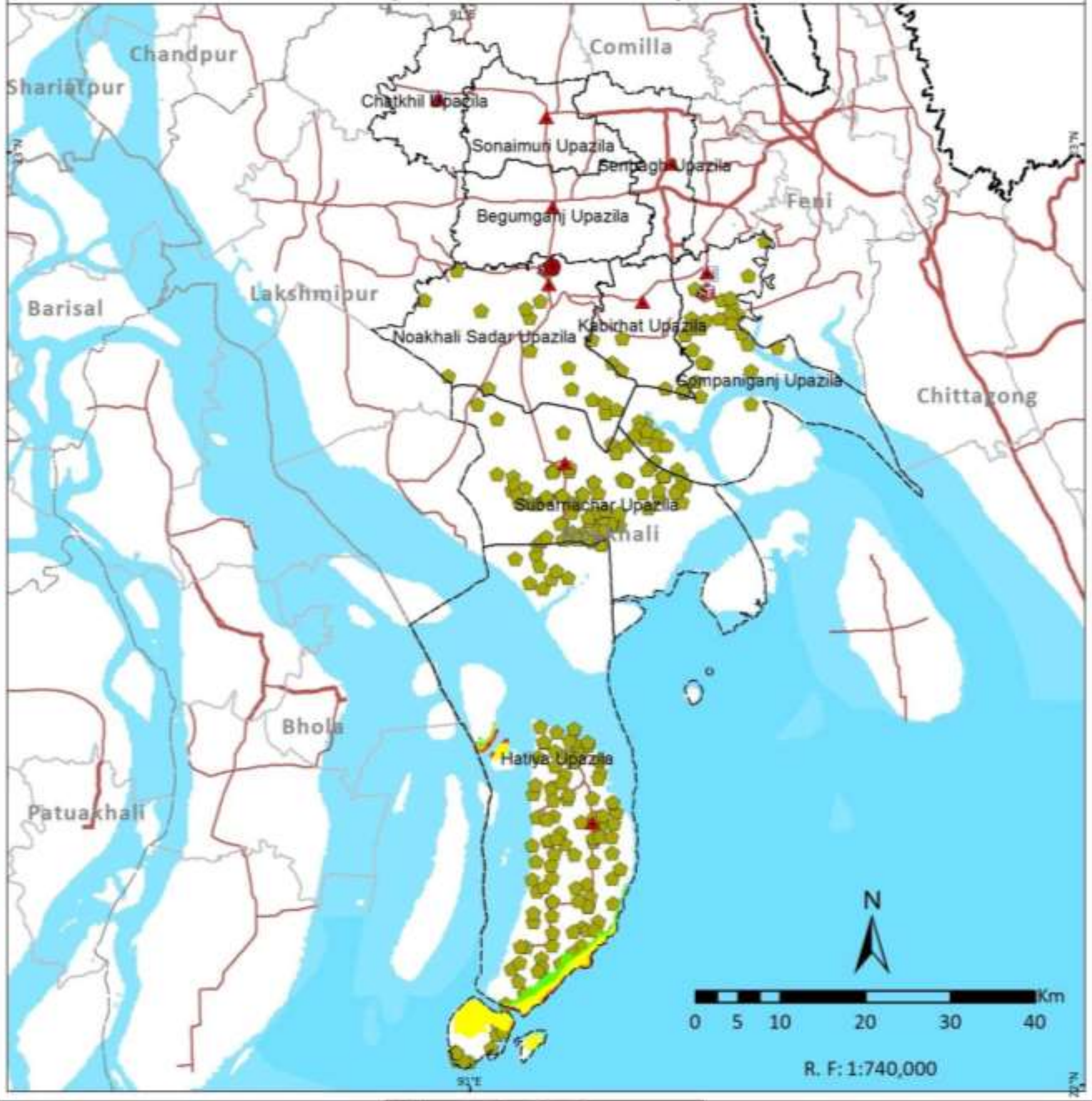



Tsunami Hazard map of 50 year return period
(Chittagong District)
Feni
Khagrachhari
Noakhali
Rangamati
Chittagong
Bay of Bengal
Bandarban
Cox's Bazar
N
Km
0 5 10 20 30 40
R. F: 1:740,000
Tsunami Hazard map of 50 year return period
(Cox's Bazar District)
Chittagong
Rangamati
Kutubdia Upazila
Pekua Upazila
Chakoria Upazila
Bandarban
Maheshkhali Upazila
Cox's Bazar
Cox's Bazar Sadar Upazila
Ramu Upazila
Ukhia Upazila
Teknaf Upazila
Bay of Bengal
N
Km
0 5 10 20 30 40
R. F: 1:800,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Depth of Inundation (m)
Not affected
< 0.5
0.5 - 1.0
1.0 - 2.0
> 2.0
Note:
Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.
Data Source: BWDB, BMD, GSB and WARPOS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard map of 50 year return period
(Feni District)



Tsunami Hazard map of 50 year return period
(Noakhali District)



Legend

	Country Boundary		District Head Quarter	Depth of Inundation (m)	
	Division Boundary		Upazila Head Quarter		Not affected
	District Boundary		Fire stations		< 0.5
	Upazila Boundary		Hospital		0.5 - 1.0
	National High Way		Cyclone Shelter		1.0 - 2.0
	Regional High Way		River/Sea/Lake		> 2.0
			Sundarbans		

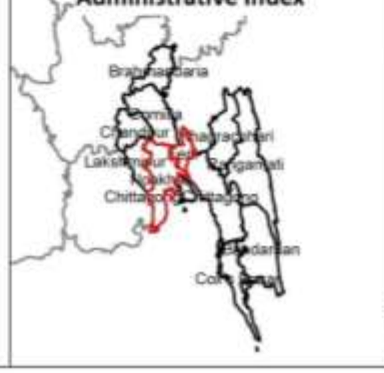
Note:

Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.

Data Source: BWDB, BMD, GSB and WARPOS.

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index



Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard map of 50 Year Return Period
(Khulna Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Depth of Inundation (m)

- Not affected
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Note:

Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.

Data Source: BWDB, BMD, GSB and WARPOS.

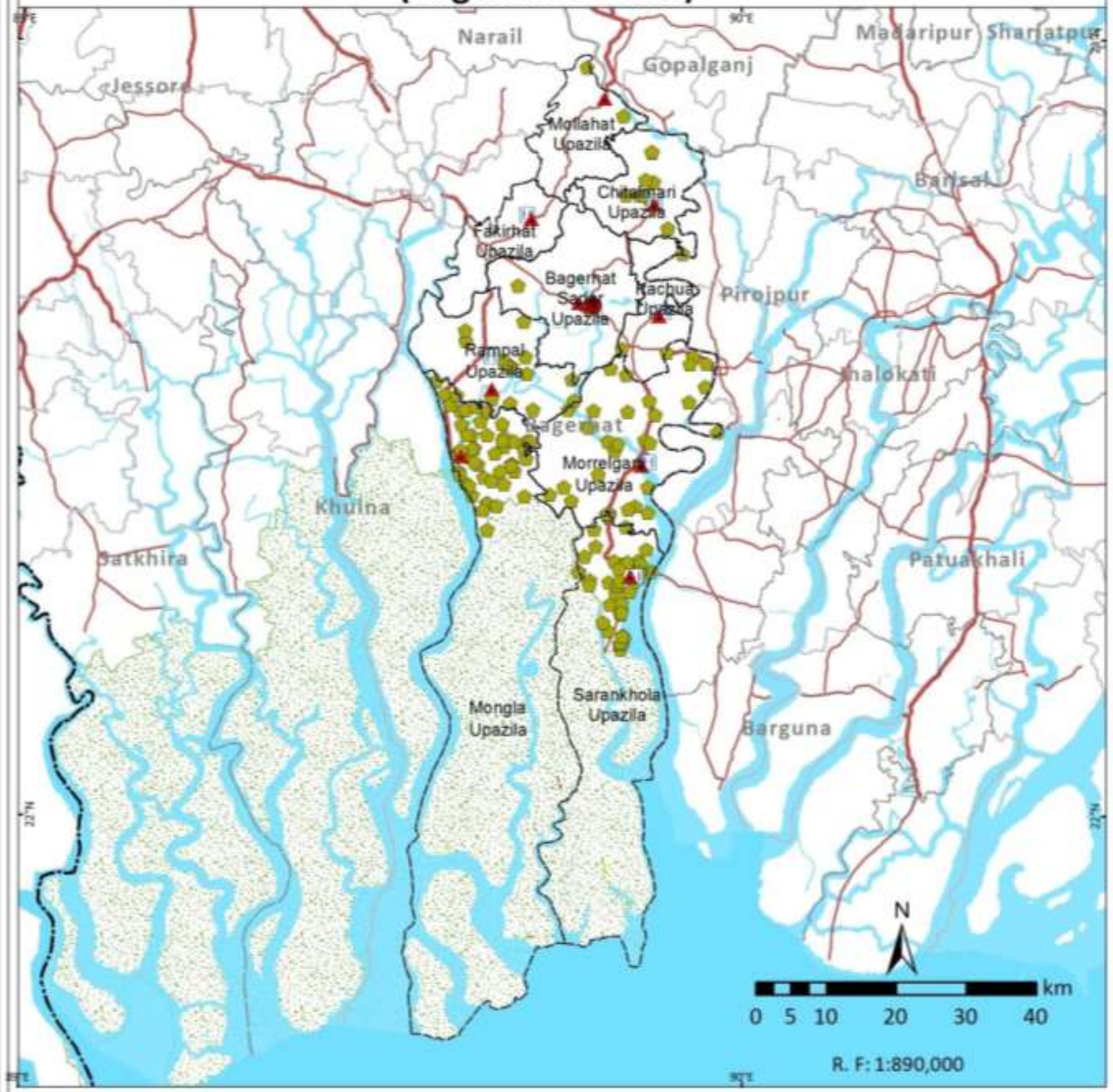
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

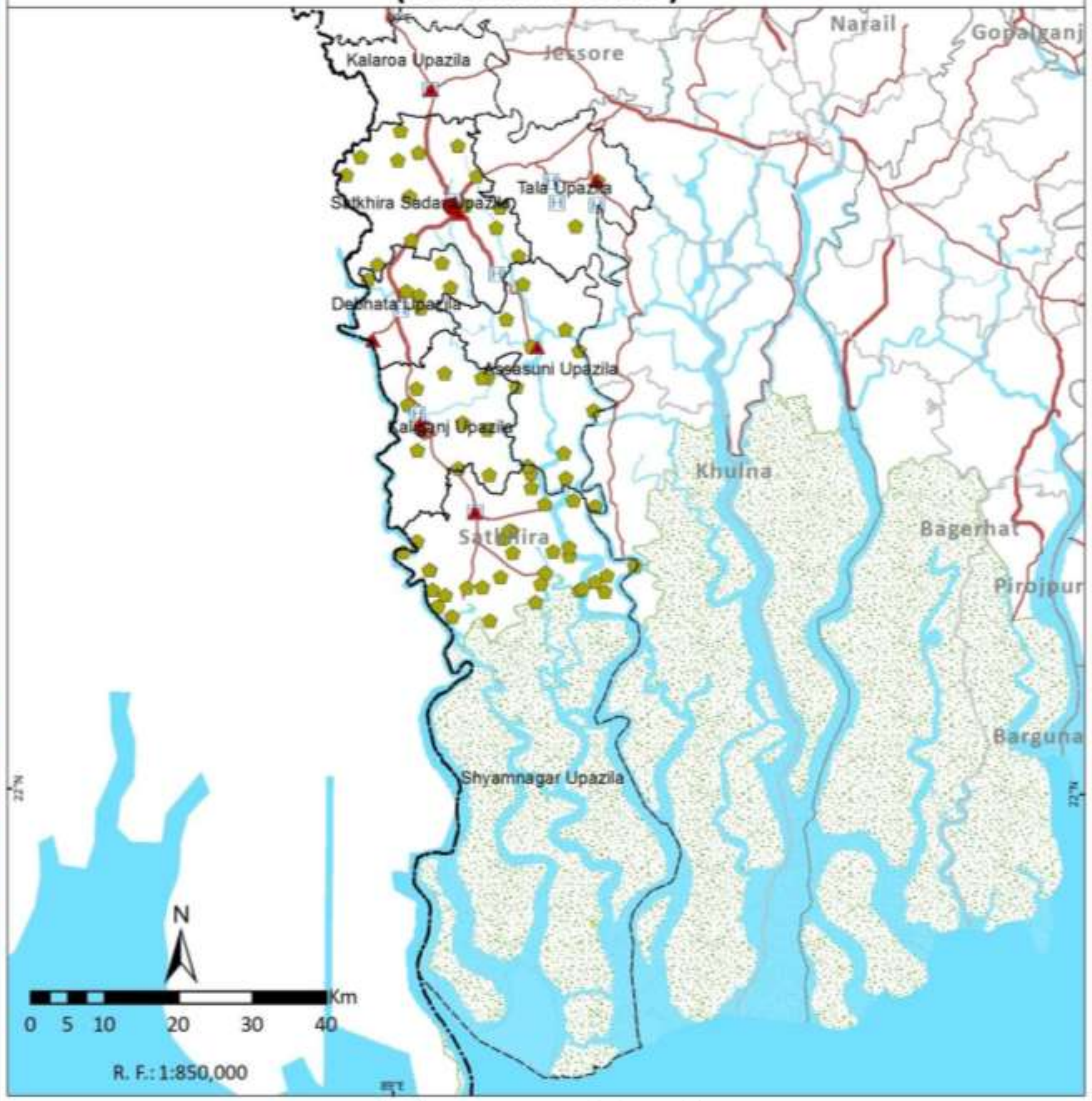
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Tsunami Hazard map of 50 year return period (Bagerhat District)



Tsunami Hazard map of 50 year return period (Satkhira District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire stations
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Depth of Inundation (m)

- Not affected
- < 0.5
- 0.5 - 1.0
- 1.0 - 2.0
- > 2.0

Note:

Tsunami hazard map at National level is used to extract division level map, which represents inundation depth due to tsunami.

Data Source: BWDB, BMD, GSB and WARPOS.

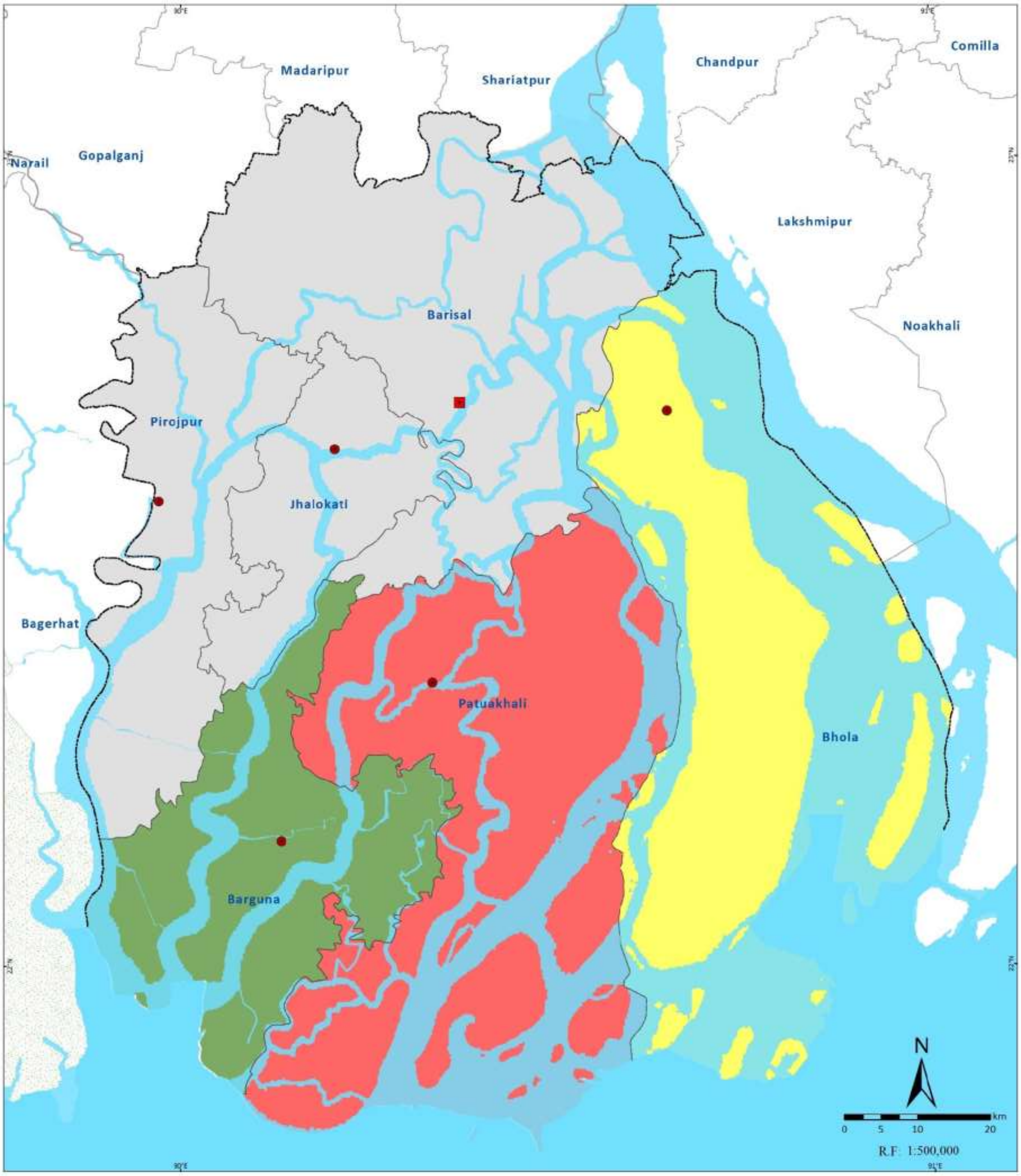
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure Map of Tsunami
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

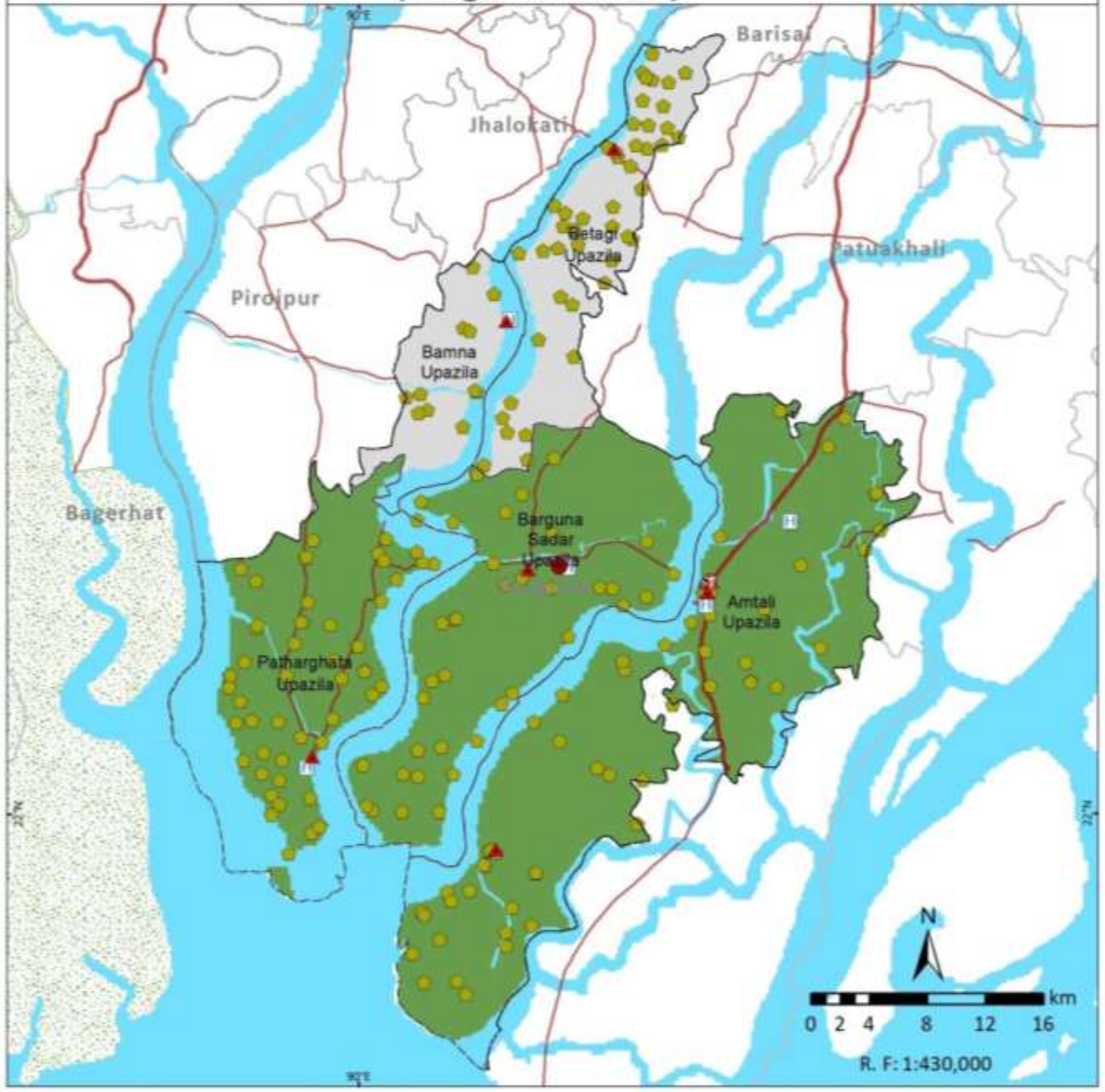
Administrative Index

Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

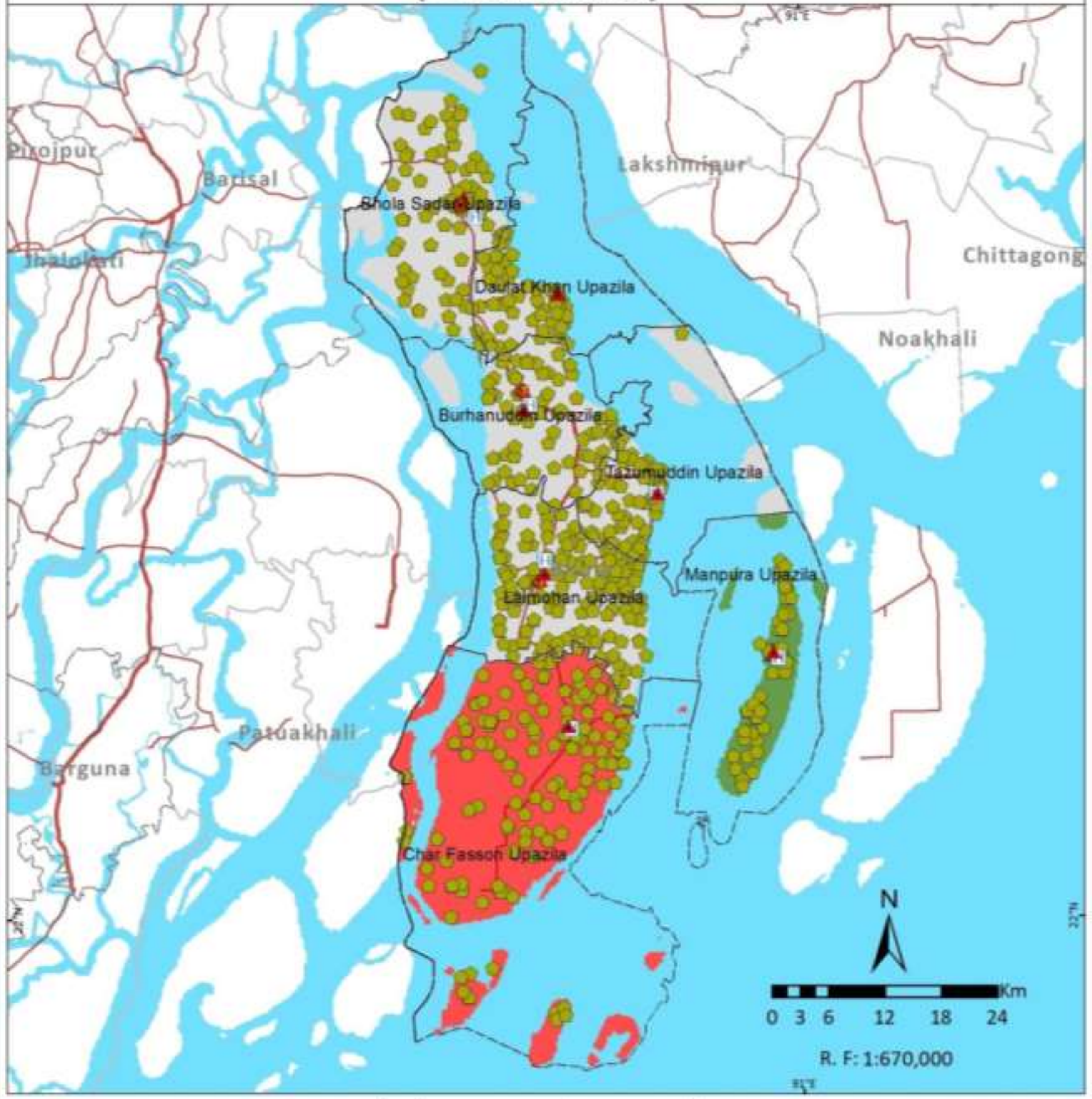
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure map of Tsunami (Barguna District)



Population Exposure map of Tsunami (Bhola District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- District Head Quarter
- Upazila Head Quarter
- Fire stations
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

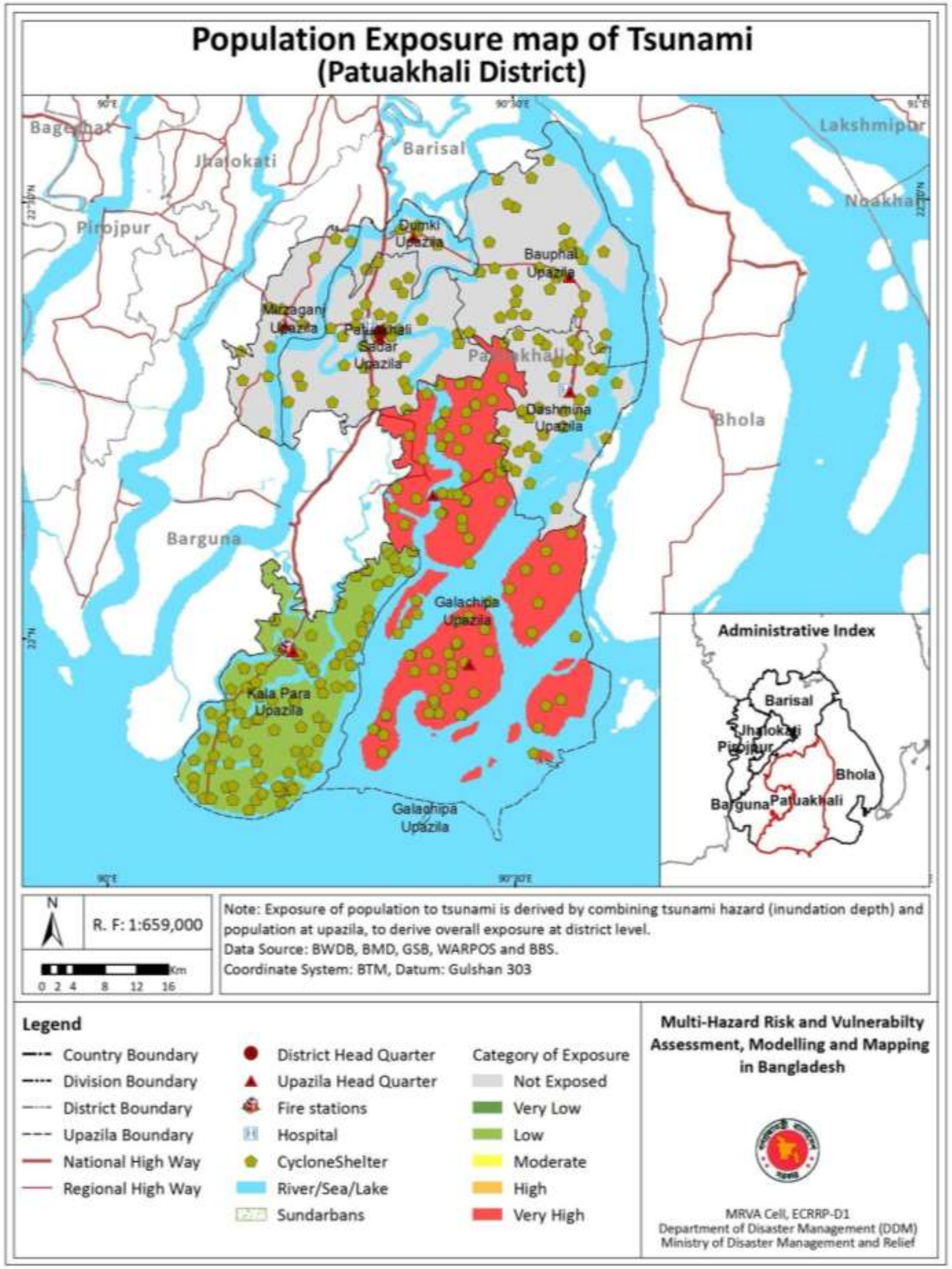
Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

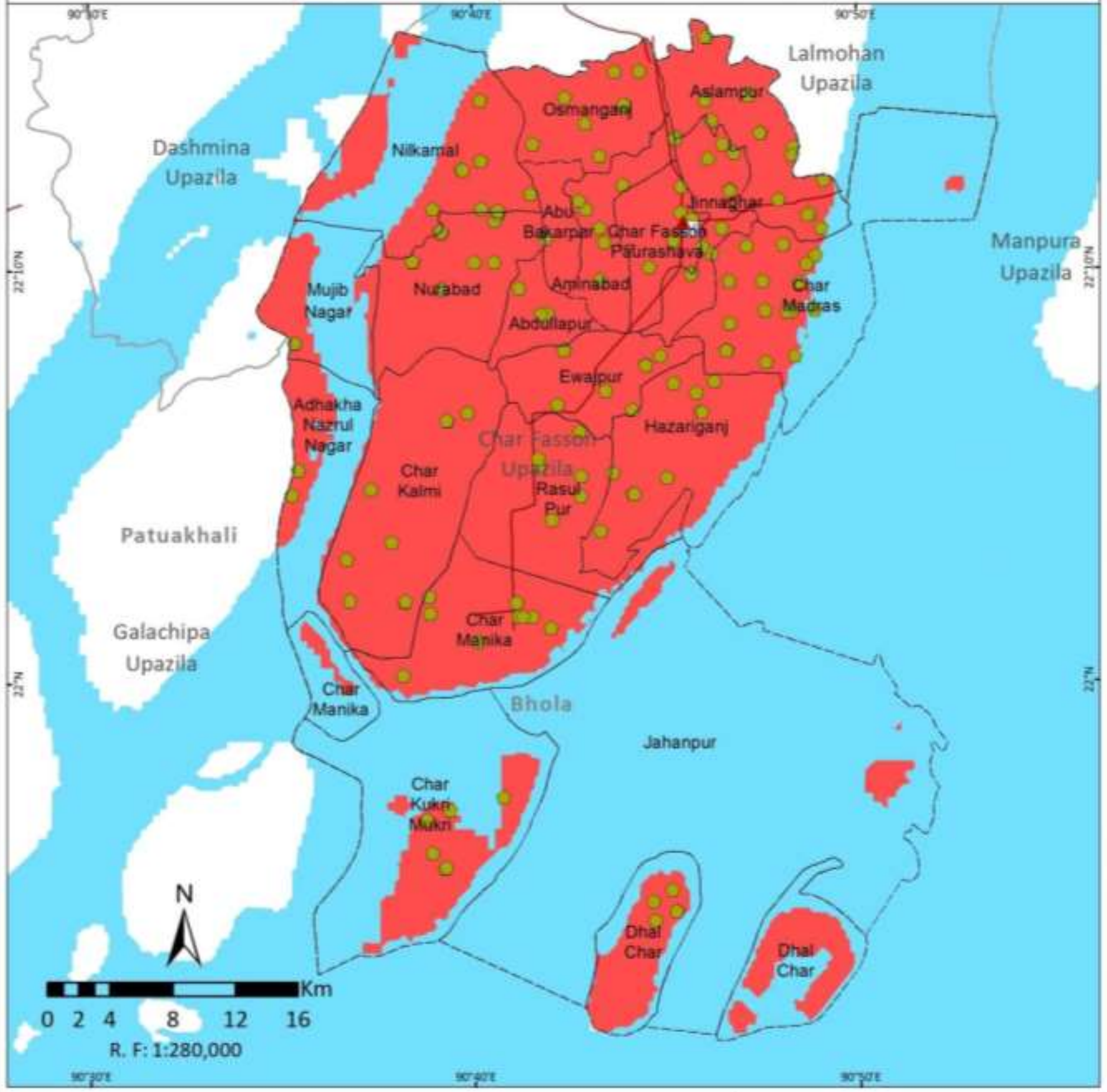
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

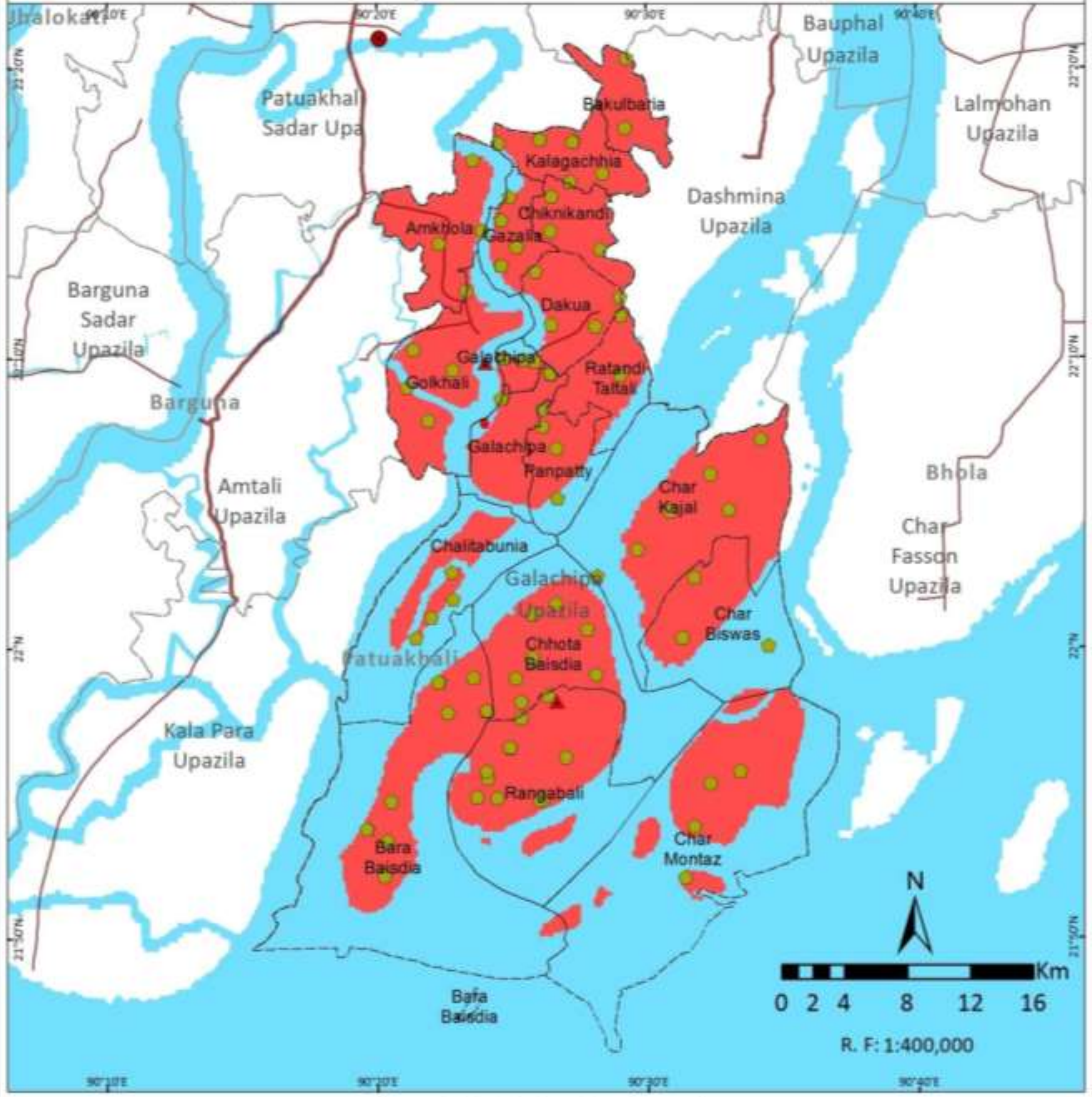


Population Exposure map of Tsunami
(Patuakhali District)
Barisal
Jhalokati
Pirojpur
Bagerhat
Lakshmipur
Noakhali
Bhola
Barguna
Dumki Upazila
Bauphal Upazila
Mirzaganj Upazila
Patuakhali Sadar Upazila
Patuakhali
Dashmina Upazila
Galachipa Upazila
Kala Para Upazila
Administrative Index
R. F: 1:659,000
Note: Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
CycloneShelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure map to Tsunami
(Char fasson Upazila of Bhola District)



Population Exposure map to Tsunami
(Galachipa Upazila of Patuakhali District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Union Head Quarter	Very Low
Upazila Boundary	Hospital	Low
Union Boundary	Cyclone Shelter	Moderate
National High Way	Fire Station	High
Regional High Way	River/Sea/Lake	Very High
	Sundarbans	

Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

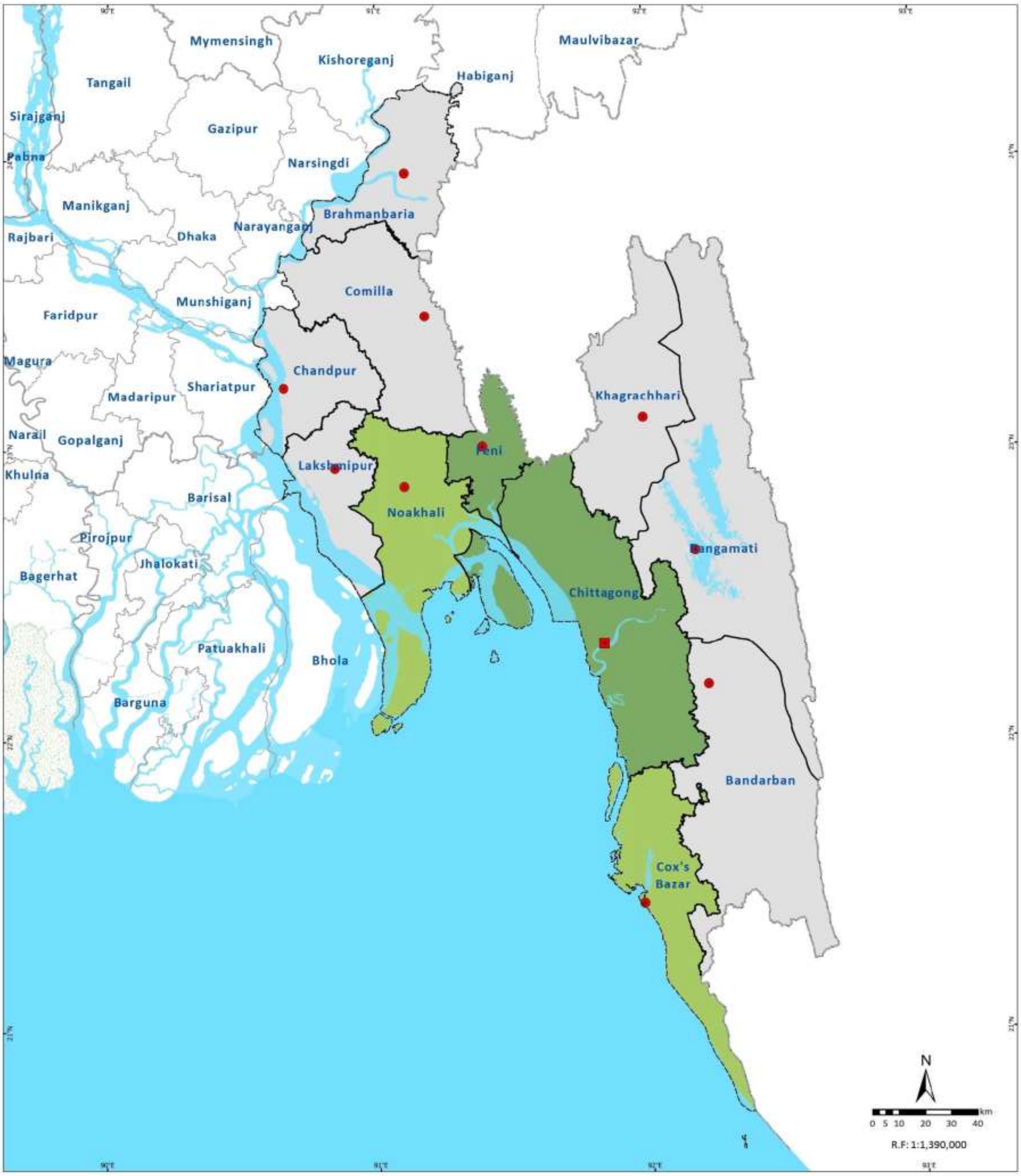
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure Map of Tsunami
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

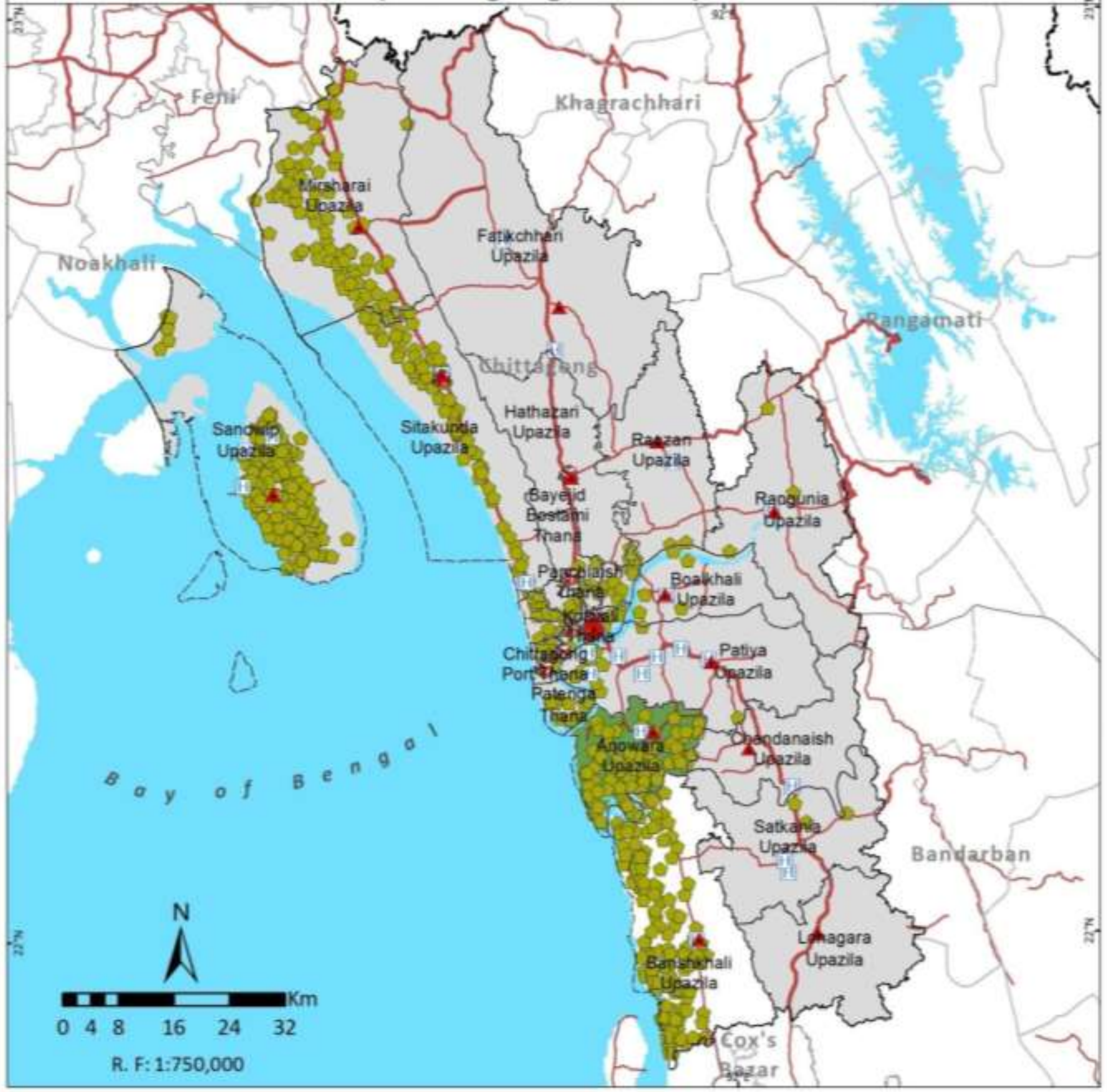
Administrative Index

Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

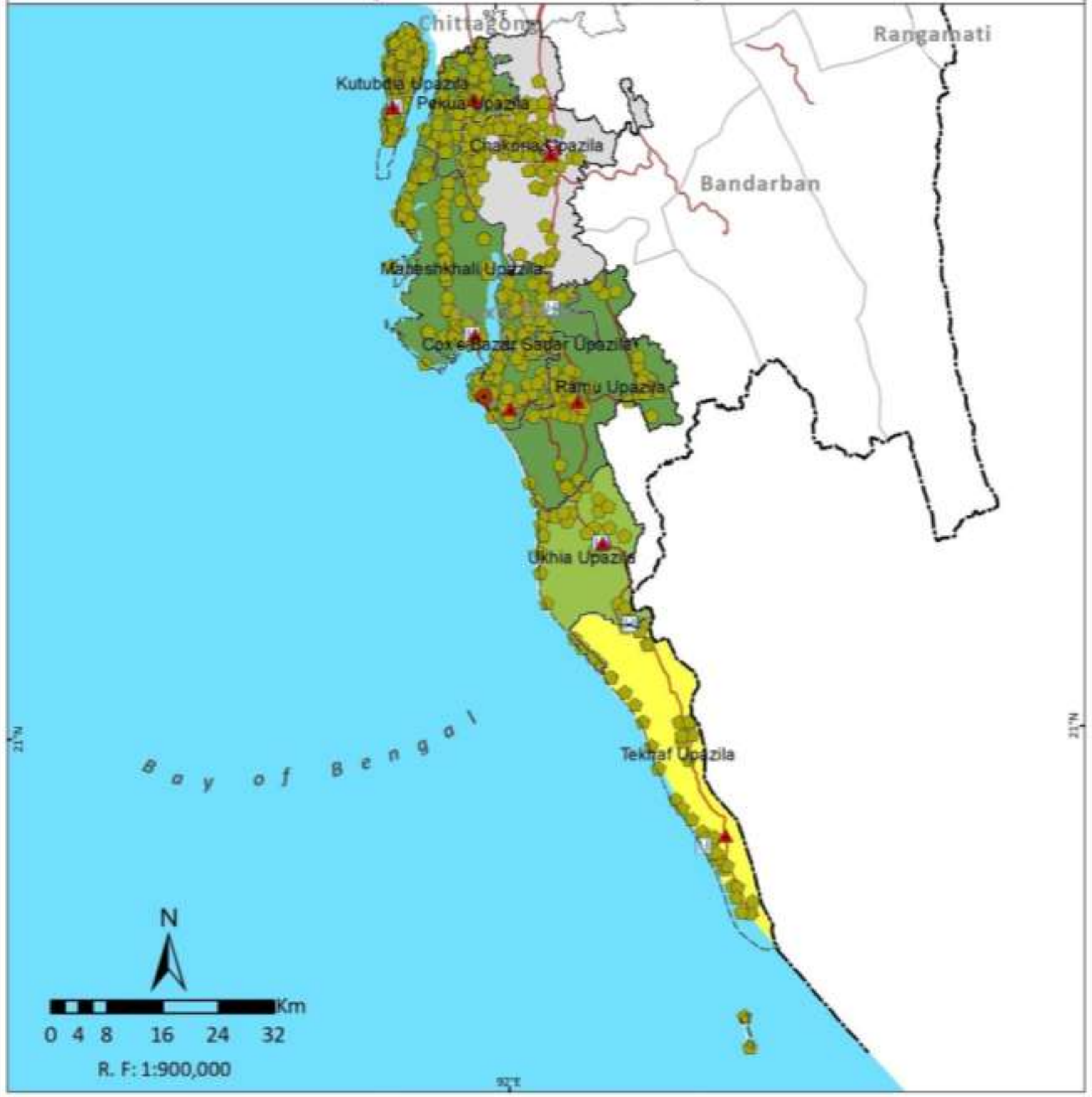
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure map of Tsunami (Chittagong District)



Population Exposure map of Tsunami (Cox's Bazar District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- Division Head Quarter
- District Head Quarter
- Upazila Head Quarter
- Fire stations
- Hospital
- Cyclone Shelter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

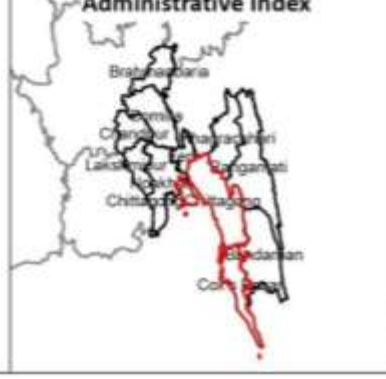
Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

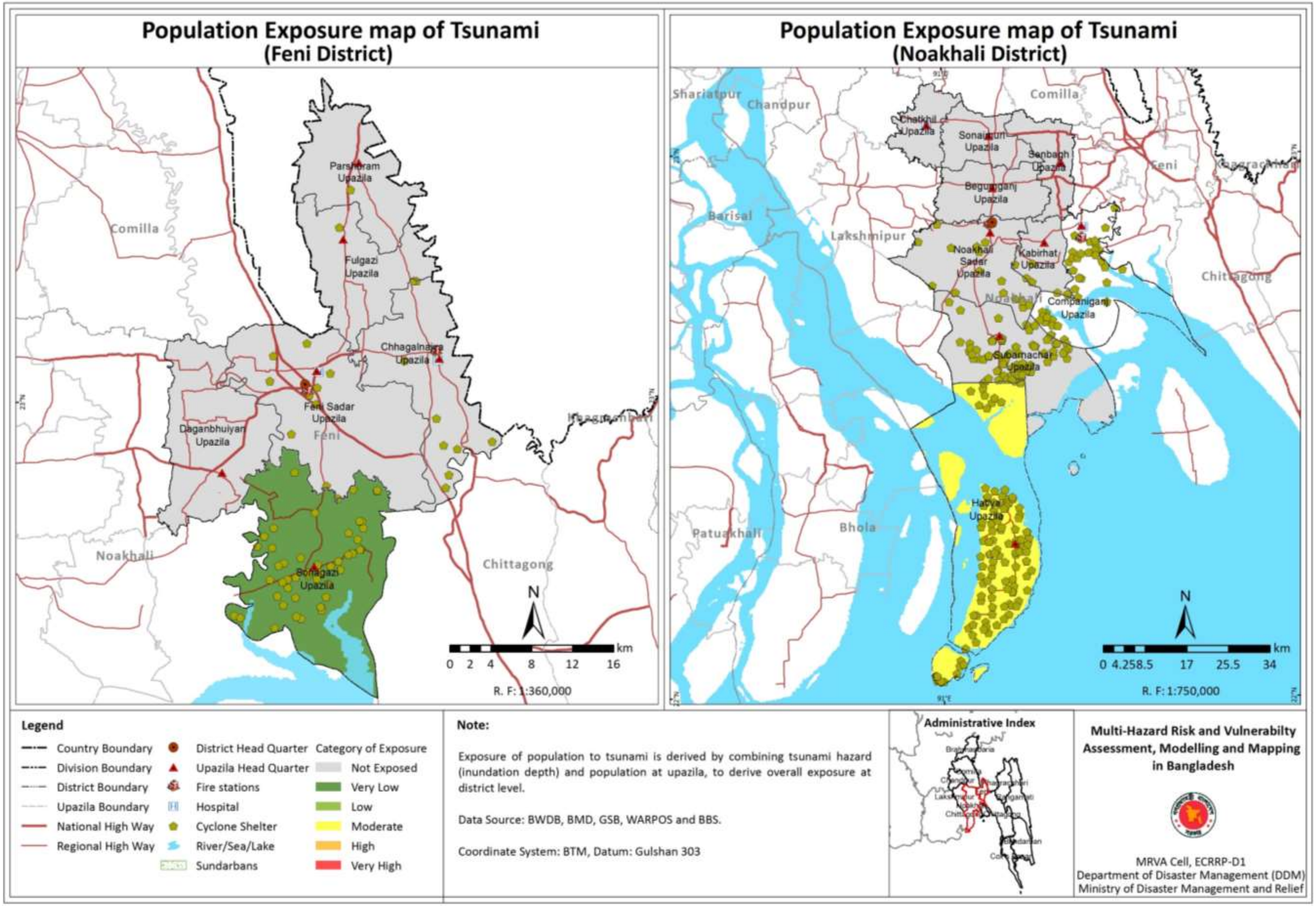
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

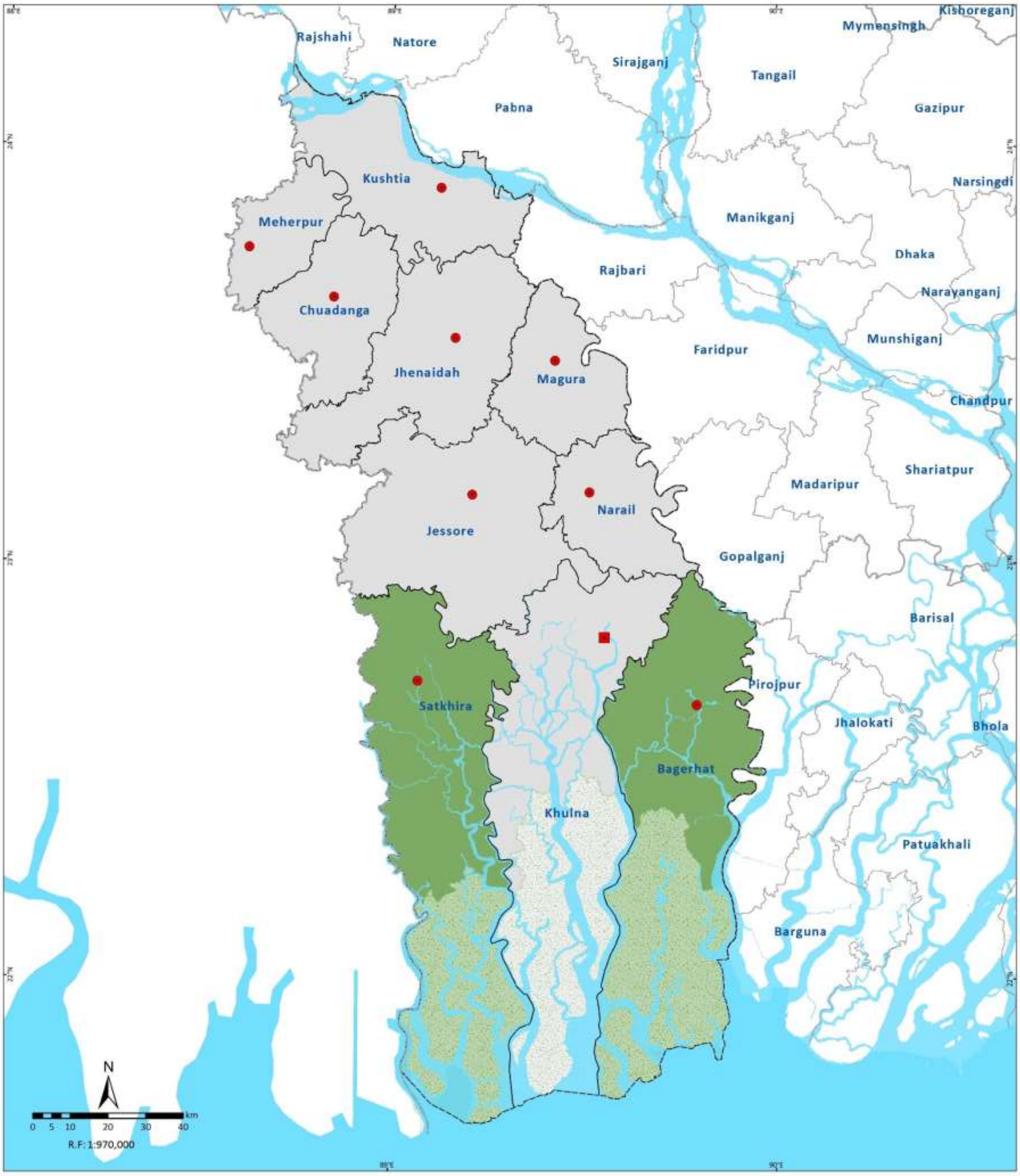


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Population Exposure map of Tsunami
(Feni District)
Parshuram Upazila
Fulgazi Upazila
Chhagalnaiya Upazila
Feni Sadar Upazila
Feni
Daganbhuiyan Upazila
Sonagazi Upazila
Comilla
Noakhali
Chittagong
N
0 2 4 8 12 16 km
R. F: 1:360,000
Population Exposure map of Tsunami
(Noakhali District)
Shariatpur
Chandpur
Comilla
Chatkhil Upazila
Sonaimuri Upazila
Senbagh Upazila
Begumganj Upazila
Feni
Barisal
Lakshmipur
Noakhali Sadar Upazila
Kabirhat Upazila
Companiganj Upazila
Noakhali
Subarnachar Upazila
Chittagong
Hatiya Upazila
Patuakhali
Bhola
N
0 4.25 8.5 17 25.5 34 km
R. F: 1:750,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Category of Exposure
Not Exposed
Very Low
Low
Moderate
High
Very High
Note:
Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure Map of Tsunami
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Category of Exposure

- Not Exposed
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

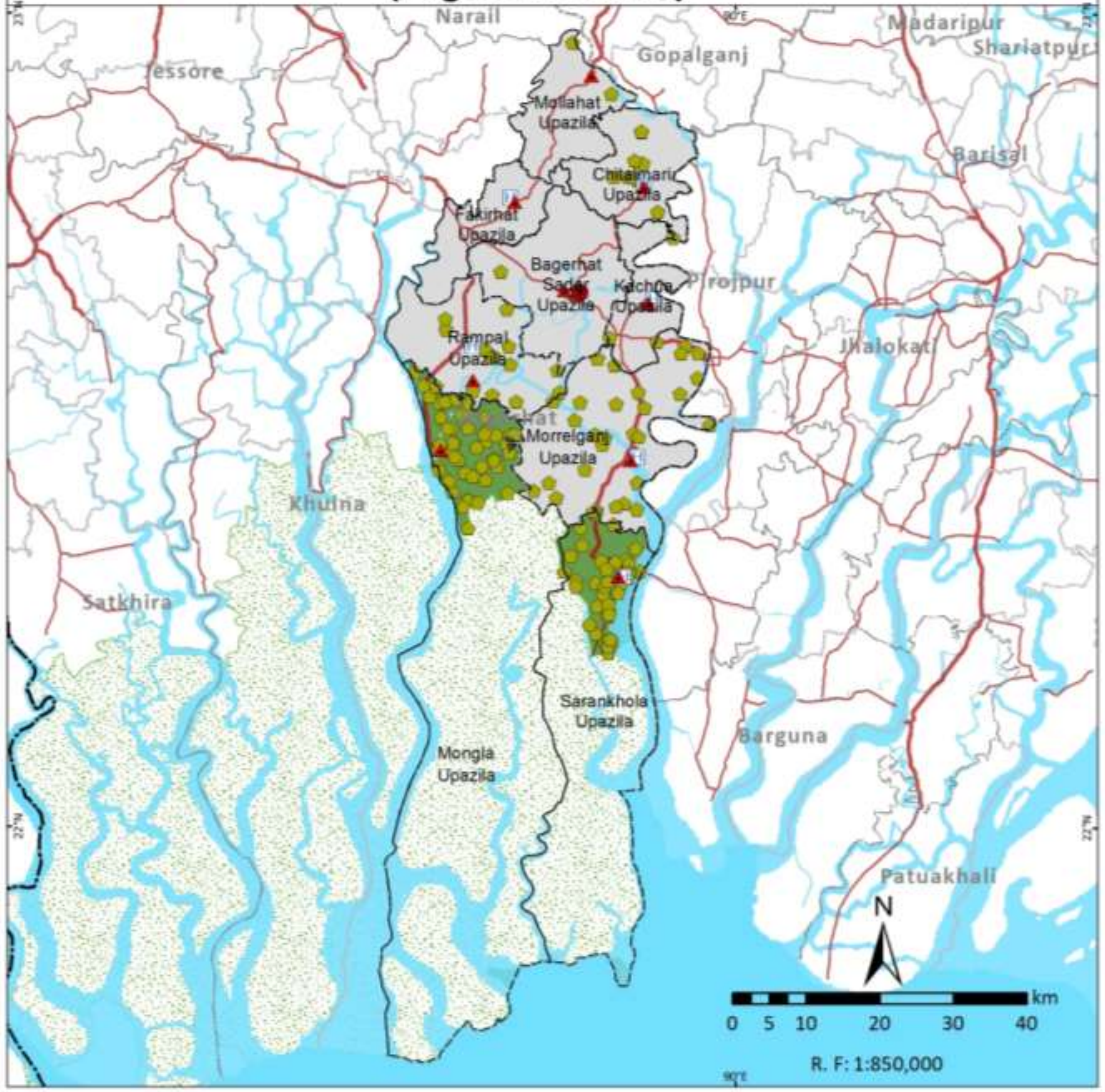
Administrative Index

Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

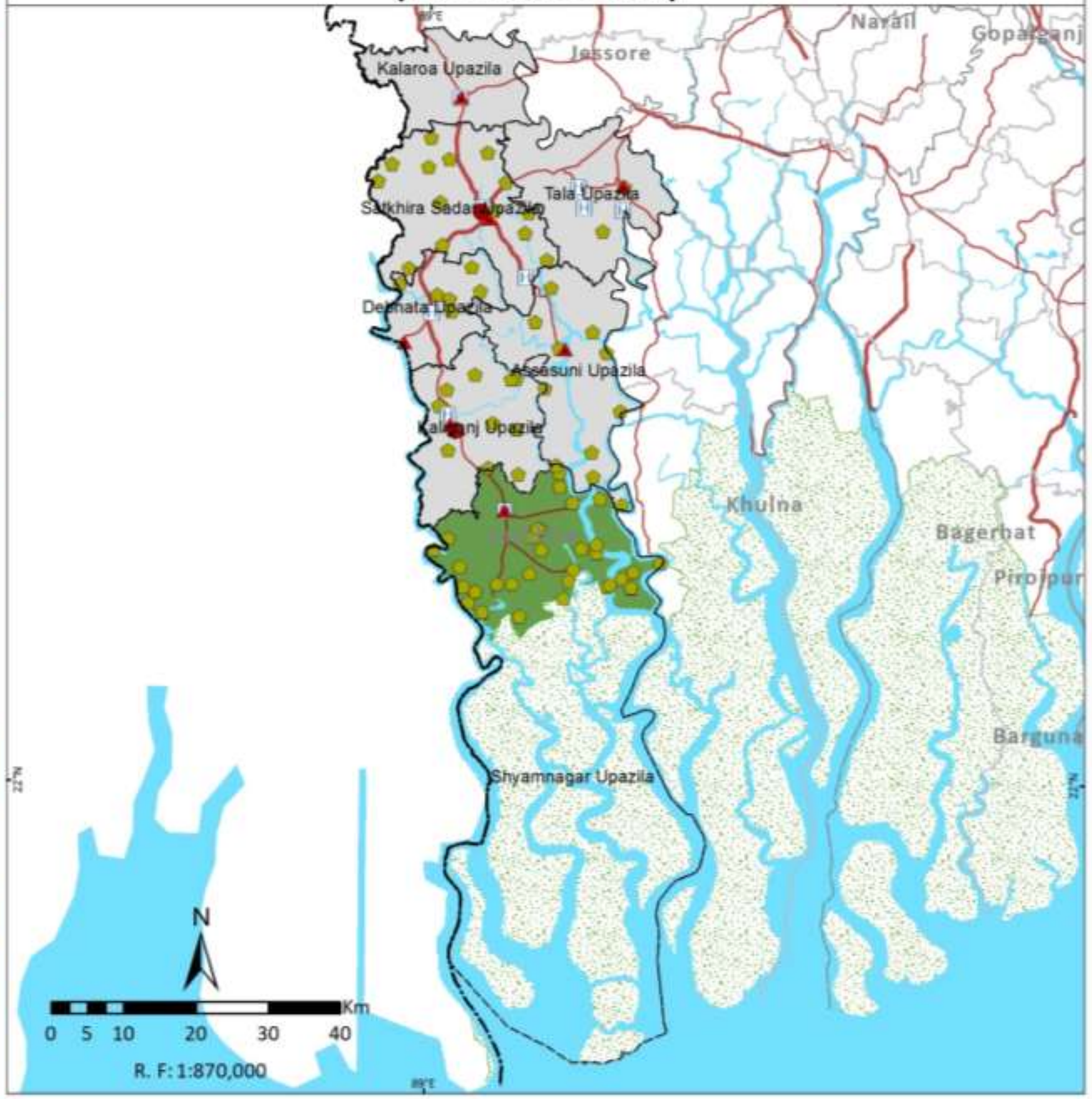
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Population Exposure map of Tsunami (Bagerhat District)



Population Exposure map of Tsunami (Satkhira District)



Legend

Country Boundary	District Head Quarter	Category of Exposure
Division Boundary	Upazila Head Quarter	Not Exposed
District Boundary	Fire stations	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

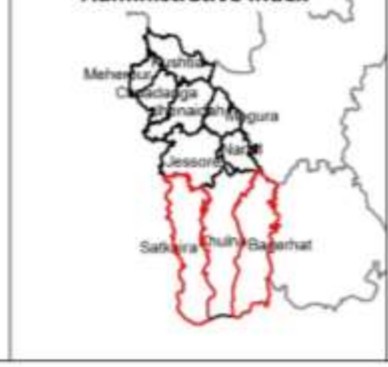
Note:

Exposure of population to tsunami is derived by combining tsunami hazard (inundation depth) and population at upazila, to derive overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

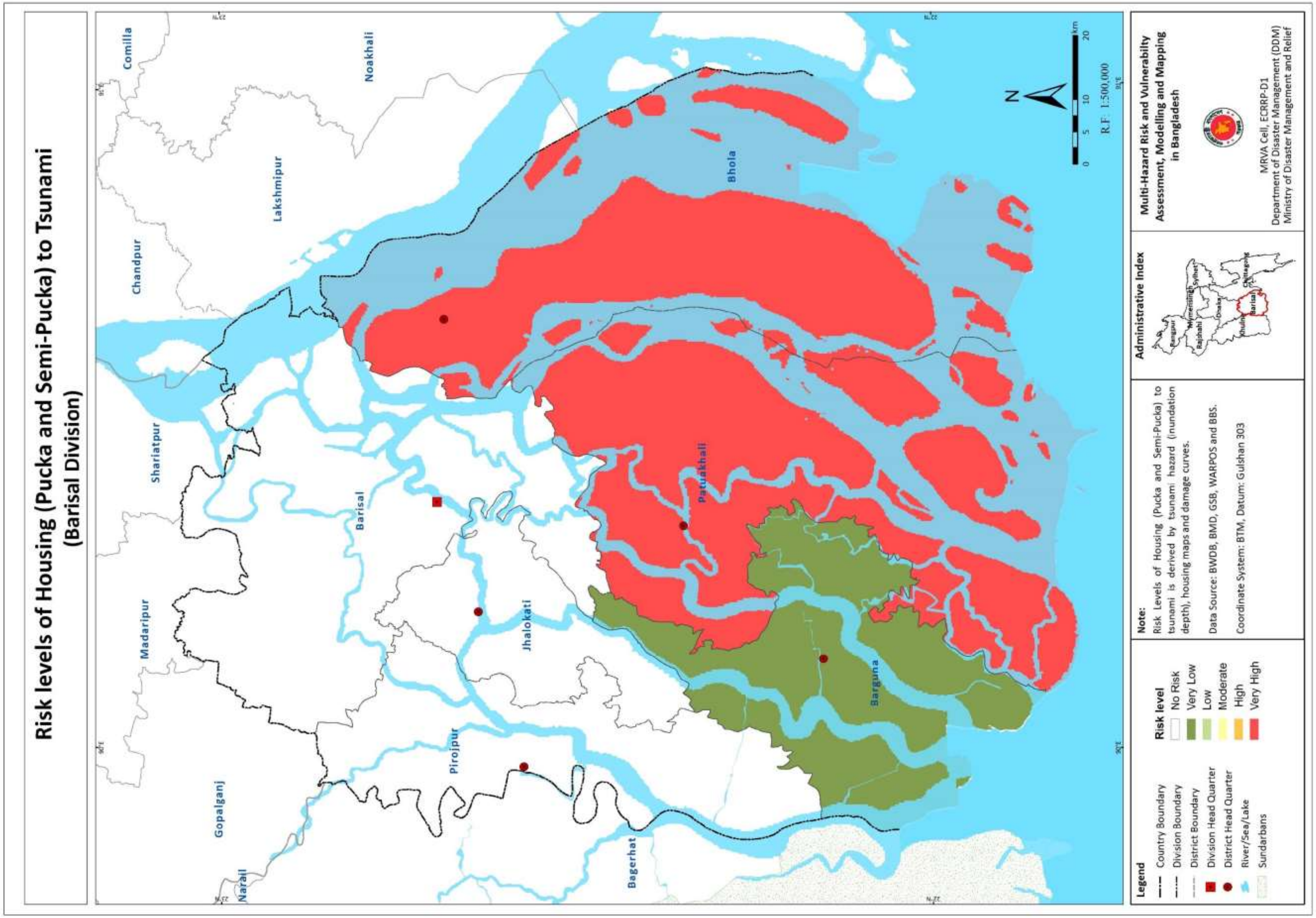
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

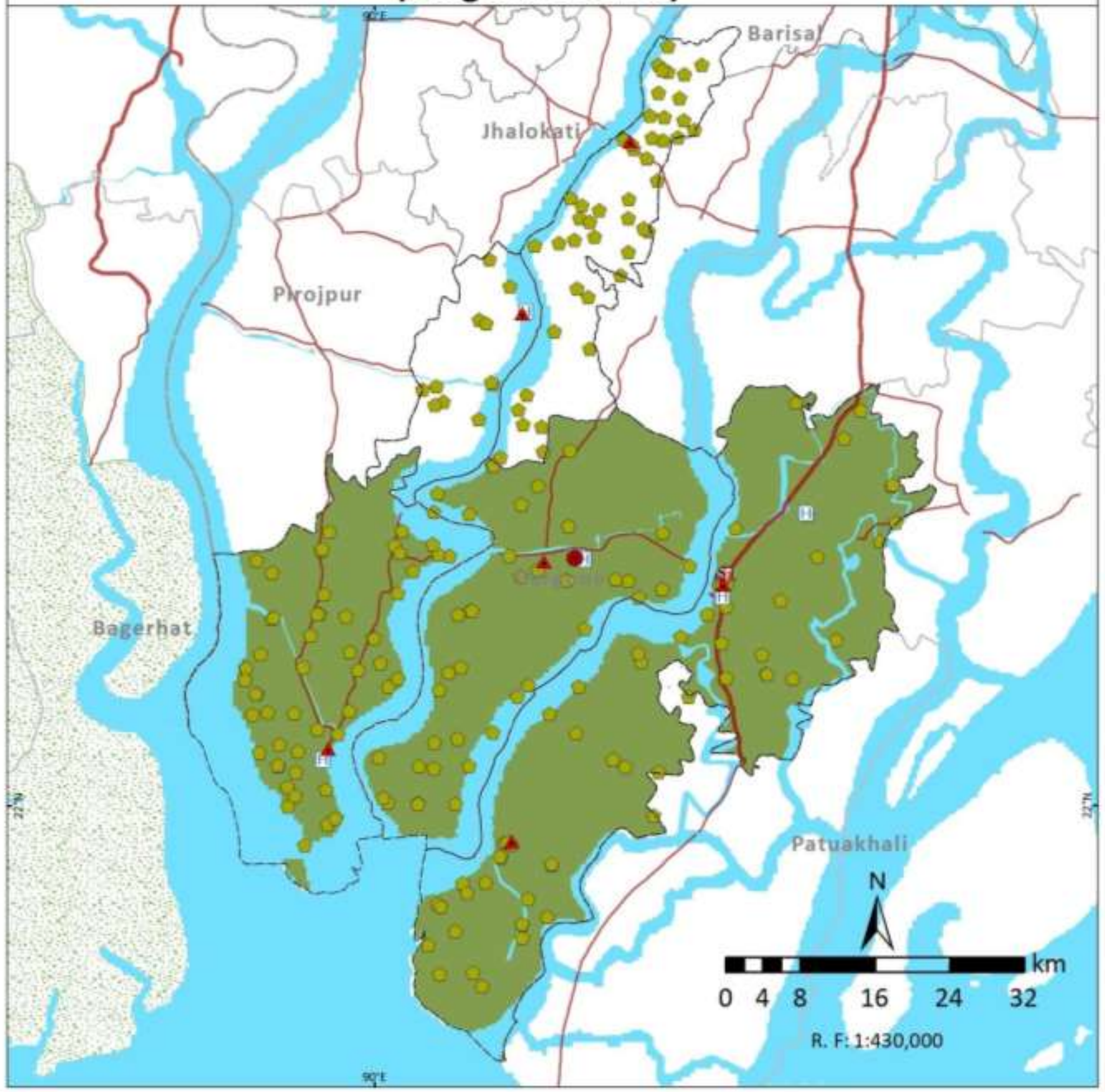


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

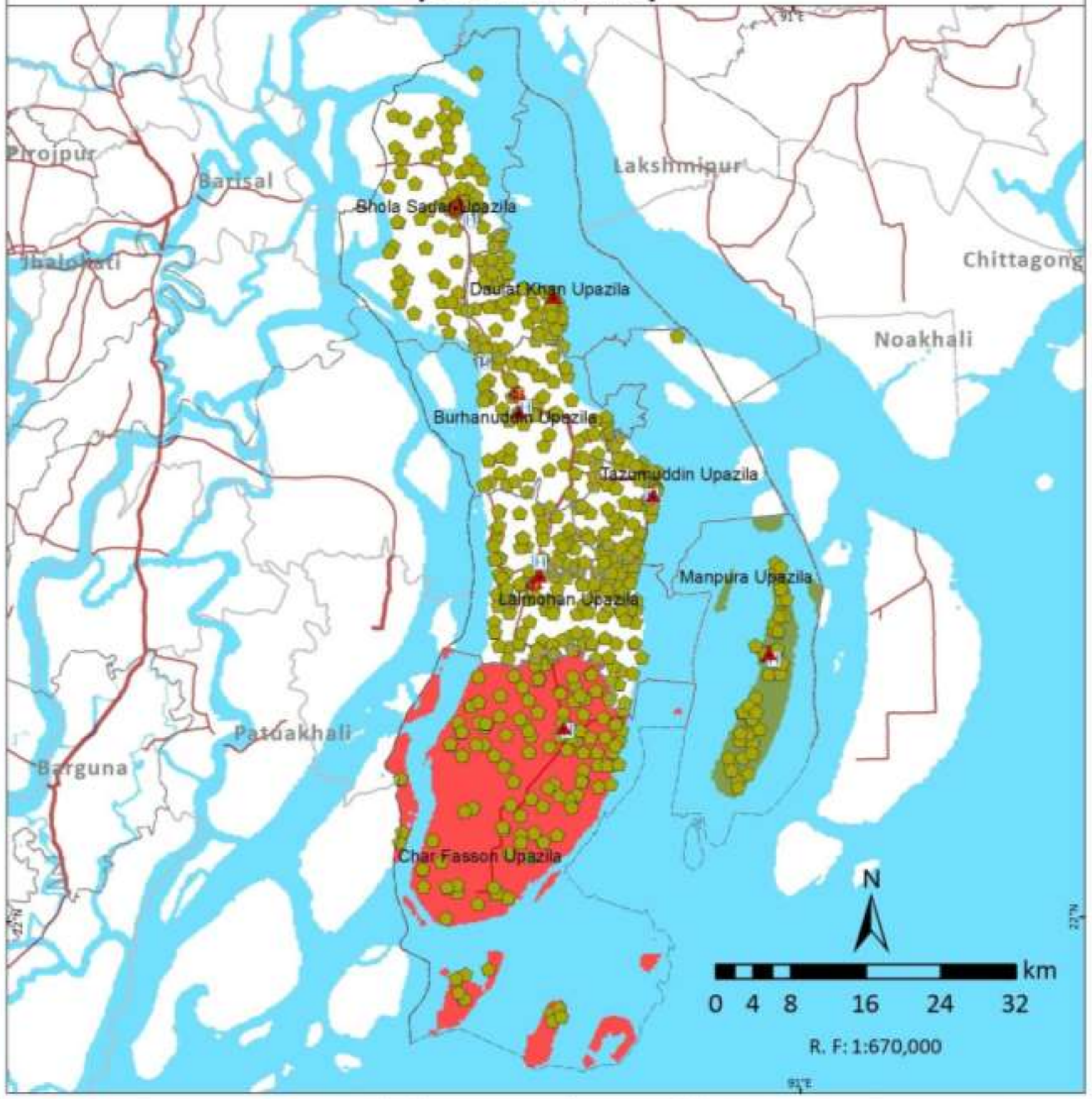
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk levels of Housing (Pucka and Semi-Pucka) to Tsunami
(Barisal Division)
Comilla
Noakhali
Lakshmipur
Chandpur
Bhola
Shariatpur
Barisal
Patuakhali
Madaripur
Jhalokati
Pirojpur
Barguna
Gopalganj
Narail
Bagerhat
N
0 5 10 20 km
R.F. 1:500,000
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans

Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Barguna District)



Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Bhola District)



Legend

Country Boundary	District Head Quarter	Risk level
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire stations	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

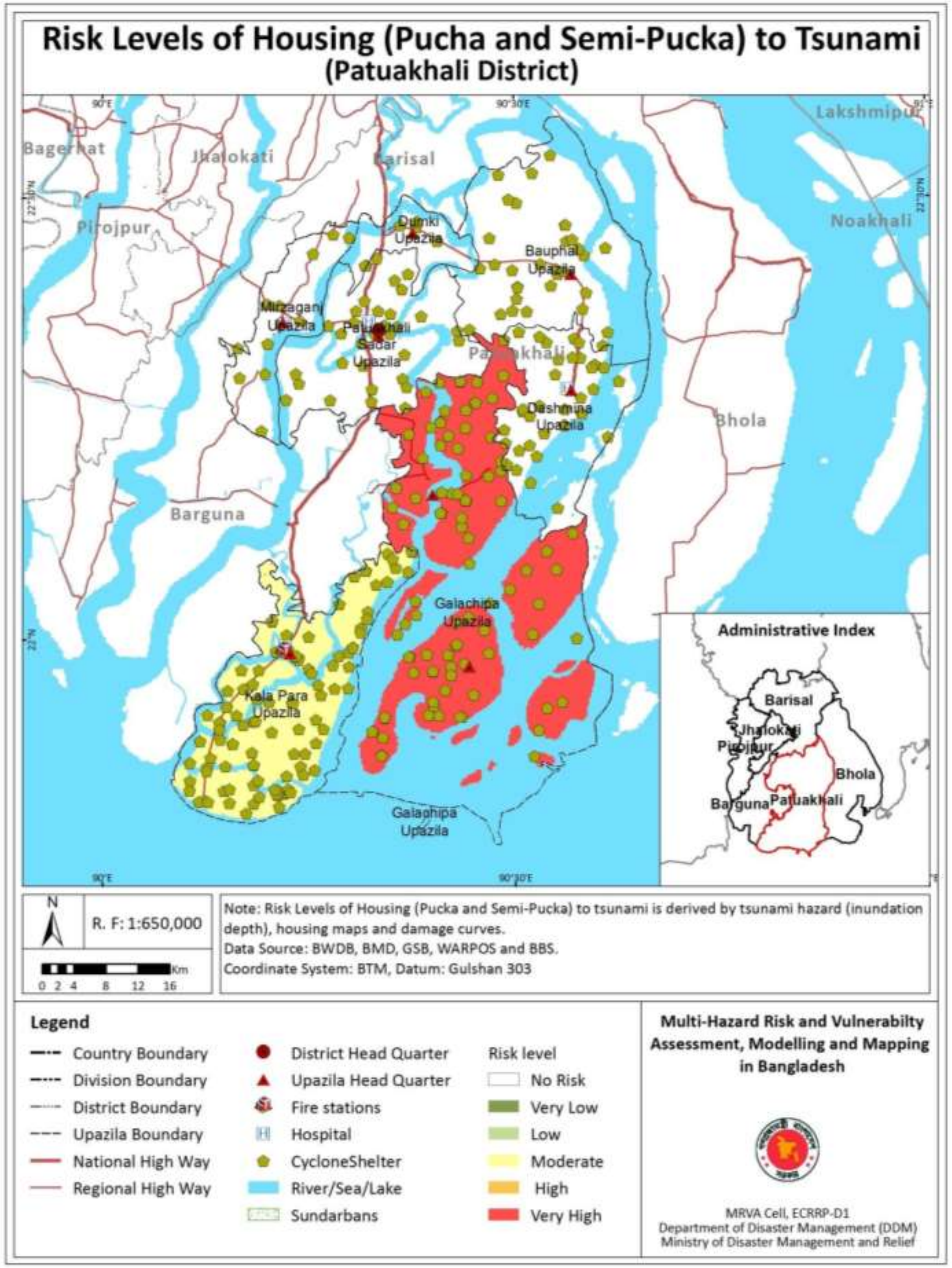
Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

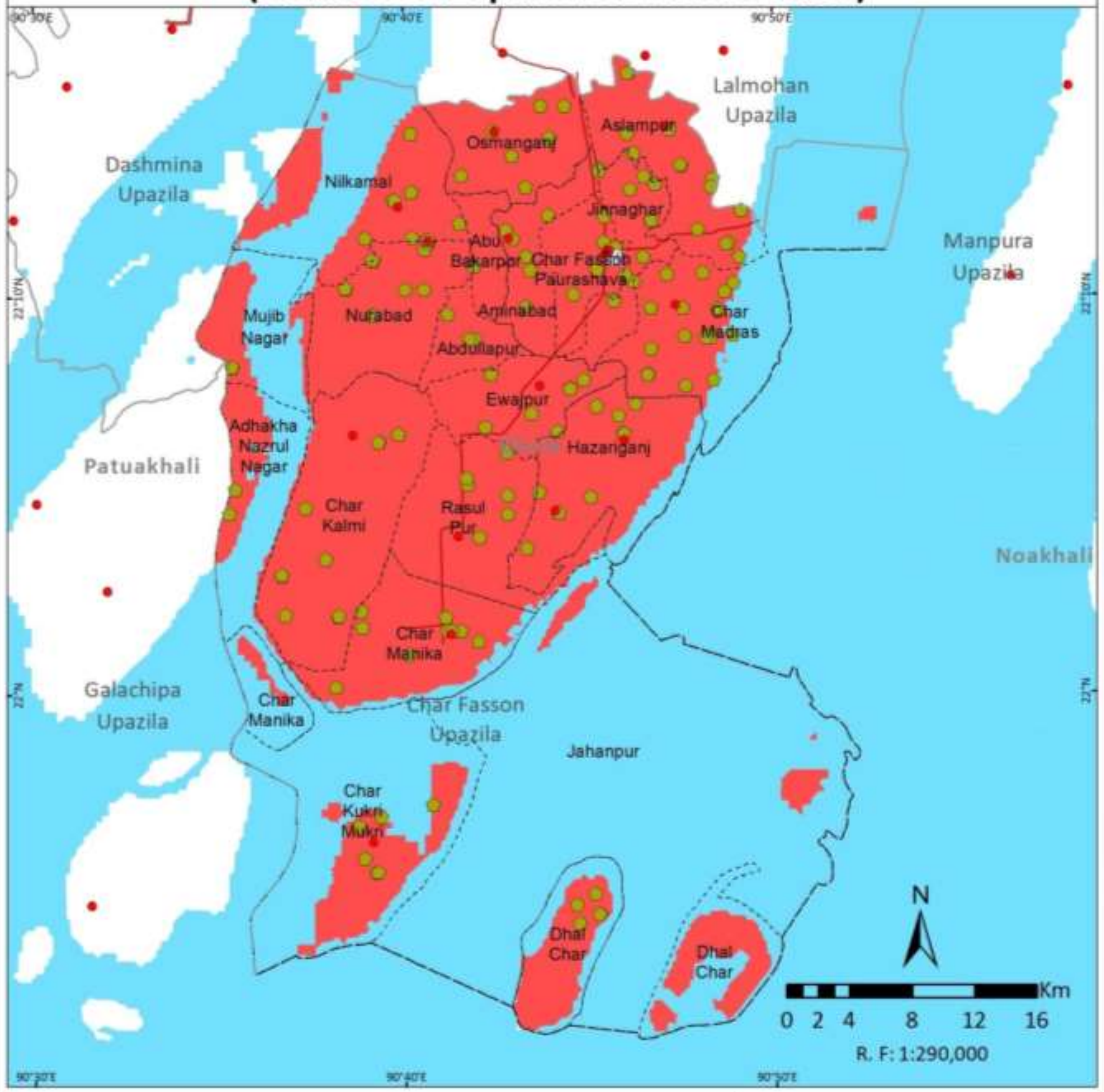
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

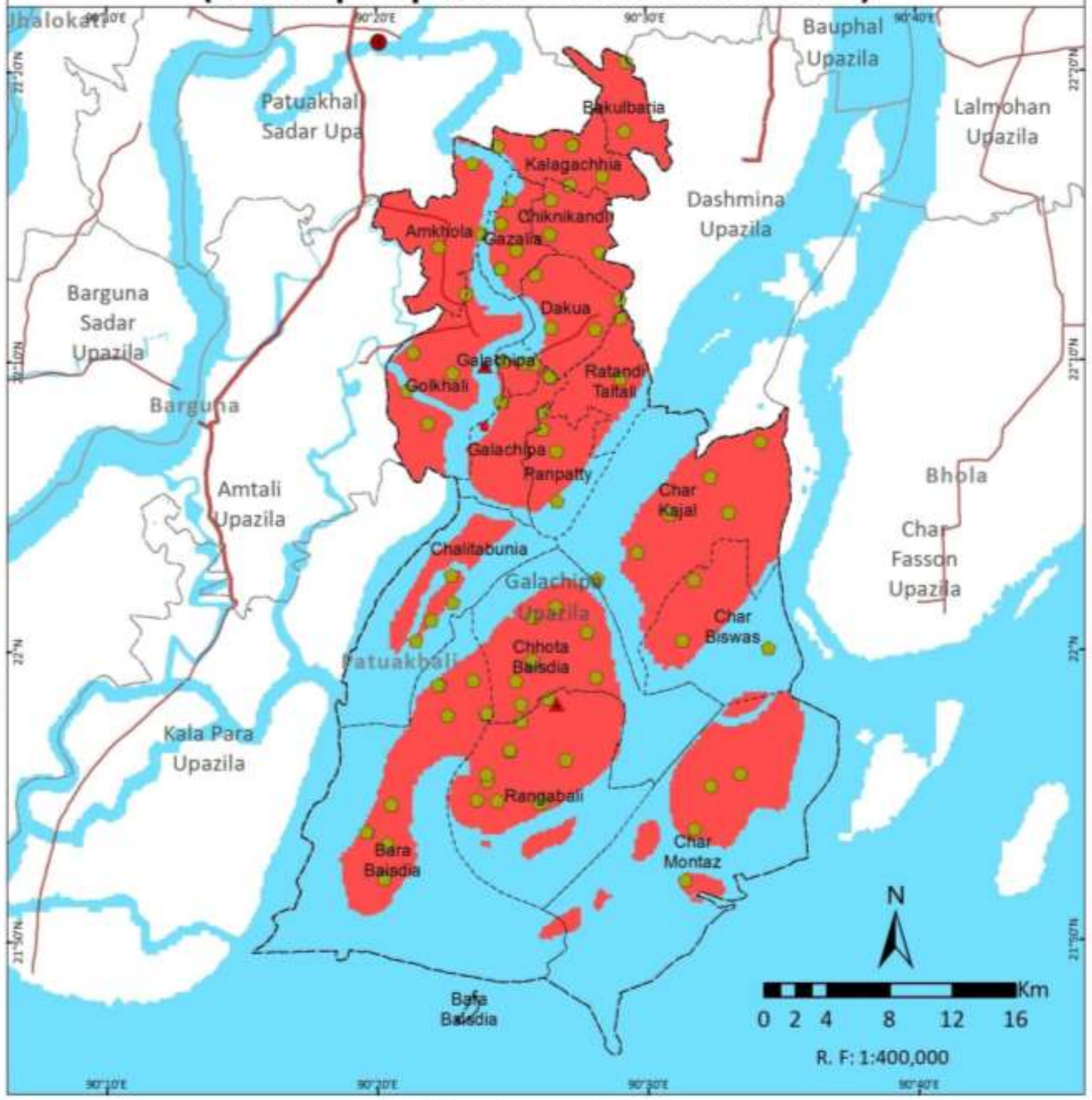
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami
(Patuakhali District)
Bagerhat
Jhalokati
Barisal
Pirojpur
Lakshmipur
Noakhali
Dumki Upazila
Bauphal Upazila
Mirzaganj Upazila
Patuakhali Sadar Upazila
Patuakhali
Dashmina Upazila
Bhola
Barguna
Galachipa Upazila
Kala Para Upazila
Galachipa Upazila
Administrative Index
Barisal
Jhalokati
Pirojpur
Bhola
Barguna
Patuakhali
R. F: 1:650,000
0 2 4 8 12 16 Km
Note: Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
CycloneShelter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Char Fasson Upazila of Bhola District)



Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Galachipa Upazila of Patuakhali District)



Legend

Country Boundary	District Head Quarter	Risk level
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Union Head Quarter	Very Low
Upazila Boundary	Hospital	Low
Union Boundary	Cyclone Shelter	Moderate
National High Way	Fire Station	High
Regional High Way	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Housing (Pucka and Semi-Pucka) to Tsunami
(Chittagong Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk level

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

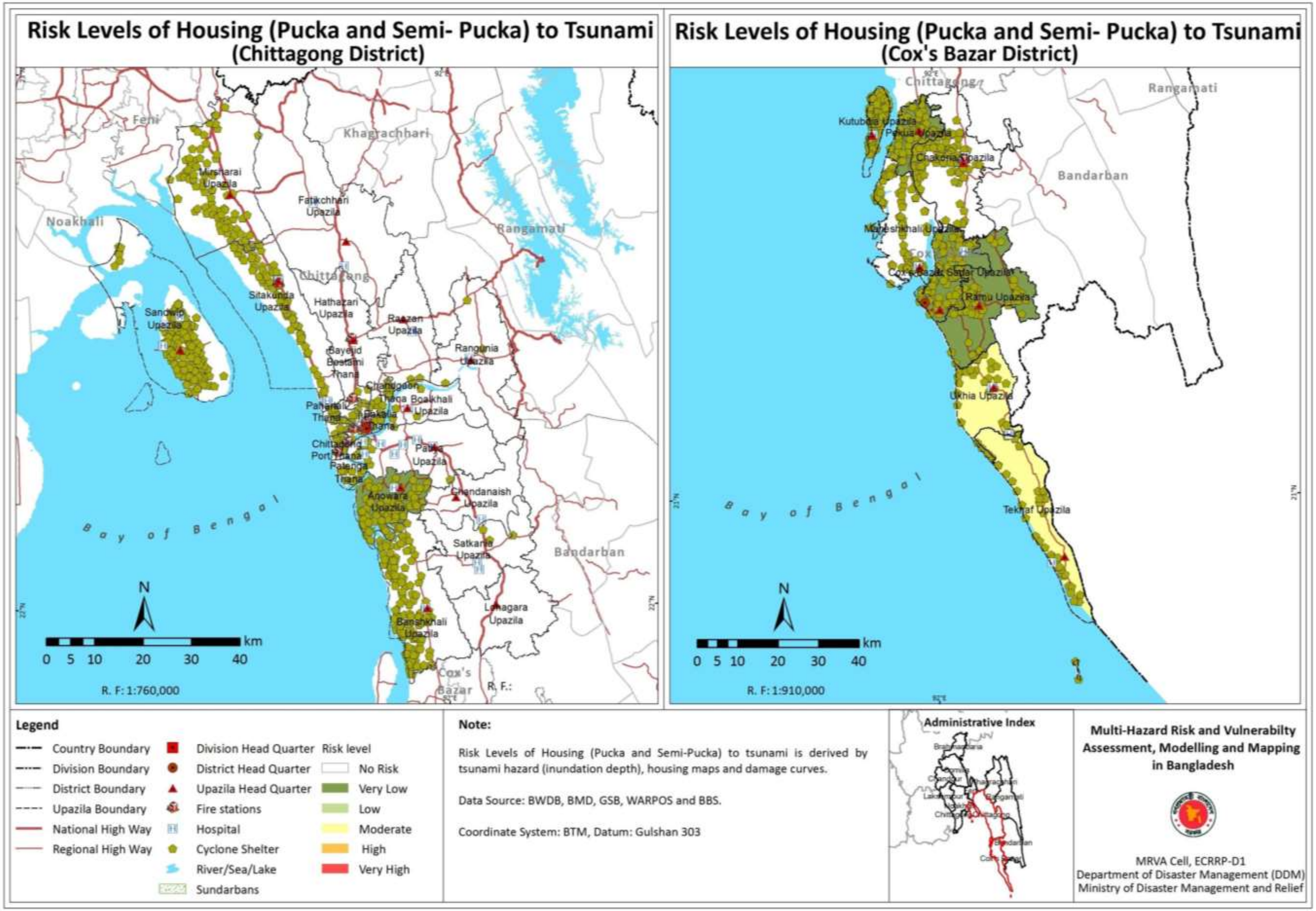
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

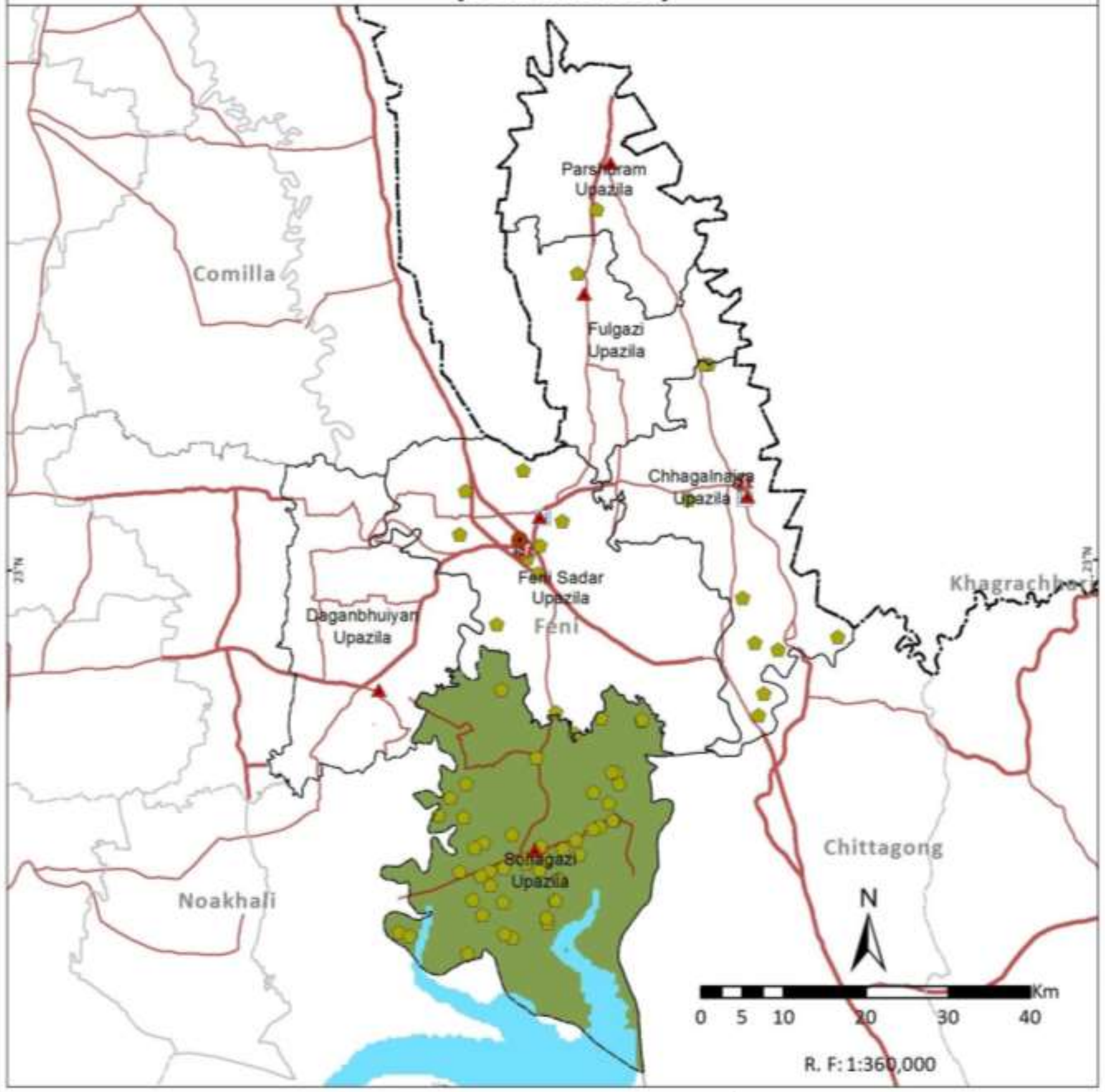
Rangpur, Mymensingh, Sylhet, Rajshahi, Dhaka, Khulna, Barisal, Chittagong

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

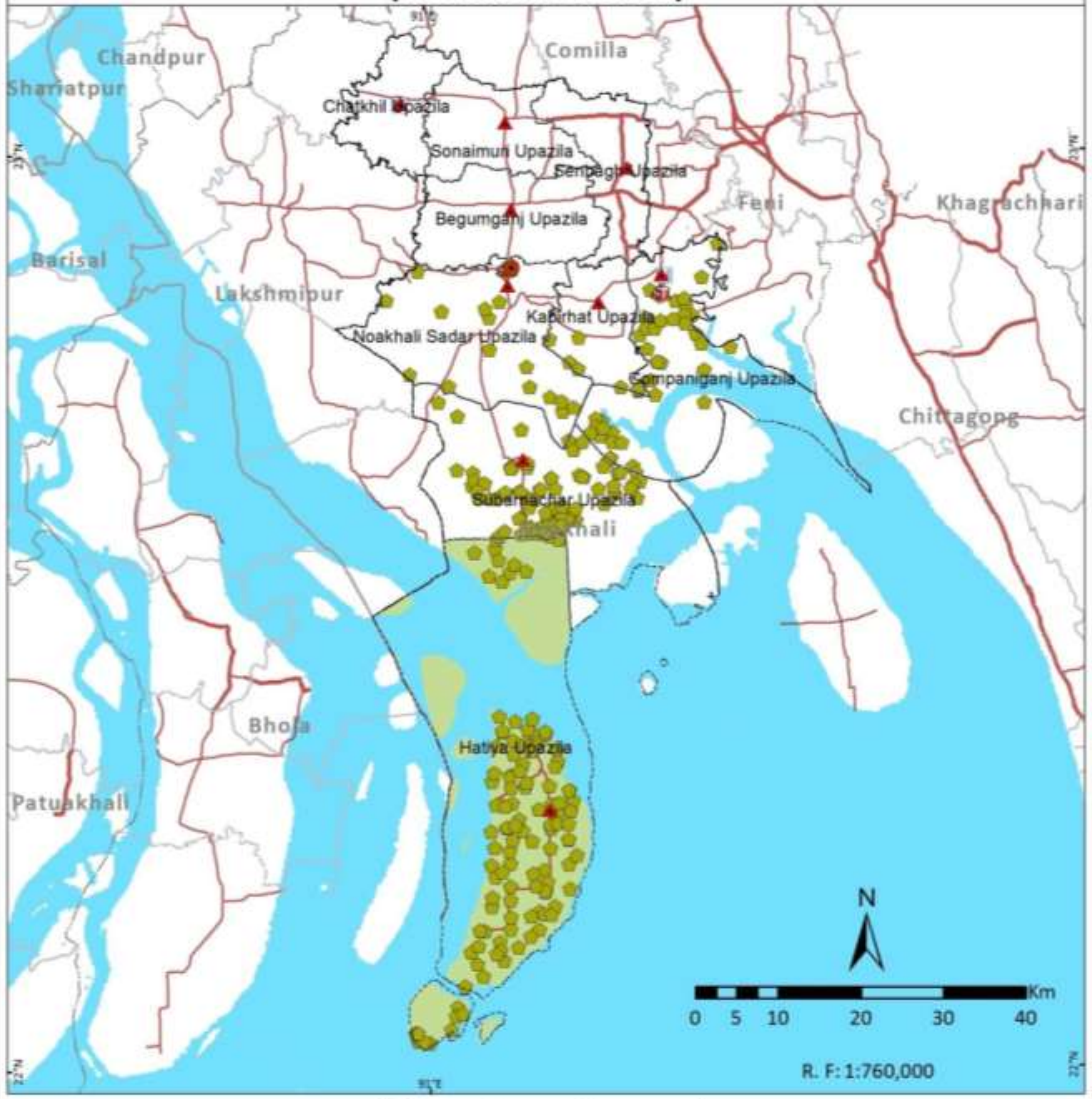
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Pucka and Semi- Pucka) to Tsunami
(Chittagong District)
Risk Levels of Housing (Pucka and Semi- Pucka) to Tsunami
(Cox's Bazar District)
Feni
Khagrachhari
Noakhali
Rangamati
Bandarban
Chittagong
Cox's Bazar
Mirsharai Upazila
Fatikchhari Upazila
Sitakunda Upazila
Sandwip Upazila
Hathazari Upazila
Raozan Upazila
Rangunia Upazila
Bayejid Bostami Thana
Chandgaon Thana
Boalkhali Upazila
Pahartali Thana
Chittagong Port Thana
Patenga Thana
Patiya Upazila
Anowara Upazila
Chandanaish Upazila
Satkania Upazila
Lohagara Upazila
Banshkhali Upazila
Kutubdia Upazila
Pekua Upazila
Chakoria Upazila
Moheshkhali Upazila
Cox's Bazar Sadar Upazila
Ramu Upazila
Ukhia Upazila
Teknaf Upazila
Bay of Bengal
N
0 5 10 20 30 40 km
R. F: 1:760,000
R. F: 1:910,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
Division Head Quarter
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Feni District)



Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami (Noakhali District)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- National High Way
- Regional High Way
- Sundarbans
- District Head Quarter
- Upazila Head Quarter
- Fire stations
- Health Facilities
- Cyclone Shelter
- River/Sea/Lake

Risk level
- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

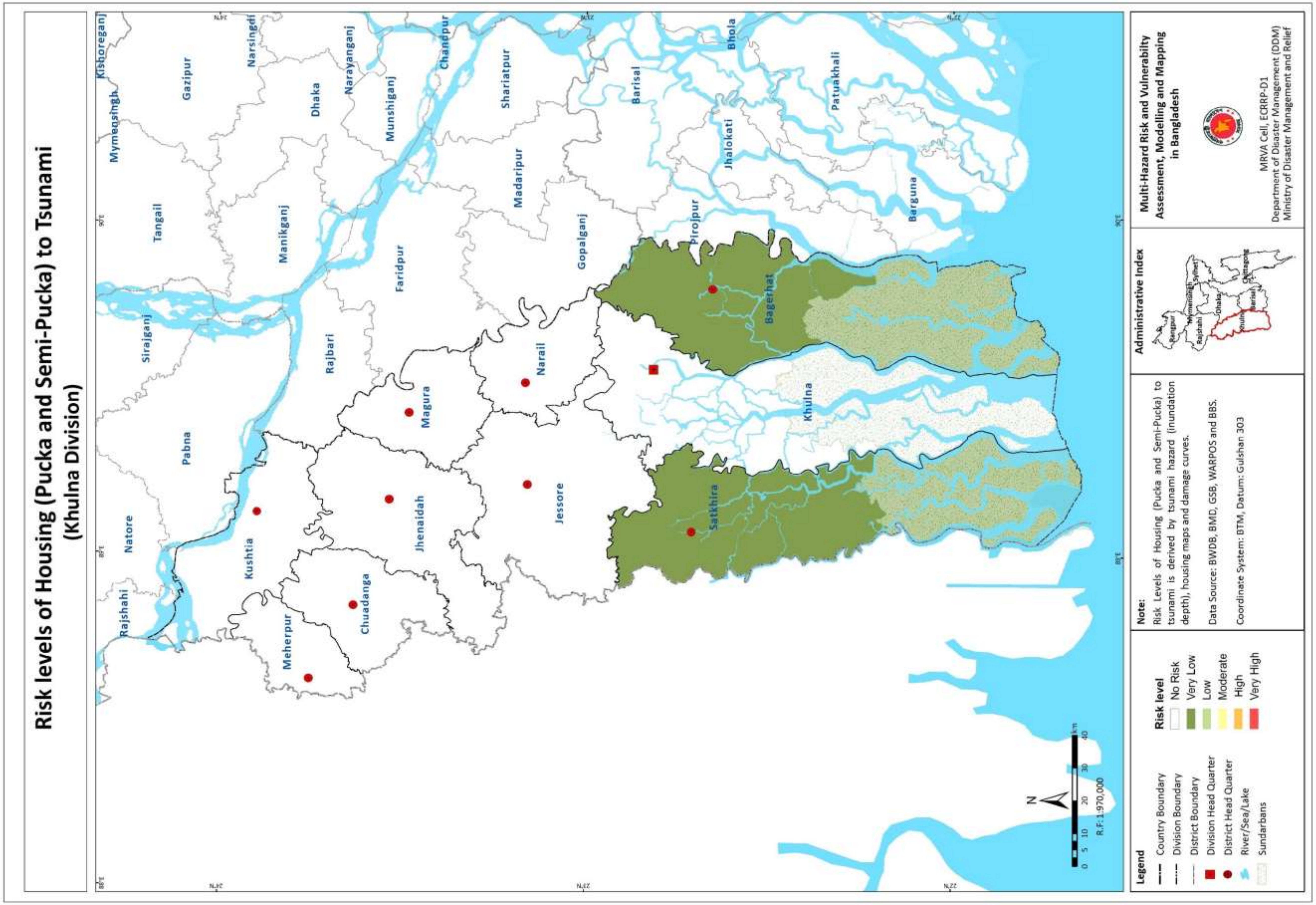
Data Source: BWDB, BMD, GSB, WARPOS and BBS.

Coordinate System: BTM, Datum: Gulshan 303

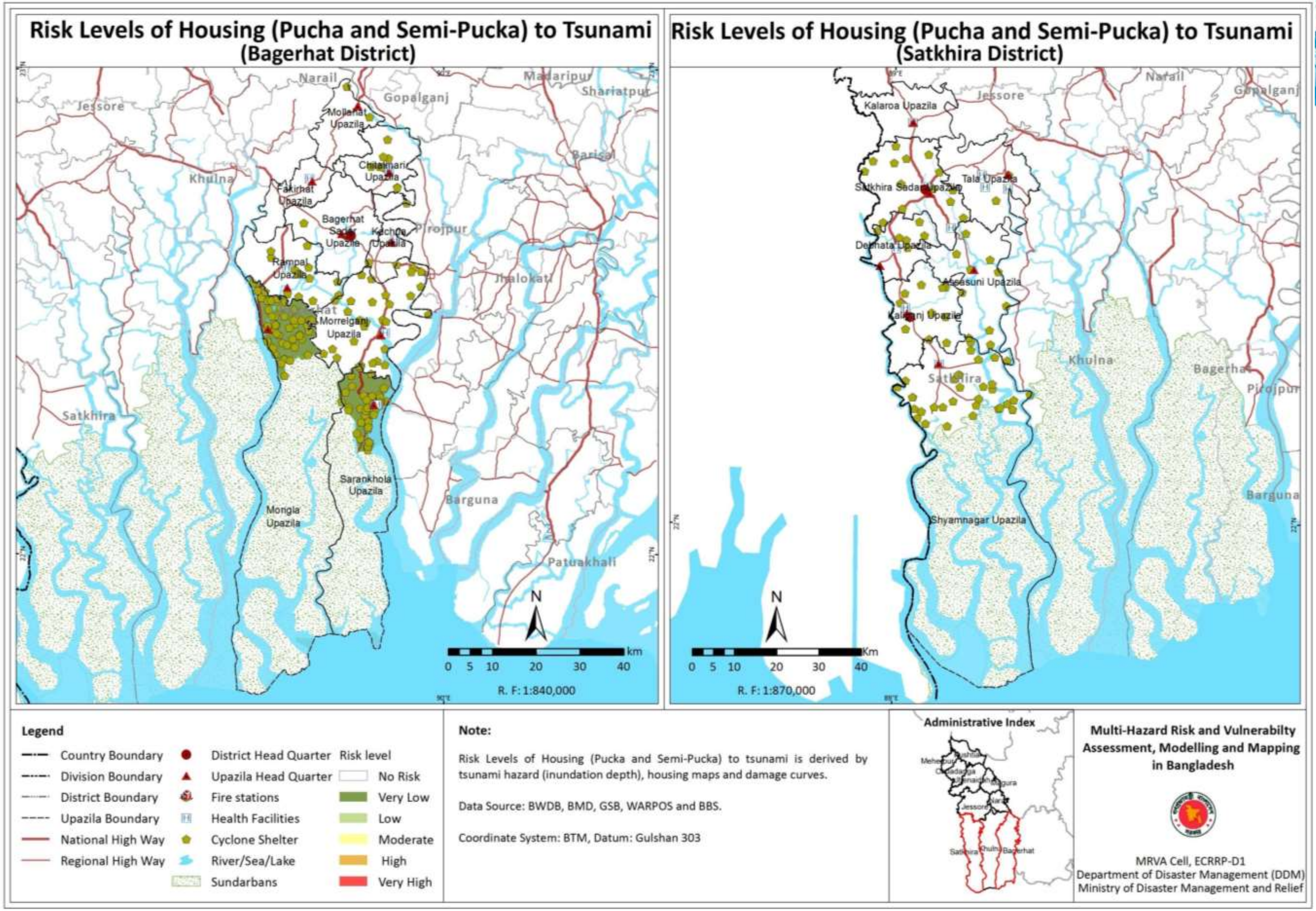
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

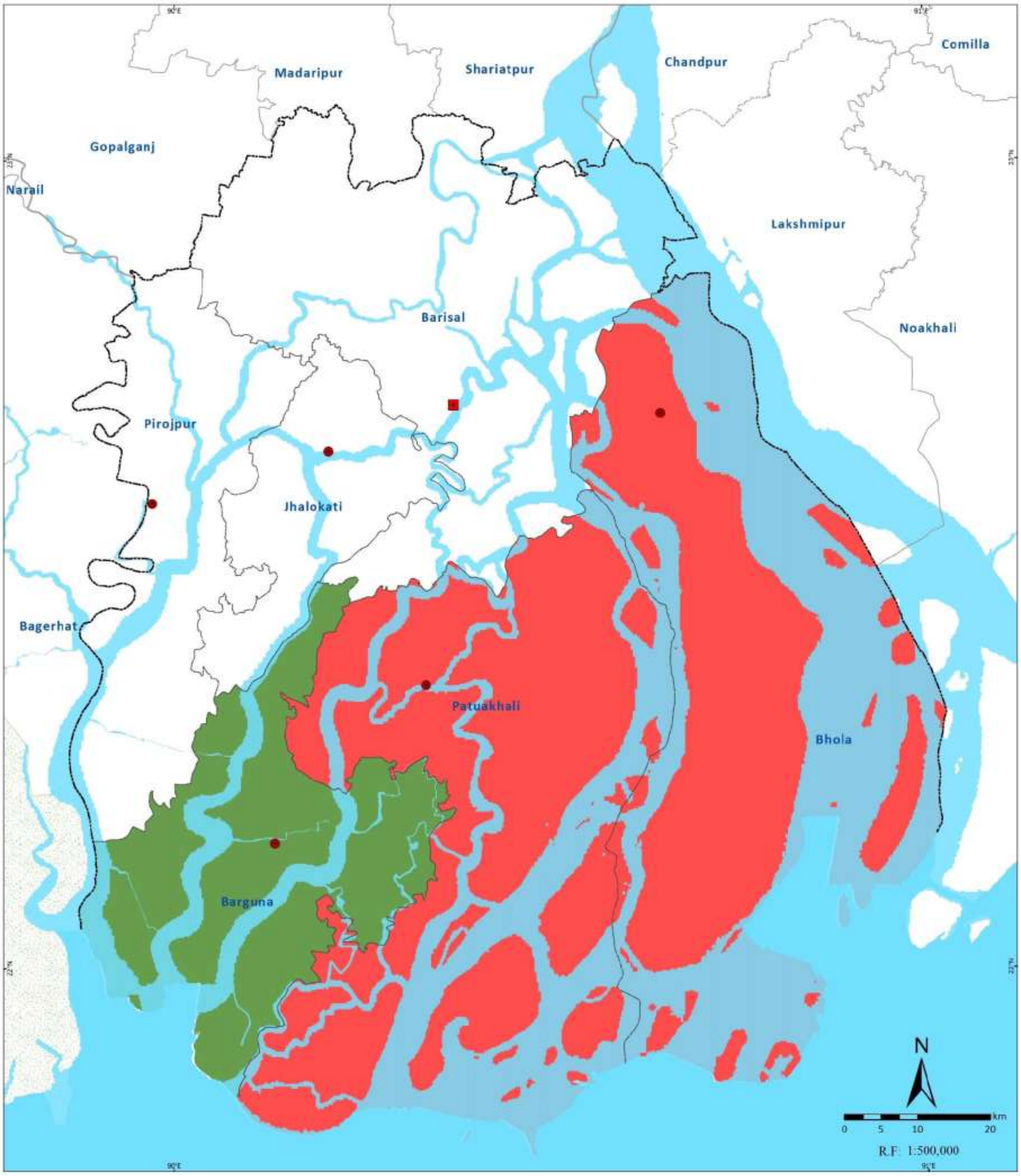


Risk levels of Housing (Pucka and Semi-Pucka) to Tsunami
(Khulna Division)
Rajshahi
Natore
Pabna
Sirajganj
Tangail
Mymensingh
Kishoreganj
Gazipur
Narsingdi
Dhaka
Manikganj
Narayanganj
Munshiganj
Chandpur
Shariatpur
Madaripur
Faridpur
Rajbari
Gopalganj
Barisal
Bhola
Patuakhali
Jhalokati
Pirojpur
Barguna
Bagerhat
Khulna
Satkhira
Narail
Magura
Jessore
Jhenaidah
Kushtia
Chuadanga
Meherpur
R.F:1:970,000
0 5 10 20 30 40 km
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami
(Bagerhat District)
Narail
Jessore
Gopalganj
Madaripur
Shariatpur
Mollahat Upazila
Chitalmari Upazila
Barisal
Khulna
Fakirhat Upazila
Bagerhat Sadar Upazila
Kachua Upazila
Pirojpur
Rampal Upazila
Jhalokati
Morrelganj Upazila
Satkhira
Sarankhola Upazila
Mongla Upazila
Barguna
Patuakhali
N
0 5 10 20 30 40 km
R. F: 1:840,000
Risk Levels of Housing (Pucha and Semi-Pucka) to Tsunami
(Satkhira District)
Kalaroa Upazila
Jessore
Narail
Gopalganj
Satkhira Sadar Upazila
Tala Upazila
Debhata Upazila
Assasuni Upazila
Kaliganj Upazila
Khulna
Bagerhat
Pirojpur
Satkhira
Shyamnagar Upazila
Barguna
N
0 5 10 20 30 40 Km
R. F: 1:870,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Health Facilities
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Satkhira
Khulna
Bagerhat
Jessore
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Housing (Kutcha and Jhupri) to Tsunami
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk level

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

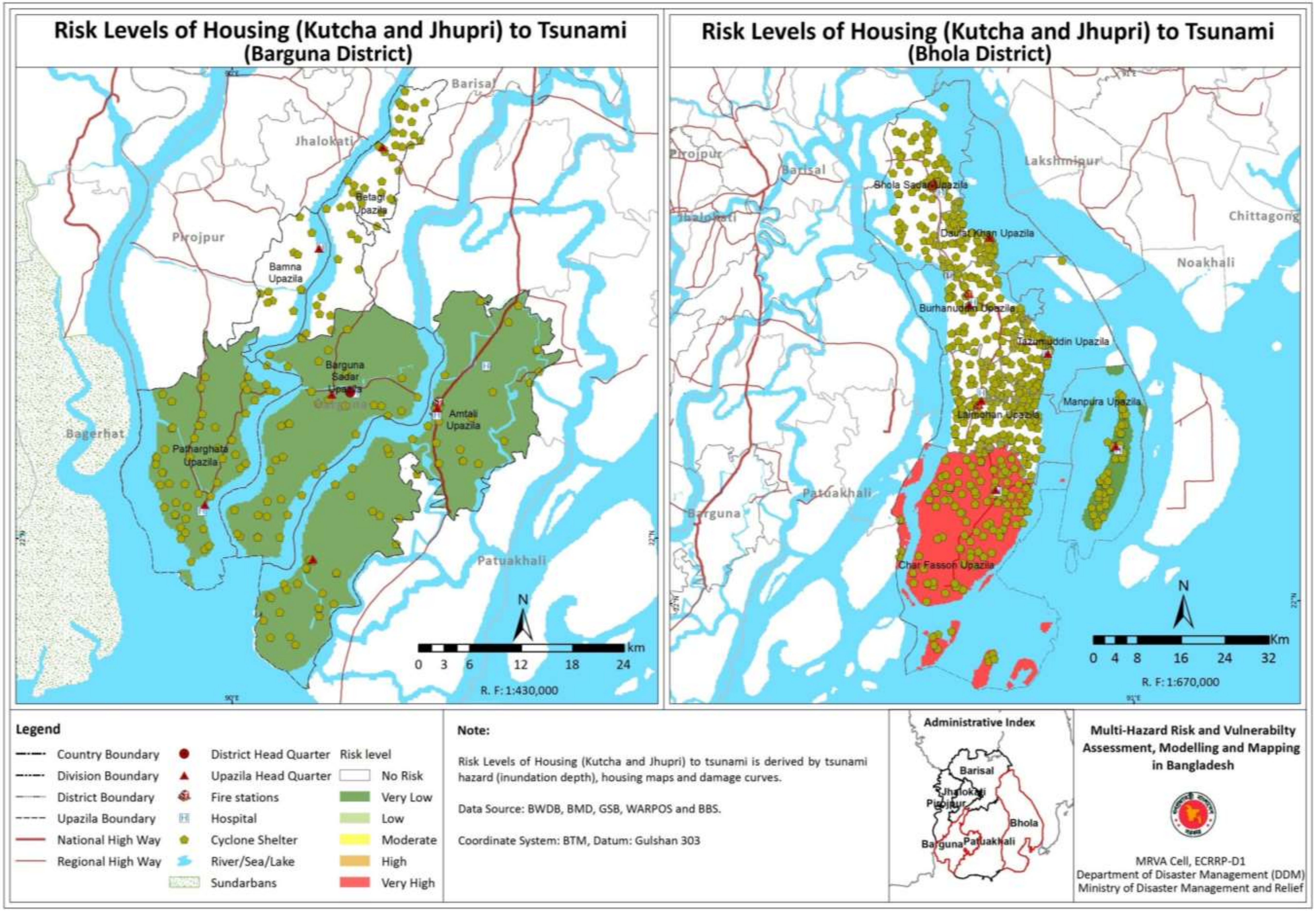
Coordinate System: BTM, Datum: Gulshan 303

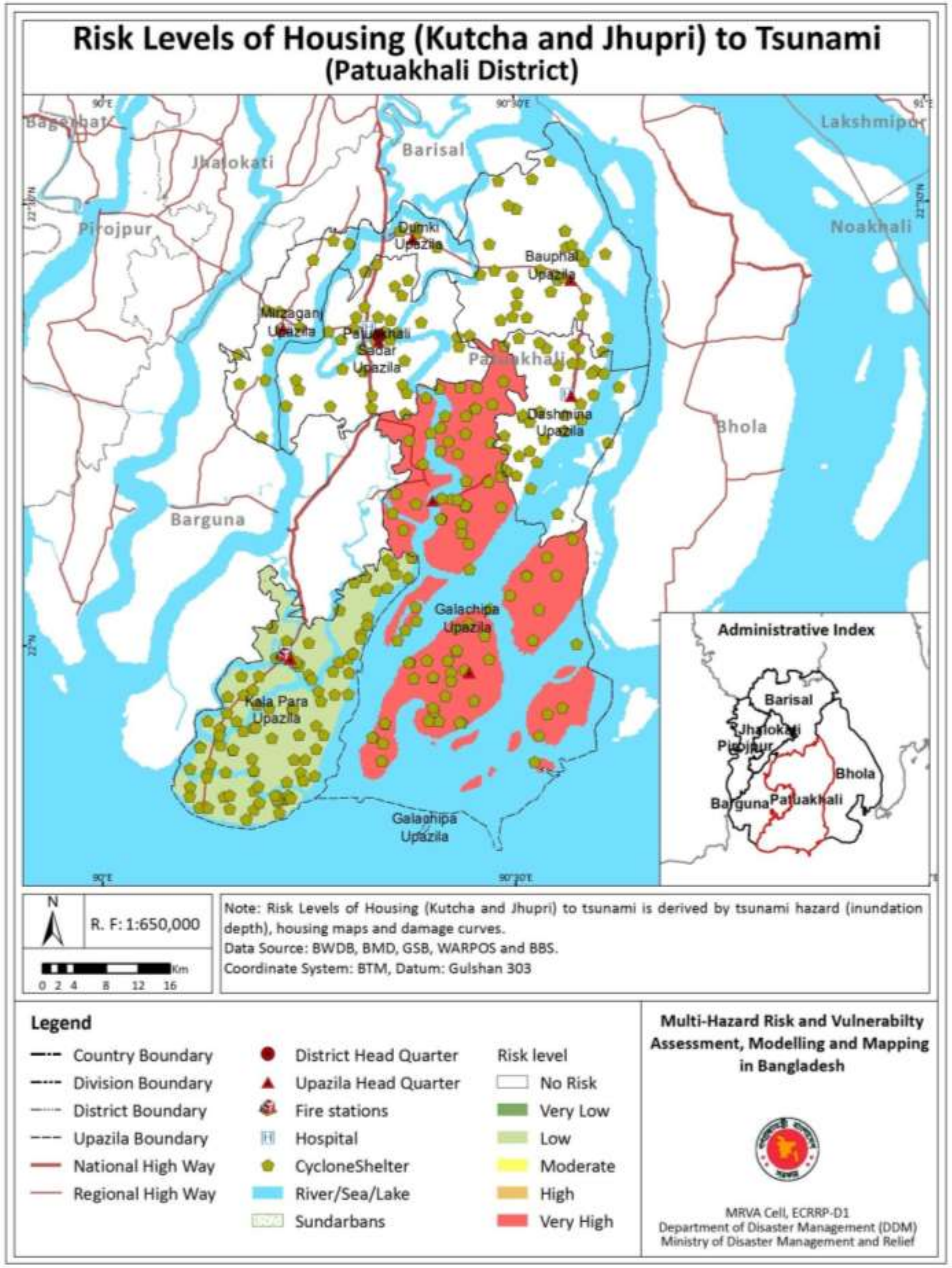
Administrative Index

Rangpur, Mymensingh, Rajshahi, Sylhet, Dhaka, Khulna, Barisal, Chittagong

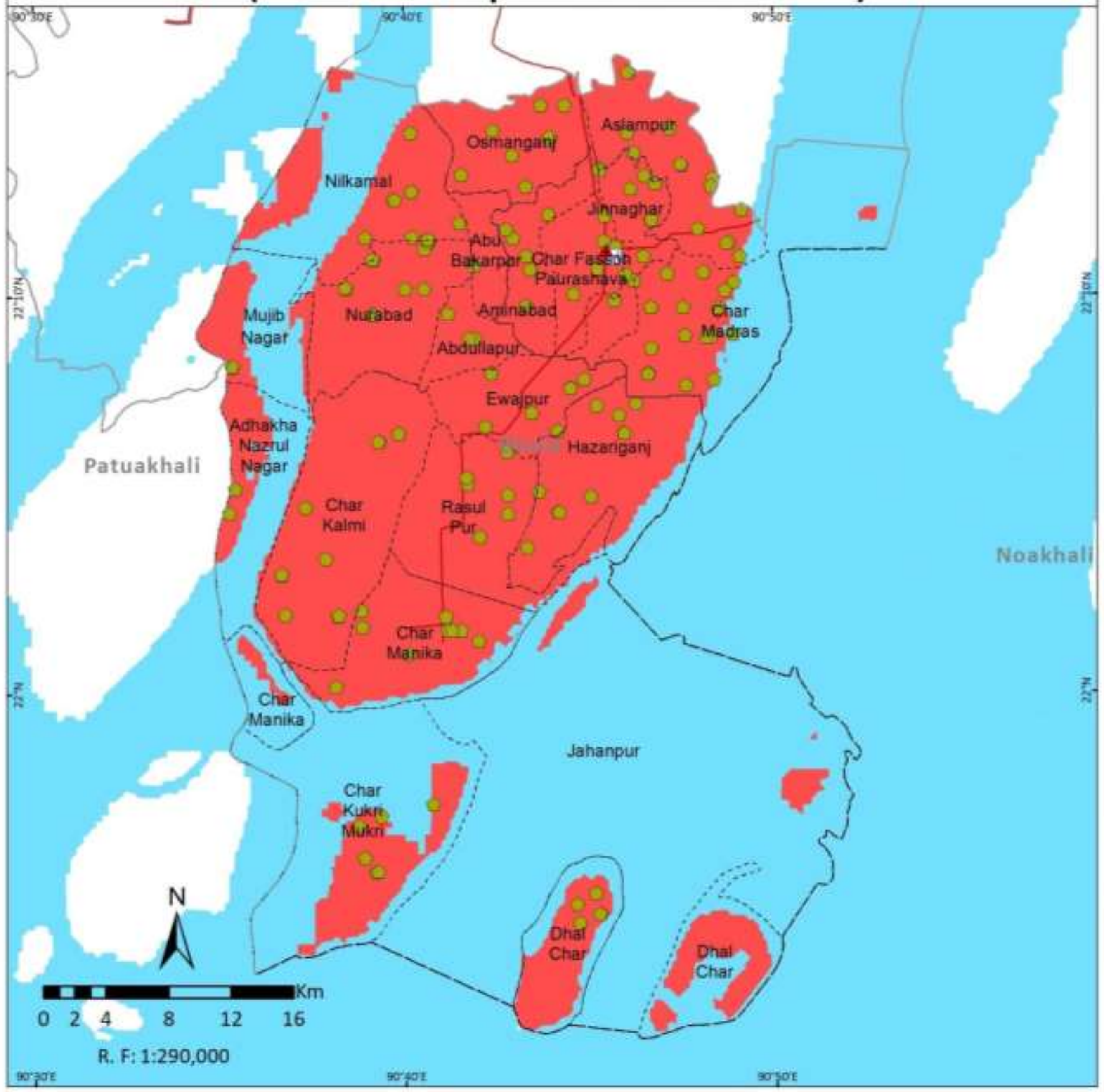
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

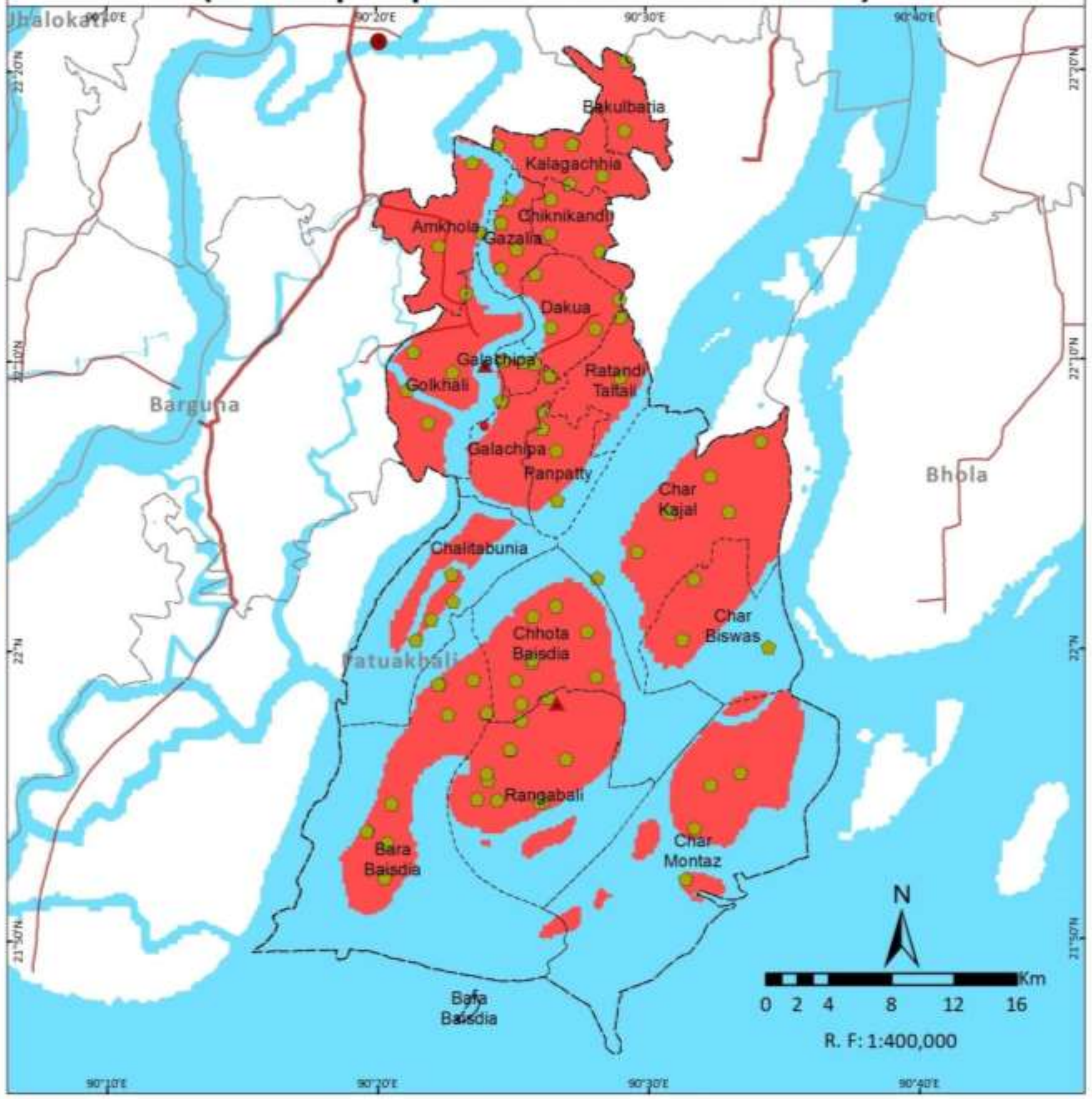

Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Barguna District)
Barisal
Jhalokati
Pirojpur
Bagerhat
Patuakhali
Betagi Upazila
Bamna Upazila
Barguna Sadar Upazila
Amtali Upazila
Patharghata Upazila
N
km
0 3 6 12 18 24
R. F: 1:430,000
Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Bhola District)
Pirojpur
Barisal
Jhalokati
Lakshmipur
Chittagong
Noakhali
Patuakhali
Barguna
Bhola Sadar Upazila
Daulat Khan Upazila
Burhanuddin Upazila
Tazumuddin Upazila
Lalmohan Upazila
Manpura Upazila
Char Fasson Upazila
N
Km
0 4 8 16 24 32
R. F: 1:670,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Barisal
Jhalokati
Pirojpur
Bhola
Barguna
Patuakhali
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Patuakhali District)
Bagerhat
Jhalokati
Barisal
Lakshmipur
Pirojpur
Noakhali
Dumki Upazila
Bauphal Upazila
Mirzaganj Upazila
Patuakhali Sadar Upazila
Patuakhali
Dashmina Upazila
Bhola
Barguna
Galachipa Upazila
Kala Para Upazila
Galachipa Upazila
Administrative Index
Barisal
Jhalokati
Pirojpur
Bhola
Barguna
Patuakhali
N
R. F: 1:650,000
Km
0 2 4 8 12 16
Note: Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.
Data Source: BWDB, BMD, GSB, WARPOS and BBS.
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
CycloneShelter
River/Sea/Lake
Sundarbans
Risk level
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Char Fasson Upazila of Bhola District)



Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Galachipa Upazila of Patuakhali District)



Legend

Country Boundary	District Head Quarter	**Risk level**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Union Head Quarter	Very Low
Upazila Boundary	Health Facilities	Low
Union Boundary	CycloneShelter	Moderate
National High Way	Fire Station	High
Regional High Way	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Pucka and Semi-Pucka) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

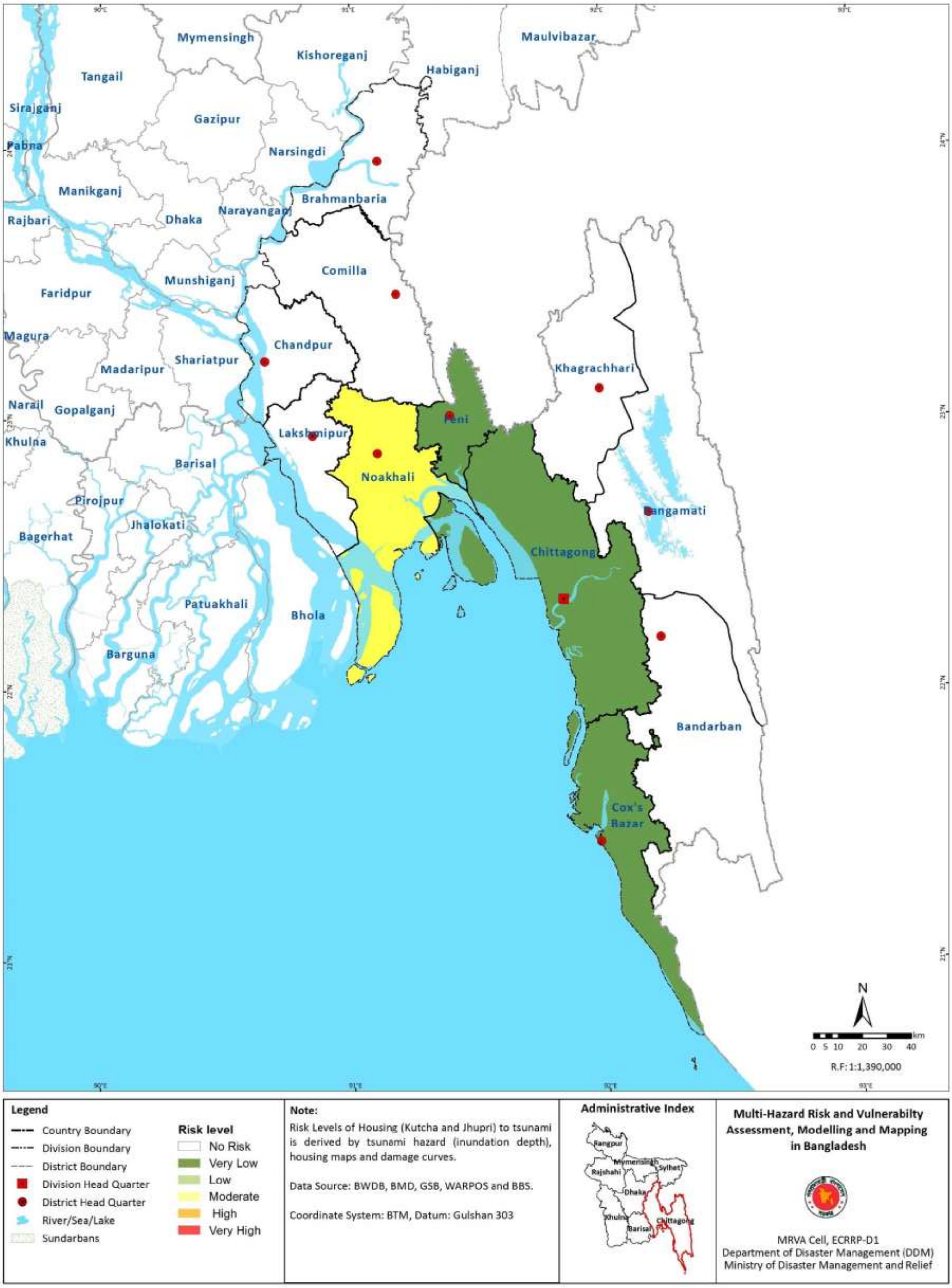
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

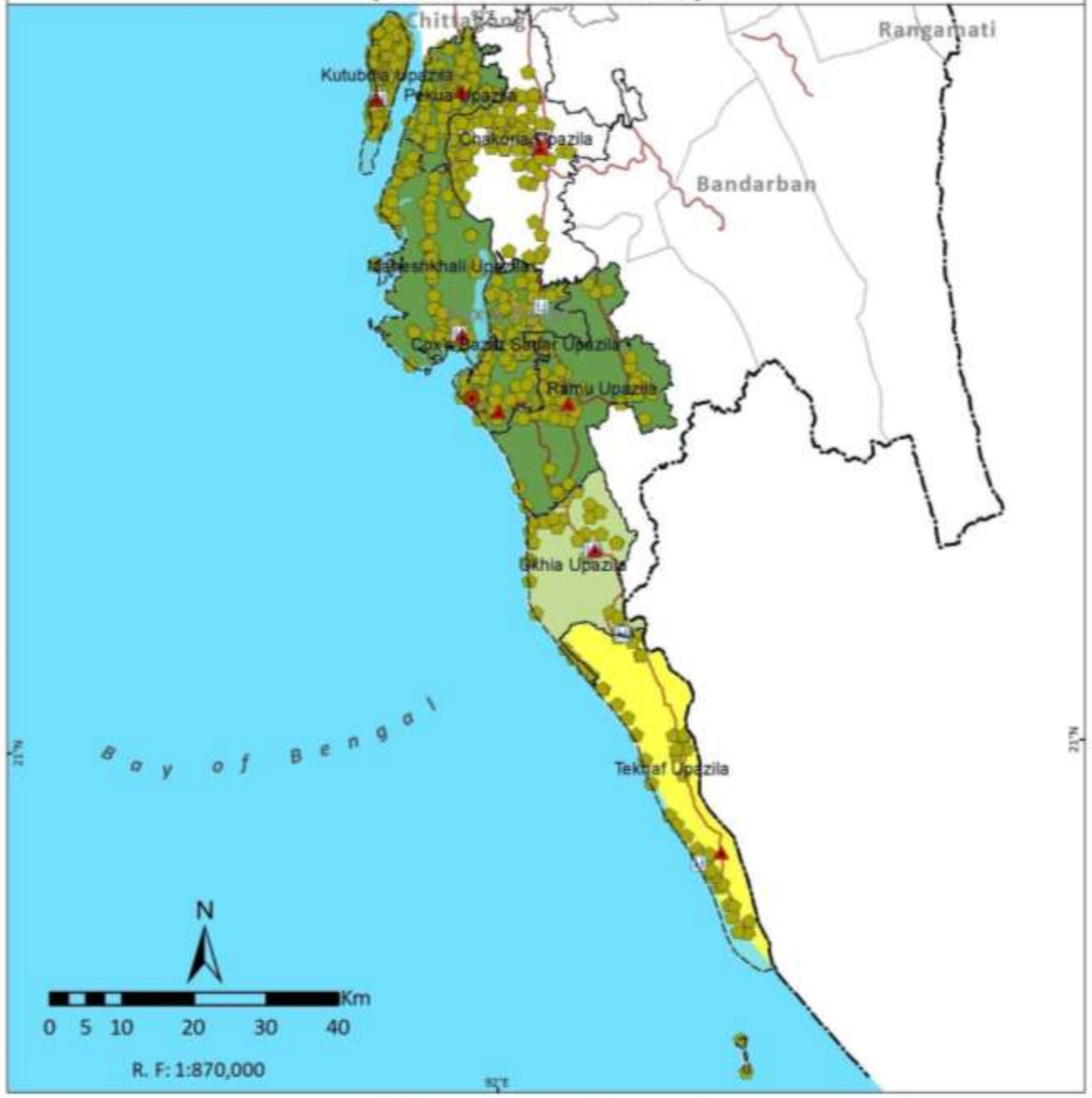
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Housing (Kutcha and Jhupri) to Tsunami
(Chittagong Division)



Risk Levels of Housing (Kutcha and Jhupri) to Tsunami (Chittagong District)

Risk Levels of Housing (Kutcha and Jhupri) to Tsunami (Cox's Bazar District)



Legend

Country Boundary	Division Head Quarter	Risk level
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire stations	Low
National High Way	Health Facilities	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

Note:

Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

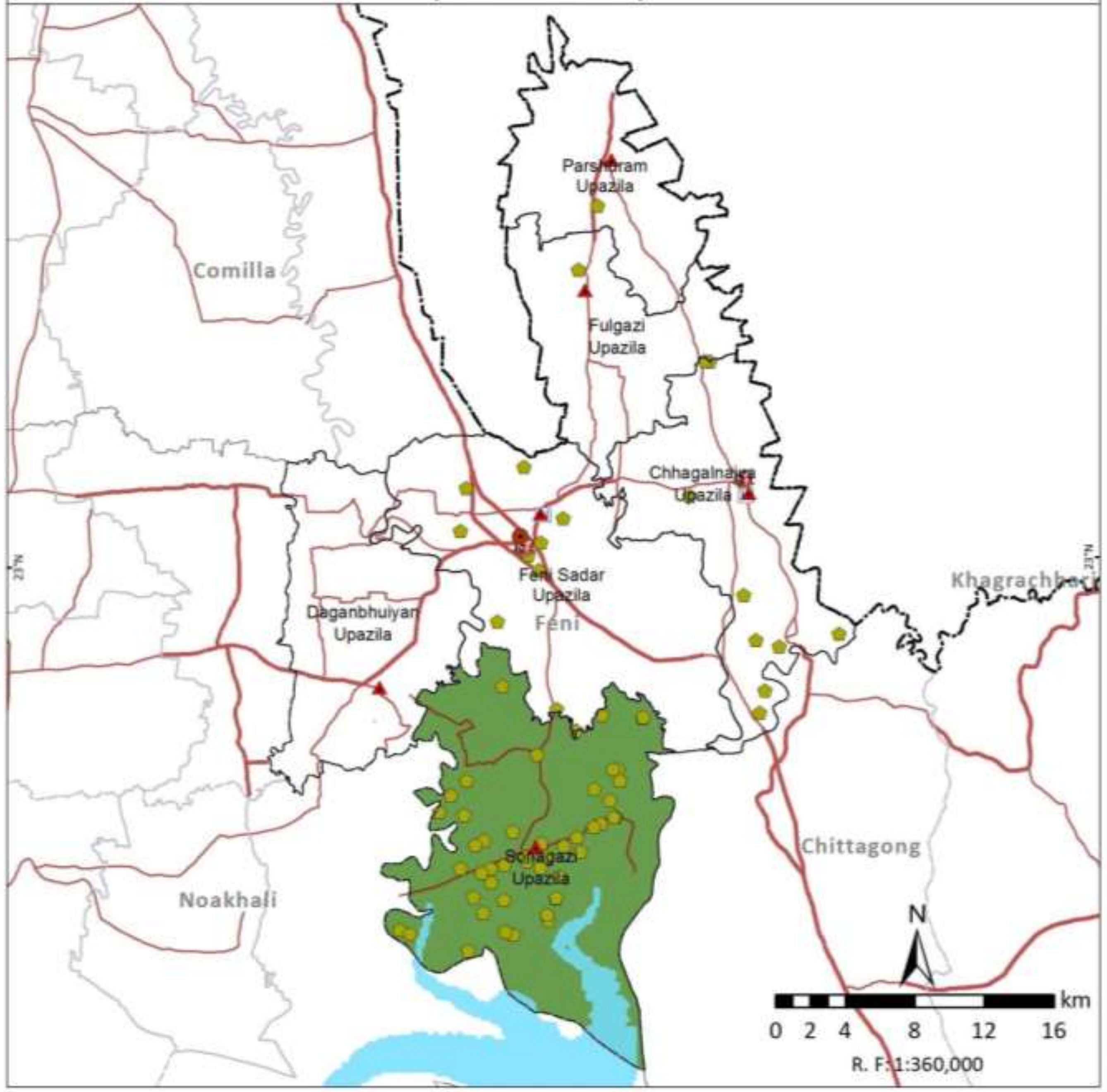
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

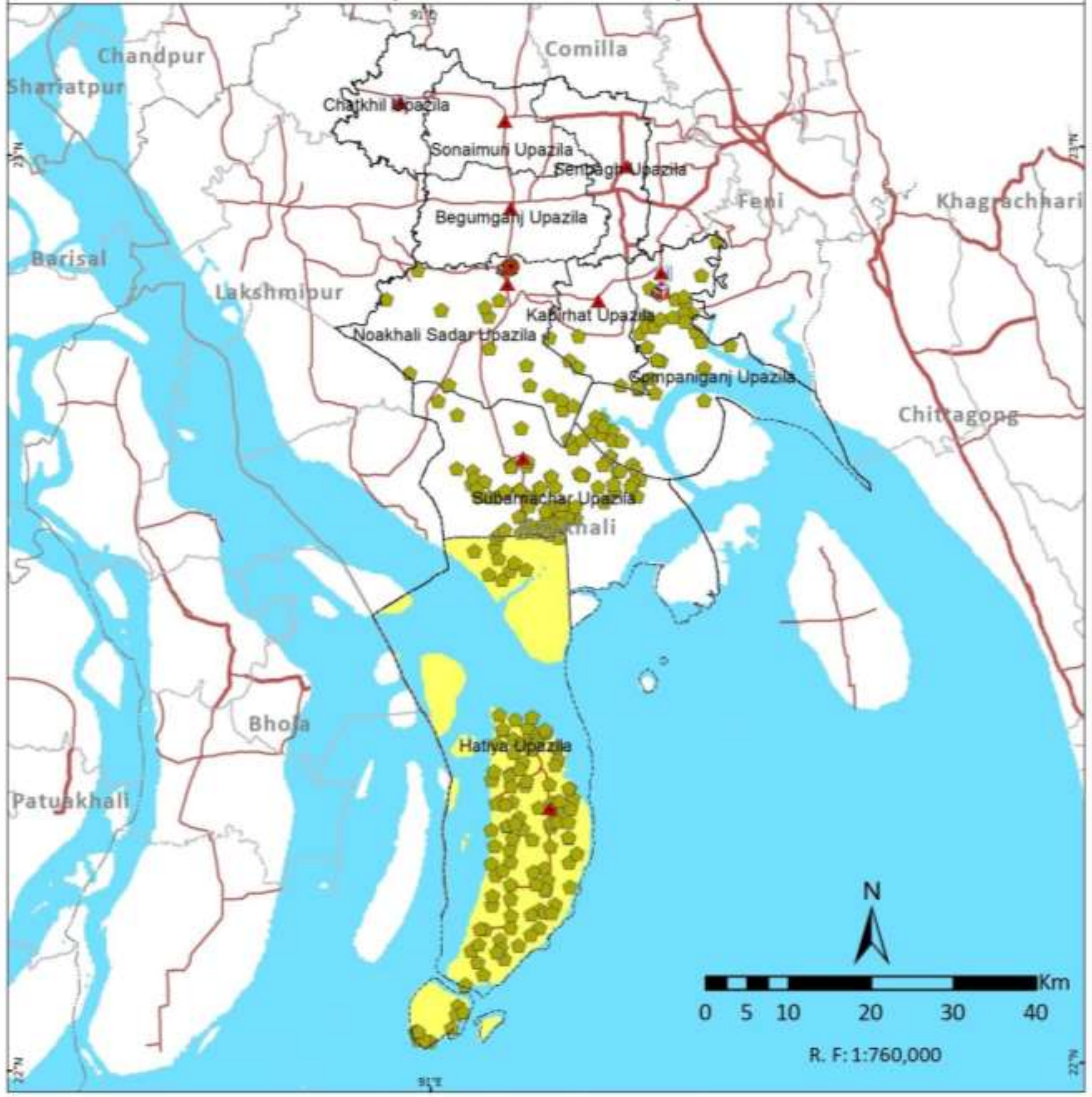
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Feni District)



Risk Levels of Housing (Kutcha and Jhupri) to Tsunami
(Noakhali District)



Legend

Country Boundary	District Head Quarter	Risk level
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire stations	Very Low
Upazila Boundary	Hospital	Low
National High Way	CycloneShelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

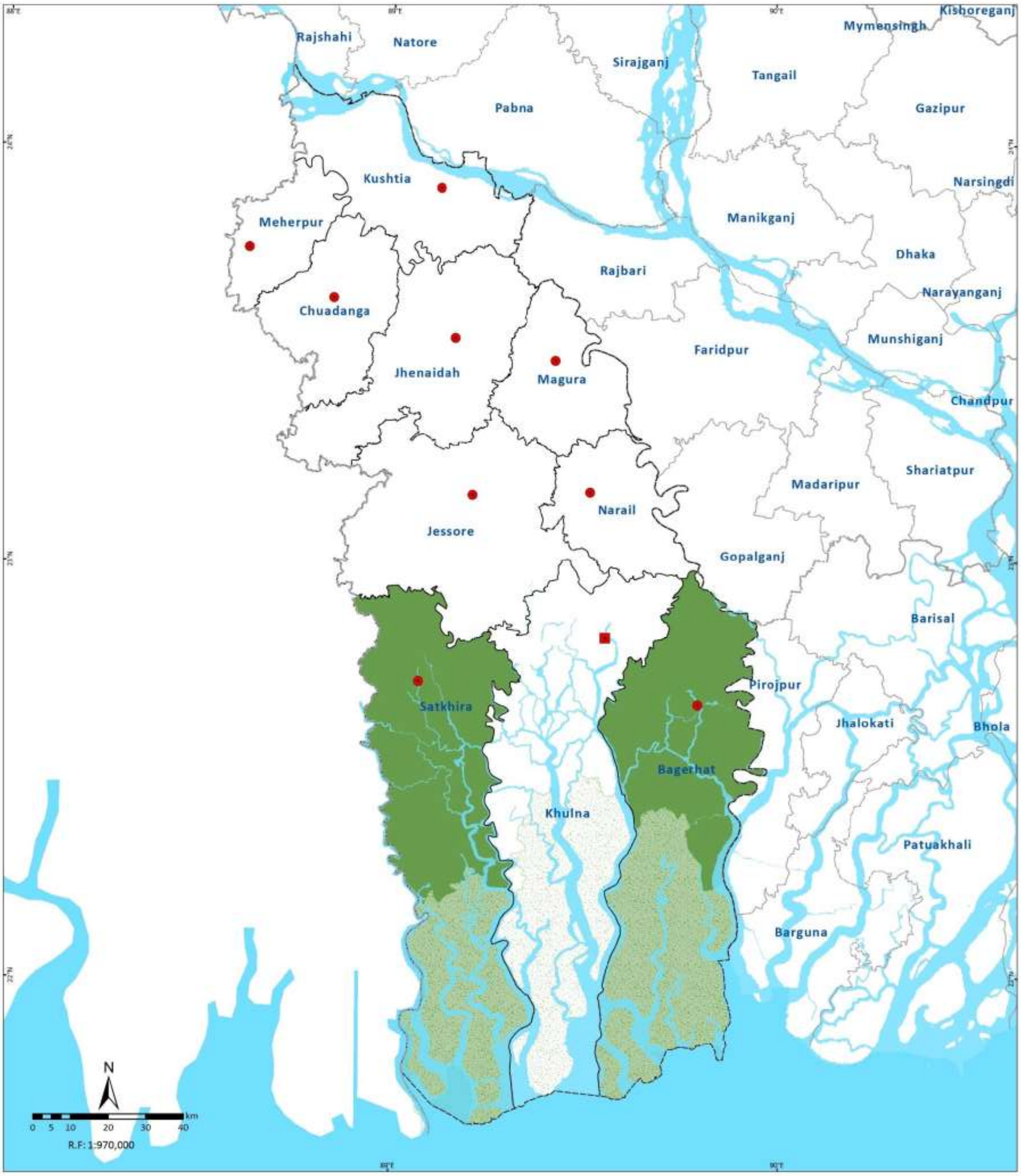
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Housing (Kutcha and Jhupri) to Tsunami
(Khulna Division)



Legend
- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Risk level
- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:
Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

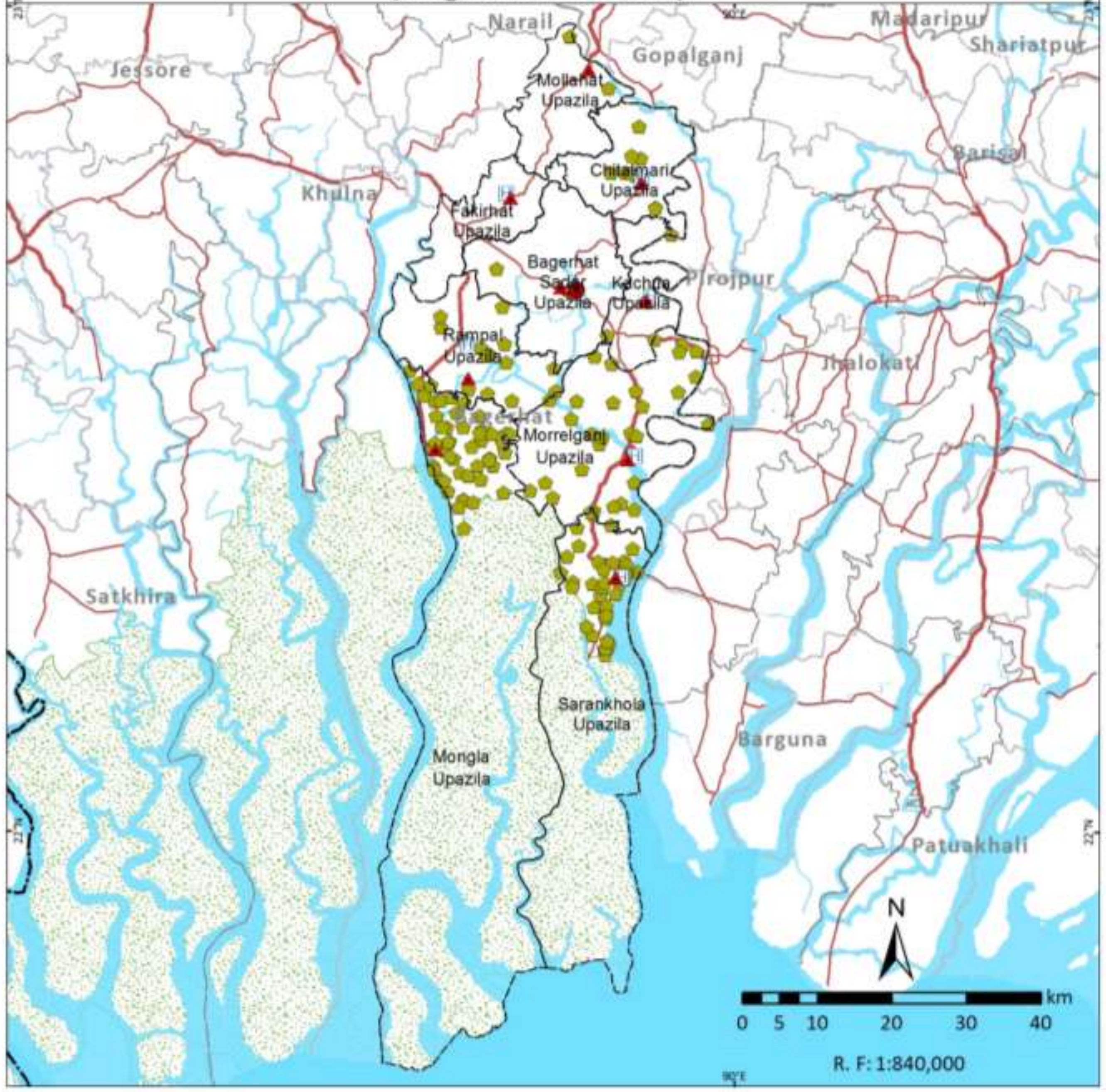
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

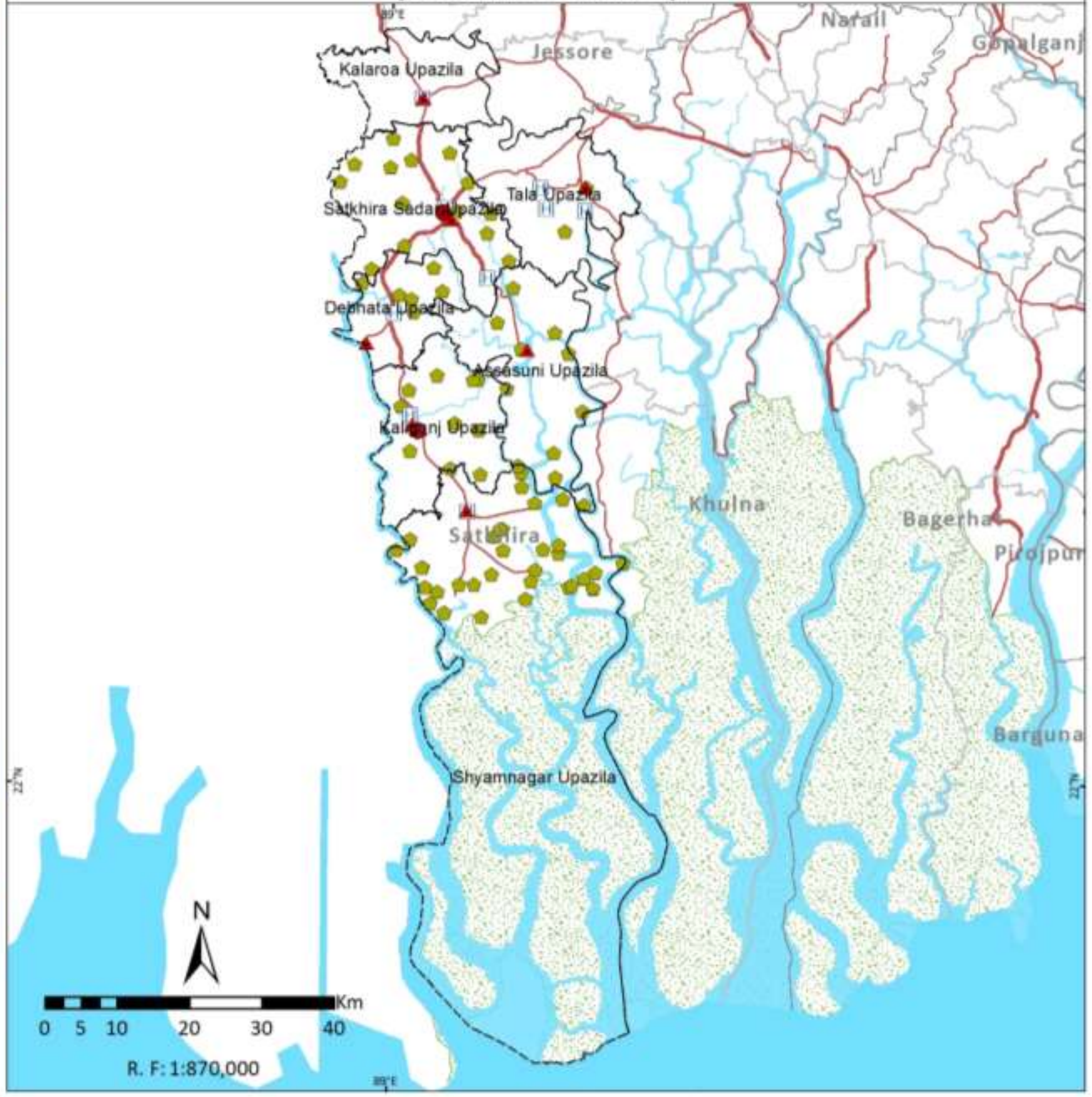
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk Levels of Housing (Kutcha and Jhupri) to Tsunami (Bagerhat District)



Risk Levels of Housing (Kutcha and Jhupri) to Tsunami (Satkhira District)



Legend

Country Boundary	District Head Quarter	Risk level
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire stations	Very Low
Upazila Boundary	Health Facilities	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Housing (Kutcha and Jhupri) to tsunami is derived by tsunami hazard (inundation depth), housing maps and damage curves.

Data Source: BWDB, BMD, GSB, WARPOS and BBS.

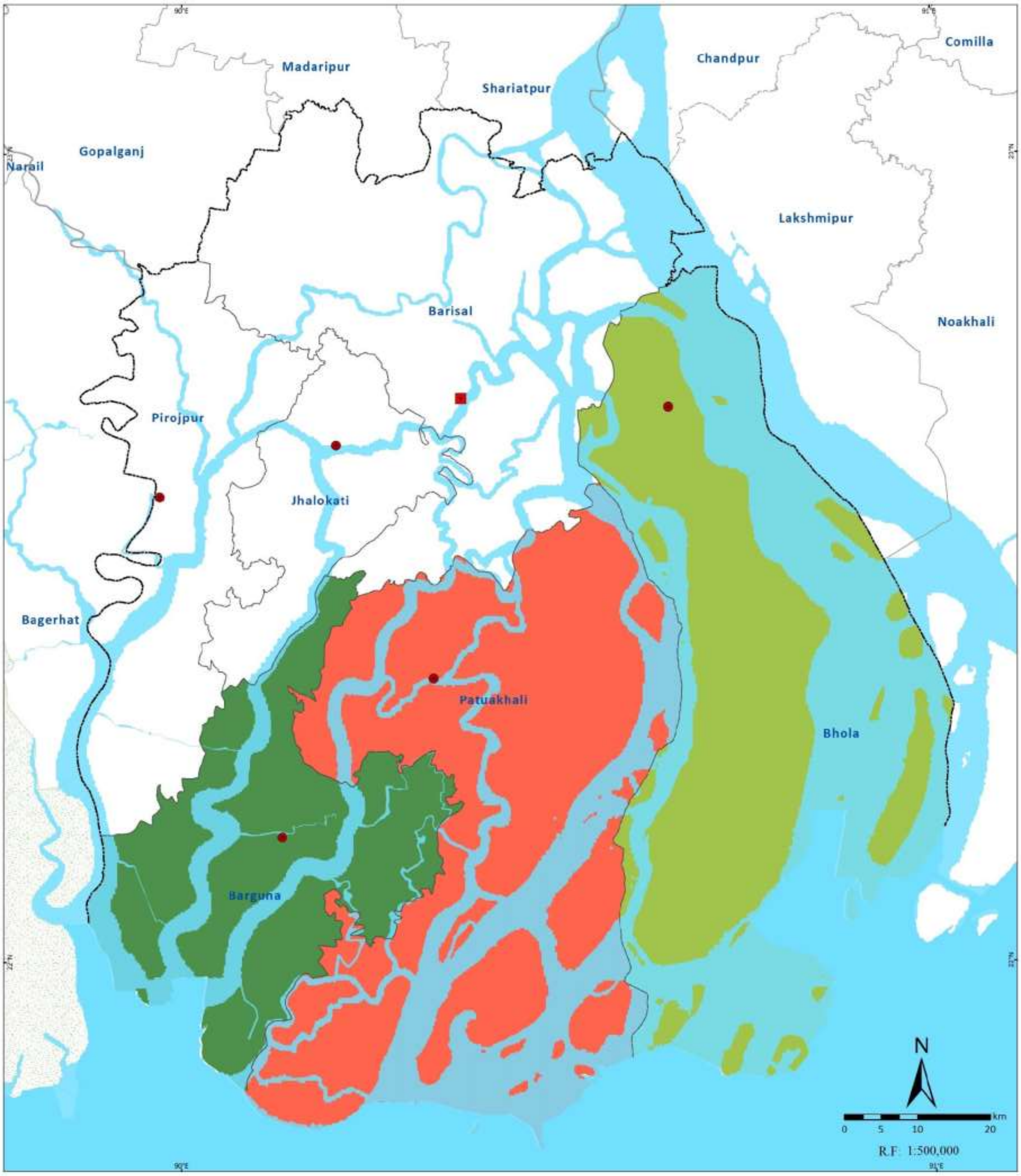
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Level of Risk

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS

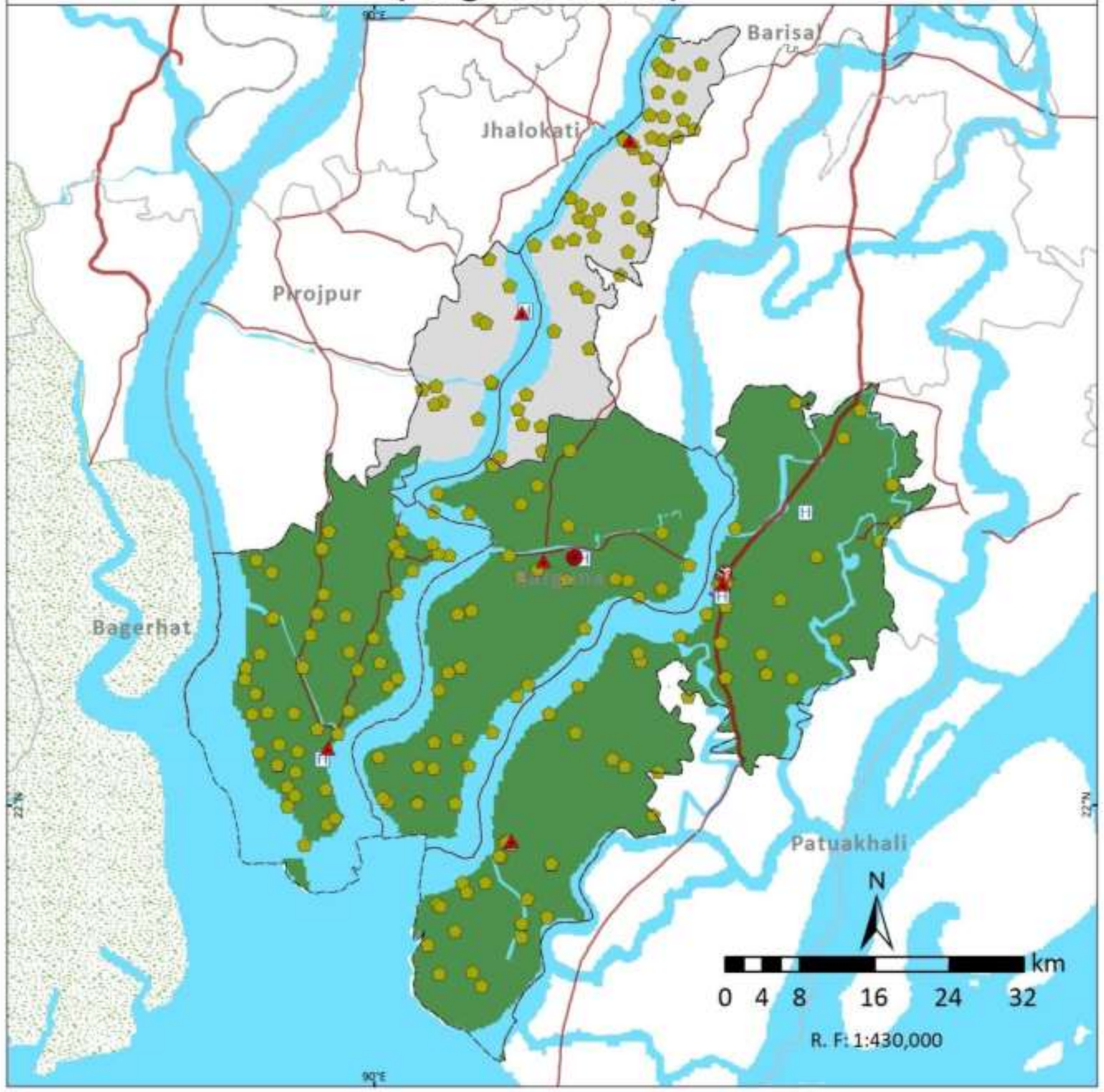
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

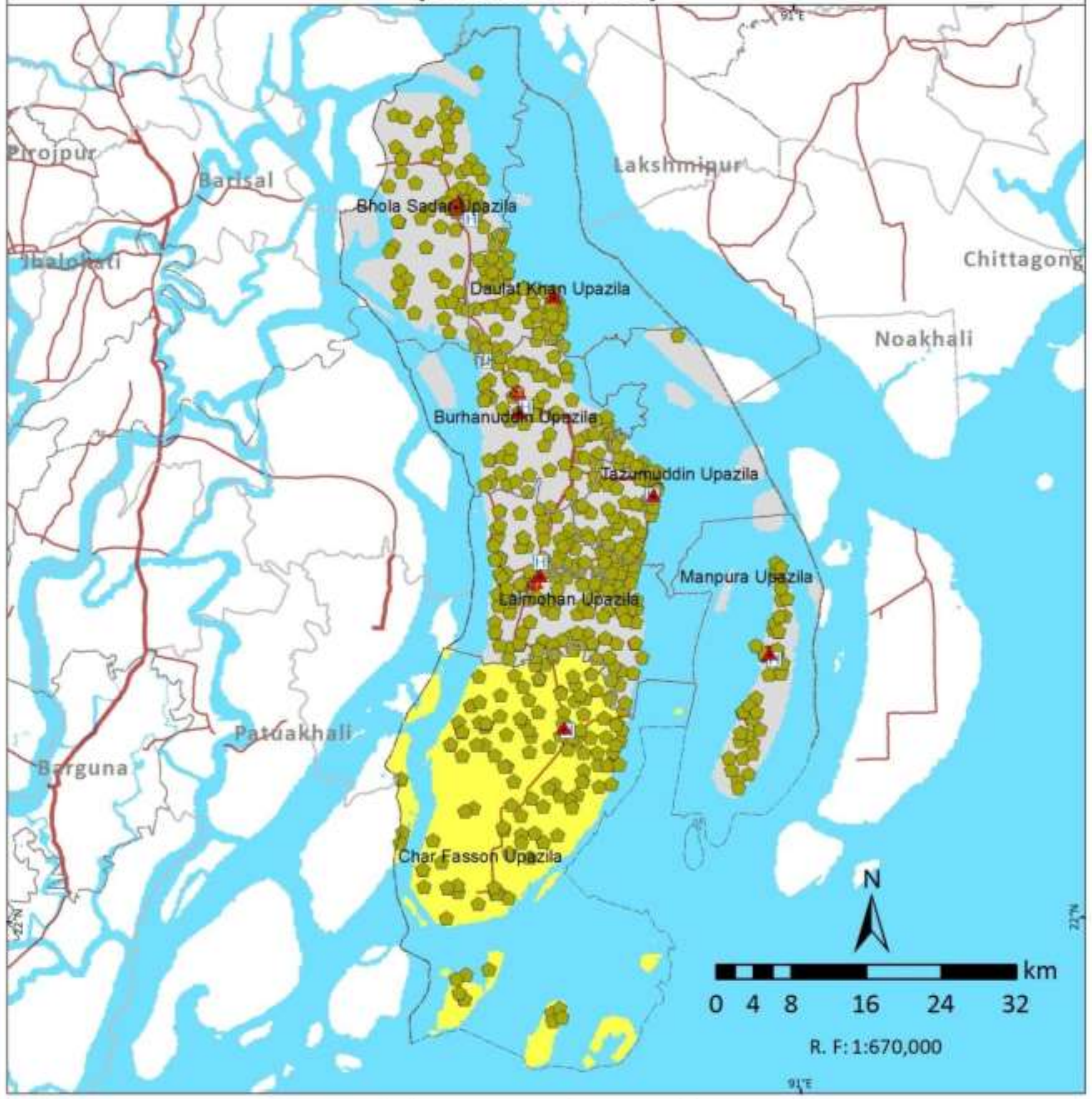
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami (Barguna District)



Risk levels of Livelihood (Agriculture) to Tsunami (Bhola District)



Legend

Country Boundary		District Head Quarter	Levels of Risk		
Division Boundary		Upazila Head Quarter		No Risk	
District Boundary		Fire stations		Very Low	
Upazila Boundary		Hospital		Low	
National High Way		Cyclone Shelter		Moderate	
Regional High Way		River/Sea/Lake		High	
		Sundarbans		Very High	

Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

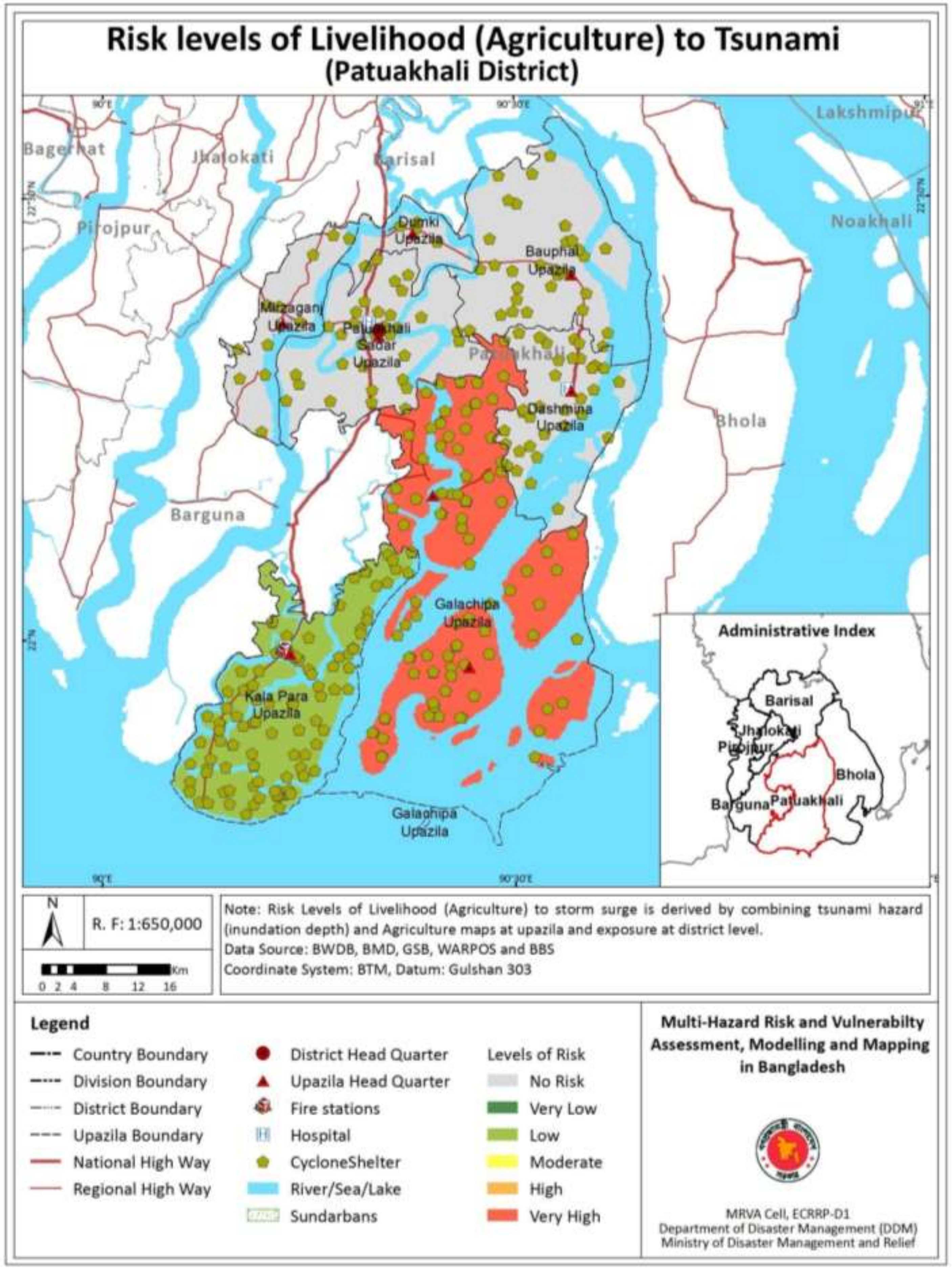
Data Source: BWDB, BMD, GSB, WARPOS and BBS

Coordinate System: BTM, Datum: Gulshan 303

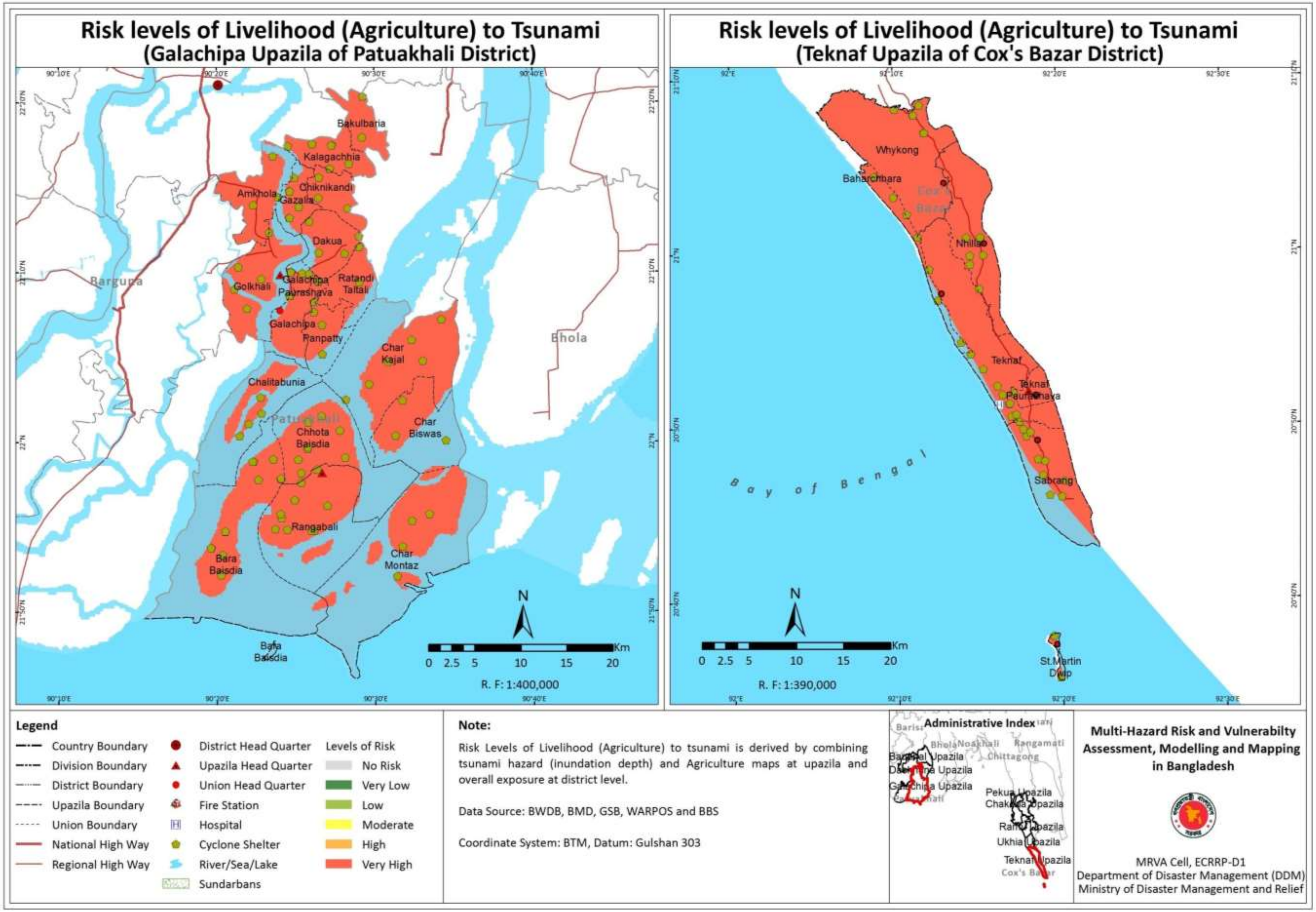
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Risk levels of Livelihood (Agriculture) to Tsunami
(Patuakhali District)
Bagerhat
Jhalokati
Barisal
Pirojpur
Barguna
Lakshmipur
Noakhali
Bhola
Dumki Upazila
Bauphal Upazila
Mirzaganj Upazila
Patuakhali Sadar Upazila
Patuakhali
Dashmina Upazila
Galachipa Upazila
Kala Para Upazila
Galachipa Upazila
Administrative Index
Barisal
Jhalokati
Pirojpur
Bhola
Barguna
Patuakhali
R. F: 1:650,000
0 2 4 8 12 16 Km
Note: Risk Levels of Livelihood (Agriculture) to storm surge is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and exposure at district level.
Data Source: BWDB, BMD, GSB, WARPOS and BBS
Coordinate System: BTM, Datum: Gulshan 303
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
CycloneShelter
River/Sea/Lake
Sundarbans
Levels of Risk
No Risk
Very Low
Low
Moderate
High
Very High
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Risk levels of Livelihood (Agriculture) to Tsunami
(Galachipa Upazila of Patuakhali District)
Risk levels of Livelihood (Agriculture) to Tsunami
(Teknaf Upazila of Cox's Bazar District)
Bakulbaria
Kalagachhia
Chiknikandi
Amkhola
Gazalia
Dakua
Golkhali
Galachipa Paurashava
Ratandi Taltali
Galachipa
Panpatty
Char Kajal
Chalitabunia
Chhota Baisdia
Char Biswas
Rangabali
Bara Baisdia
Char Montaz
Bargura
Bhola
Patuakhali
Whykong
Baharchhara
Nhilla
Teknaf
Teknaf Paurashava
Sabrang
St.Martin Dwip
Bay of Bengal
N
0 2.5 5 10 15 20 Km
R. F: 1:400,000
R. F: 1:390,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Union Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Union Head Quarter
Fire Station
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Levels of Risk
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.
Data Source: BWDB, BMD, GSB, WARPOS and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Galachipa Upazila
Pekua Upazila
Chakaria Upazila
Ramu Upazila
Ukhia Upazila
Teknaf Upazila
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami
(Chittagong Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Level of Risk

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS

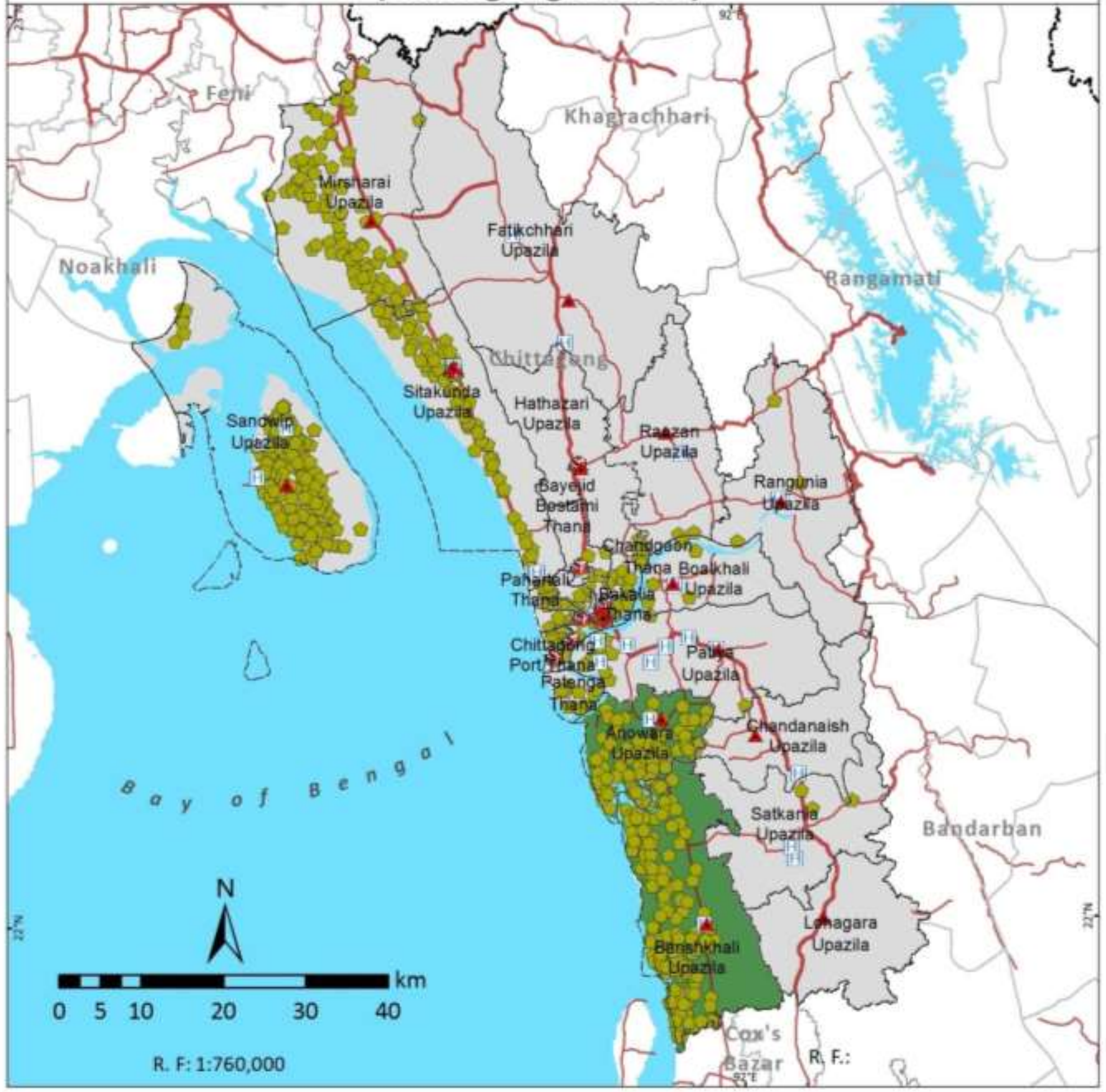
Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

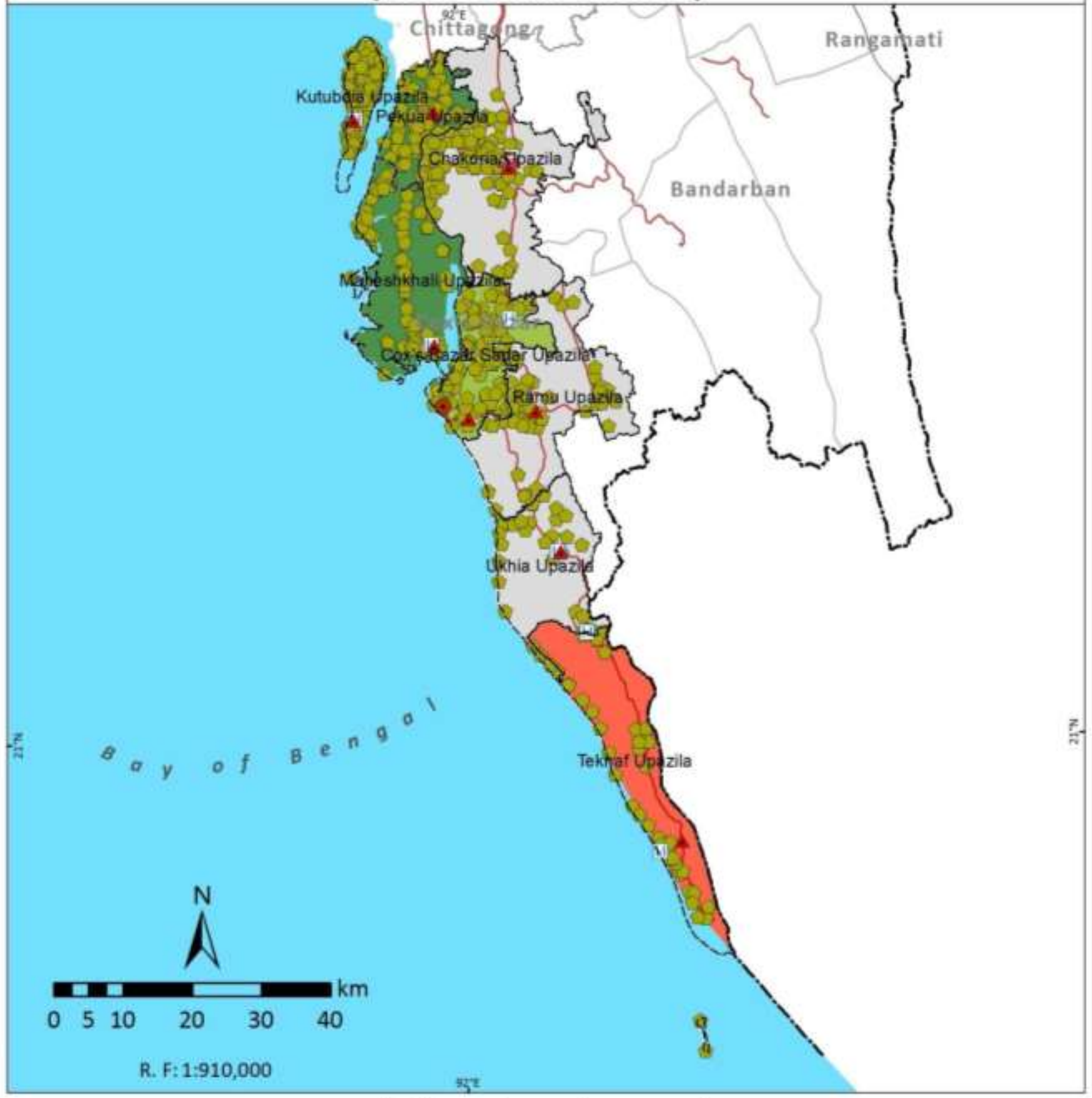
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami (Chittagong District)



Risk levels of Livelihood (Agriculture) to Tsunami (Cox's Bazar District)



Legend

Country Boundary	Division Head Quarter	**Levels of Risk**
Division Boundary	District Head Quarter	No Risk
District Boundary	Upazila Head Quarter	Very Low
Upazila Boundary	Fire stations	Low
National High Way	Hospital	Moderate
Regional High Way	Cyclone Shelter	High
	River/Sea/Lake	Very High
	Sundarbans	

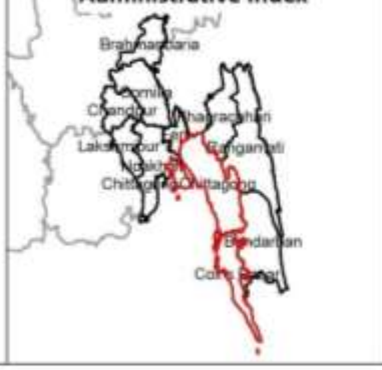
Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS

Coordinate System: BTM, Datum: Gulshan 303

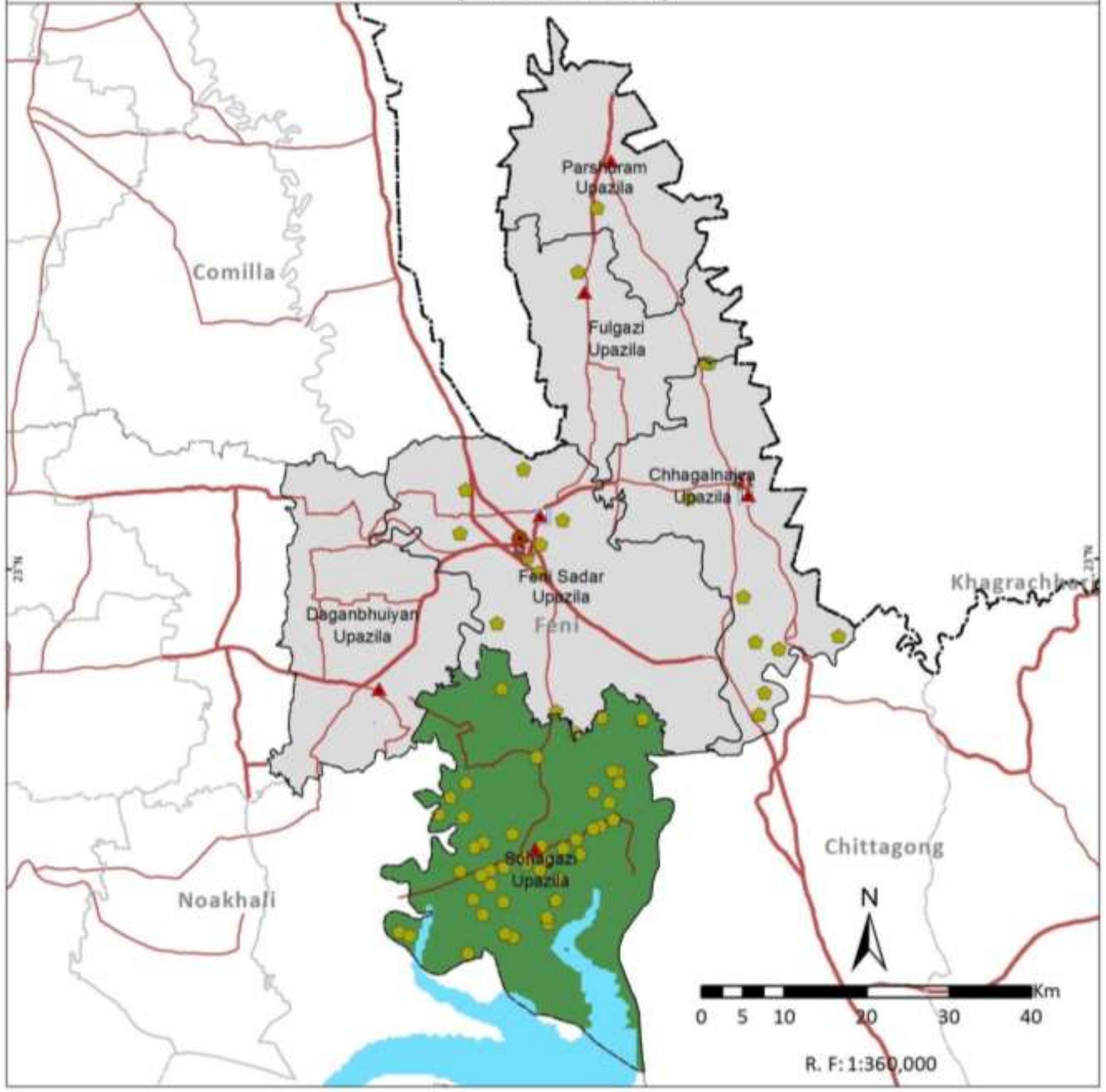
Administrative Index



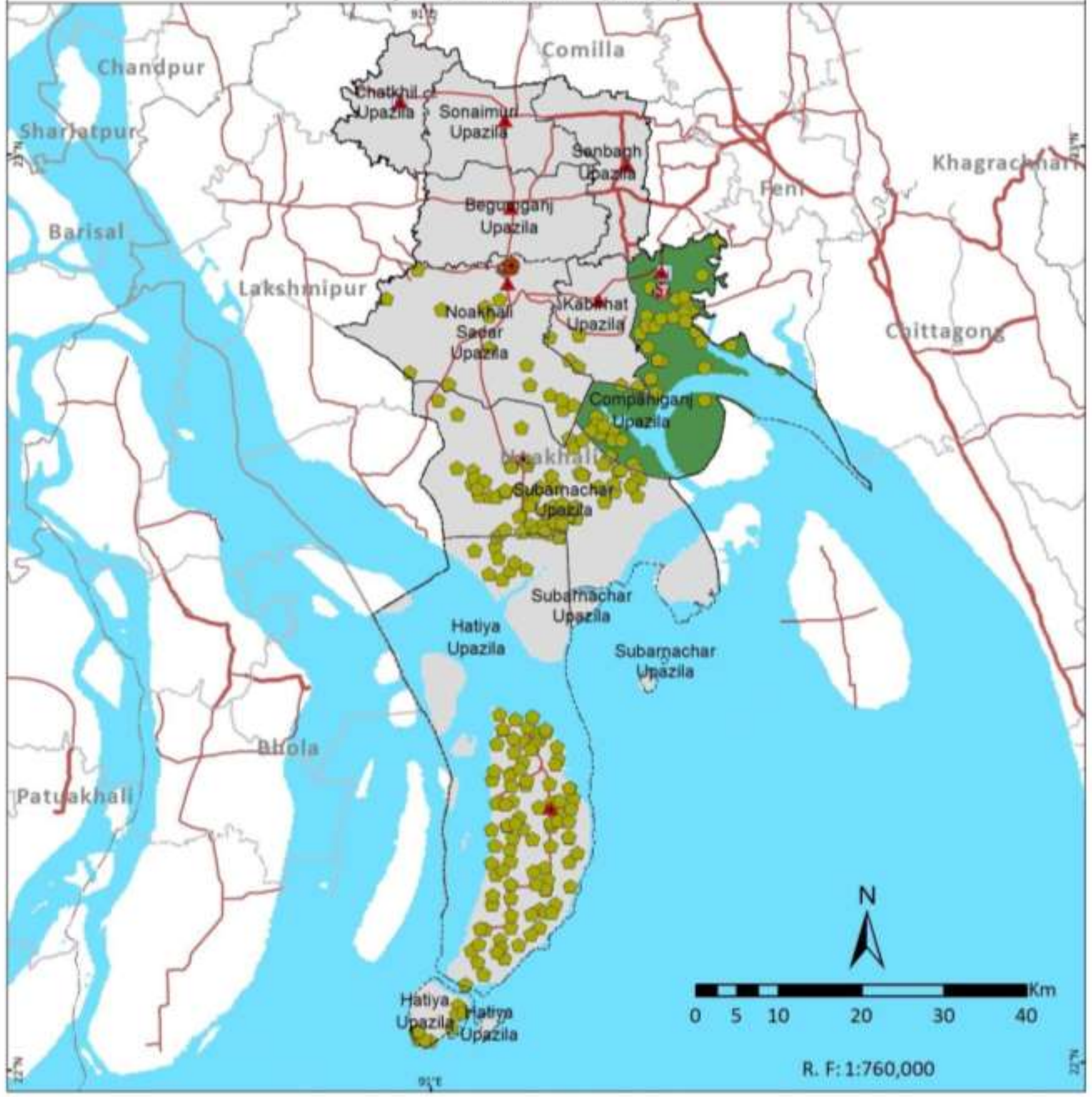
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami
(Feni District)



Risk levels of Livelihood (Agriculture) to Tsunami
(Noakhali District)



Legend

Country Boundary	District Head Quarter	**Levels of Risk**
Division Boundary	Upazila Head Quarter	No Risk
District Boundary	Fire stations	Very Low
Upazila Boundary	Hospital	Low
National High Way	Cyclone Shelter	Moderate
Regional High Way	River/Sea/Lake	High
	Sundarbans	Very High

Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

Data Source: BWDB, BMD, GSB, WARPOS and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Risk levels of Livelihood (Agriculture) to Tsunami
(Khulna Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Levels of Risk

- No Risk
- Very Low
- Low
- Moderate
- High
- Very High

Note:

Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.

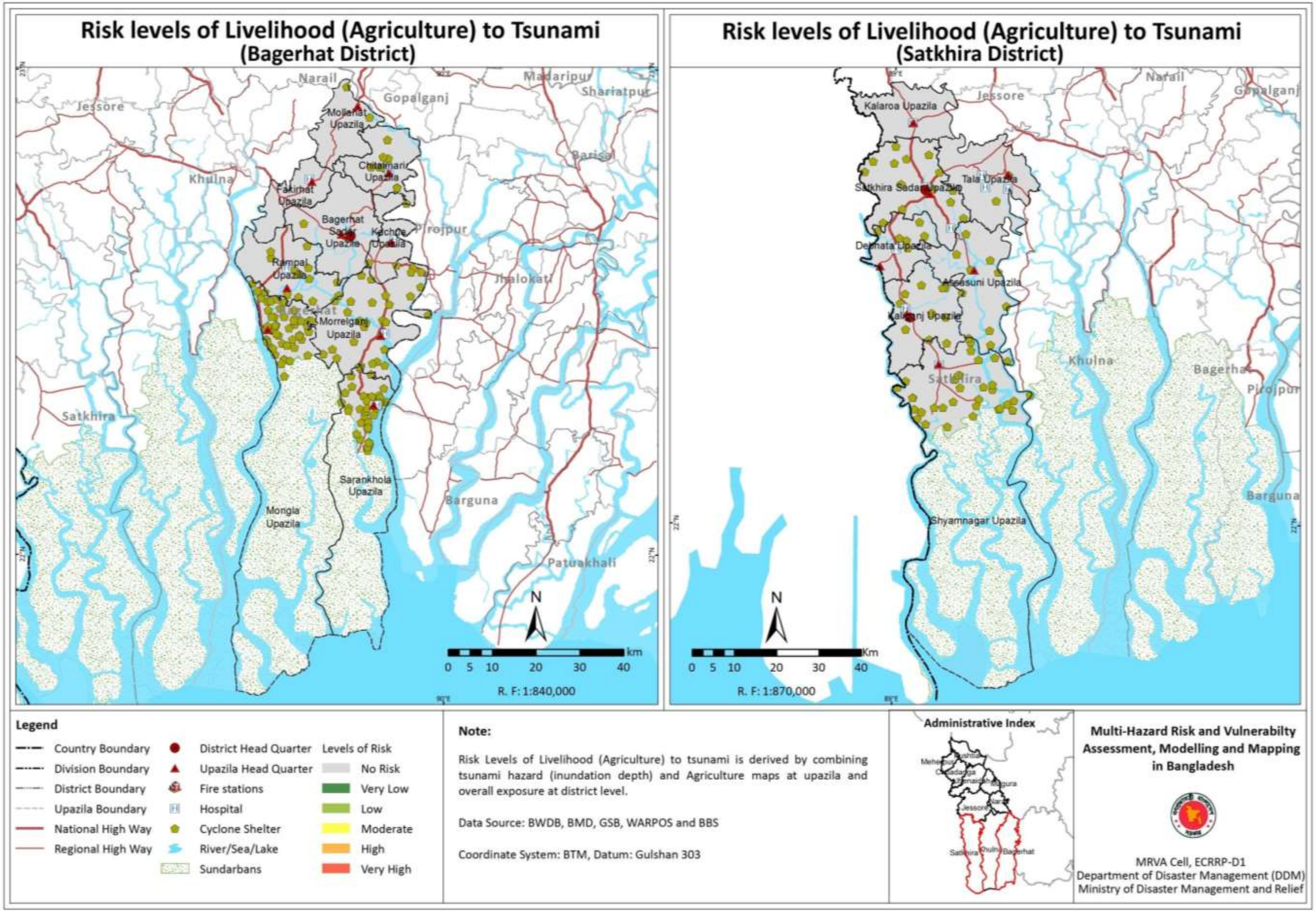
Data Source: BWDB, BMD, GSB, WARPOS and BBS

Coordinate System: BTM, Datum: Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Risk levels of Livelihood (Agriculture) to Tsunami
(Bagerhat District)
Risk levels of Livelihood (Agriculture) to Tsunami
(Satkhira District)
Narail
Jessore
Gopalganj
Madaripur
Shariatpur
Khulna
Barisal
Pirojpur
Jhalokati
Satkhira
Barguna
Patuakhali
Bagerhat
Mollahat Upazila
Chitalmari Upazila
Fakirhat Upazila
Bagerhat Sadar Upazila
Kachua Upazila
Rampal Upazila
Morrelganj Upazila
Sarankhola Upazila
Mongla Upazila
Kalaroa Upazila
Tala Upazila
Debhata Upazila
Assasuni Upazila
Shyamnagar Upazila
N
0 5 10 20 30 40 km
R. F: 1:840,000
R. F: 1:870,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
National High Way
Regional High Way
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Cyclone Shelter
River/Sea/Lake
Sundarbans
Levels of Risk
No Risk
Very Low
Low
Moderate
High
Very High
Note:
Risk Levels of Livelihood (Agriculture) to tsunami is derived by combining tsunami hazard (inundation depth) and Agriculture maps at upazila and overall exposure at district level.
Data Source: BWDB, BMD, GSB, WARPOS and BBS
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

TECHNOLOGY

4 Technological Hazard

Industrialization in Bangladesh has been growing very rapidly during the last few decades and it has been greatly contributing to the development of the country. The industrial sectors contributed 28.6 percent of the country's total GDP in 2011 (Paul et al., 2013). Textiles and clothing, leathers, pharmaceuticals and chemical industries are the main sectors that play a major role in the country's economic growth and provide a significant contribution to employment in Bangladesh.

Although the industrial sectors have been making a very important contribution to the economic growth of Bangladesh, these industries have also caused increasingly serious health, safety, and environmental problems. Common technological hazards in Bangladesh are accidents in garment industries, pollution caused by tannery industries and ship breaking industries, and chemical accidents. In this study an attempt has been made to assess the possible exposure of population to chemical release (ammonia) from selected industries (six) for which data was available from ministry of industries.

4.1 Methodology

A semi-quantitative approach based on the Seveso III Directive was carried out to classify dangerous chemical substances and a quantitative method of ALOHA was used to simulate the ammonia releases from a leaking tank of six selected industries and exposure of population.

4.2 Map Content

The hazards maps of ammonia leakage from selected industries represents different levels of concentration of ammonia pollution in parts per million (ppm), categorized into three levels, which are Acute Exposure Guideline Levels (AEGL). The length of the influence of these pollution zones varies based on the diameter of the opening in the tank in which ammonia is stored. The color codes used for these three pollution levels are given in Table 4.1.

Table 4.1: Classification of Ammonia pollution levels in Chemical industries (Technological hazards)

Level of Ammonia pollution (in ppm)	Acute Exposure Guideline Levels (AEGL)	Hazard Level	Color code
1100 ppm	AEGL- 1	Very High	
160 ppm	AEGL- 2	High	
30 ppm	AEGL- 3	Moderate	

4.3 Analysis of Technological Hazard

The simulation of possible leakage of ammonia using ALOHA methodology in the six chemical industries resulted into hazard zones of each industry, which are combined with union/upazila/district maps to assess the area (km^2) and percentage likely to be affected in each union / upazila/district. As an example, hazard assessment for Chittagong Urea Fertilizer Ltd. (CUFL) is shown in Table 4.2.

Table 4.2: Possible affected area and percentage in each union/upazila/district due to CUFL

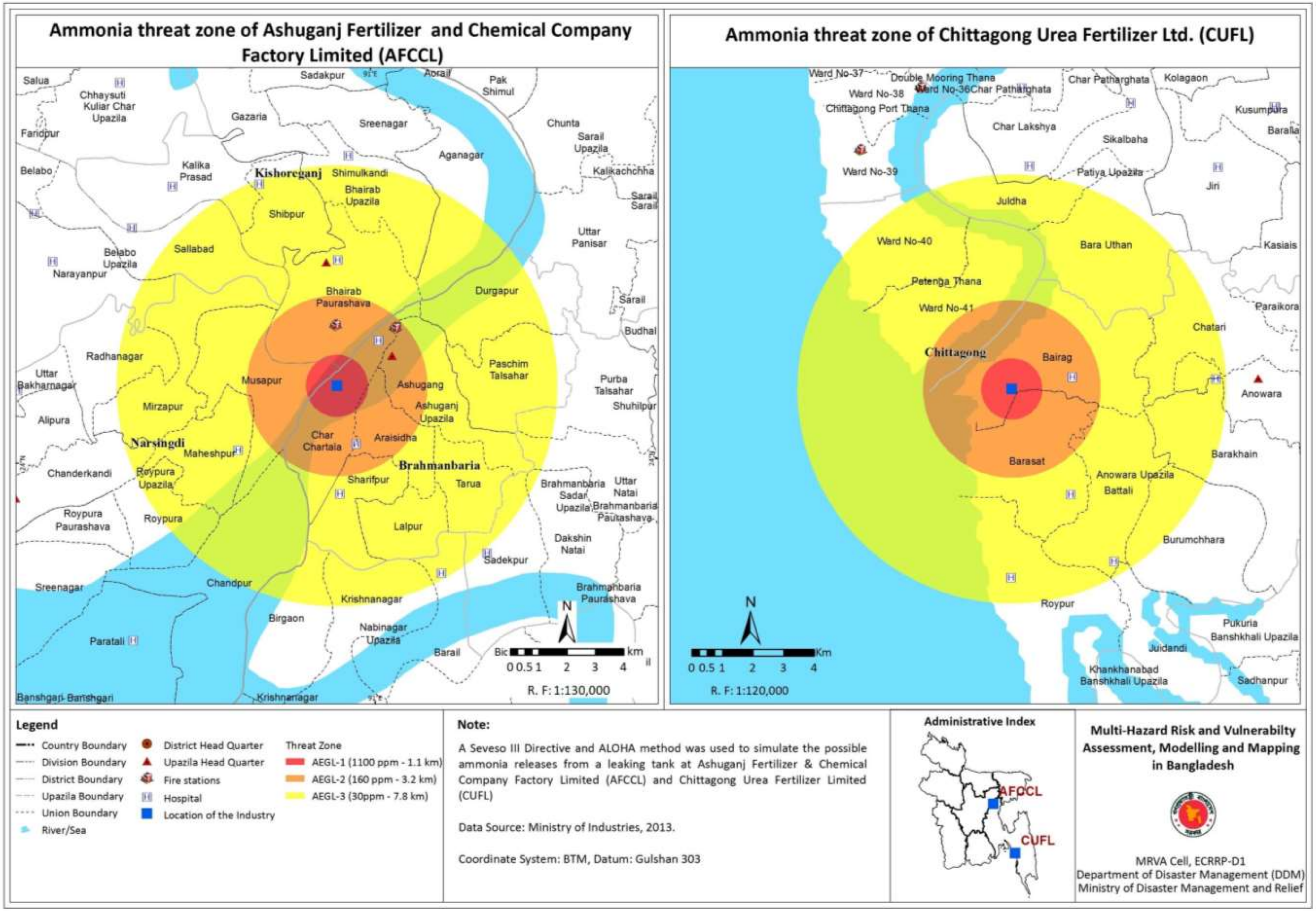
S.No.	Name of the Industry	Hazard Zone / Length of influence	Geographical area affected			
			District	Upazilas	Union (% of area)	Area (sq.km)
1	Chittagong Urea Fertilizer Ltd. (CUFL)	AEGL- 1 (1100 ppm) / 1.0 km	Chittagong	AnowaraPatiya	NIL	NIL (No settlement)
		AEGL- 2 (160 ppm) / 2.9 km	Chittagong	Anowara	Bairag (28.94%)	5.35
					Barasat (31.25%)	4.29
					Battali (5.68%)	0.67
		AEGL- 3 (30 ppm) / 7.0 km	Chittagong	AnowaraPatiya	many unions	varying from 8.21 to 22.94

4.4 Technological Hazard maps

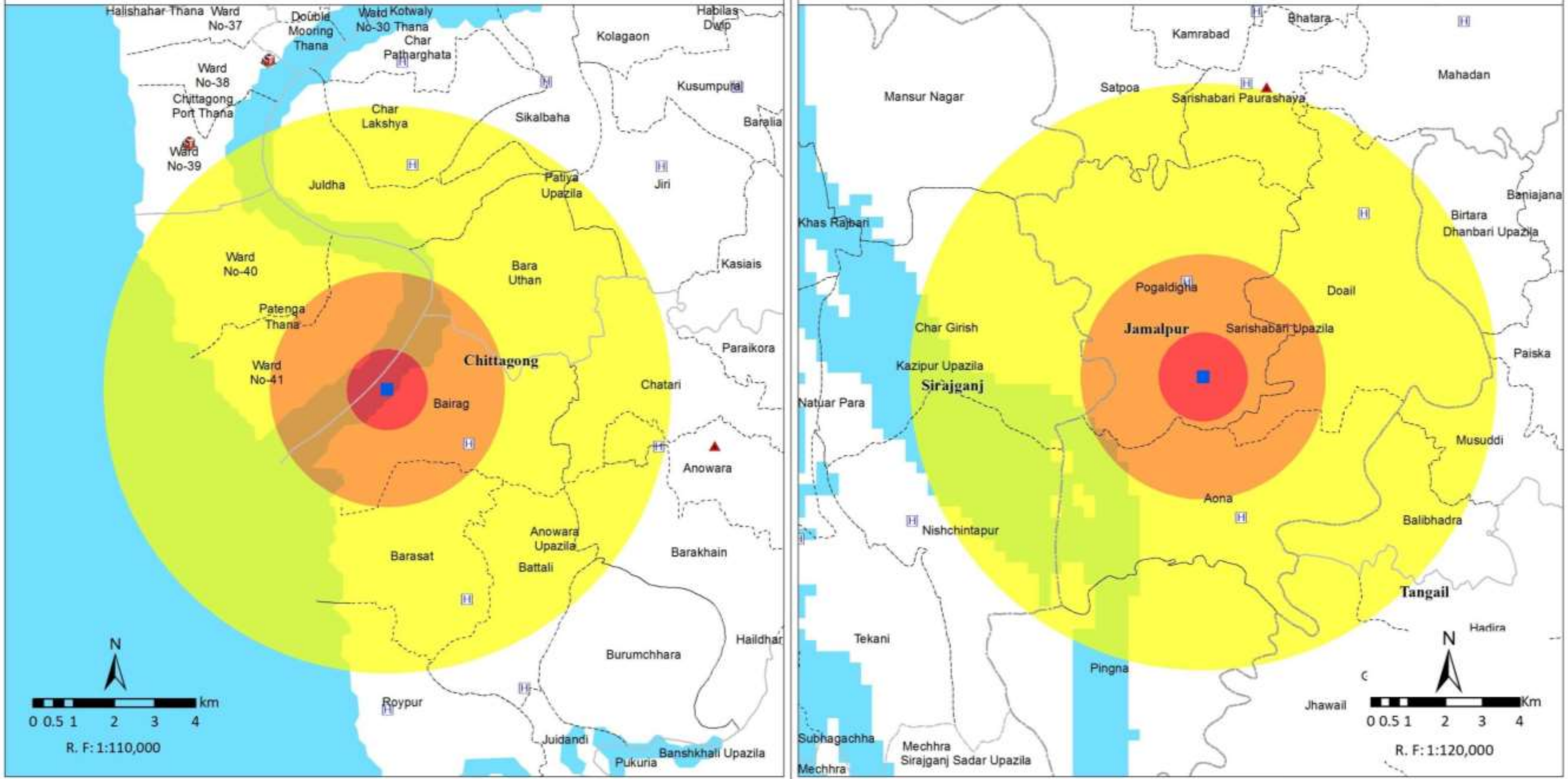
- Technological hazard maps are available only for six industries in Chittagong and Dhaka divisions. Exposure maps of Population to six industries at upazila level as given in table 4.3.

Table 4.3: Population Exposure due to Technological Hazard

S.No.	Name of the Industry	Division	District	Number of Upazilas
1	Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL)	Chittagong	Brahmanbaria	3
			Kishoreganj	1
			Narsingdi	2
2	Chittagong Urea Fertilizer Limited (CUFL)	Chittagong	Chittagong	2
3	DAP Fertilizer Company Ltd. (DAPFCL)	Chittagong	Chittagong	2
4	Jamuna Fertilizer Company (JFCL),	Mymensingh	Jamalpur	1
		Dhaka	Tangail	2
		Rajshahi	Sirajganj	1
5	Natural Gas Fertilizer Factory Ltd. (NGFFL)	Sylhet	Maulvibazar	2
			Sylhet	2
6	Polash Fertilizer Factory Limited (PFFL)	Dhaka	Gazipur	2
			Narsigdi	3


Ammonia threat zone of Ashuganj Fertilizer and Chemical Company Factory Limited (AFCCL)
Ammonia threat zone of Chittagong Urea Fertilizer Ltd. (CUFL)
Kishoreganj
Bhairab Upazila
Bhairab Paurashava
Musapur
Ashugang
Ashuganj Upazila
Char Chartala
Araisidha
Brahmanbaria
Narsingdi
Sharifpur
Lalpur
Chandpur
Krishnanagar
Nabinagar Upazila
Sarail Upazila
R. F: 1:130,000
Ward No-40
Patenga Thana
Ward No-41
Chittagong
Juldha
Bara Uthan
Bairag
Barasat
Anowara Upazila
Chatari
Anowara
Roypur
R. F: 1:120,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Union Boundary
River/Sea
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Location of the Industry
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
A Seveso III Directive and ALOHA method was used to simulate the possible ammonia releases from a leaking tank at Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL) and Chittagong Urea Fertilizer Limited (CUFL)
Data Source: Ministry of Industries, 2013.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
AFCCL
CUFL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Ammonia threat zone of DAP Fertilizer Company Ltd. (DAPFCL) | **Ammonia threat zone of Jamuna Fertilizer Company Ltd. (JFCL)**



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- Union Boundary
- River/Sea
- District Head Quarter
- Upazila Head Quarter
- Fire stations
- Hospital
- Location of the Industry

Threat Zone
- AEGL-1 (1100 ppm - 1.1 km)
- AEGL-2 (160 ppm - 3.2 km)
- AEGL-3 (30ppm - 7.8 km)

Note:

A Seveso III Directive and ALOHA method was used to simulate the possibleammonia releases from a leaking tank at DAP Fertilizer Company Ltd. (DAPFCL) and Jamuna Fertilizer Company (JFCL)

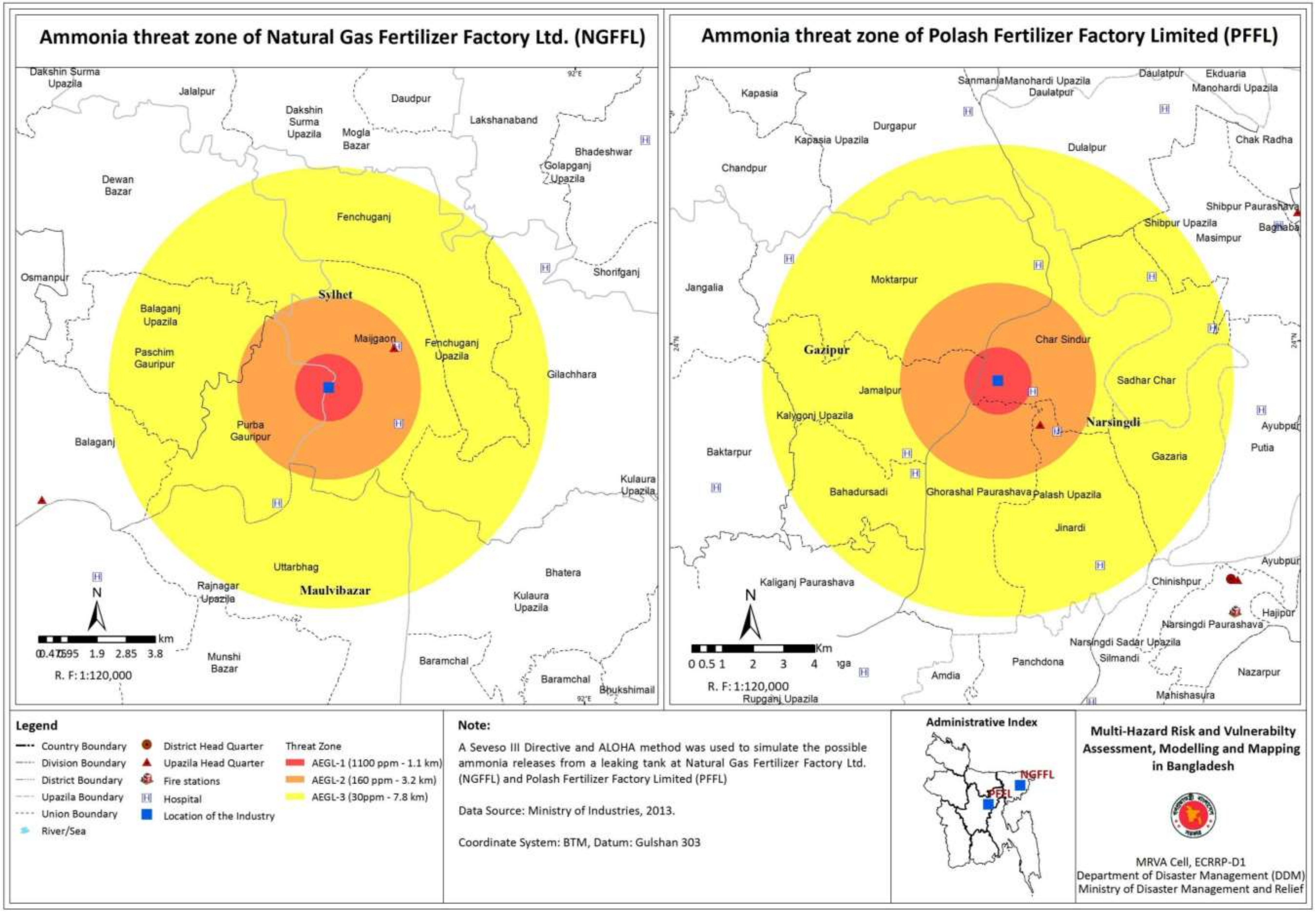
Data Source: Ministry of Industries, 2013.

Coordinate System: BTM, Datum: Gulshan 303

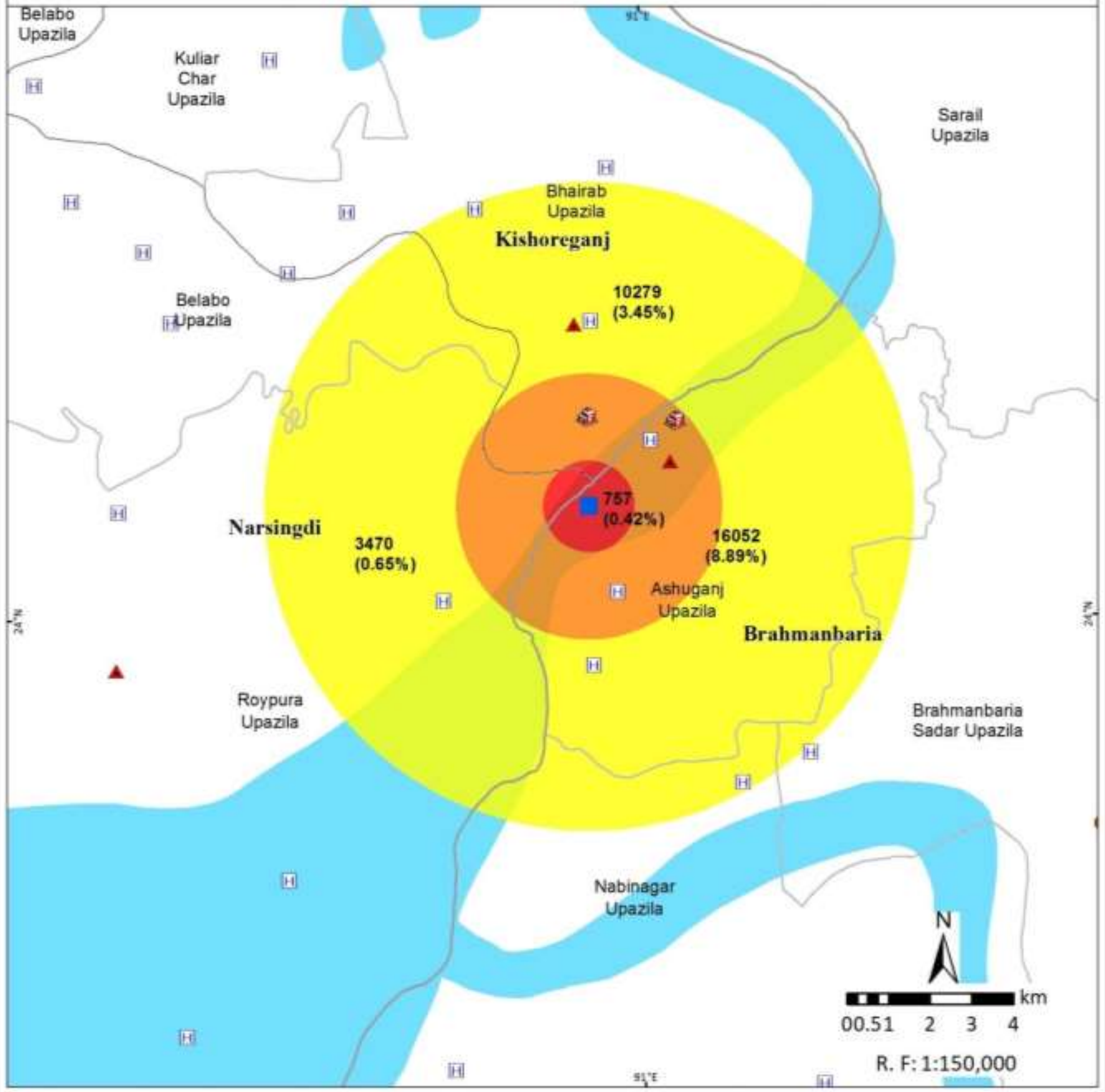
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

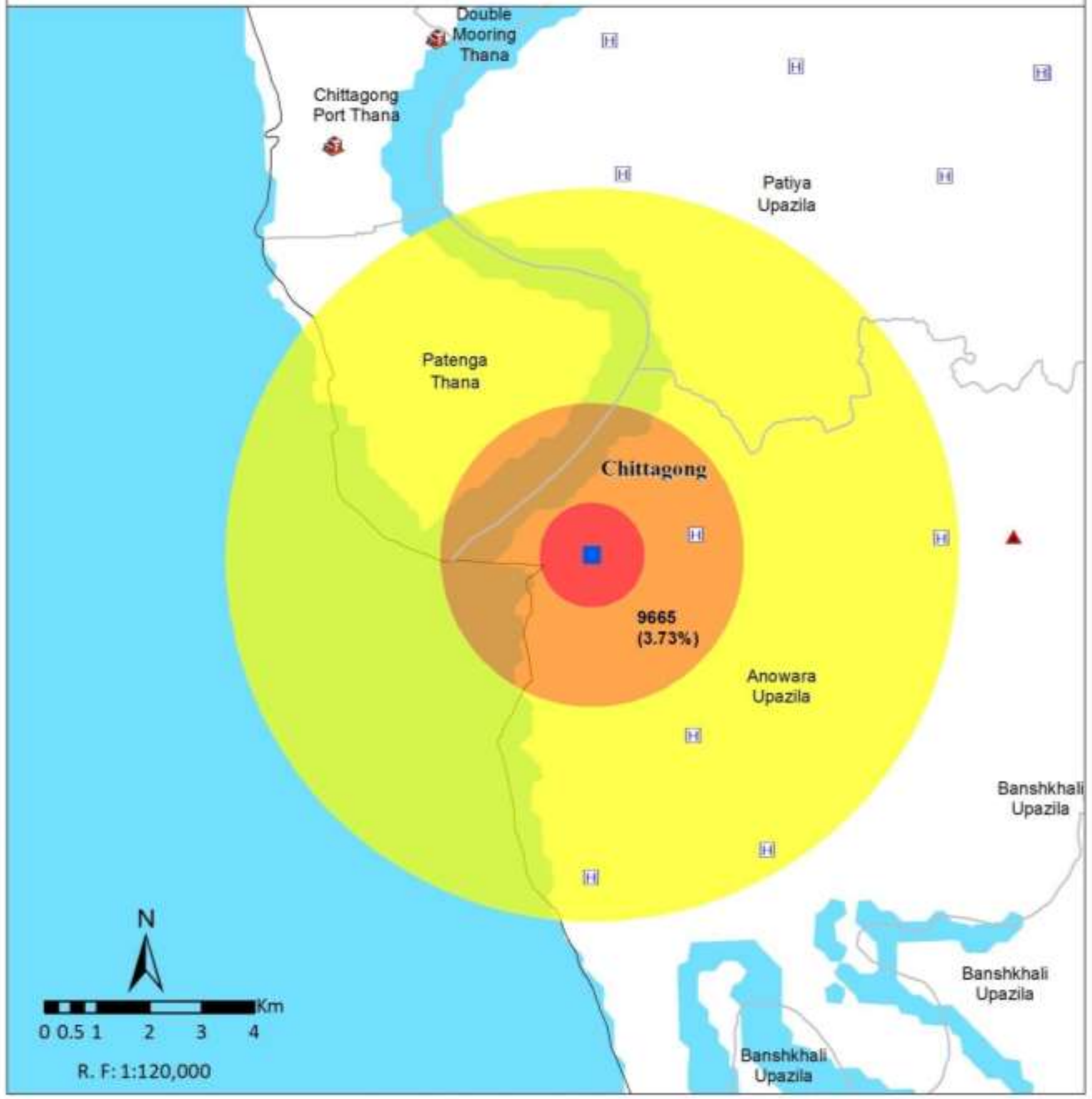
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Ammonia threat zone of Natural Gas Fertilizer Factory Ltd. (NGFFL)
Dakshin Surma Upazila
Jalalpur
Daudpur
Dakshin Surma Upazila
Mogla Bazar
Lakshanaband
Bhadeshwar
Golapganj Upazila
Dewan Bazar
Fenchuganj
Shorifganj
Osmanpur
Balaganj Upazila
Sylhet
Paschim Gauripur
Maijgaon
Fenchuganj Upazila
Gilachhara
Purba Gauripur
Balaganj
Kulaura Upazila
Uttarbhag
Bhatera
Rajnagar Upazila
Maulvibazar
Kulaura Upazila
Munshi Bazar
Baramchal
Baramchal
Bhukshimail
0.475 0.95 1.9 2.85 3.8 km
R. F: 1:120,000
Ammonia threat zone of Polash Fertilizer Factory Limited (PFFL)
Kapasia
Sanmania Manohardi Upazila
Daulatpur
Daulatpur
Ekduaria
Manohardi Upazila
Durgapur
Kapasia Upazila
Dulalpur
Chak Radha
Chandpur
Shibpur Paurashava
Shibpur Upazila
Masimpur
Baghaba
Jangalia
Moktarpur
Gazipur
Char Sindur
Jamalpur
Sadhar Char
Kalygonj Upazila
Narsingdi
Ayubpur
Putia
Baktarpur
Gazaria
Bahadursadi
Ghorashal Paurashava
Palash Upazila
Jinardi
Ayubpur
Kaliganj Paurashava
Chinishpur
Hajipur
Narsingdi Paurashava
Narsingdi Sadar Upazila
Silmandi
0 0.5 1 2 3 4 Km
Amdia
Panchdona
Nazarpur
R. F: 1:120,000
Rupganj Upazila
Mahishasura
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Union Boundary
River/Sea
District Head Quarter
Upazila Head Quarter
Fire stations
Hospital
Location of the Industry
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
A Seveso III Directive and ALOHA method was used to simulate the possible ammonia releases from a leaking tank at Natural Gas Fertilizer Factory Ltd. (NGFFL) and Polash Fertilizer Factory Limited (PFFL)
Data Source: Ministry of Industries, 2013.
Coordinate System: BTM, Datum: Gulshan 303
Administrative Index
NGFFL
PFFL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population (Male) to Ashuganj Fertilizer and Chemical Company Factory Limited (AFCCL) among Brahmanbaria, Kishoreganj and Narshingdi Districts



Exposure Category of Population (Male) to Chittagong Urea Fertilizer Ltd. (CUFL) in Chittagong District



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- Location of Industry
- District Head Quarter
- Upazila Head Quarter
- Hospital
- Fire stations
- River/Sea

Threat Zone

- AEGL-1 (1100 ppm - 1.1 km)
- AEGL-2 (160 ppm - 3.2 km)
- AEGL-3 (30ppm - 7.8 km)

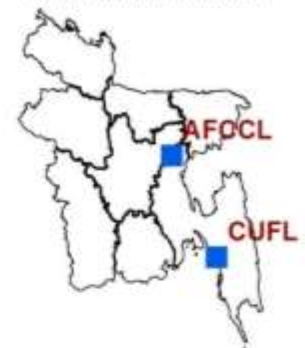
Note:

Exposure of population (male) to possible ammonia releases from a leaking tank at Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL) and Chittagong Urea Fertilizer Limited (CUFL)

Data Source: Ministry of Industries, 2013

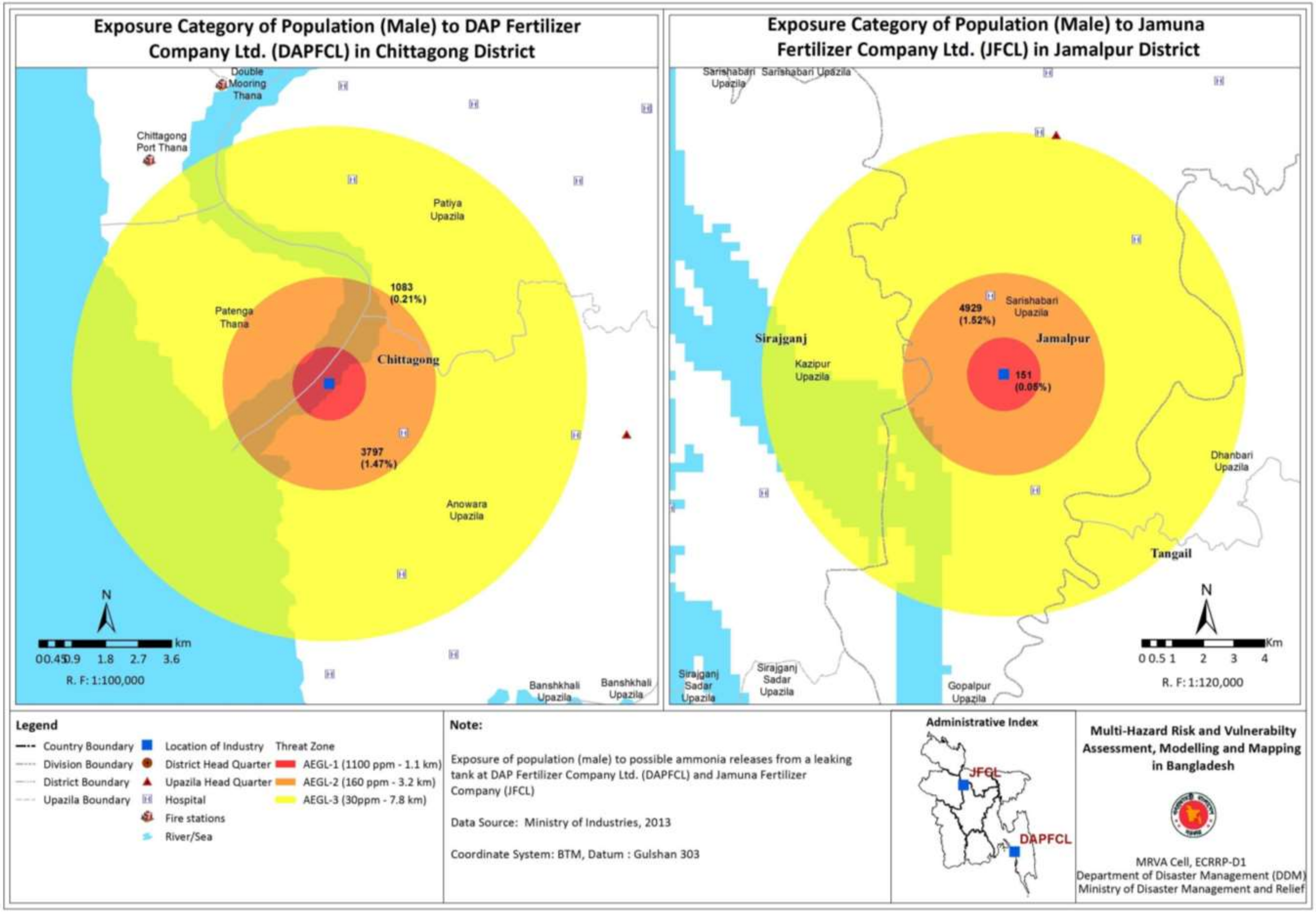
Coordinate System: BTM, Datum : Gulshan 303

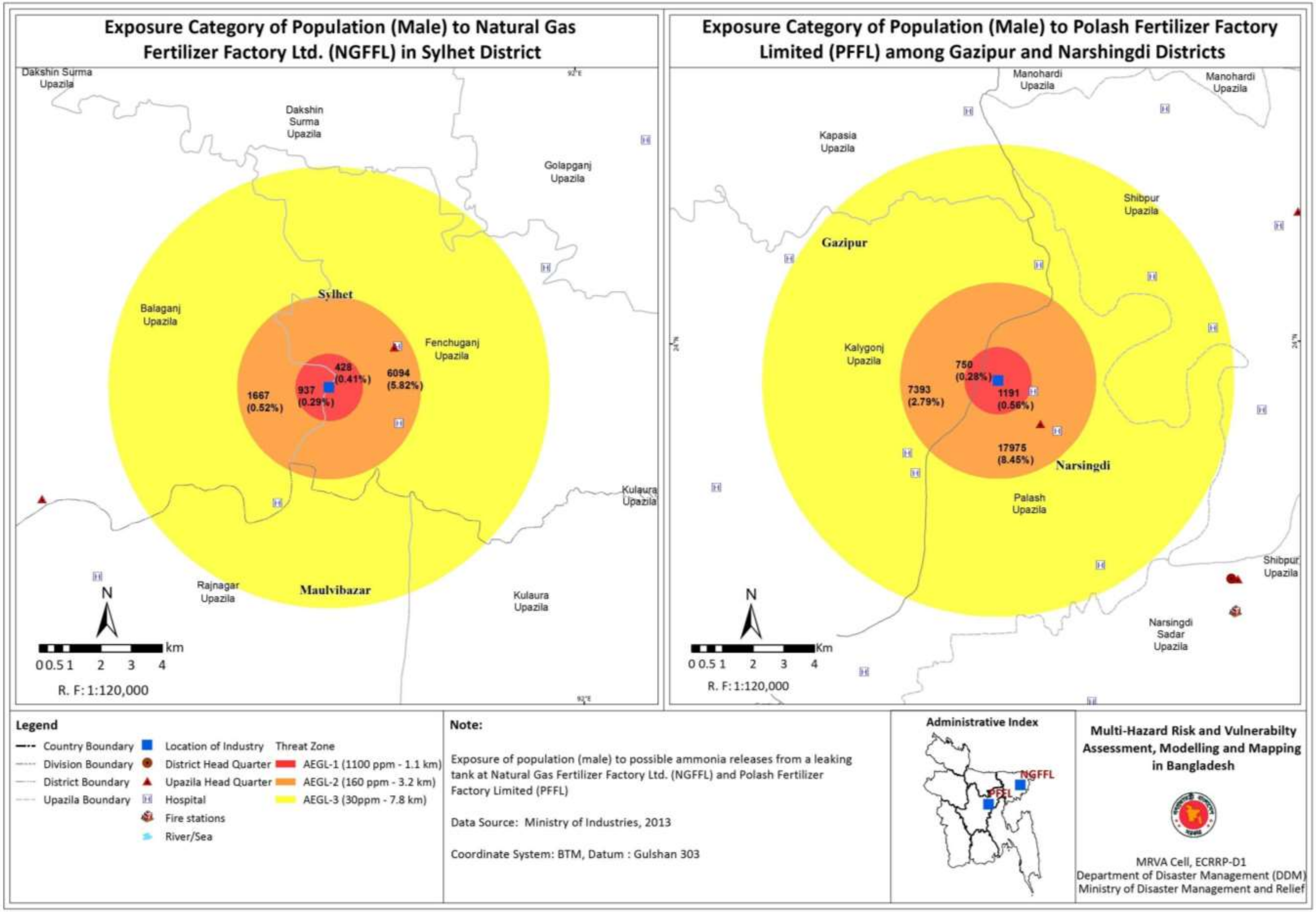
Administrative Index



Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

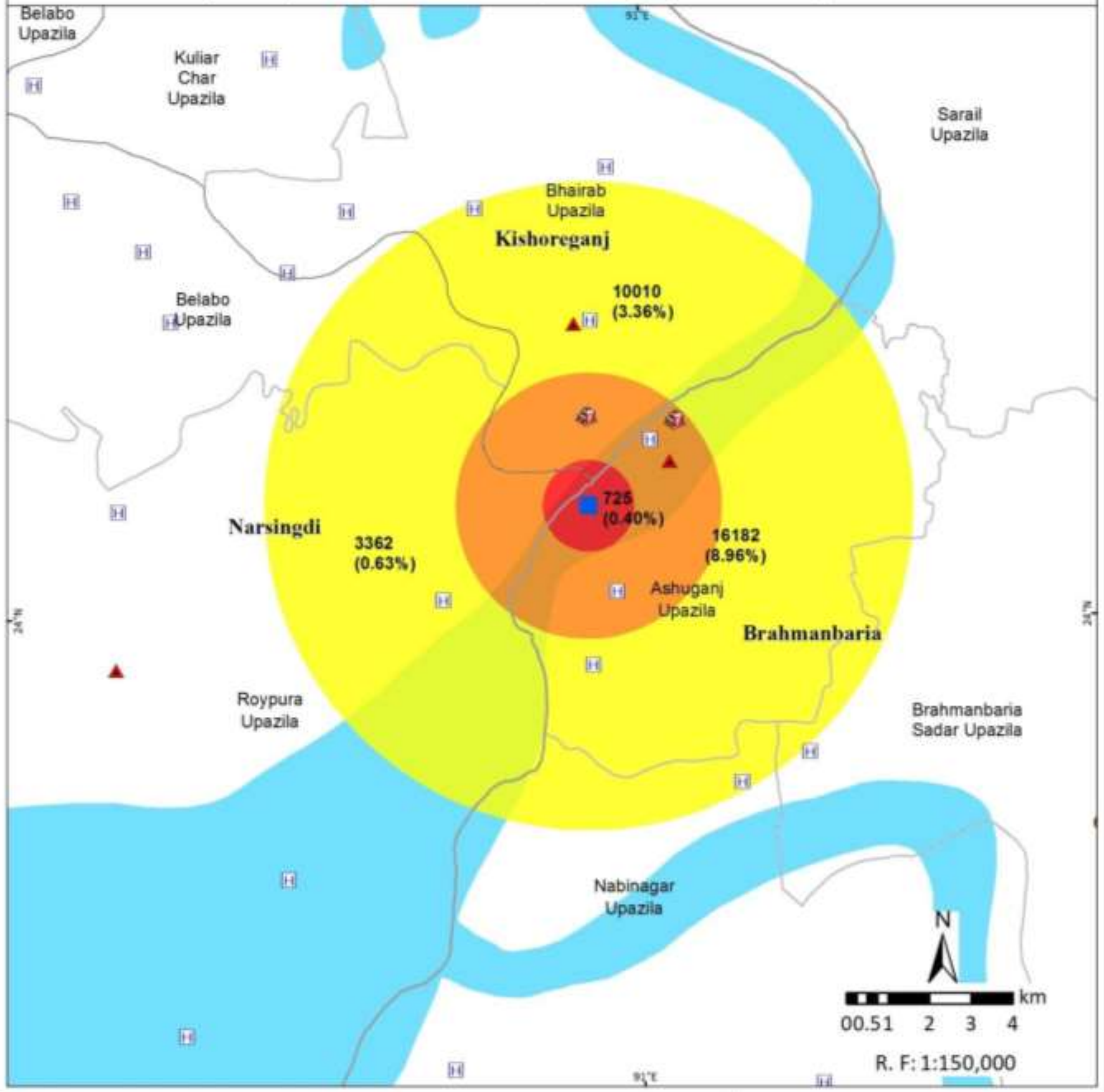
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population (Male) to DAP Fertilizer Company Ltd. (DAPFCL) in Chittagong District
Double Mooring Thana
Chittagong Port Thana
Patiya Upazila
Patenga Thana
1083 (0.21%)
Chittagong
3797 (1.47%)
Anowara Upazila
Banshkhali Upazila
Banshkhali Upazila
N
km
0 0.45 0.9 1.8 2.7 3.6
R. F: 1:100,000
Exposure Category of Population (Male) to Jamuna Fertilizer Company Ltd. (JFCL) in Jamalpur District
Sarishabari Upazila
Sarishabari Upazila
Sarishabari Upazila
4929 (1.52%)
Jamalpur
Sirajganj
Kazipur Upazila
151 (0.05%)
Dhanbari Upazila
Tangail
N
Km
0 0.5 1 2 3 4
R. F: 1:120,000
Sirajganj Sadar Upazila
Sirajganj Sadar Upazila
Gopalpur Upazila
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Location of Industry
District Head Quarter
Upazila Head Quarter
Hospital
Fire stations
River/Sea
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
Exposure of population (male) to possible ammonia releases from a leaking tank at DAP Fertilizer Company Ltd. (DAPFCL) and Jamuna Fertilizer Company (JFCL)
Data Source: Ministry of Industries, 2013
Coordinate System: BTM, Datum : Gulshan 303
Administrative Index
JFCL
DAPFCL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

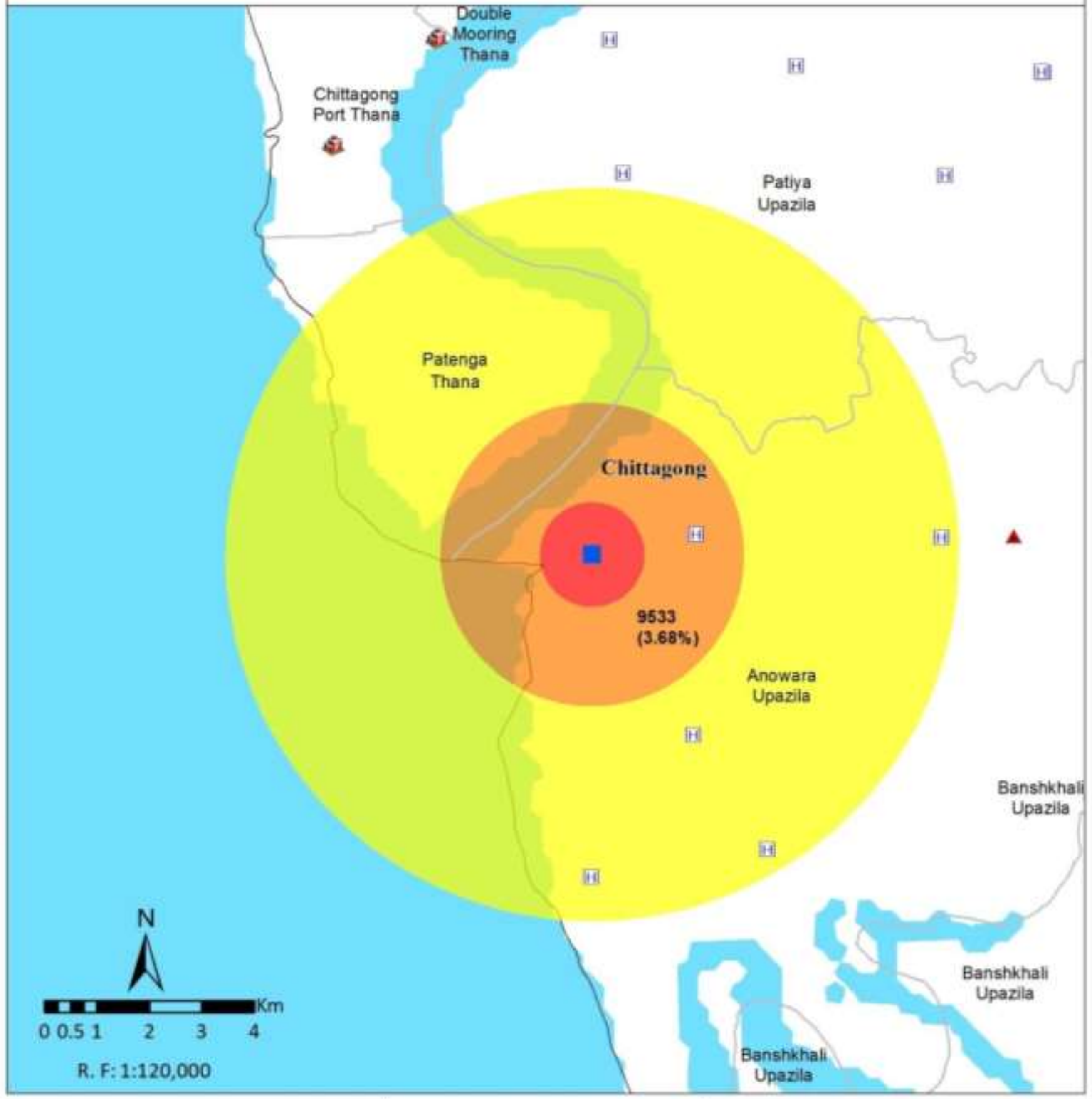


Exposure Category of Population (Male) to Natural Gas Fertilizer Factory Ltd. (NGFFL) in Sylhet District
Dakshin Surma Upazila
Dakshin Surma Upazila
Golapganj Upazila
Balaganj Upazila
Sylhet
Fenchuganj Upazila
428 (0.41%)
6094 (5.82%)
1667 (0.52%)
937 (0.29%)
Kulaura Upazila
Rajnagar Upazila
Maulvibazar
Kulaura Upazila
N
km
0 0.5 1 2 3 4
R. F: 1:120,000
Exposure Category of Population (Male) to Polash Fertilizer Factory Limited (PFFL) among Gazipur and Narshingdi Districts
Manohardi Upazila
Manohardi Upazila
Kapasia Upazila
Shibpur Upazila
Gazipur
Kalygonj Upazila
750 (0.28%)
7393 (2.79%)
1191 (0.56%)
17975 (8.45%)
Narsingdi
Palash Upazila
Shibpur Upazila
Narsingdi Sadar Upazila
N
Km
0 0.5 1 2 3 4
R. F: 1:120,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Location of Industry
District Head Quarter
Upazila Head Quarter
Hospital
Fire stations
River/Sea
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
Exposure of population (male) to possible ammonia releases from a leaking tank at Natural Gas Fertilizer Factory Ltd. (NGFFL) and Polash Fertilizer Factory Limited (PFFL)
Data Source: Ministry of Industries, 2013
Coordinate System: BTM, Datum : Gulshan 303
Administrative Index
NGFFL
PFFL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population (Female) to Ashuganj Fertilizer and Chemical Company Factory Limited (AFCCL) among Brahmanbaria, Kishoreganj and Narshingdi Districts



Exposure Category of Population (Female) to Chittagong Urea Fertilizer Ltd. (CUFL) in Chittagong District



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- Location of Industry
- District Head Quarter
- Upazila Head Quarter
- Hospital
- Fire stations
- River/Sea

Threat Zone

- AEGL-1 (1100 ppm - 1.1 km)
- AEGL-2 (160 ppm - 3.2 km)
- AEGL-3 (30ppm - 7.8 km)

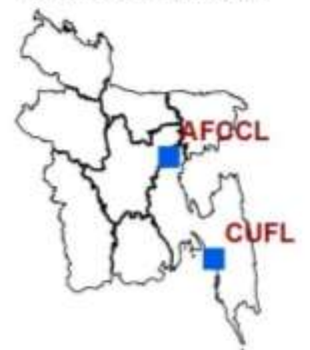
Note:

Exposure of population (female) to possible ammonia releases from a leaking tank at Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL) and Chittagong Urea Fertilizer Limited (CUFL)

Data Source: Ministry of Industries, 2013

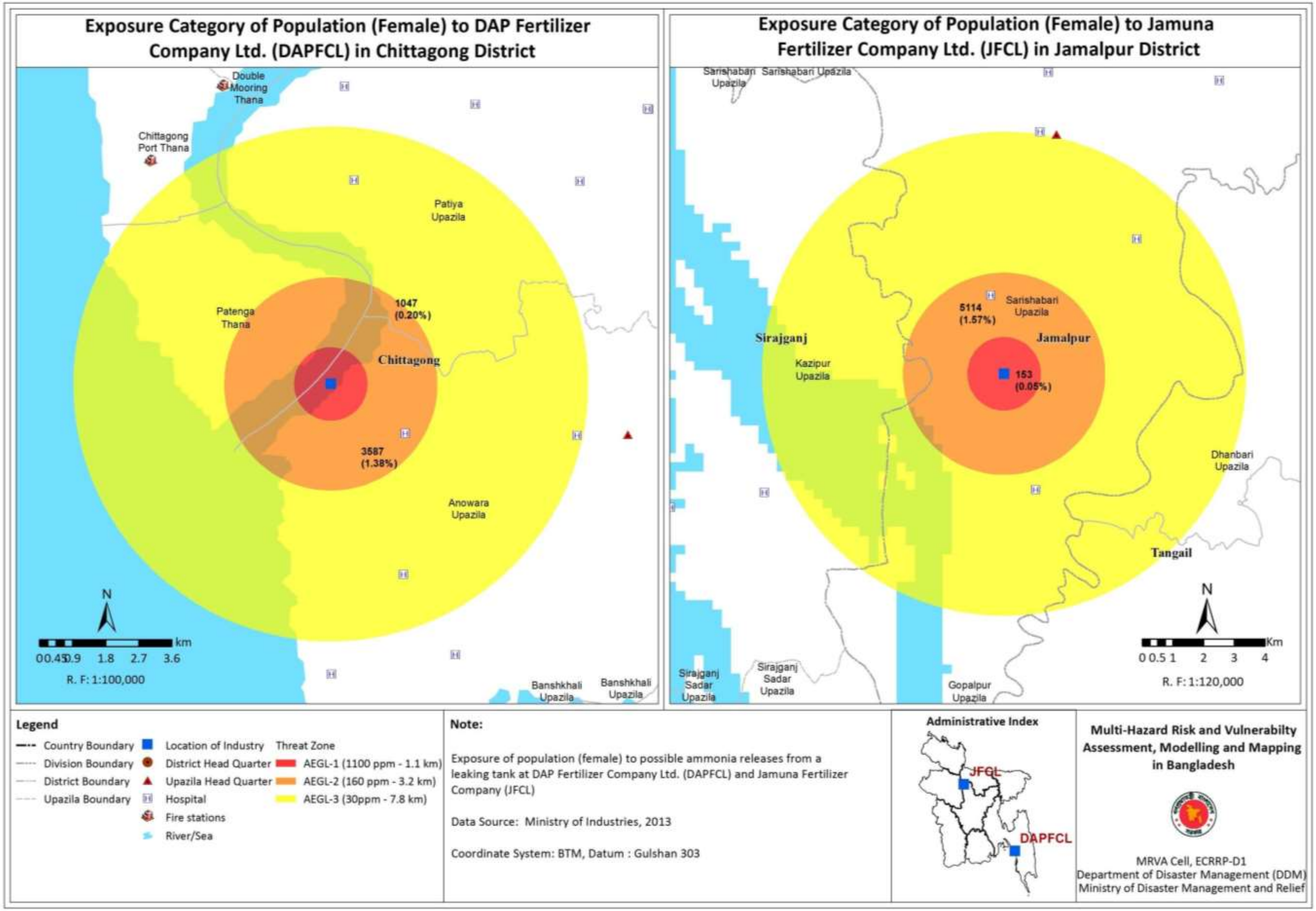
Coordinate System: BTM, Datum : Gulshan 303

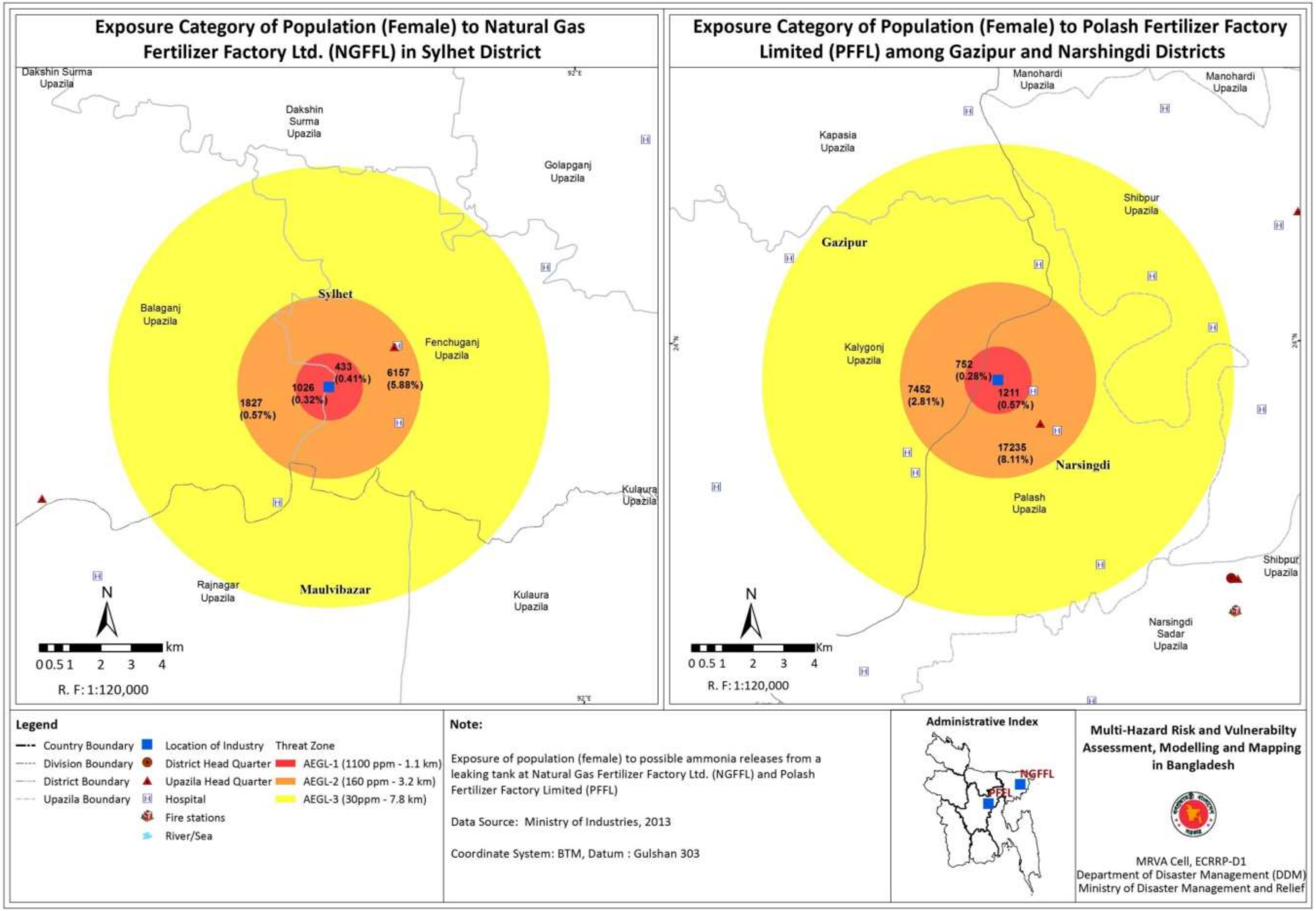
Administrative Index



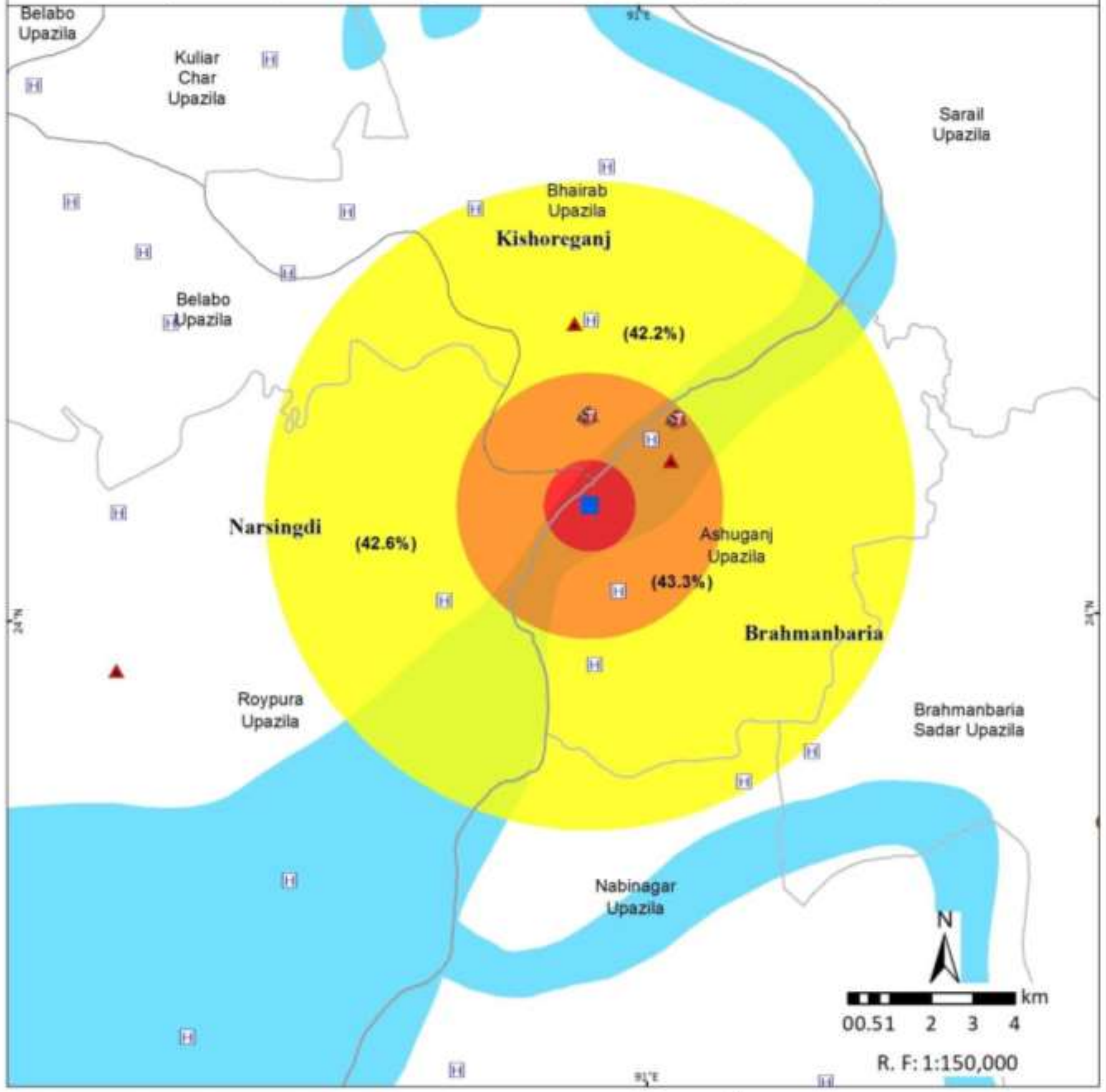
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

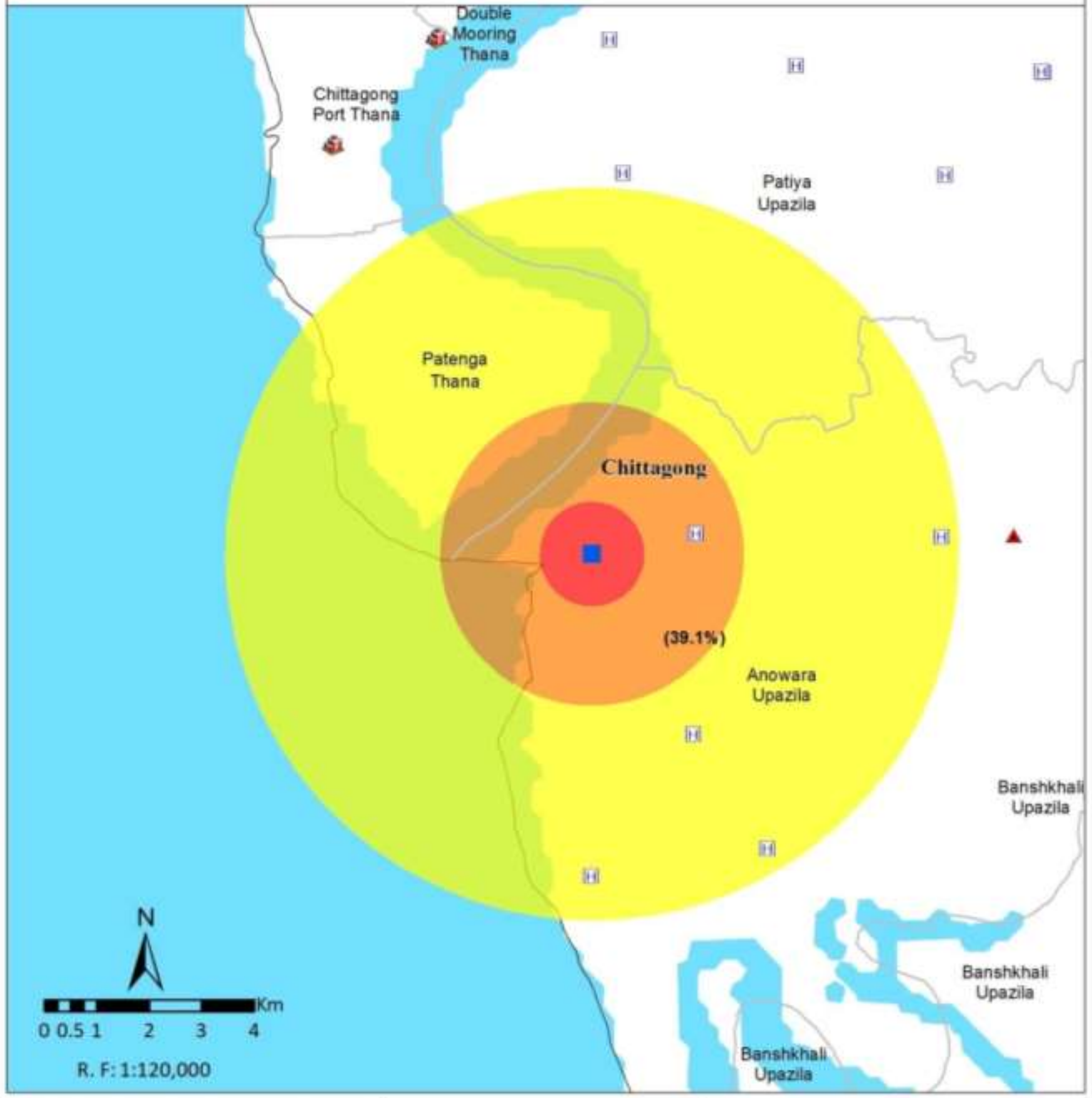

Exposure Category of Population (Female) to DAP Fertilizer Company Ltd. (DAPFCL) in Chittagong District
Double Mooring Thana
Chittagong Port Thana
Patiya Upazila
Patenga Thana
1047 (0.20%)
Chittagong
3587 (1.38%)
Anowara Upazila
Banshkhali Upazila
Banshkhali Upazila
N
km
0 0.45 0.9 1.8 2.7 3.6
R. F: 1:100,000
Exposure Category of Population (Female) to Jamuna Fertilizer Company Ltd. (JFCL) in Jamalpur District
Sarishabari Upazila
Sarishabari Upazila
5114 (1.57%)
Sarishabari Upazila
Jamalpur
Sirajganj
Kazipur Upazila
153 (0.05%)
Dhanbari Upazila
Tangail
N
Km
0 0.5 1 2 3 4
R. F: 1:120,000
Sirajganj Sadar Upazila
Sirajganj Sadar Upazila
Gopalpur Upazila
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Location of Industry
District Head Quarter
Upazila Head Quarter
Hospital
Fire stations
River/Sea
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
Exposure of population (female) to possible ammonia releases from a leaking tank at DAP Fertilizer Company Ltd. (DAPFCL) and Jamuna Fertilizer Company (JFCL)
Data Source: Ministry of Industries, 2013
Coordinate System: BTM, Datum : Gulshan 303
Administrative Index
JFCL
DAPFCL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population (Female) to Natural Gas Fertilizer Factory Ltd. (NGFFL) in Sylhet District
Dakshin Surma Upazila
Dakshin Surma Upazila
Golapganj Upazila
Balaganj Upazila
Sylhet
Fenchuganj Upazila
433 (0.41%)
1026 (0.32%)
6157 (5.88%)
1827 (0.57%)
Kulaura Upazila
Rajnagar Upazila
Maulvibazar
Kulaura Upazila
N
km
0 0.5 1 2 3 4
R. F: 1:120,000
Exposure Category of Population (Female) to Polash Fertilizer Factory Limited (PFFL) among Gazipur and Narshingdi Districts
Manohardi Upazila
Manohardi Upazila
Kapasia Upazila
Gazipur
Shibpur Upazila
Kalygonj Upazila
752 (0.28%)
7452 (2.81%)
1211 (0.57%)
17235 (8.11%)
Narsingdi
Palash Upazila
Shibpur Upazila
Narsingdi Sadar Upazila
N
Km
0 0.5 1 2 3 4
R. F: 1:120,000
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Location of Industry
District Head Quarter
Upazila Head Quarter
Hospital
Fire stations
River/Sea
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
Exposure of population (female) to possible ammonia releases from a leaking tank at Natural Gas Fertilizer Factory Ltd. (NGFFL) and Polash Fertilizer Factory Limited (PFFL)
Data Source: Ministry of Industries, 2013
Coordinate System: BTM, Datum : Gulshan 303
Administrative Index
NGFFL
PFFL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population (0 - 14 year) to Ashuganj Fertilizer and Chemical Company Factory Limited (AFCCL) among Brahmanbaria, Kishoreganj and Narshingdi Districts



Exposure Category of Population (0 - 14 year) to Chittagong Urea Fertilizer Ltd. (CUFL) in Chittagong District



Legend

Country Boundary	Location of Industry	Threat Zone
Division Boundary	District Head Quarter	AEGL-1 (1100 ppm - 1.1 km)
District Boundary	Upazila Head Quarter	AEGL-2 (160 ppm - 3.2 km)
Upazila Boundary	Hospital	AEGL-3 (30ppm - 7.8 km)
	Fire stations	
	River/Sea	

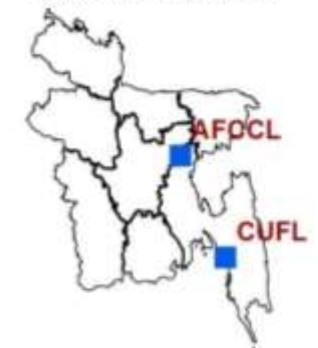
Note:

Exposure of population (0 - 14 year) to possible ammonia releases from a leaking tank at Ashuganj Fertilizer & Chemical Company Factory Limited (AFCCL) and Chittagong Urea Fertilizer Limited (CUFL)

Data Source: Ministry of Industries, 2013

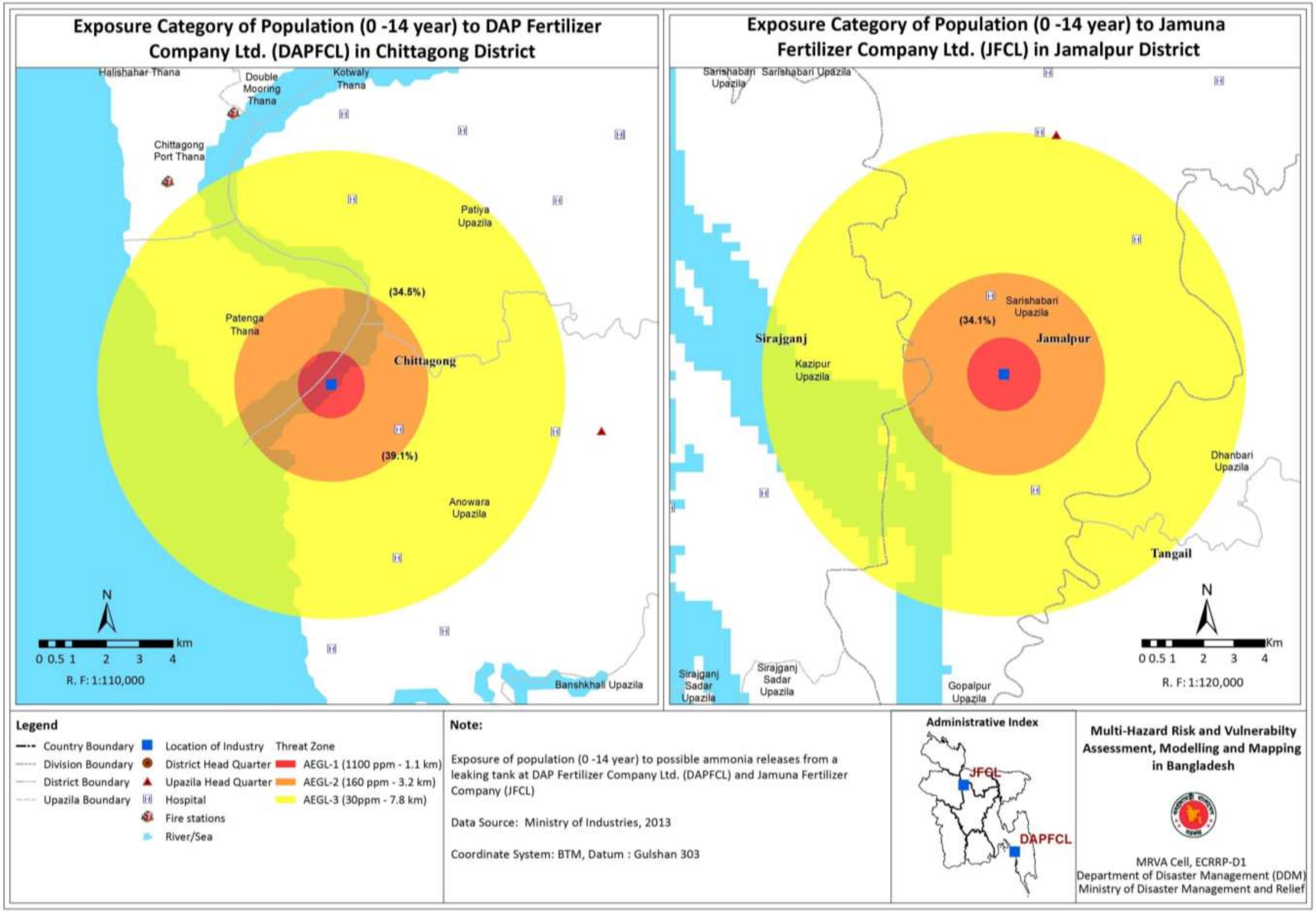
Coordinate System: BTM, Datum : Gulshan 303

Administrative Index

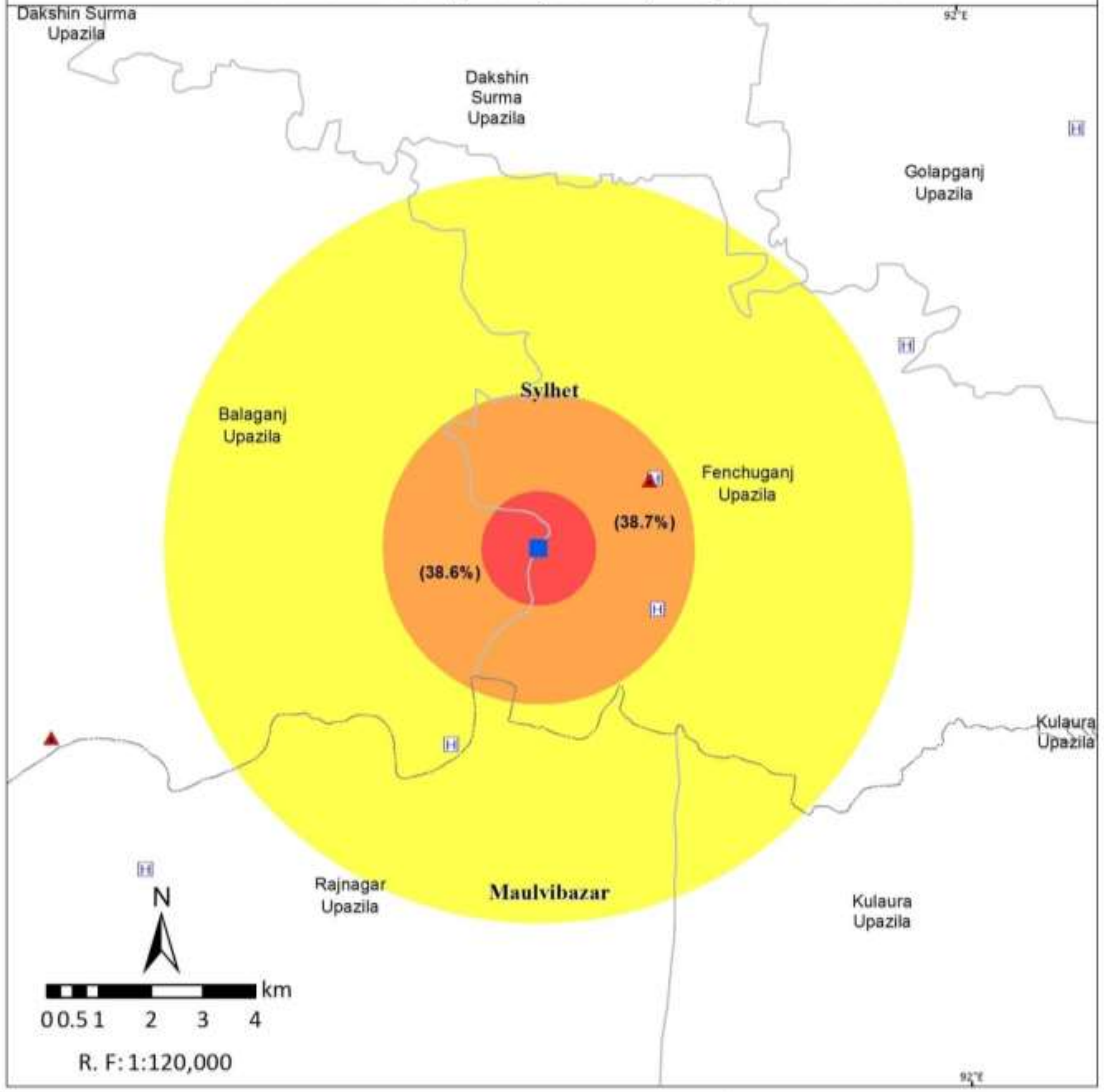


Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

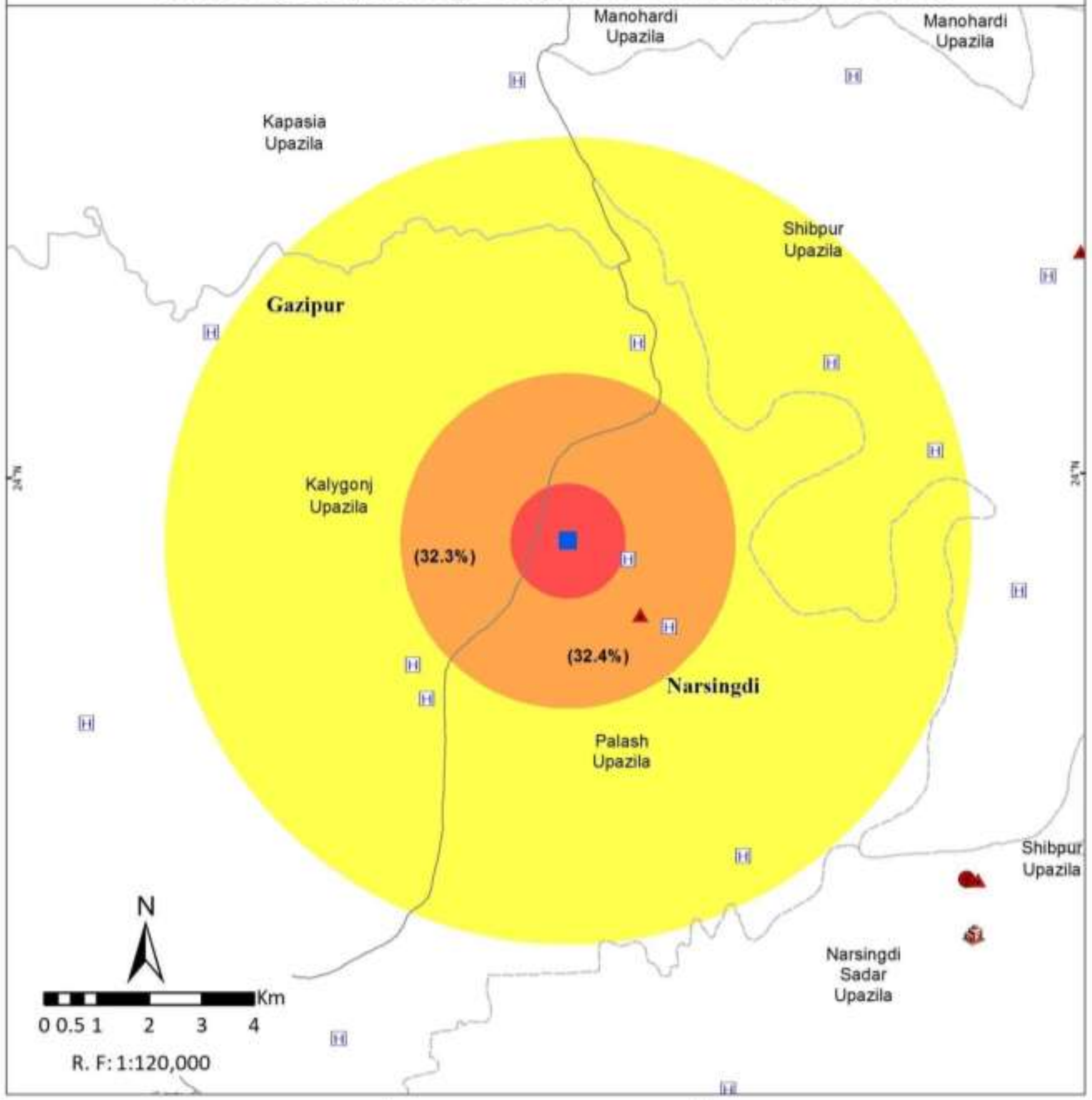
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Exposure Category of Population (0 -14 year) to DAP Fertilizer Company Ltd. (DAPFCL) in Chittagong District
Halishahar Thana
Double Mooring Thana
Kotwaly Thana
Chittagong Port Thana
Patiya Upazila
(34.5%)
Patenga Thana
Chittagong
(39.1%)
Anowara Upazila
Banshkhali Upazila
N
km
0 0.5 1 2 3 4
R. F: 1:110,000
Exposure Category of Population (0 -14 year) to Jamuna Fertilizer Company Ltd. (JFCL) in Jamalpur District
Sarishabari Upazila
Sarishabari Upazila
(34.1%)
Sirajganj
Jamalpur
Kazipur Upazila
Dhanbari Upazila
Tangail
N
Km
0 0.5 1 2 3 4
R. F: 1:120,000
Sirajganj Sadar Upazila
Sirajganj Sadar Upazila
Gopalpur Upazila
Legend
Country Boundary
Division Boundary
District Boundary
Upazila Boundary
Location of Industry
District Head Quarter
Upazila Head Quarter
Hospital
Fire stations
River/Sea
Threat Zone
AEGL-1 (1100 ppm - 1.1 km)
AEGL-2 (160 ppm - 3.2 km)
AEGL-3 (30ppm - 7.8 km)
Note:
Exposure of population (0 -14 year) to possible ammonia releases from a leaking tank at DAP Fertilizer Company Ltd. (DAPFCL) and Jamuna Fertilizer Company (JFCL)
Data Source: Ministry of Industries, 2013
Coordinate System: BTM, Datum : Gulshan 303
Administrative Index
JFCL
DAPFCL
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Exposure Category of Population (0 -14 year) to Natural Gas Fertilizer Factory Ltd. (NGFFL) in Sylhet District



Exposure Category of Population (0 -14 year) to Polash Fertilizer Factory Limited (PFFL) among Gazipur and Narshingdi Districts



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Upazila Boundary
- Location of Industry
- District Head Quarter
- Upazila Head Quarter
- Hospital
- Fire stations
- River/Sea

Threat Zone

- AEGL-1 (1100 ppm - 1.1 km)
- AEGL-2 (160 ppm - 3.2 km)
- AEGL-3 (30ppm - 7.8 km)

Note:

Exposure of population (0 -14 year) to possible ammonia releases from a leaking tank at Natural Gas Fertilizer Factory Ltd. (NGFFL) and Polash Fertilizer Factory Limited (PFFL)

Data Source: Ministry of Industries, 2013

Coordinate System: BTM, Datum : Gulshan 303

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

HEALTH

5 Health Hazard

Due to the country's very high population density, pollution and environment, Bangladesh is highly conducive for emerging diseases. The Directorate General of Health Services (DGHS), under the Ministry of Health and Family Welfare (MoHFW), Government of Bangladesh in partnership with the World Health Organization compiles and manages epidemic surveillance system for the country. However, very limited assessments and mapping work have been carried out at the national and local levels. Based on the past experience, ADPC has collected necessary data from Director General of Health Service (DGHS) website (www.dghs.gov.bd) and information from health bulletins for the most predominant communicable diseases prevailing in the country for the year 2011, 2012 and 2013 and health hazard assessment is carried out using Incidence Index. in this study.

5. 1 Methodology

Data available in DHGS website as *Monthly Disease Profile Report* is the number people affected by 157 diseases at the district level for all the 64 districts of Bangladesh. Other details available for this data are number of population based on gender (male/female) and their age in seven categories (0 – 28 days, 29 days to 11 months, 1- 4, 5-14, 15-24, 25-49 and more than 50 years). The eight most communicable diseases i.e. Dengue, Diarrhea, Encephalitis, Filariasis, Kala-azar, Leprosy, Malaria, Tuberculosis (Pulmonary), are considered for health hazard assessments, along with water borne disease such as Diarrhea. This data has been collected for the years 2011, 2012 and 2013 on monthly basis for all the districts and analyzed in this study, as shown in figure 5.1.

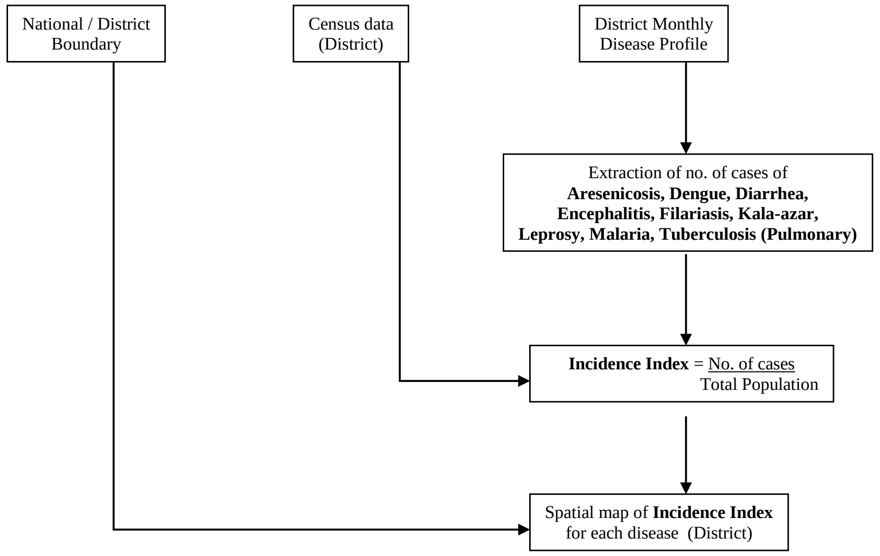


Figure 5.1: Methodology of Health Hazard Assessment

5.2 Map Content

The health hazard assessment maps developed represent the number of reported persons for each disease, which are categorized into three classes as given Table 4.1.

Table 5.1: Health hazard categories

Health hazard Category	Number of reported cases	Color symbol used
Low	< 50	
Medium	50 - 100	
High	>100	

5.3 Analysis of Hazard maps

The number of reported cases for nine diseases is analyzed during 2011, 2012 and 2013 at division and district level. A summary of highest number of cases reported at district level for 3 years is given in table 5.2.

Table 5.2: Highest number of cases reported for nine diseases at district level during 2011, 2012 and 2013

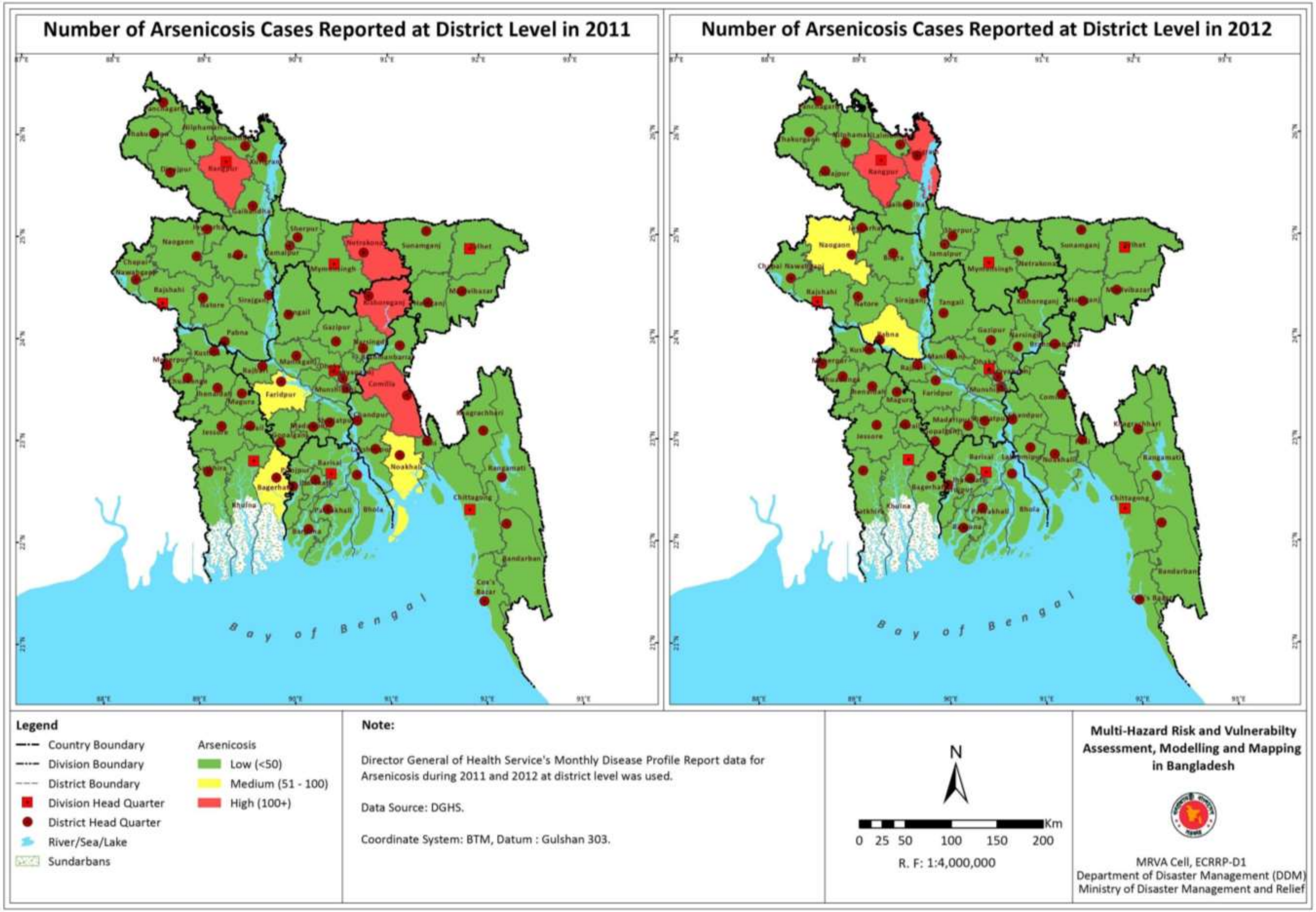
Disease	2011		2012		2013	
	Highest Number of cases	District	Highest Number of cases	District	Highest Number of cases	District
Diarrhea	442	Rangpur	553	Rangpur	376	Faridpur
Dengue	341	Comilla	6372	Narayanganj	117	Rangpur
Diarrhea	27408	Chittagong	30528	Chittagong	27855	Chittagong
Encephalitis	789	Rangpur	846	Rangpur	471	Rangpur
Filariasis	372	Narayanganj	233	Dinajpur	244	Faridpur
Kala-azar	488	Mymensingh	588	Mymensingh	183	Mymensingh
Leprosy	179	Rangpur	227	Sylhet	238	Sylhet
Malaria	2567	Bandarban	1173	Bandarban	514	Bandarban
Tuberculosis	2046	Narayanganj	371	Rangpur	291	Brammanbaria

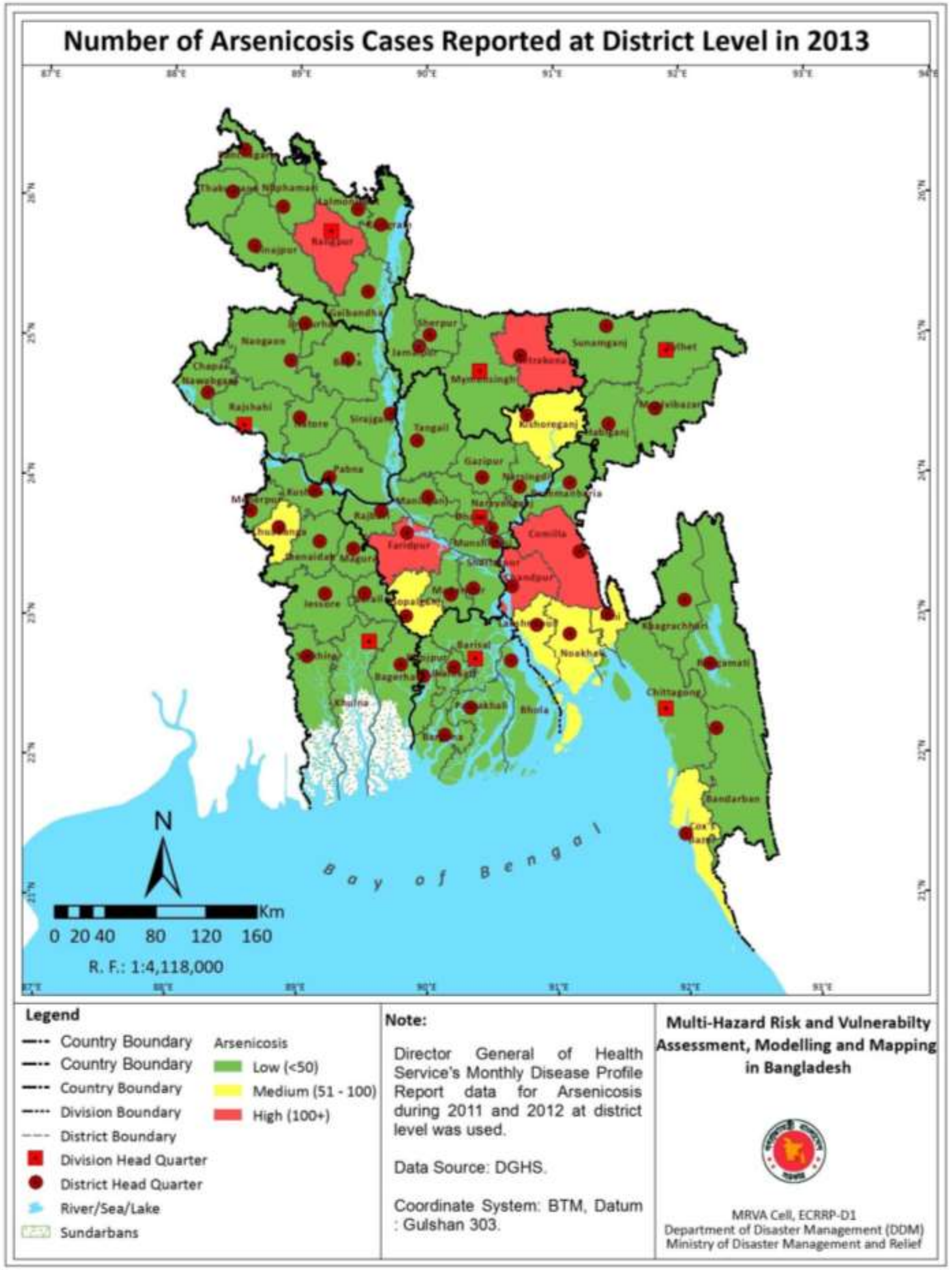
5.4 Health Hazard maps

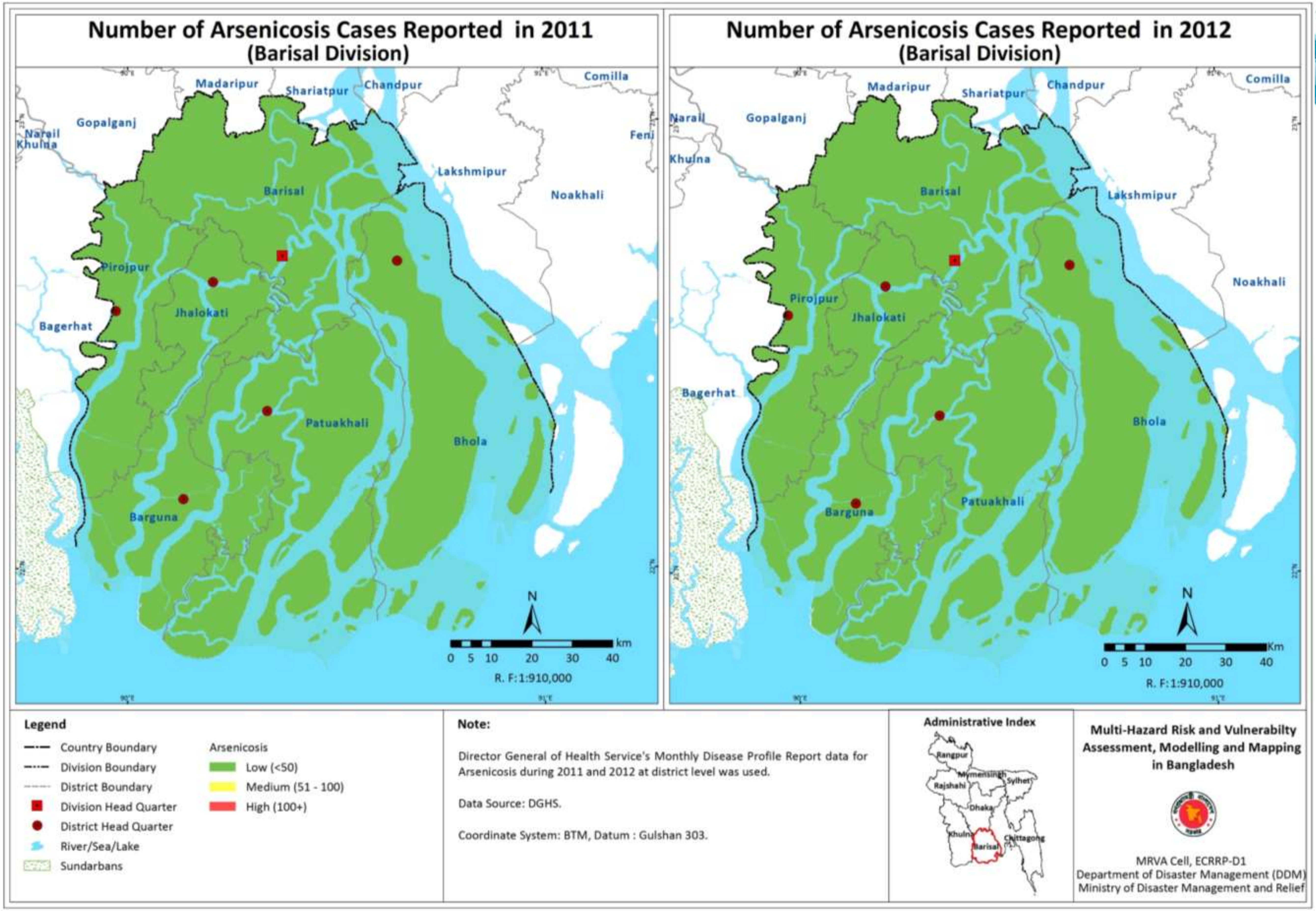
5. Health hazard maps represents number of population affected to 9 diseases (Diarrhea, Dengue, Diarrhea, Encephalitis, Filariasis, Kalaazar, Leprosy, Malaria, Tuberculosis (Pulmonary)) are shown at national level and division level for 2011, 2012 and 2013, which represents the exposure of Population to Health hazard. Number of maps are given in table 5.3.

Table 5.3: Number of maps presented for Health Hazard

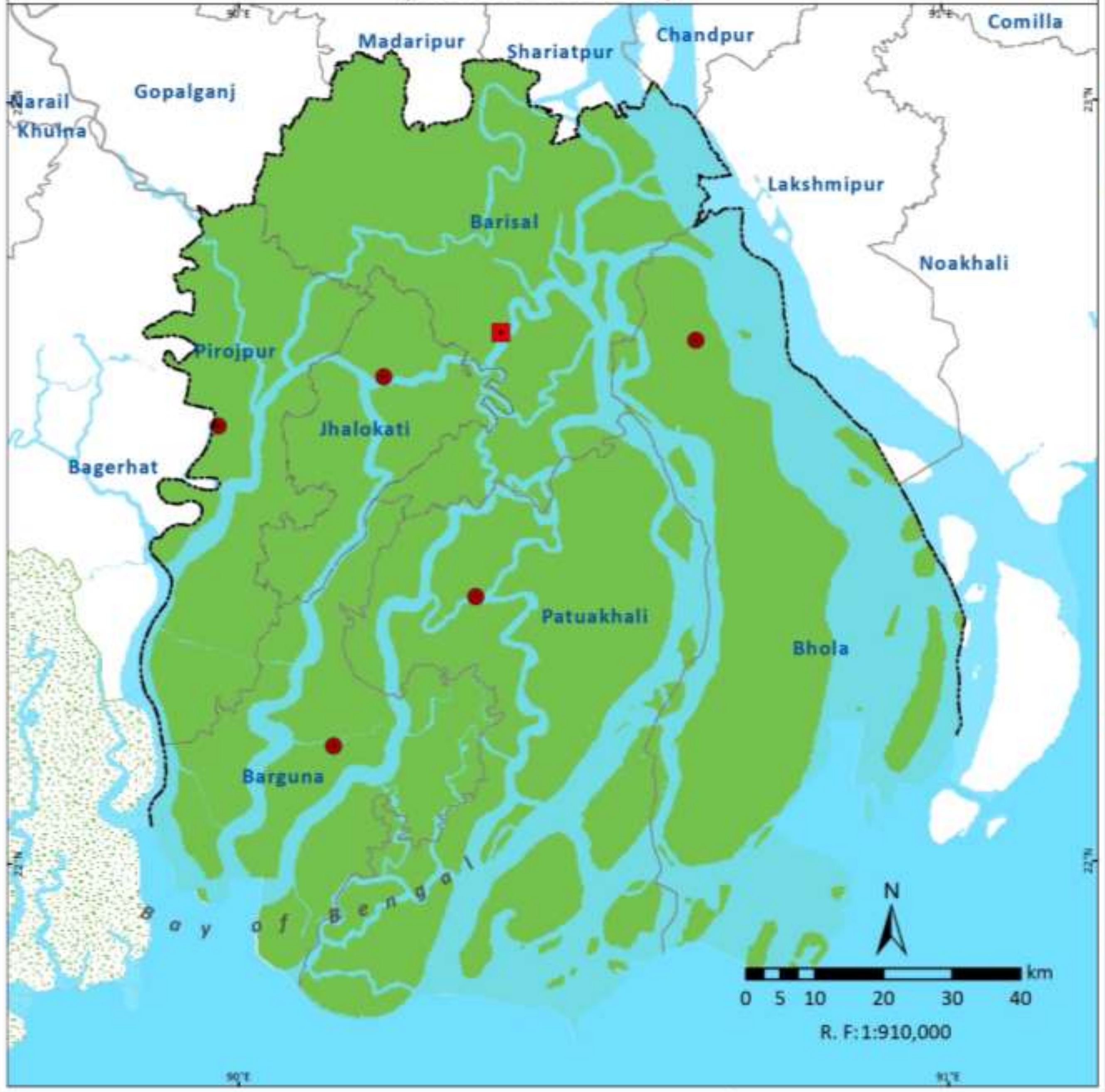
Disease	National Level	Division level		
		2011	2012	2013
Diarrhea	1	8	8	8
Dengue	1	8	8	8
Diarrhea	1	8	8	8
Encephalitis	1	8	8	8
Filariasis	1	8	8	8
Kala-azar	1	8	8	8
Leprosy	1	8	8	8
Malaria	1	8	8	8
Tuberculosis	1	8	8	8
Total	9	72	72	72


Number of Arsenicosis Cases Reported at District Level in 2011
Number of Arsenicosis Cases Reported at District Level in 2012
Bay of Bengal
Bay of Bengal
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
N
0 25 50 100 150 200 Km
R. F: 1:4,000,000
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

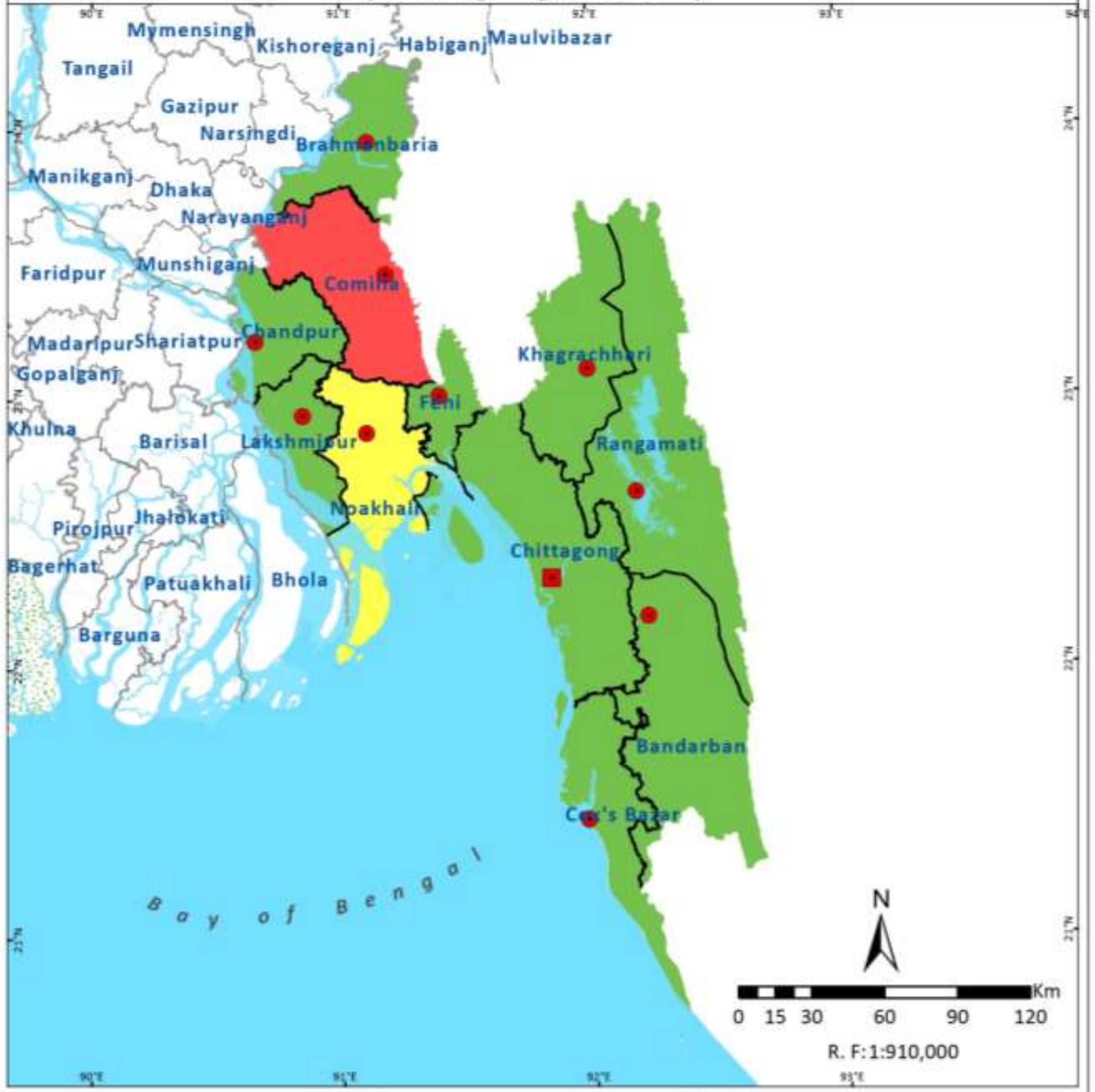

Number of Arsenicosis Cases Reported at District Level in 2013
Bay of Bengal
N
Km
0 20 40 80 120 160
R. F.: 1:4,118,000
Legend
Country Boundary
Country Boundary
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Arsenicosis Cases Reported in 2011
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Gopalganj
Narail
Khulna
Feni
Lakshmipur
Barisal
Noakhali
Pirojpur
Jhalokati
Bagerhat
Patuakhali
Bhola
Barguna
N
0 5 10 20 30 40 km
R. F:1:910,000
Number of Arsenicosis Cases Reported in 2012
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Narail
Gopalganj
Khulna
Barisal
Lakshmipur
Noakhali
Pirojpur
Jhalokati
Bagerhat
Bhola
Barguna
Patuakhali
N
0 5 10 20 30 40 Km
R. F:1:910,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2013 (Barisal Division)



Number of Arsenicosis Cases Reported in 2011 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2013 at district level was used.

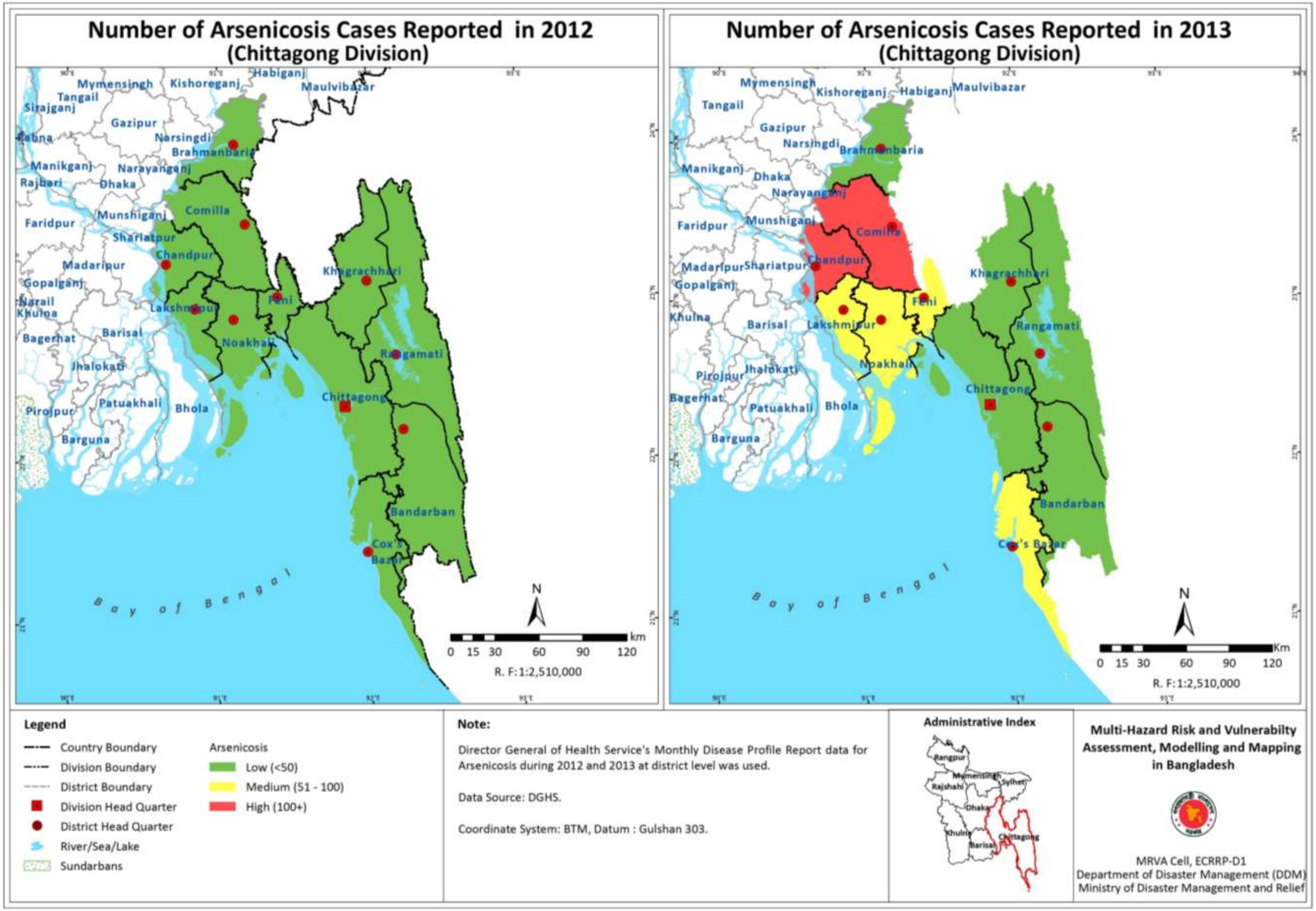
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

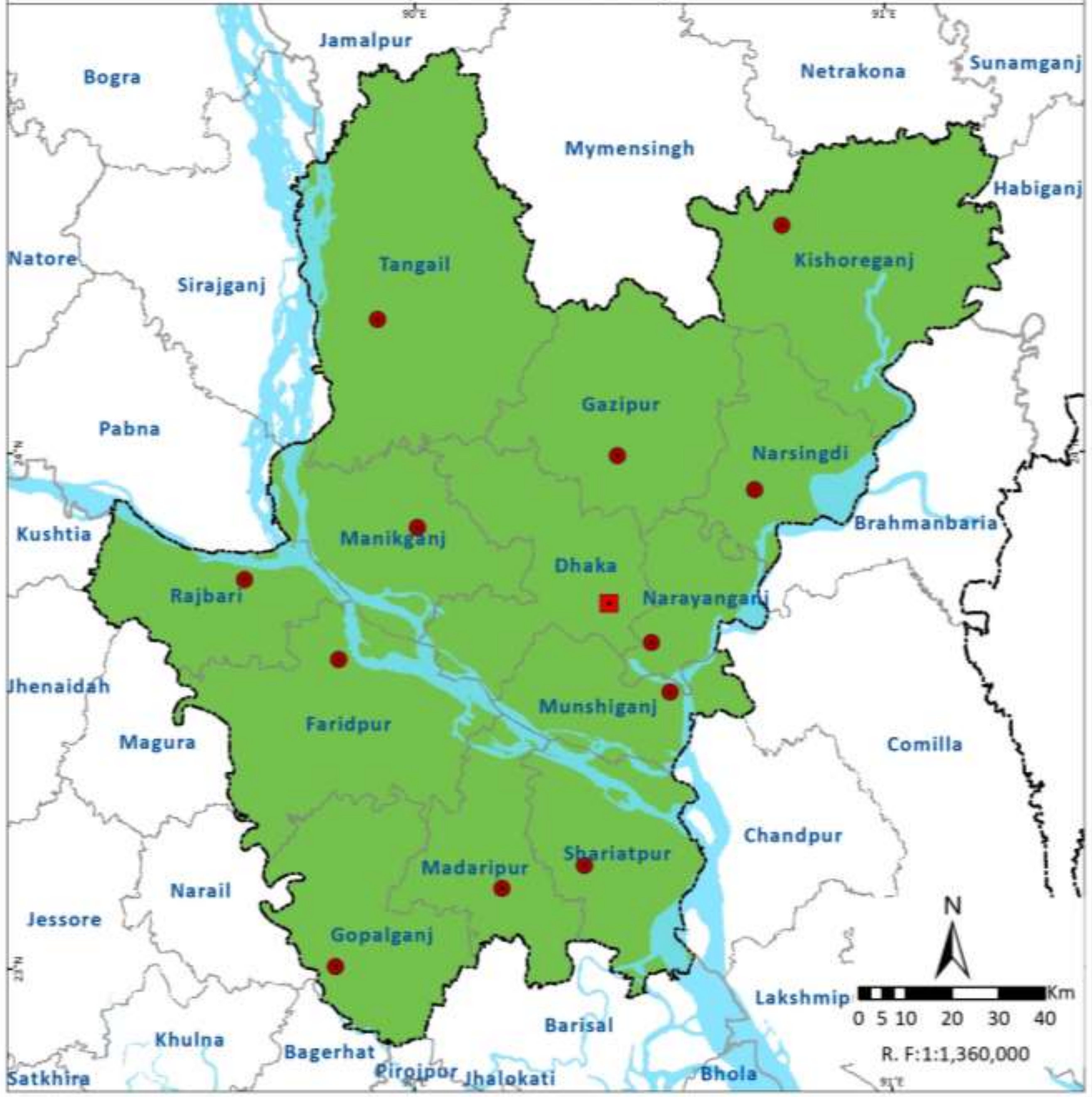
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Arsenicosis Cases Reported in 2012
(Chittagong Division)
Number of Arsenicosis Cases Reported in 2013
(Chittagong Division)
Bay of Bengal
R. F: 1:2,510,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2011
(Dhaka Division)

Number of Arsenicosis Cases Reported in 2012
(Dhaka Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.

Data Source: DGHS.

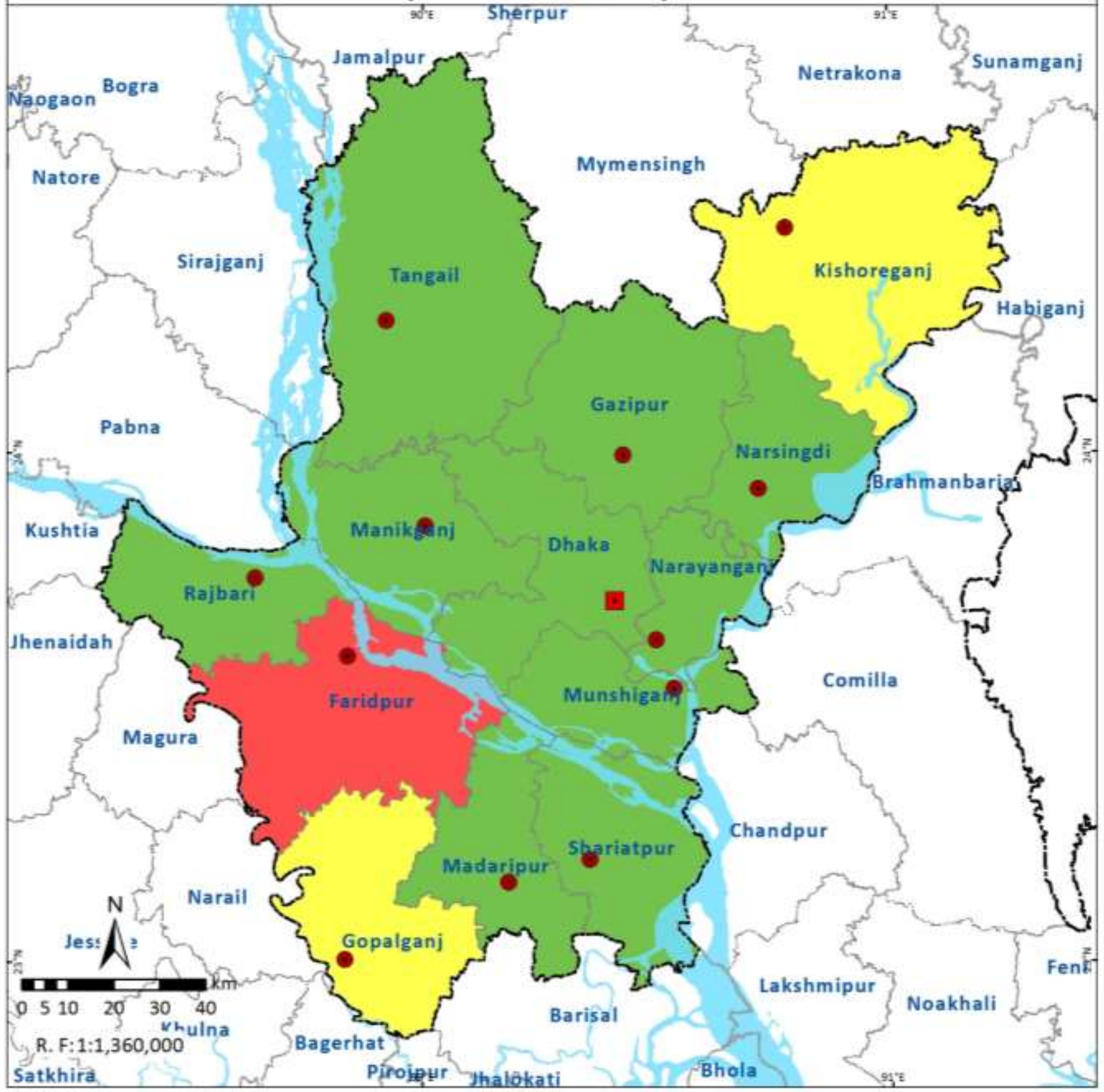
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

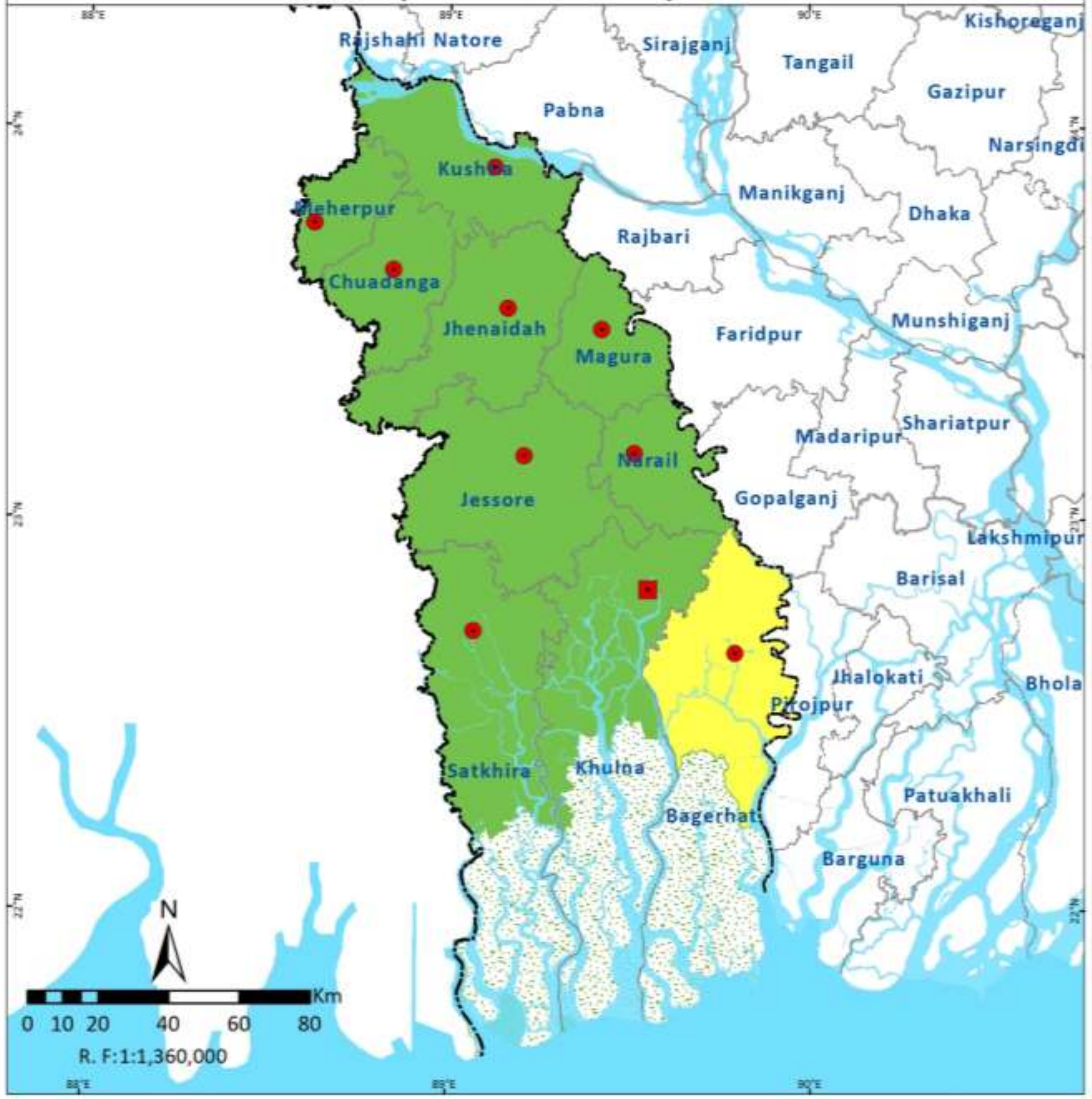
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2013 (Dhaka Division)



Number of Arsenicosis Cases Reported in 2011 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2013 at district level was used.

Data Source: DGHS.

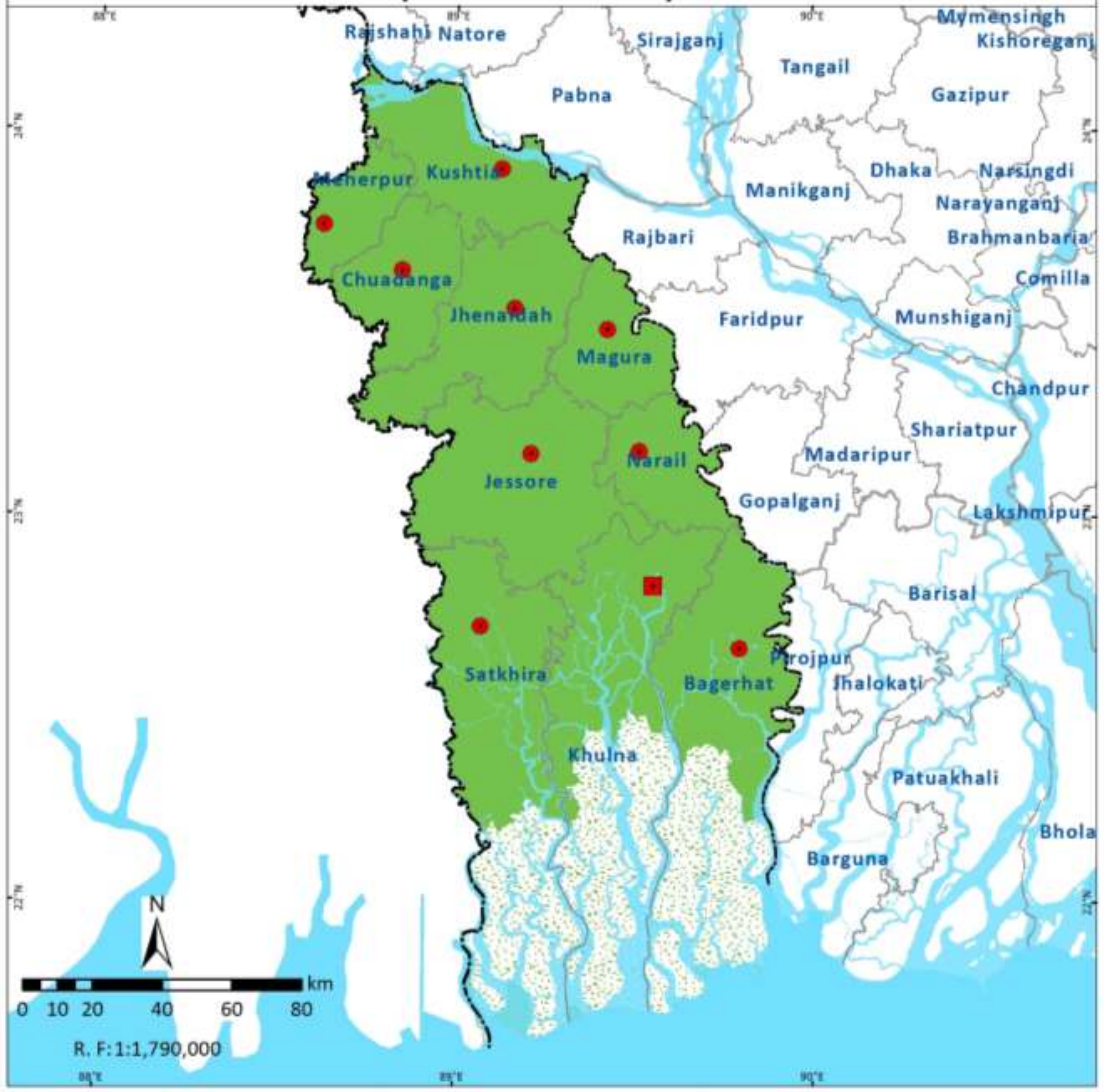
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

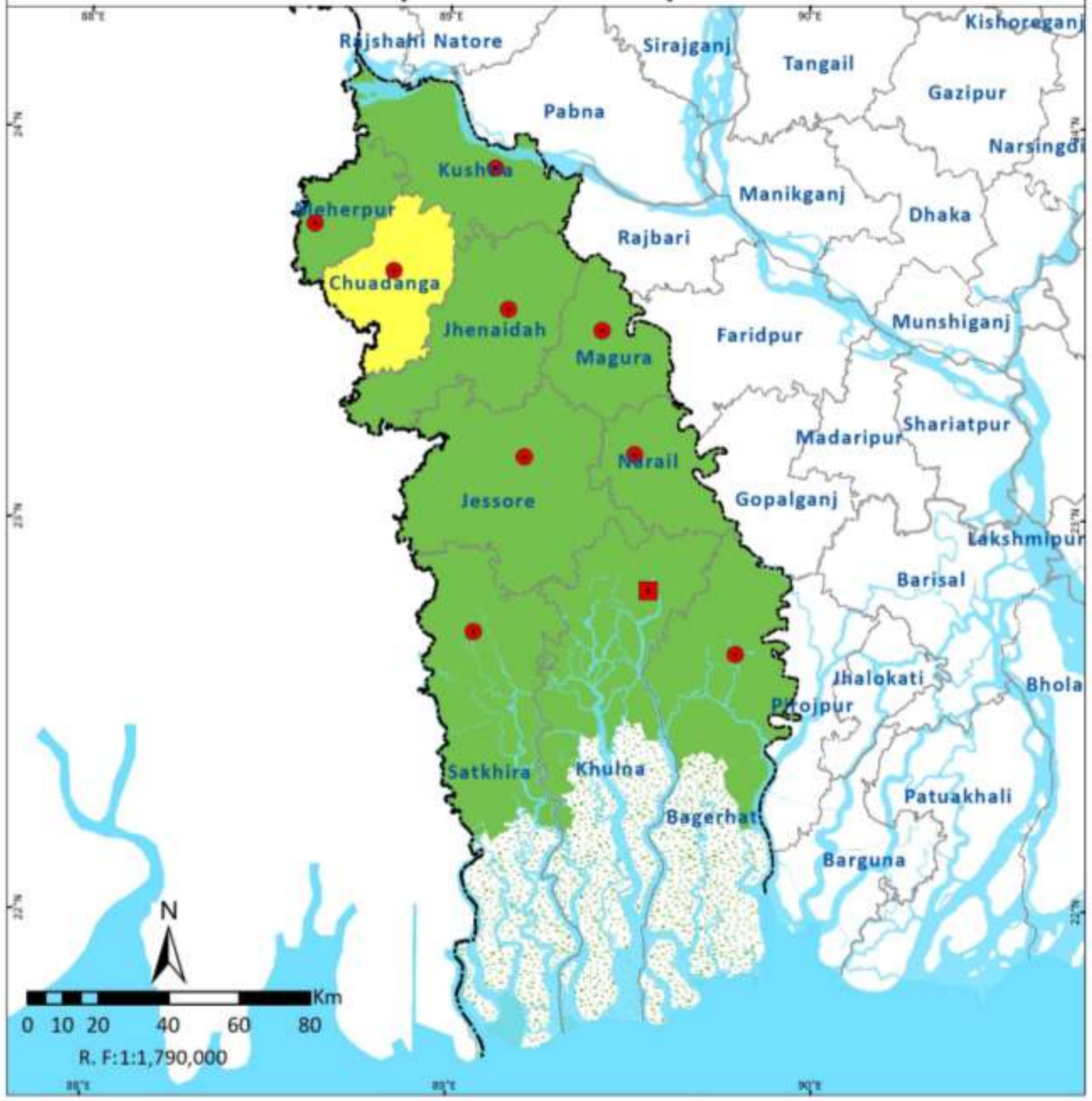
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2012
(Khulna Division)



Number of Arsenicosis Cases Reported in 2013
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2012 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

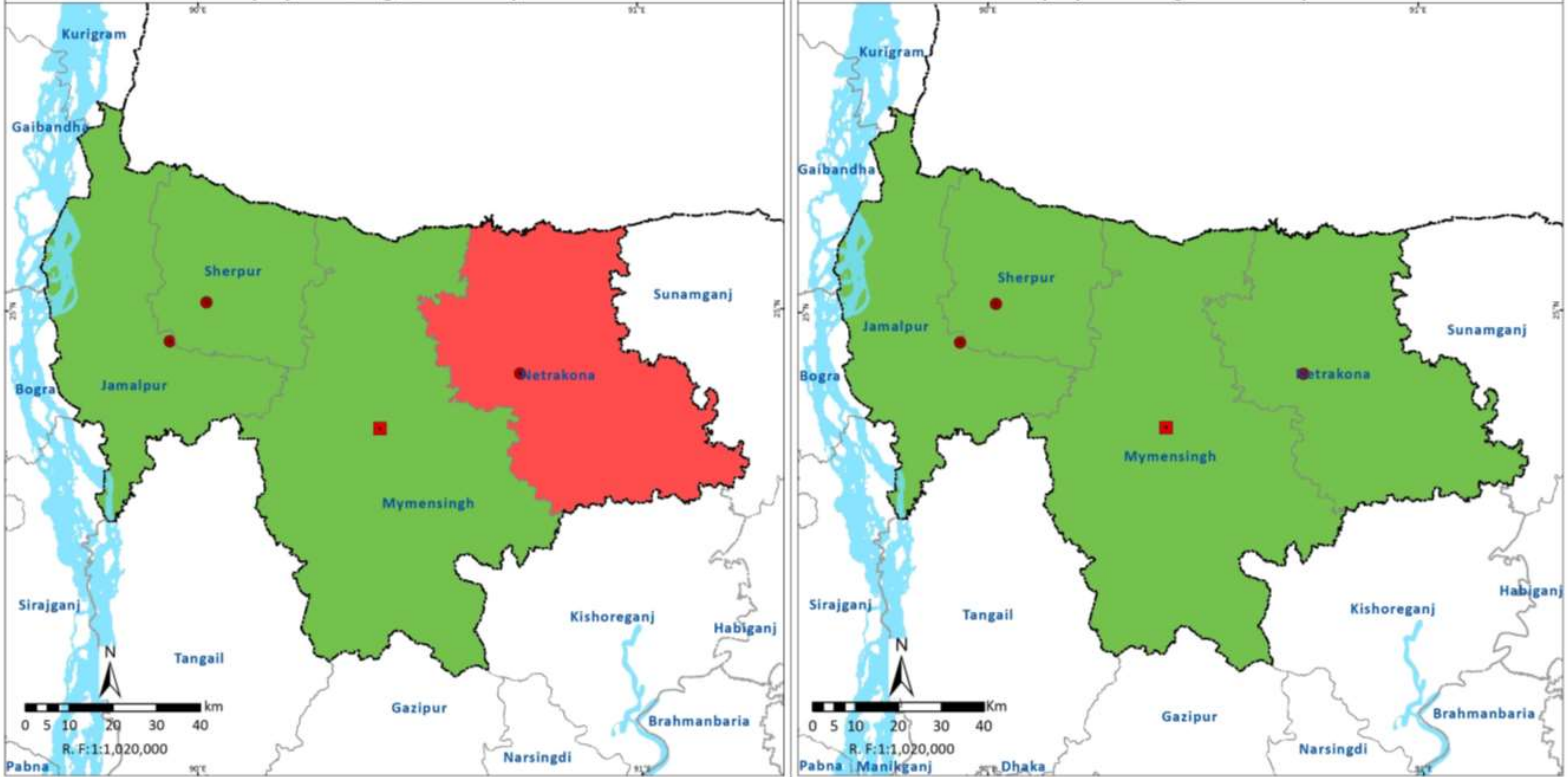
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2011 (Mymensingh Division)

Number of Arsenicosis Cases Reported in 2012 (Mymensingh Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis
- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.

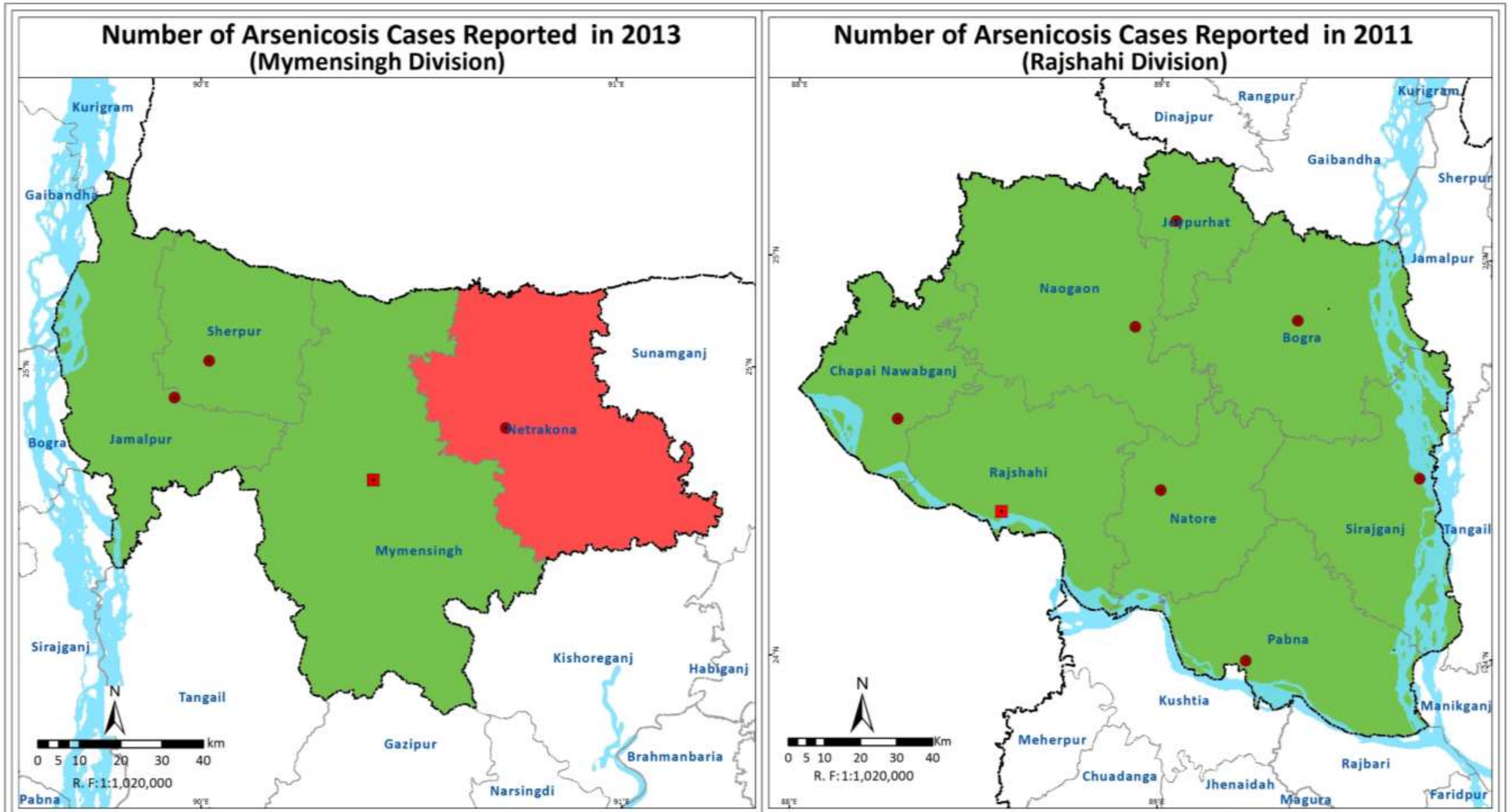
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2013 at district level was used.

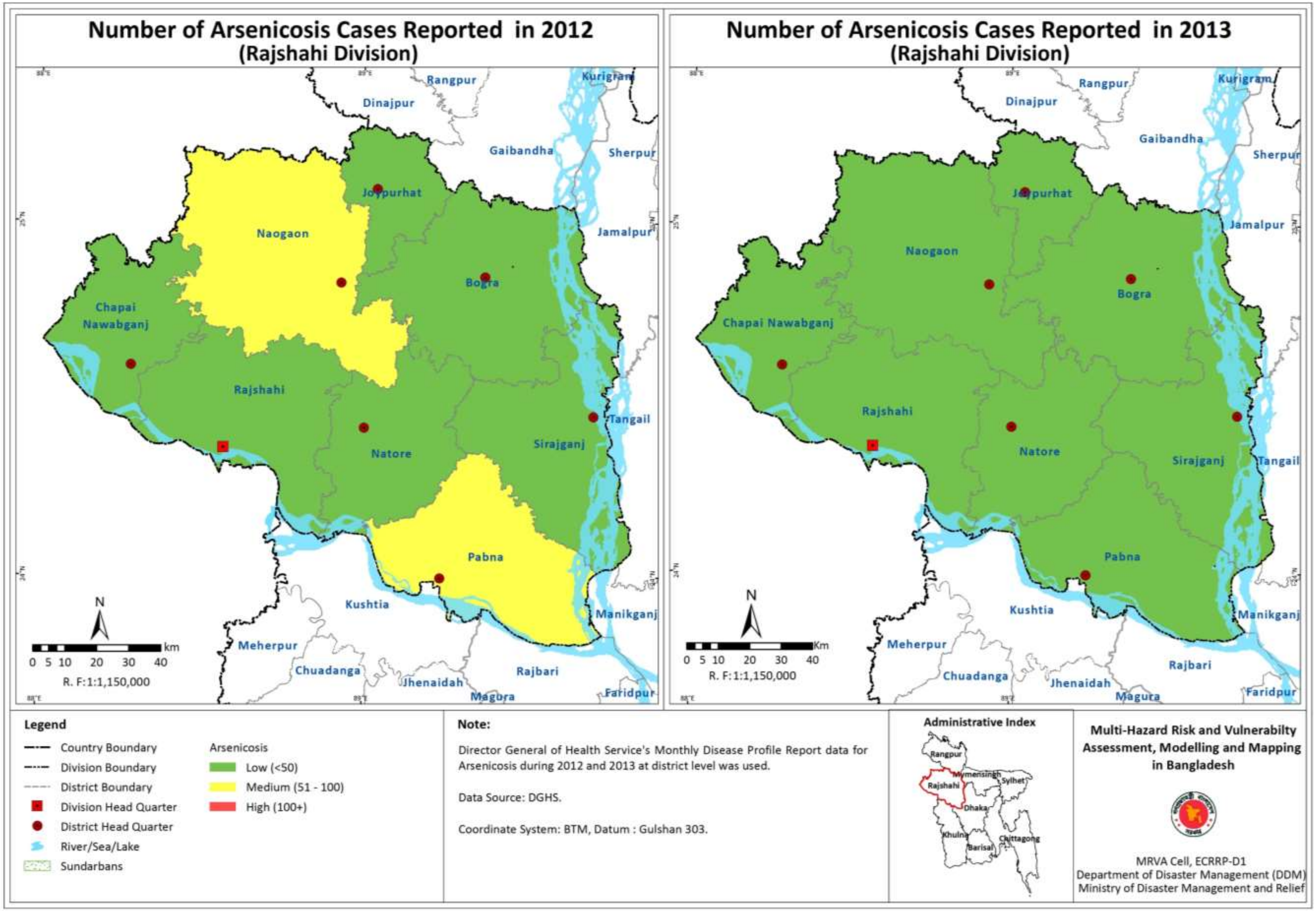
Data Source: DGHS.

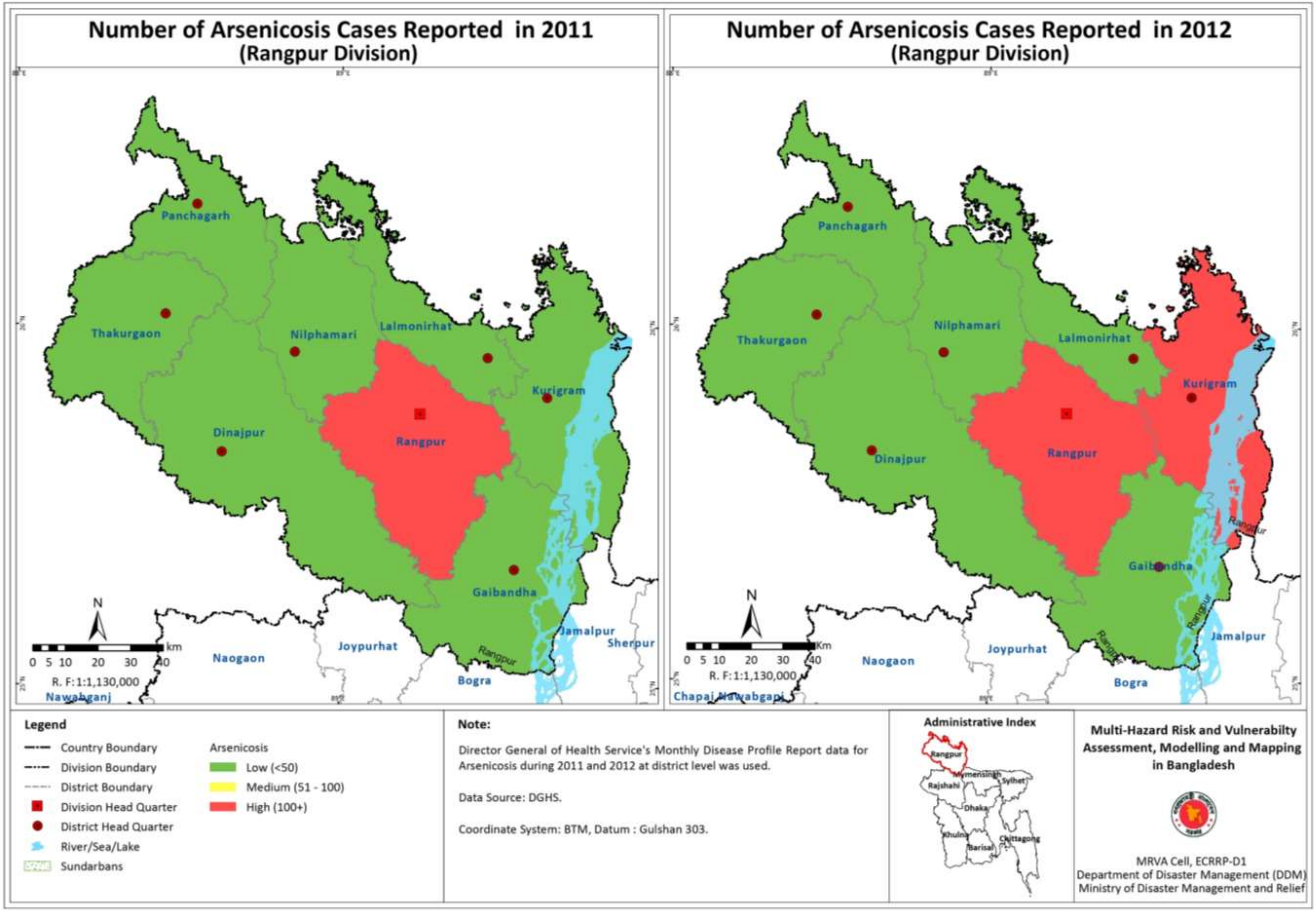
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

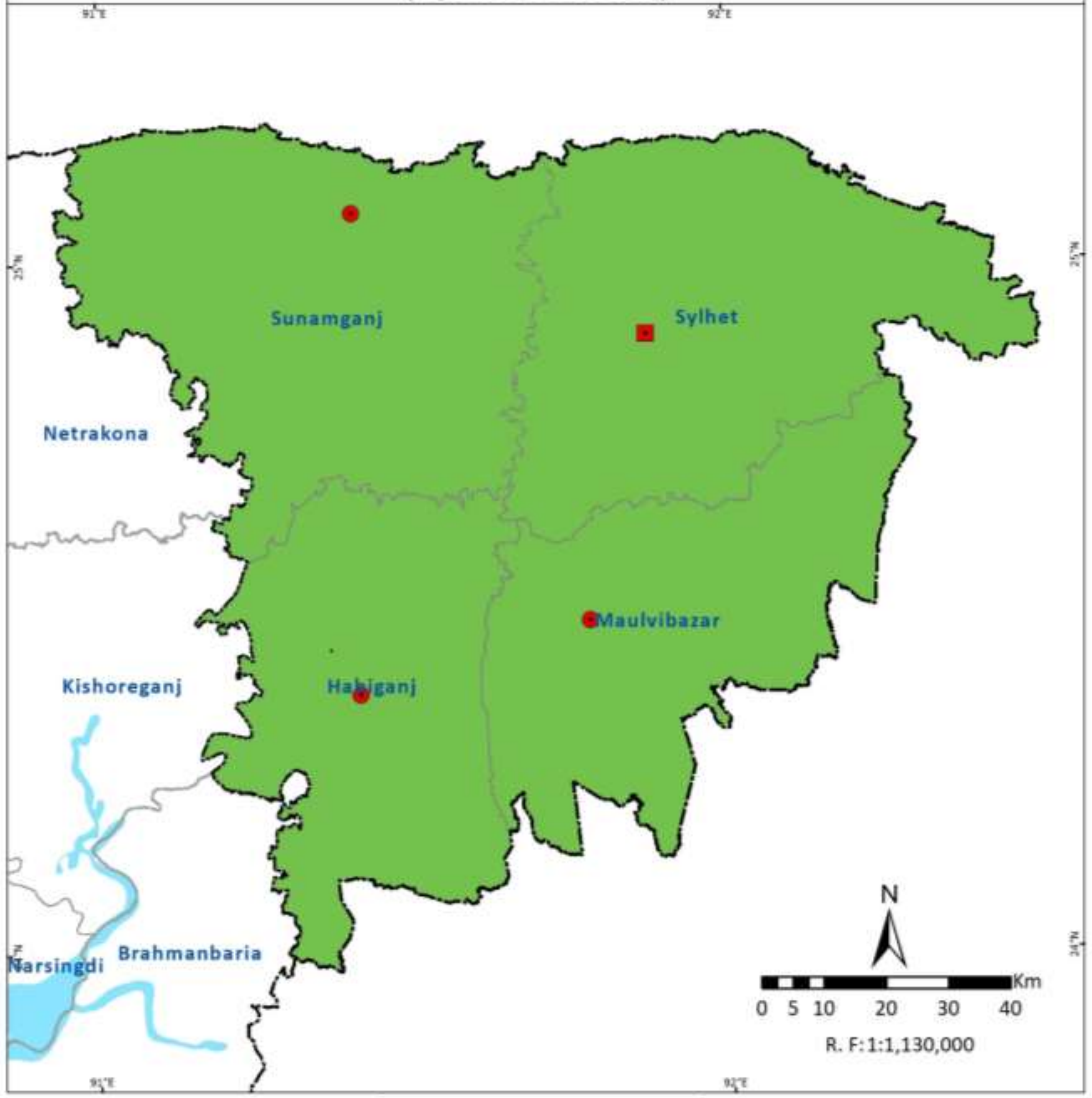
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Arsenicosis Cases Reported in 2012
(Rajshahi Division)
Number of Arsenicosis Cases Reported in 2013
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Naogaon
Bogra
Jamalpur
Chapai Nawabganj
Rajshahi
Natore
Tangail
Sirajganj
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
0 5 10 20 30 40 km
R. F:1:1,150,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Arsenicosis Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F: 1:1,130,000
Number of Arsenicosis Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Arsenicosis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2013
(Rangpur Division)

Number of Arsenicosis Cases Reported in 2011
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2011 and 2013 at district level was used.

Data Source: DGHS.

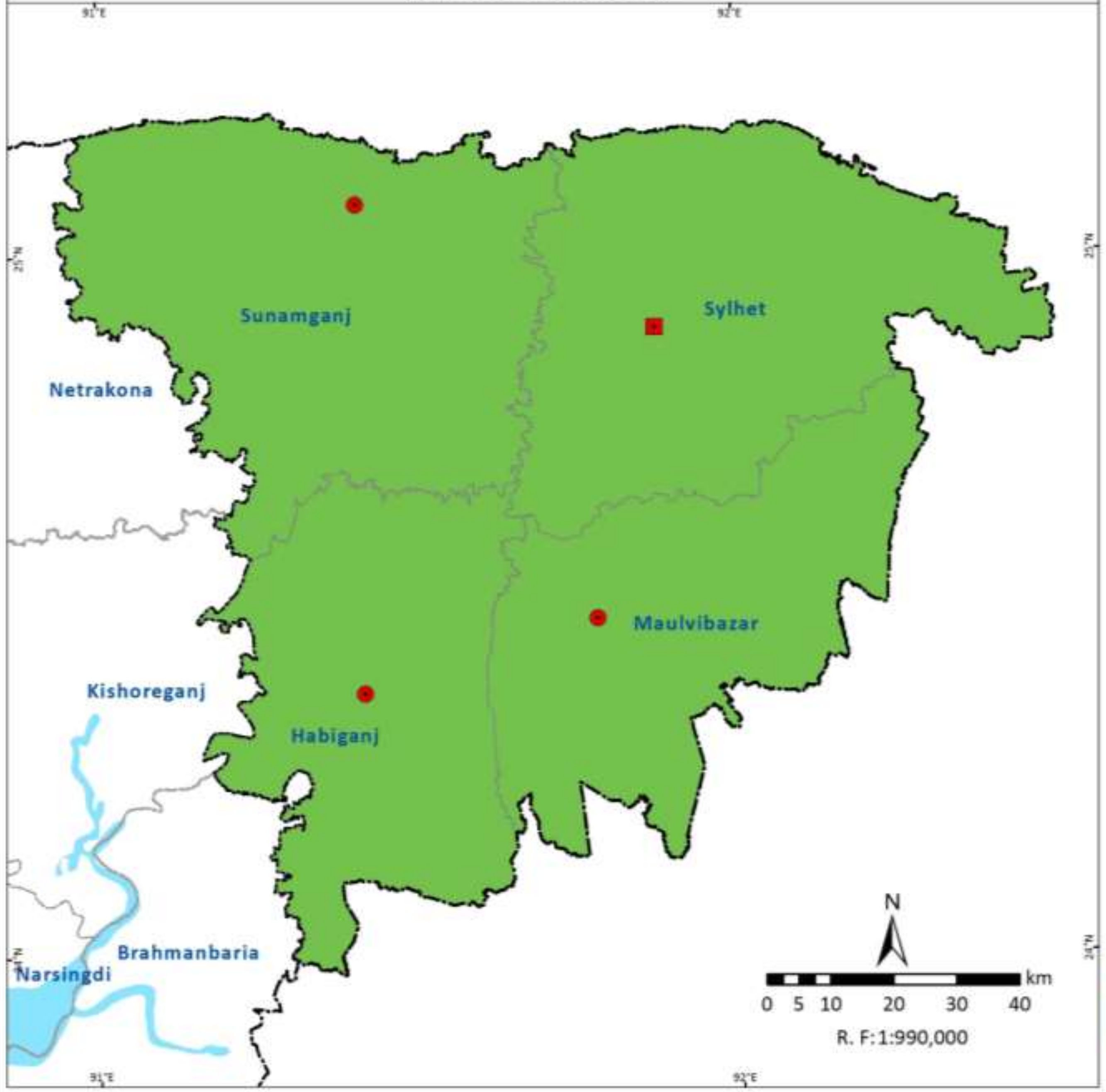
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

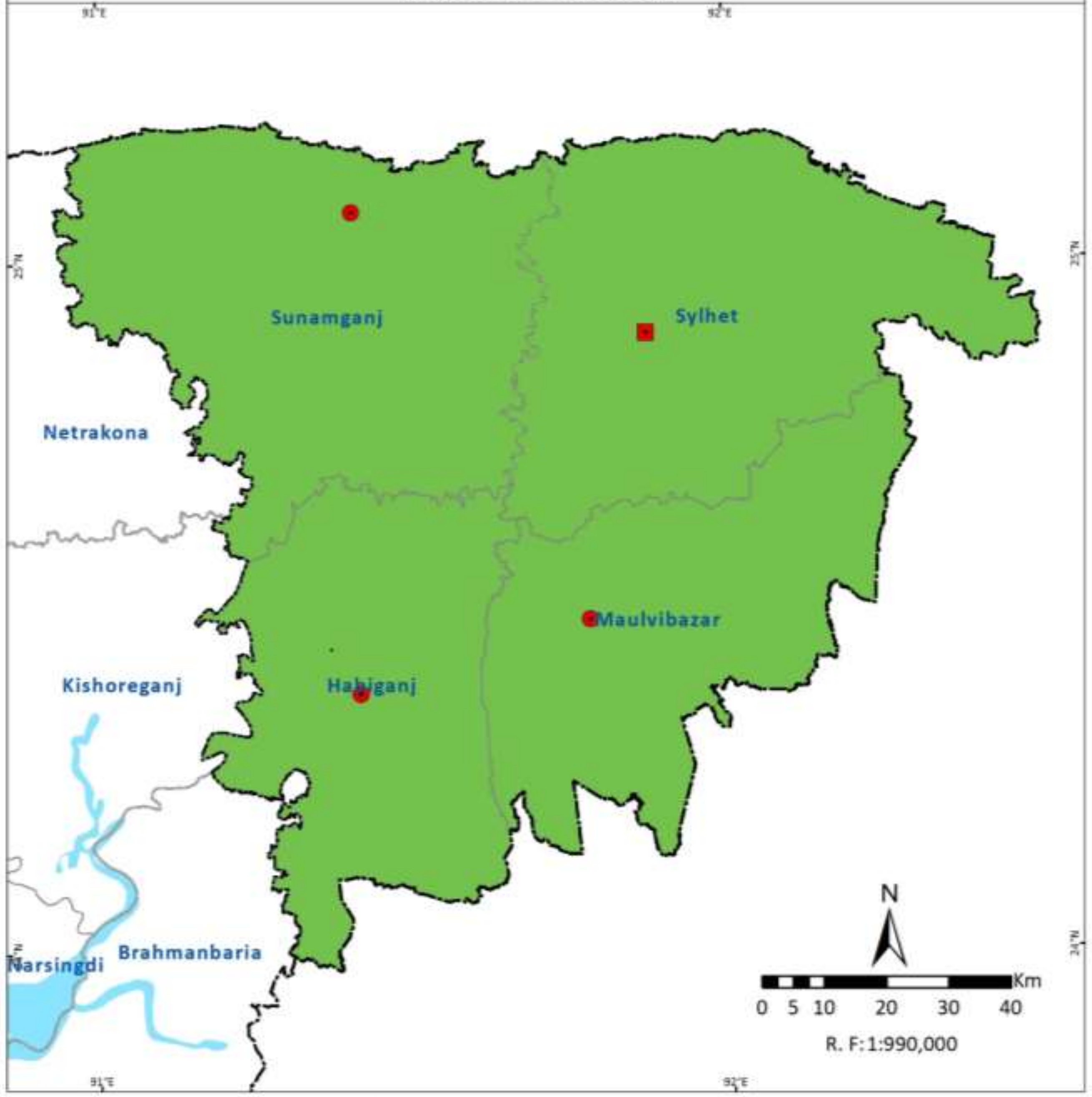
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Arsenicosis Cases Reported in 2012 (Sylhet Division)



Number of Arsenicosis Cases Reported in 2013 (Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Arsenicosis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Arsenicosis during 2012 and 2013 at district level was used.

Data Source: DGHS.

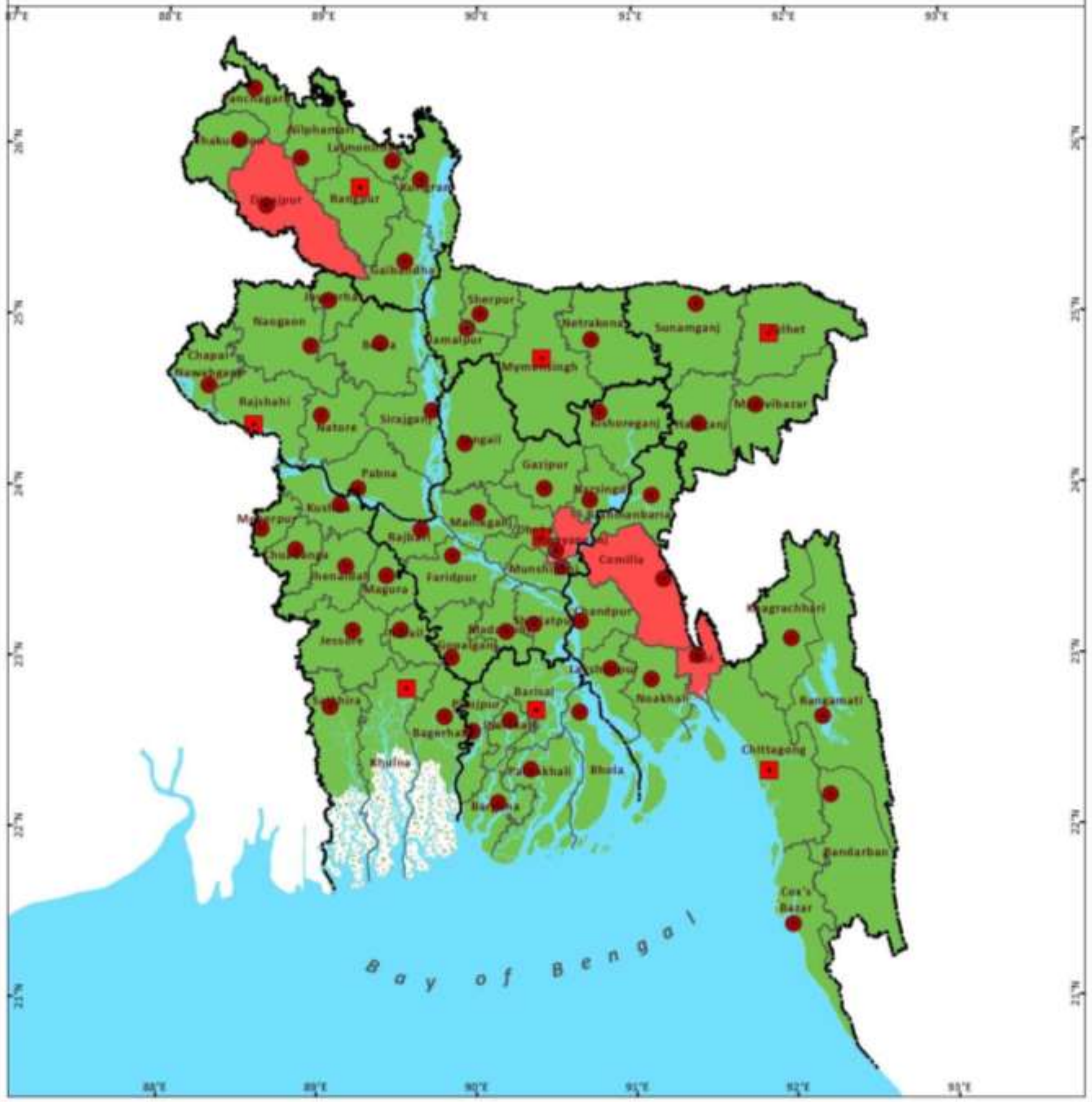
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

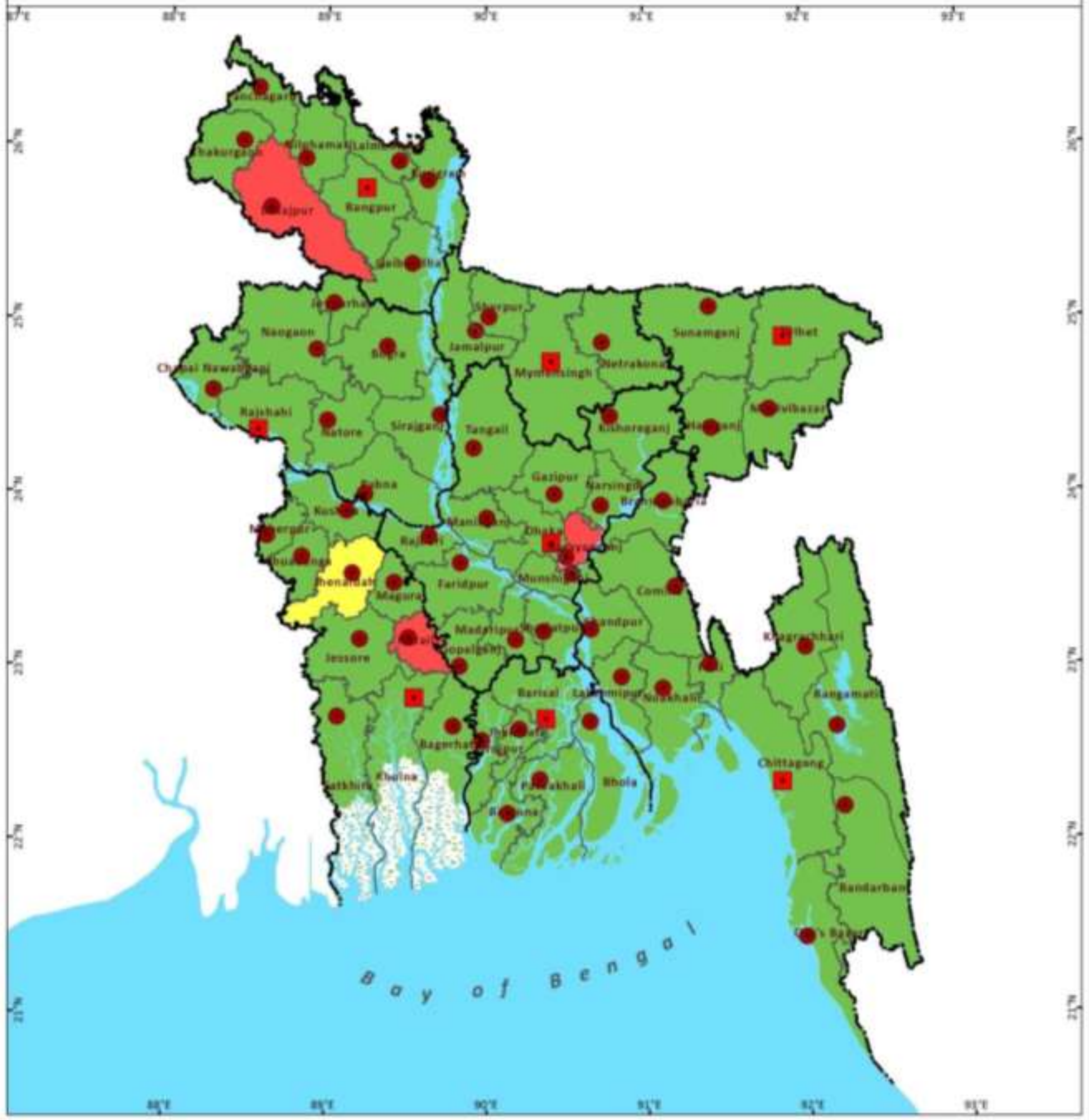
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported at District Level in 2011



Number of Dengue Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

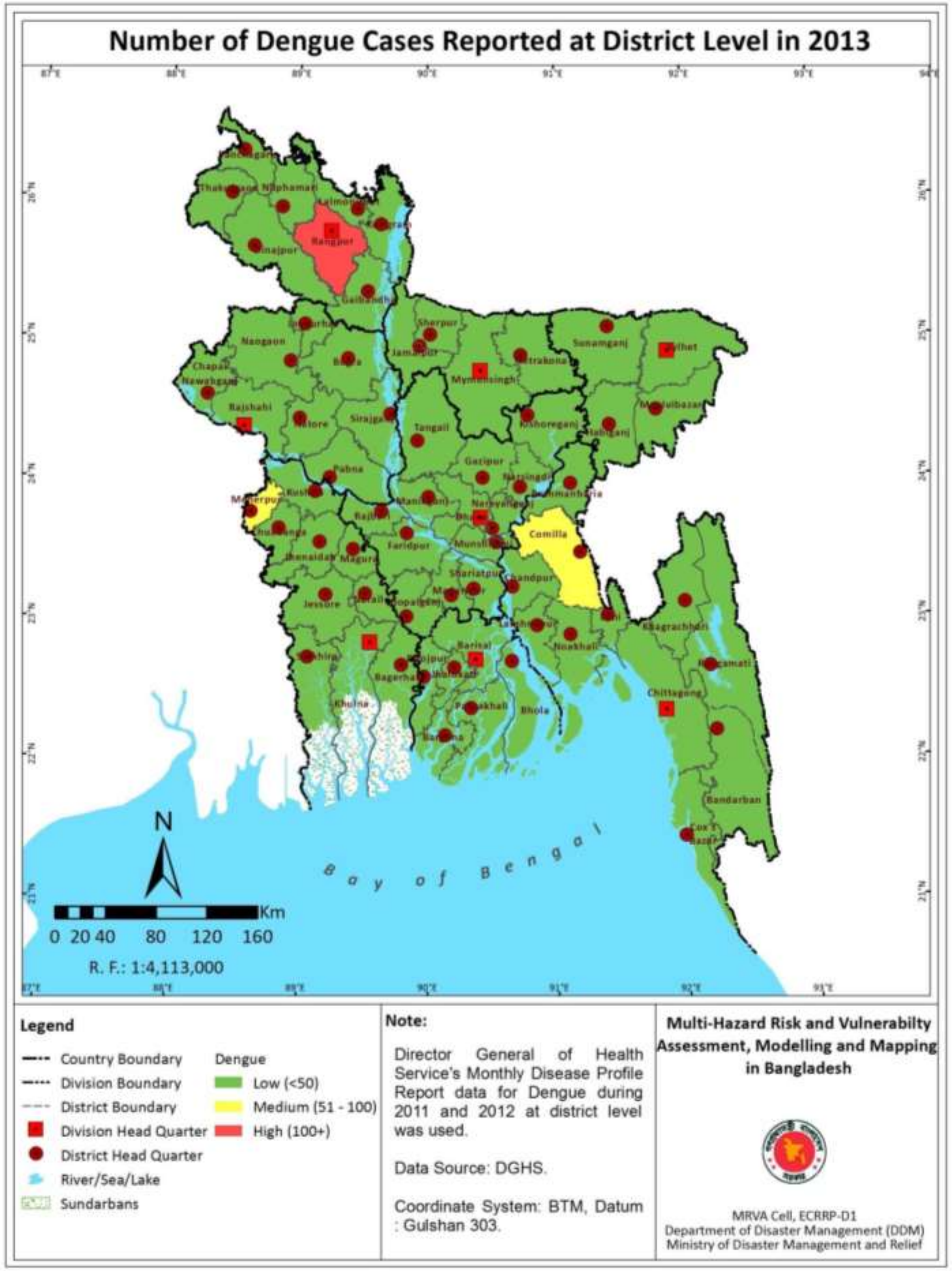
N

0 25 50 100 150 200 Km

R. F.: 1:4,000,000

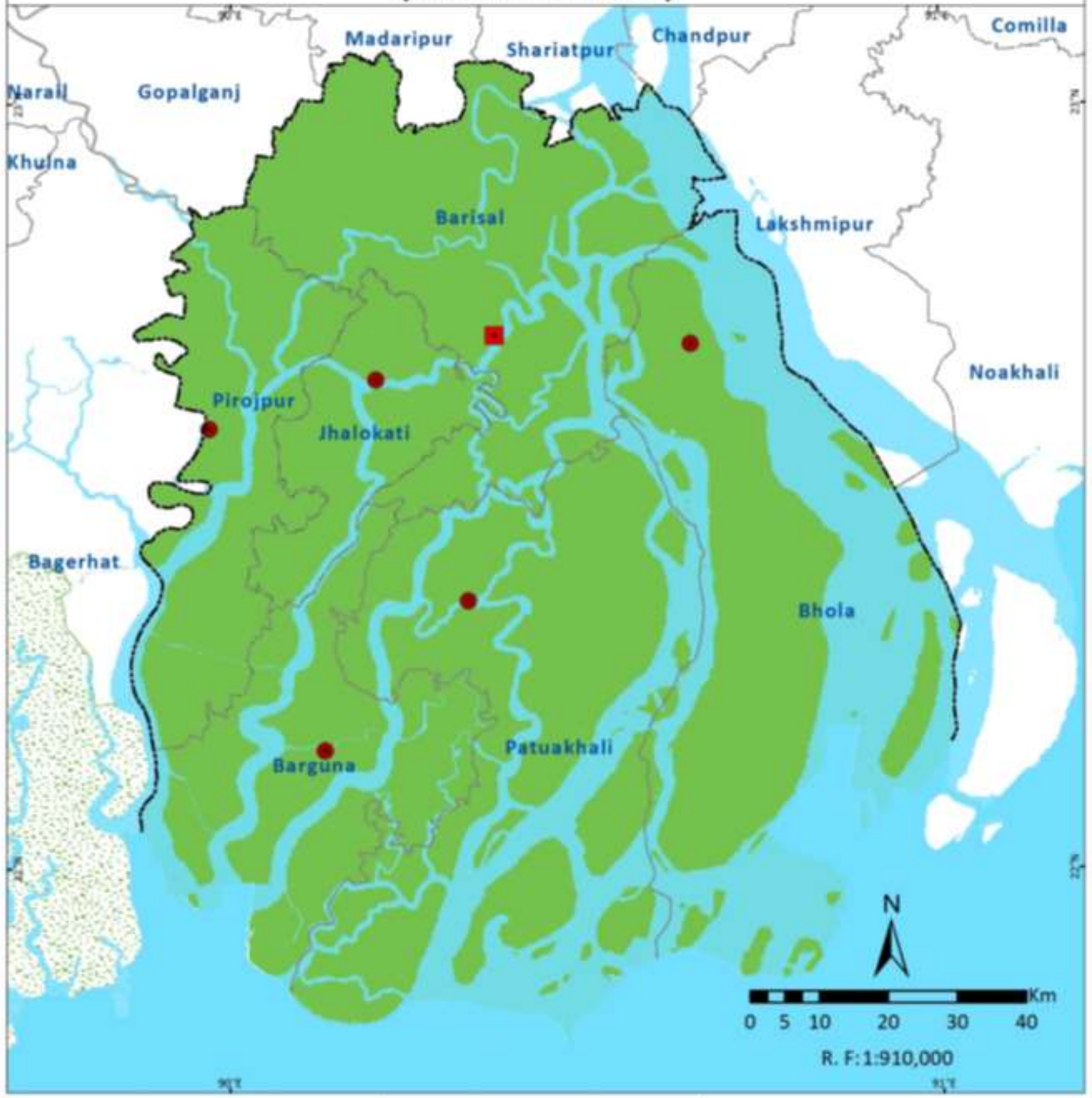
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Dengue Cases Reported at District Level in 2013
Bay of Bengal
N
Km
0 20 40 80 120 160
R. F.: 1:4,113,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2011
(Barisal Division)

Number of Dengue Cases Reported in 2012
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.

Data Source: DGHS.

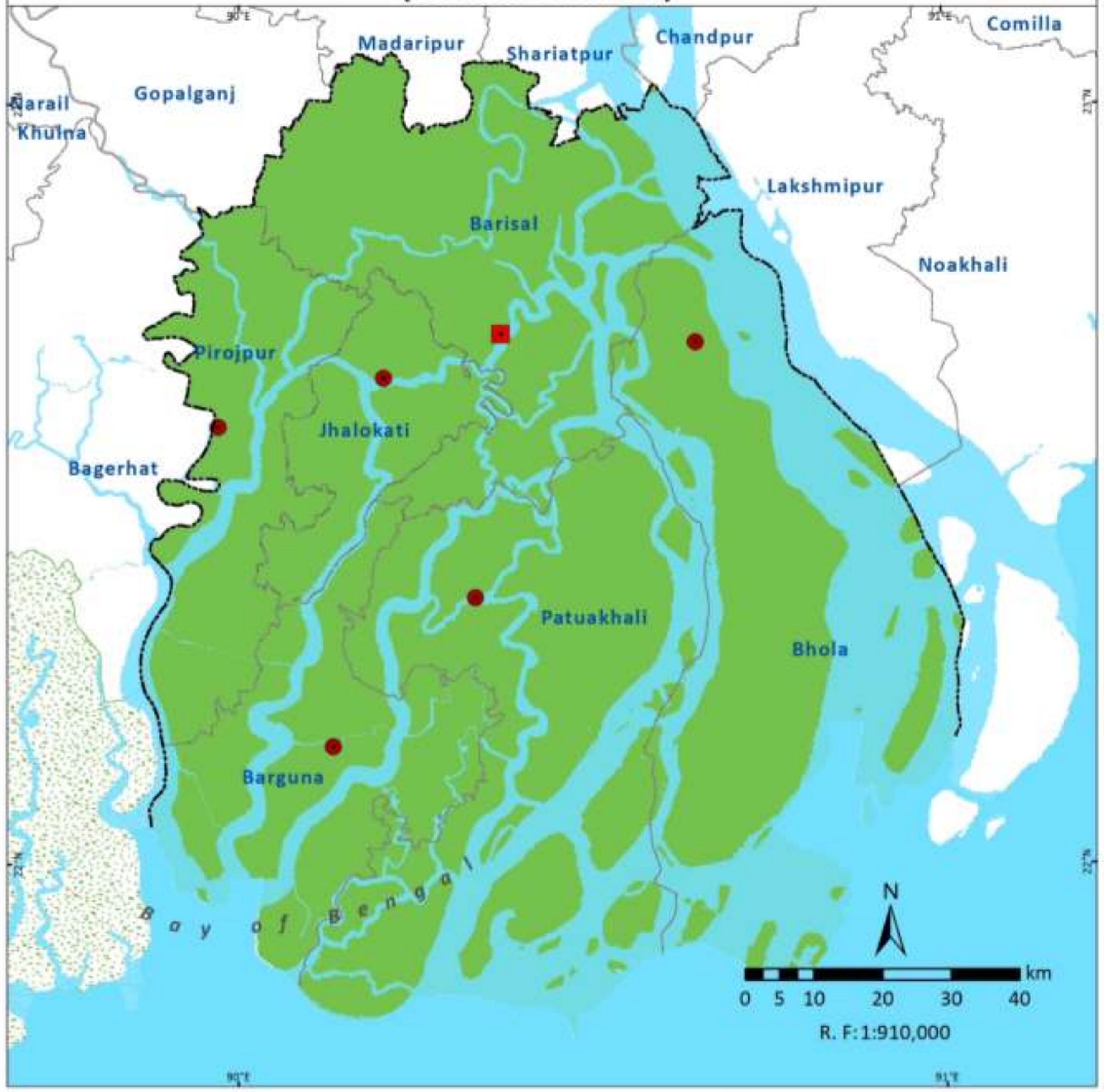
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

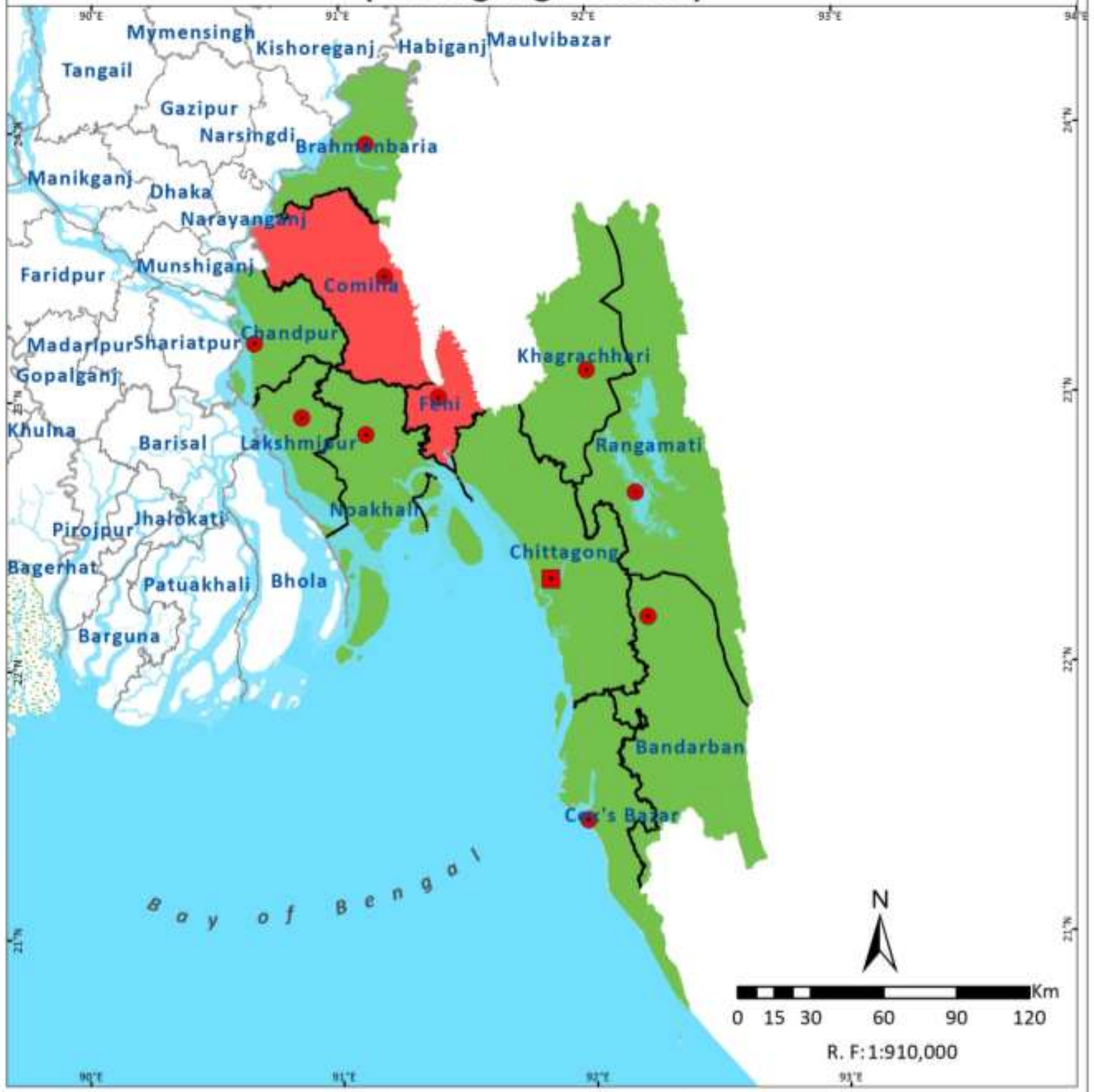
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2013
(Barisal Division)



Number of Dengue Cases Reported in 2011
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2013 at district level was used.

Data Source: DGHS.

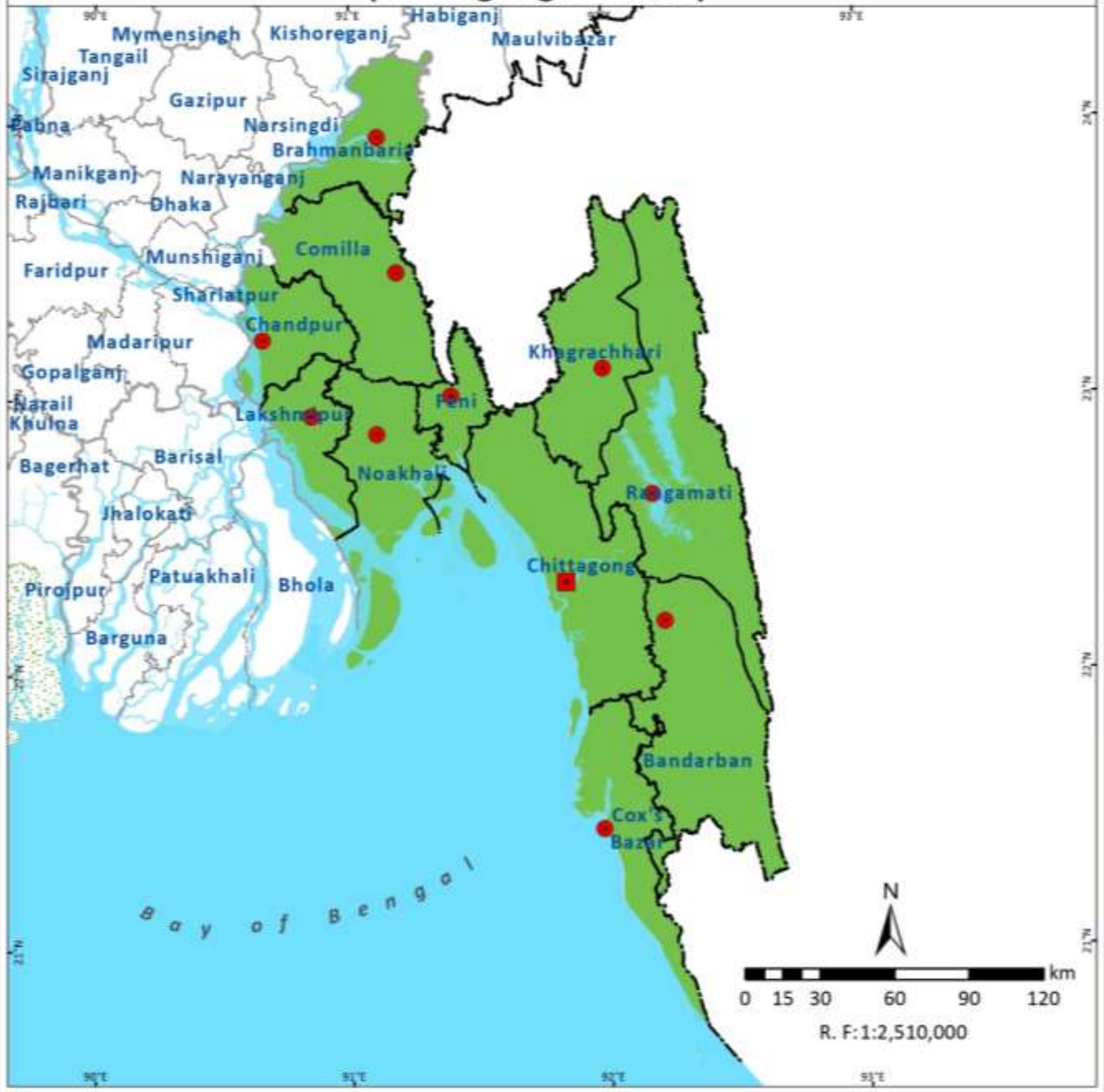
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

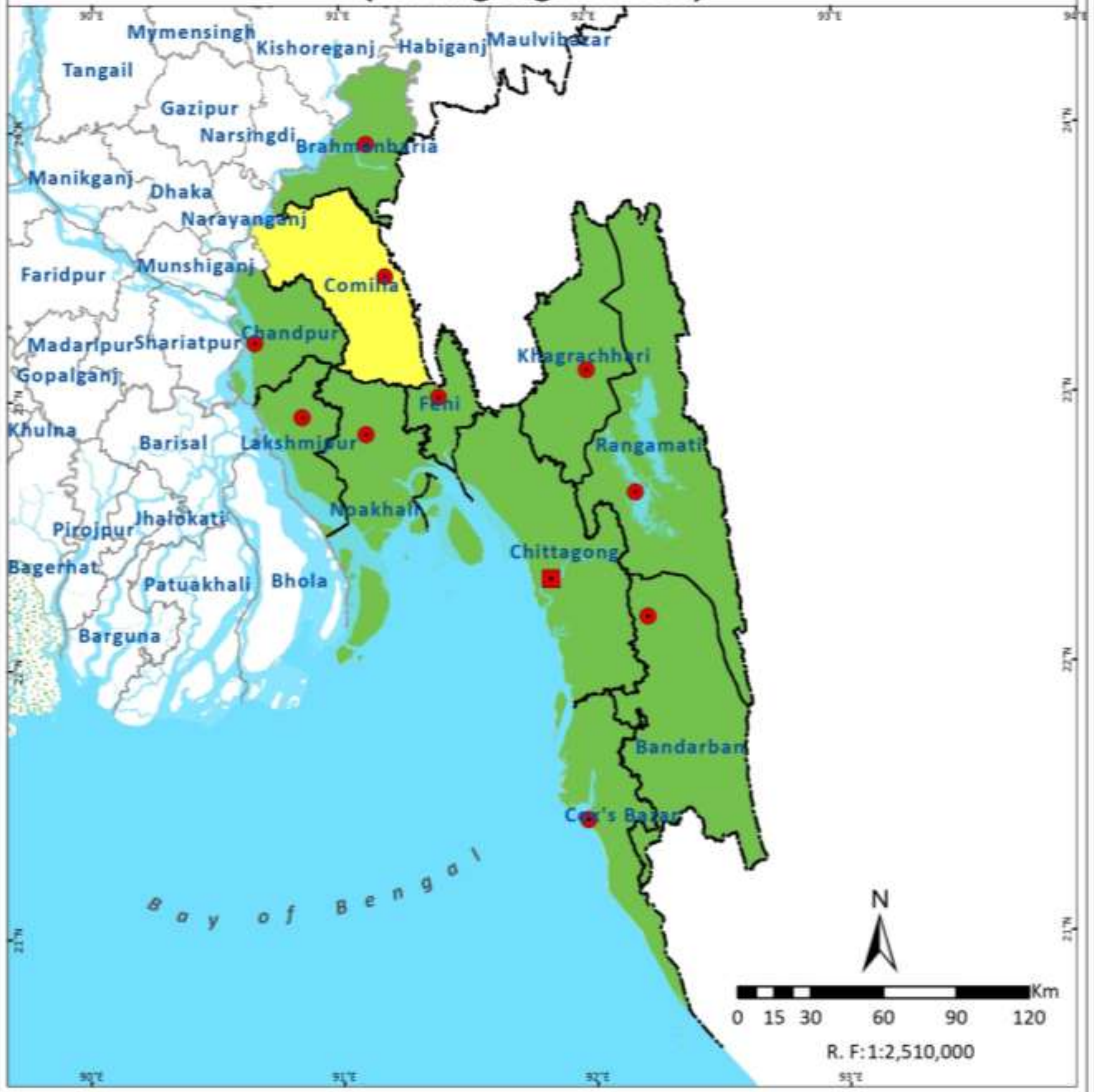
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2012 (Chittagong Division)



Number of Dengue Cases Reported in 2013 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2012 and 2013 at district level was used.

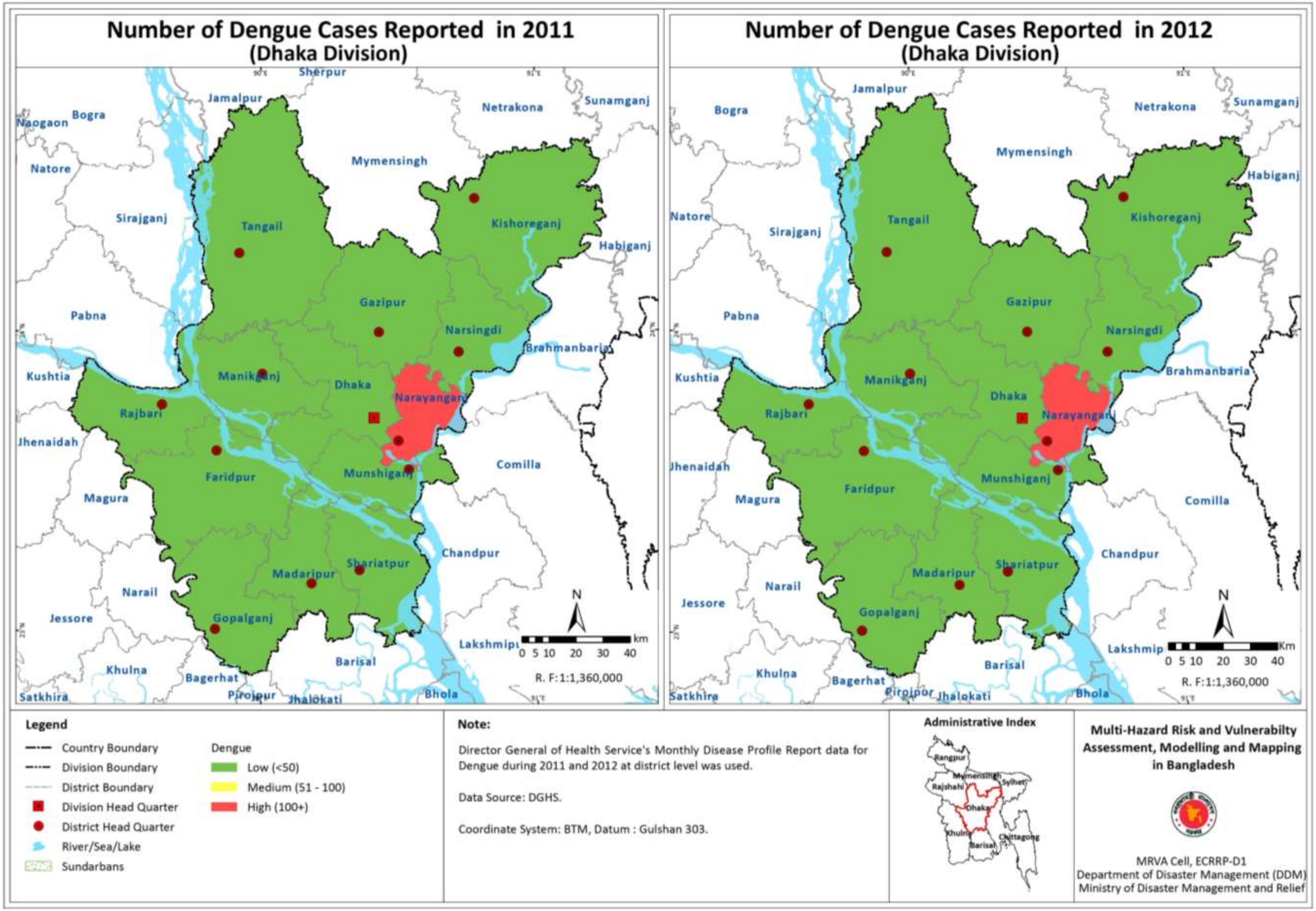
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

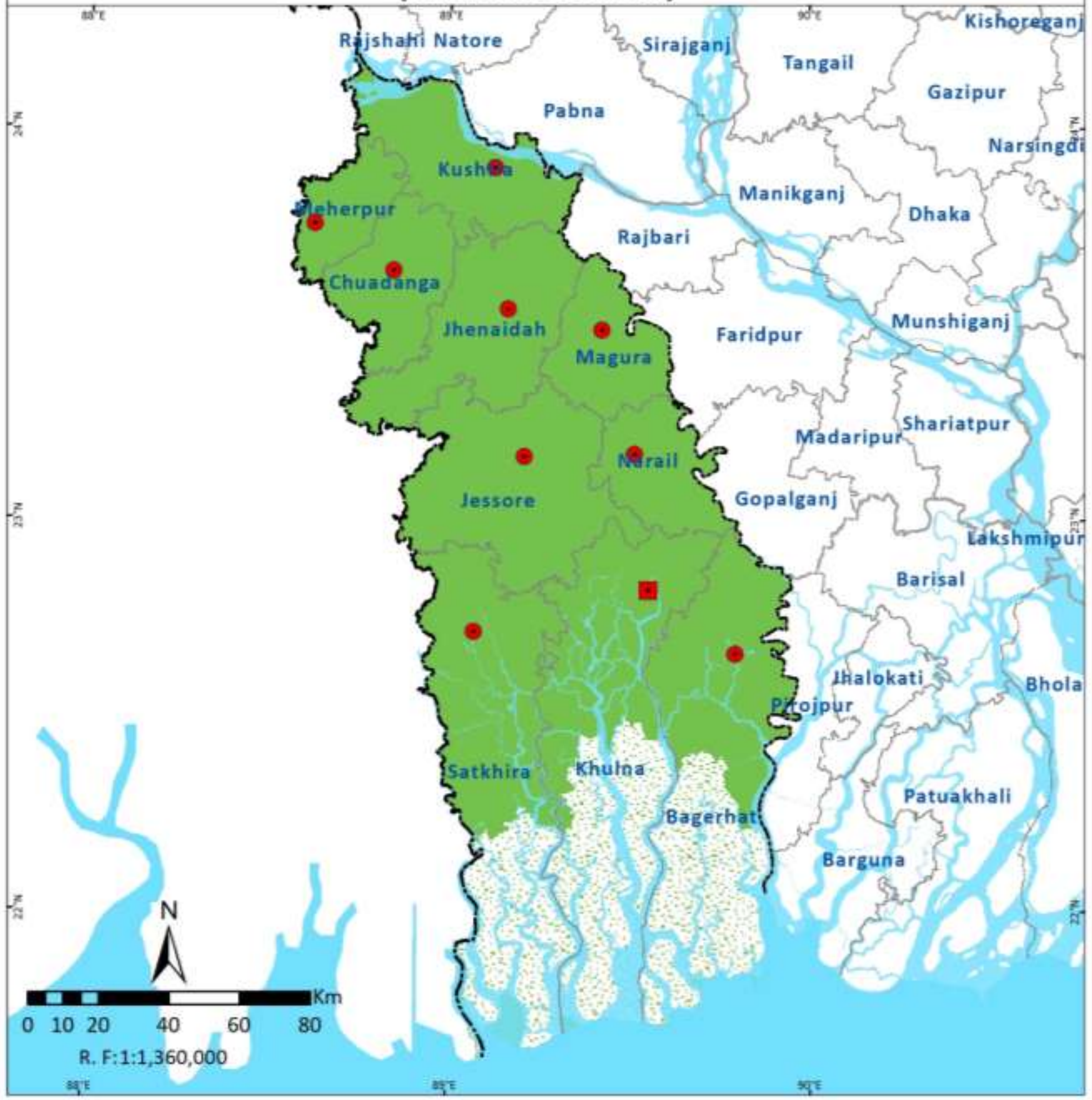
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Dengue Cases Reported in 2011
(Dhaka Division)
Number of Dengue Cases Reported in 2012
(Dhaka Division)
Jamalpur
Sherpur
Netrakona
Sunamganj
Bogra
Naogaon
Natore
Mymensingh
Habiganj
Sirajganj
Tangail
Kishoreganj
Pabna
Gazipur
Narsingdi
Brahmanbaria
Kushtia
Manikganj
Dhaka
Narayanganj
Rajbari
Jhenaidah
Faridpur
Munshiganj
Comilla
Magura
Chandpur
Shariatpur
Madaripur
Narail
Jessore
Gopalganj
Lakshmipur
Khulna
Barisal
Bagerhat
Satkhira
Pirojpur
Jhalokati
Bhola
0 5 10 20 30 40 km
R. F:1:1,360,000
N
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2013
(Dhaka Division)

Number of Dengue Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2013 at district level was used.

Data Source: DGHS.

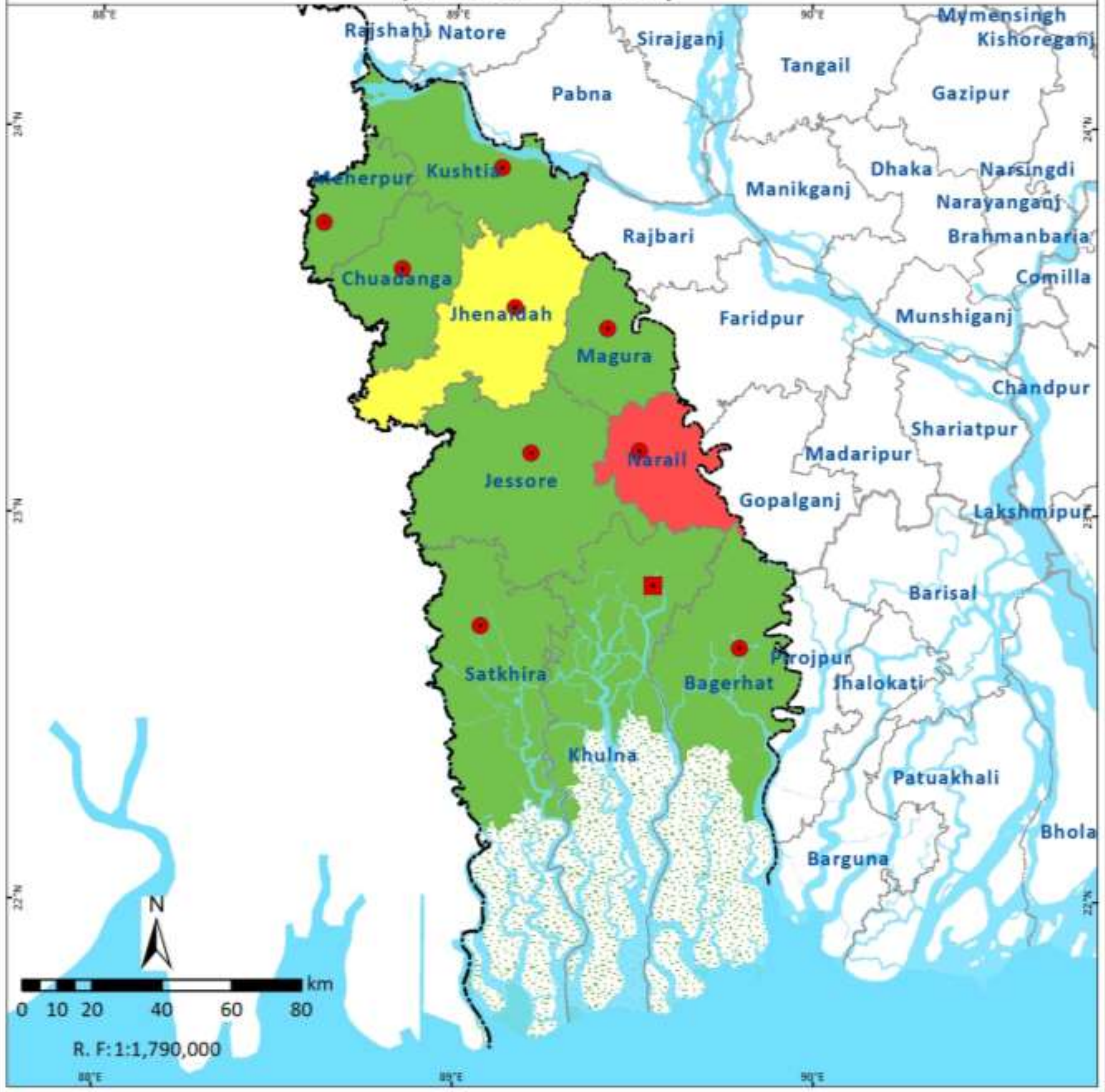
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

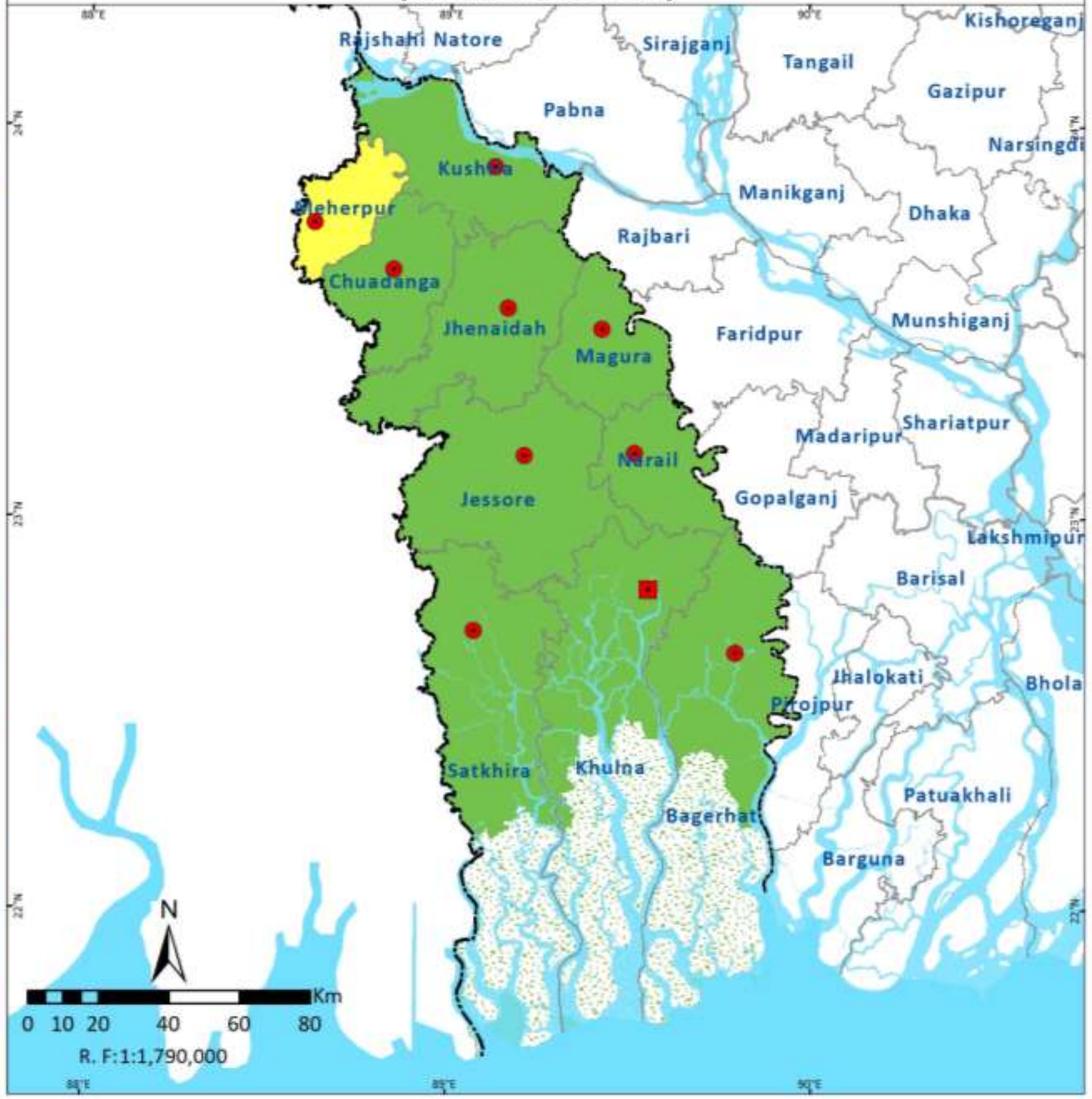
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2012 (Khulna Division)



Number of Dengue Cases Reported in 2013 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2012 and 2013 at district level was used.

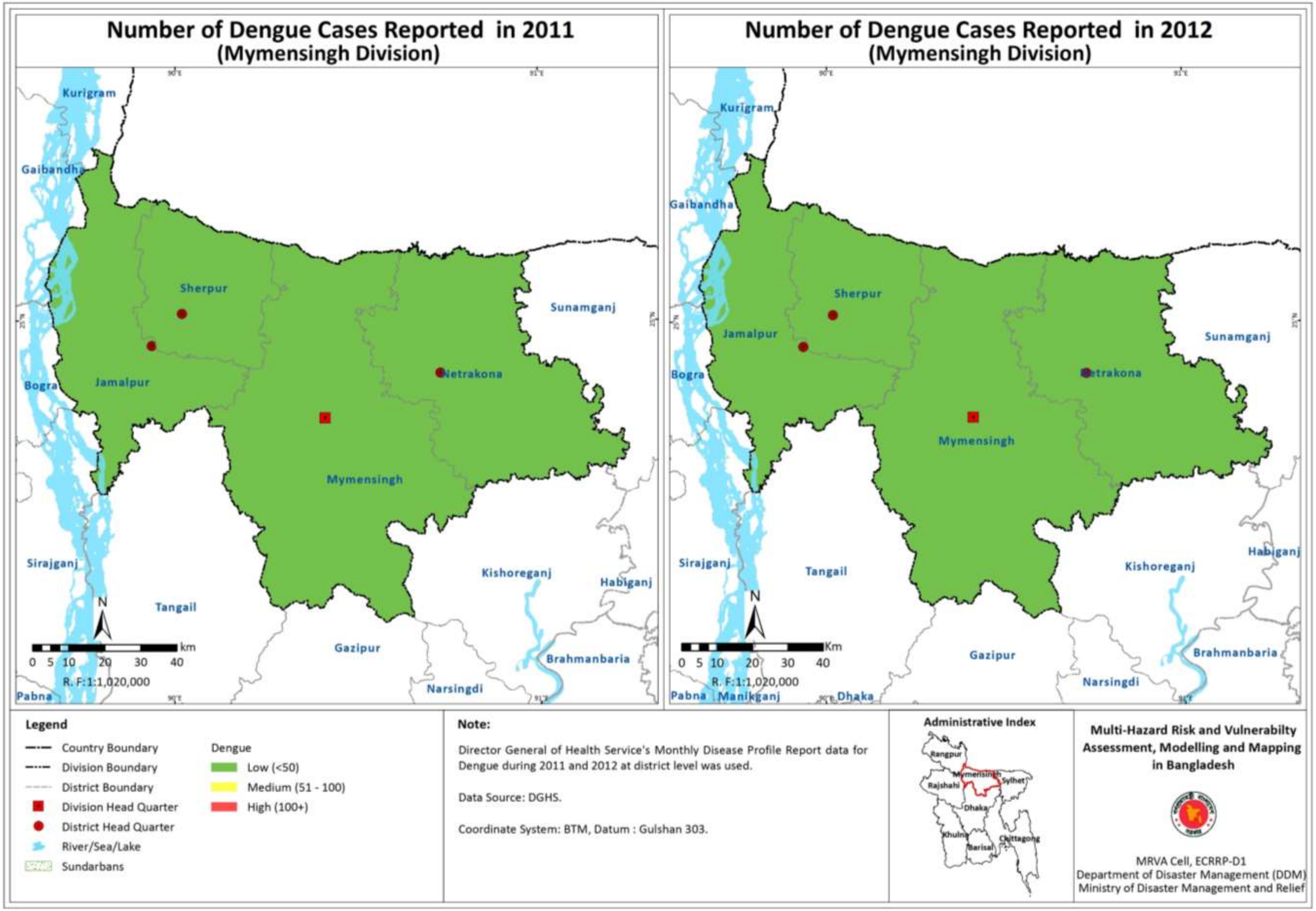
Data Source: DGHS.

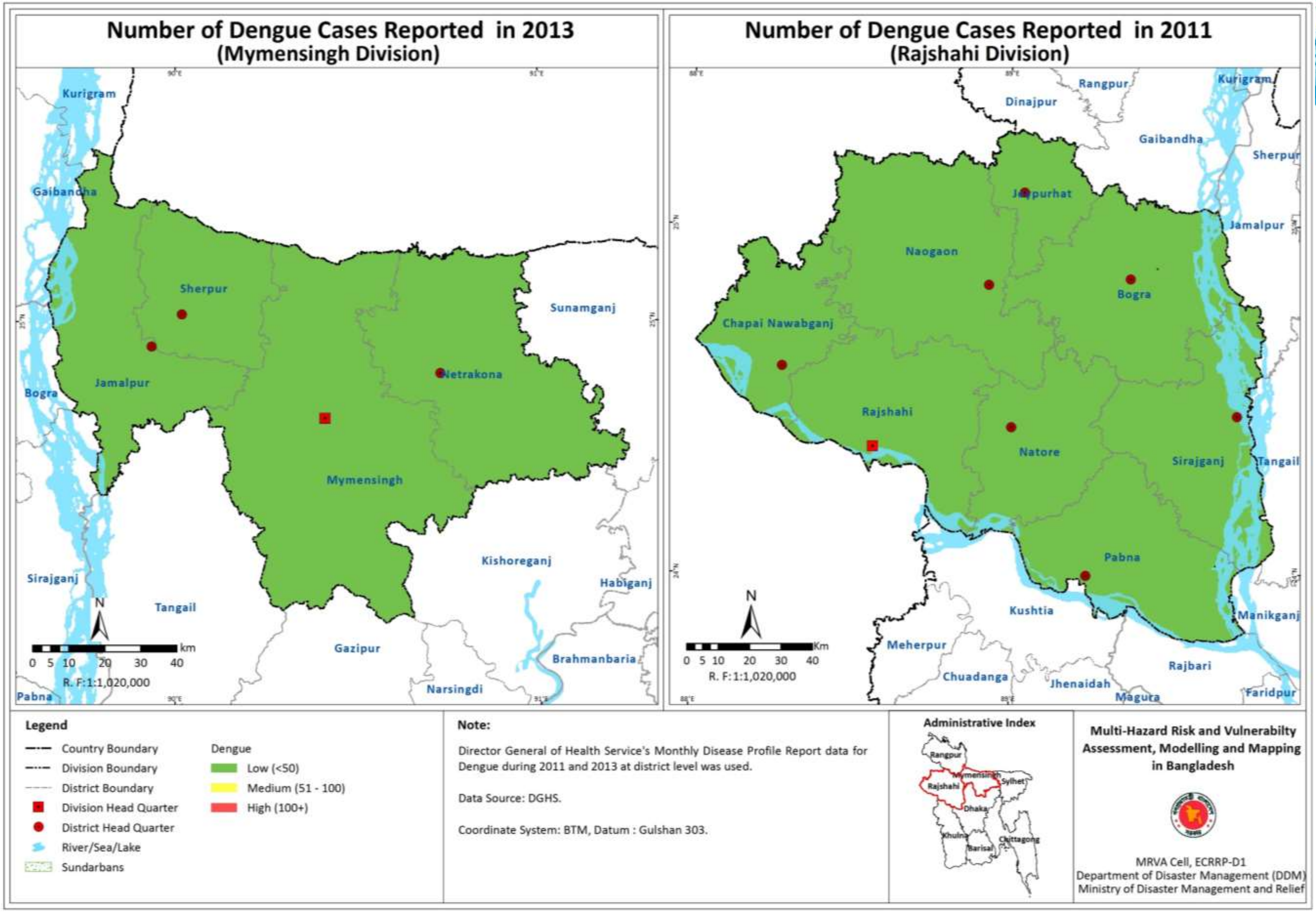
Coordinate System: BTM, Datum : Gulshan 303.

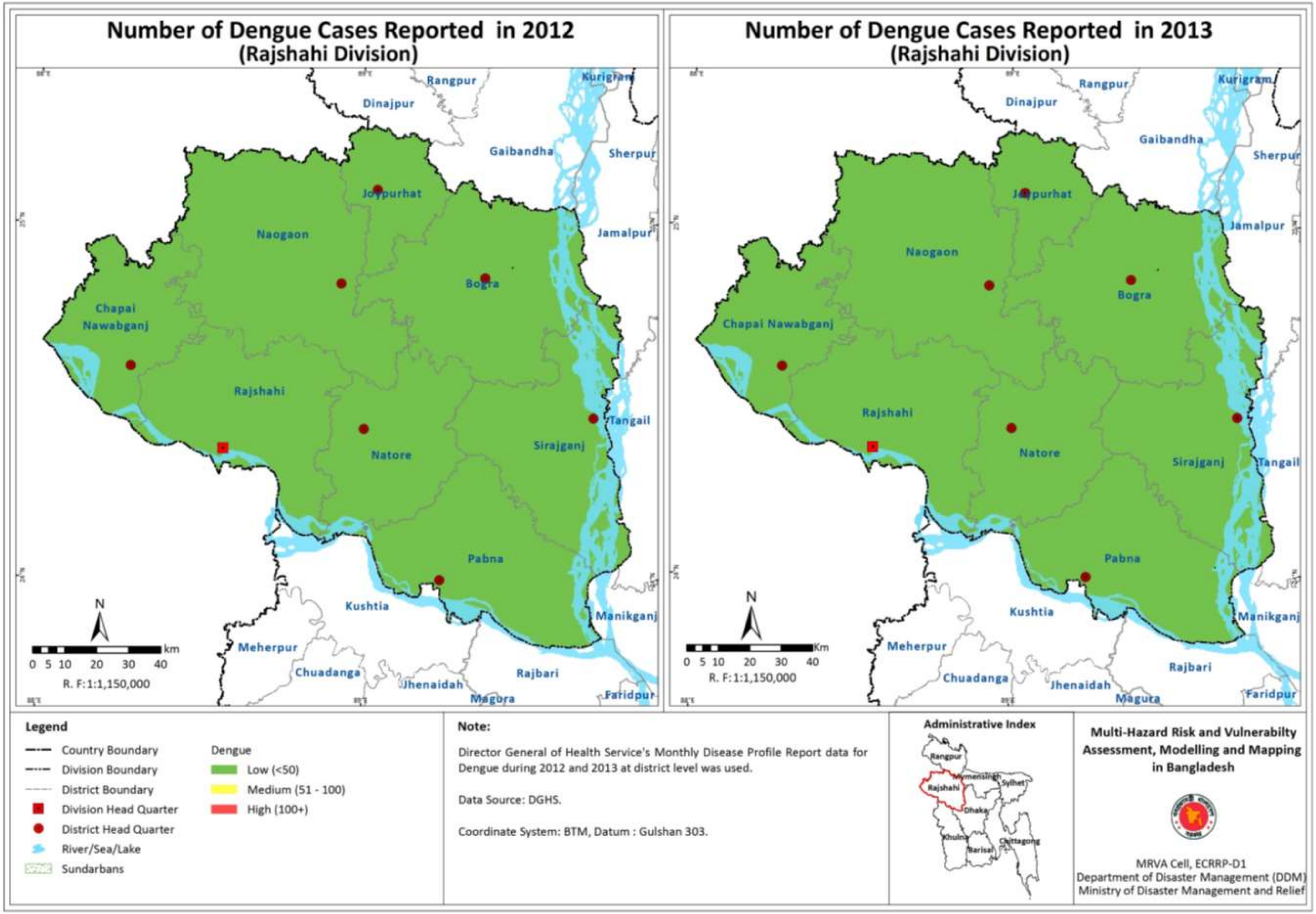
Administrative Index

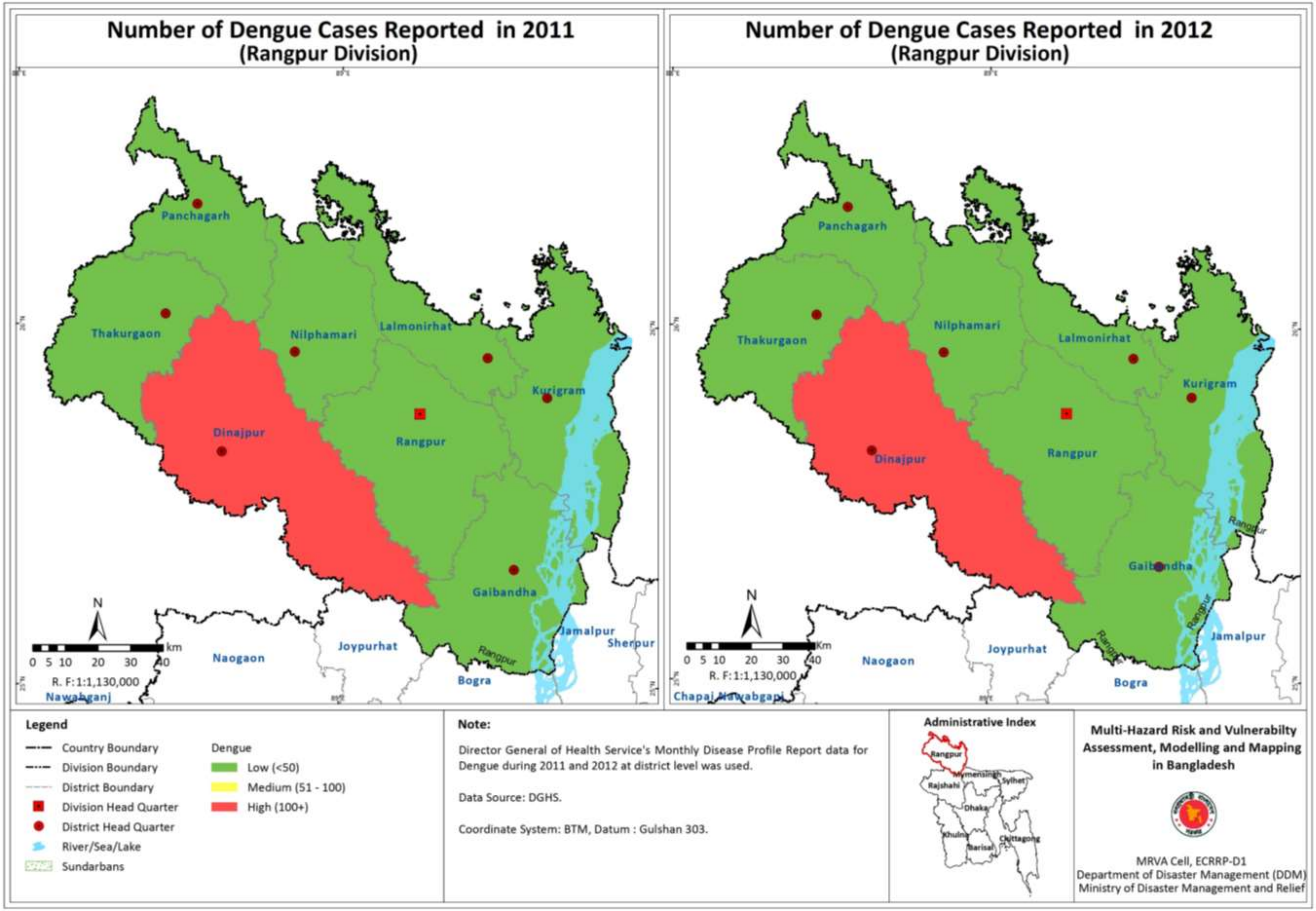
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

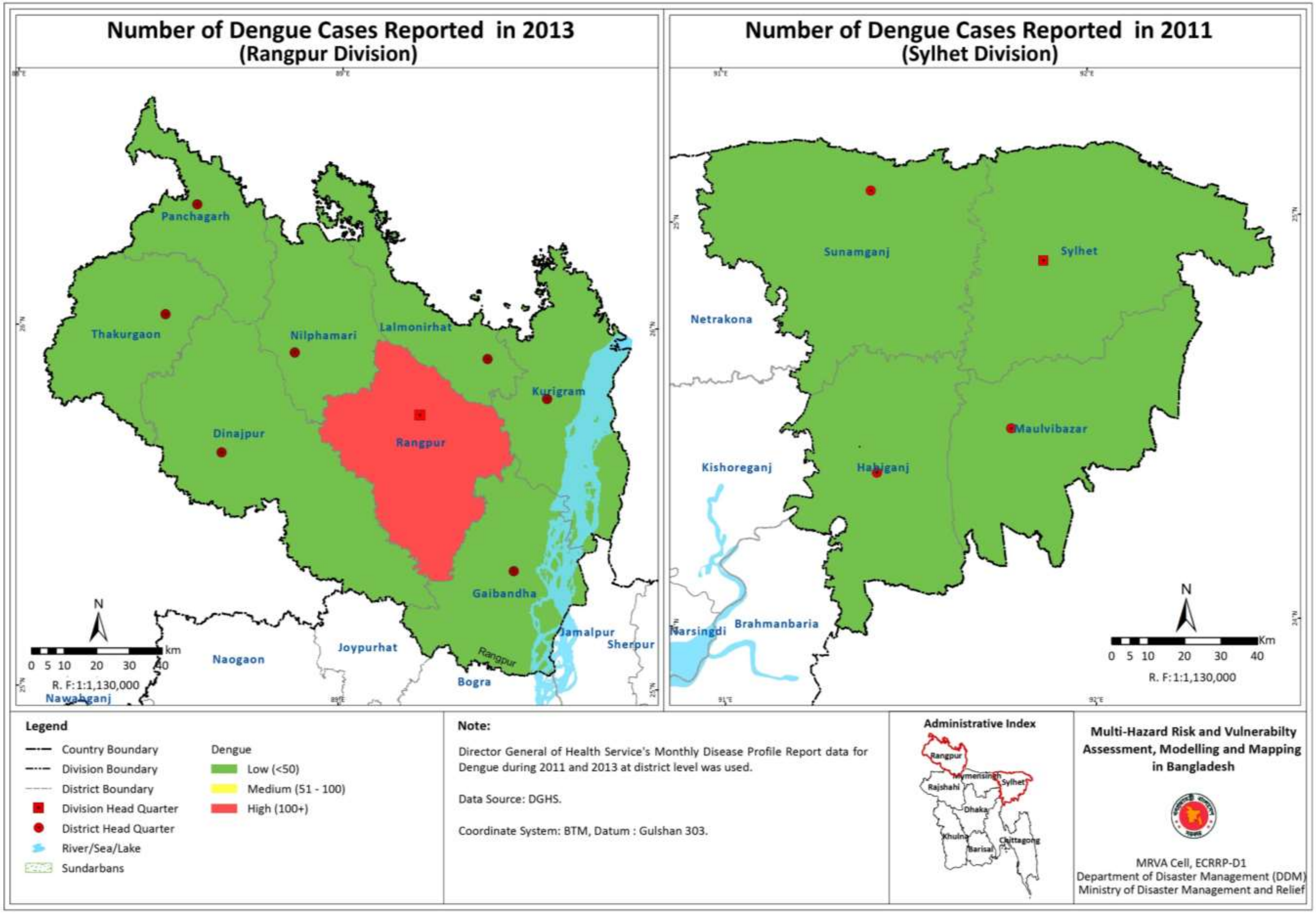
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Dengue Cases Reported in 2011
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Sunamganj
Jamalpur
Netrakona
Bogra
Mymensingh
Sirajganj
Kishoreganj
Habiganj
Tangail
Gazipur
Brahmanbaria
Narsingdi
Pabna
0 5 10 20 30 40 km
R. F:1:1,020,000
Number of Dengue Cases Reported in 2012
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Sunamganj
Bogra
Netrakona
Mymensingh
Sirajganj
Tangail
Kishoreganj
Habiganj
Gazipur
Brahmanbaria
Narsingdi
Pabna
Manikganj
Dhaka
0 5 10 20 30 40 Km
R. F:1:1,020,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

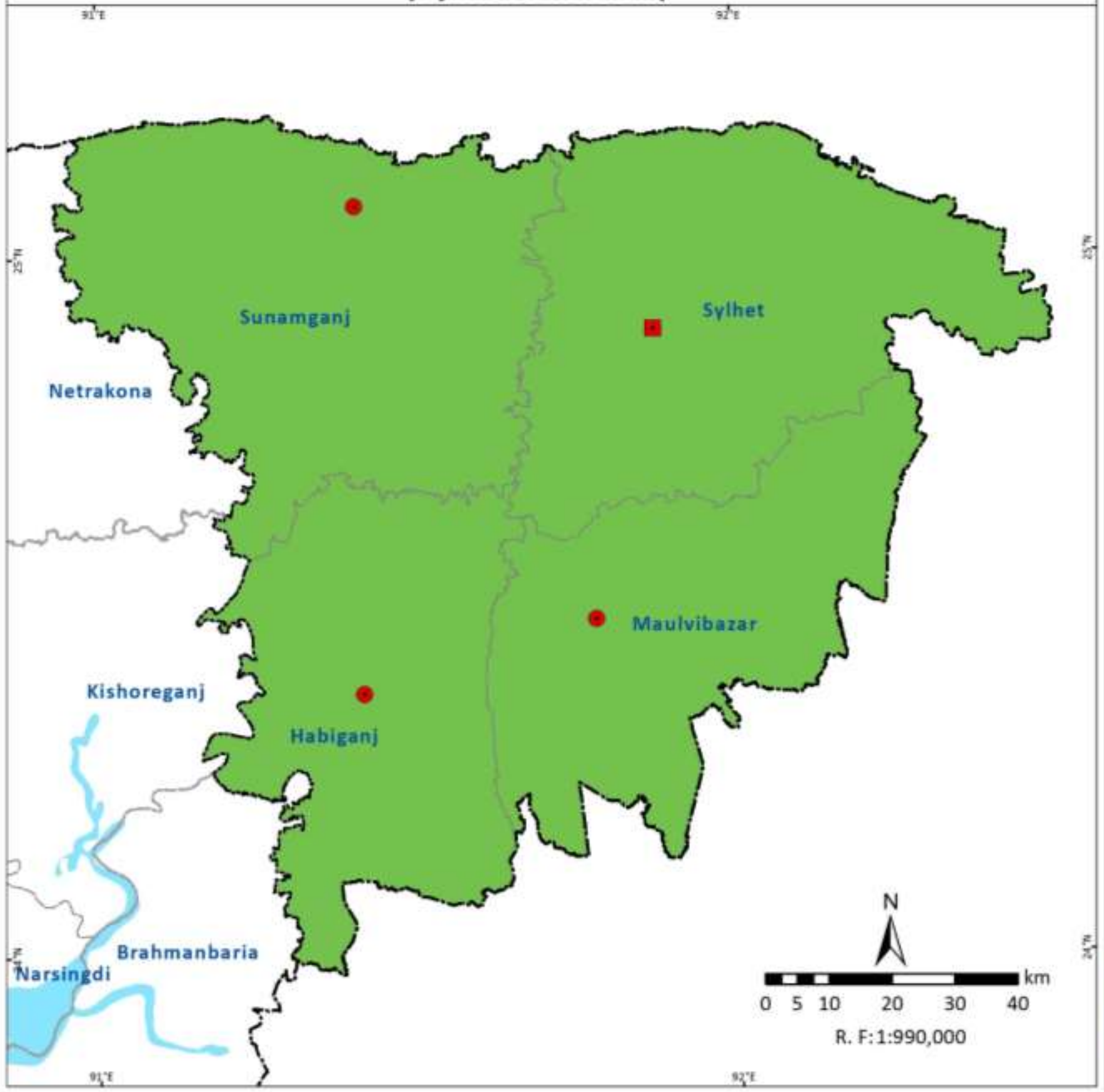

Number of Dengue Cases Reported in 2013
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Bogra
Netrakona
Sunamganj
Mymensingh
Kishoreganj
Habiganj
Sirajganj
Tangail
Gazipur
Brahmanbaria
Narsingdi
Pabna
0 5 10 20 30 40 km
R. F:1:1,020,000
Number of Dengue Cases Reported in 2011
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Jamalpur
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Magura
Rajbari
Faridpur
0 5 10 20 30 40 Km
R. F:1:1,020,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Dengue Cases Reported in 2012
(Rajshahi Division)
Number of Dengue Cases Reported in 2013
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Jamalpur
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
0 5 10 20 30 40 km
R. F:1:1,150,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

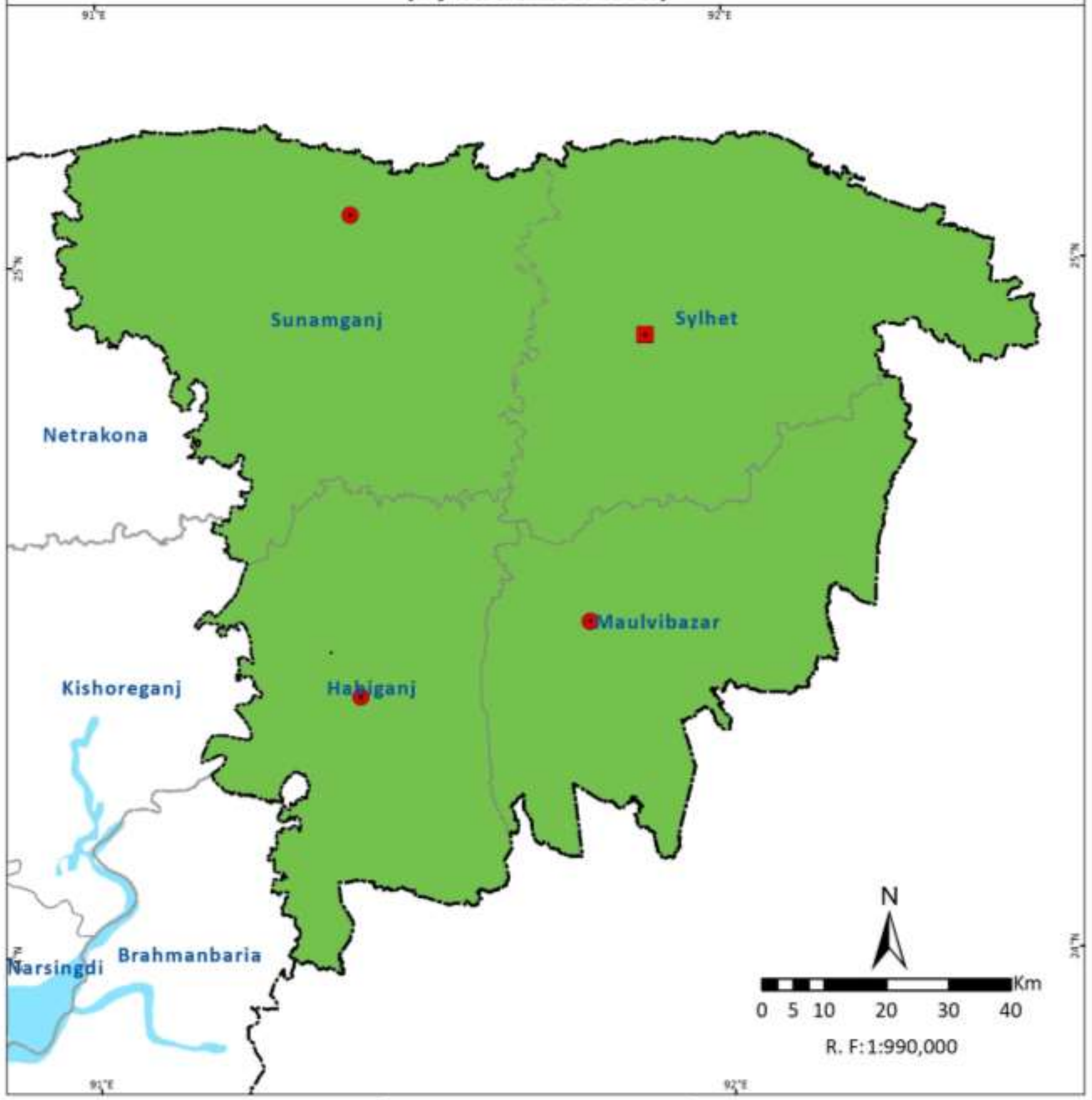

Number of Dengue Cases Reported in 2011
(Rangpur Division)
Number of Dengue Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
Chapai Nawabganj
N
km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Dengue Cases Reported in 2013
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Naogaon
Joypurhat
Bogra
Jamalpur
Sherpur
Nawabganj
N
km
0 5 10 20 30 40
R. F: 1:1,130,000
Number of Dengue Cases Reported in 2011
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Narsingdi
Brahmanbaria
N
Km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Dengue
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Dengue Cases Reported in 2012
(Sylhet Division)



Number of Dengue Cases Reported in 2013
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Dengue

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Dengue during 2012 and 2013 at district level was used.

Data Source: DGHS.

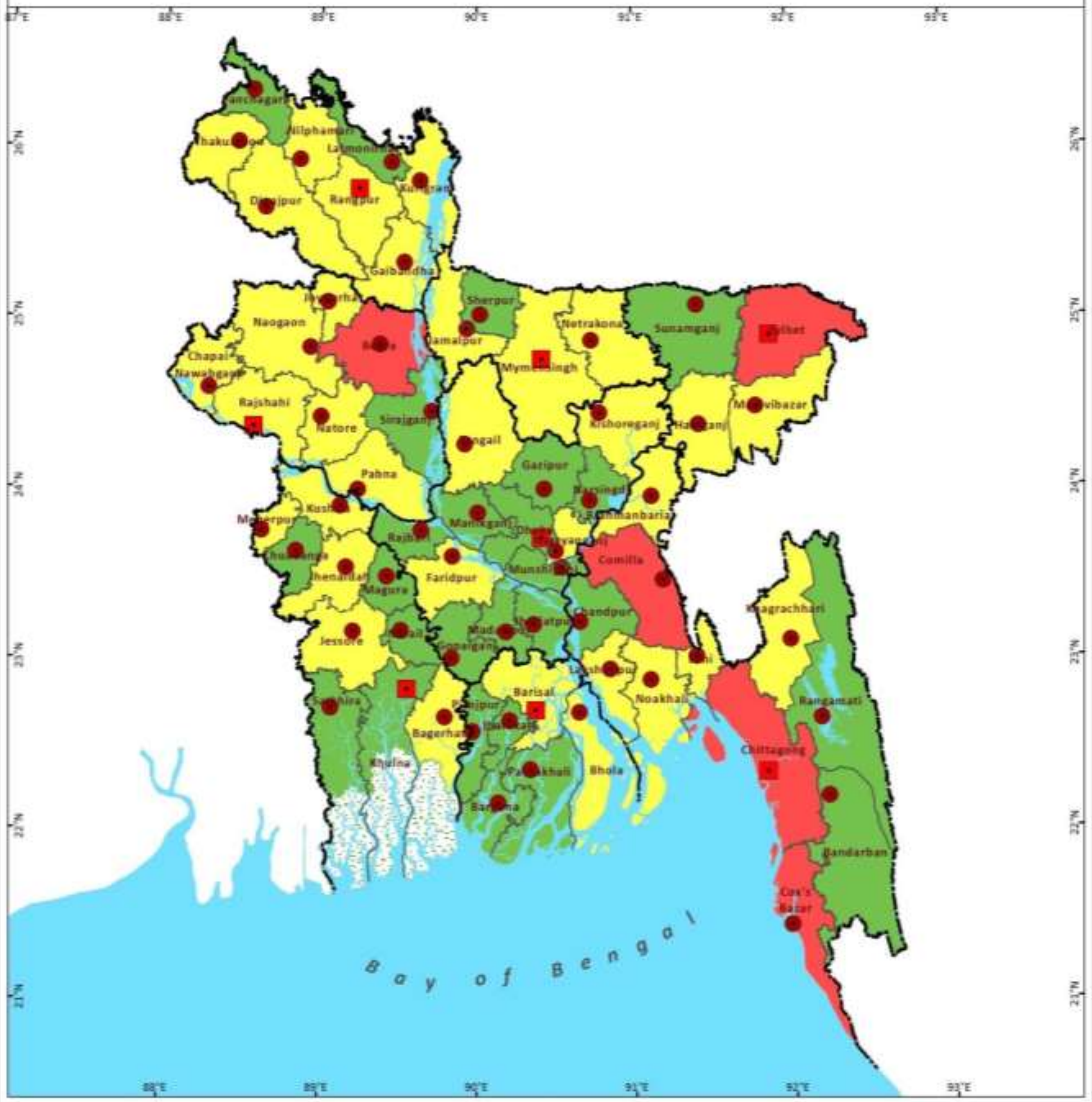
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

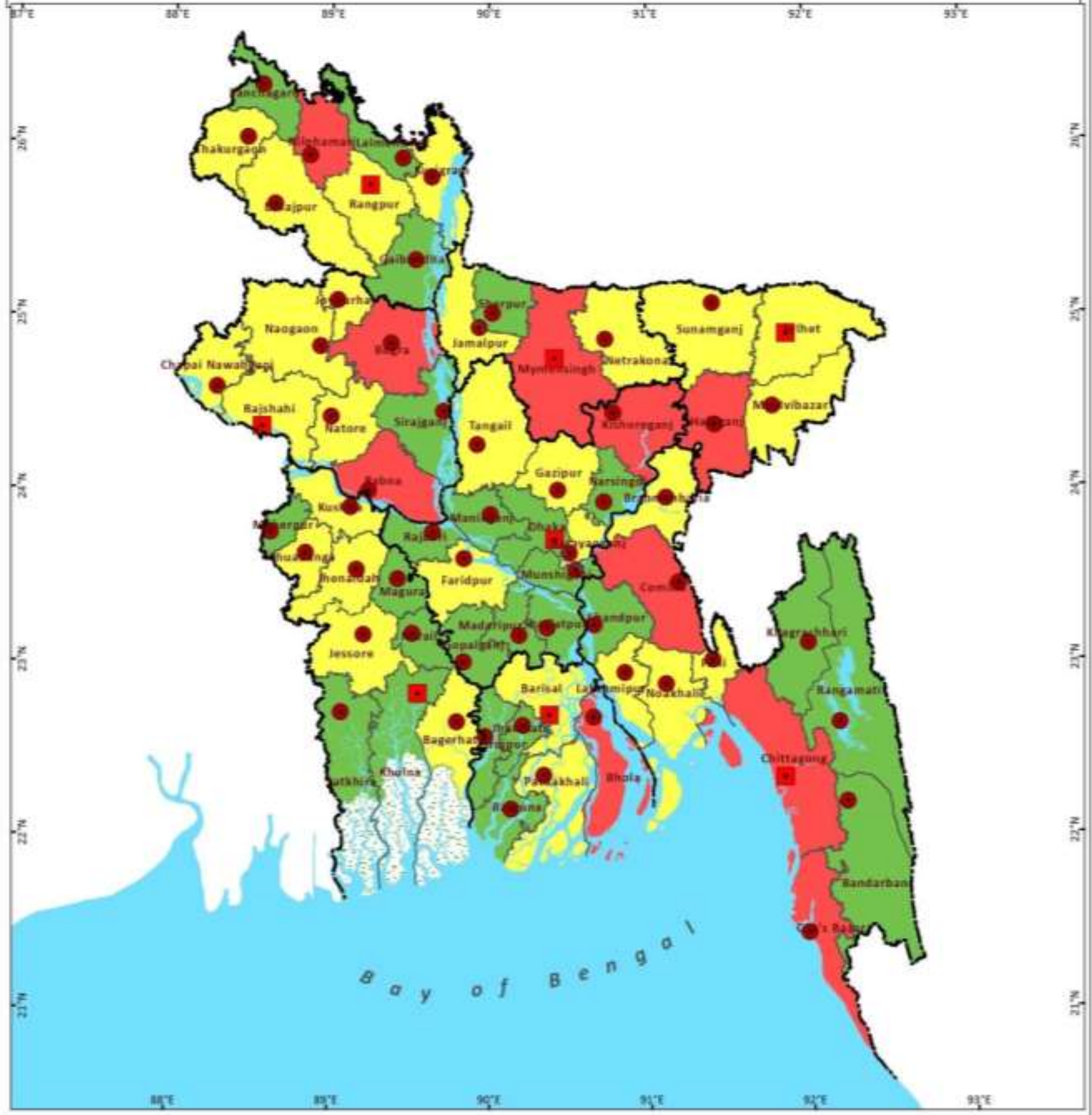
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported at District Level in 2011



Number of Diarrhea Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

N

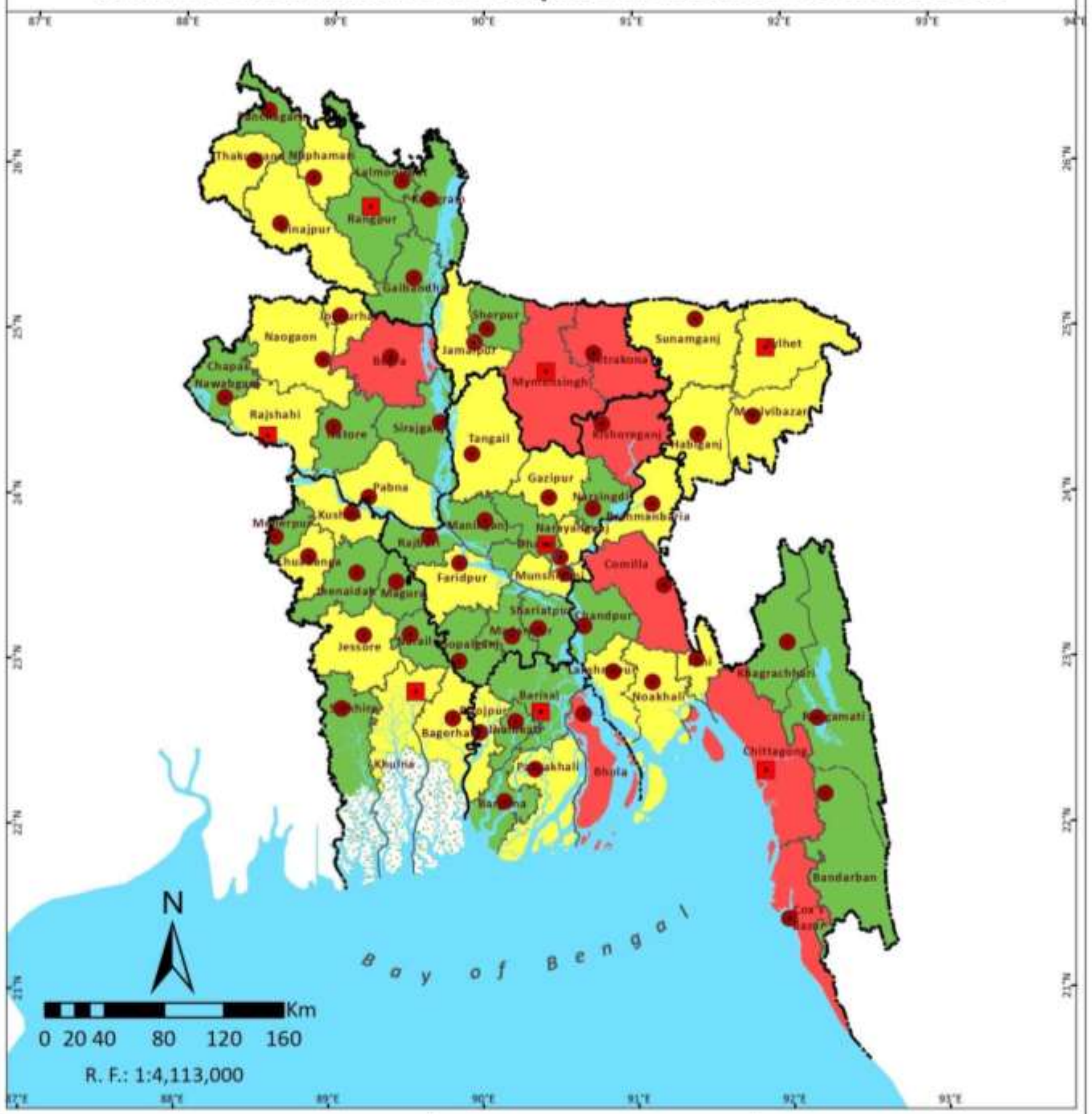
0 25 50 100 150 200 Km

R. F.: 1:4,000,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported at District Level in 2013



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

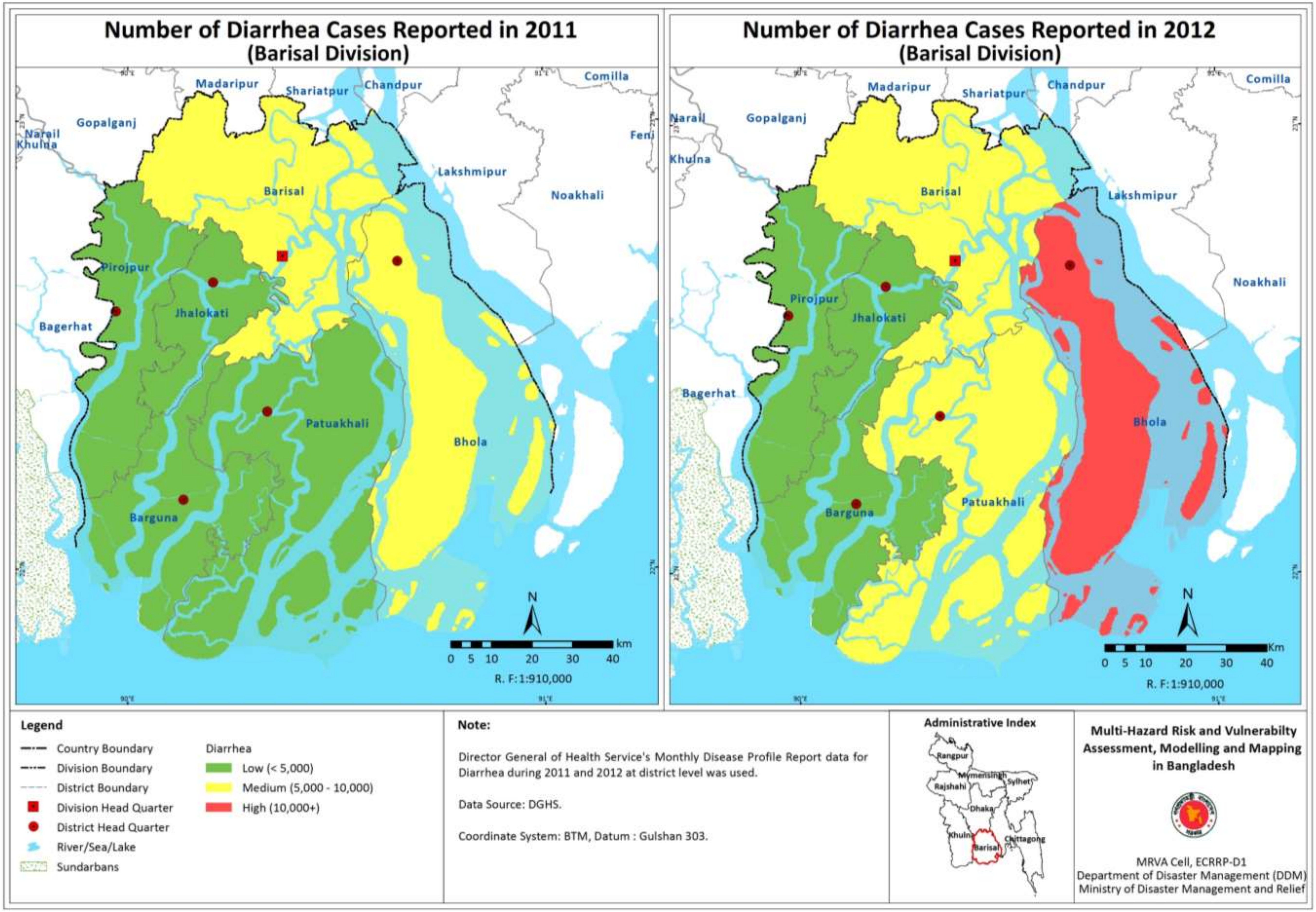
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.

Data Source: DGHS.

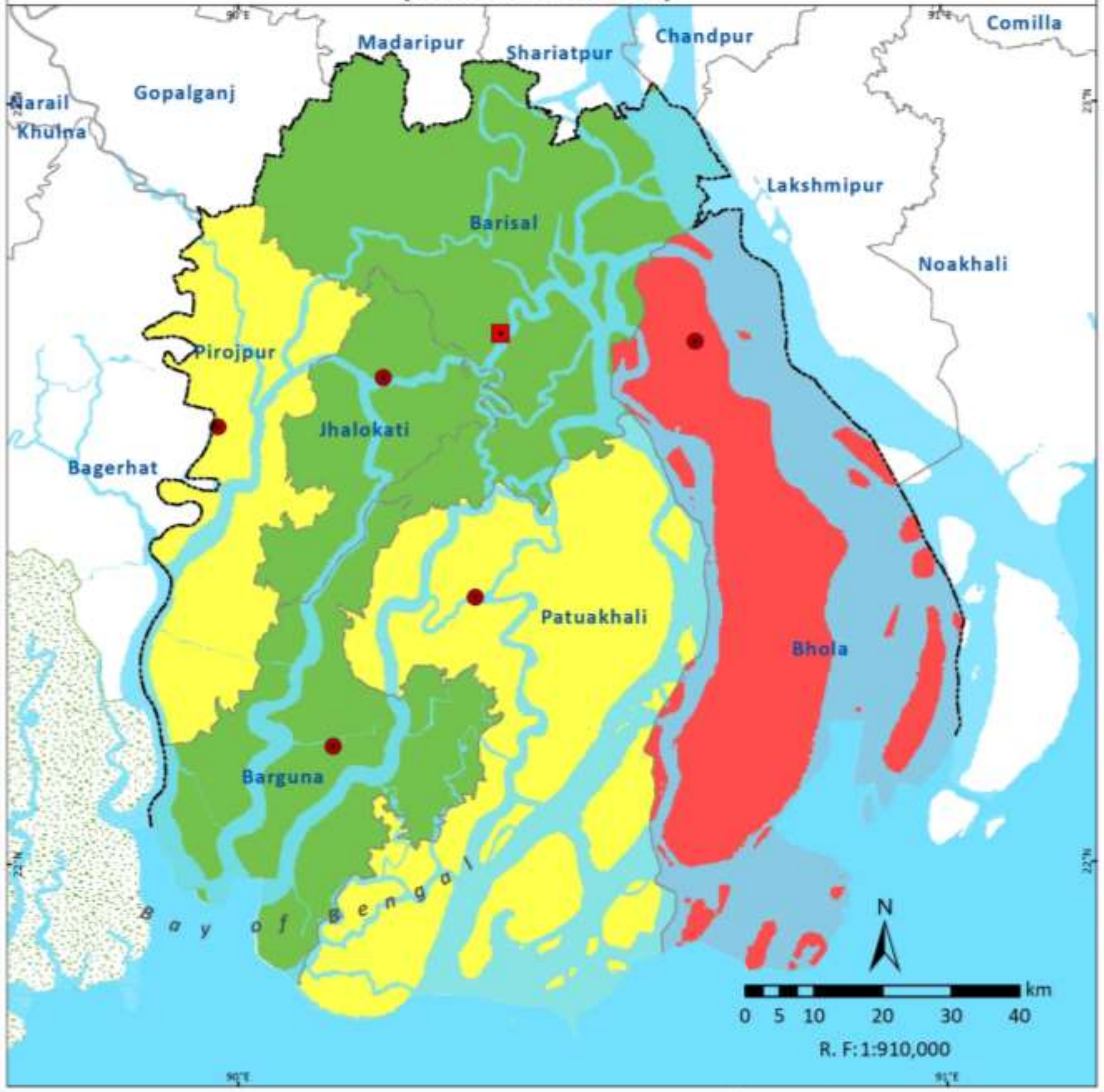
Coordinate System: BTM, Datum : Gulshan 303.

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

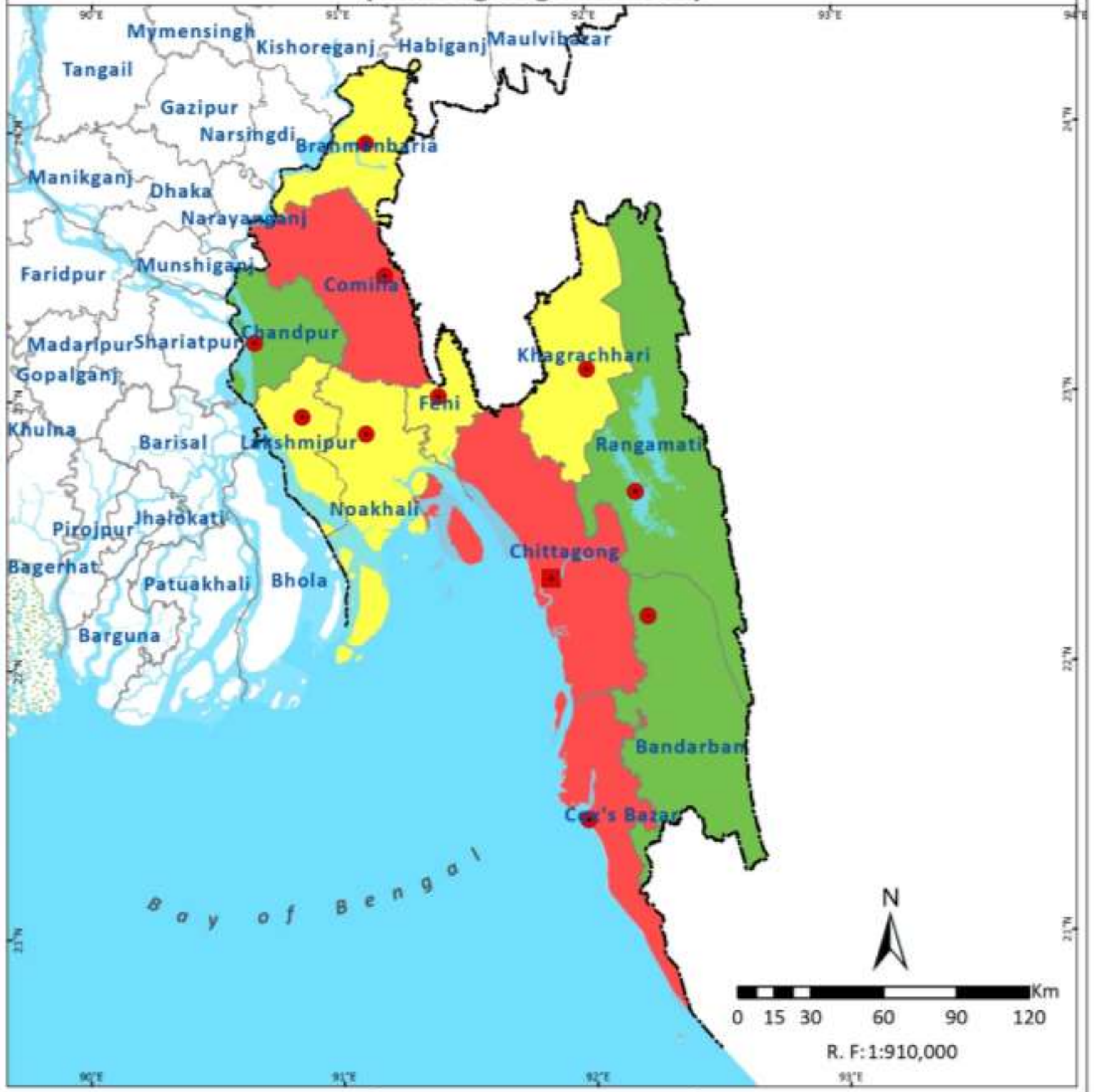
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Diarrhea Cases Reported in 2011
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Gopalganj
Narail
Khulna
Feni
Lakshmipur
Noakhali
Barisal
Pirojpur
Jhalokati
Bagerhat
Patuakhali
Bhola
Barguna
N
0 5 10 20 30 40 km
R. F: 1:910,000
Number of Diarrhea Cases Reported in 2012
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Narail
Gopalganj
Khulna
Barisal
Lakshmipur
Noakhali
Pirojpur
Jhalokati
Bagerhat
Bhola
Patuakhali
Barguna
N
0 5 10 20 30 40 Km
R. F: 1:910,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Diarrhea
Low (< 5,000)
Medium (5,000 - 10,000)
High (10,000+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2013
(Barisal Division)



Number of Diarrhea Cases Reported in 2011
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2013 at district level was used.

Data Source: DGHS.

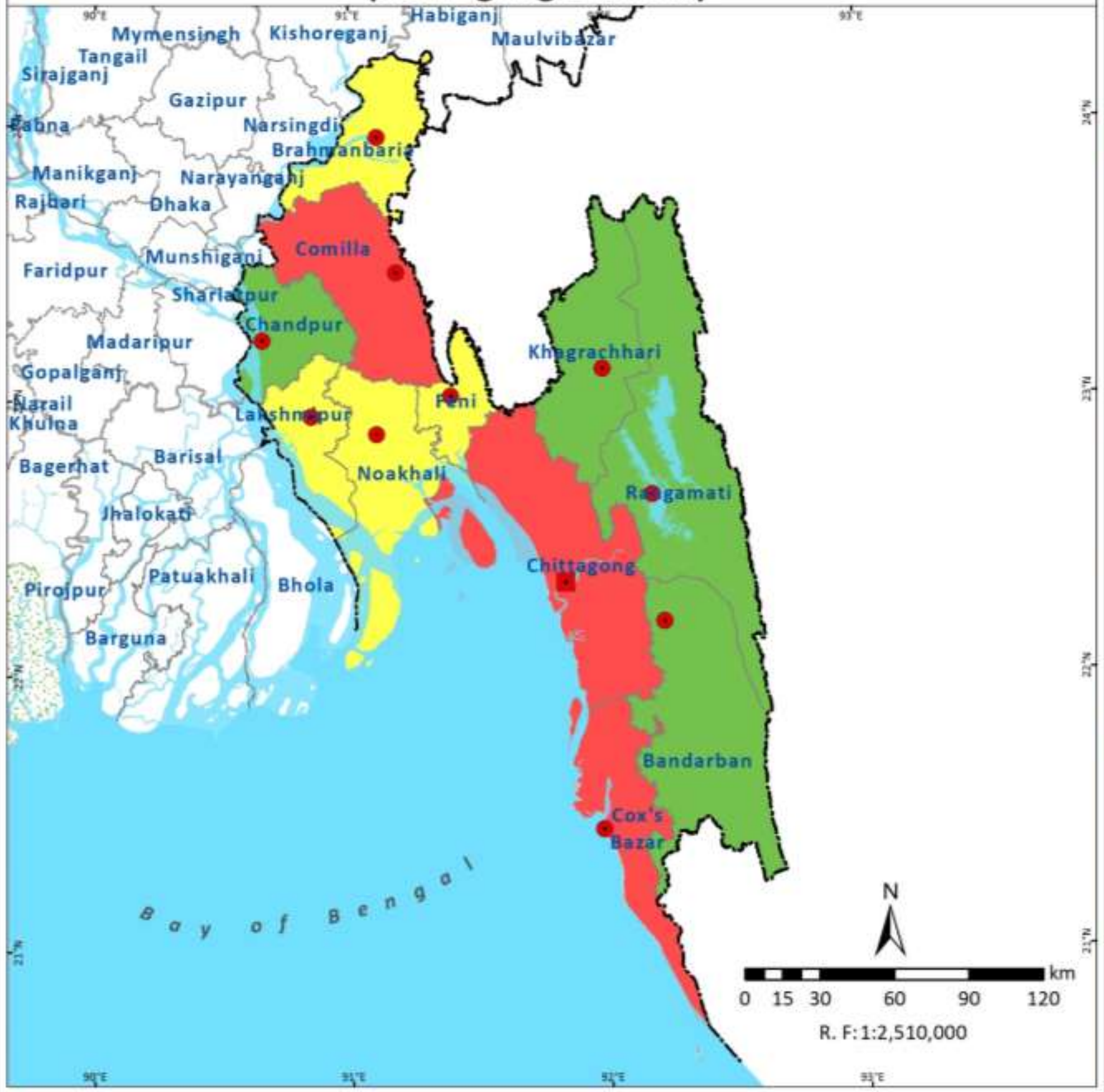
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

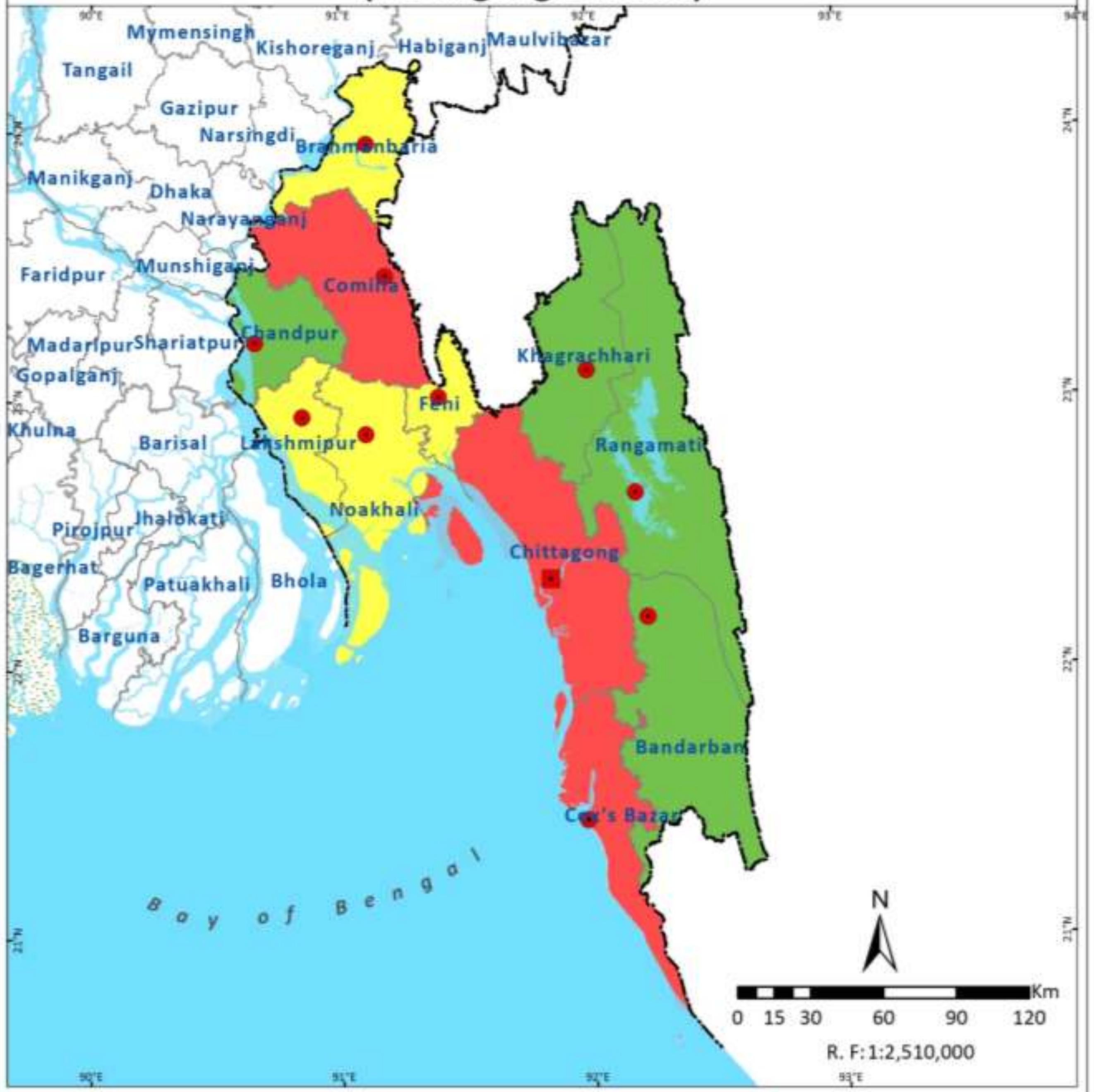
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2012
(Chittagong Division)



Number of Diarrhea Cases Reported in 2013
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2012 and 2013 at district level was used.

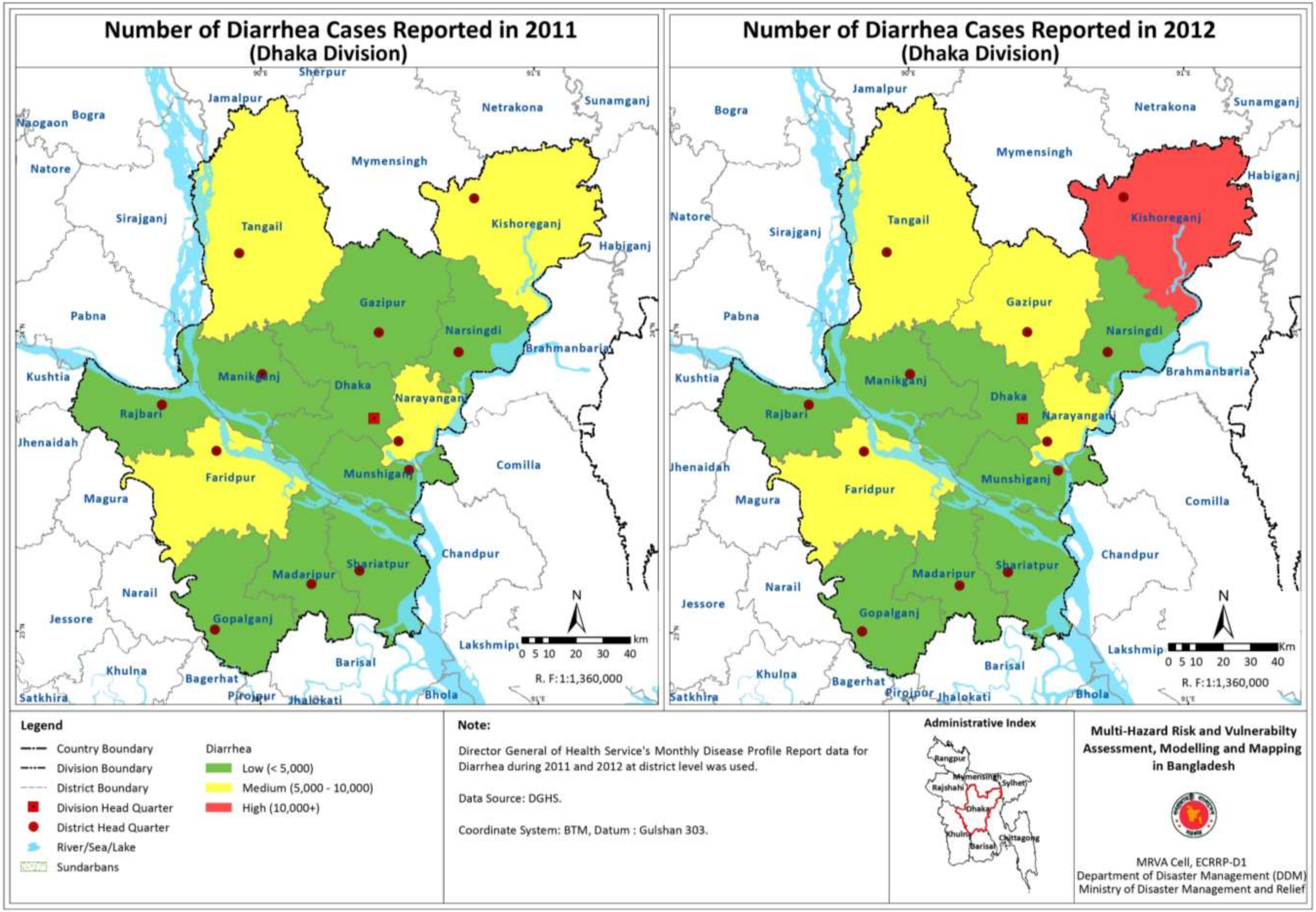
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

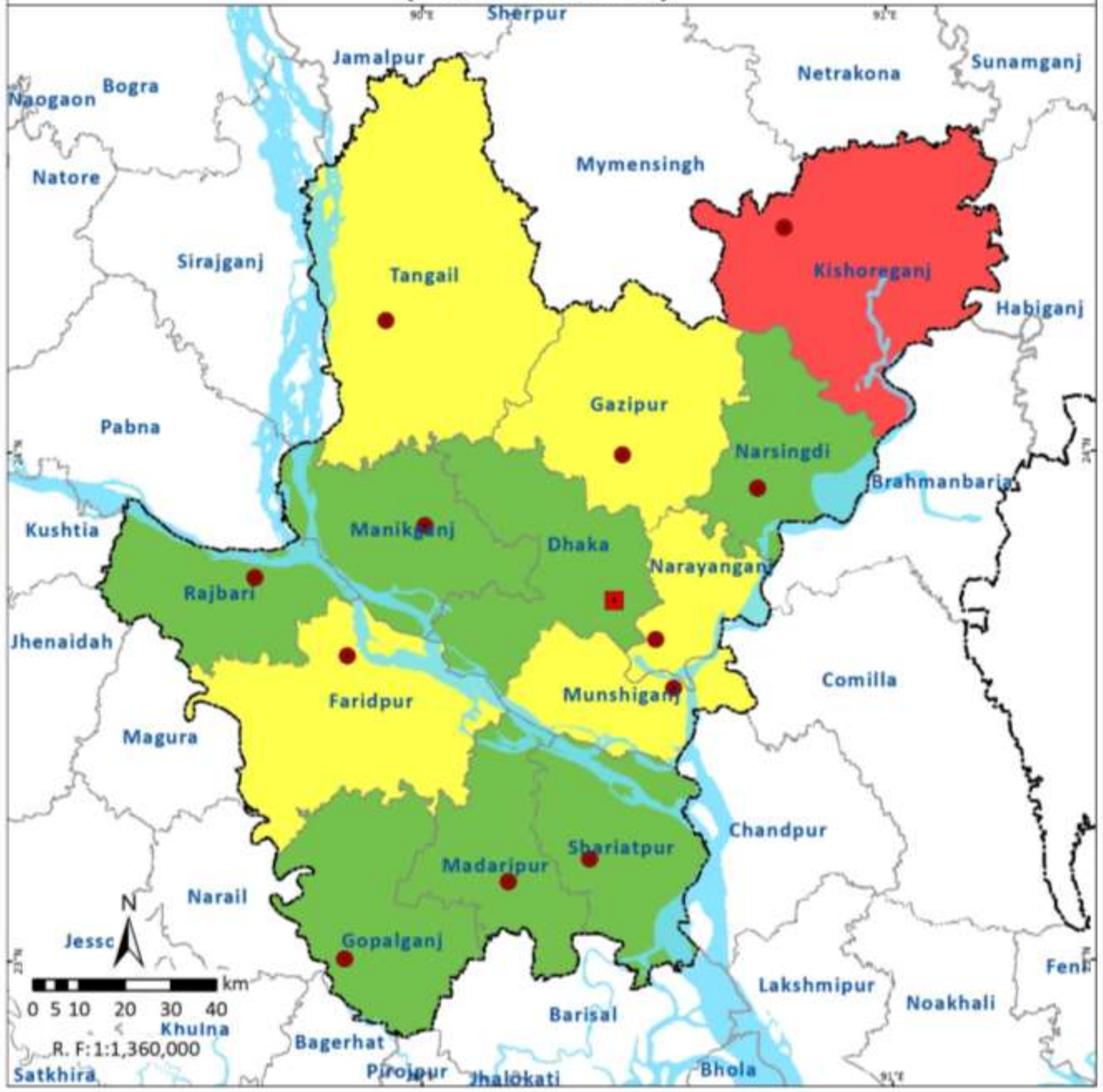
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

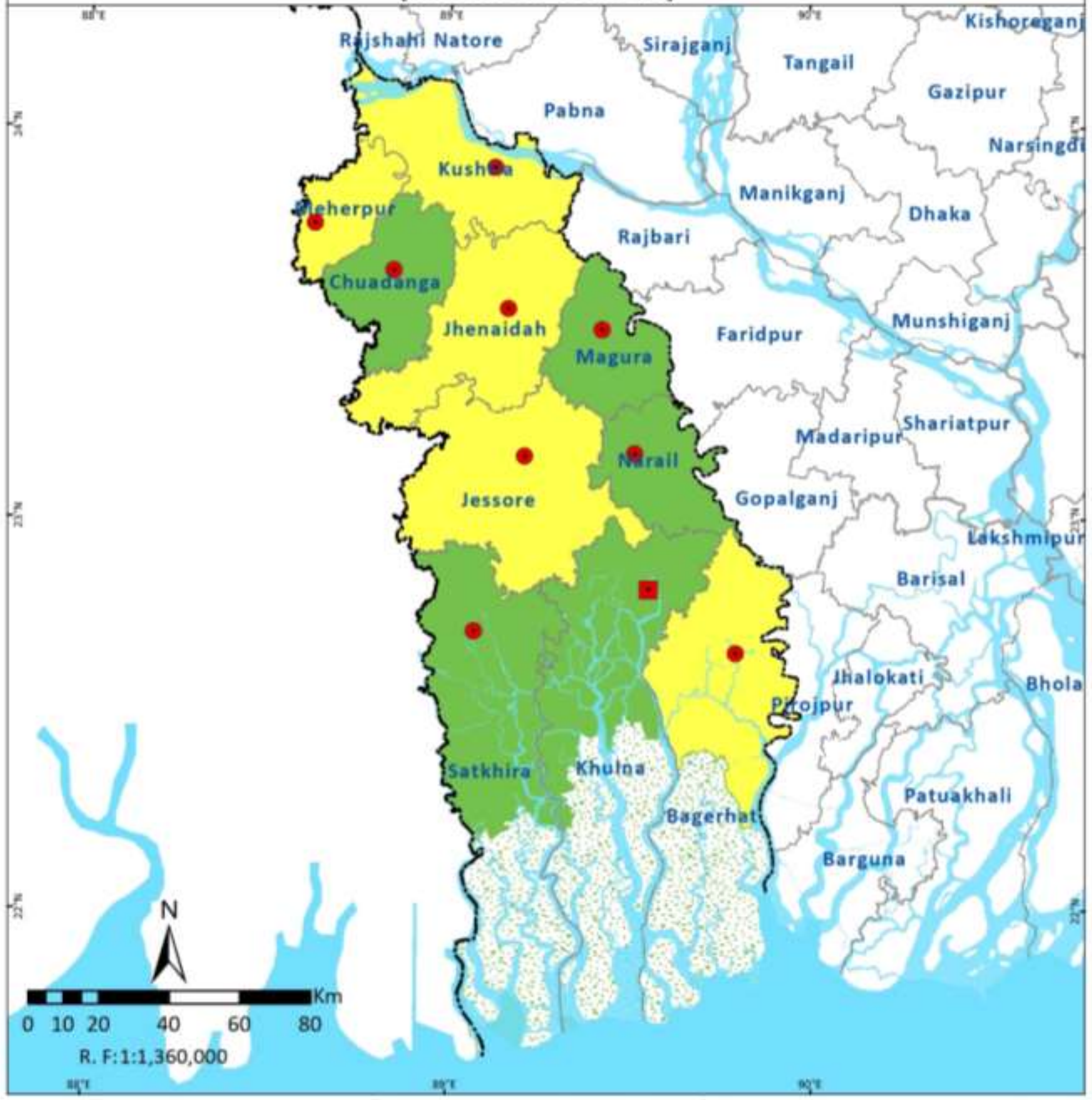
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Diarrhea Cases Reported in 2011
(Dhaka Division)
Number of Diarrhea Cases Reported in 2012
(Dhaka Division)
Sherpur
Jamalpur
Naogaon
Bogra
Natore
Sirajganj
Pabna
Kushtia
Jhenaidah
Magura
Narail
Jessore
Khulna
Satkhira
Bagerhat
Pirojpur
Jhalokati
Barisal
Bhola
Lakshmipur
Chandpur
Comilla
Brahmanbaria
Habiganj
Sunamganj
Netrakona
Mymensingh
Kishoreganj
Tangail
Gazipur
Narsingdi
Manikganj
Dhaka
Narayanganj
Rajbari
Faridpur
Munshiganj
Madaripur
Shariatpur
Gopalganj
N
km
0 5 10 20 30 40
R. F: 1:1,360,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Diarrhea
Low (< 5,000)
Medium (5,000 - 10,000)
High (10,000+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2013
(Dhaka Division)



Number of Diarrhea Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2013 at district level was used.

Data Source: DGHS.

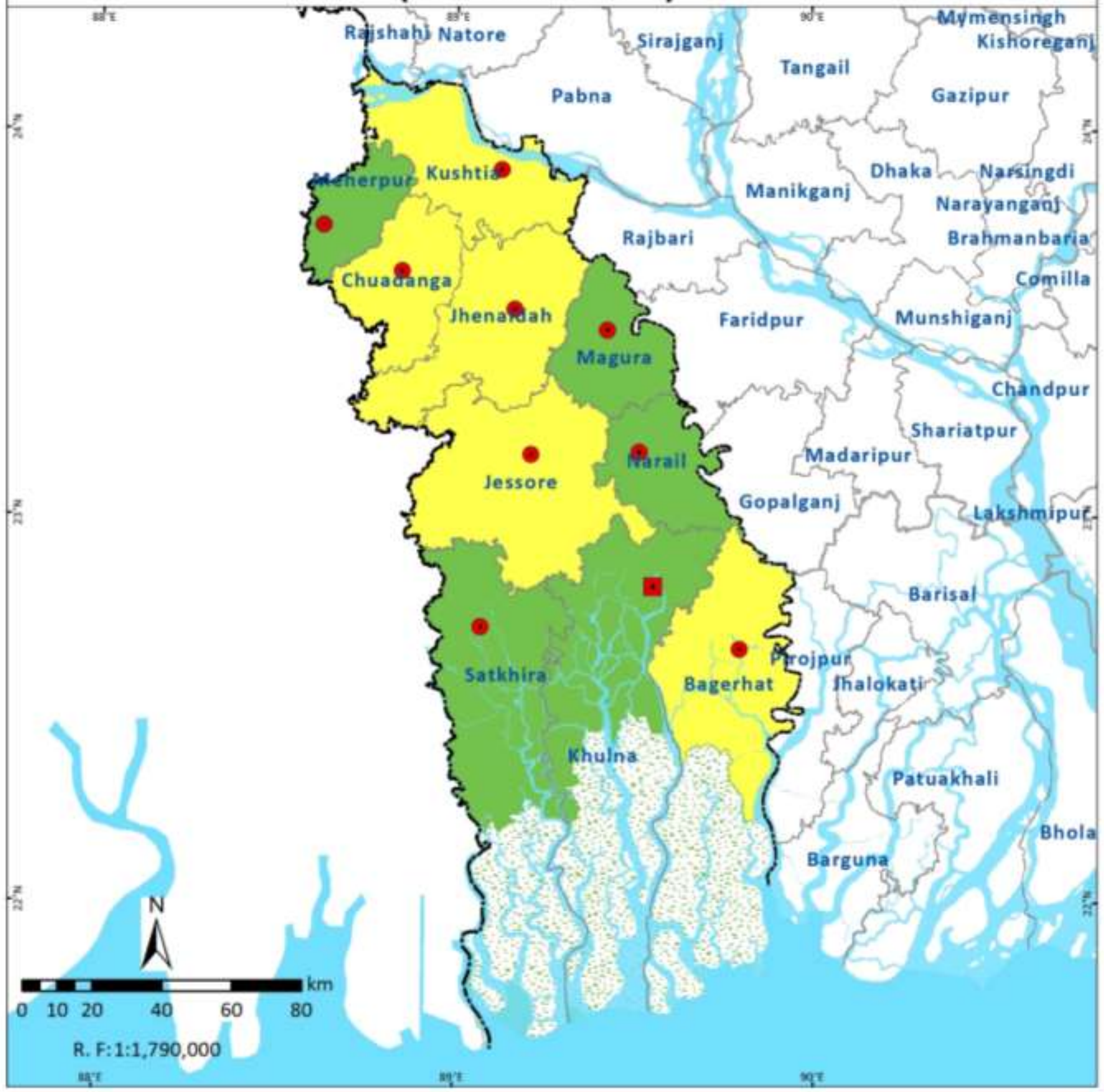
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

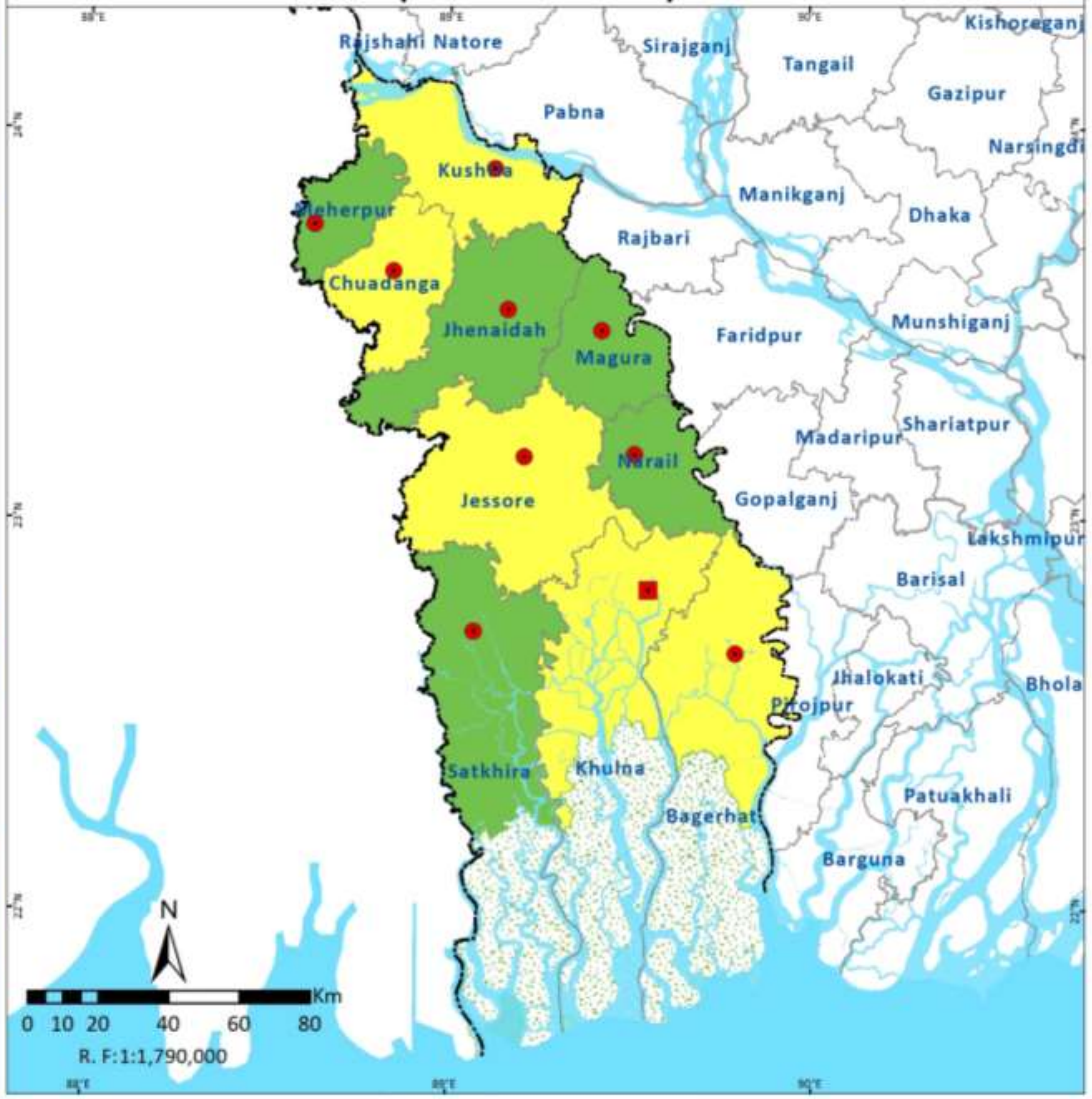
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2012
(Khulna Division)



Number of Diarrhea Cases Reported in 2013
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2012 and 2013 at district level was used.

Data Source: DGHS.

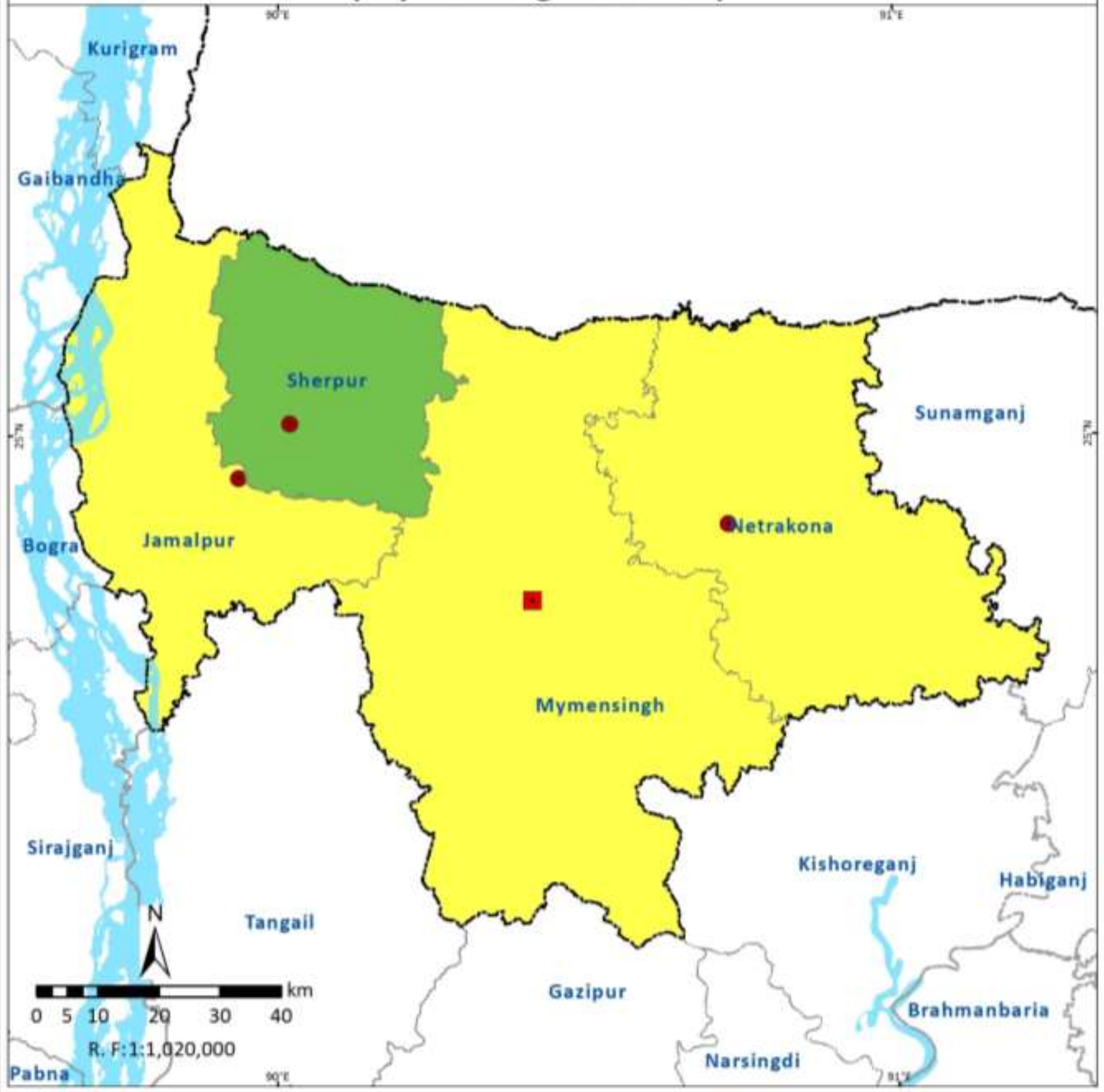
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2011 (Mymensingh Division)



Number of Diarrhea Cases Reported in 2012 (Mymensingh Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

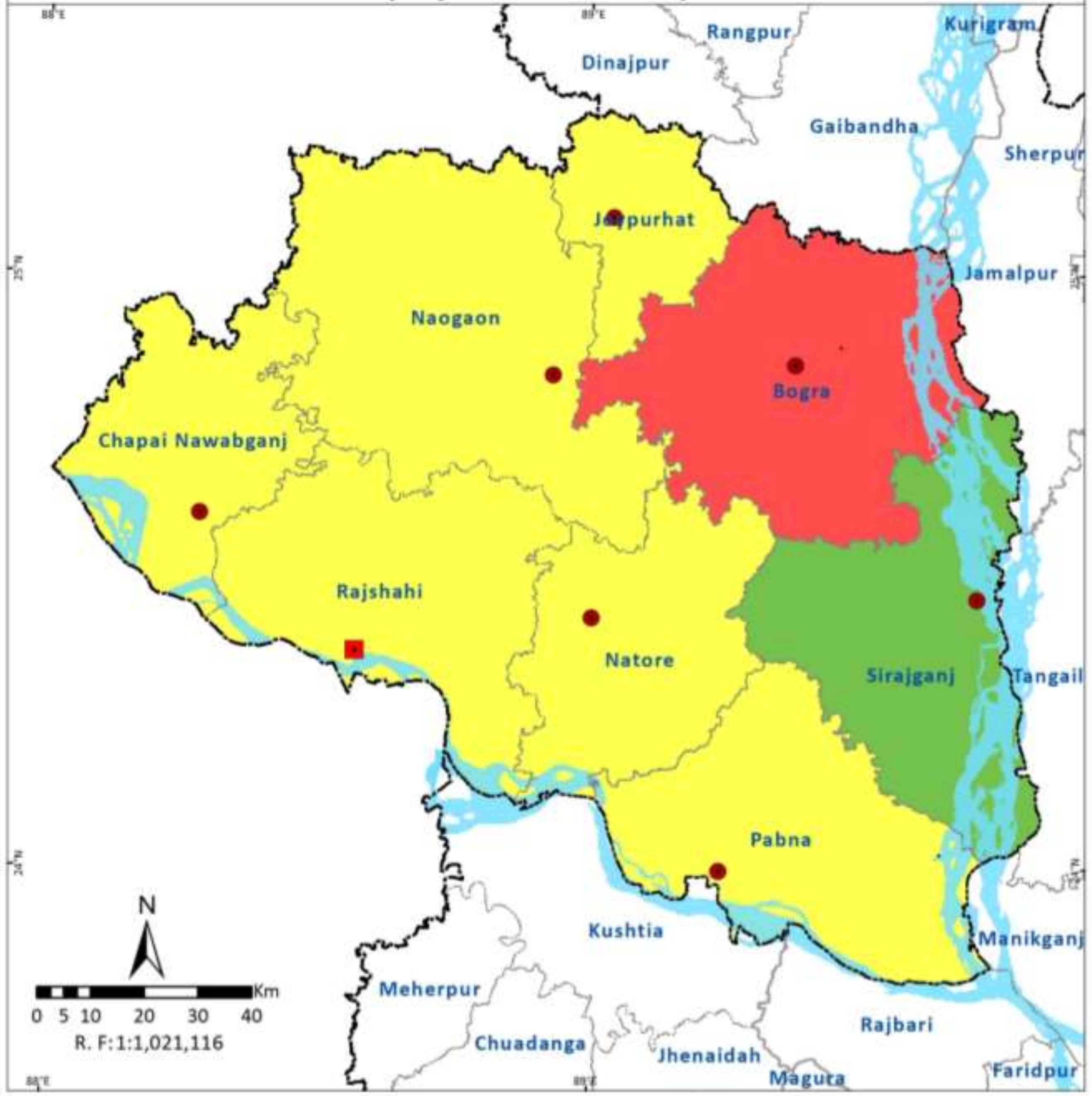
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2013 (Mymensingh Division)

Number of Diarrhea Cases Reported in 2011 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea

- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2013 at district level was used.

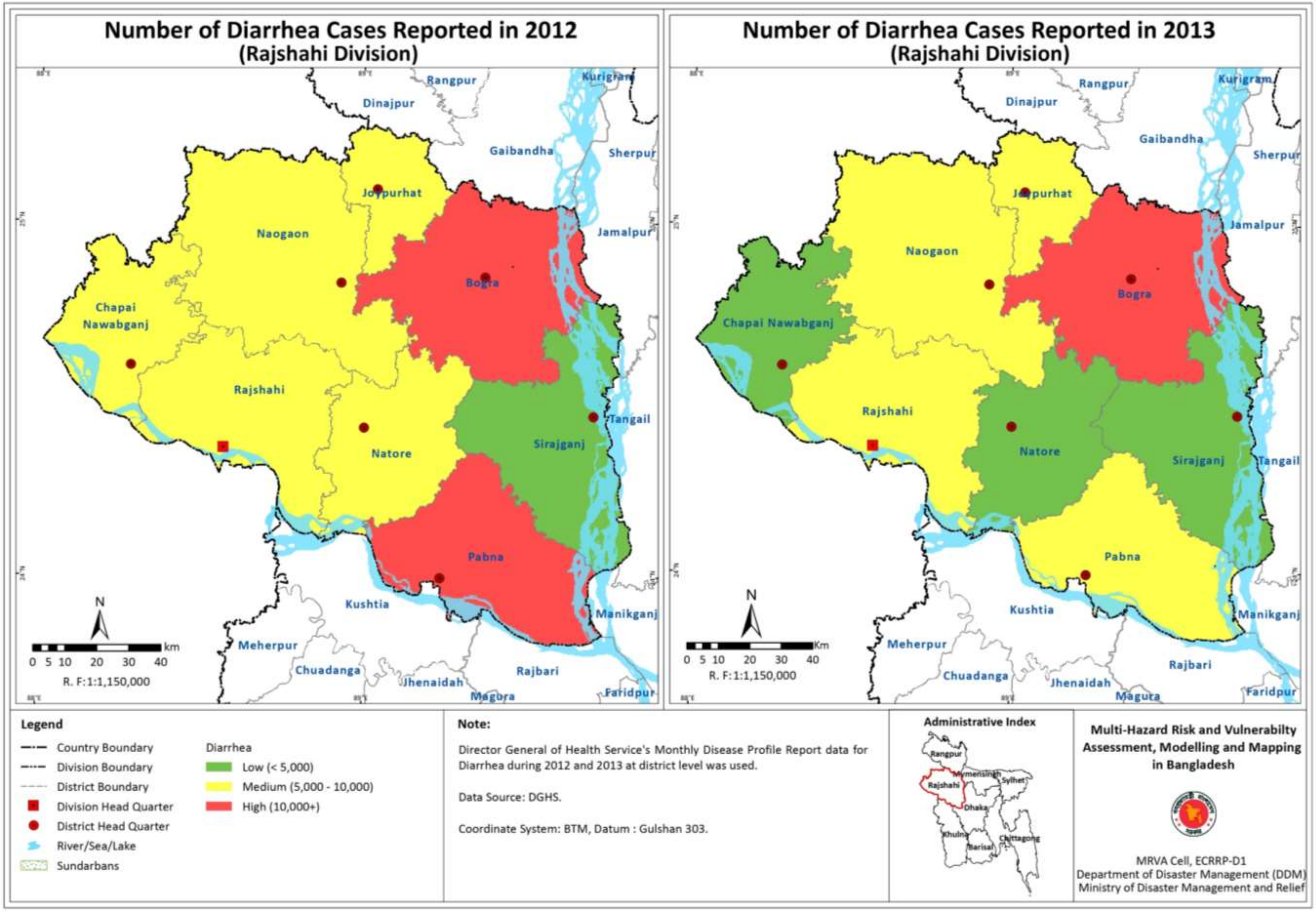
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

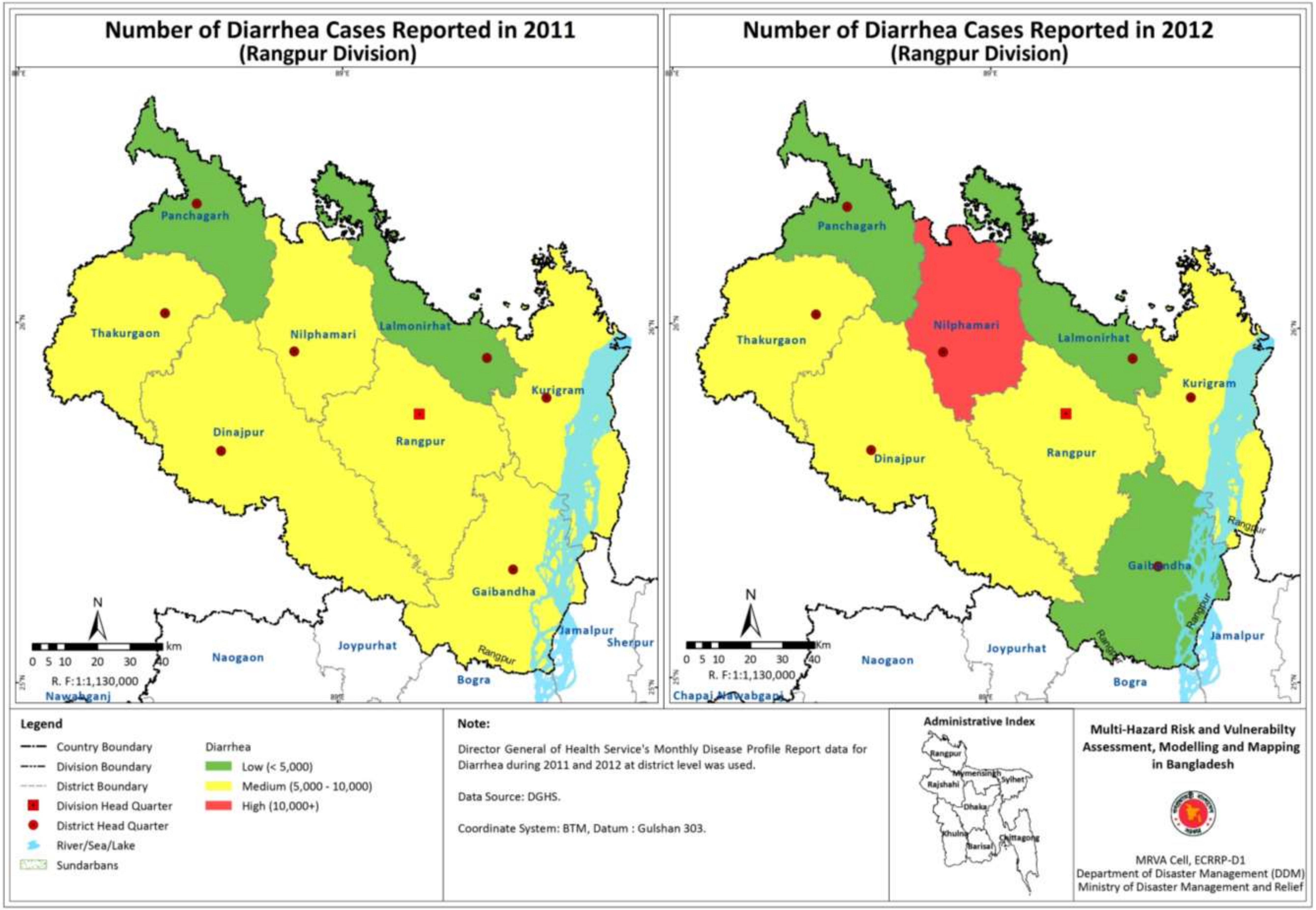
Administrative Index

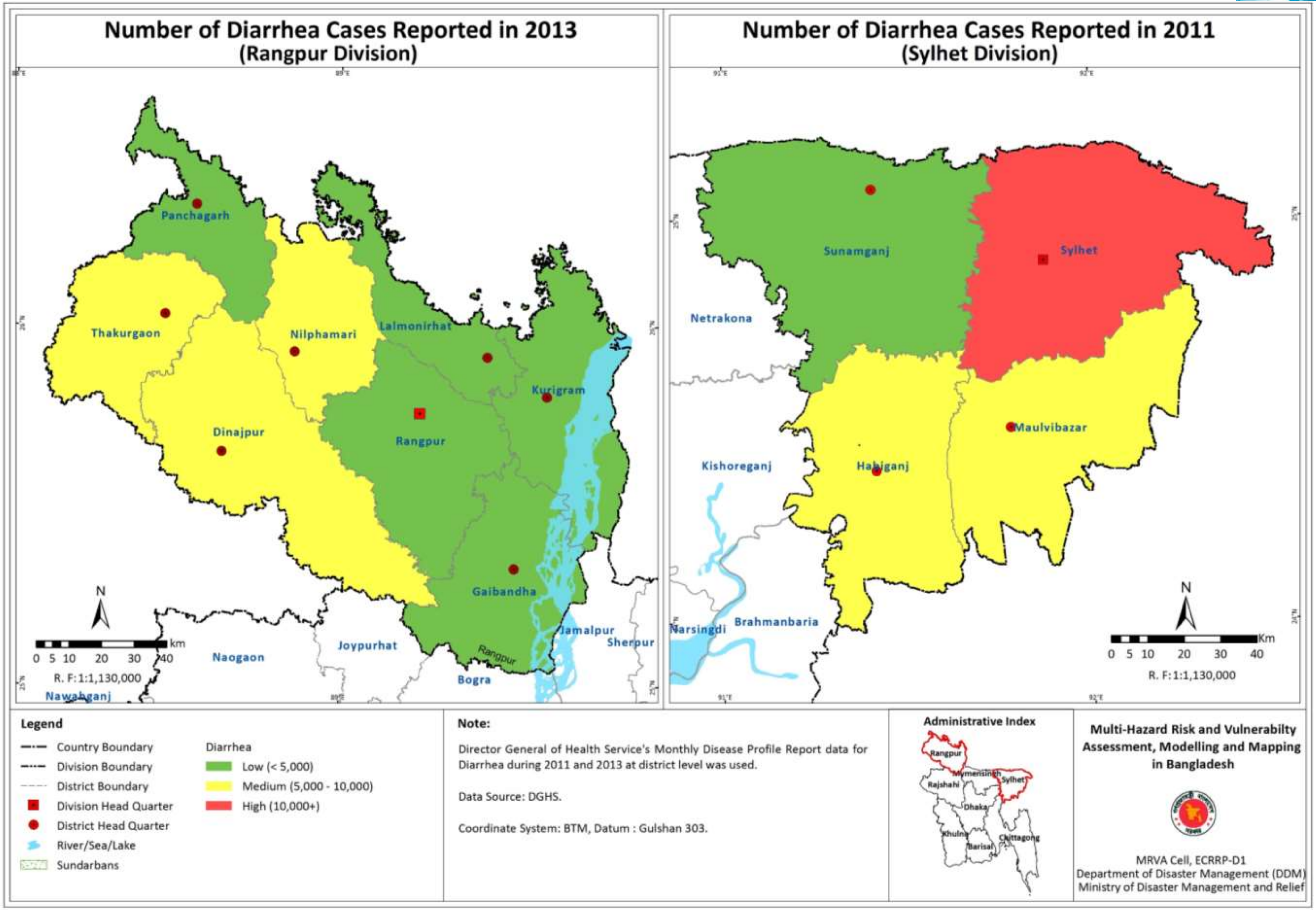
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

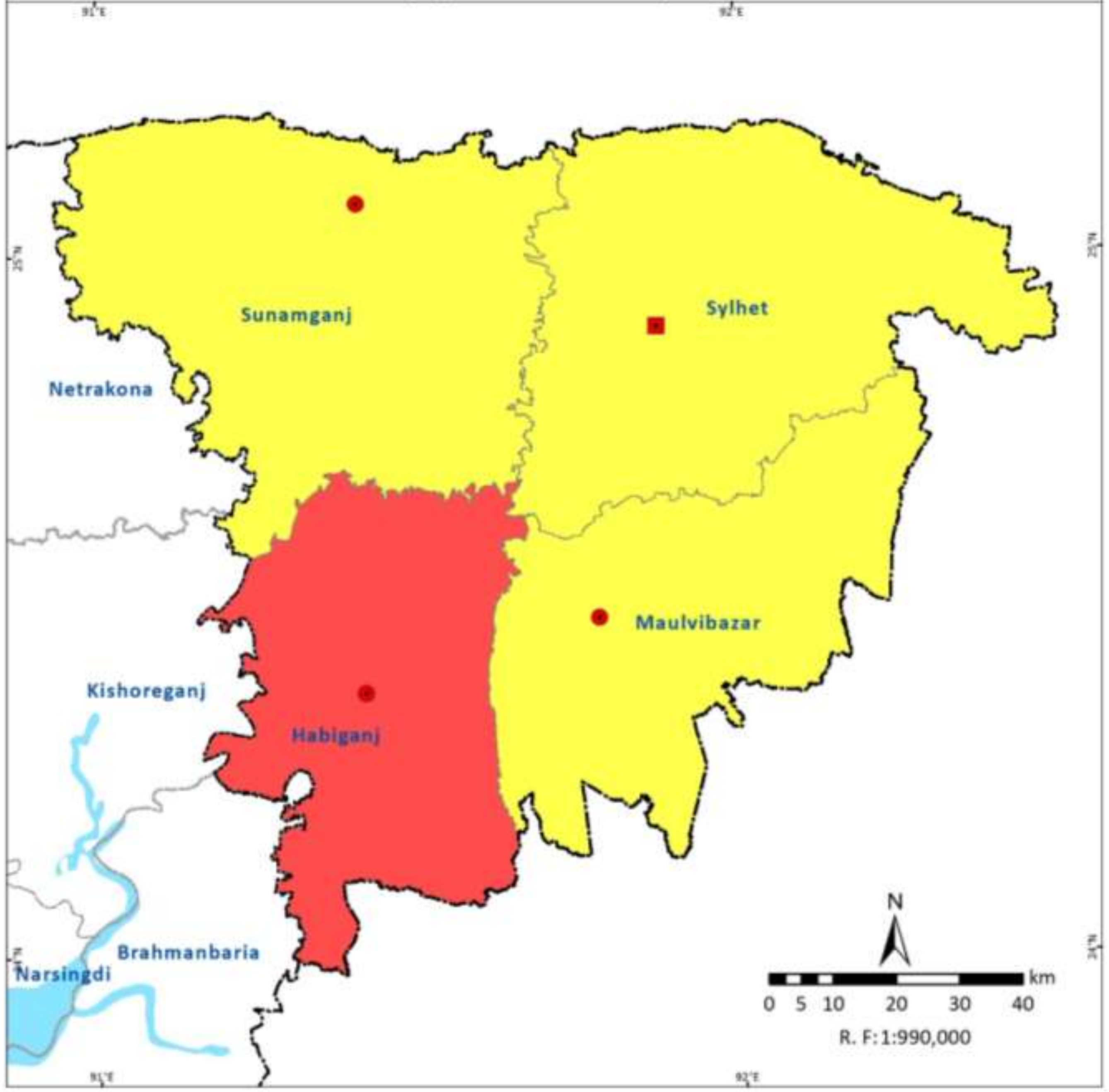


Number of Diarrhea Cases Reported in 2012
(Rajshahi Division)
Number of Diarrhea Cases Reported in 2013
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Jamalpur
Joypurhat
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
0 5 10 20 30 40 km
R. F:1:1,150,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Diarrhea
Low (< 5,000)
Medium (5,000 - 10,000)
High (10,000+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

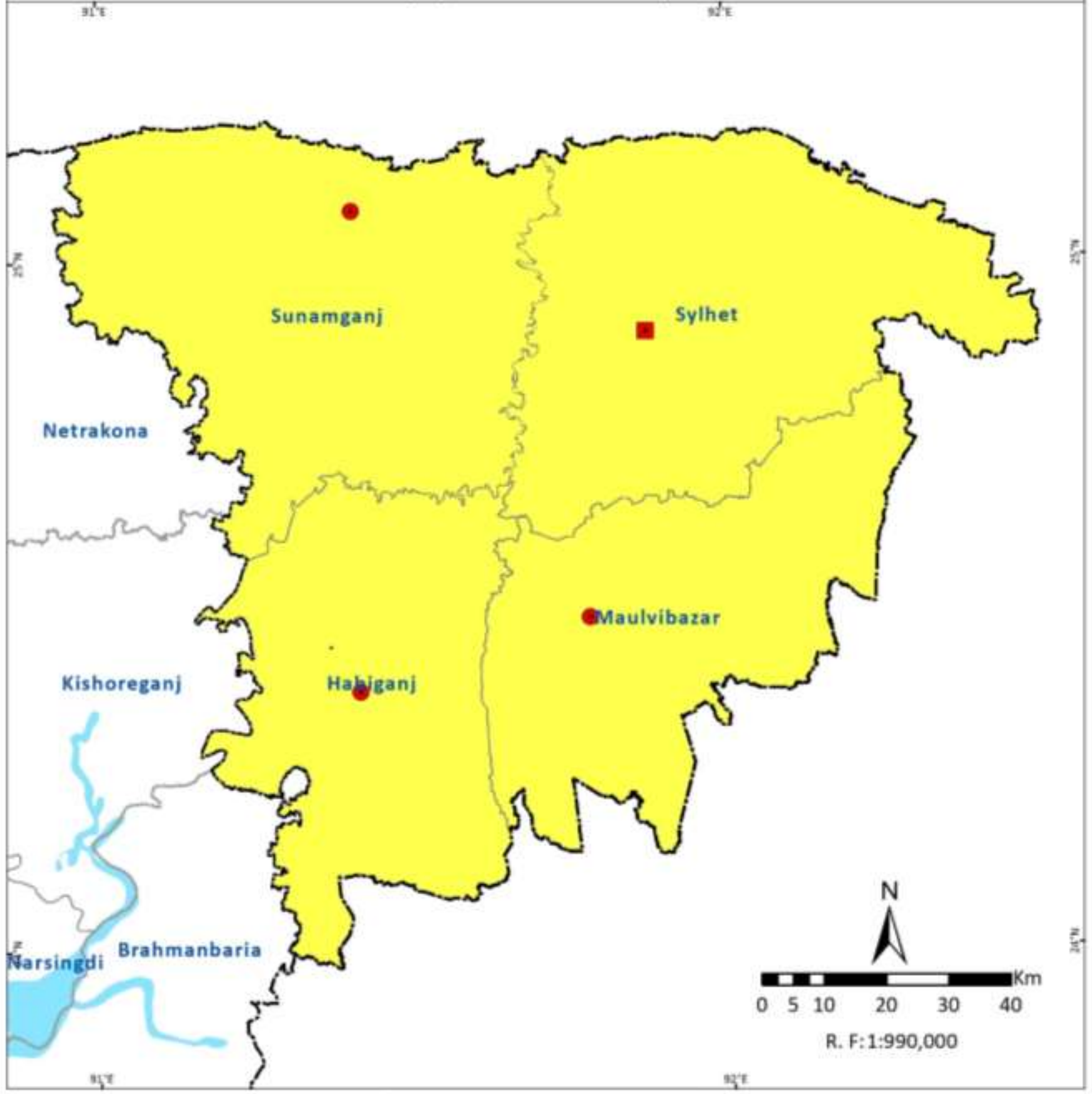

Number of Diarrhea Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F:1:1,130,000
Number of Diarrhea Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Chapai Nawabganj
N
Km
0 5 10 20 30 40
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Diarrhea
Low (< 5,000)
Medium (5,000 - 10,000)
High (10,000+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Diarrhea Cases Reported in 2013
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Rangpur
Dinajpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F:1:1,130,000
Number of Diarrhea Cases Reported in 2011
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Narsingdi
Brahmanbaria
N
Km
0 5 10 20 30 40
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Diarrhea
Low (< 5,000)
Medium (5,000 - 10,000)
High (10,000+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Diarrhea Cases Reported in 2012
(Sylhet Division)



Number of Diarrhea Cases Reported in 2013
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Diarrhea
- Low (< 5,000)
- Medium (5,000 - 10,000)
- High (10,000+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Diarrhea during 2012 and 2013 at district level was used.

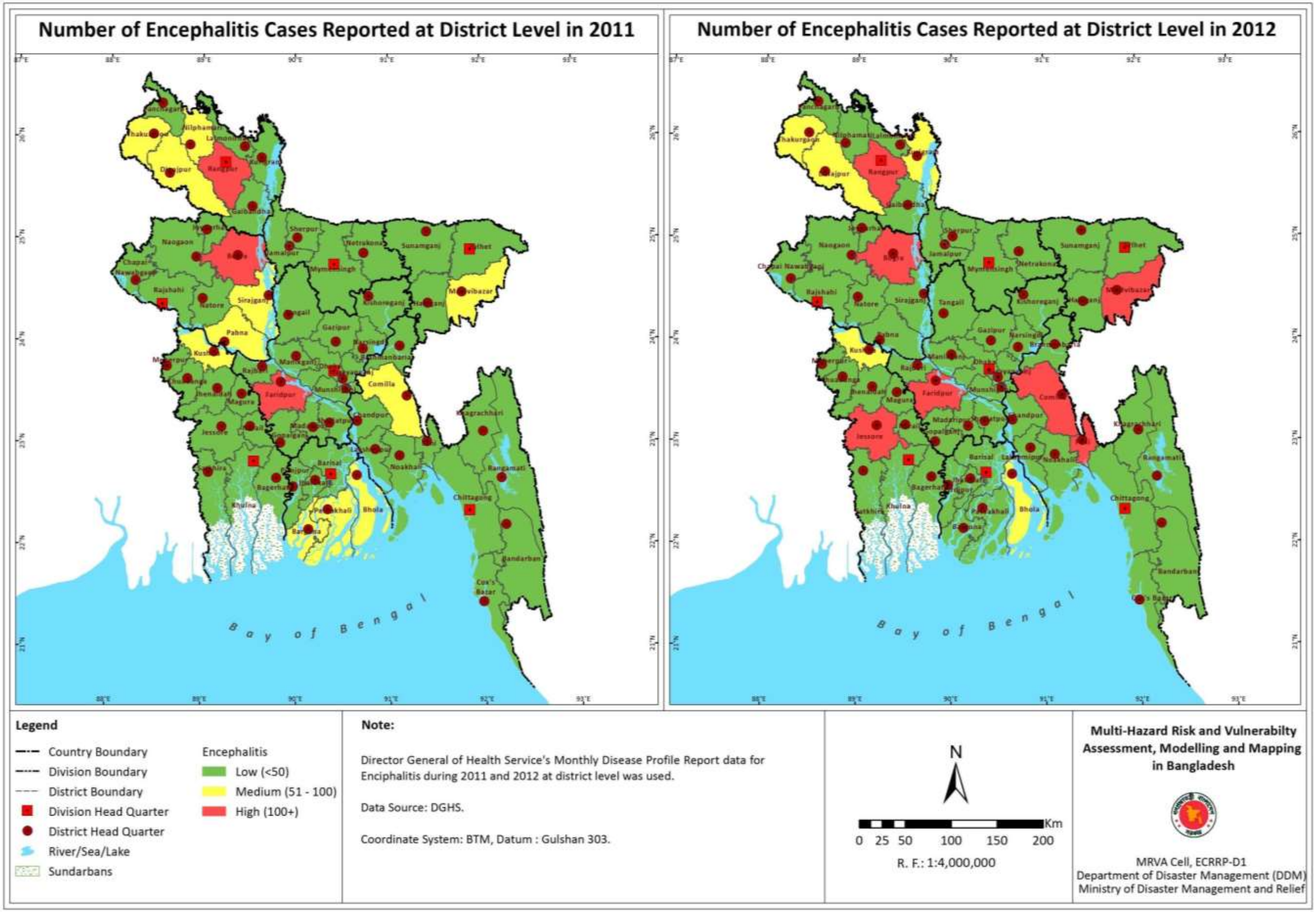
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

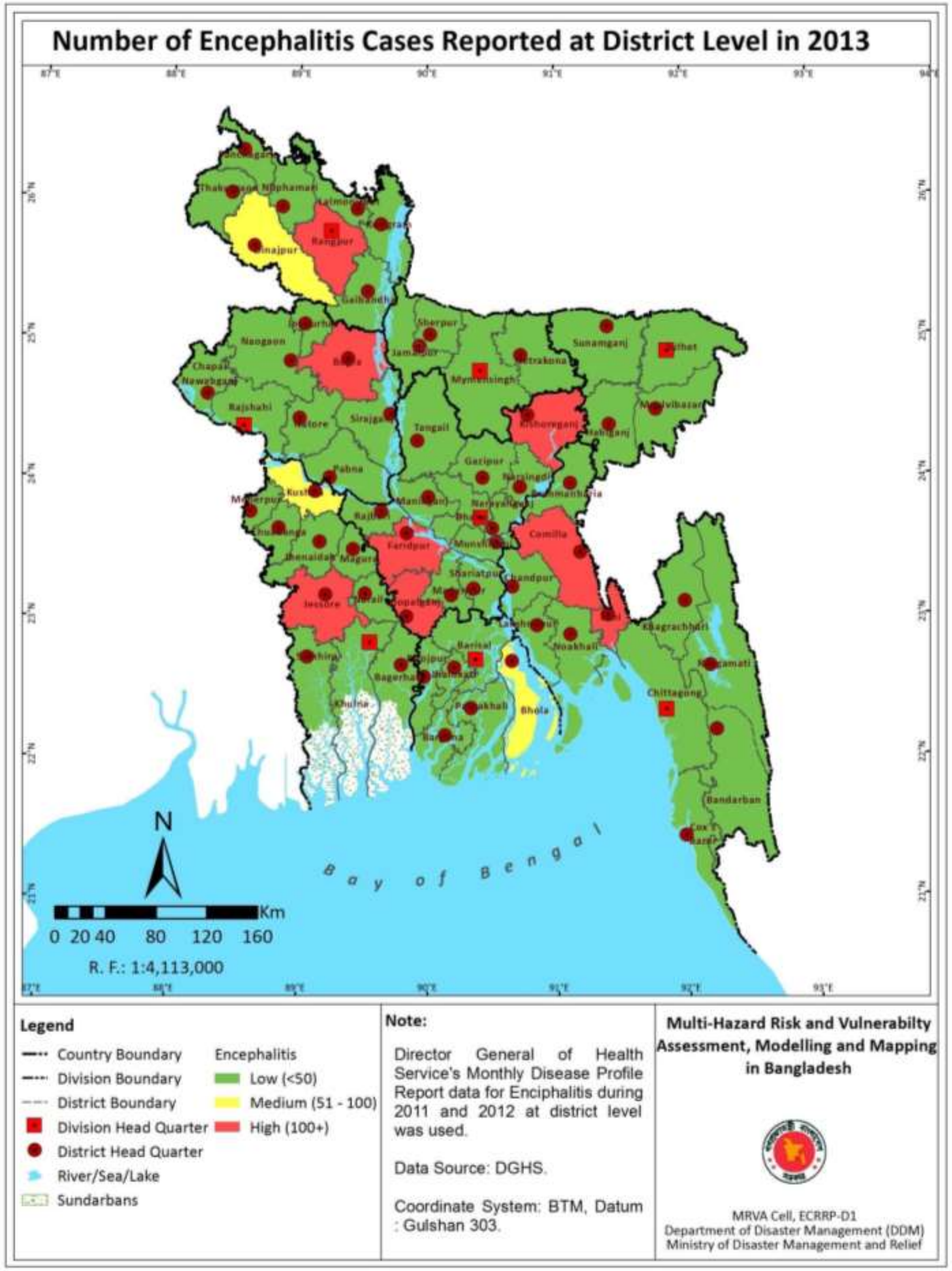
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

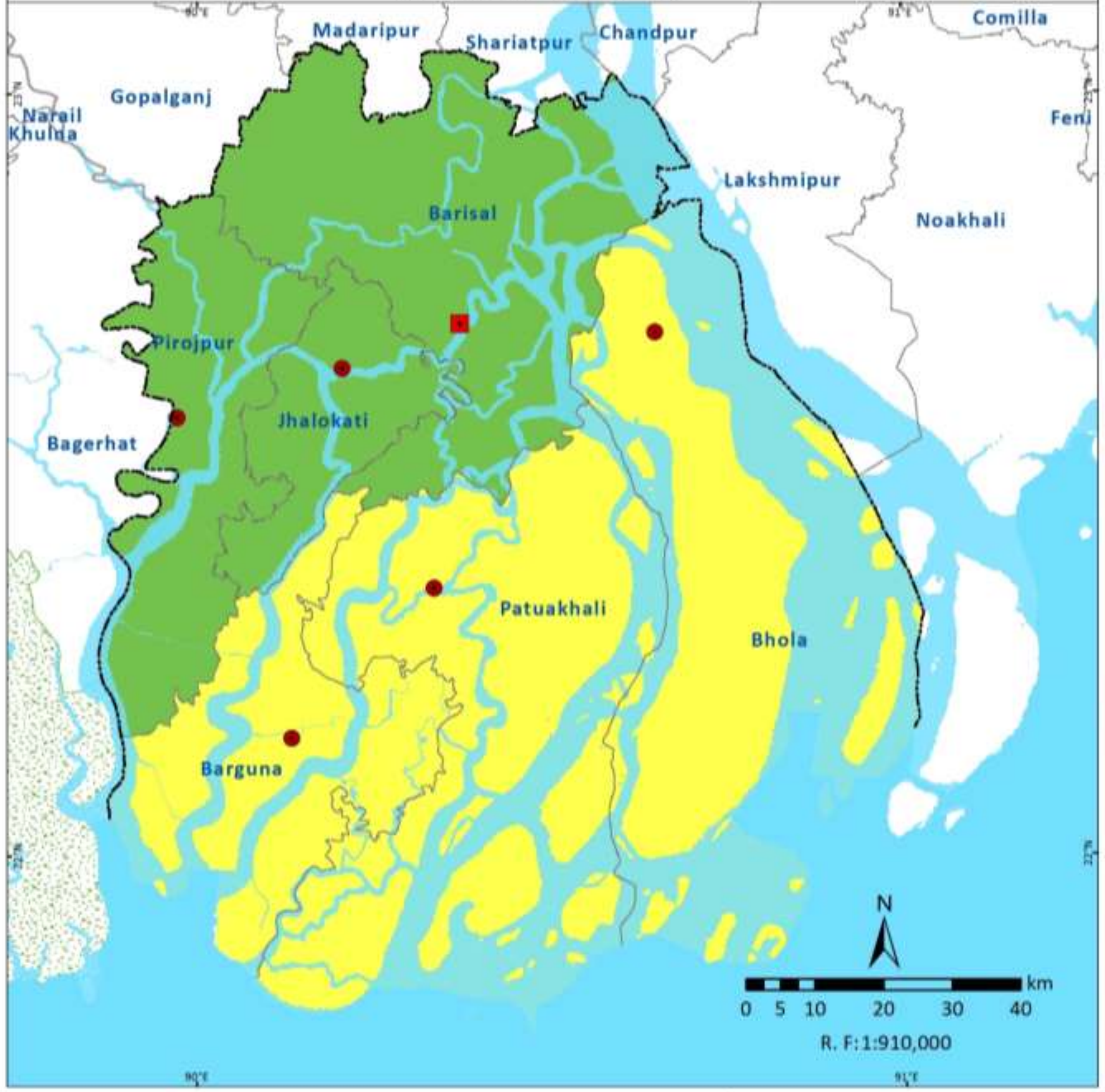
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



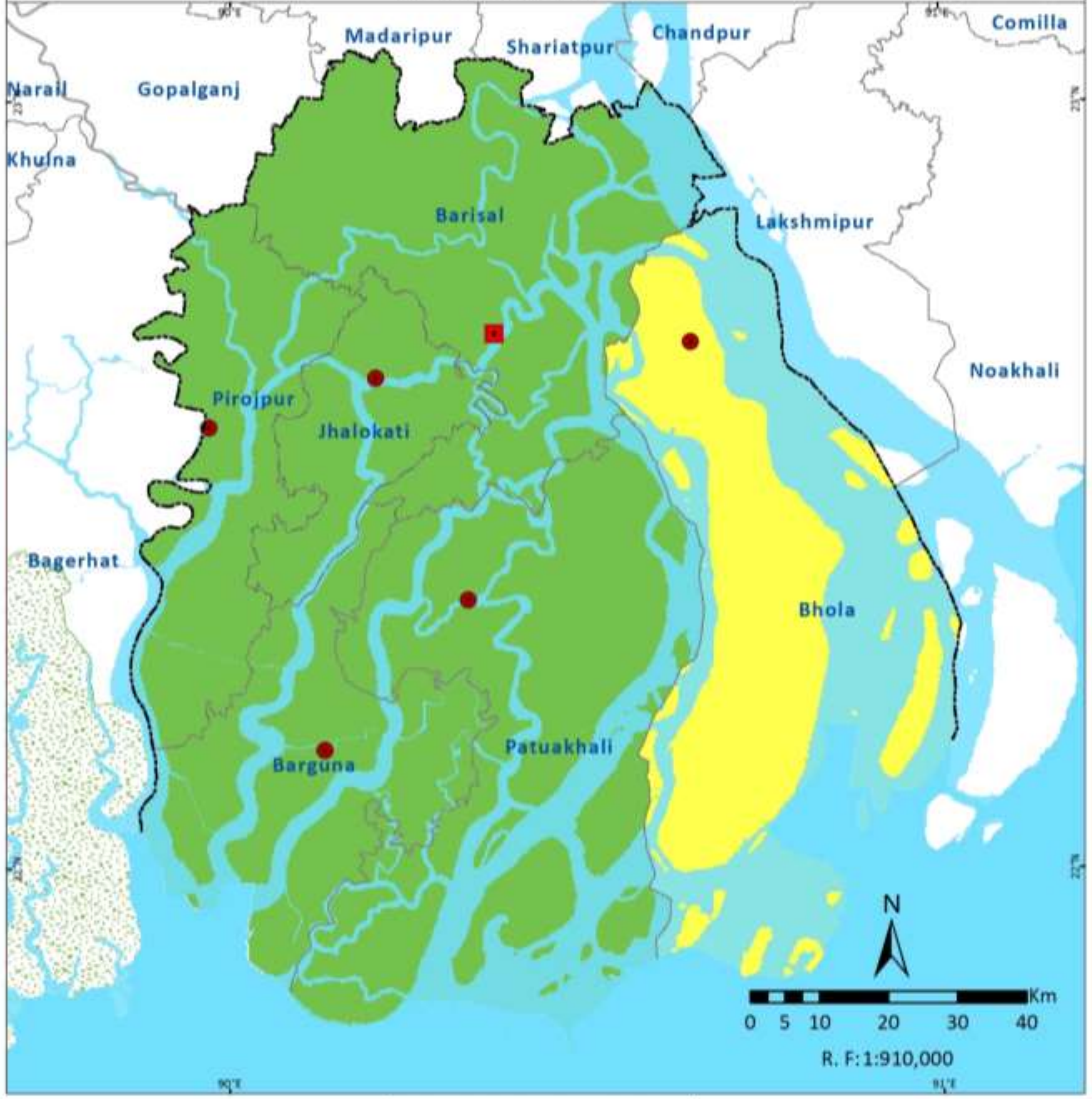
Number of Encephalitis Cases Reported at District Level in 2011
Number of Encephalitis Cases Reported at District Level in 2012
Bay of Bengal
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Encephalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
N
0 25 50 100 150 200 Km
R. F.: 1:4,000,000
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Encephalitis Cases Reported at District Level in 2013
Bay of Bengal
N
Km
0 20 40 80 120 160
R. F.: 1:4,113,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Encephalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2011
(Barisal Division)



Number of Encephalitis Cases Reported in 2012
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.

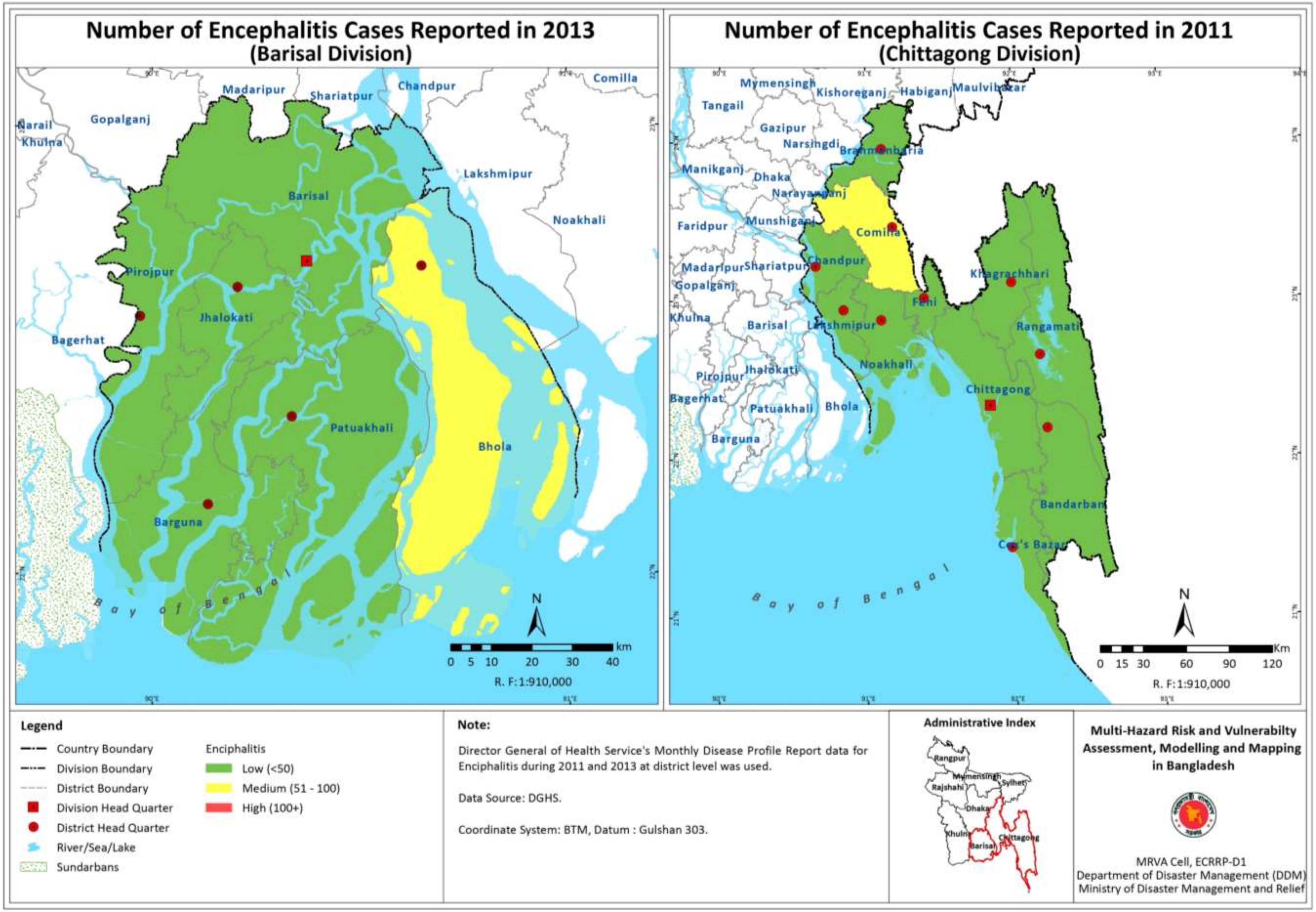
Data Source: DGHS.

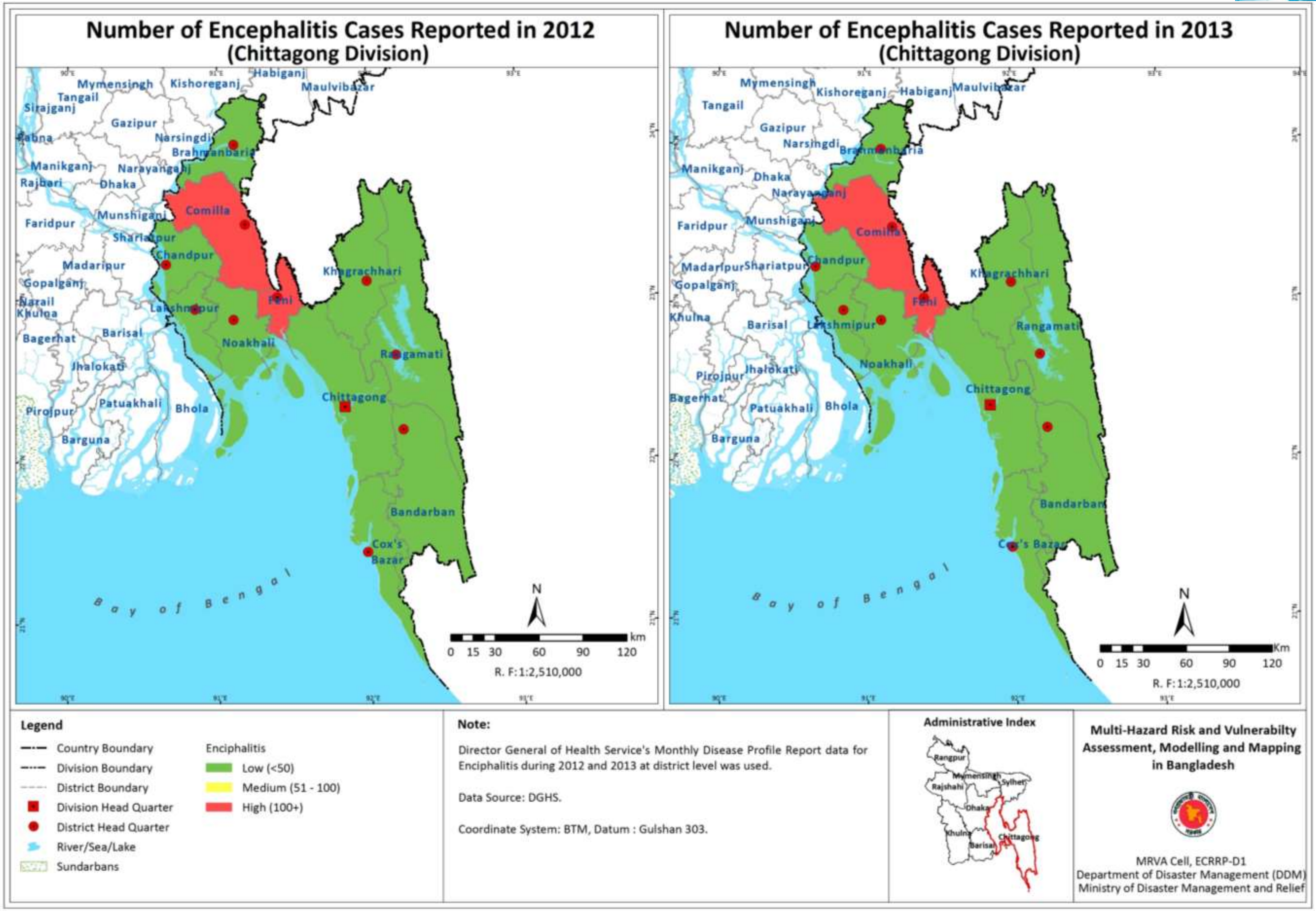
Coordinate System: BTM, Datum : Gulshan 303.

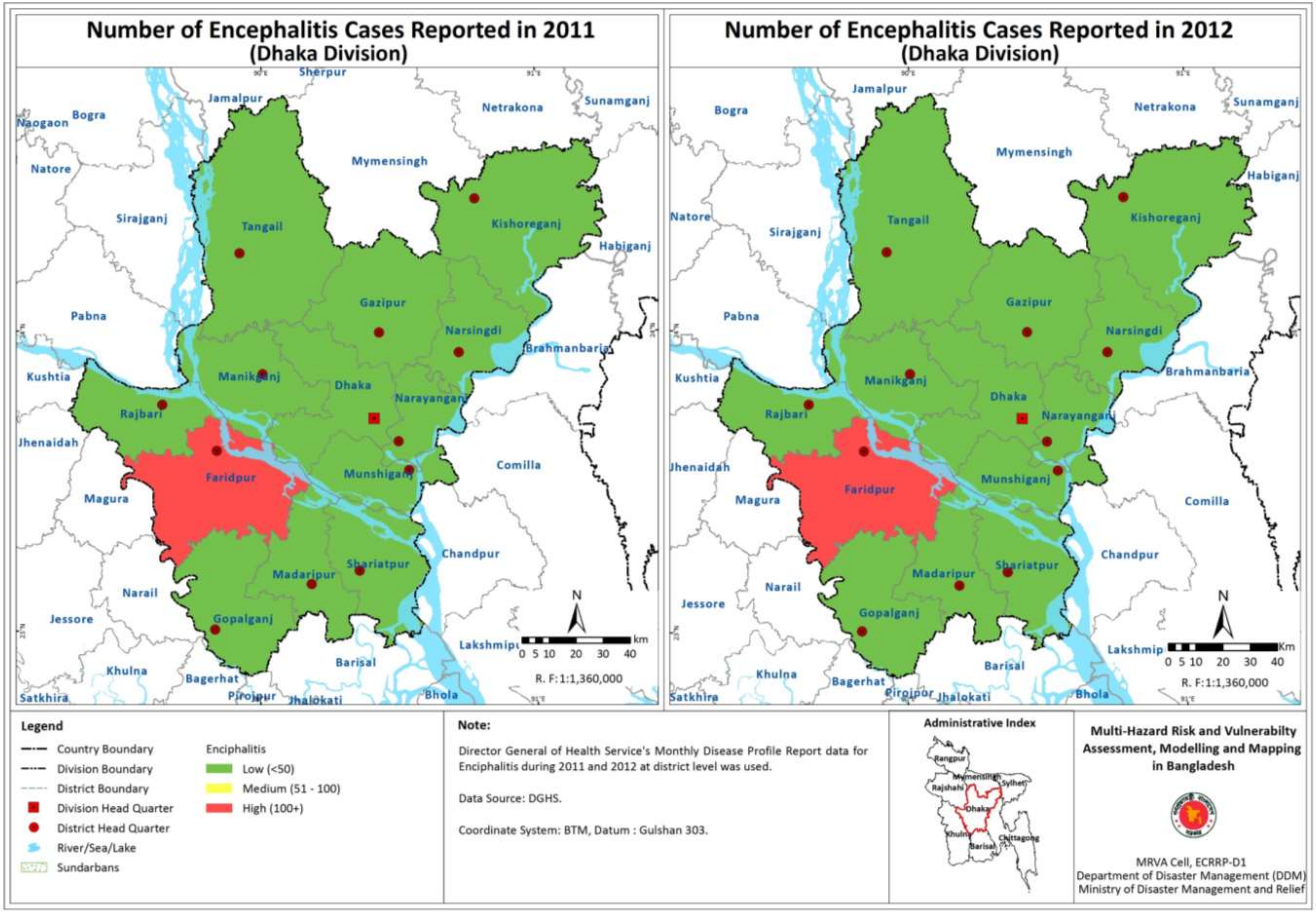
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

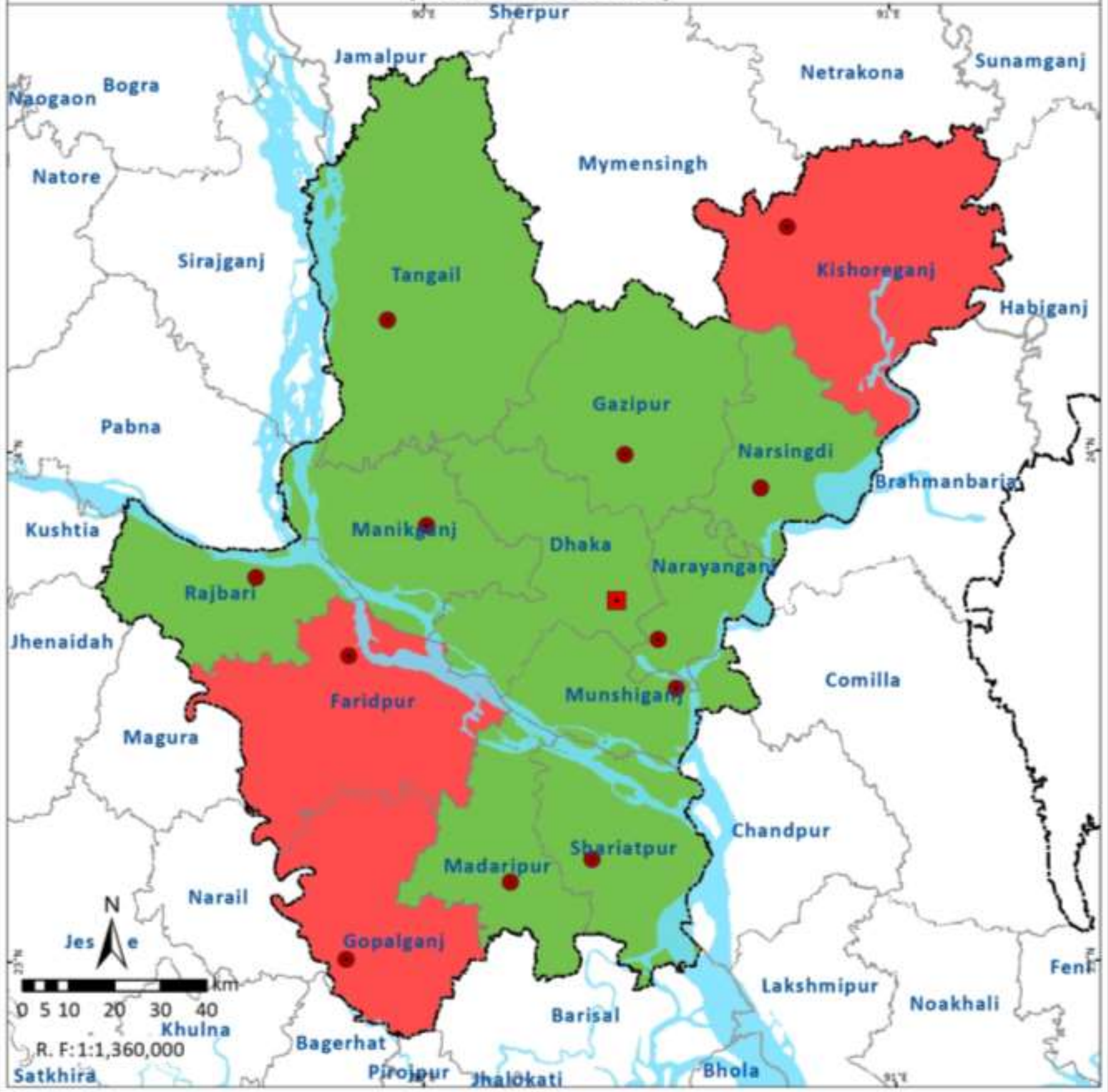

Number of Encephalitis Cases Reported in 2013
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Narail
Khulna
Gopalganj
Lakshmipur
Barisal
Noakhali
Pirojpur
Jhalokati
Bagerhat
Patuakhali
Bhola
Barguna
Bay of Bengal
N
0 5 10 20 30 40 km
R. F:1:910,000
Number of Encephalitis Cases Reported in 2011
(Chittagong Division)
Mymensingh
Kishoreganj
Habiganj
Maulvibazar
Tangail
Gazipur
Narsingdi
Brahmanbaria
Manikganj
Dhaka
Narayanganj
Faridpur
Munshiganj
Comilla
Madaripur
Shariatpur
Chandpur
Gopalganj
Khagrachhari
Feni
Khulna
Barisal
Lakshmipur
Rangamati
Pirojpur
Jhalokati
Noakhali
Chittagong
Bagerhat
Patuakhali
Bhola
Barguna
Bandarban
Cox's Bazar
Bay of Bengal
N
0 15 30 60 90 120 Km
R. F:1:910,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Encephalitis Cases Reported in 2012
(Chittagong Division)
Mymensingh
Kishoreganj
Habiganj
Maulvibazar
Tangail
Sirajganj
Gazipur
Pabna
Narsingdi
Brahmanbaria
Manikganj
Narayanganj
Rajbari
Dhaka
Comilla
Faridpur
Munshiganj
Shariatpur
Chandpur
Madaripur
Khagrachhari
Gopalganj
Feni
Narail
Khulna
Lakshmipur
Noakhali
Bagerhat
Barisal
Rangamati
Jhalokati
Chittagong
Pirojpur
Patuakhali
Bhola
Barguna
Bandarban
Cox's Bazar
Bay of Bengal
N
km
0 15 30 60 90 120
R. F: 1:2,510,000
Number of Encephalitis Cases Reported in 2013
(Chittagong Division)
Mymensingh
Kishoreganj
Habiganj
Maulvibazar
Tangail
Gazipur
Narsingdi
Brahmanbaria
Manikganj
Dhaka
Narayanganj
Faridpur
Munshiganj
Comilla
Madaripur
Shariatpur
Chandpur
Khagrachhari
Gopalganj
Feni
Khulna
Barisal
Lakshmipur
Rangamati
Pirojpur
Jhalokati
Noakhali
Chittagong
Bagerhat
Patuakhali
Bhola
Barguna
Bandarban
Cox's Bazar
Bay of Bengal
N
Km
0 15 30 60 90 120
R. F: 1:2,510,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

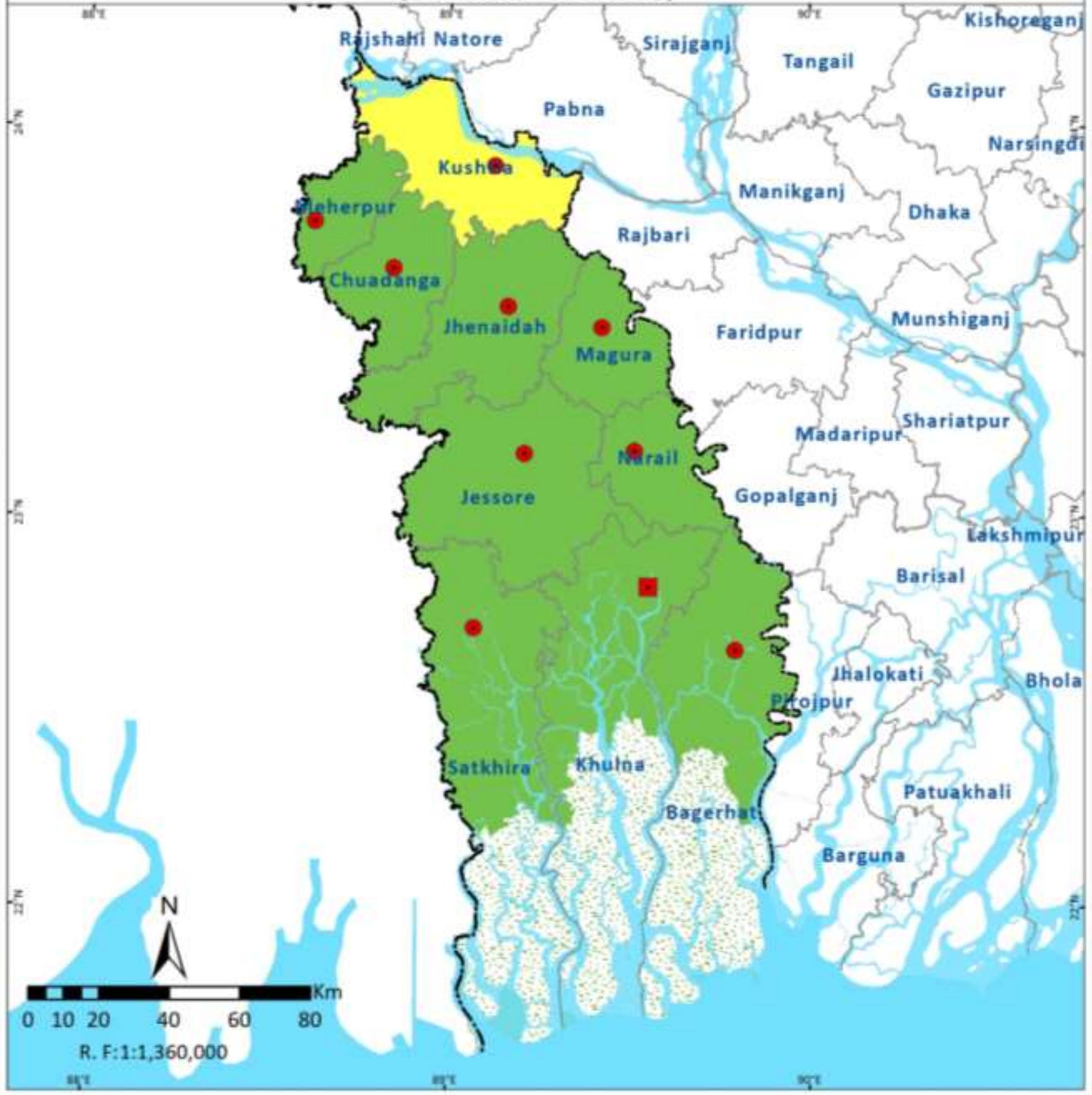


Number of Encephalitis Cases Reported in 2011
(Dhaka Division)
Number of Encephalitis Cases Reported in 2012
(Dhaka Division)
Sherpur
Jamalpur
Netrakona
Sunamganj
Naogaon
Bogra
Natore
Mymensingh
Habiganj
Sirajganj
Tangail
Kishoreganj
Gazipur
Pabna
Narsingdi
Brahmanbaria
Kushtia
Manikganj
Dhaka
Narayanganj
Rajbari
Jhenaidah
Faridpur
Munshiganj
Comilla
Magura
Chandpur
Shariatpur
Madaripur
Narail
Jessore
Gopalganj
Lakshmipur
Barisal
Khulna
Bagerhat
Satkhira
Pirojpur
Jhalokati
Bhola
N
0 5 10 20 30 40 km
R. F:1:1,360,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2013
(Dhaka Division)



Number of Encephalitis Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2013 at district level was used.

Data Source: DGHS.

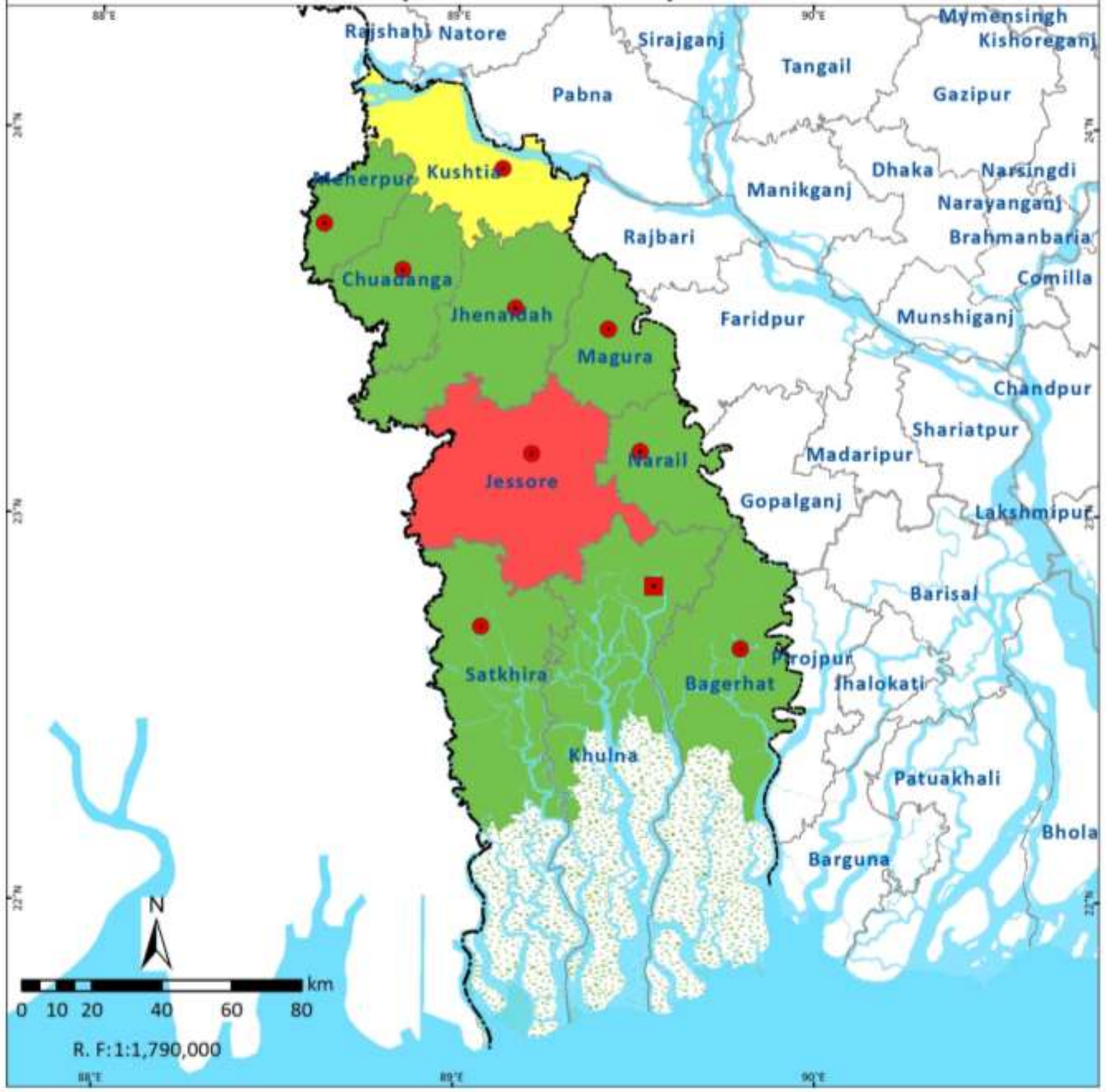
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

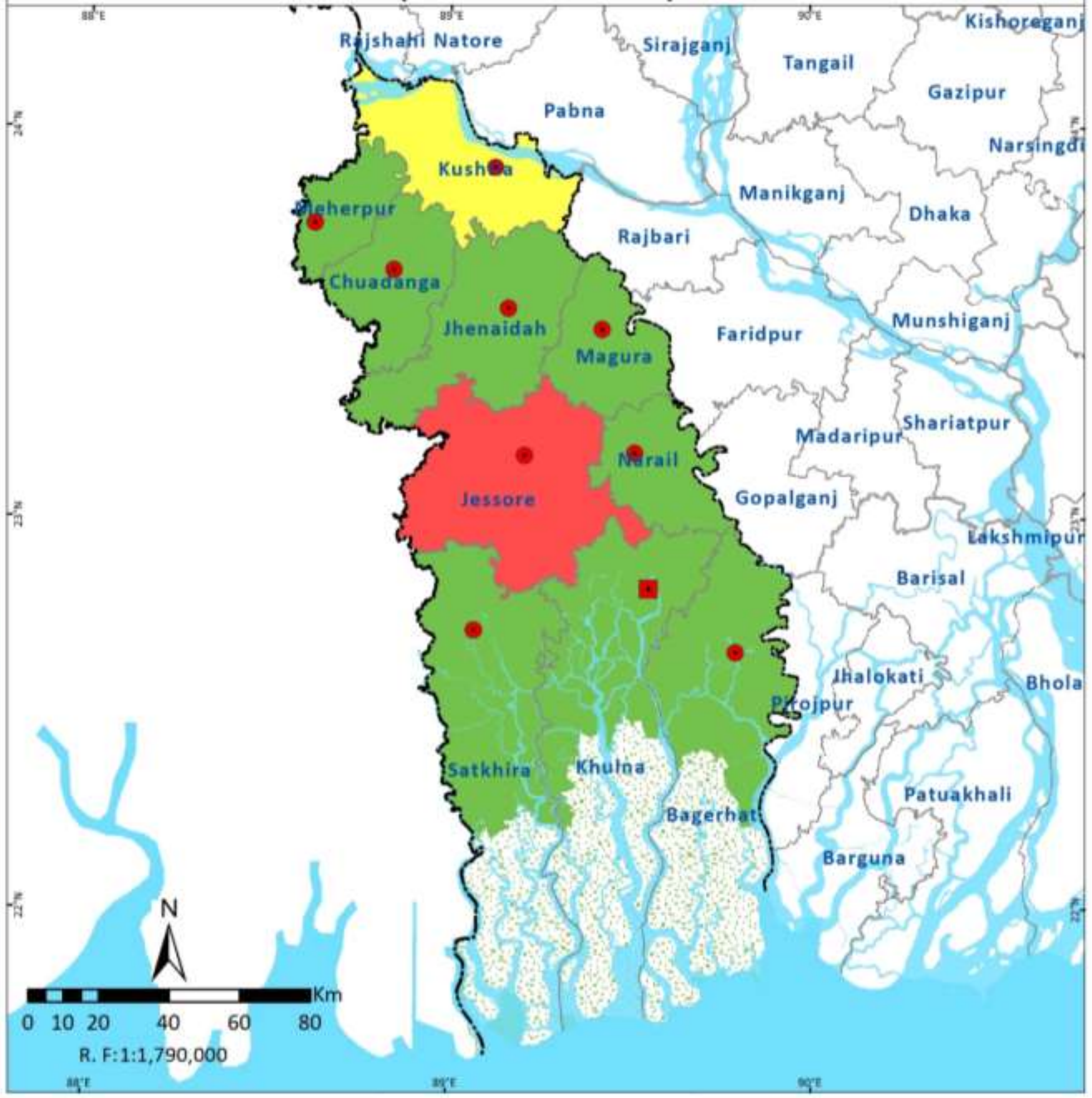
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2012 (Khulna Division)



Number of Encephalitis Cases Reported in 2013 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2012 and 2013 at district level was used.

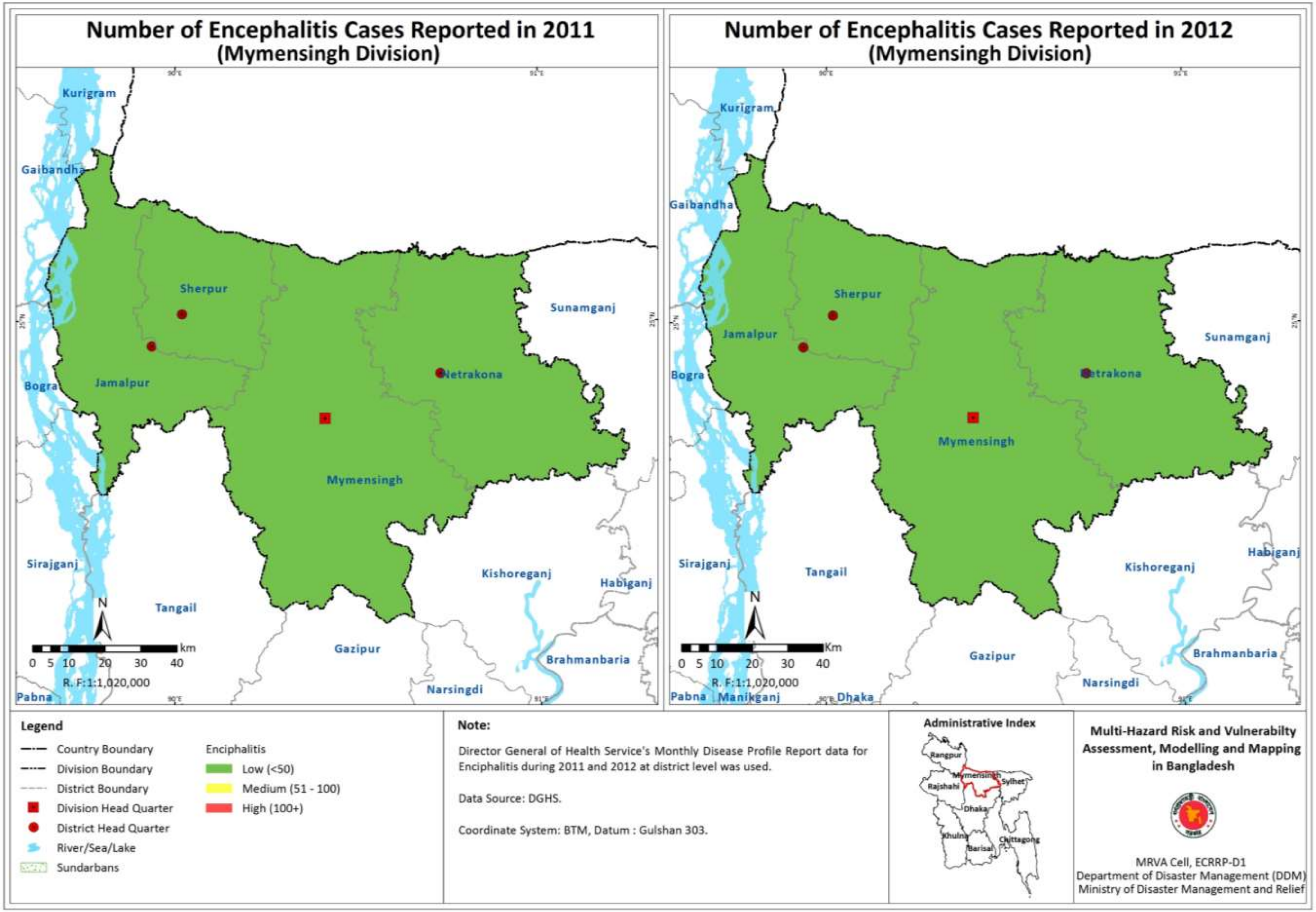
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

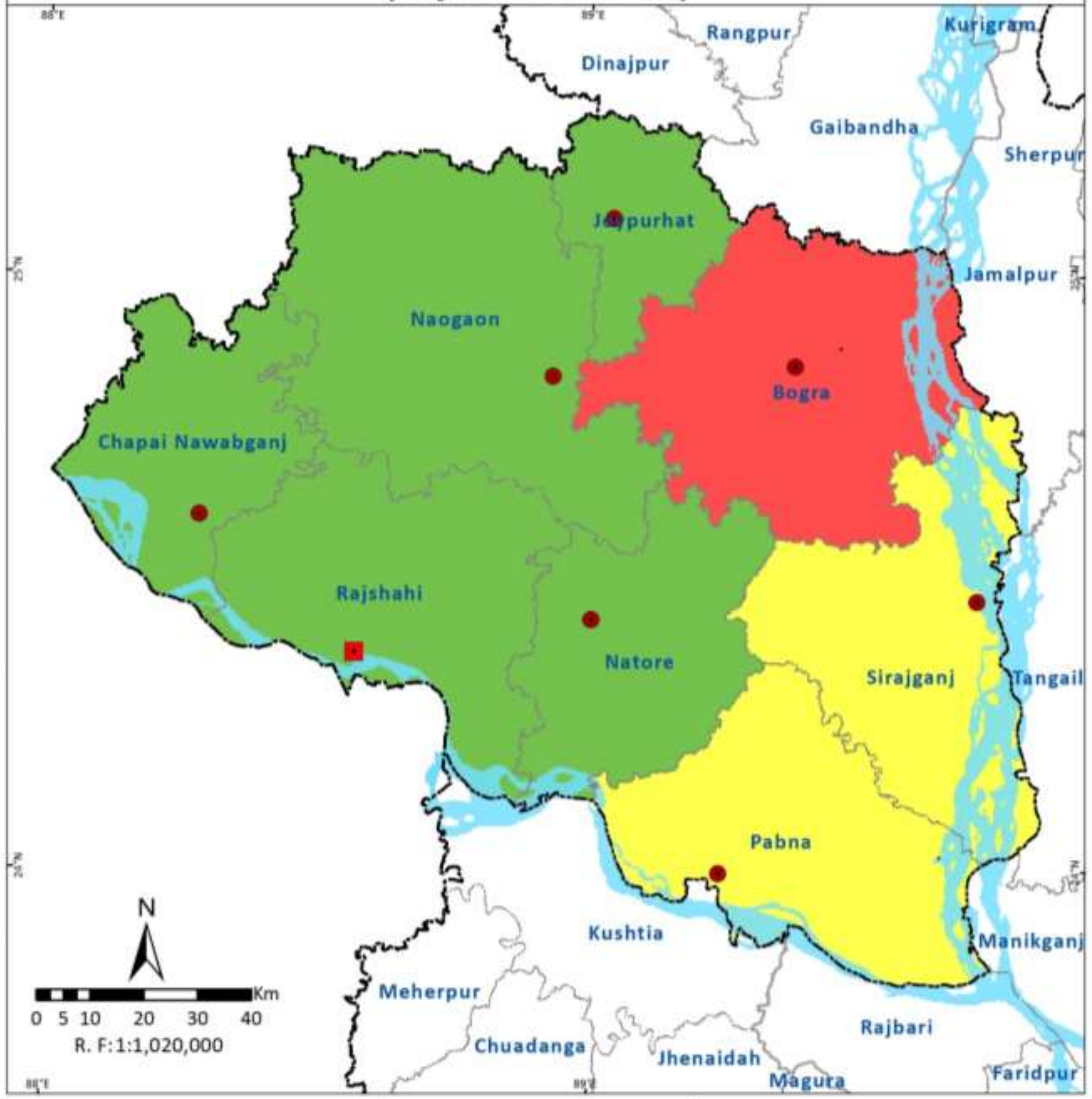
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Encephalitis Cases Reported in 2011
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Bogra
Netrakona
Sunamganj
Mymensingh
Sirajganj
Tangail
Kishoreganj
Habiganj
Gazipur
Brahmanbaria
Narsingdi
Pabna
N
0 5 10 20 30 40 km
R. F: 1:1,020,000
Number of Encephalitis Cases Reported in 2012
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Bogra
Netrakona
Sunamganj
Mymensingh
Sirajganj
Tangail
Kishoreganj
Habiganj
Gazipur
Brahmanbaria
Narsingdi
Pabna
Manikganj
Dhaka
N
0 5 10 20 30 40 Km
R. F: 1:1,020,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2013
(Mymensingh Division)

Number of Encephalitis Cases Reported in 2011
(Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2013 at district level was used.

Data Source: DGHS.

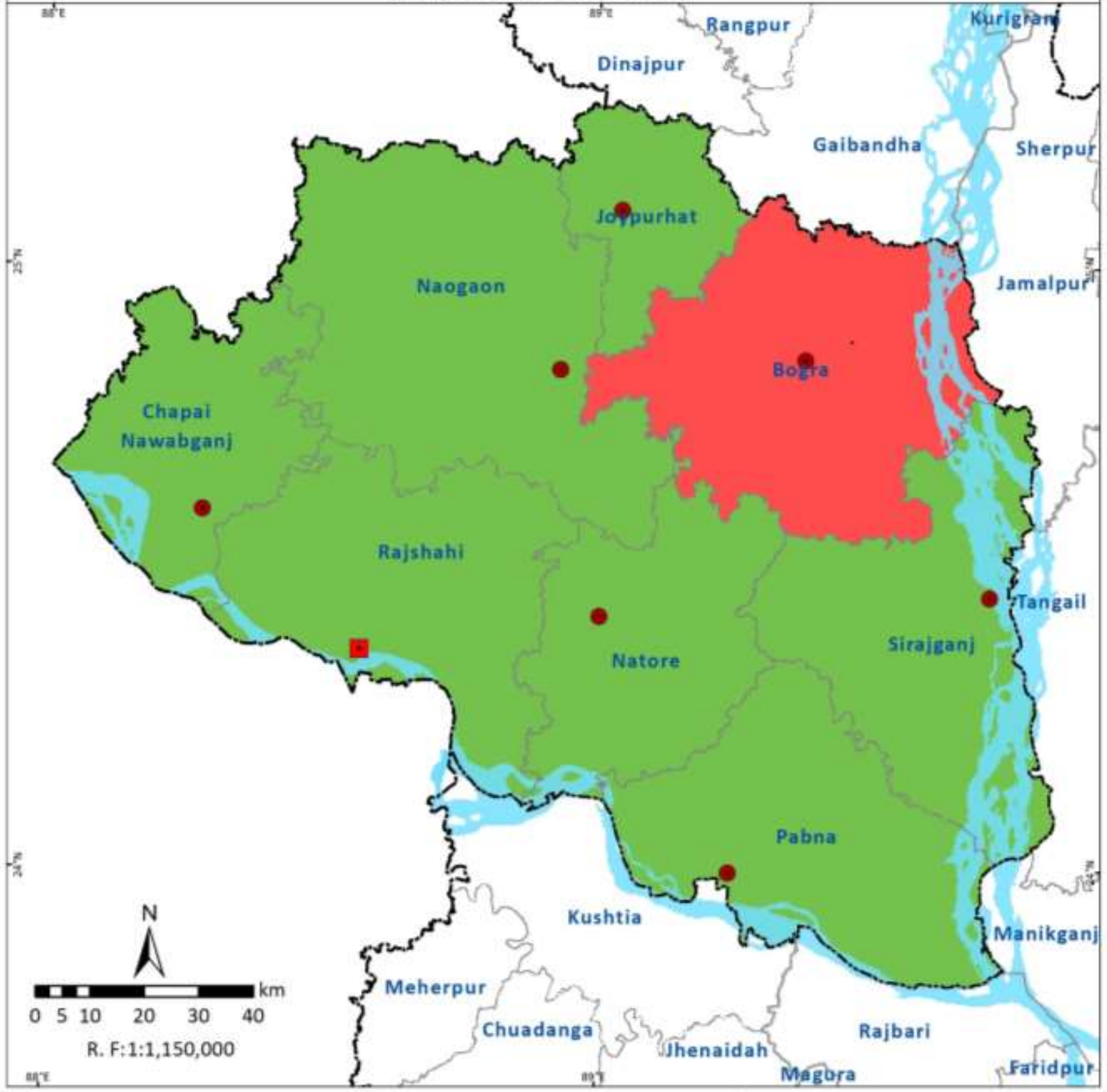
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

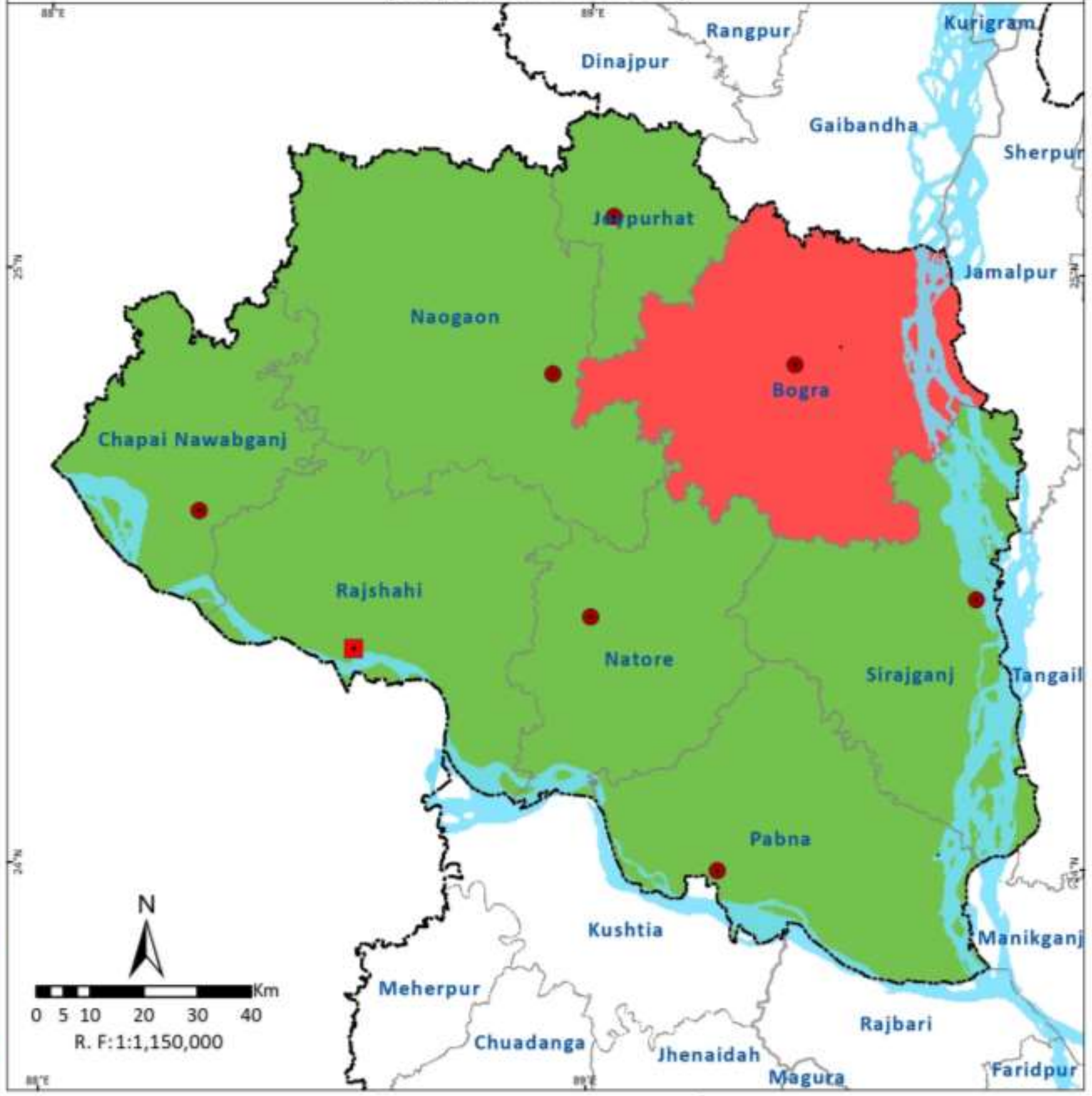
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2012 (Rajshahi Division)



Number of Encephalitis Cases Reported in 2013 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2012 and 2013 at district level was used.

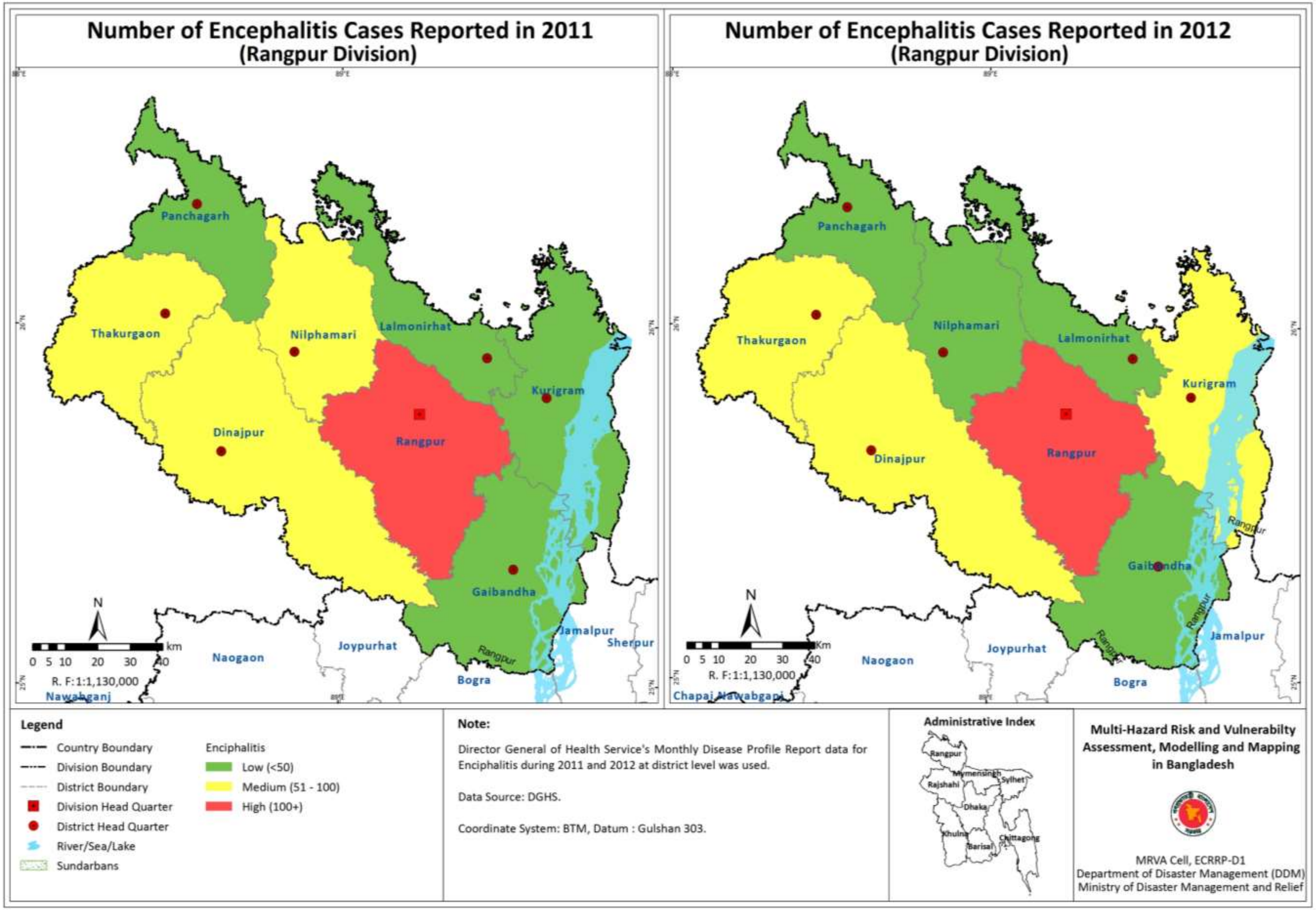
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

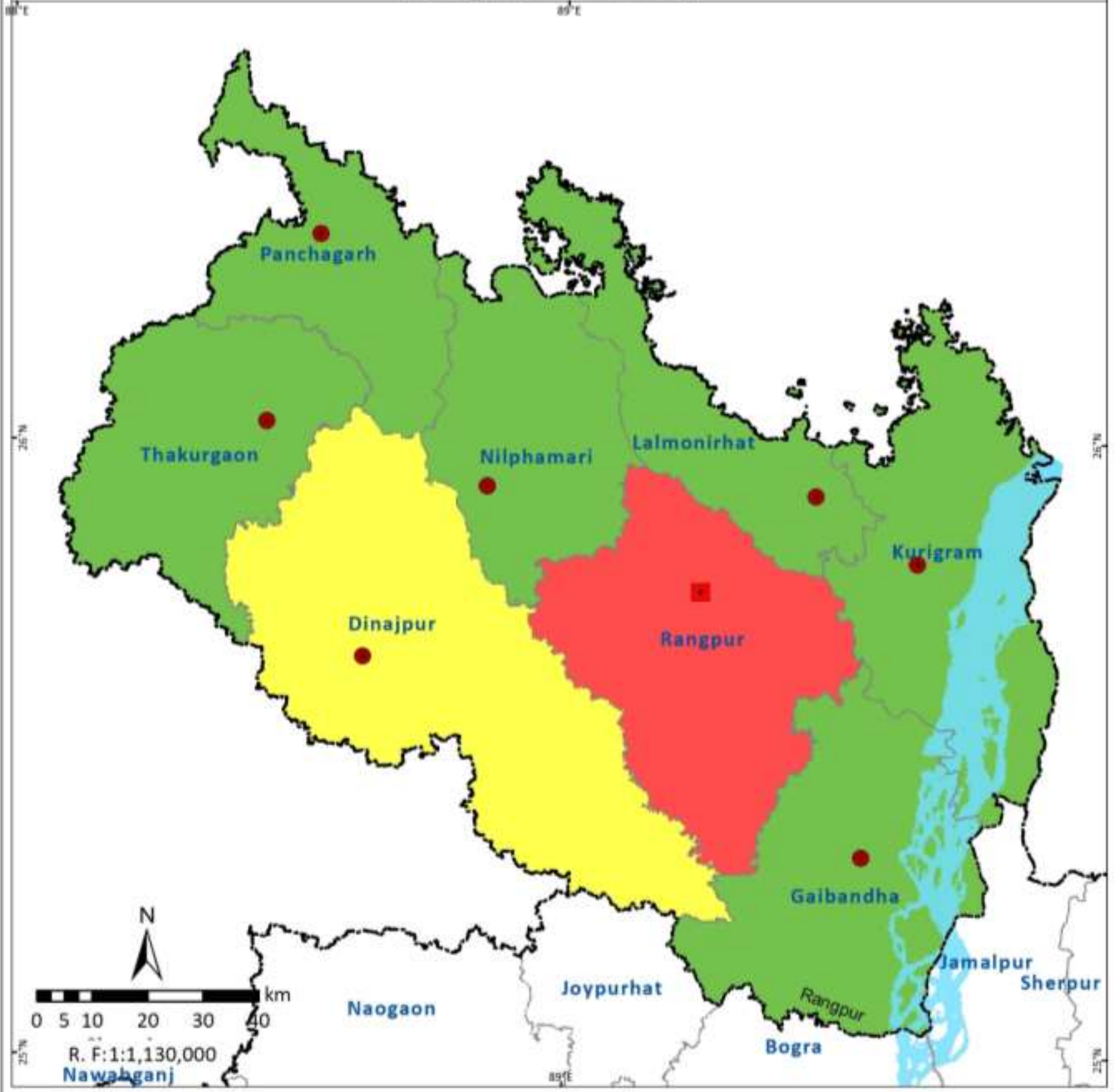
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

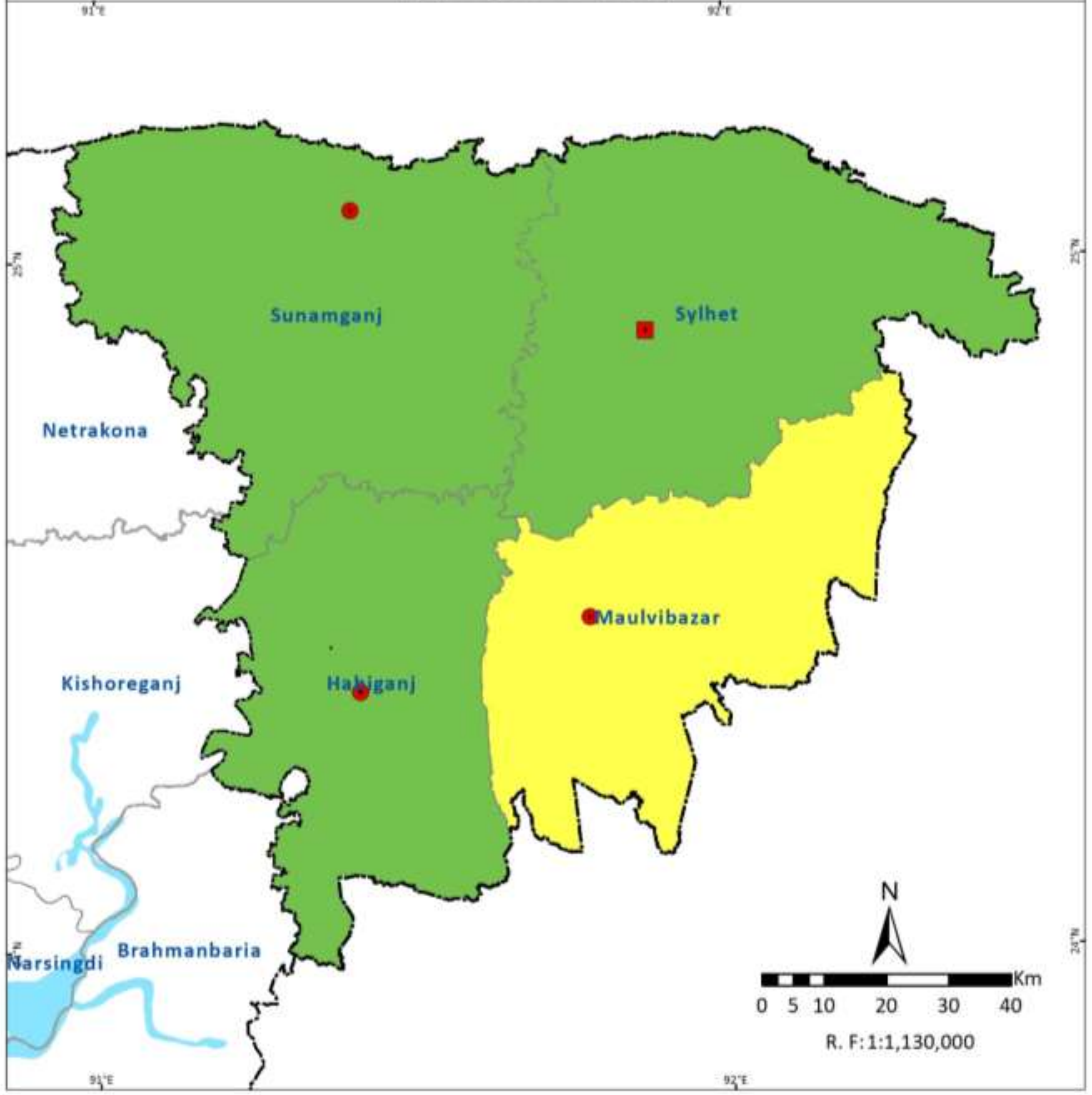
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Encephalitis Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F: 1:1,130,000
Number of Encephalitis Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Chapai Nawabganj
N
Km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Rajshahi
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Encephalitis Cases Reported in 2013
(Rangpur Division)



Number of Encephalitis Cases Reported in 2011
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Enciphalitis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2011 and 2013 at district level was used.

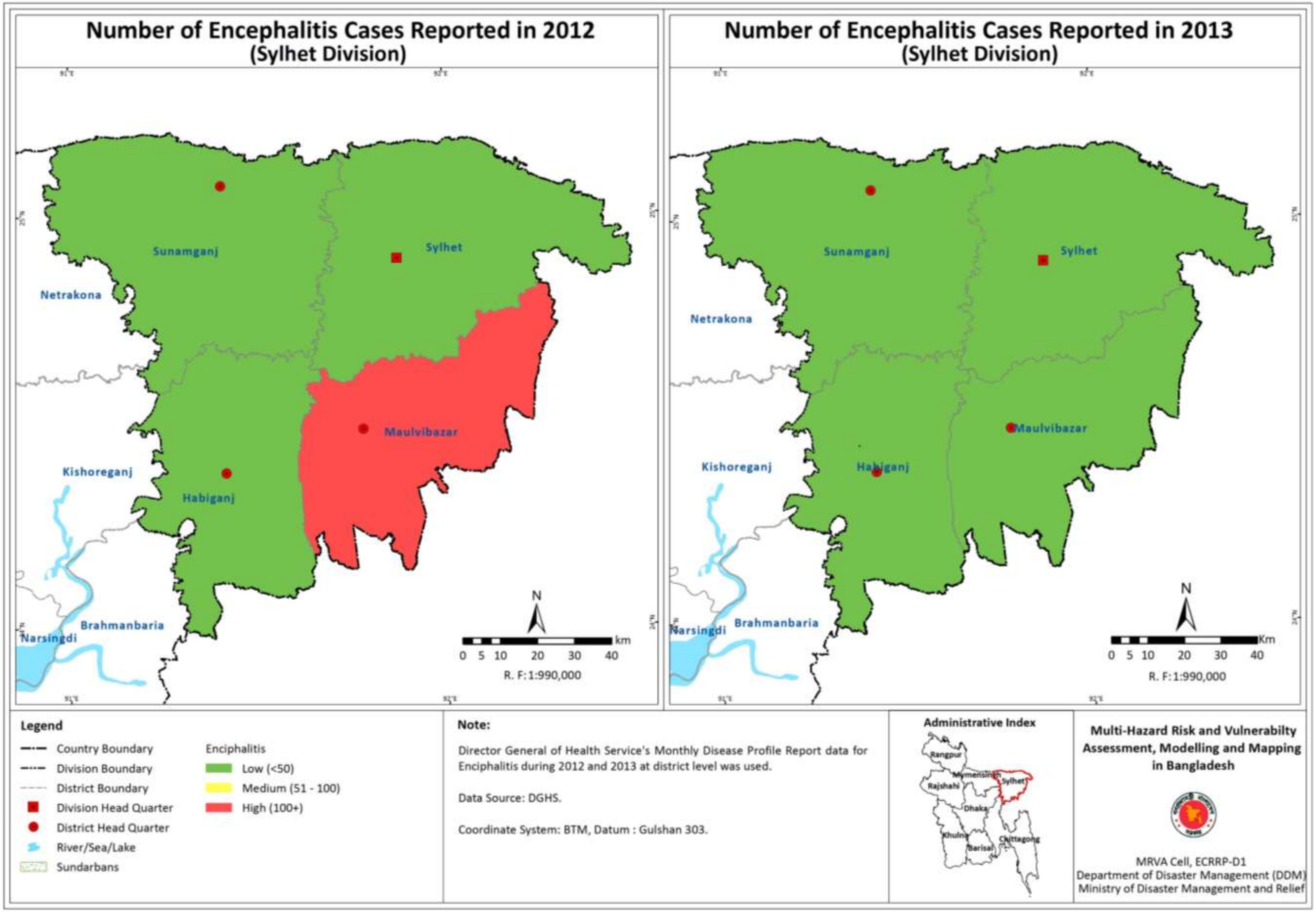
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

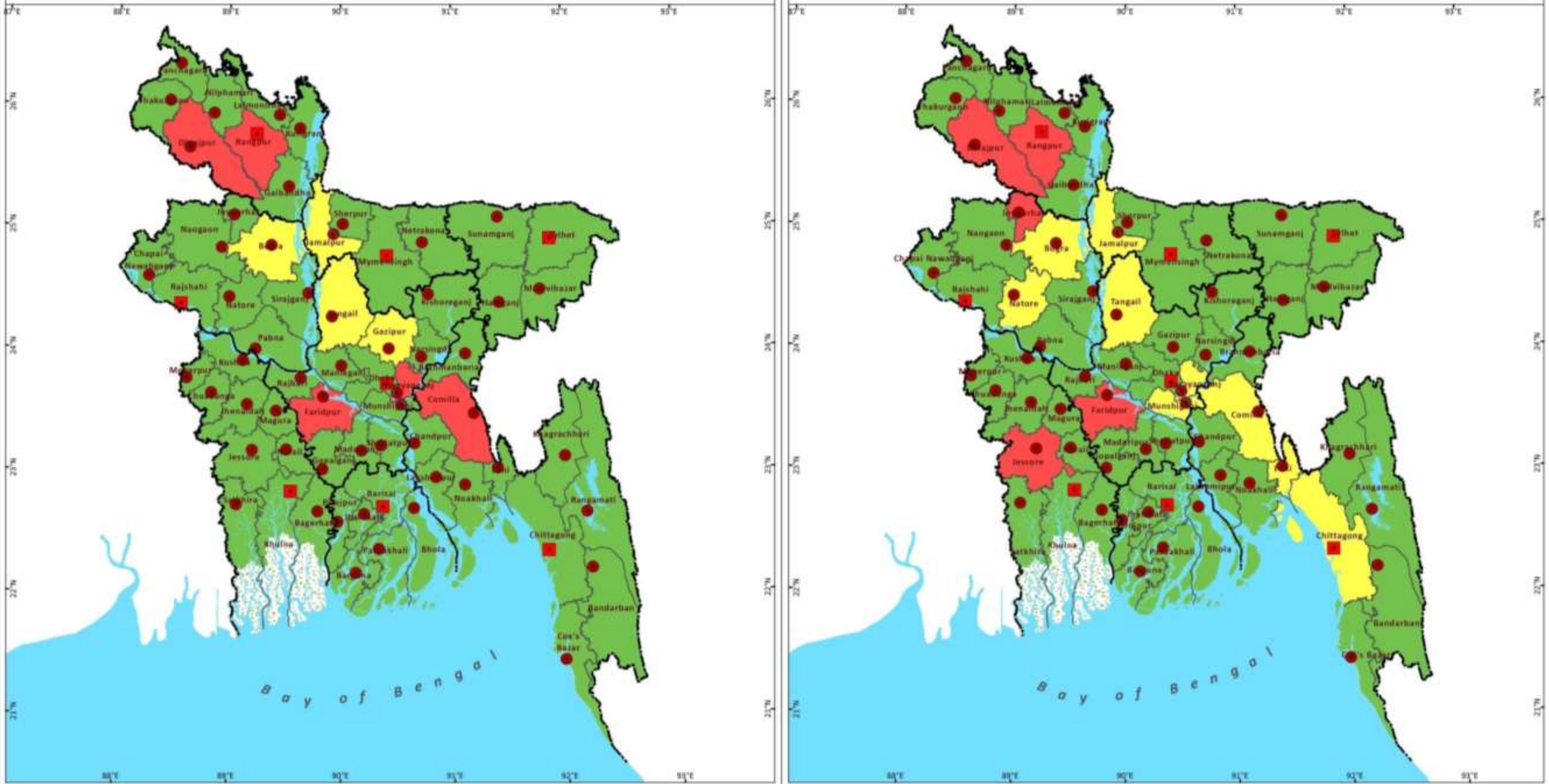
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Encephalitis Cases Reported in 2012
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Brahmanbaria
Narsingdi
0 5 10 20 30 40 km
R. F: 1:990,000
Number of Encephalitis Cases Reported in 2013
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Brahmanbaria
Narsingdi
0 5 10 20 30 40 Km
R. F: 1:990,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Enciphalitis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Enciphalitis during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported at District Level in 2011

Number of Filariasis Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

N

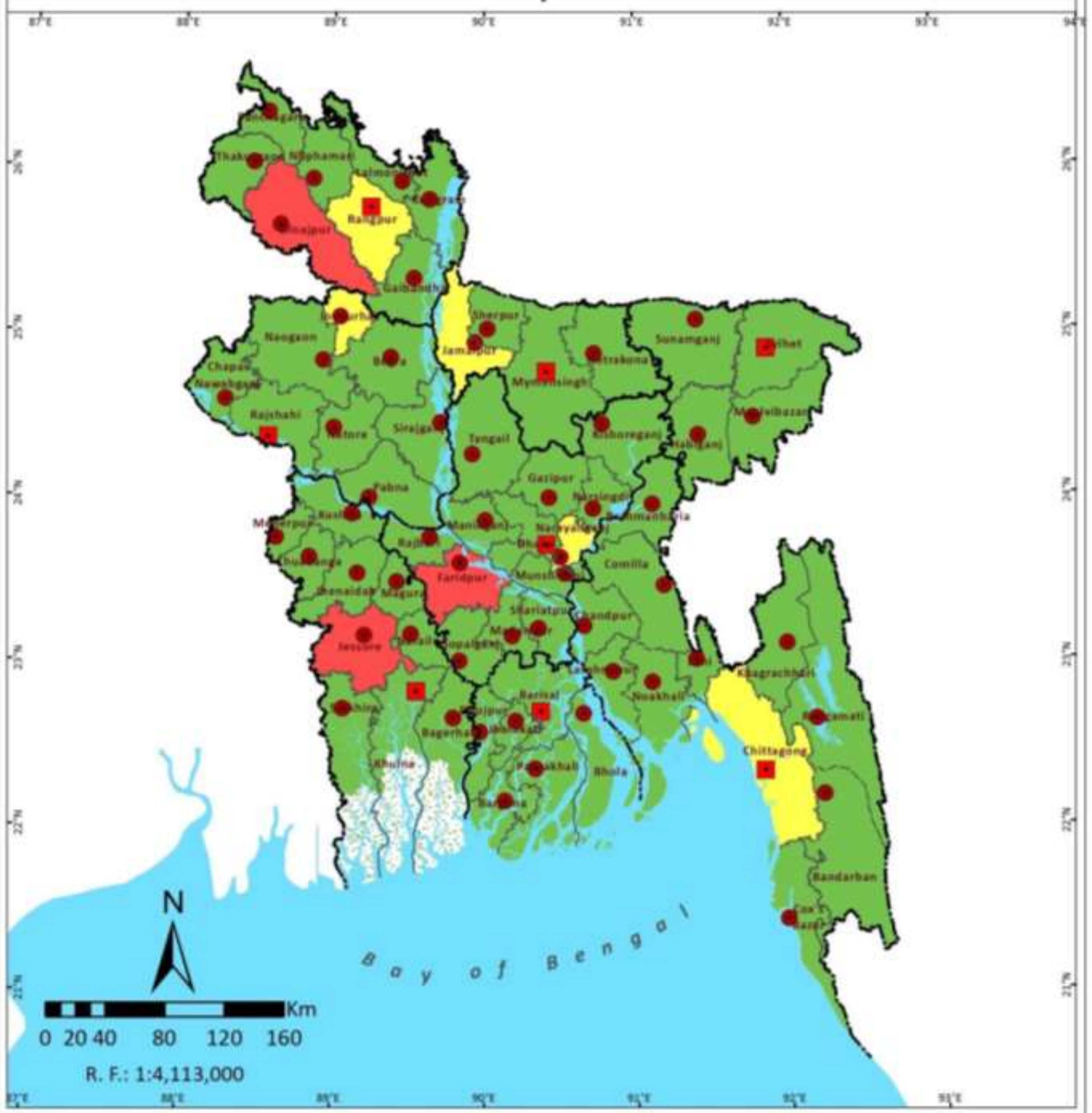
0 25 50 100 150 200 Km

R. F.: 1:4,000,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported at District Level in 2013



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

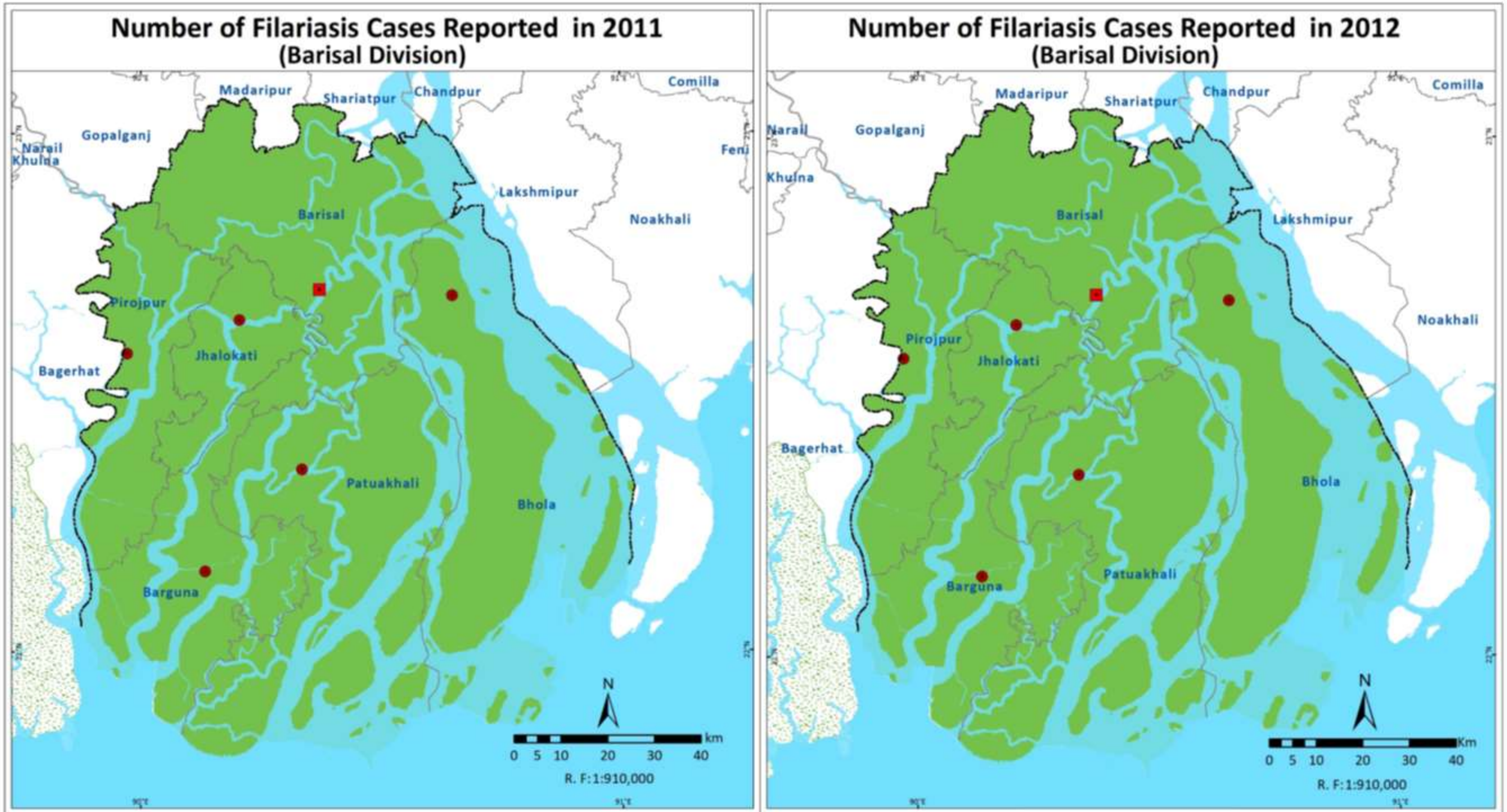
Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Legend

Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans

Filariasis
Low (<50)
Medium (51 - 100)
High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.

Data Source: DGHS.

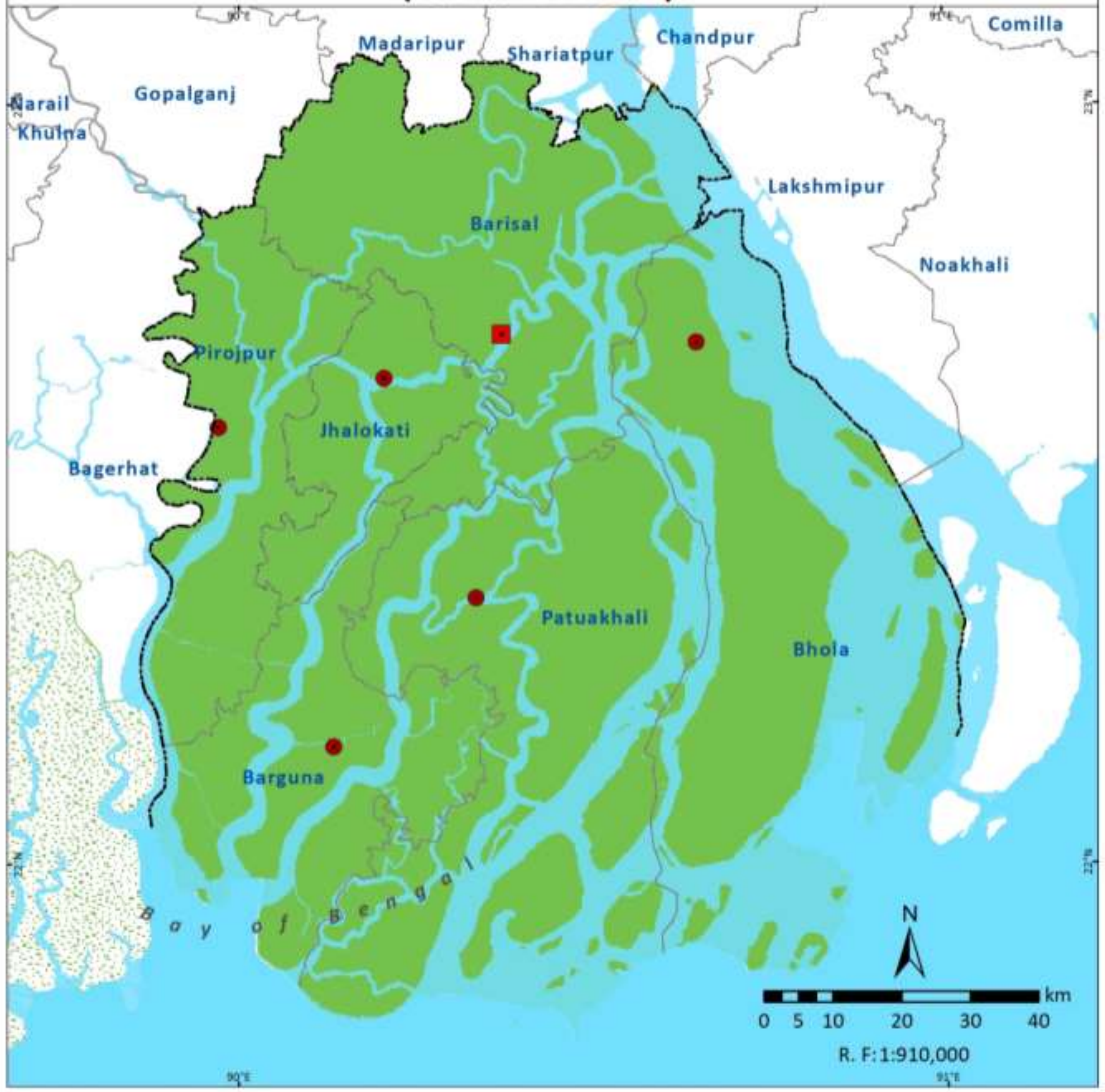
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

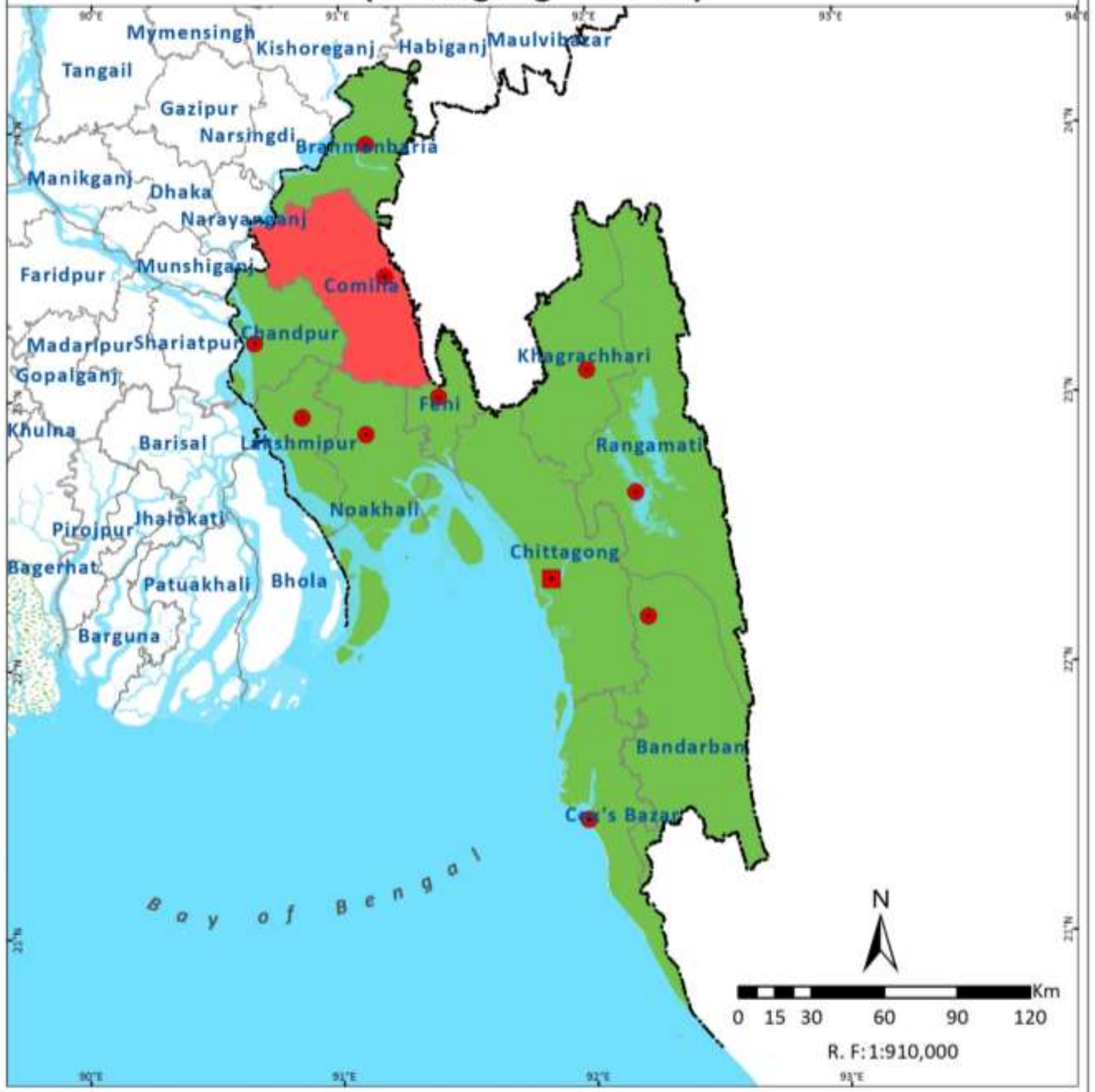
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2013
(Barisal Division)



Number of Filariasis Cases Reported in 2011
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2013 at district level was used.

Data Source: DGHS.

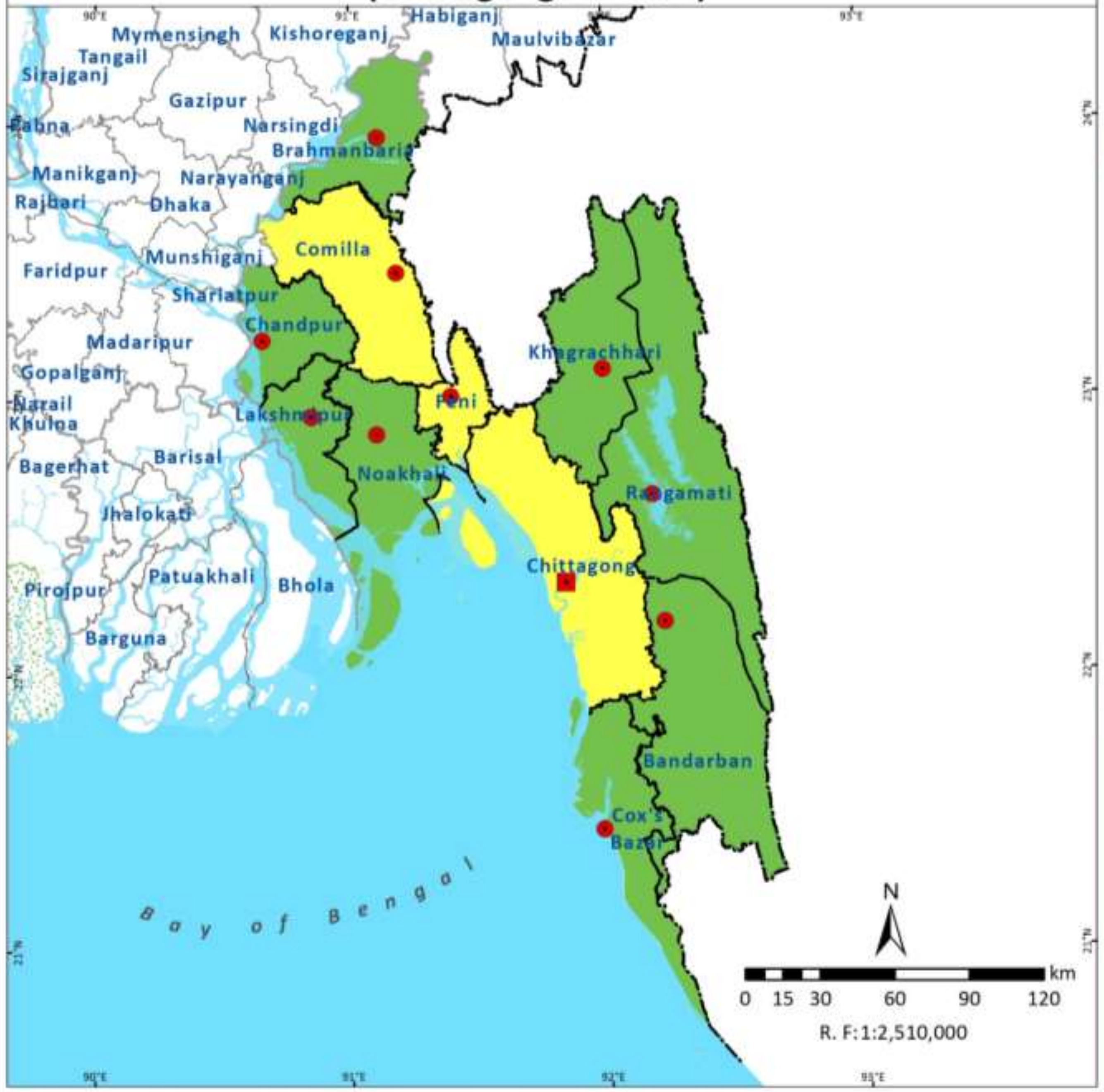
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

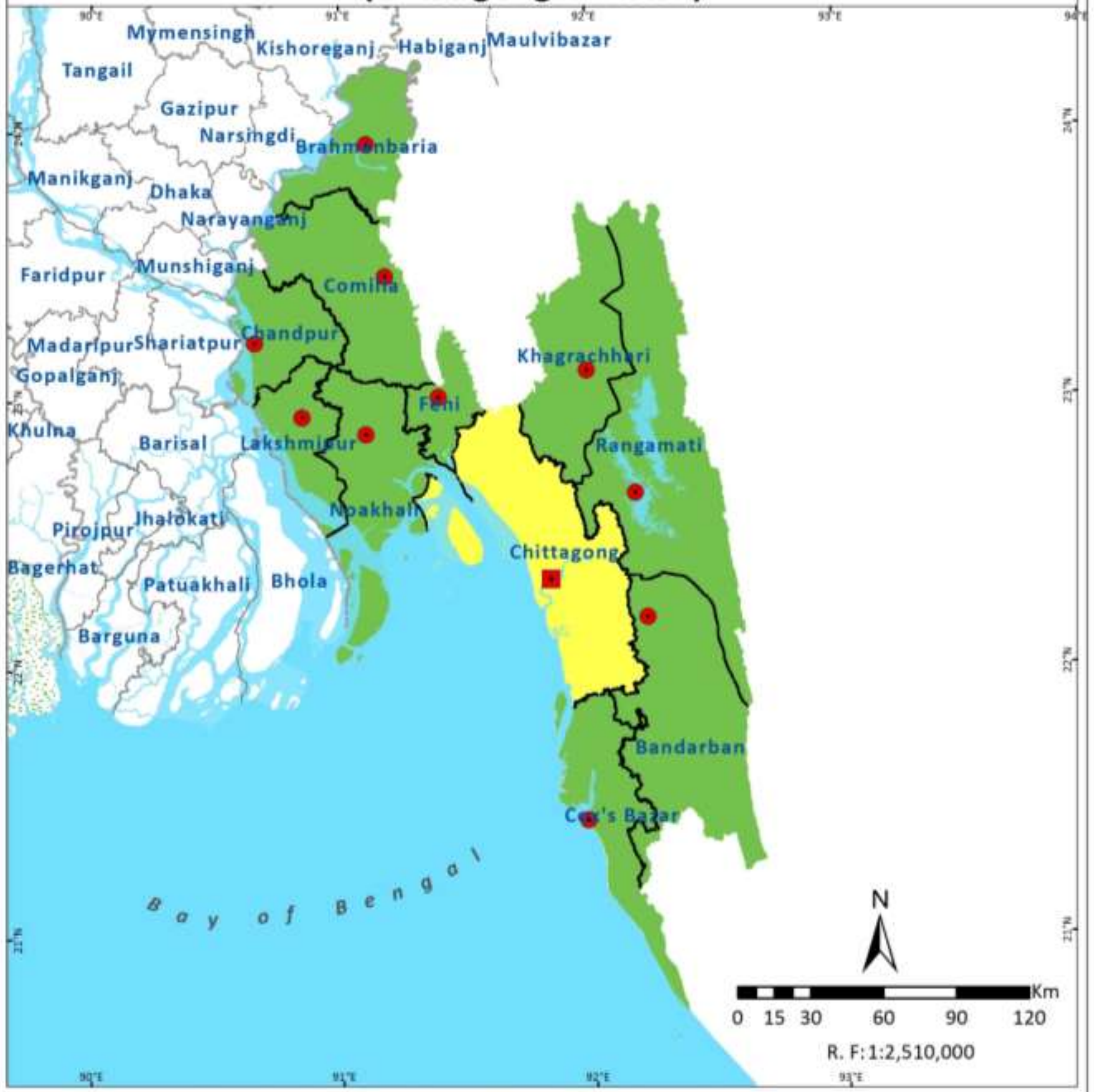
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2012 (Chittagong Division)



Number of Filariasis Cases Reported in 2013 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2012 and 2013 at district level was used.

Data Source: DGHS.

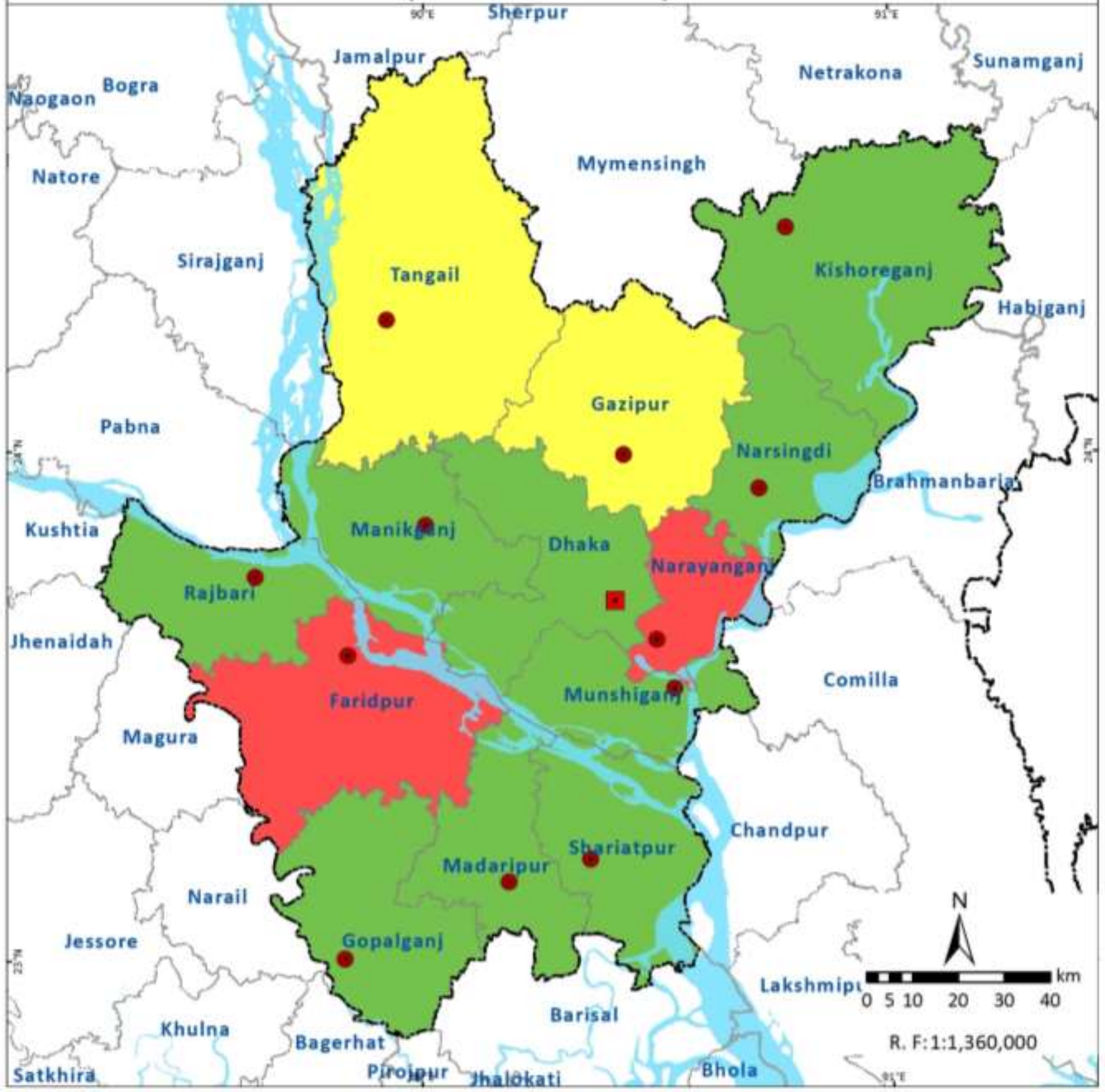
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

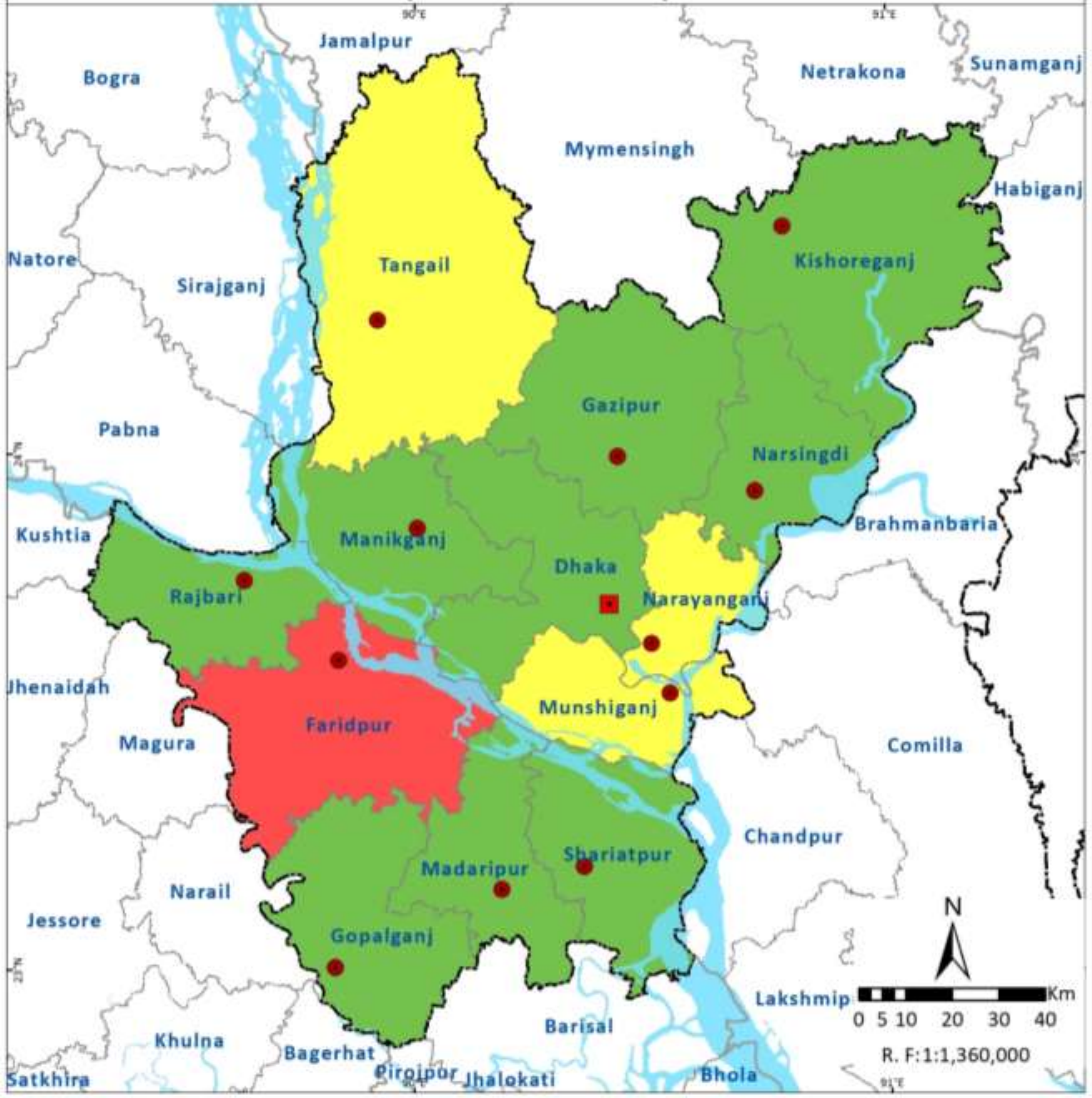
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2011
(Dhaka Division)



Number of Filariasis Cases Reported in 2012
(Dhaka Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis
- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.

Data Source: DGHS.

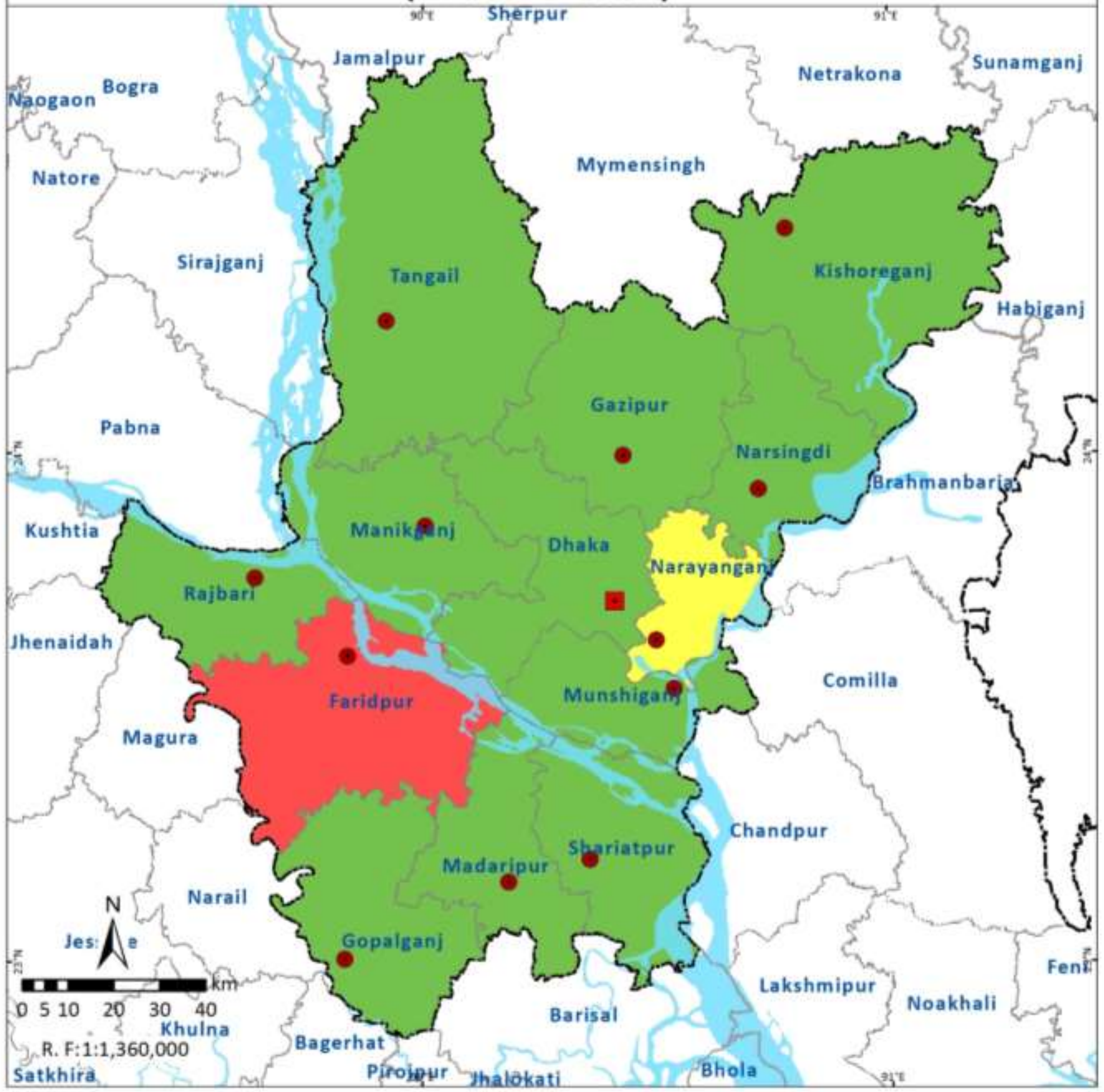
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

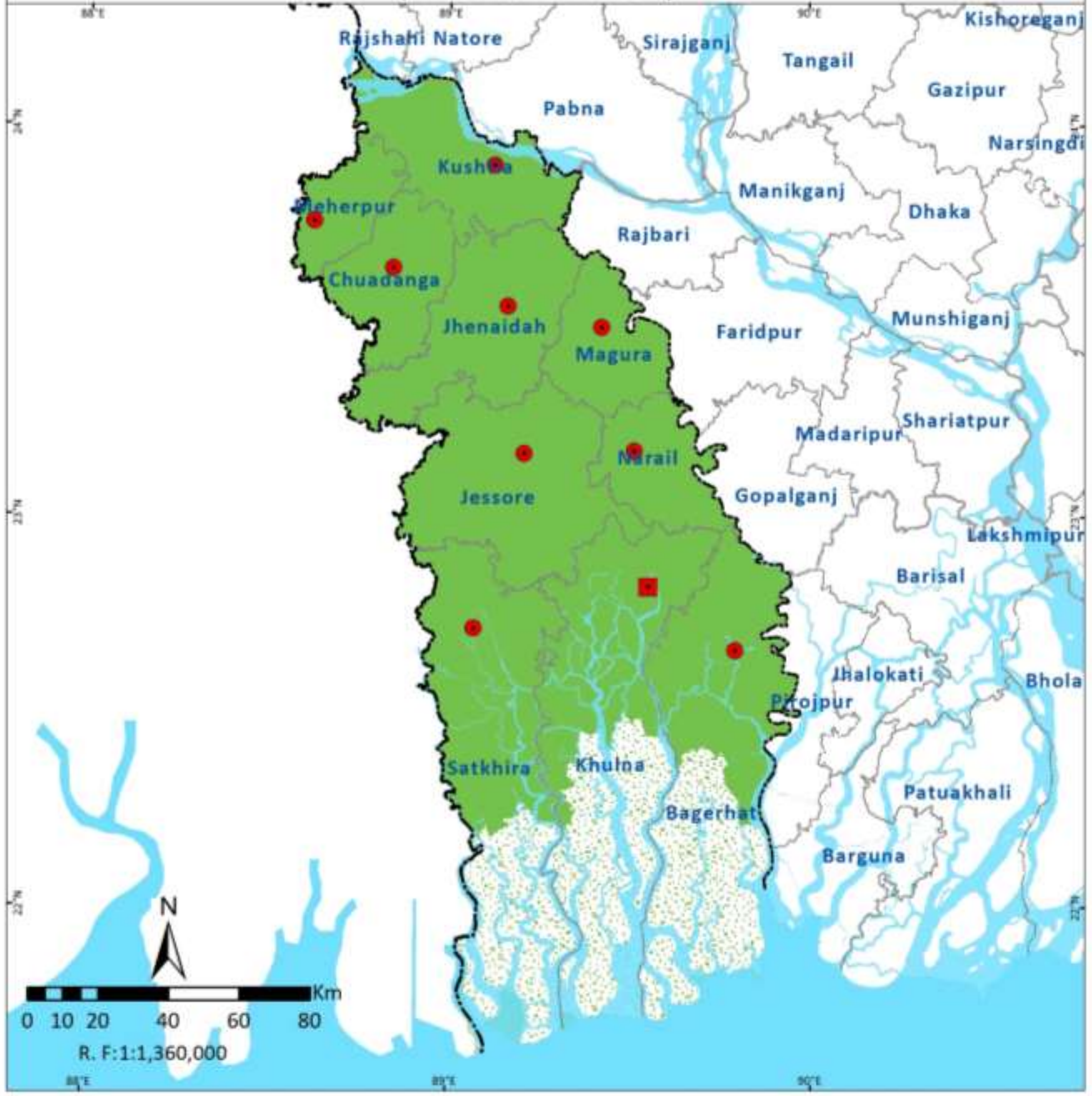
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2013
(Dhaka Division)



Number of Filariasis Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2013 at district level was used.

Data Source: DGHS.

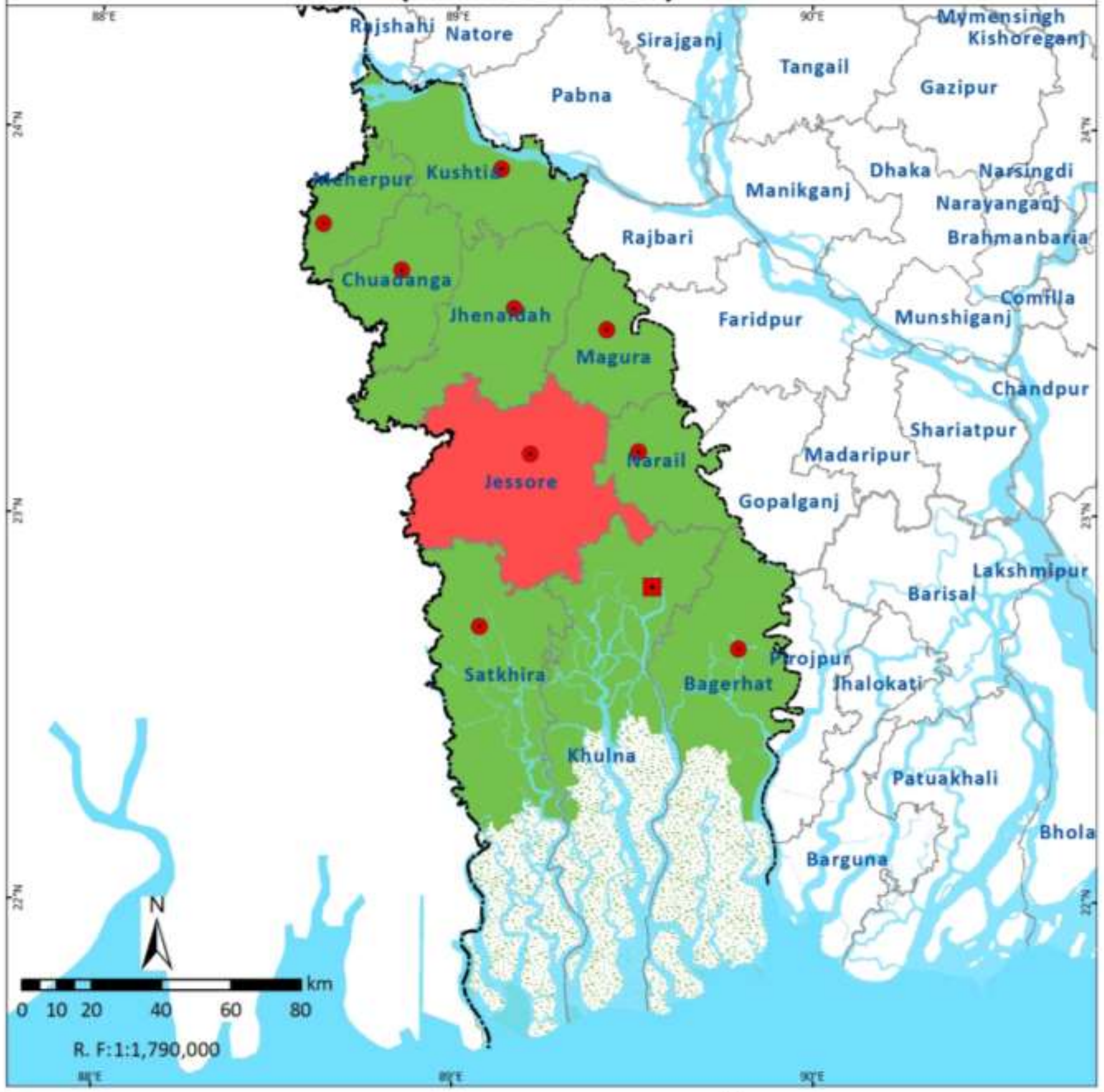
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

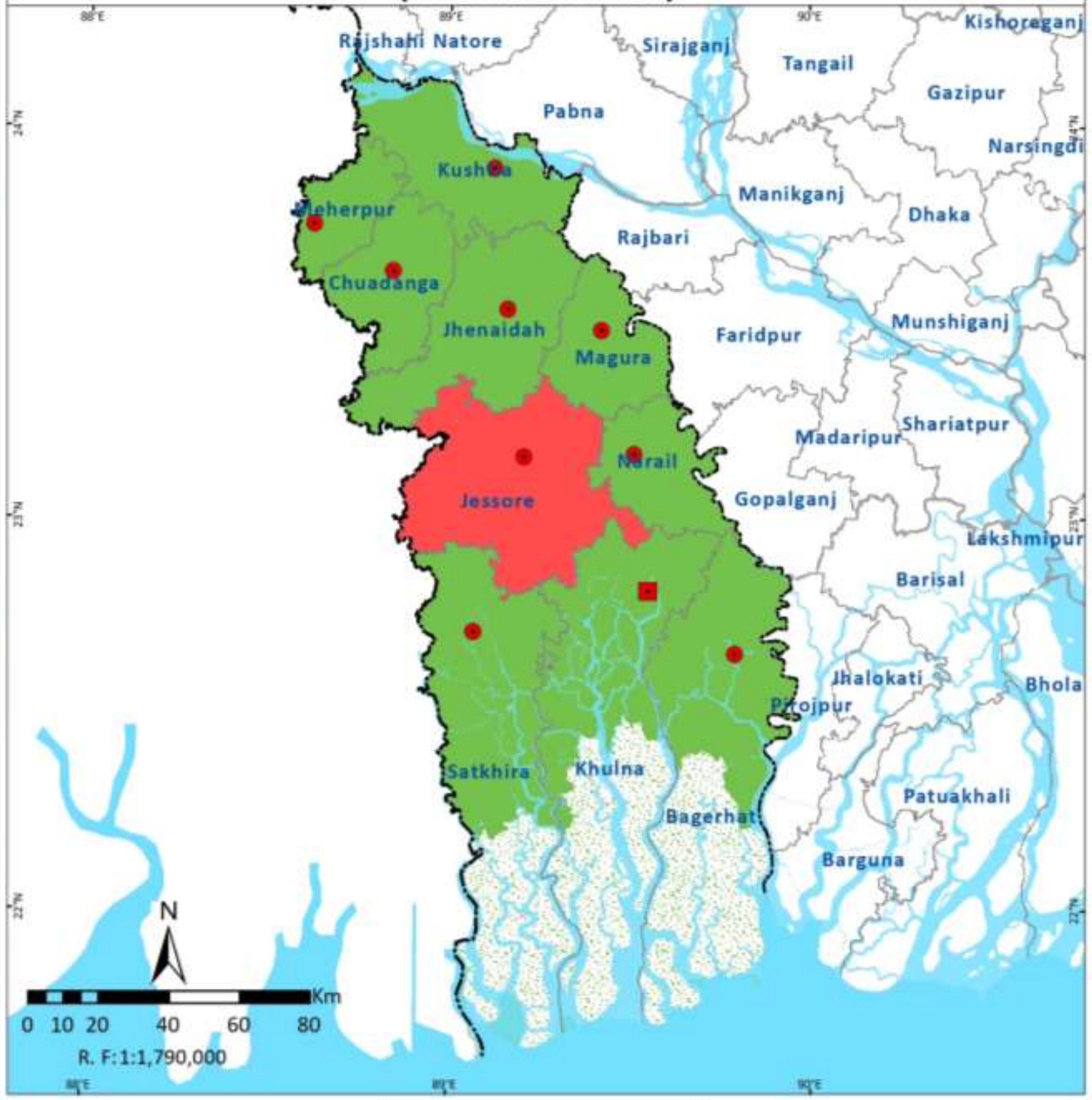
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2012 (Khulna Division)



Number of Filariasis Cases Reported in 2013 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2012 and 2013 at district level was used.

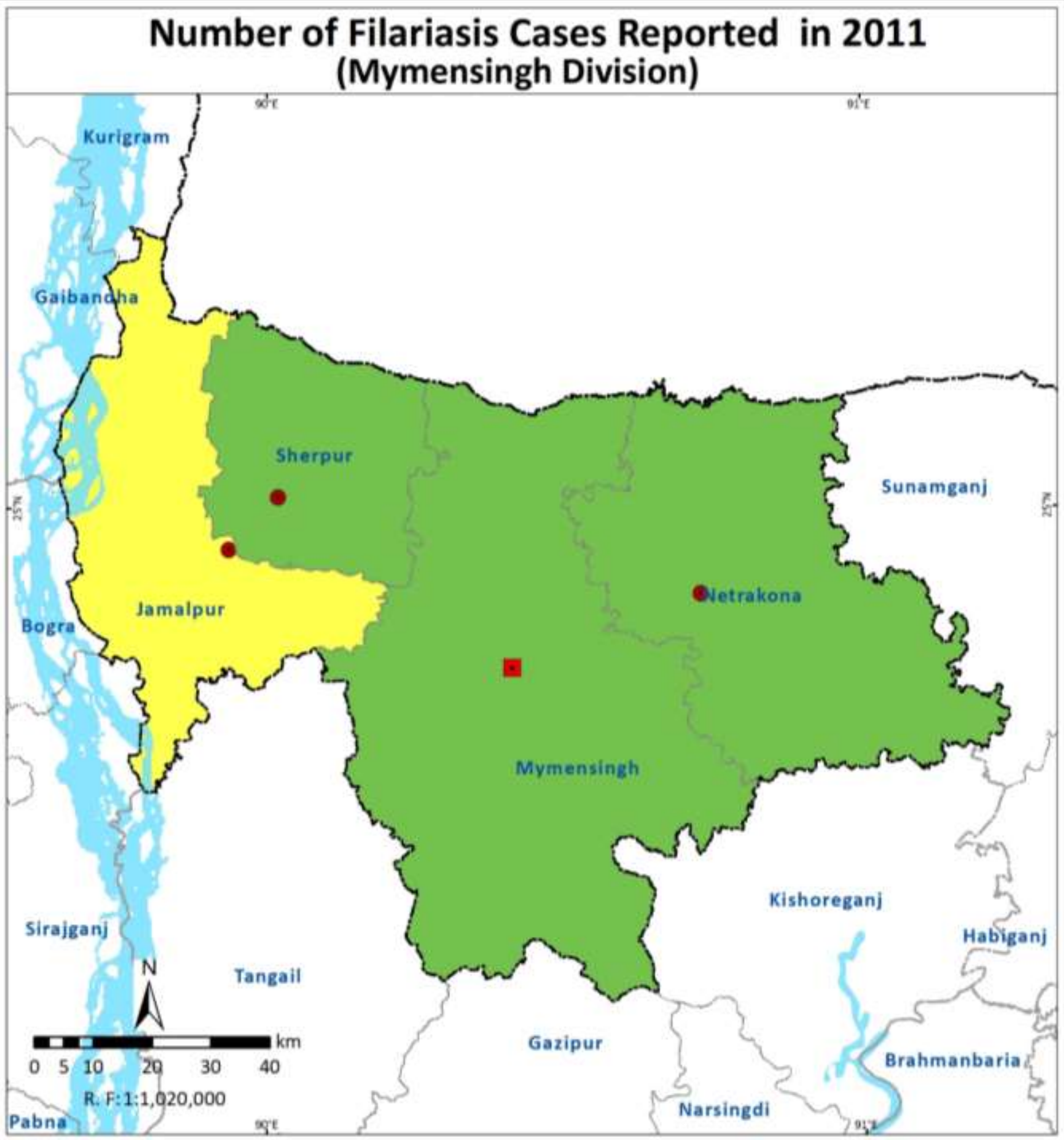
Data Source: DGHS.

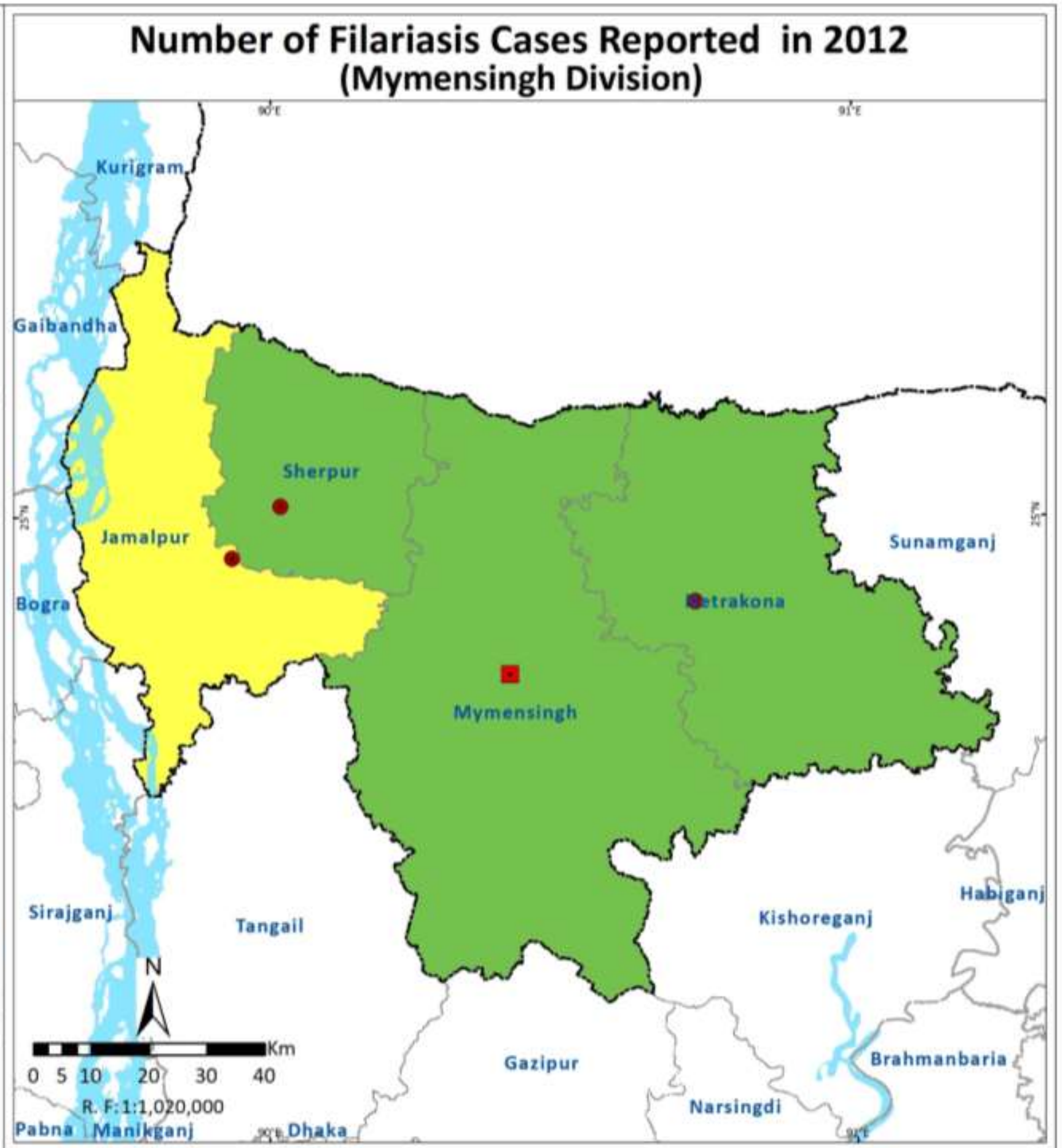
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief





Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

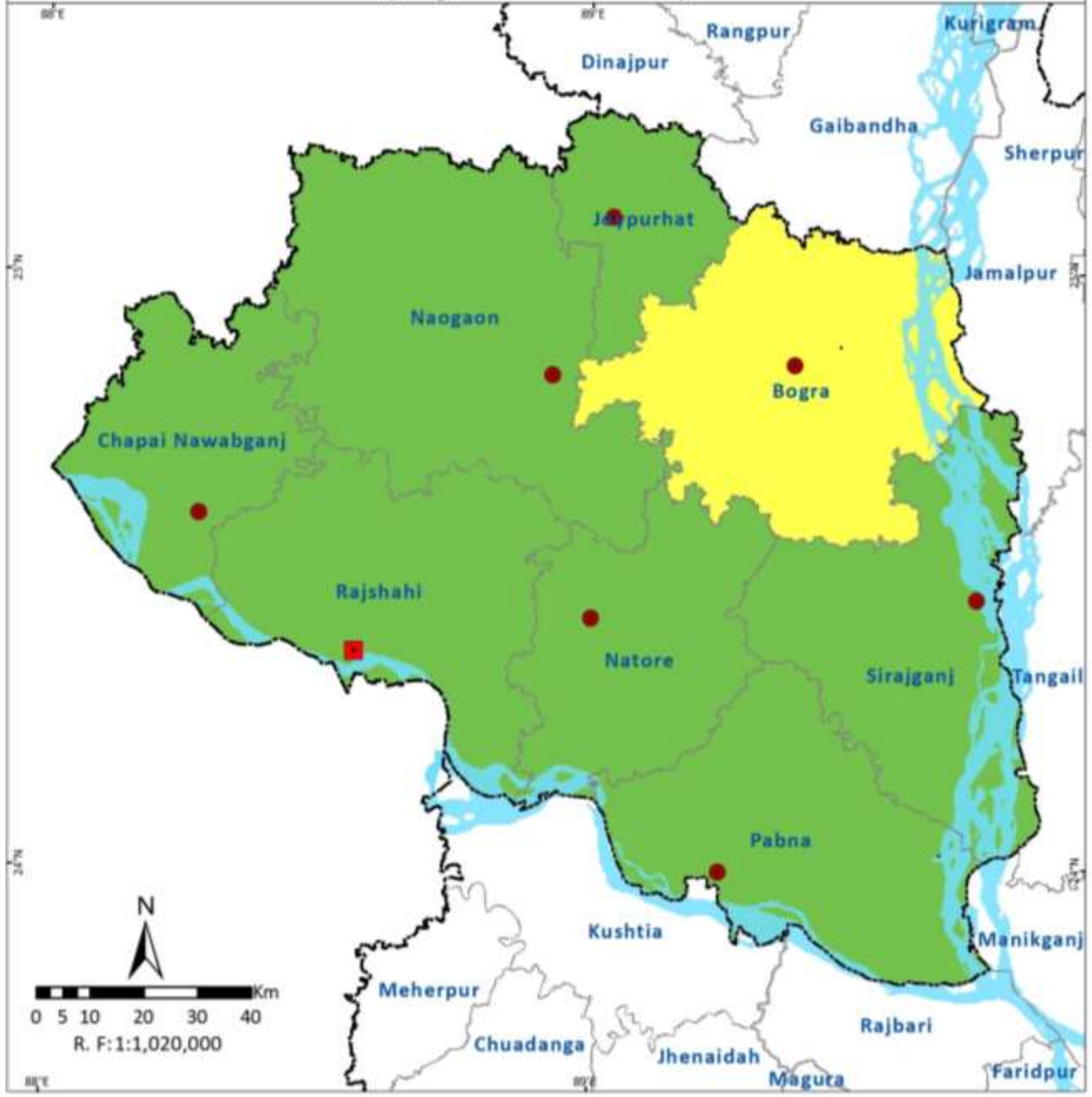
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Filariasis Cases Reported in 2013 (Mymensingh Division)

Number of Filariasis Cases Reported in 2011 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2013 at district level was used.

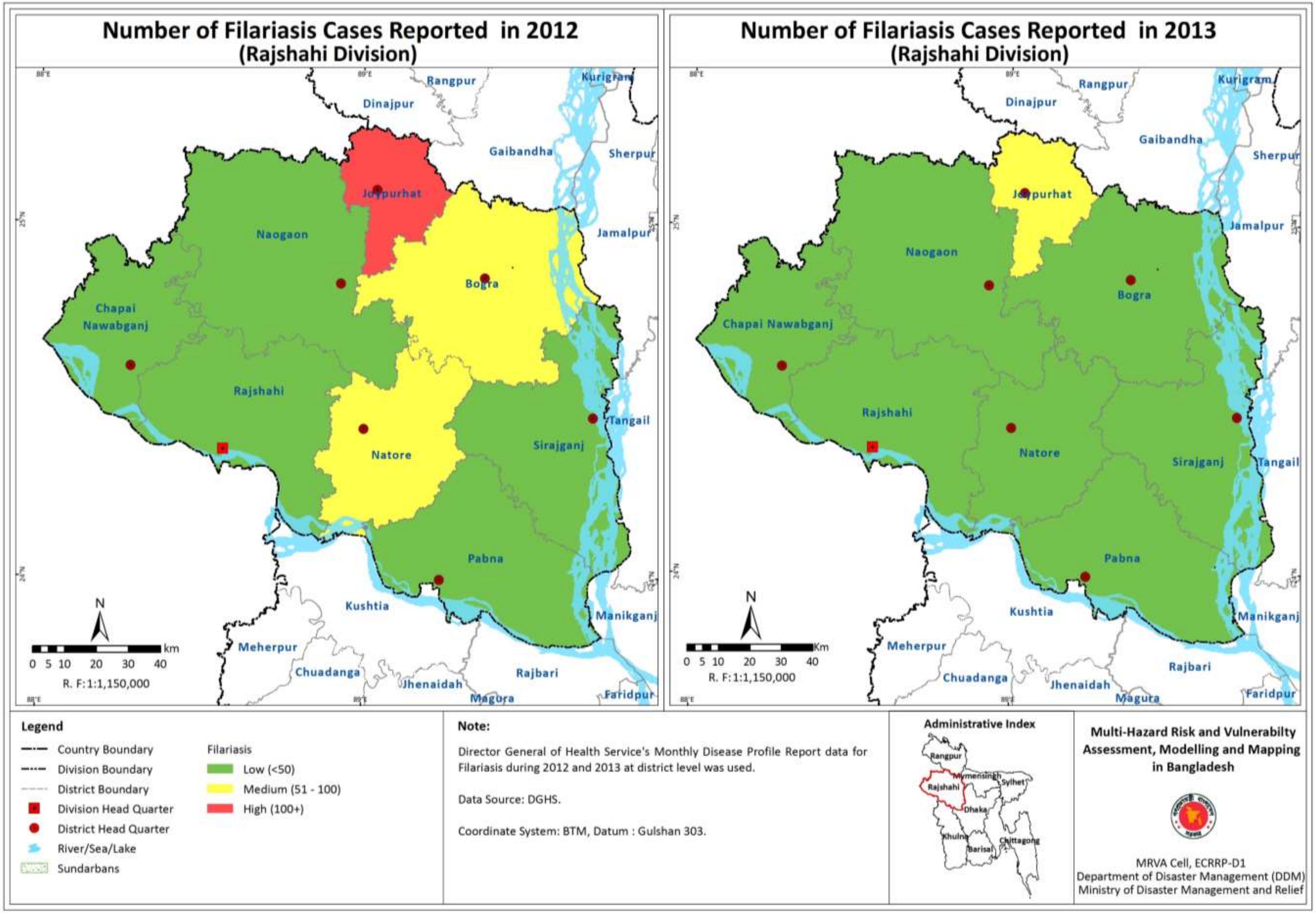
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

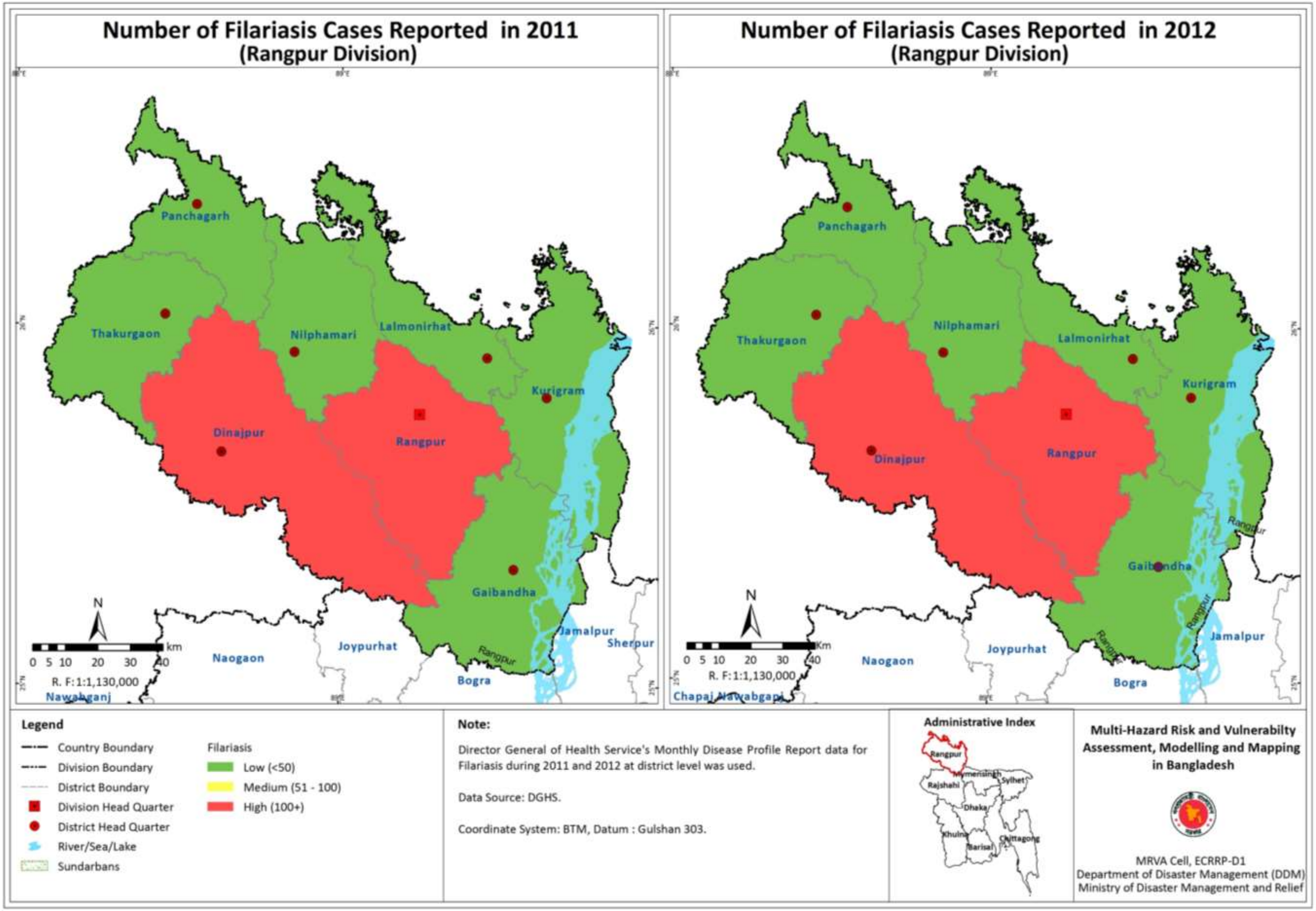
Administrative Index

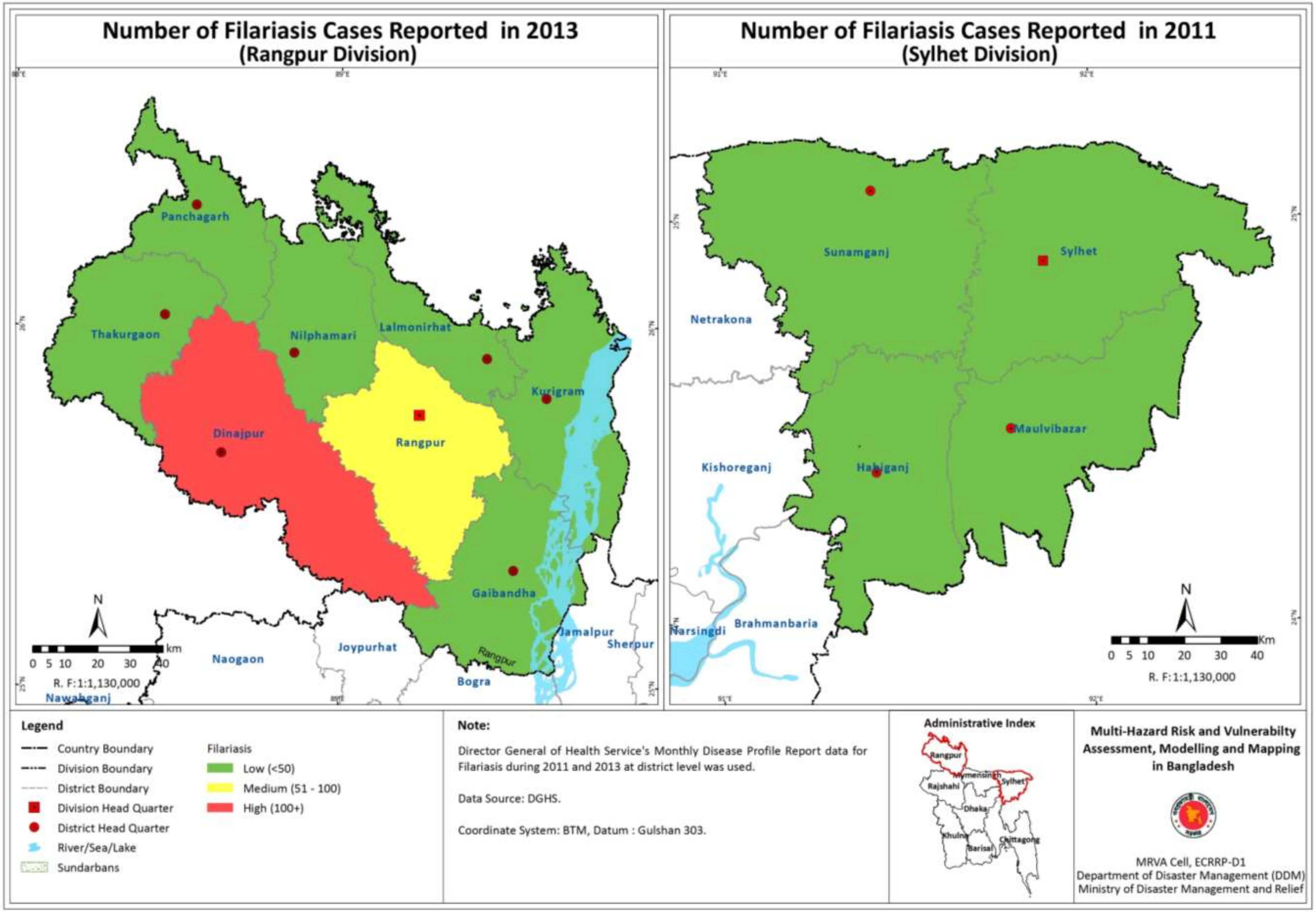
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

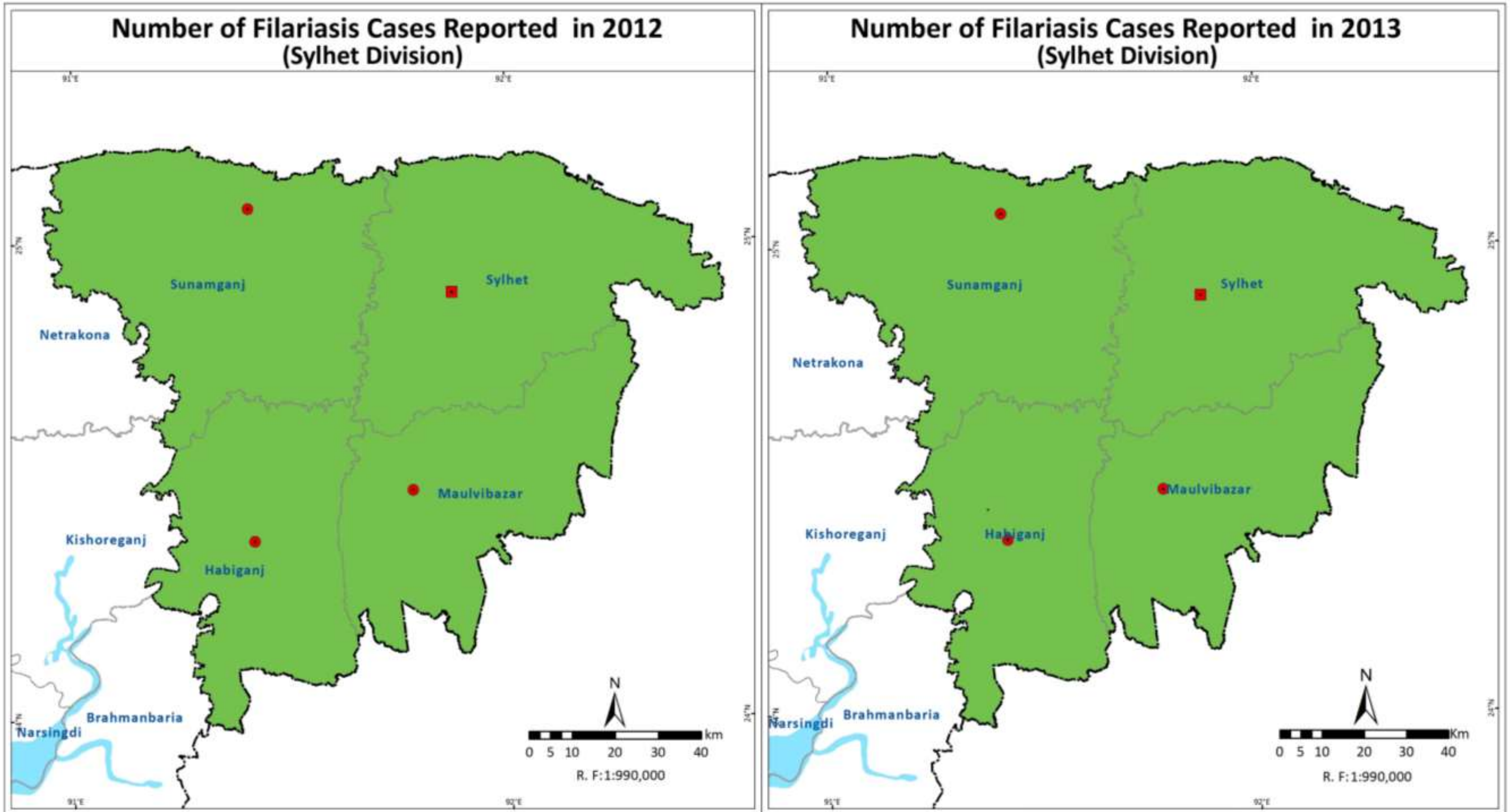
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Number of Filariasis Cases Reported in 2012
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Naogaon
Bogra
Jamalpur
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
km
0 5 10 20 30 40
R. F:1:1,150,000
Number of Filariasis Cases Reported in 2013
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Naogaon
Bogra
Jamalpur
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
Km
0 5 10 20 30 40
R. F:1:1,150,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Filariasis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Filariasis Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
0 5 10 20 30 40 km
R. F:1:1,130,000
Number of Filariasis Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Chapai Nawabganj
N
0 5 10 20 30 40 Km
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Filariasis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Filariasis Cases Reported in 2013
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F:1:1,130,000
Number of Filariasis Cases Reported in 2011
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Brahmanbaria
Narsingdi
N
Km
0 5 10 20 30 40
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Filariasis
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Filariasis

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Filariasis during 2012 and 2013 at district level was used.

Data Source: DGHS.

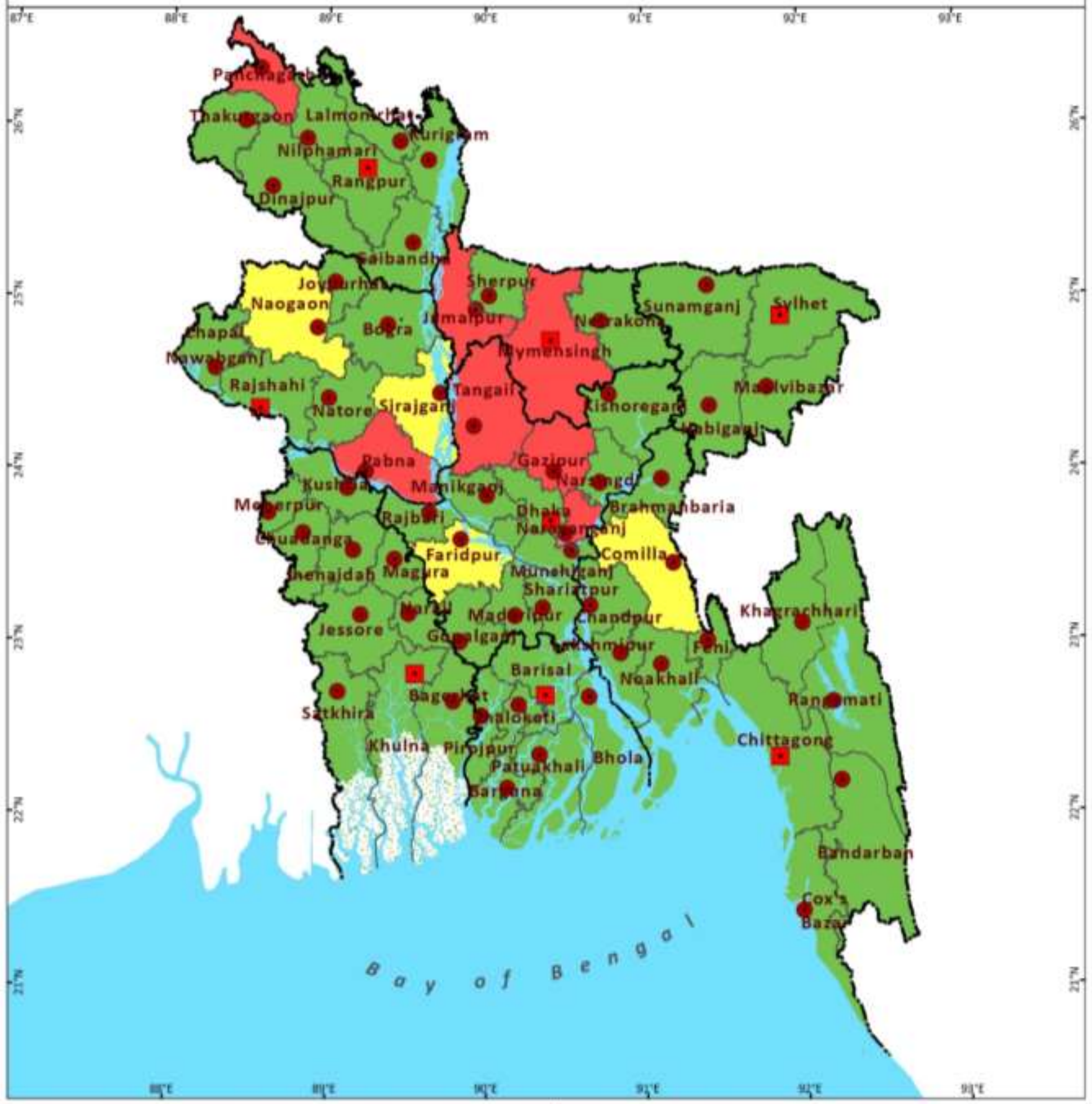
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

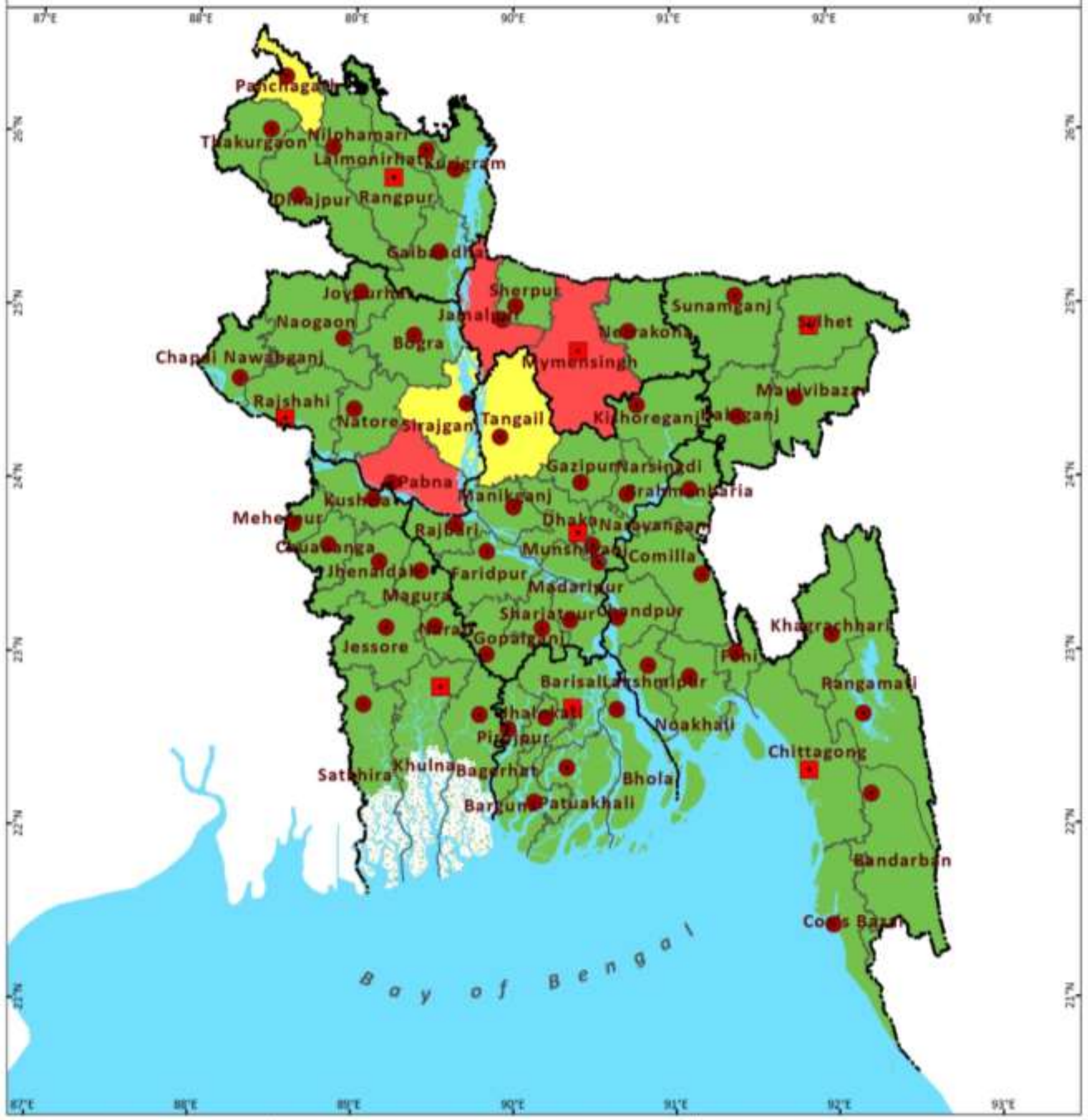
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported at District level in 2011



Number of Kala-azar Cases Reported at District level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

N

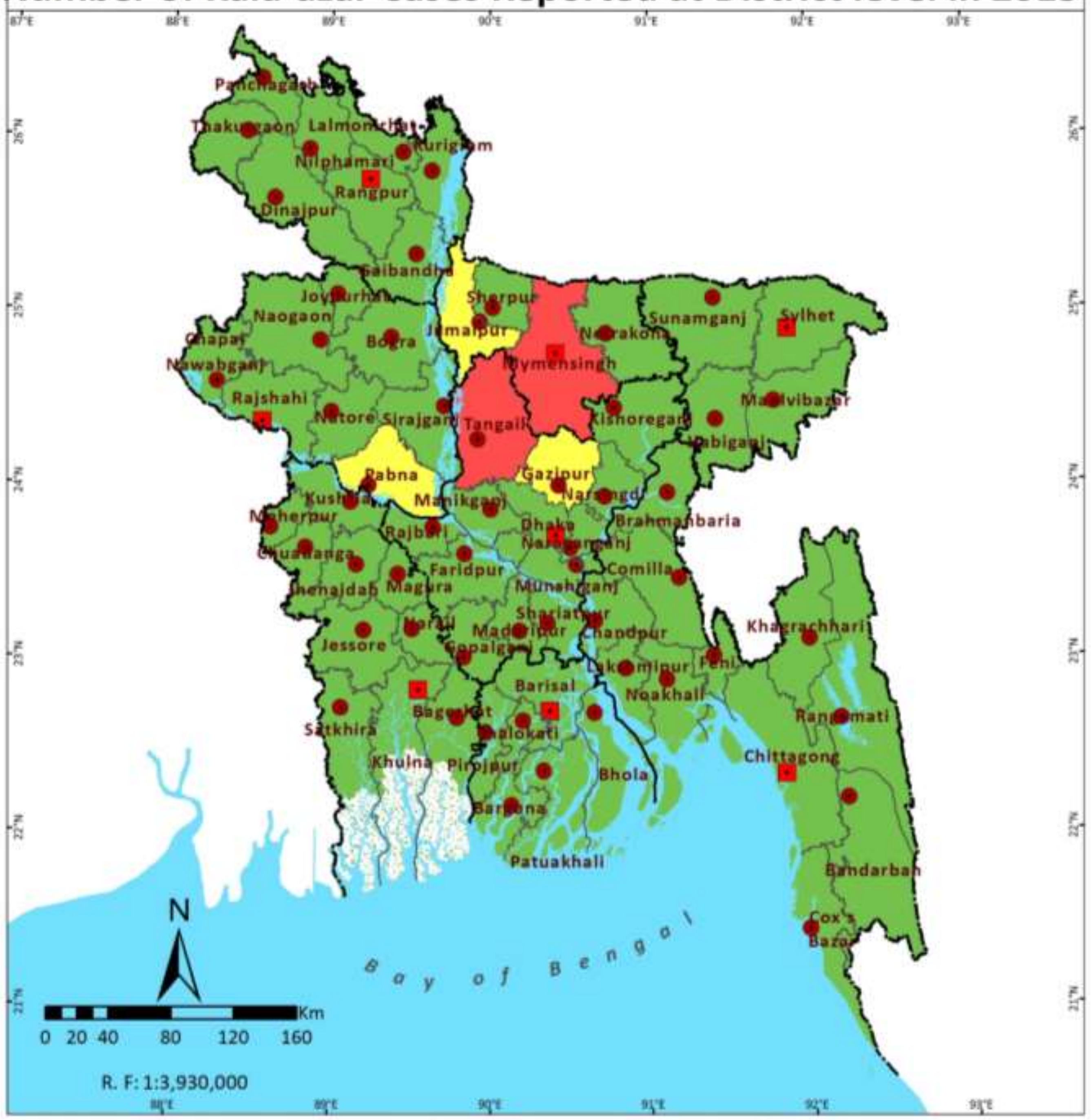
0 25 50 100 150 200 Km

R. F: 1:4,000,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported at District level in 2013



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note

Director General of Health Service's Monthly Disease Profile Report data for kala-azar during 2013 at district level was used.

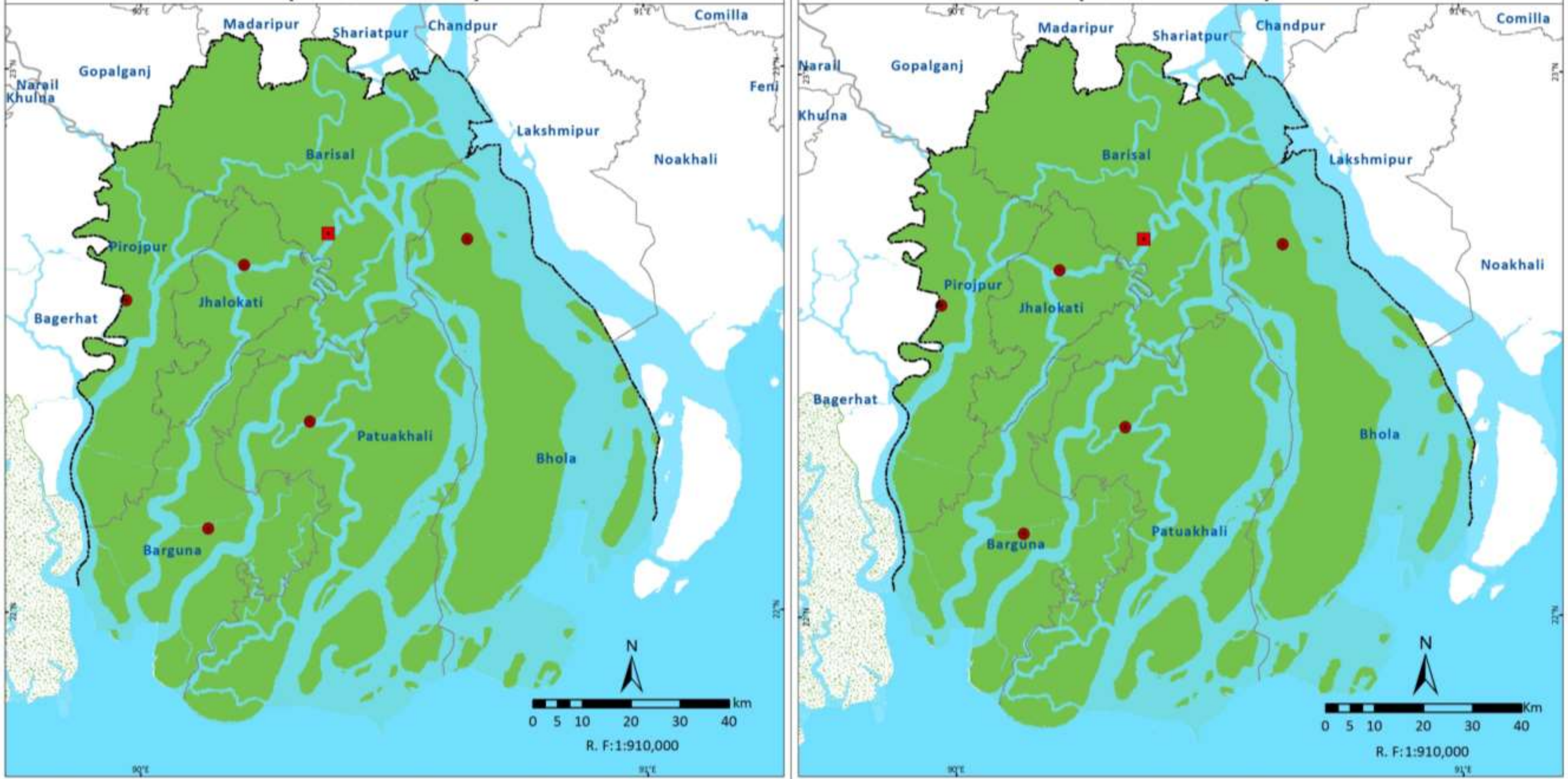
Data Source: DGHS.
Coordinate System: BTM,
Datum : Gulshan 303.

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2011 (Barisal Division)

Number of Kala-azar Cases Reported in 2012 (Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2012 at district level was used.

Data Source: DGHS.

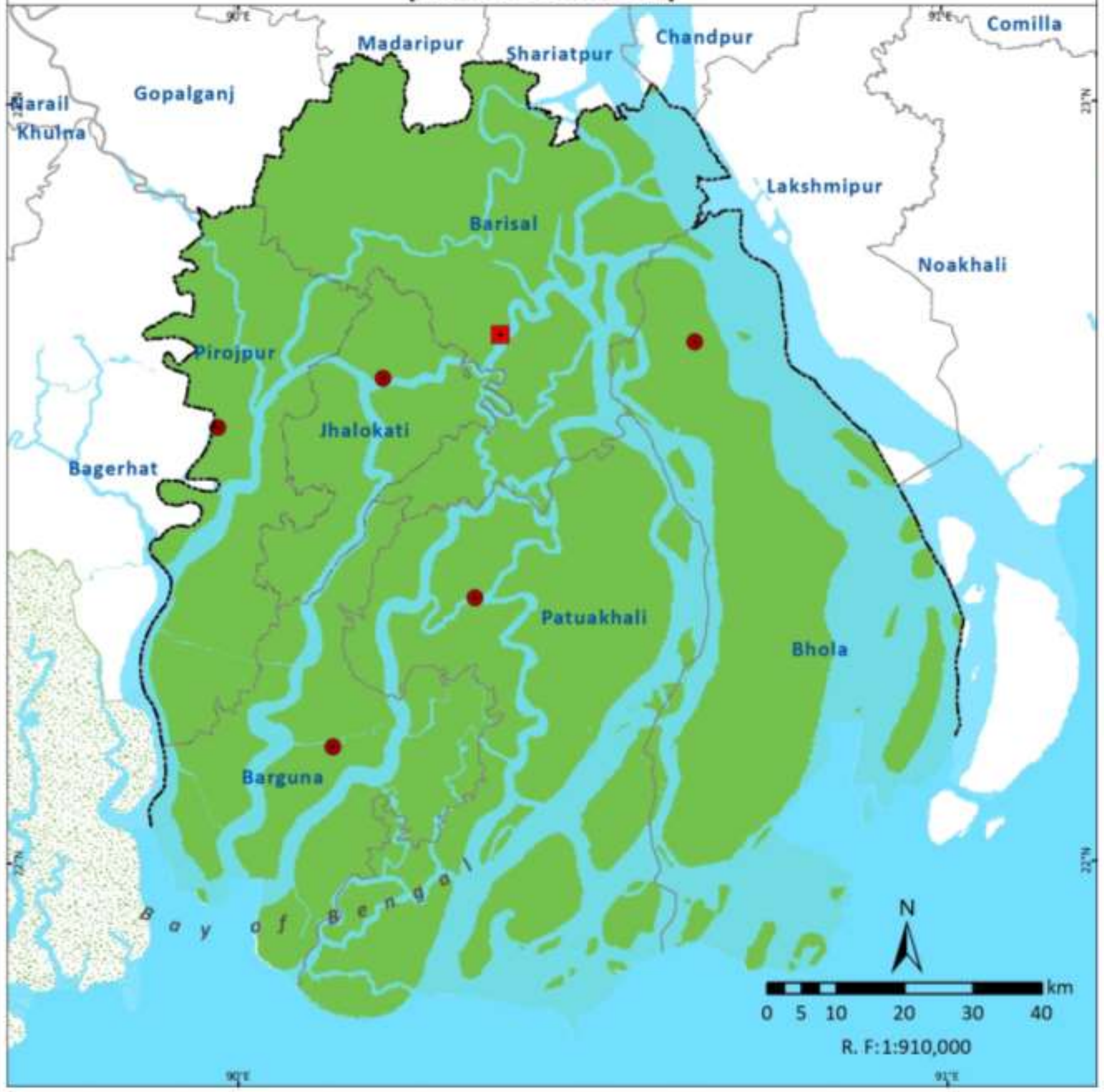
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

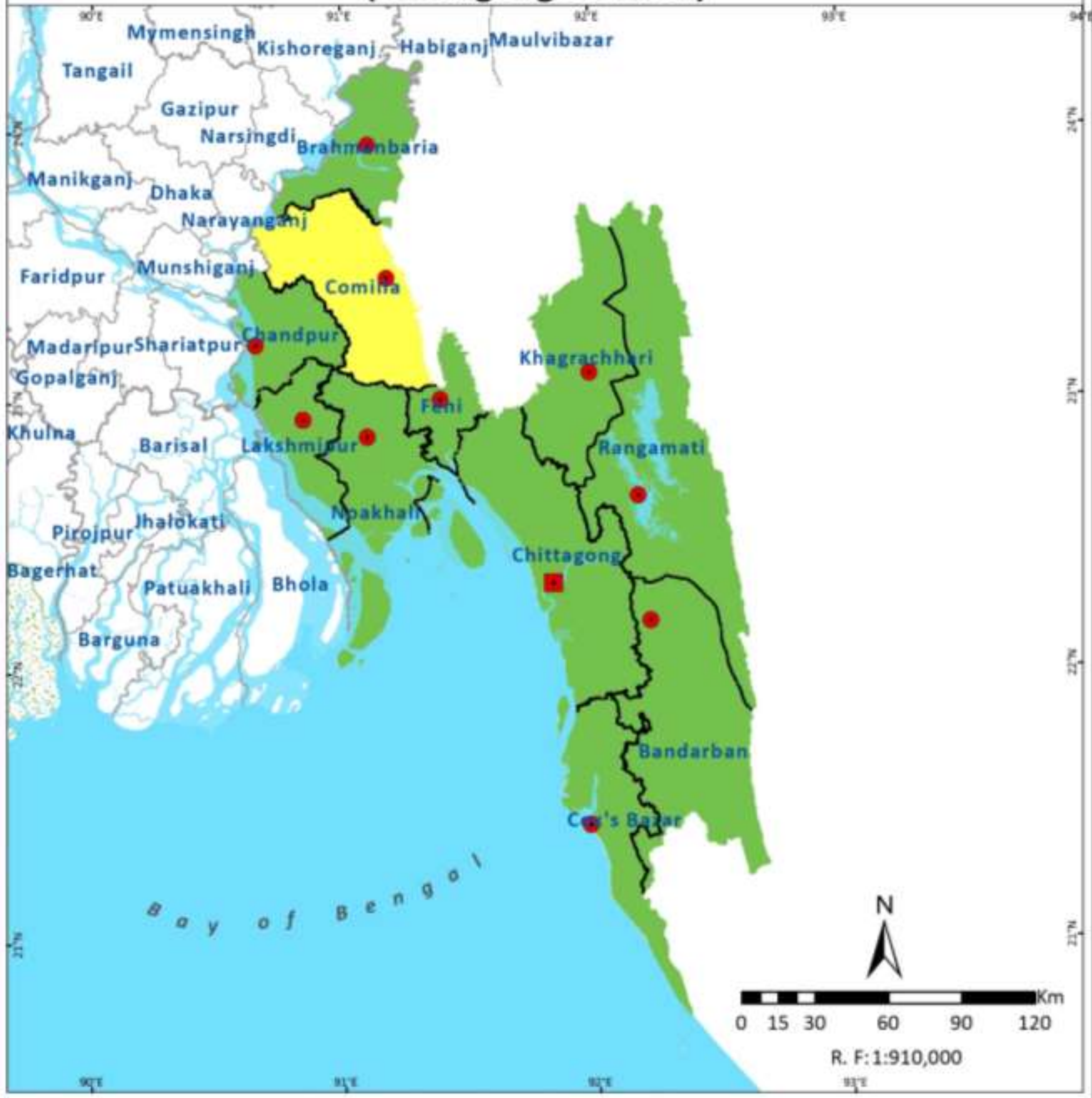
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2013 (Barisal Division)



Number of Kala-azar Cases Reported in 2011 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2013 at district level was used.

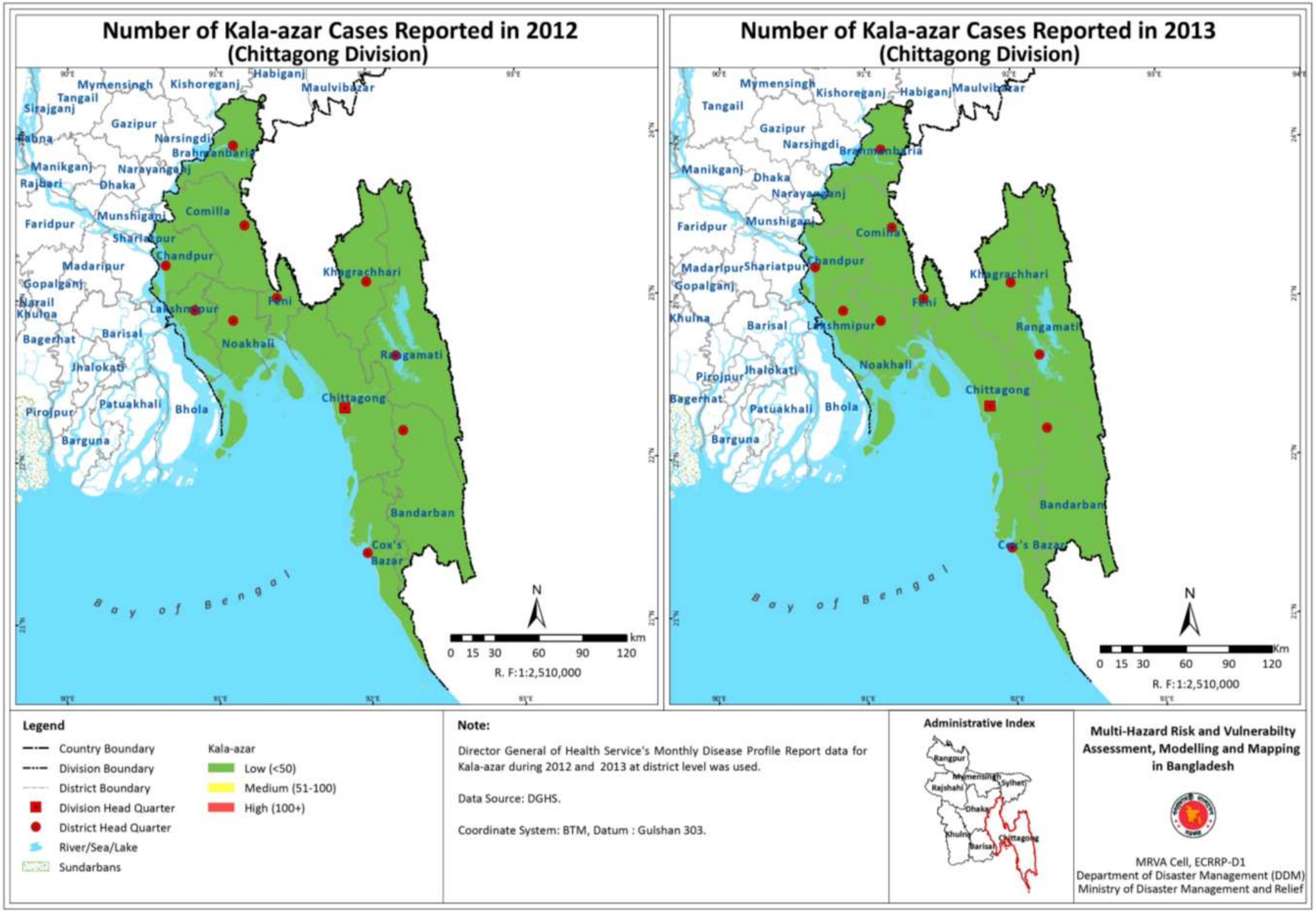
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

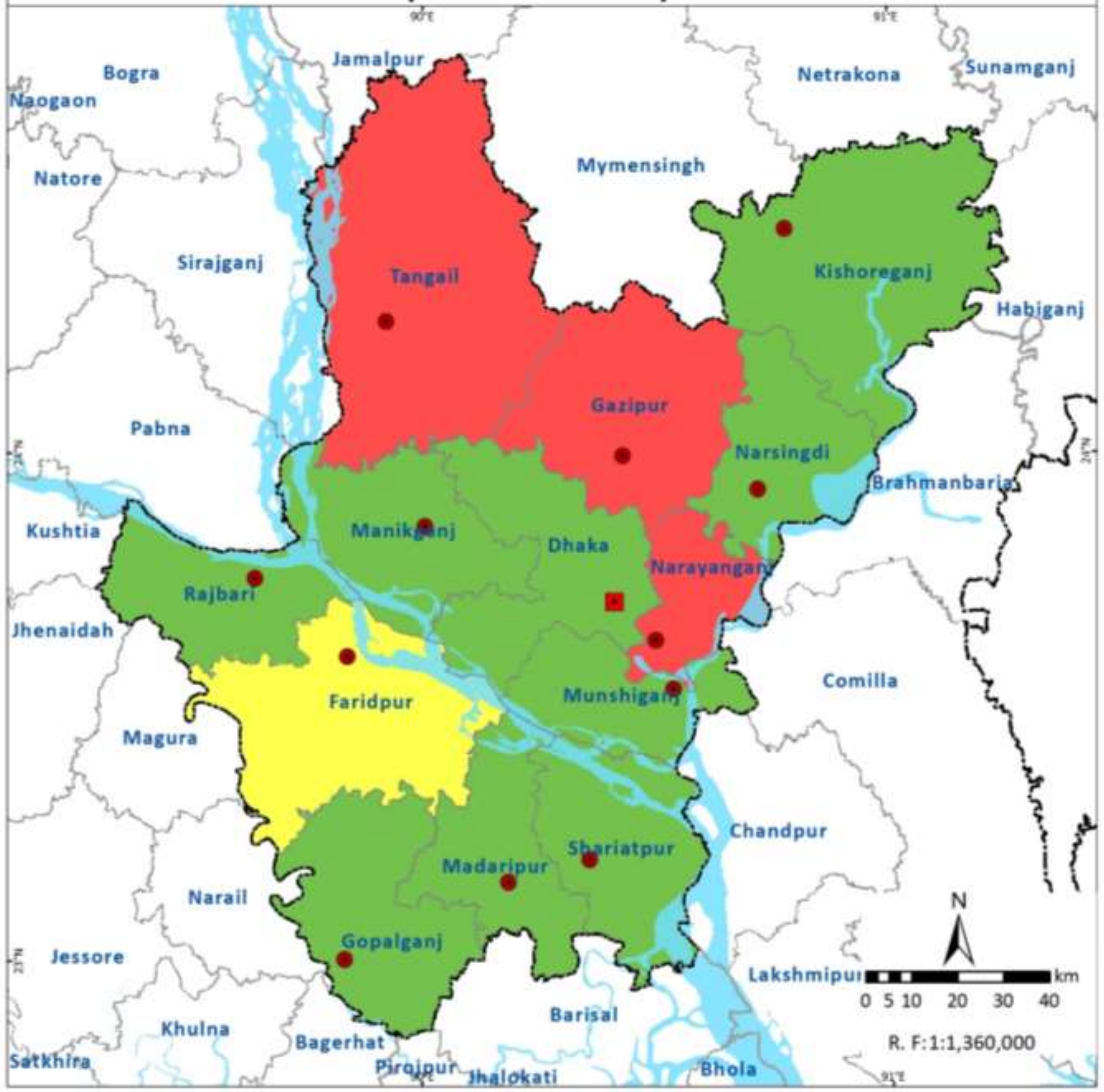
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Kala-azar Cases Reported in 2012
(Chittagong Division)
Number of Kala-azar Cases Reported in 2013
(Chittagong Division)
Bay of Bengal
0 15 30 60 90 120 km
R. F: 1:2,510,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2011 (Dhaka Division)



Number of Kala-azar Cases Reported in 2012 (Dhaka Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

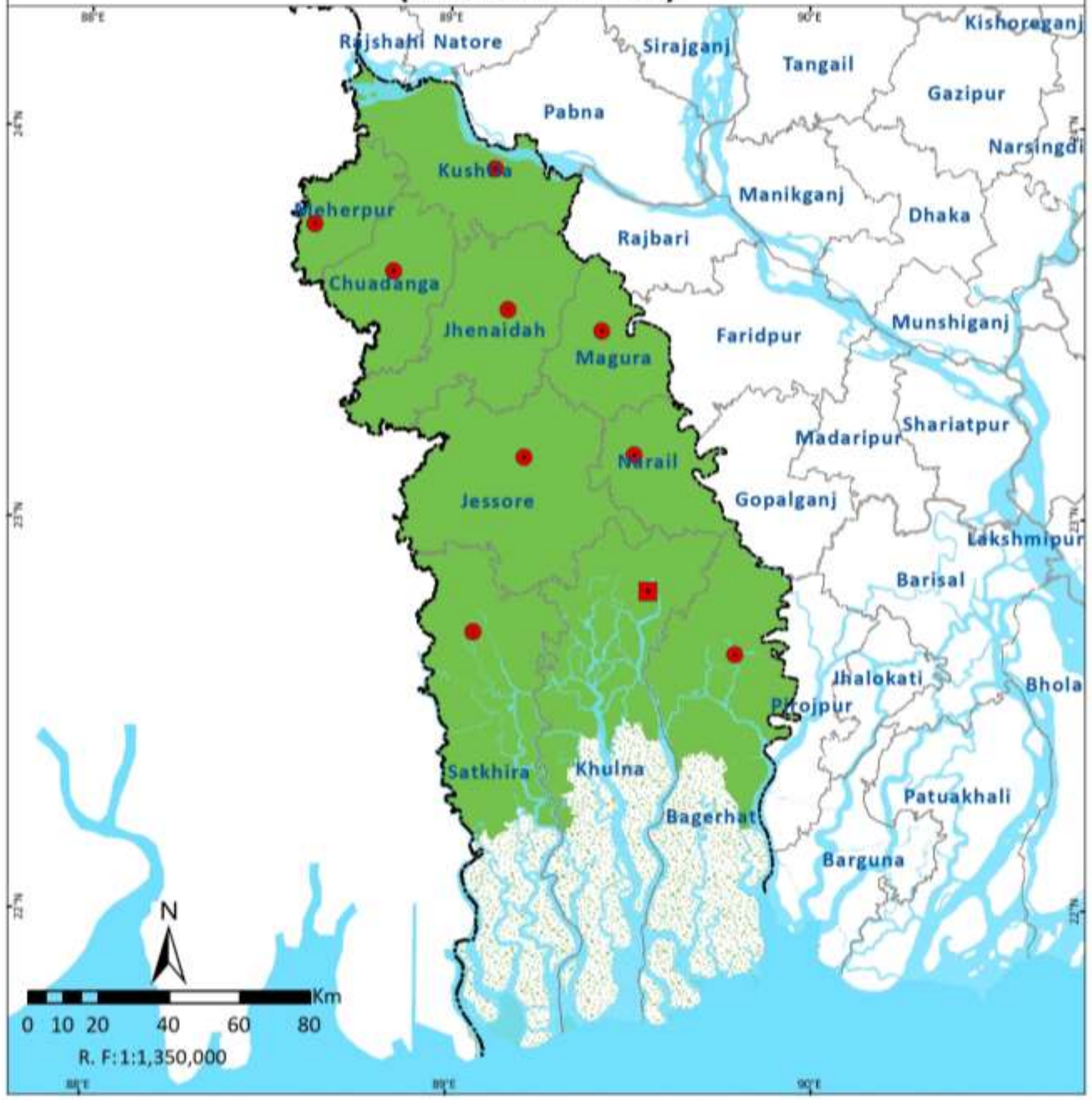
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2013
(Dhaka Division)

Number of Kala-azar Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2013 at district level was used.

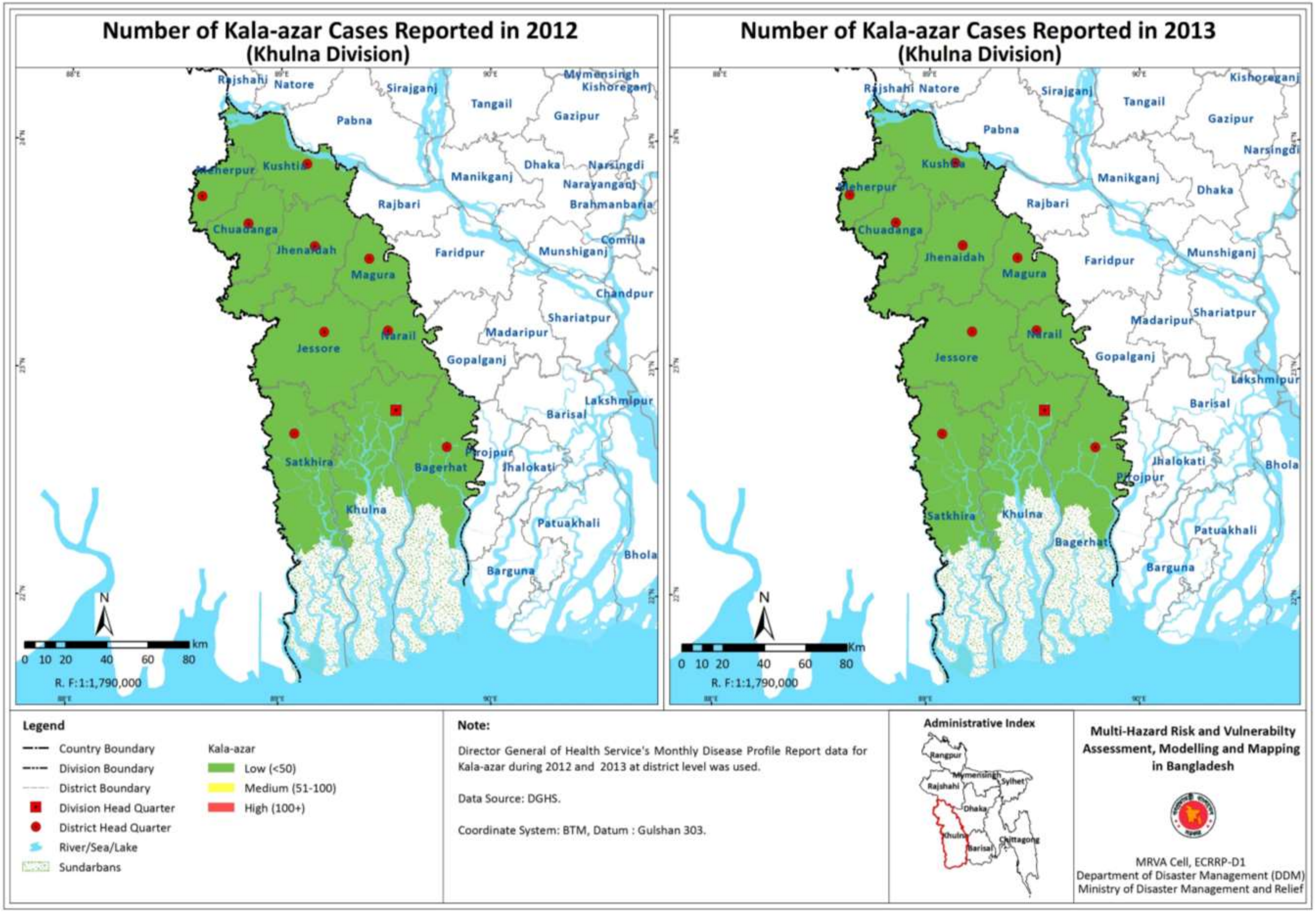
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Kala-azar Cases Reported in 2012
(Khulna Division)
Number of Kala-azar Cases Reported in 2013
(Khulna Division)
Rajshahi
Natore
Sirajganj
Mymensingh
Kishoreganj
Tangail
Gazipur
Pabna
Narsingdi
Meherpur
Kushtia
Manikganj
Dhaka
Narayanganj
Brahmanbaria
Rajbari
Chuadanga
Jhenaidah
Magura
Faridpur
Munshiganj
Comilla
Chandpur
Shariatpur
Madaripur
Narail
Jessore
Gopalganj
Lakshmipur
Barisal
Satkhira
Bagerhat
Pirojpur
Jhalokati
Khulna
Patuakhali
Bhola
Barguna
N
0 10 20 40 60 80
km
R. F:1:1,790,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2011 (Mymensingh Division)

Number of Kala-azar Cases Reported in 2012 (Mymensingh Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2012 at district level was used.

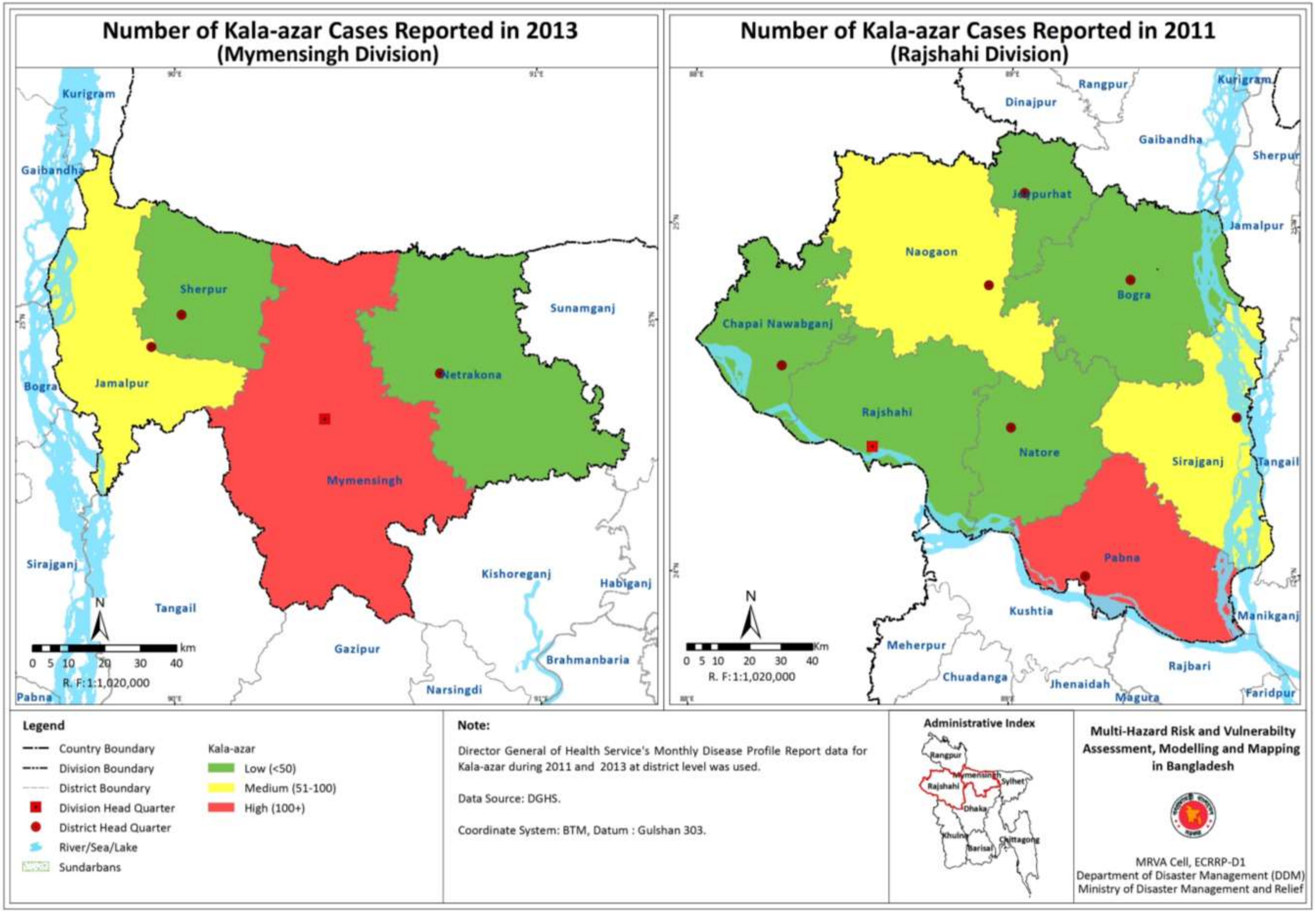
Data Source: DGHS.

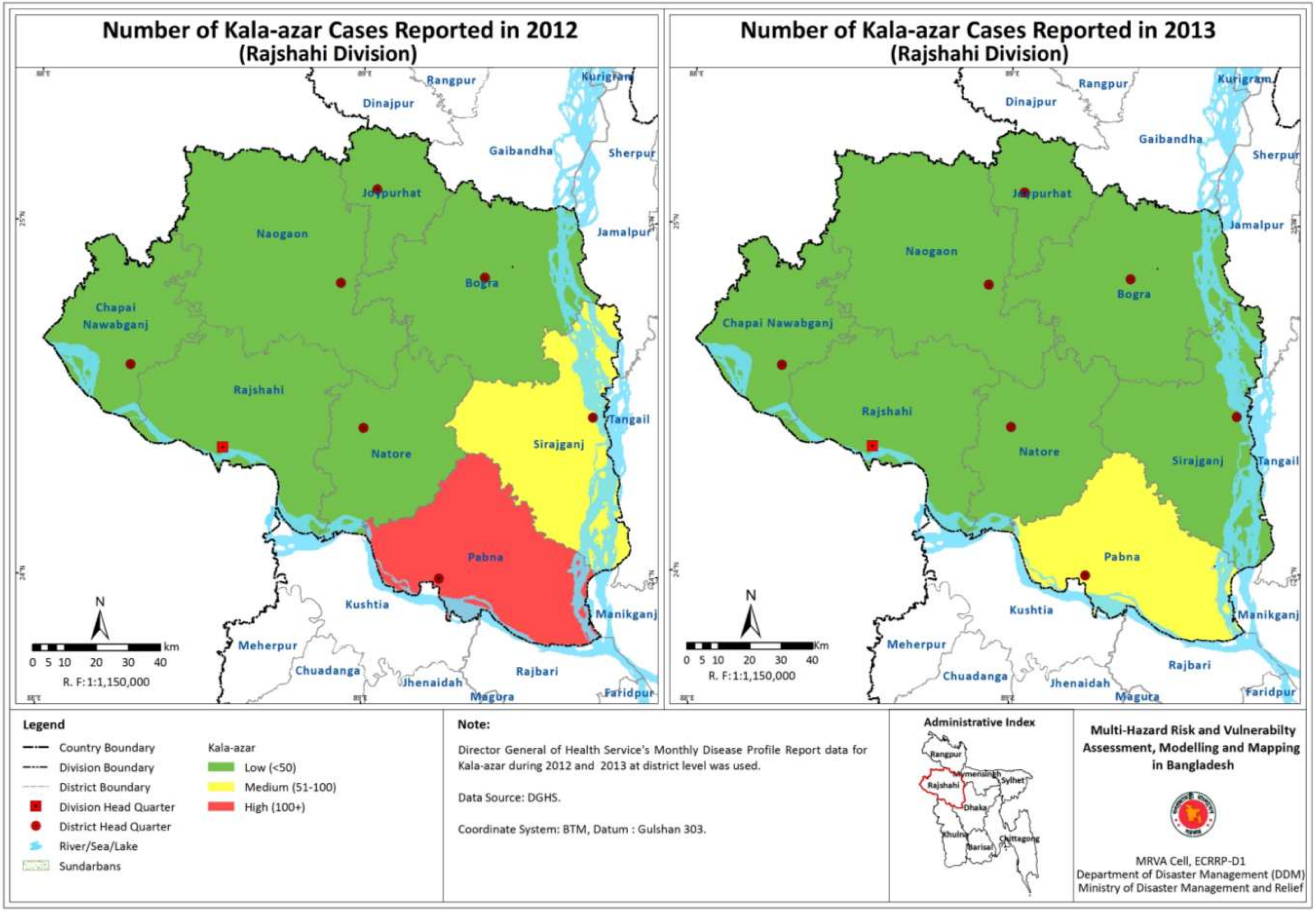
Coordinate System: BTM, Datum : Gulshan 303.

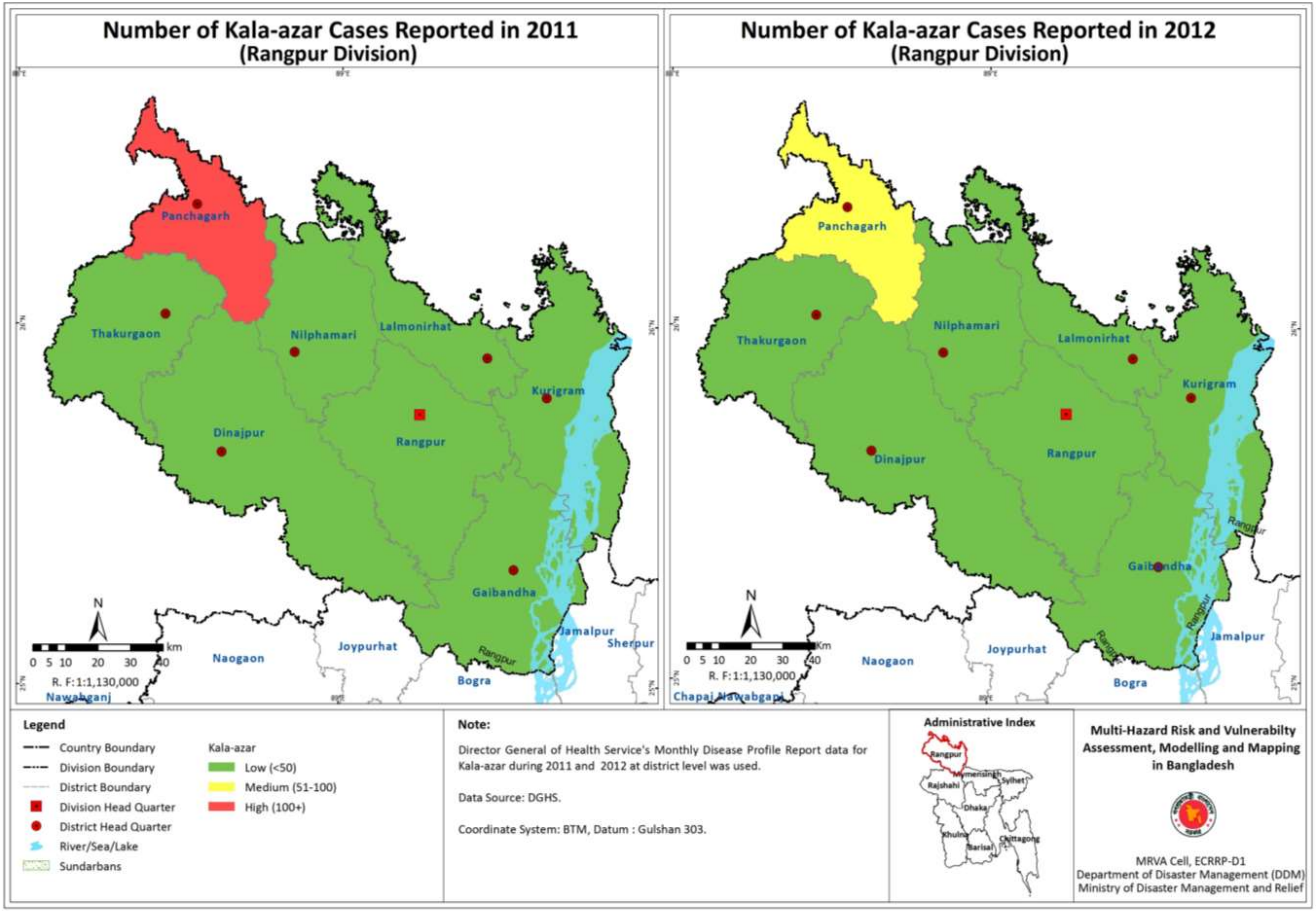
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

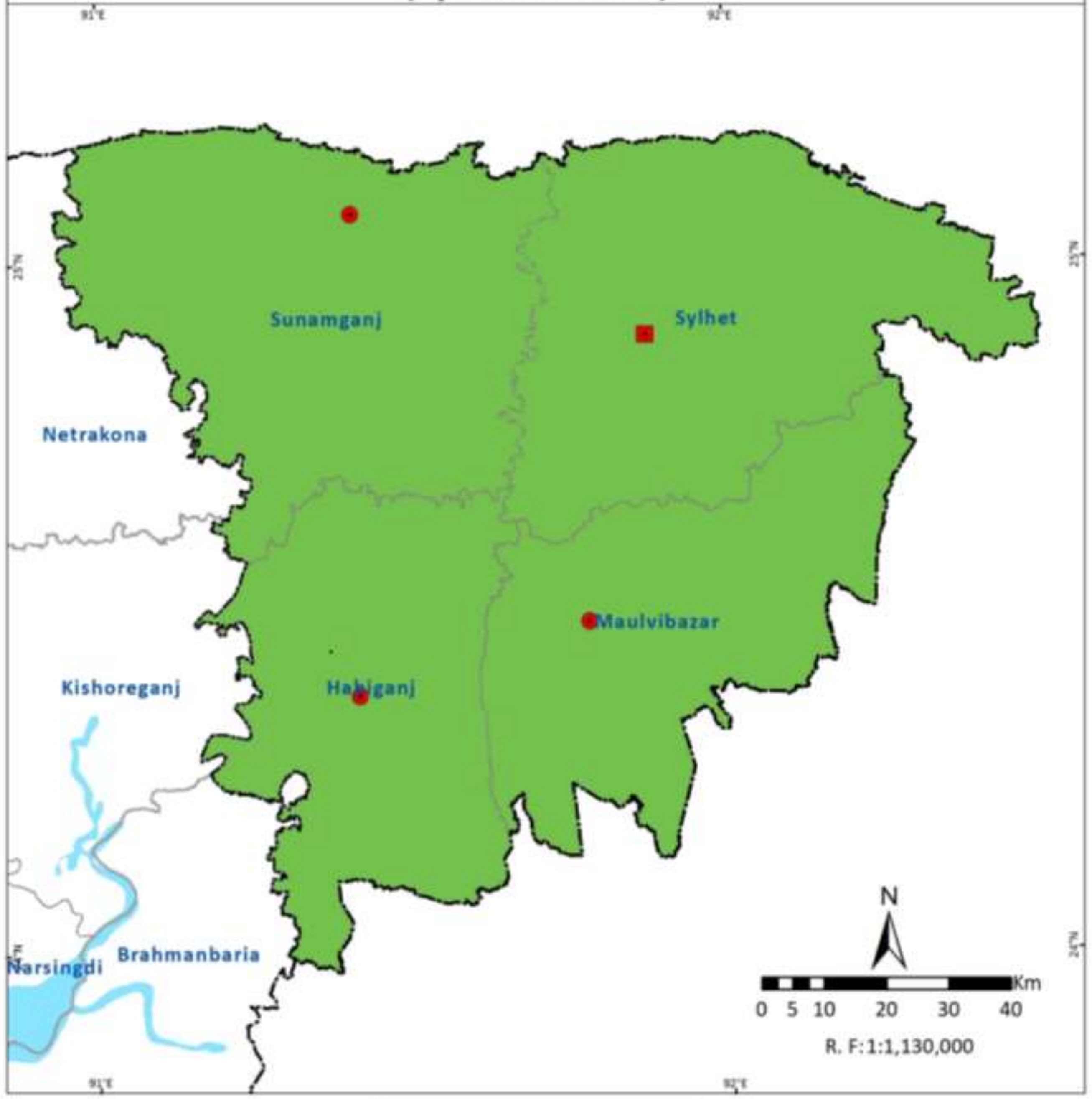

Number of Kala-azar Cases Reported in 2013
(Mymensingh Division)
Number of Kala-azar Cases Reported in 2011
(Rajshahi Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Bogra
Netrakona
Sunamganj
Mymensingh
Sirajganj
Tangail
Kishoreganj
Habiganj
Gazipur
Brahmanbaria
Narsingdi
Pabna
0 5 10 20 30 40 km
R. F:1:1,020,000
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Jamalpur
Naogaon
Bogra
Chapai Nawabganj
Rajshahi
Natore
Sirajganj
Tangail
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Magura
Rajbari
Faridpur
0 5 10 20 30 40 Km
R. F:1:1,020,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Kala-azar Cases Reported in 2012
(Rajshahi Division)
Rangpur
Dinajpur
Kurigram
Gaibandha
Sherpur
Joypurhat
Naogaon
Jamalpur
Bogra
Chapai Nawabganj
Rajshahi
Natore
Tangail
Sirajganj
Pabna
Kushtia
Manikganj
Meherpur
Chuadanga
Jhenaidah
Rajbari
Magura
Faridpur
N
km
0 5 10 20 30 40
R. F:1:1,150,000
Number of Kala-azar Cases Reported in 2013
(Rajshahi Division)
Km
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Kala-azar Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F: 1:1,130,000
Number of Kala-azar Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Chapai Nawabganj
N
Km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Kala-azar Cases Reported in 2013
(Rangpur Division)

Number of Kala-azar Cases Reported in 2011
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Kala-azar

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2011 and 2013 at district level was used.

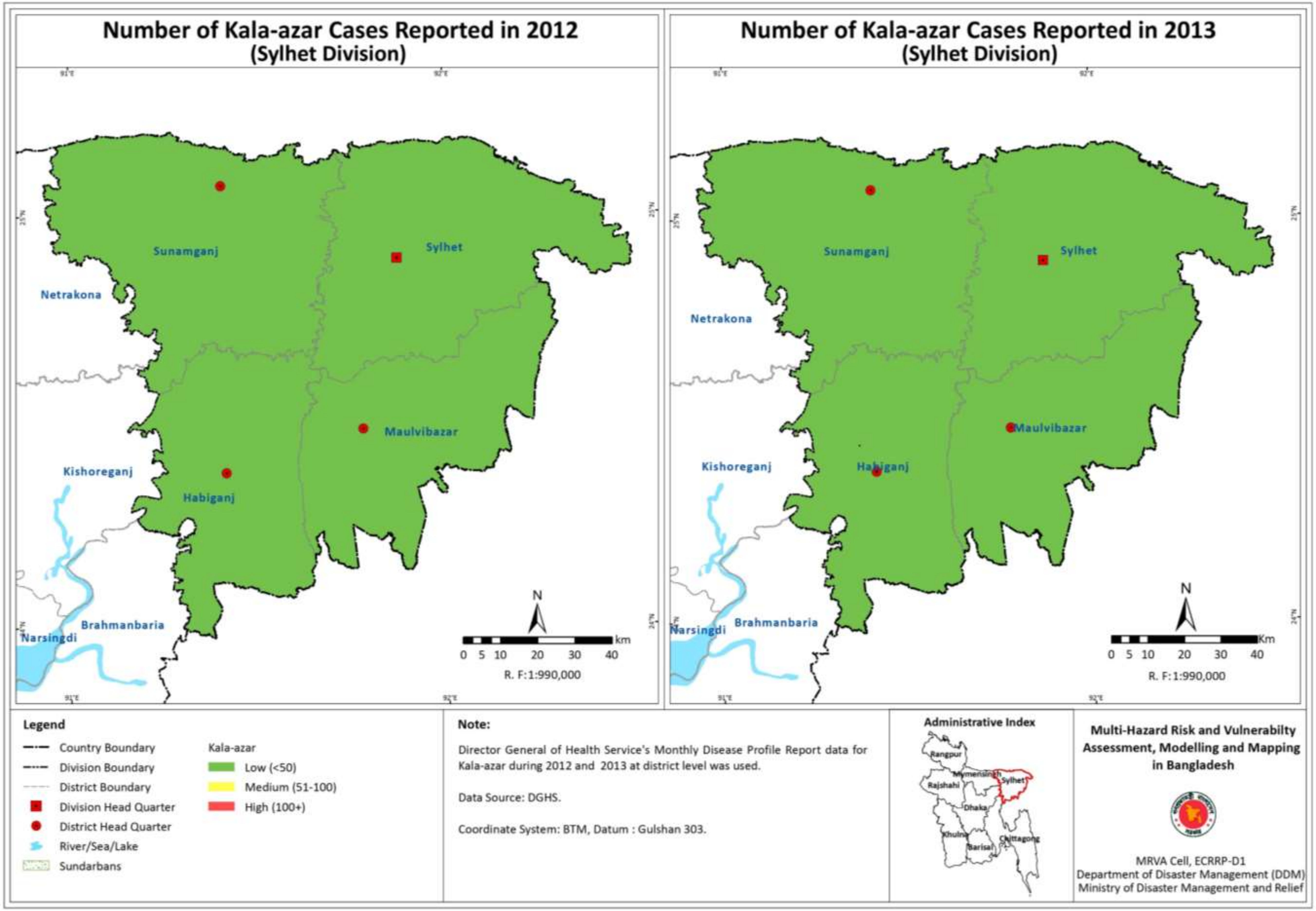
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

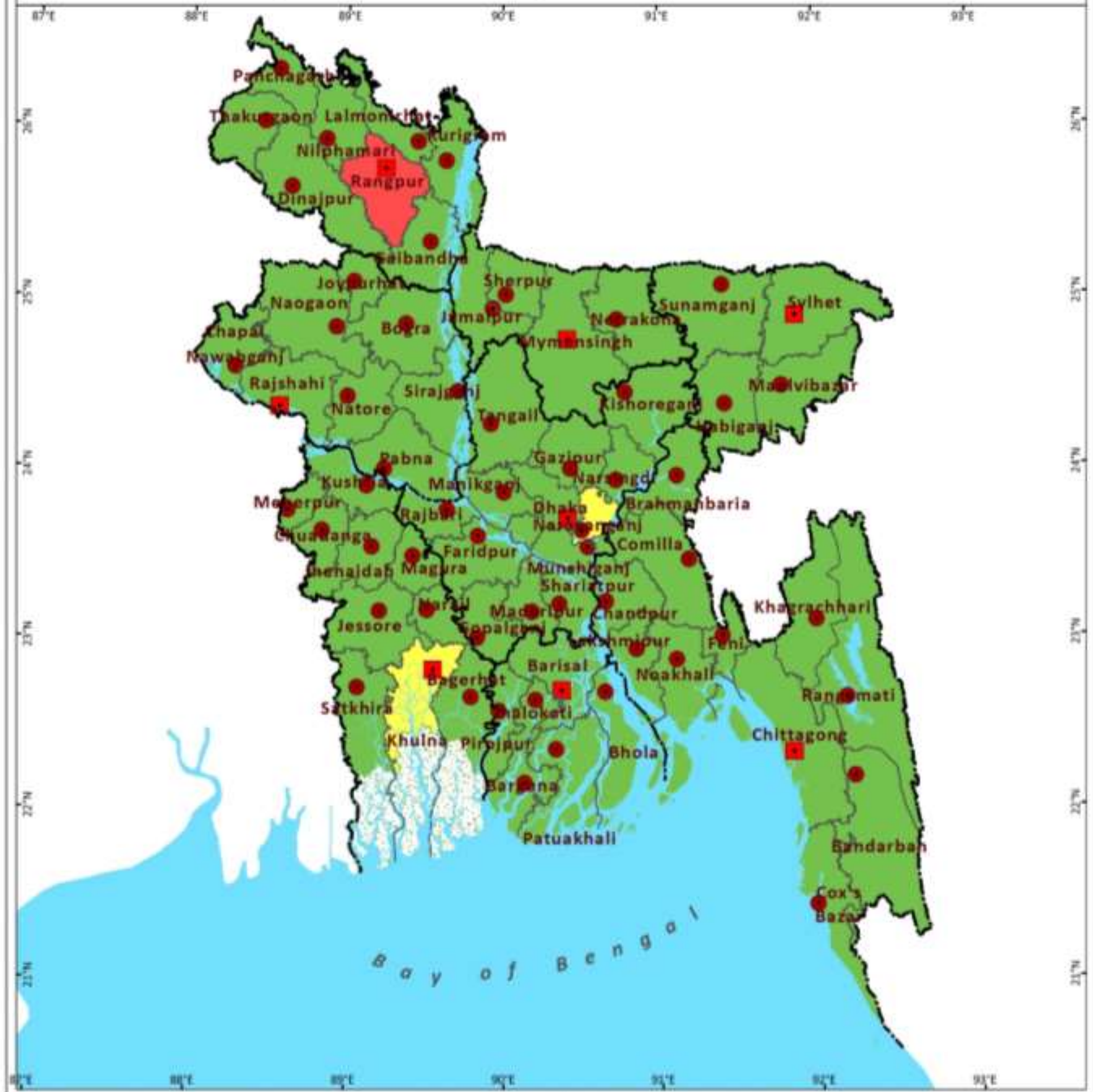
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

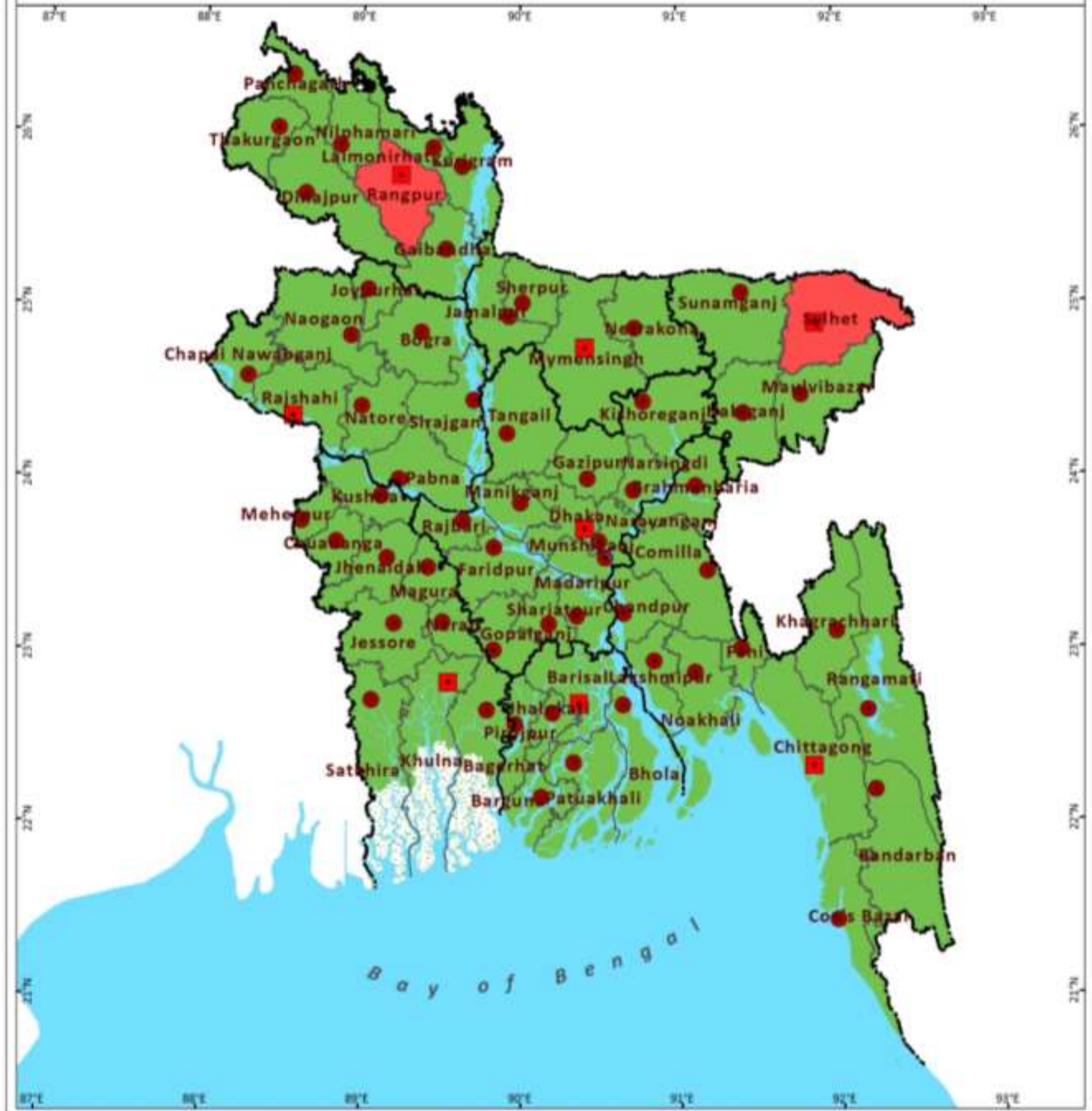
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Kala-azar Cases Reported in 2012
(Sylhet Division)
Number of Kala-azar Cases Reported in 2013
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Brahmanbaria
Narsingdi
N
0 5 10 20 30 40 km
R. F: 1:990,000
0 5 10 20 30 40 Km
R. F: 1:990,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Kala-azar
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Kala-azar during 2012 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported at District Level in 2011



Number of Leprosy Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

N

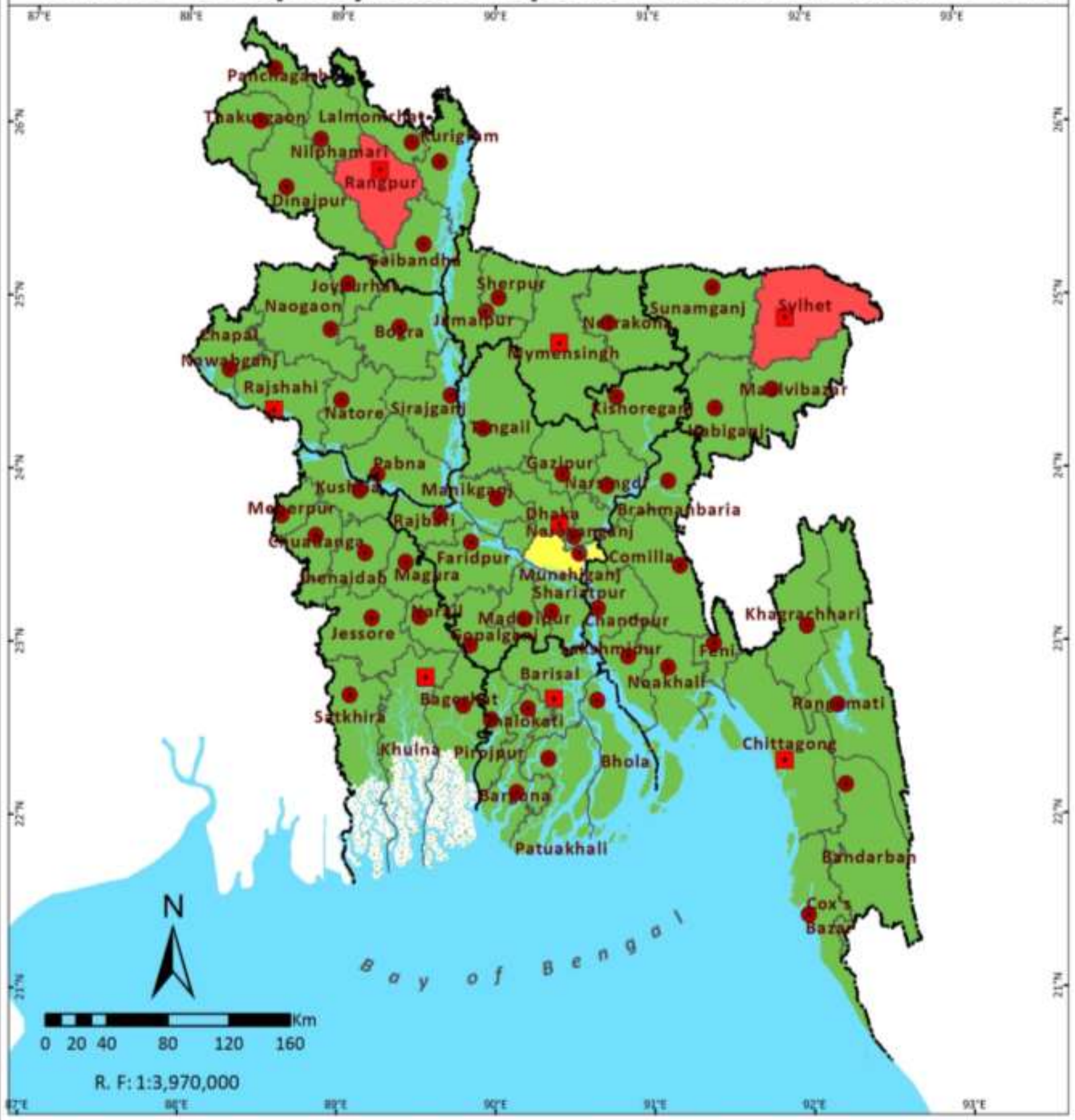
0 25 50 100 150 200 Km

R. F: 1:4,000,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported at District Level in 2013



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy
- Low (<50)
- Medium (51 - 100)
- High (100+)

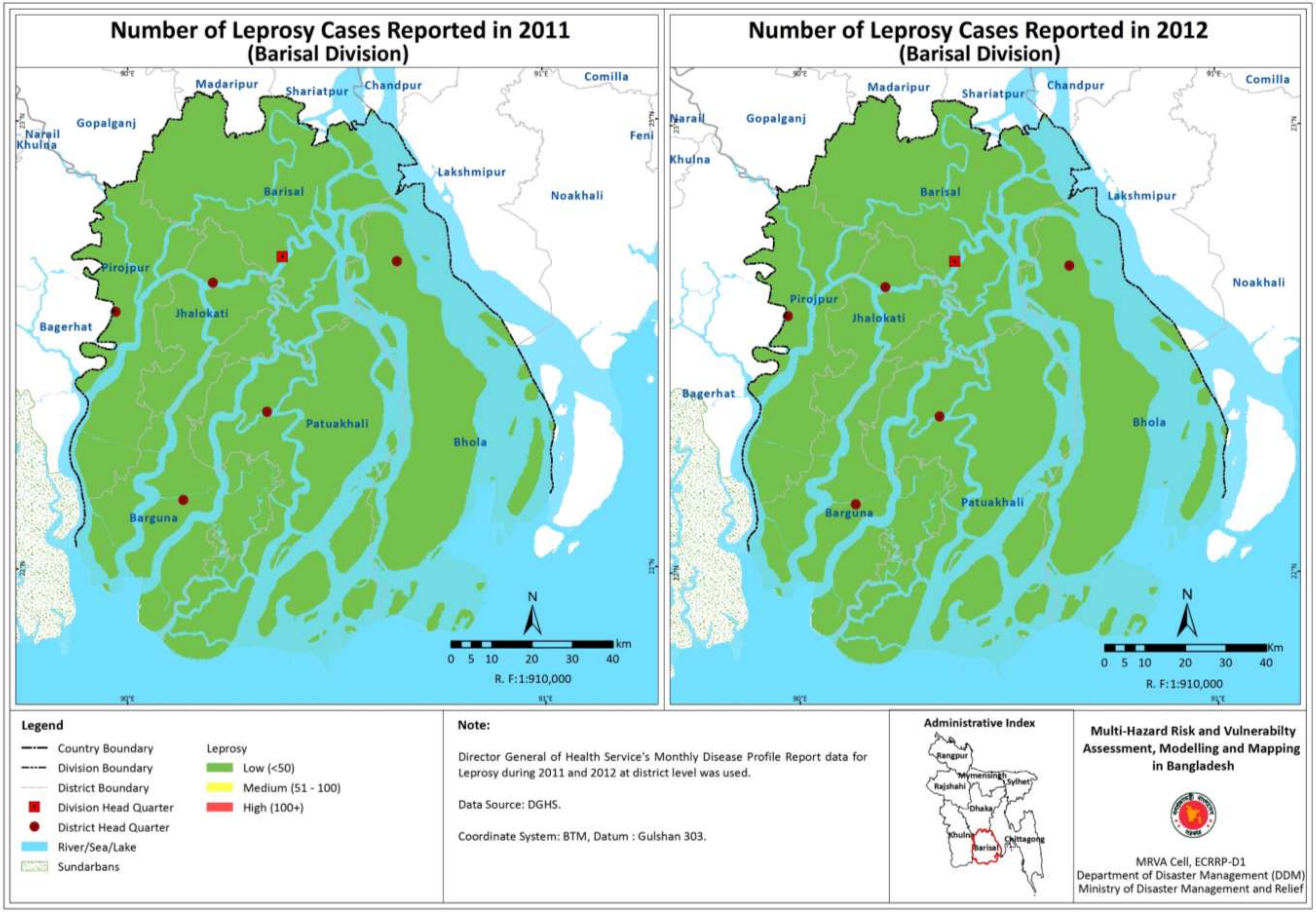
Note

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2013 at district level was used.

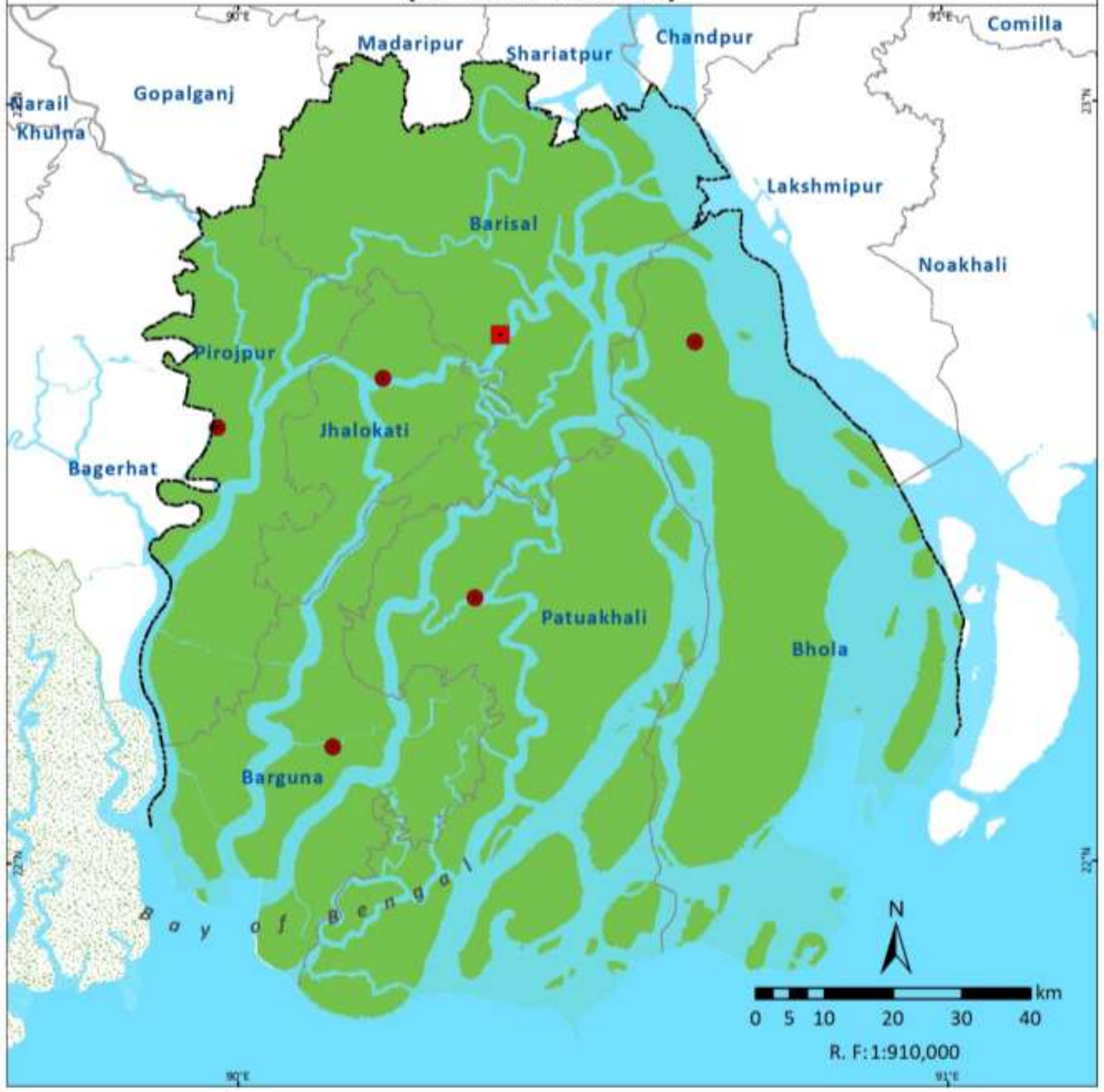
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

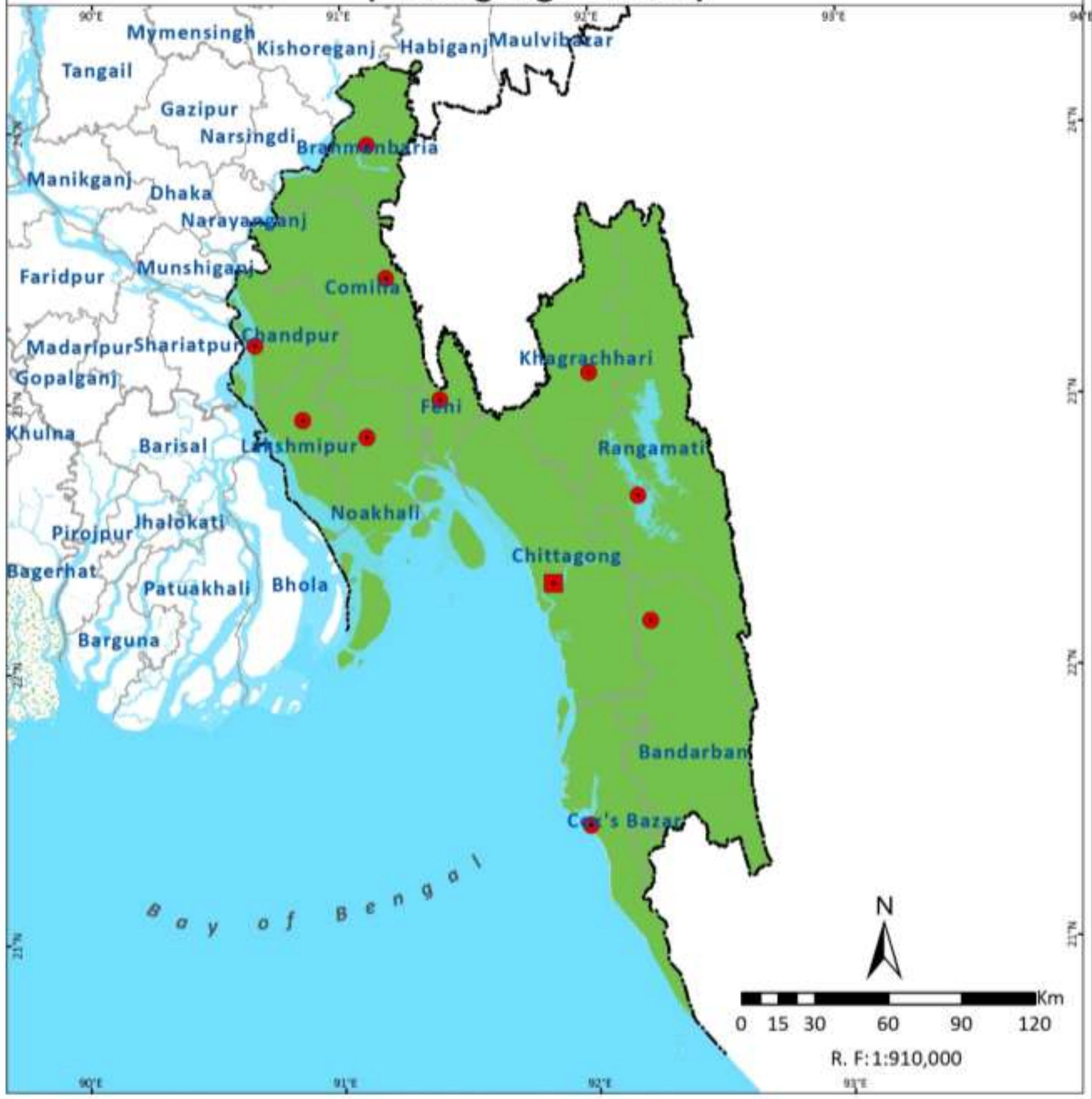
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Leprosy Cases Reported in 2011
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Gopalganj
Narail
Khulna
Feni
Lakshmipur
Noakhali
Barisal
Pirojpur
Jhalokati
Bagerhat
Patuakhali
Bhola
Barguna
N
km
0 5 10 20 30 40
R. F:1:910,000
Number of Leprosy Cases Reported in 2012
(Barisal Division)
Madaripur
Shariatpur
Chandpur
Comilla
Gopalganj
Narail
Khulna
Barisal
Lakshmipur
Noakhali
Pirojpur
Jhalokati
Bagerhat
Bhola
Patuakhali
Barguna
N
Km
0 5 10 20 30 40
R. F:1:910,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Leprosy
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2013 (Barisal Division)



Number of Leprosy Cases Reported in 2011 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

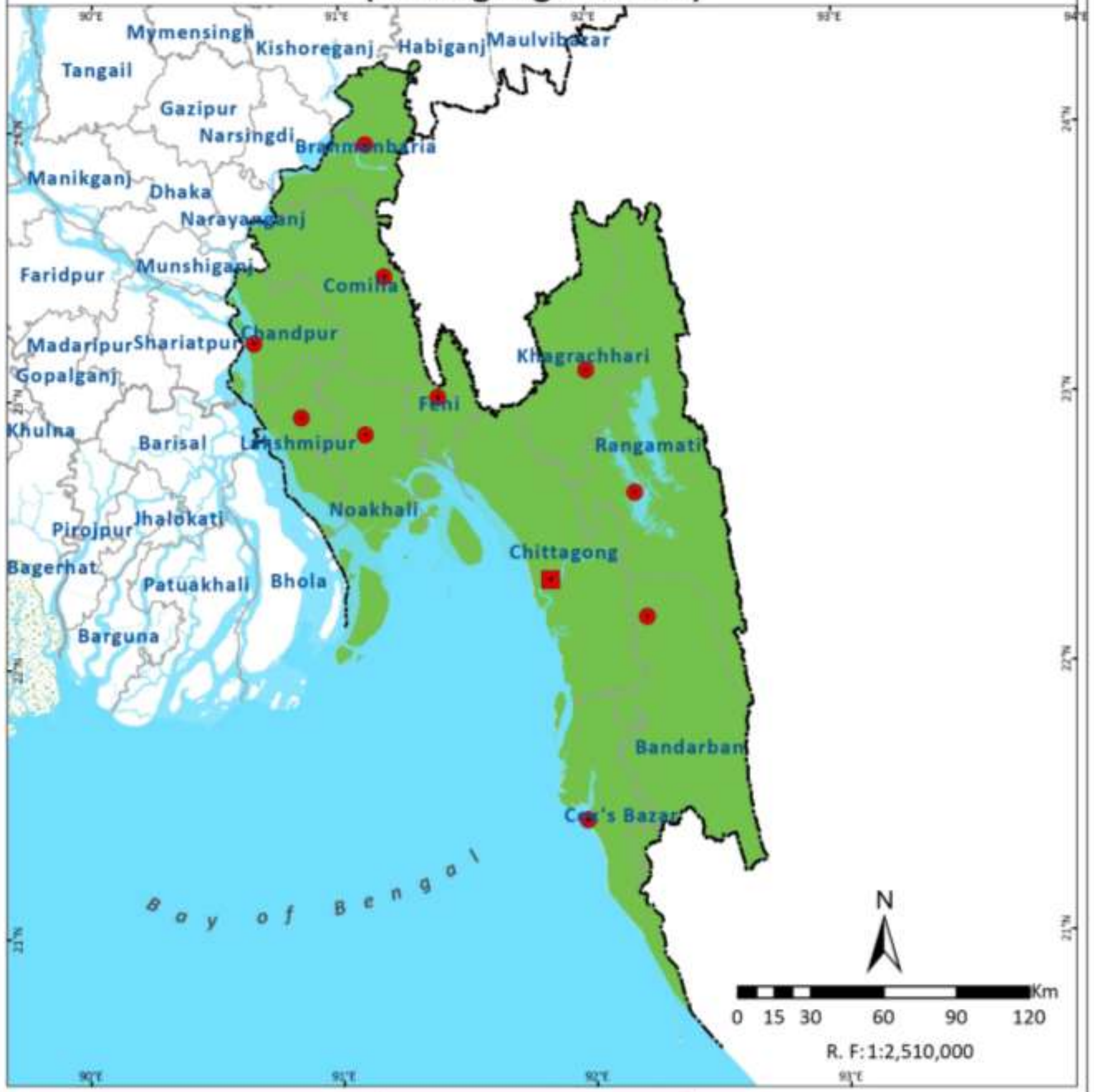
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2012
(Chittagong Division)

Number of Leprosy Cases Reported in 2013
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2012 and 2013 at district level was used.

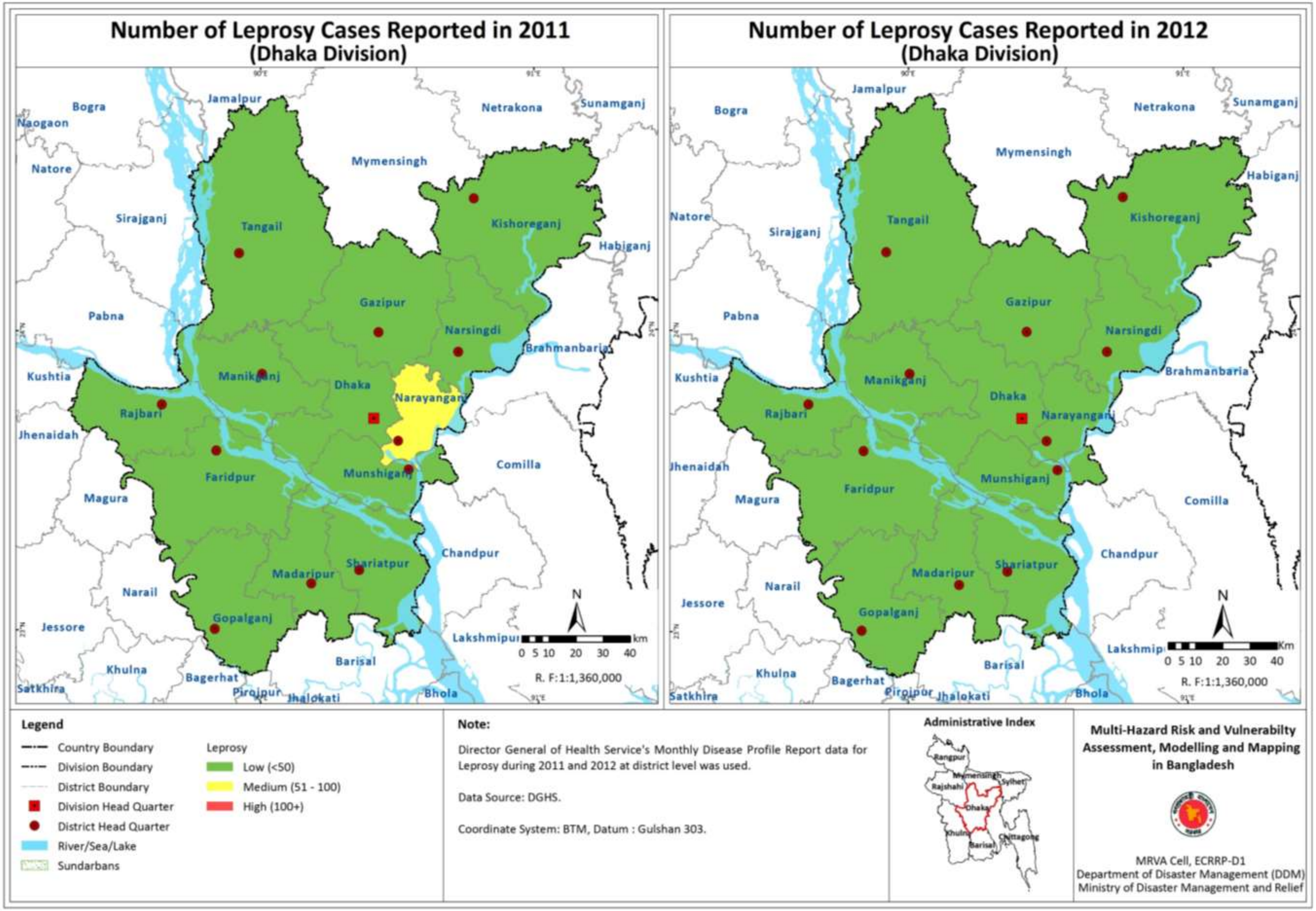
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

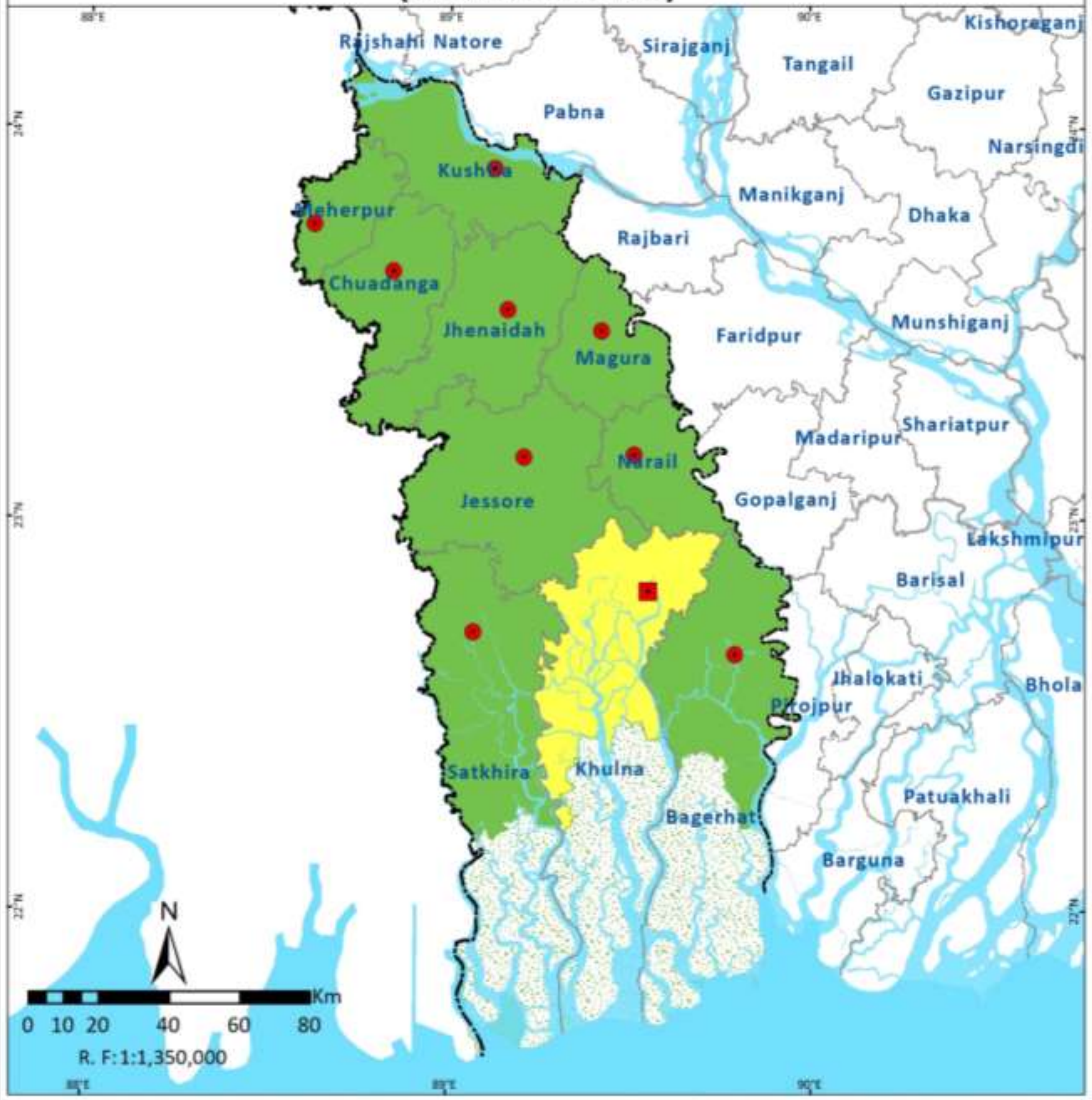
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief



Number of Leprosy Cases Reported in 2011
(Dhaka Division)
Jamalpur
Bogra
Naogaon
Natore
Sirajganj
Netrakona
Sunamganj
Mymensingh
Tangail
Kishoreganj
Habiganj
Gazipur
Narsingdi
Pabna
Brahmanbaria
Kushtia
Manikganj
Dhaka
Narayanganj
Rajbari
Jhenaidah
Faridpur
Munshiganj
Comilla
Magura
Chandpur
Narail
Madaripur
Shariatpur
Gopalganj
Jessore
Lakshmipur
Khulna
Bagerhat
Barisal
Satkhira
Pirojpur
Jhalokati
Bhola
N
km
0 5 10 20 30 40
R. F:1:1,360,000
Number of Leprosy Cases Reported in 2012
(Dhaka Division)
Km
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Leprosy
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2013 (Dhaka Division)

Number of Leprosy Cases Reported in 2011 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2013 at district level was used.

Data Source: DGHS.

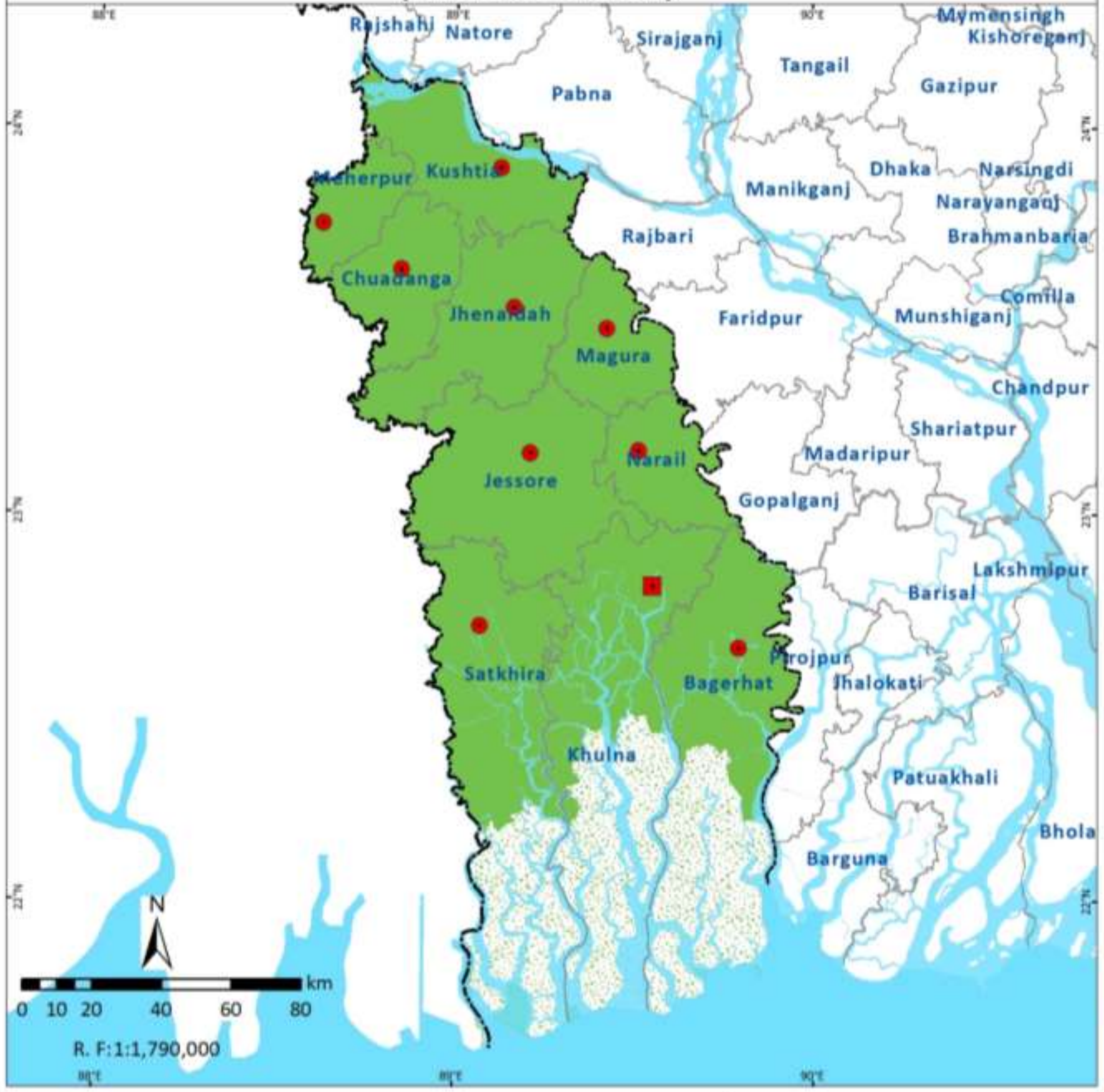
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

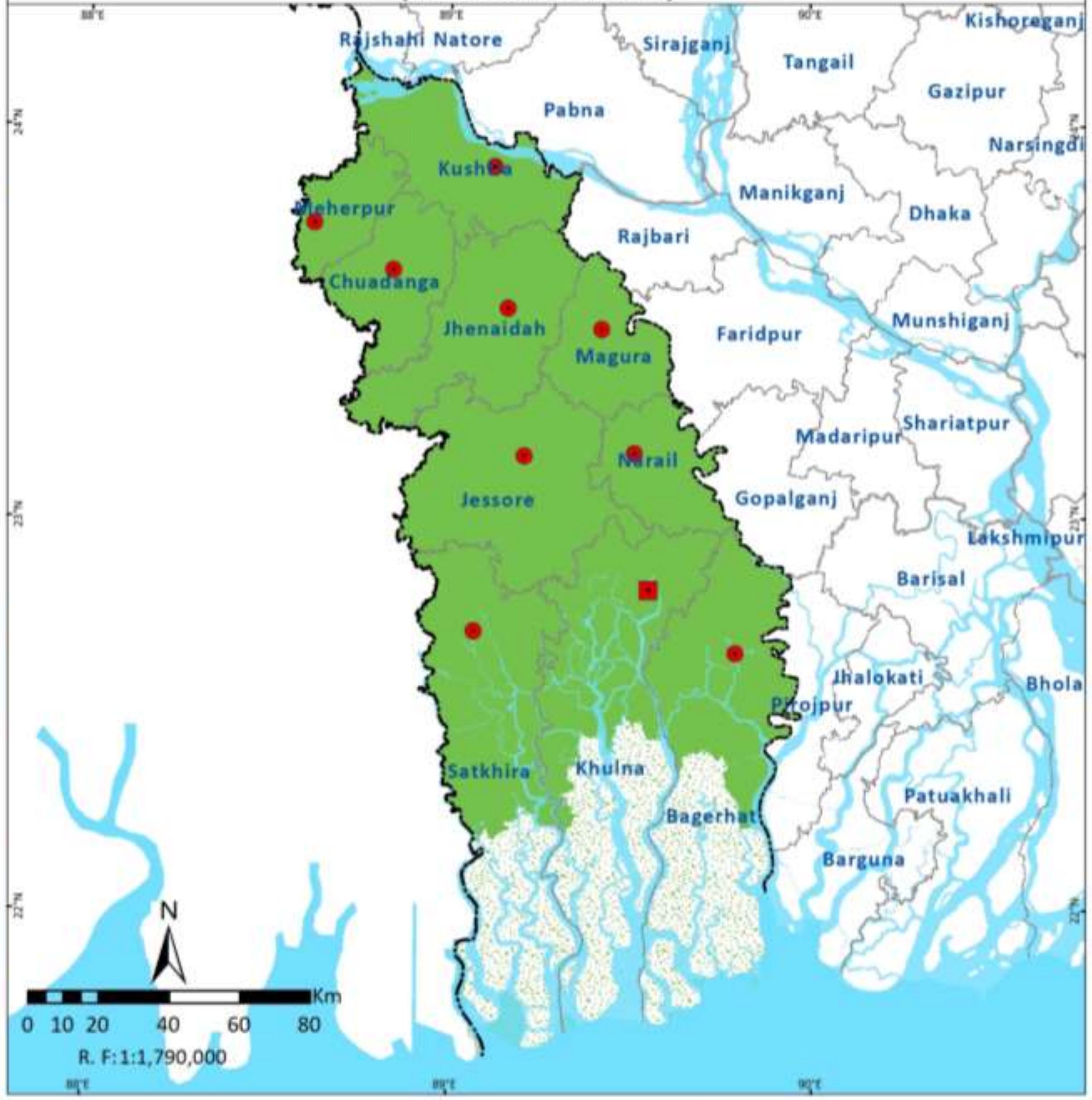
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2012
(Khulna Division)



Number of Leprosy Cases Reported in 2013
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2012 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2011
(Mymensingh Division)

Number of Leprosy Cases Reported in 2012
(Mymensingh Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

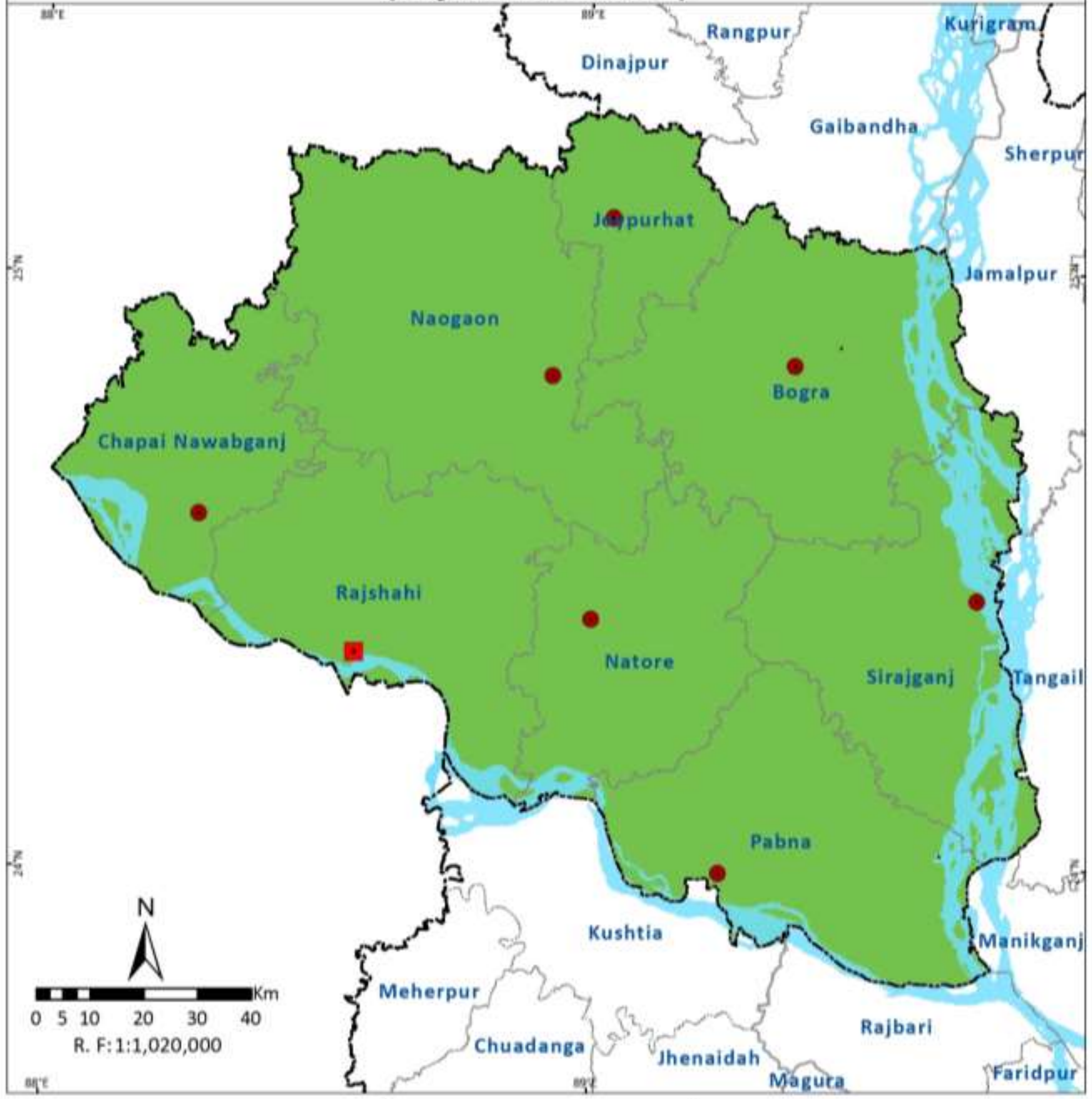
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2013
(Mymensingh Division)

Number of Leprosy Cases Reported in 2011
(Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

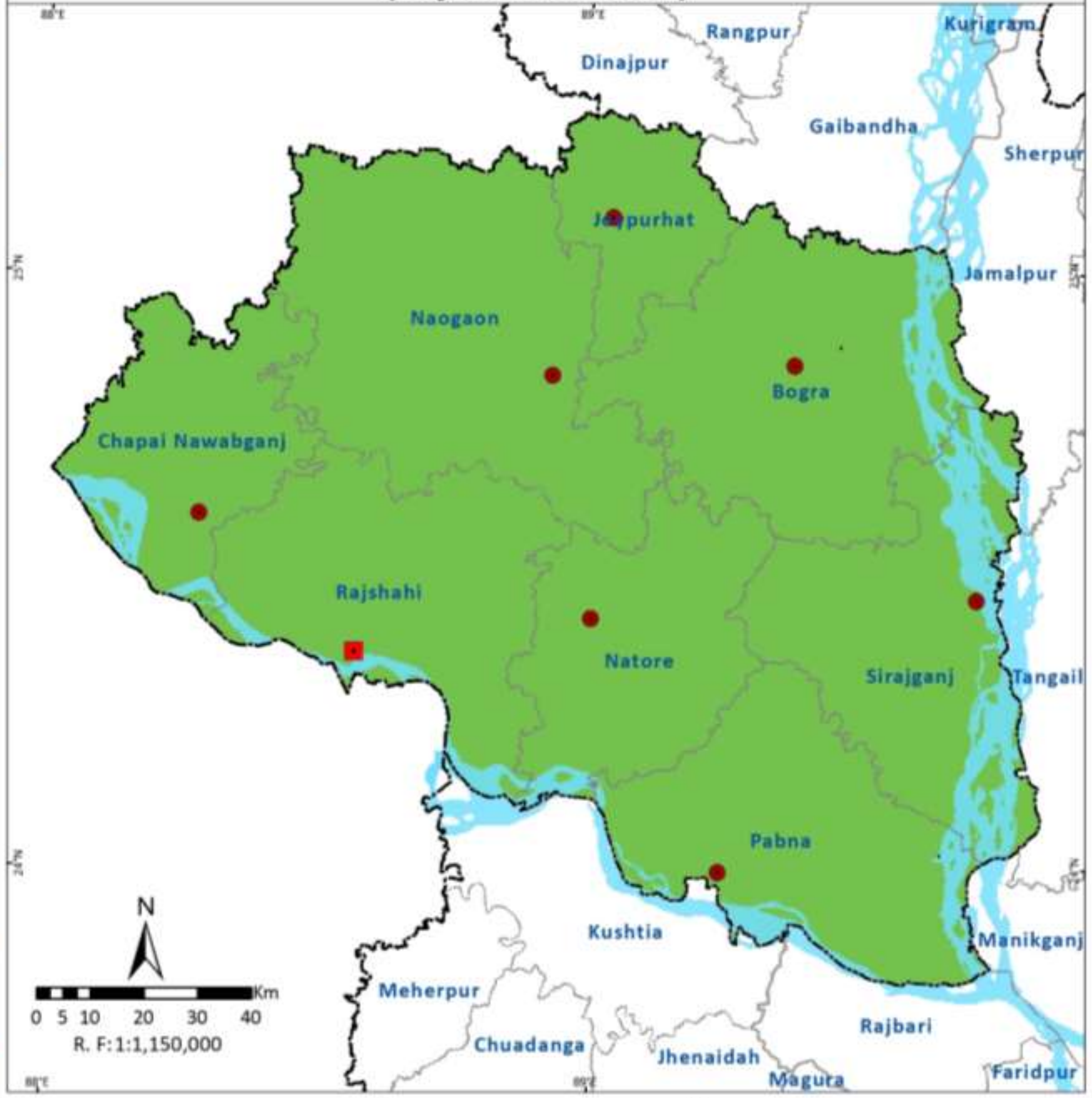
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2012 (Rajshahi Division)

Number of Leprosy Cases Reported in 2013 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2012 and 2013 at district level was used.

Data Source: DGHS.

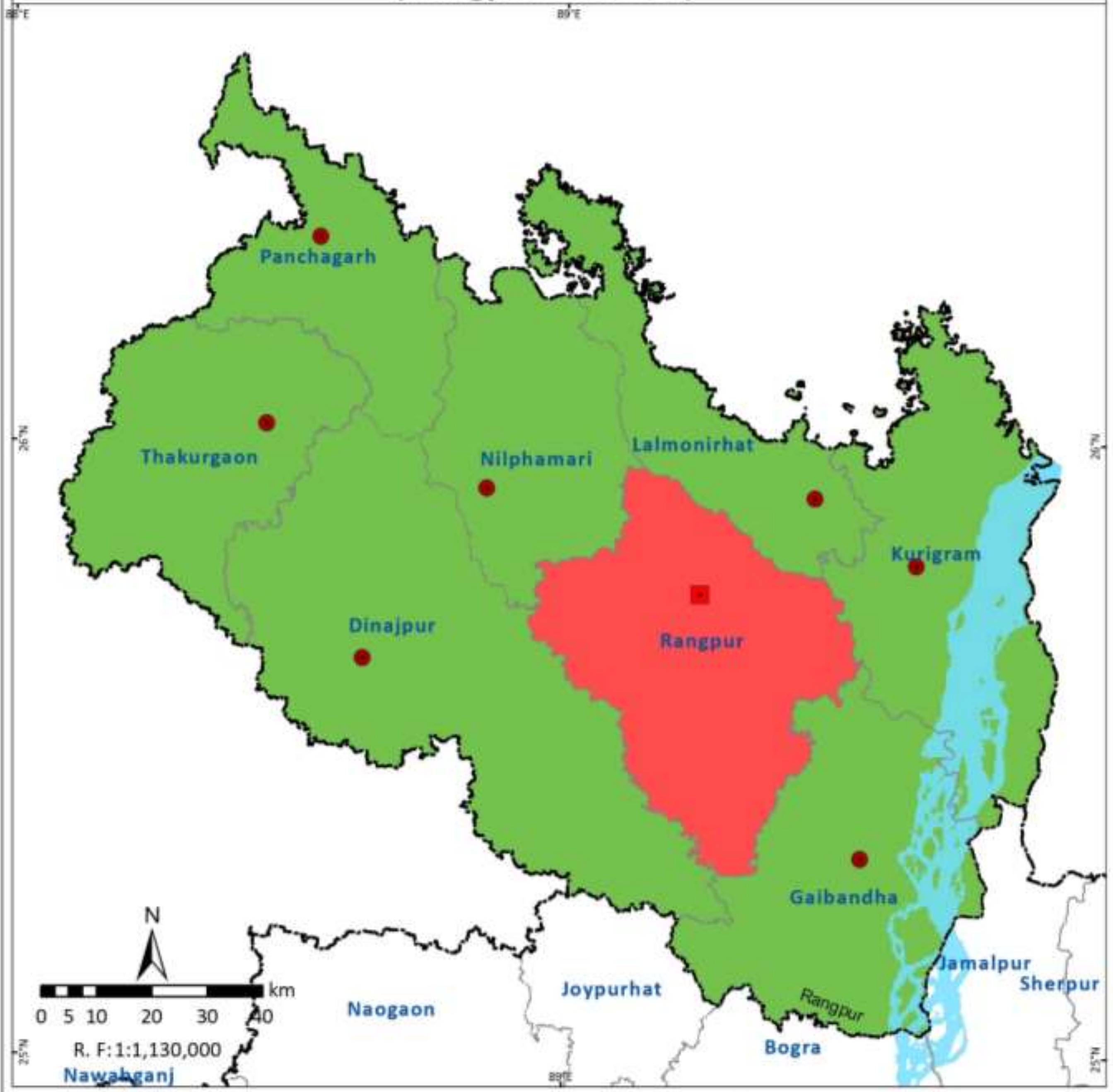
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2011
(Rangpur Division)



Number of Leprosy Cases Reported in 2012
(Rangpur Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2012 at district level was used.

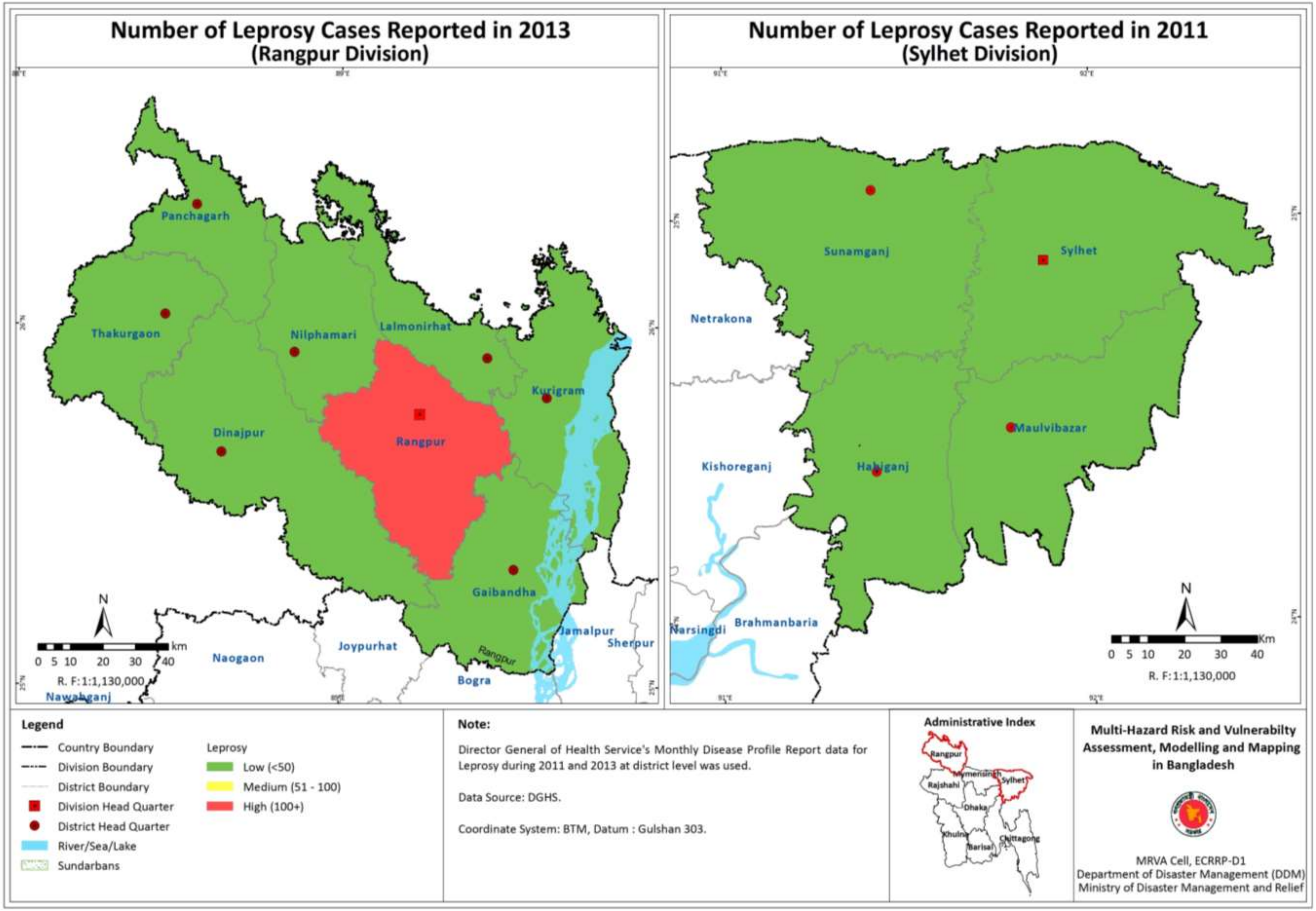
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

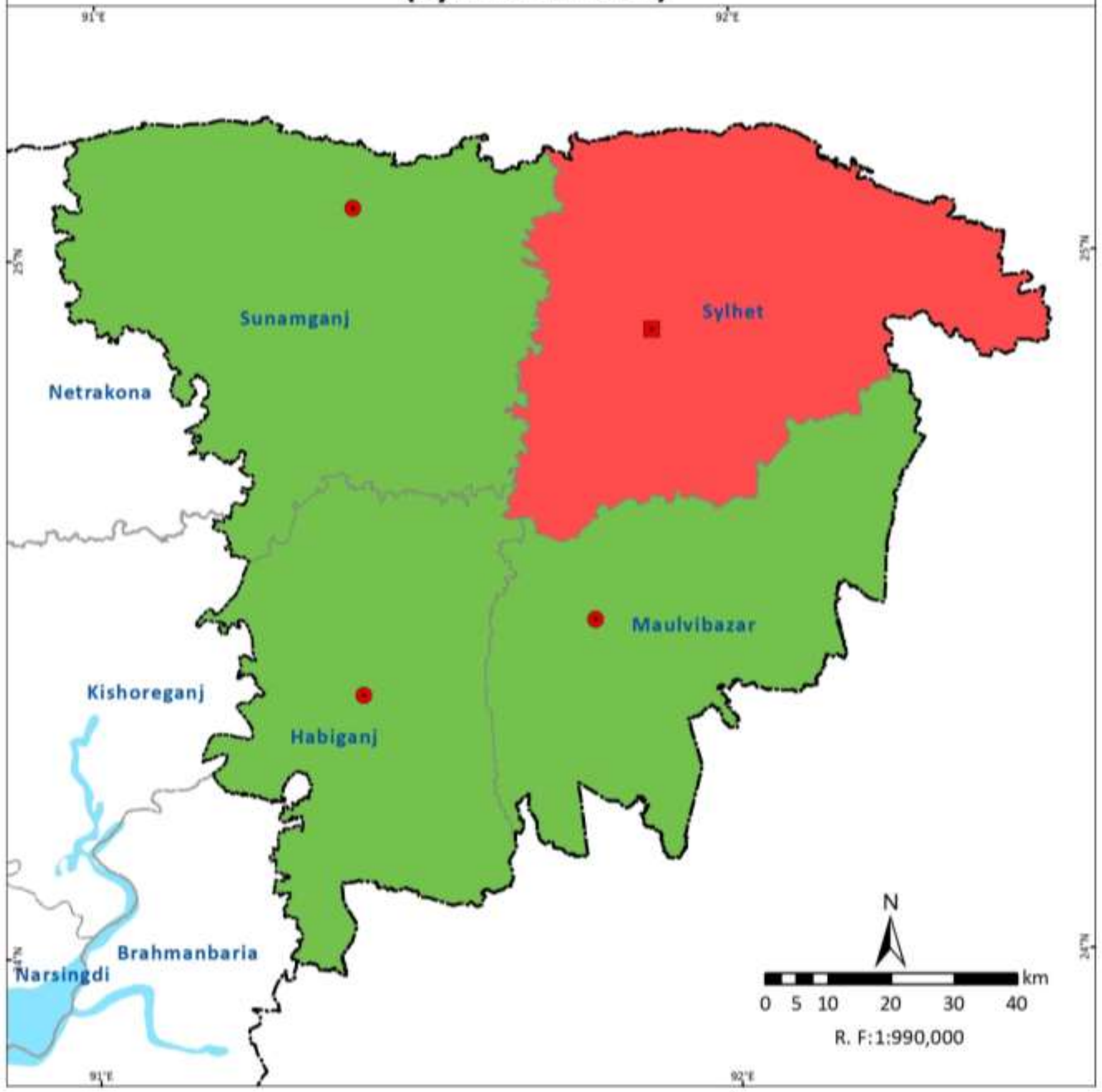
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

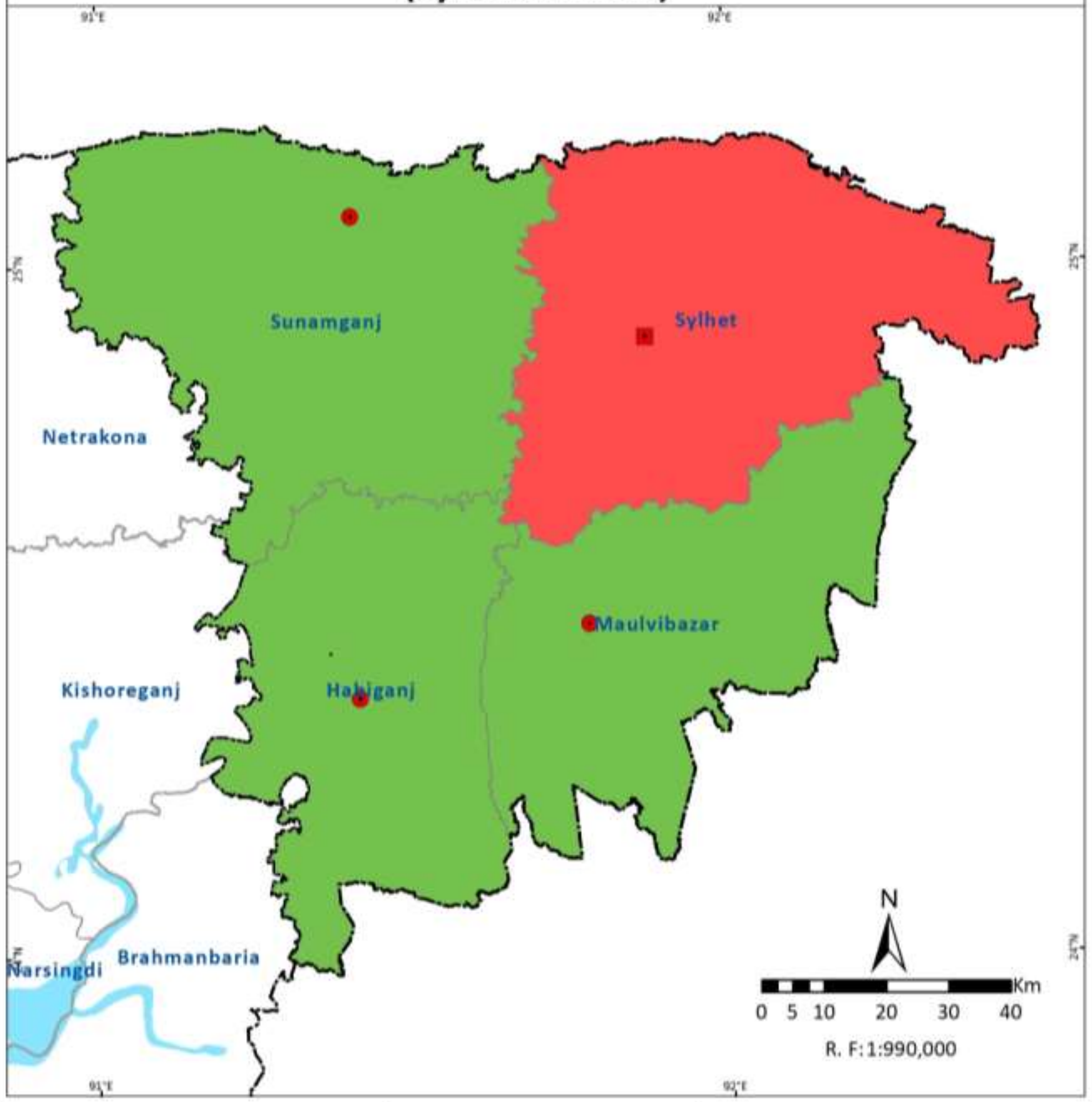


Number of Leprosy Cases Reported in 2013
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
km
0 5 10 20 30 40
R. F: 1:1,130,000
Number of Leprosy Cases Reported in 2011
(Sylhet Division)
Sunamganj
Sylhet
Netrakona
Maulvibazar
Kishoreganj
Habiganj
Narsingdi
Brahmanbaria
Km
0 5 10 20 30 40
R. F: 1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Leprosy
Low (<50)
Medium (51 - 100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Leprosy Cases Reported in 2012
(Sylhet Division)



Number of Leprosy Cases Reported in 2013
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Leprosy

- Low (<50)
- Medium (51 - 100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Leprosy during 2012 and 2013 at district level was used.

Data Source: DGHS.

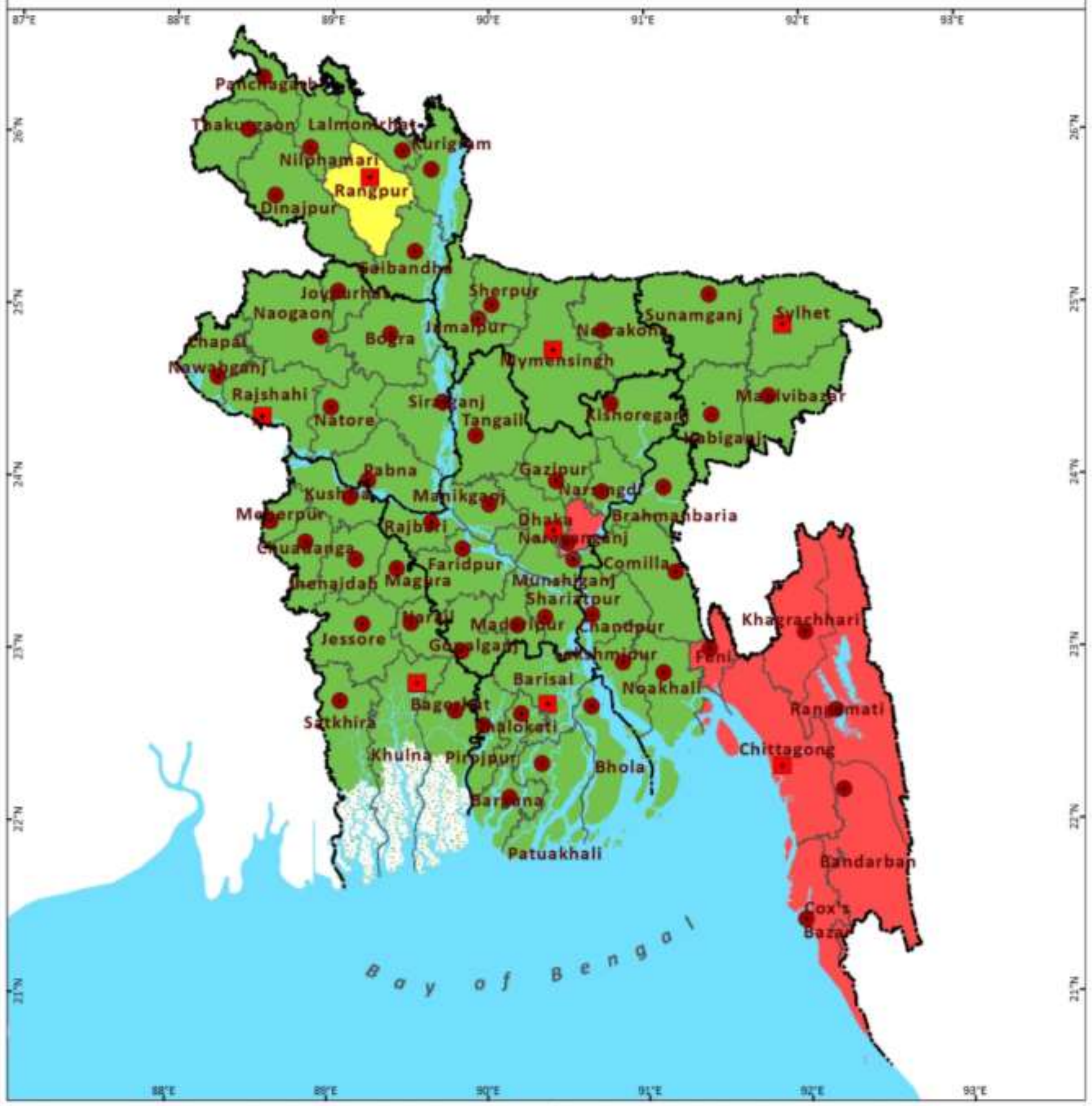
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

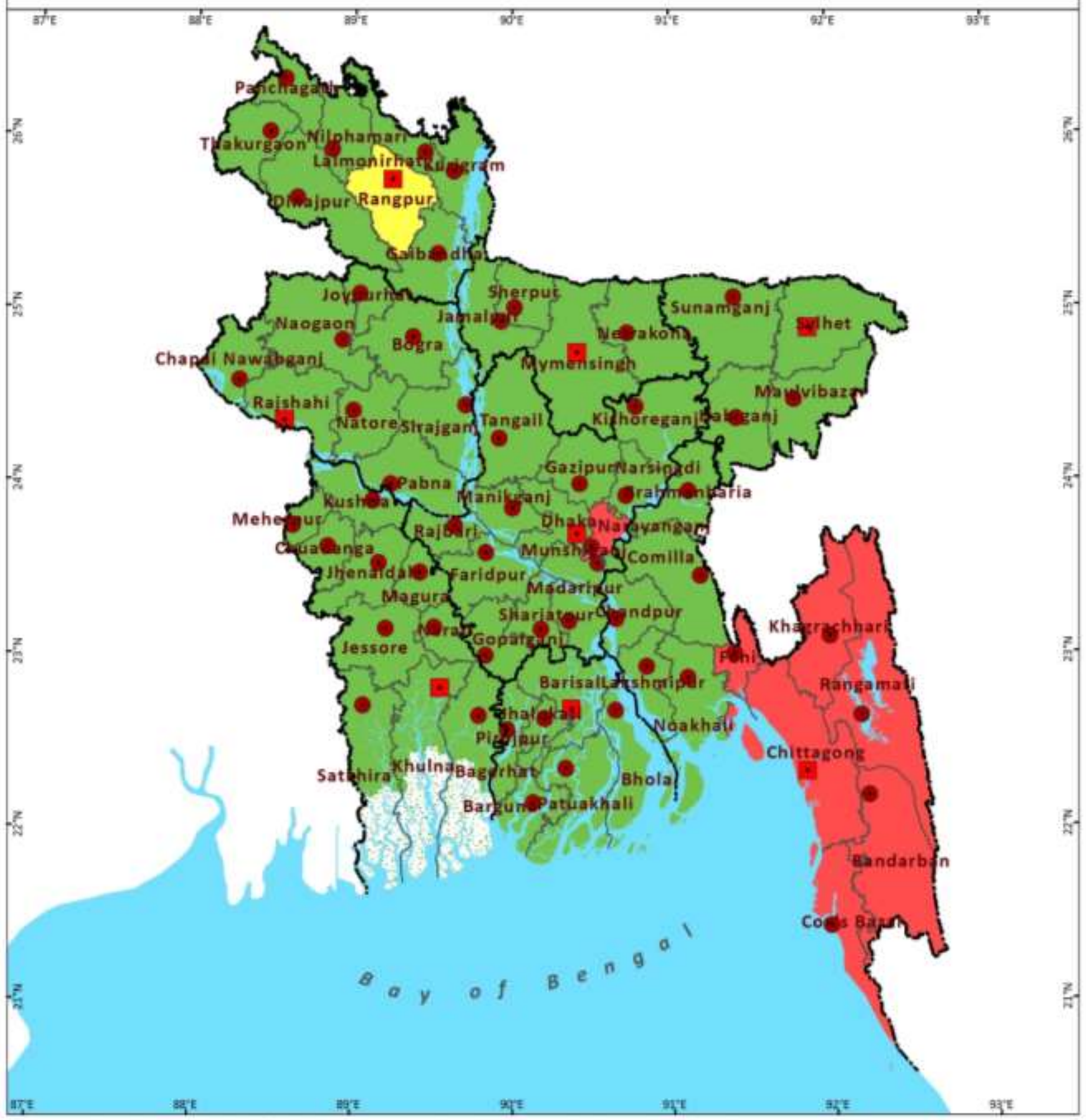
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported at District Level in 2011



Number of Malaria Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

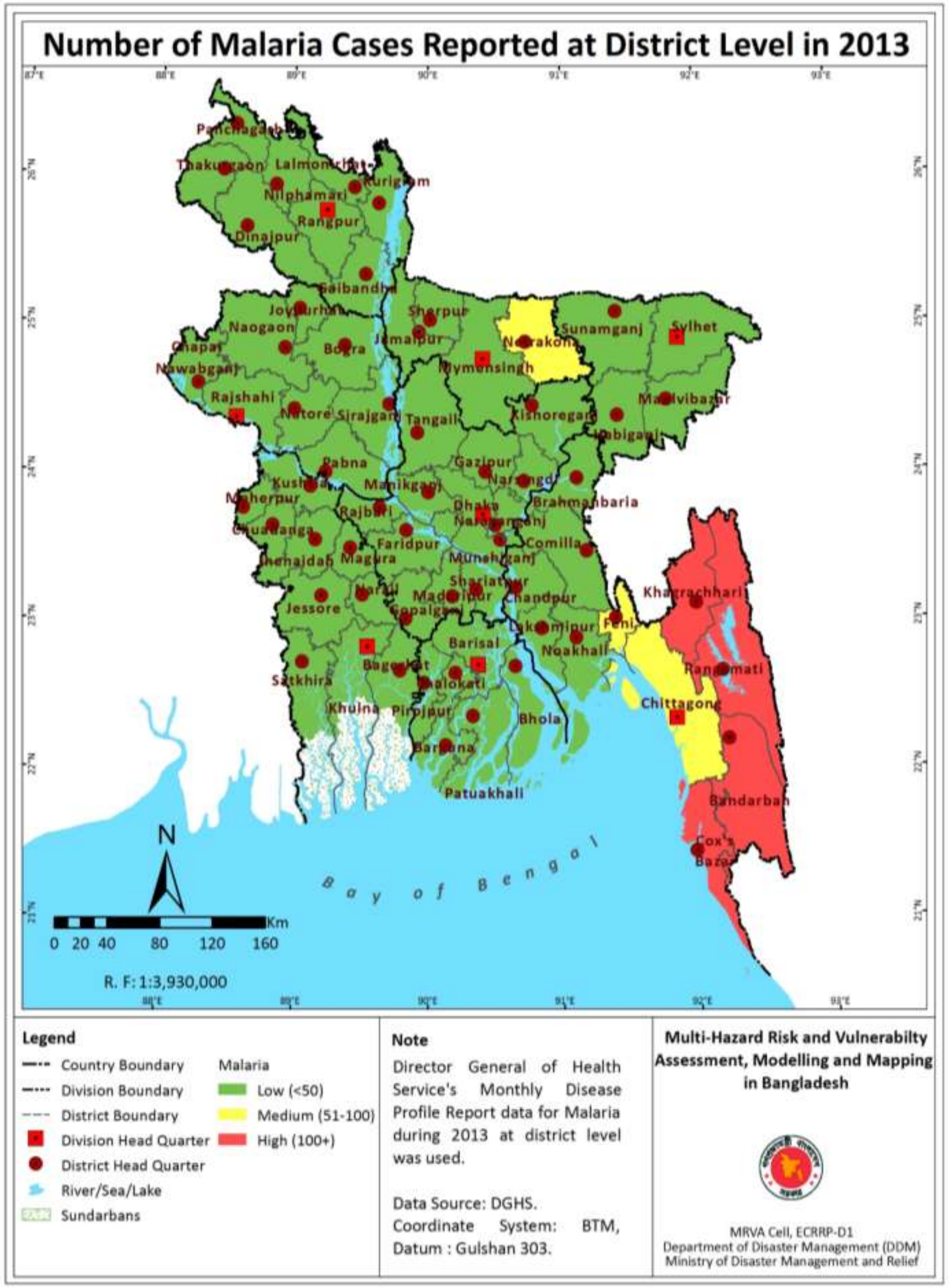
N

0 25 50 100 150 200 Km

R. F: 1:4,000,000

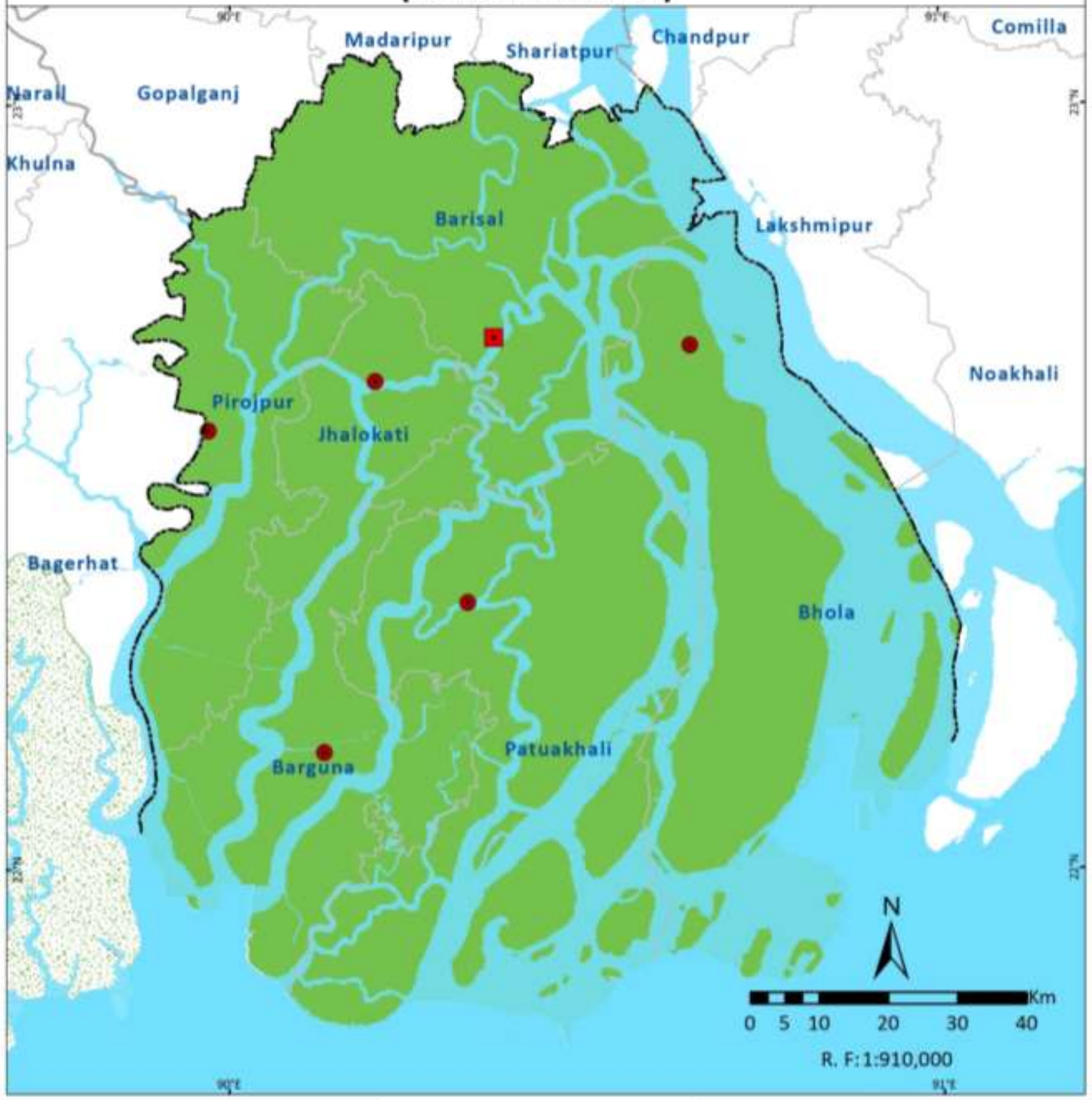
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Malaria Cases Reported at District Level in 2013
Bay of Bengal
N
Km
0 20 40 80 120 160
R. F: 1:3,930,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Malaria
Low (<50)
Medium (51-100)
High (100+)
Note
Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief
Rangpur
Dinajpur
Sunamganj
Sylhet
Rajshahi
Tangail
Pabna
Brahmanbaria
Faridpur
Jessore
Barisal
Noakhali
Chittagong
Bhola
Patuakhali
Bandarban

Number of Malaria Cases Reported in 2011
(Barisal Division)

Number of Malaria Cases Reported in 2012
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2012 at district level was used.

Data Source: DGHS.

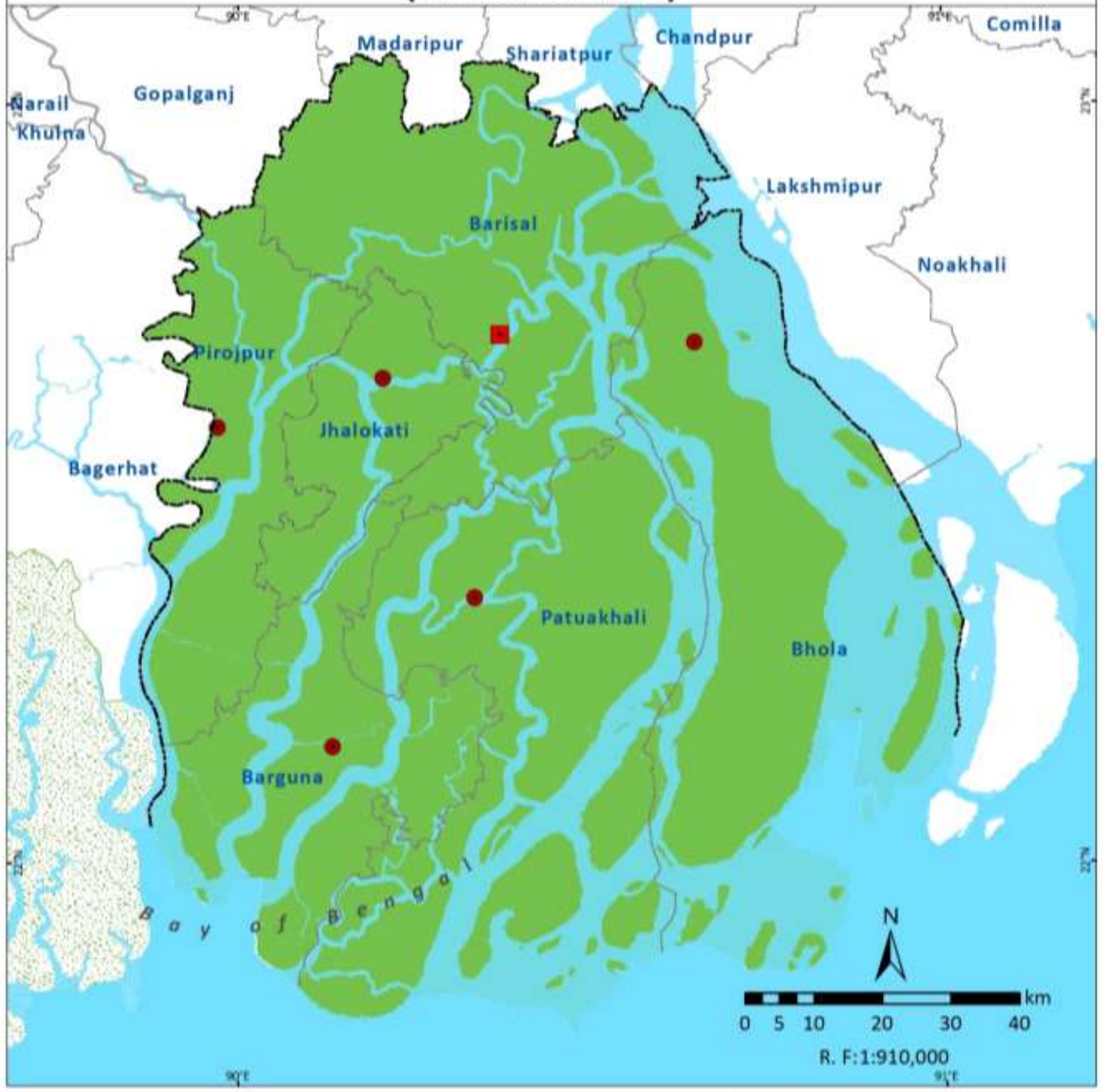
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

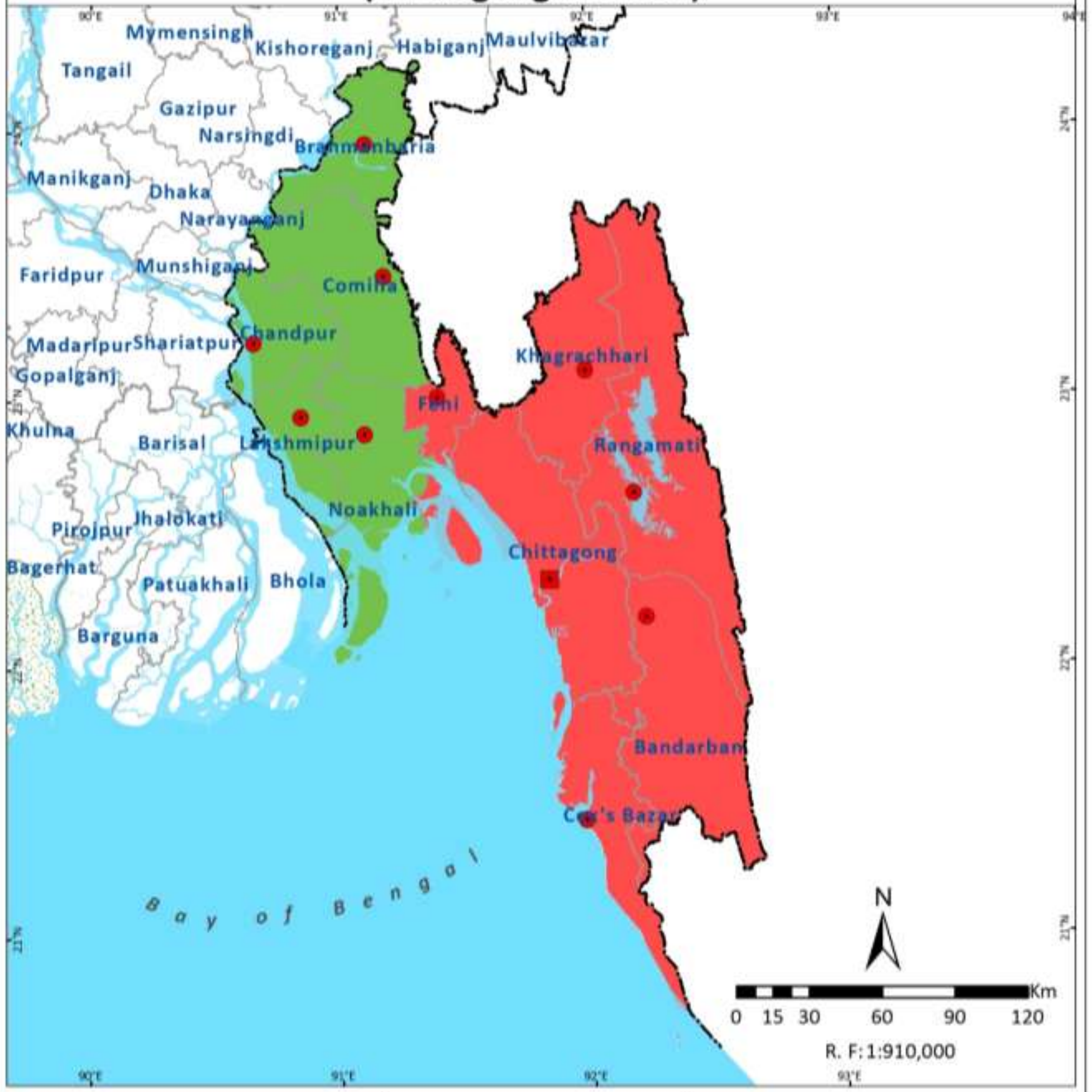
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2013
(Barisal Division)



Number of Malaria Cases Reported in 2011
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2013 at district level was used.

Data Source: DGHS.

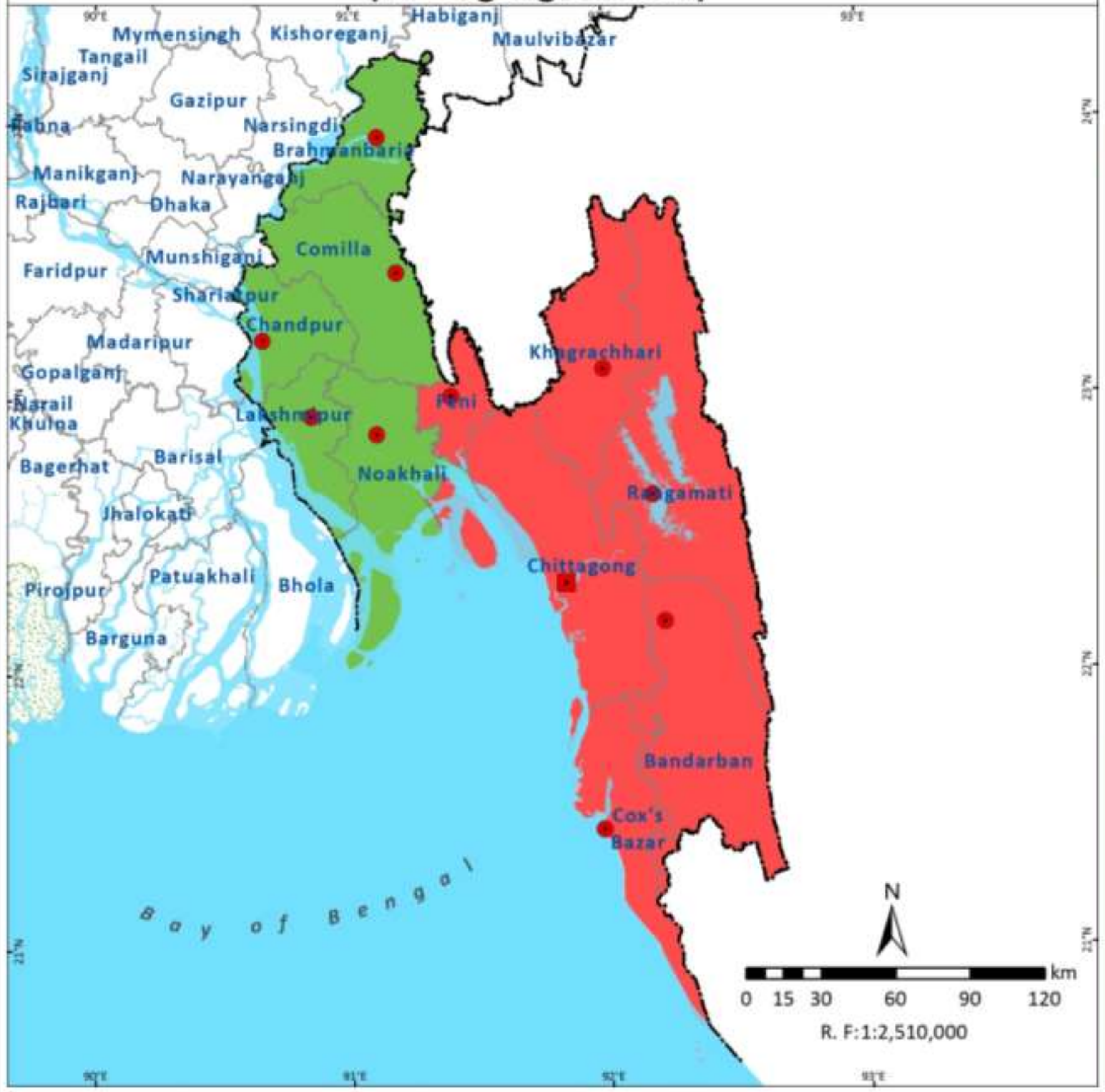
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

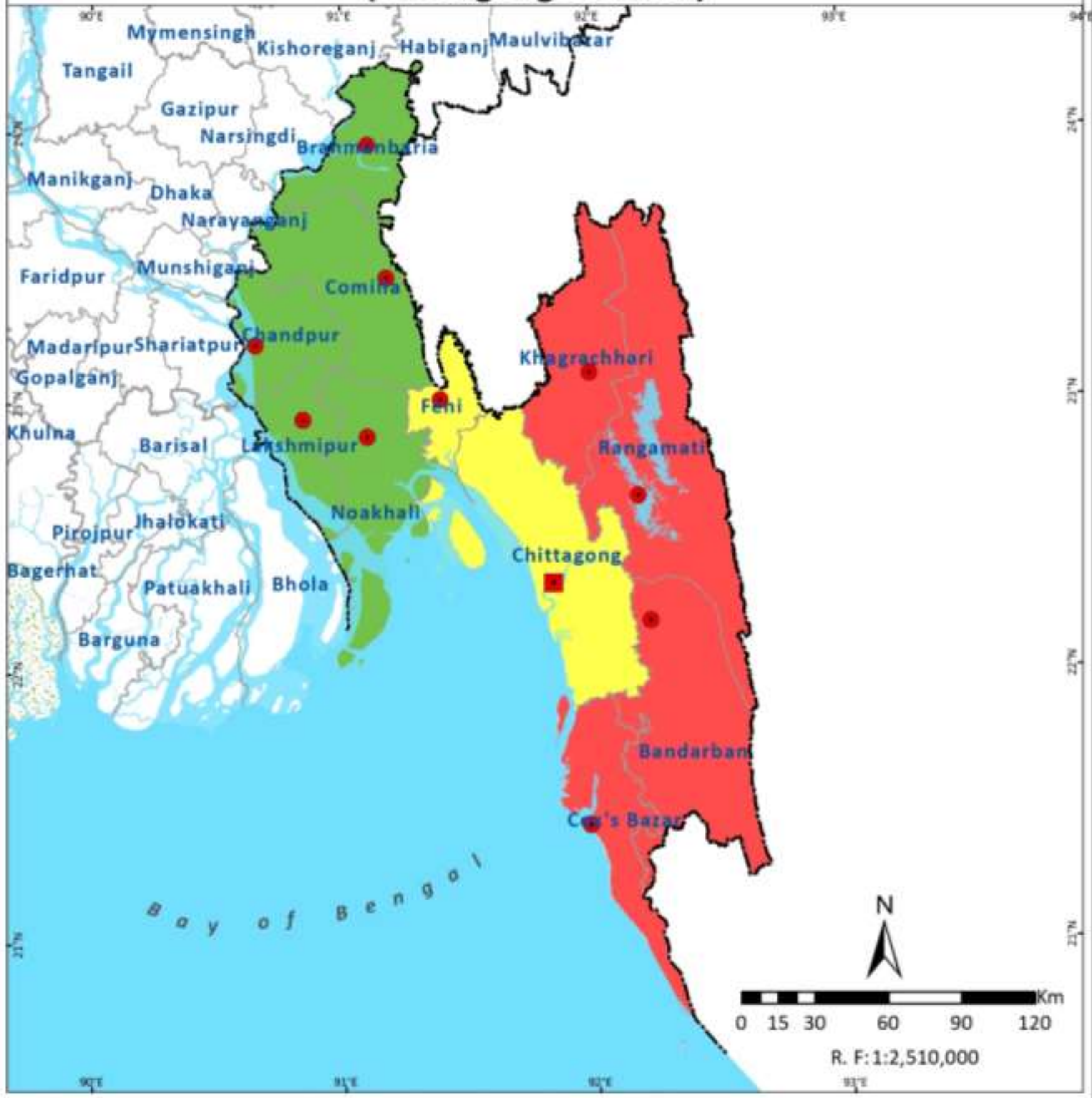
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2012
(Chittagong Division)



Number of Malaria Cases Reported in 2013
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2012 and 2013 at district level was used.

Data Source: DGHS.

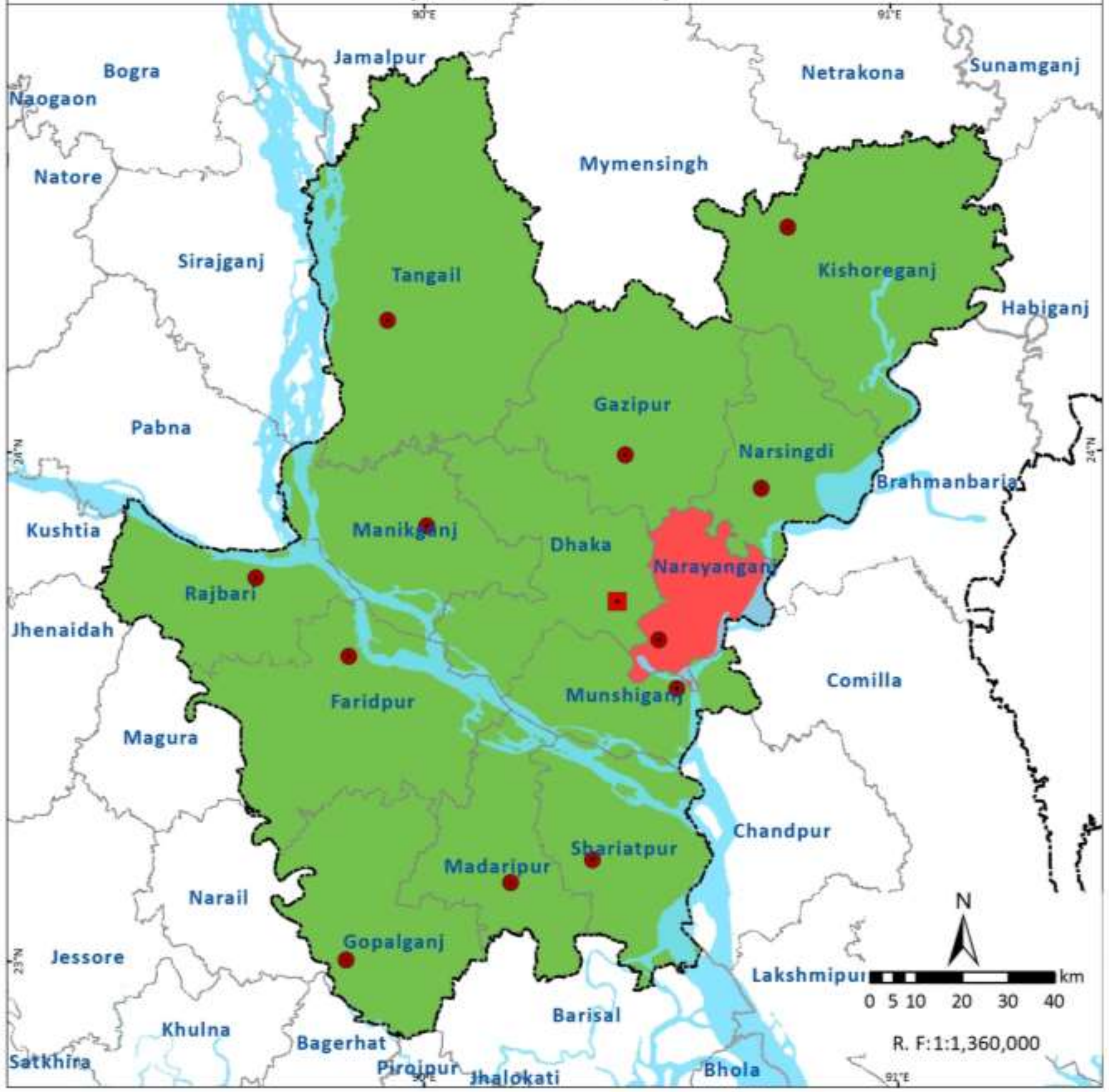
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

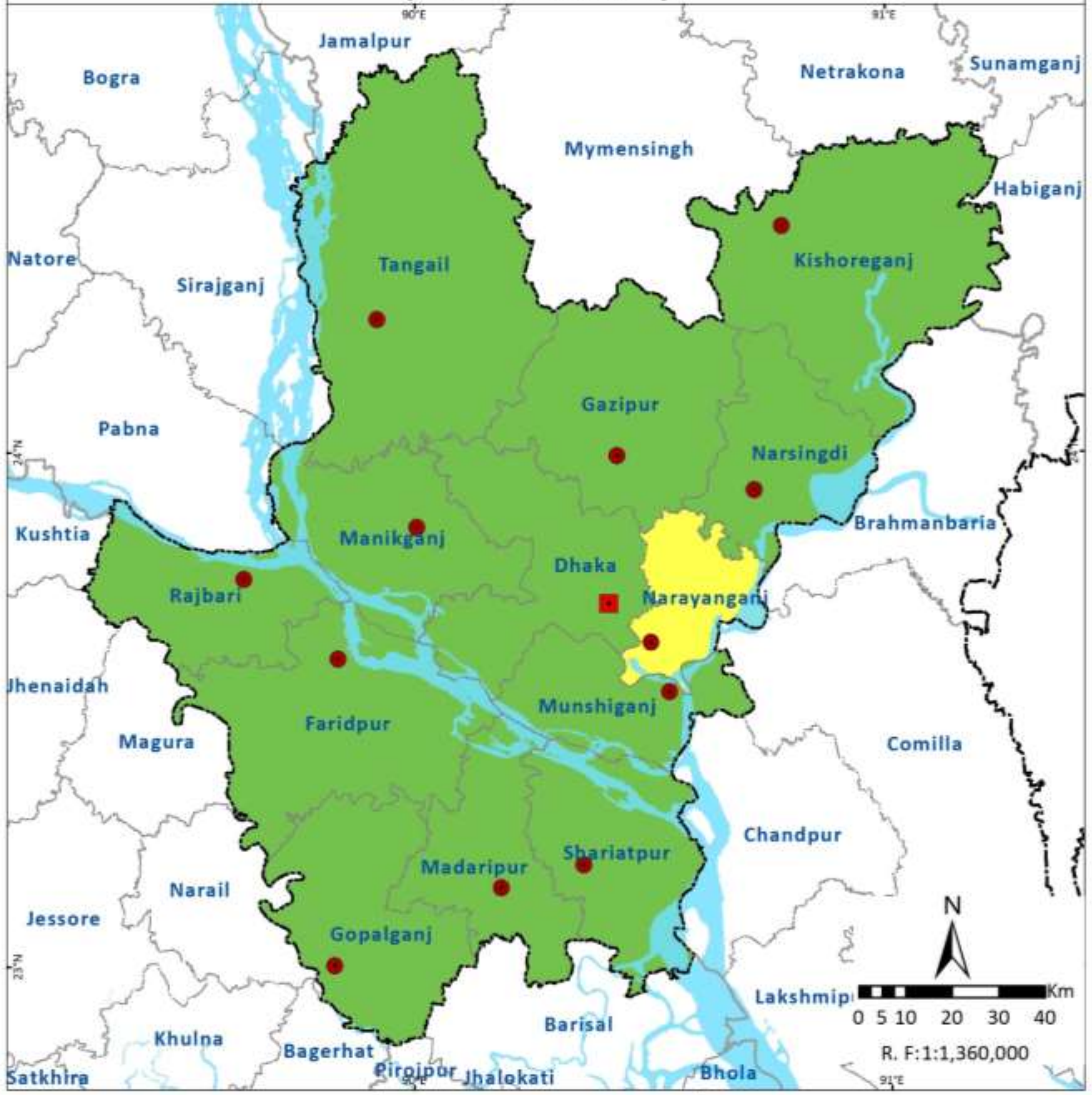
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2011
(Dhaka Division)



Number of Malaria Cases Reported in 2012
(Dhaka Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

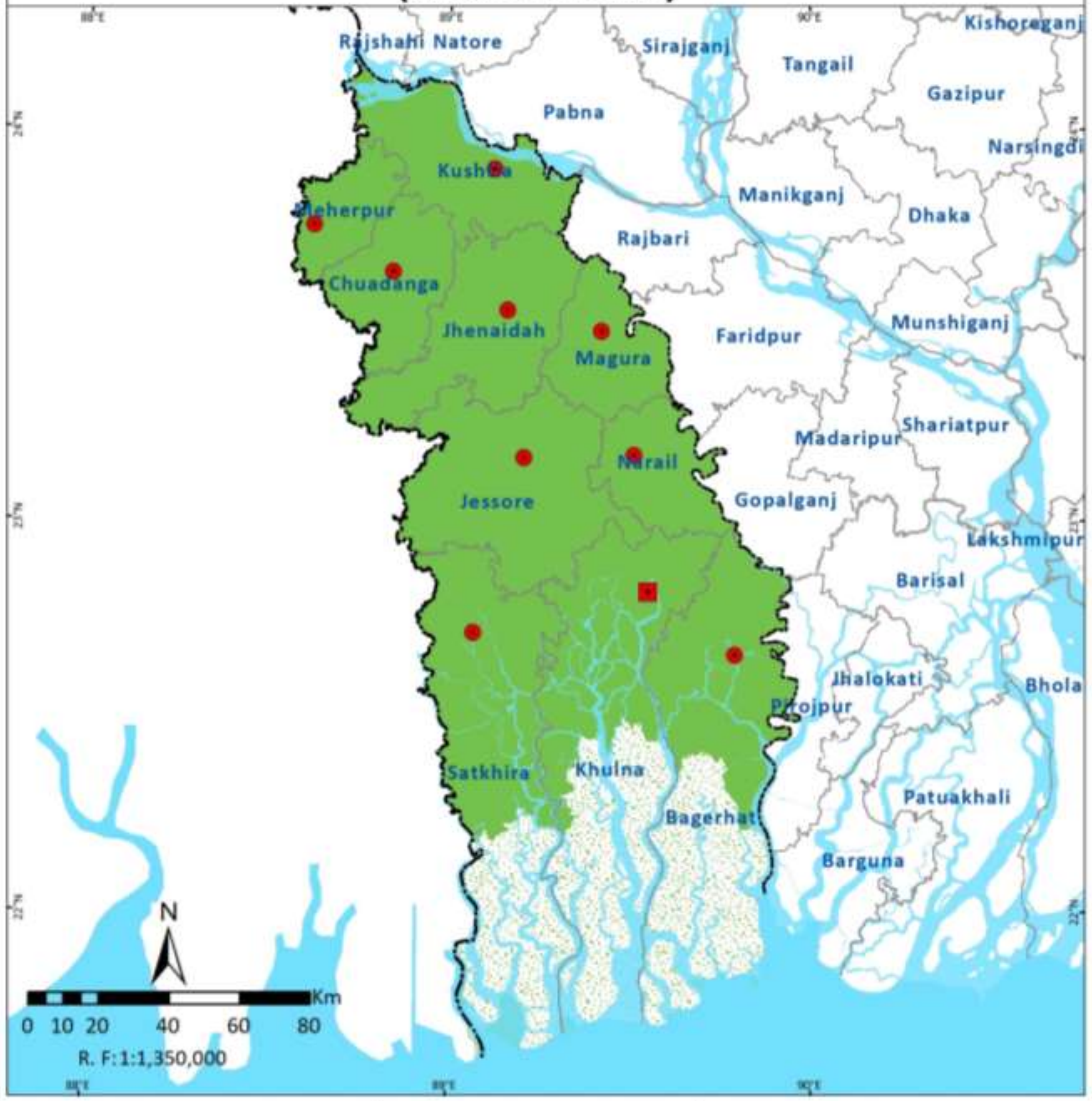
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2013
(Dhaka Division)

Number of Malaria Cases Reported in 2011
(Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2013 at district level was used.

Data Source: DGHS.

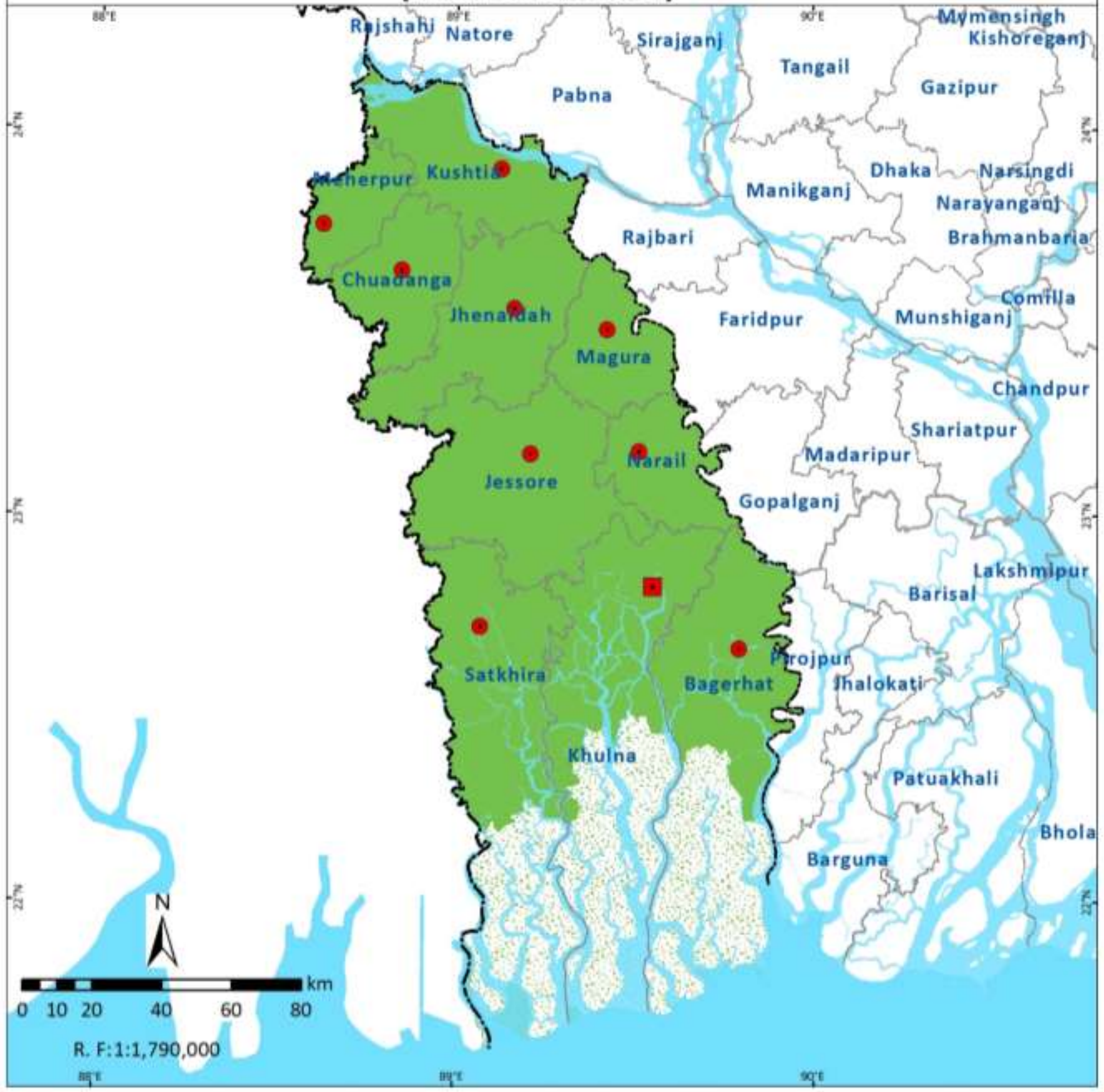
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

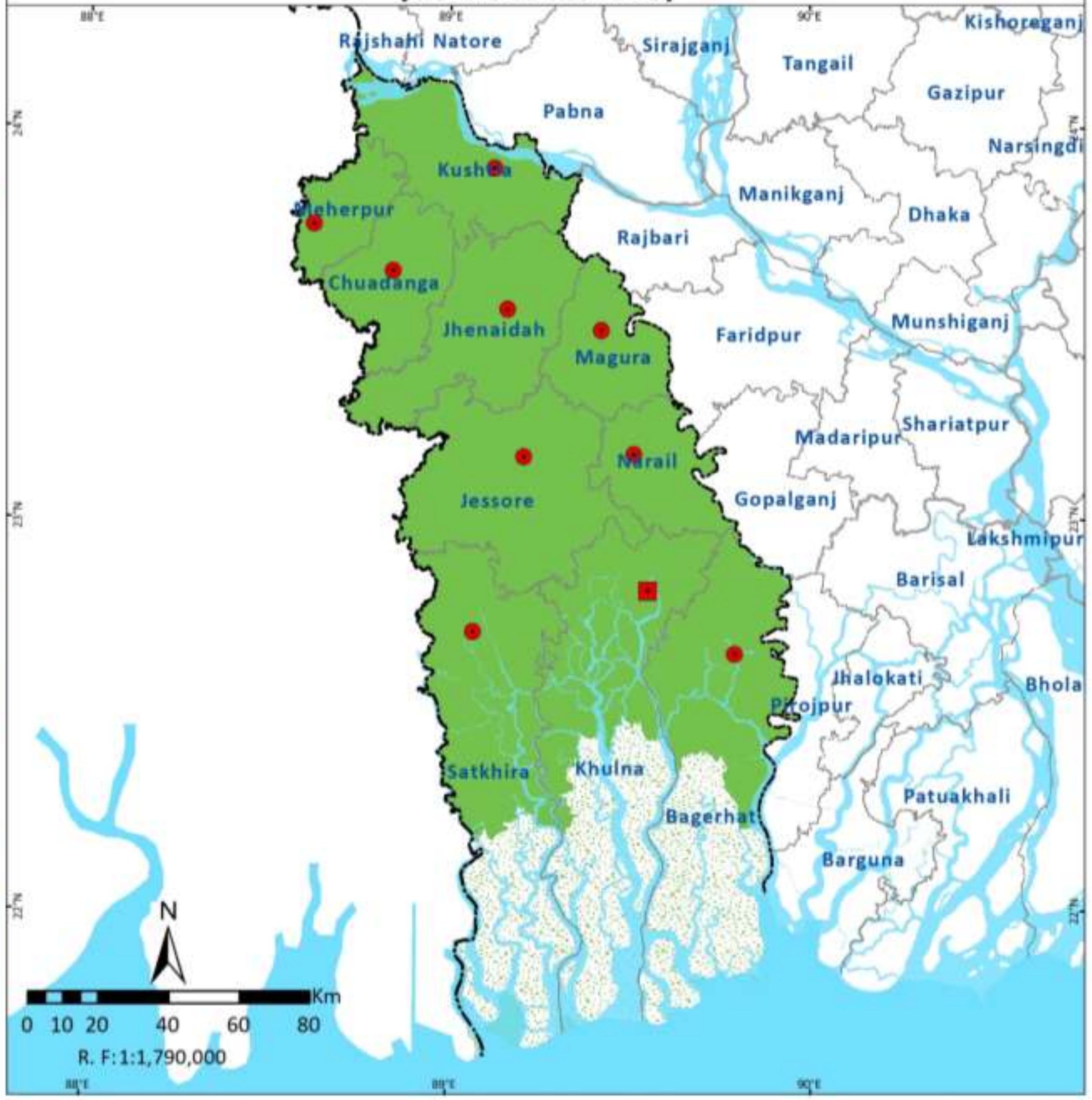
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2012 (Khulna Division)



Number of Malaria Cases Reported in 2013 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2012 and 2013 at district level was used.

Data Source: DGHS.

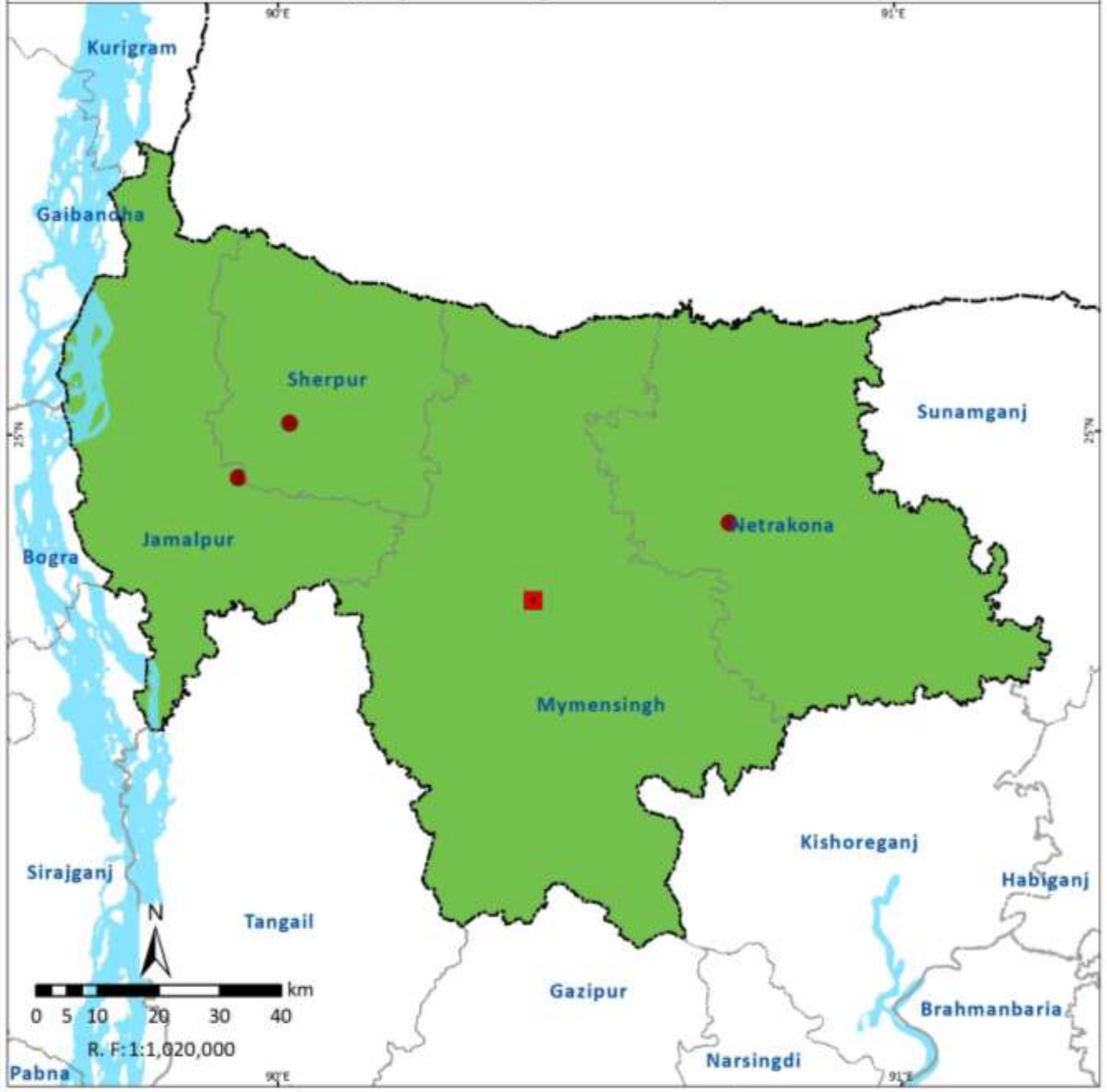
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2011
(Mymensingh Division)



Number of Malaria Cases Reported in 2012
(Mymensingh Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

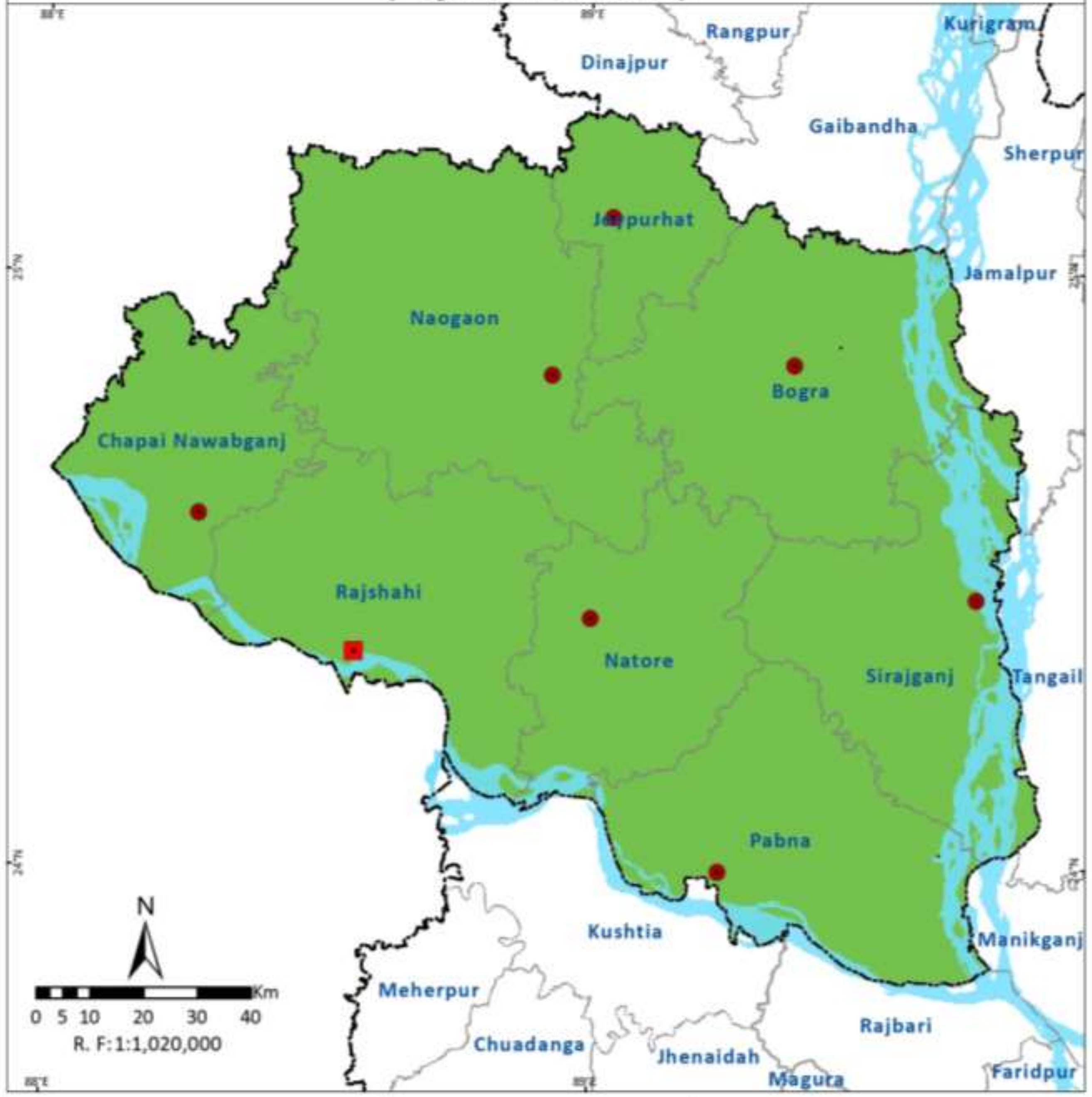
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2013
(Mymensingh Division)

Number of Malaria Cases Reported in 2011
(Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

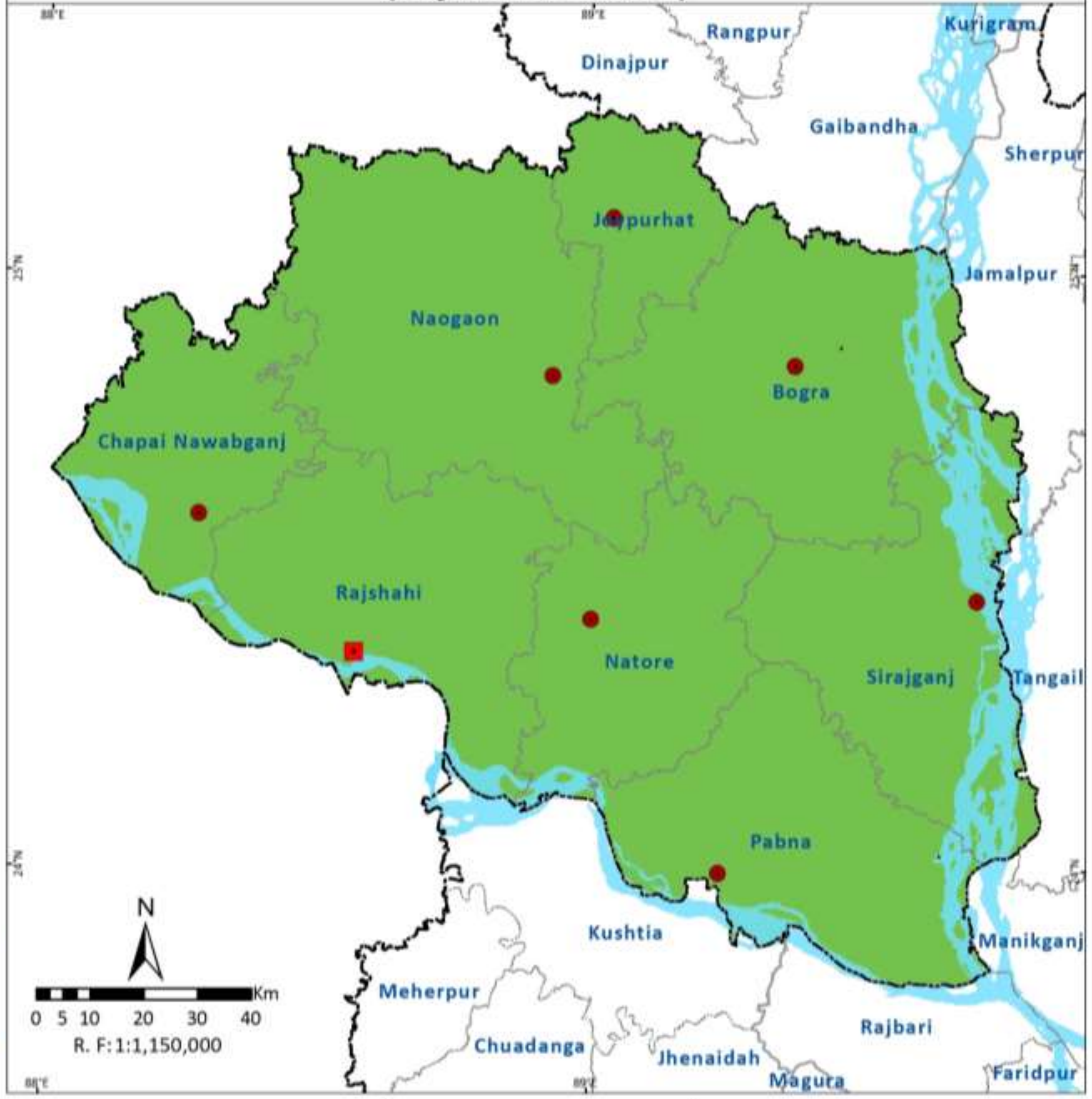
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2012 (Rajshahi Division)

Number of Malaria Cases Reported in 2013 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2012 and 2013 at district level was used.

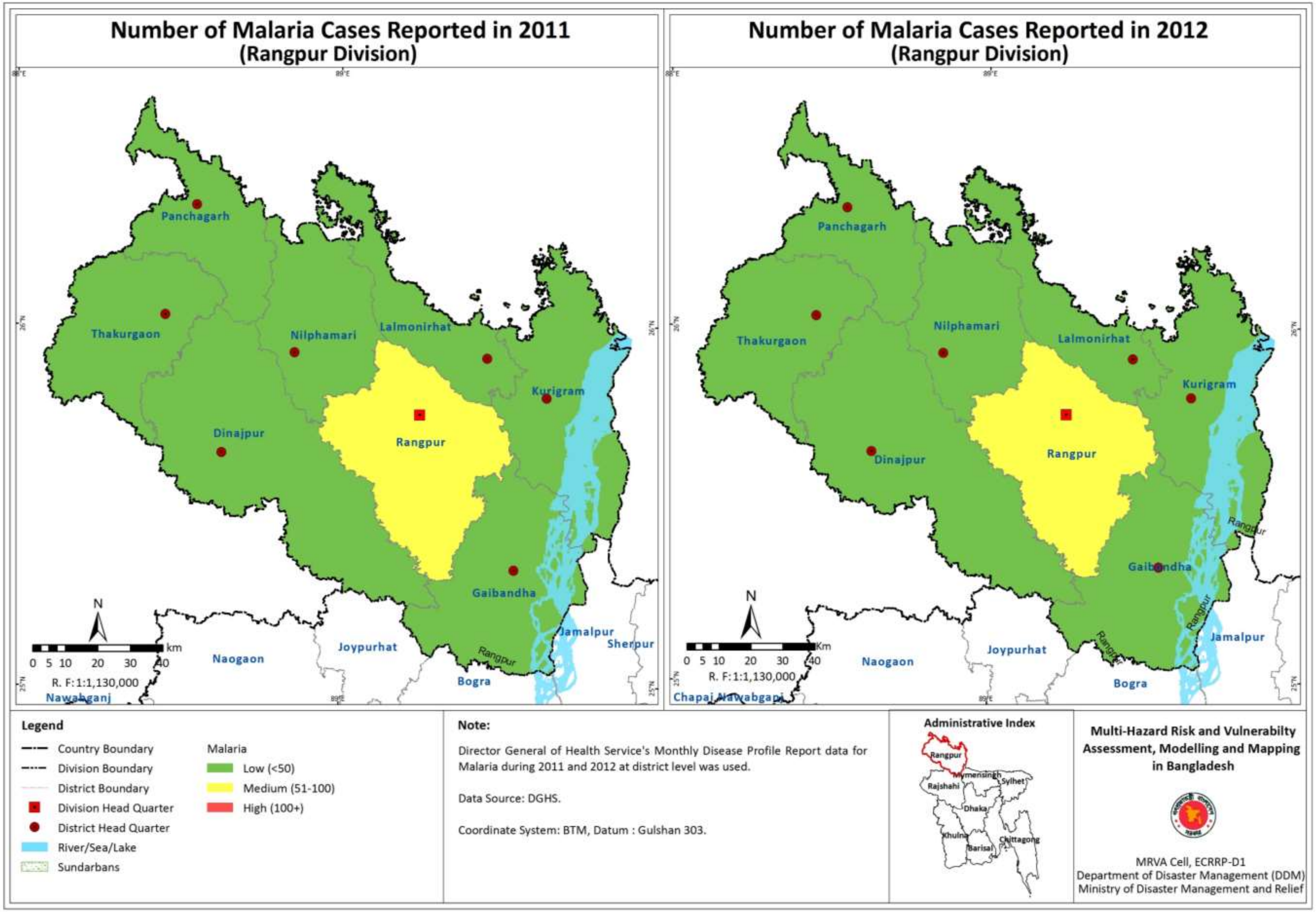
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

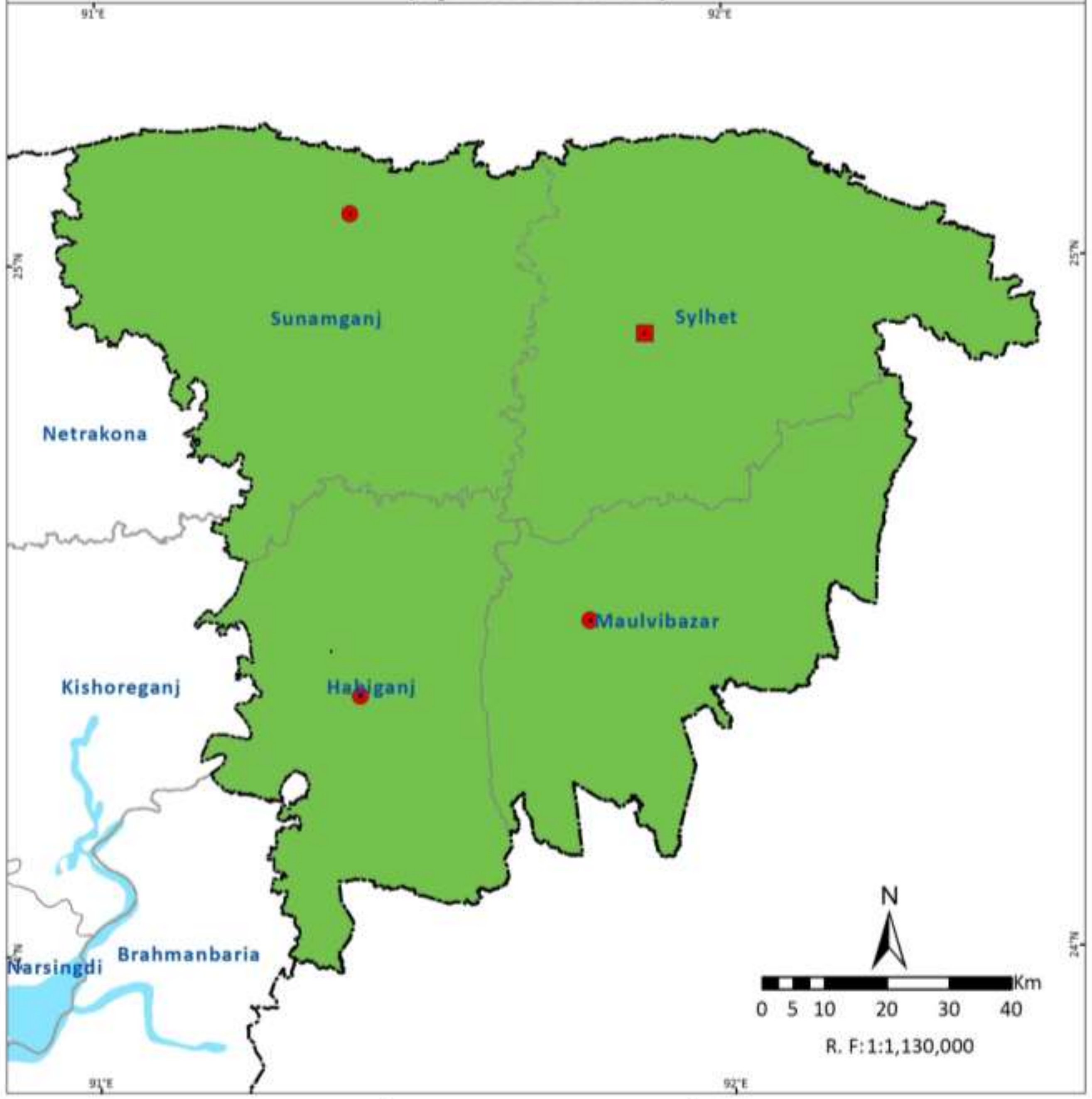
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Malaria Cases Reported in 2011
(Rangpur Division)
Number of Malaria Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
Chapai Nawabganj
N
0 5 10 20 30 40 km
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Malaria
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2013
(Rangpur Division)

Number of Malaria Cases Reported in 2011
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2011 and 2013 at district level was used.

Data Source: DGHS.

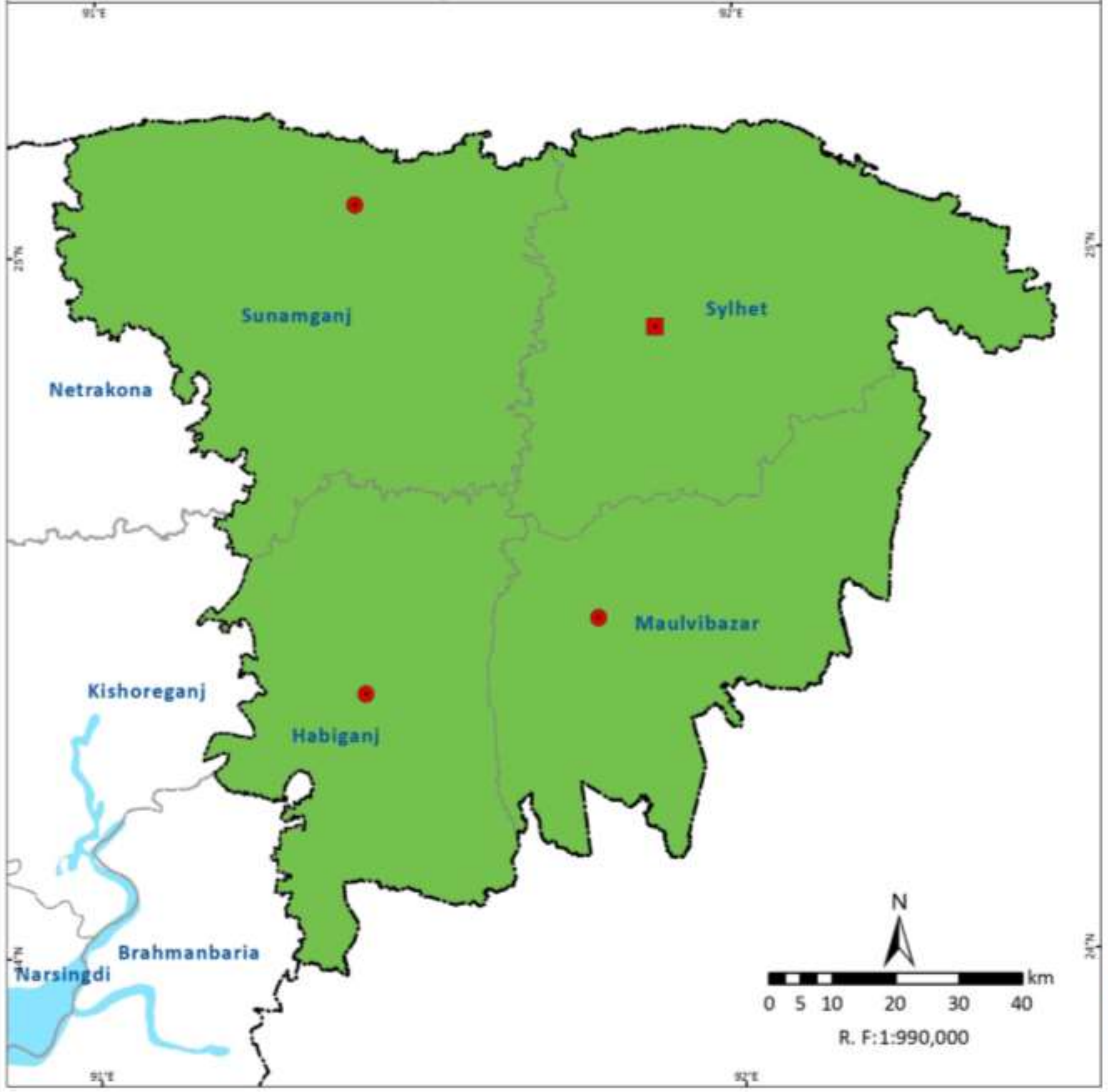
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

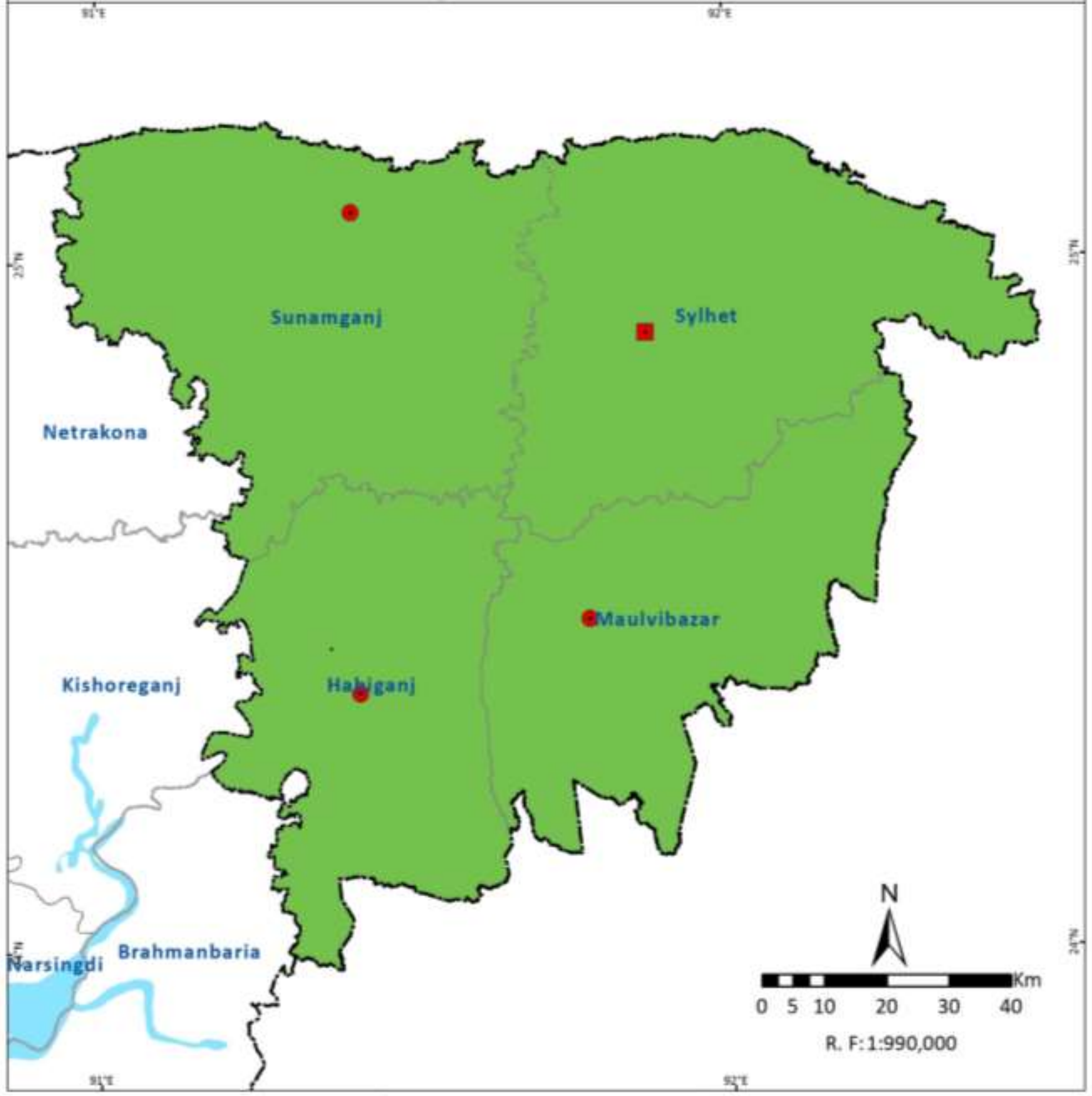
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Malaria Cases Reported in 2012
(Sylhet Division)



Number of Malaria Cases Reported in 2013
(Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Malaria

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Malaria during 2012 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

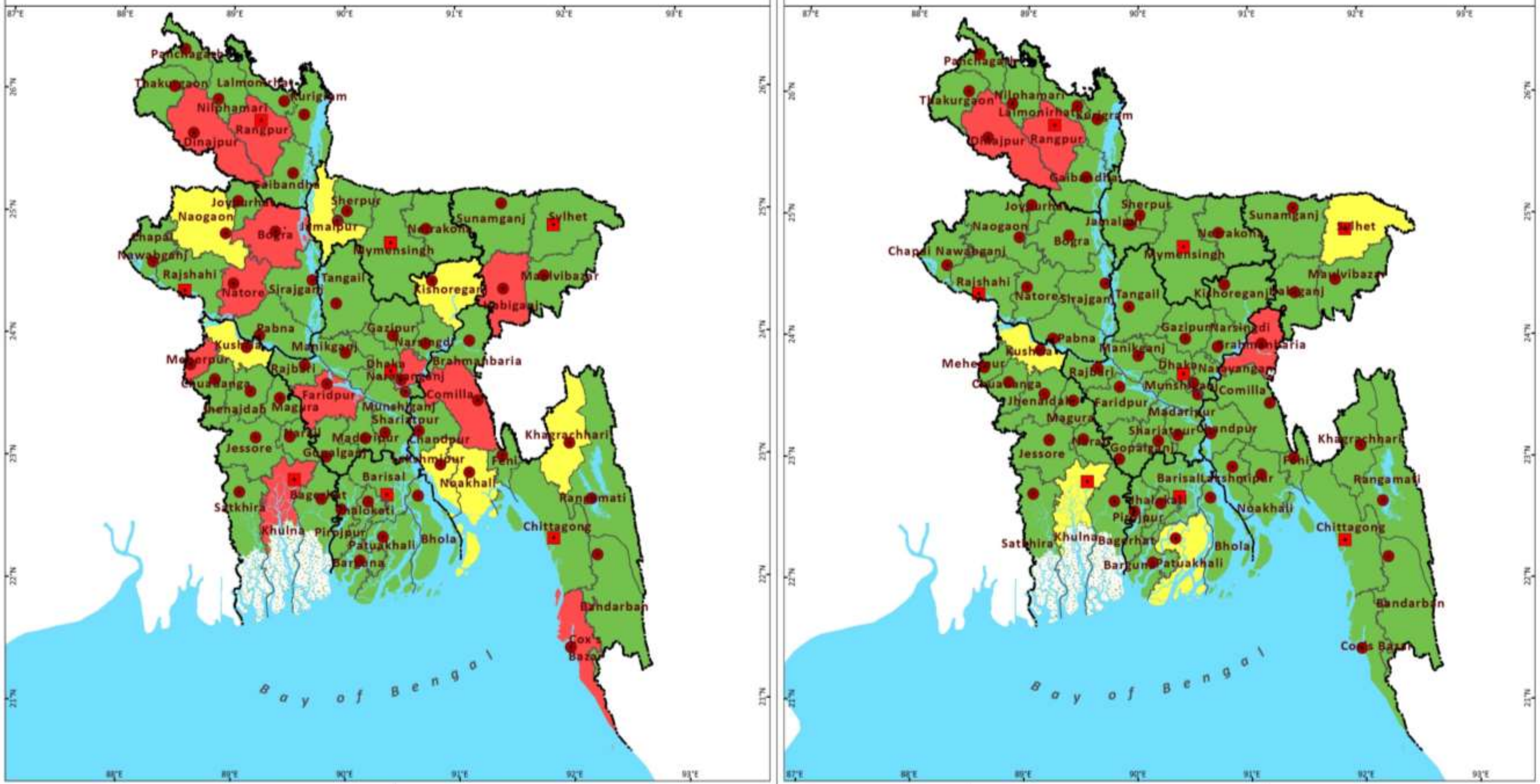
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported at District Level in 2011

Number of Tuberculosis Cases Reported at District Level in 2012



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2012 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

N

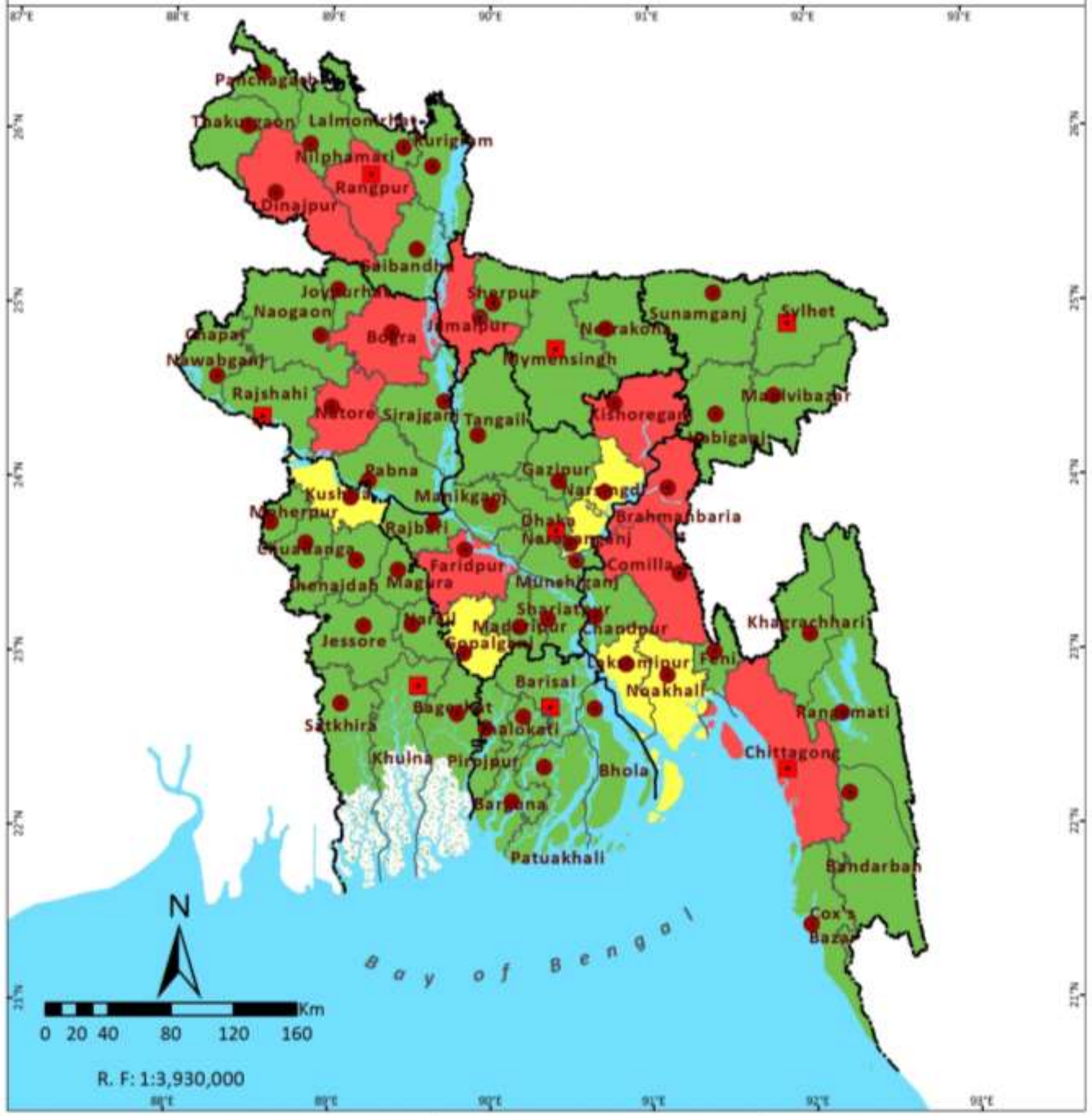
0 25 50 100 150 200 Km

R. F: 1:4,000,000

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported at District Level in 2013



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2013 at district level was used.

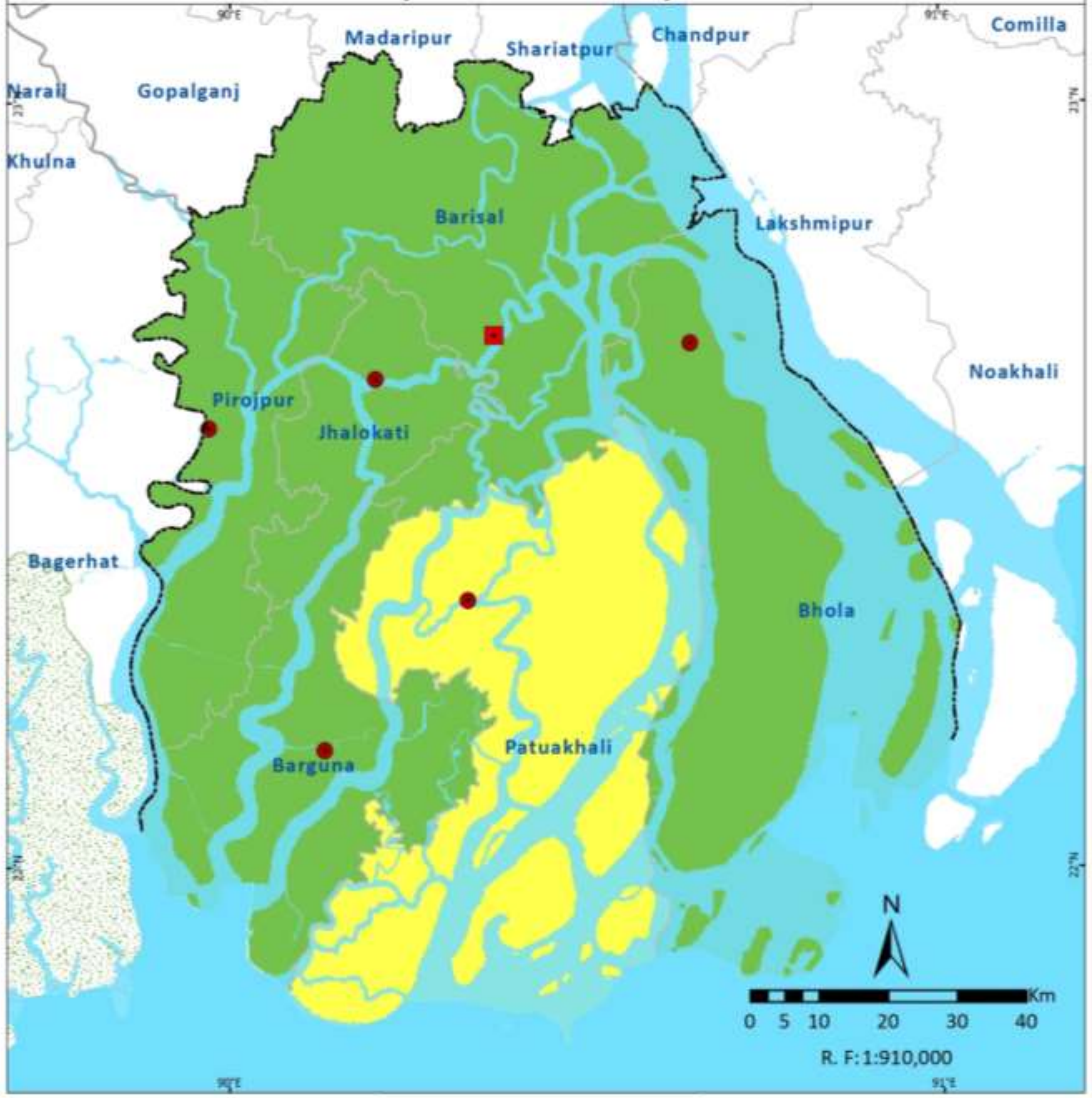
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2011
(Barisal Division)

Number of Tuberculosis Cases Reported in 2012
(Barisal Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2012 at district level was used.

Data Source: DGHS.

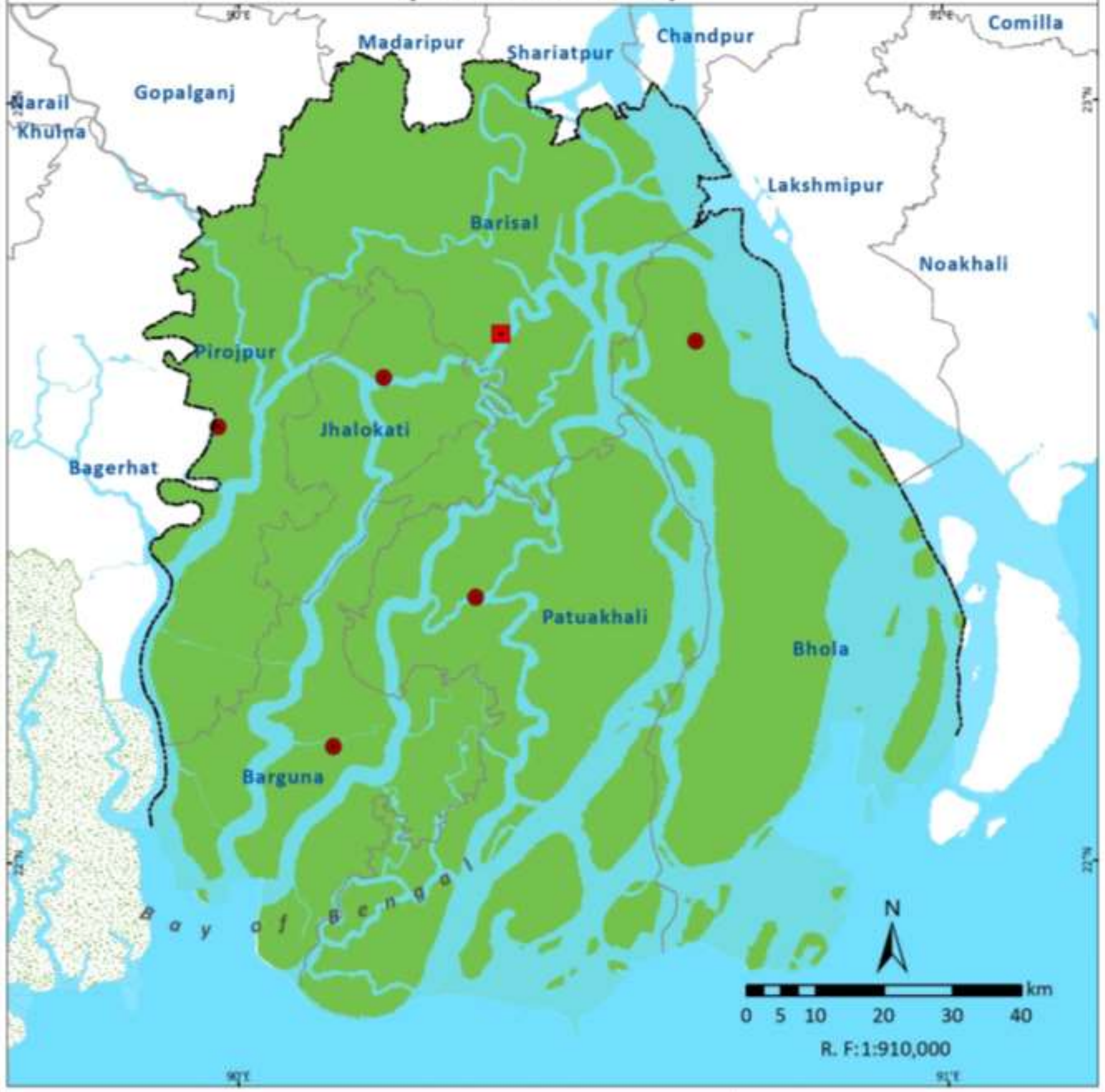
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

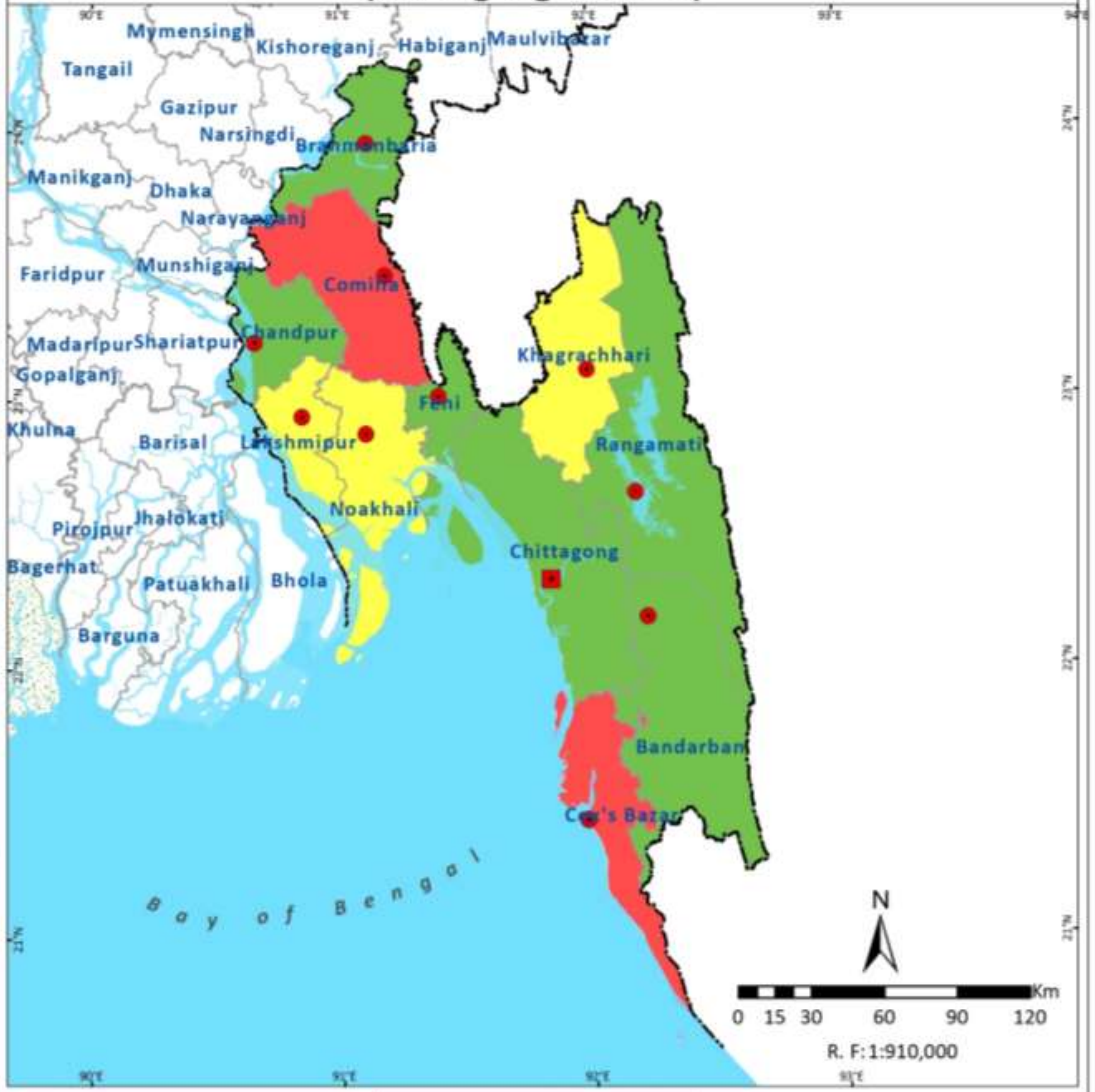
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2013 (Barisal Division)



Number of Tuberculosis Cases Reported in 2011 (Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2013 at district level was used.

Data Source: DGHS.

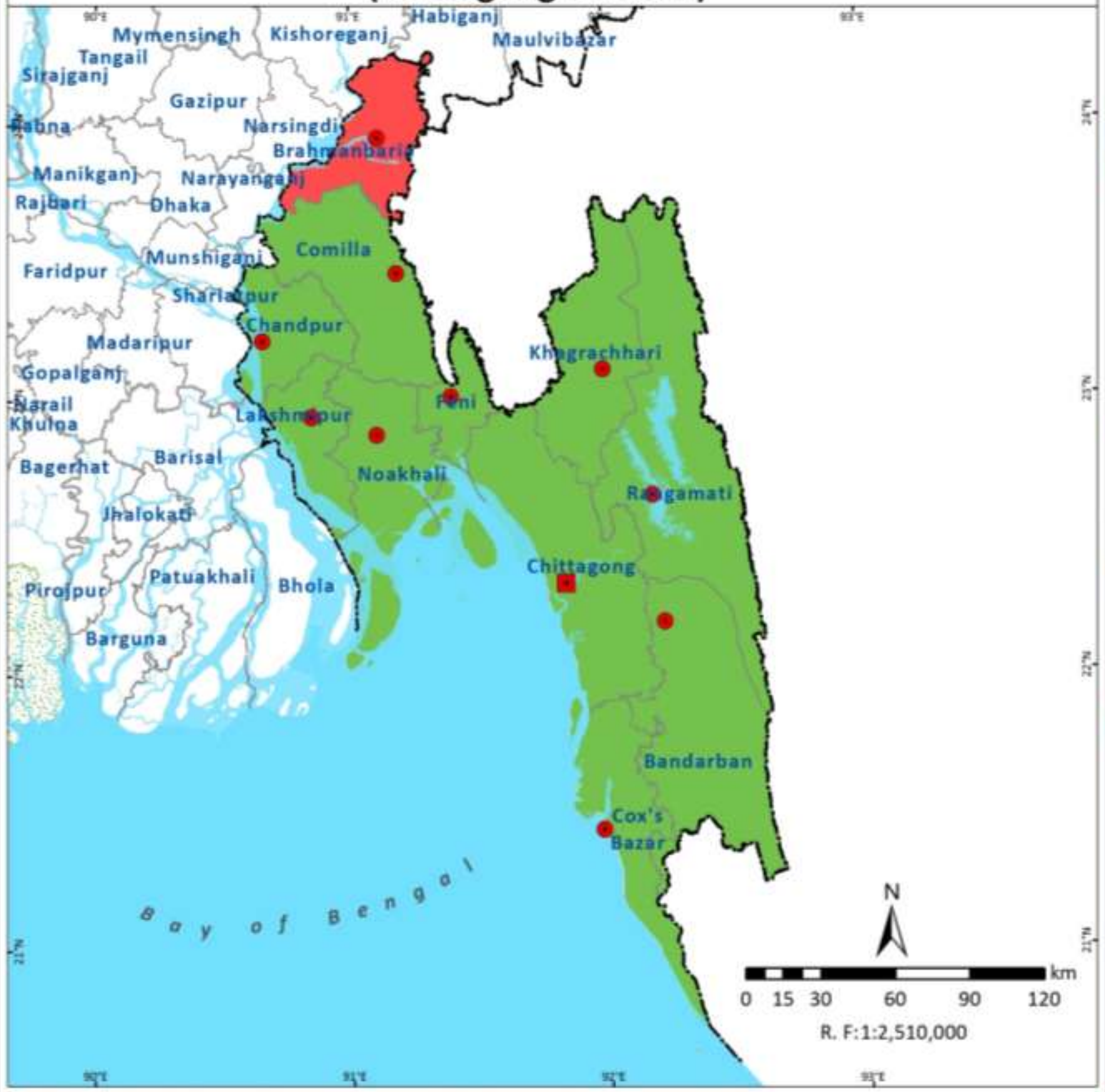
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

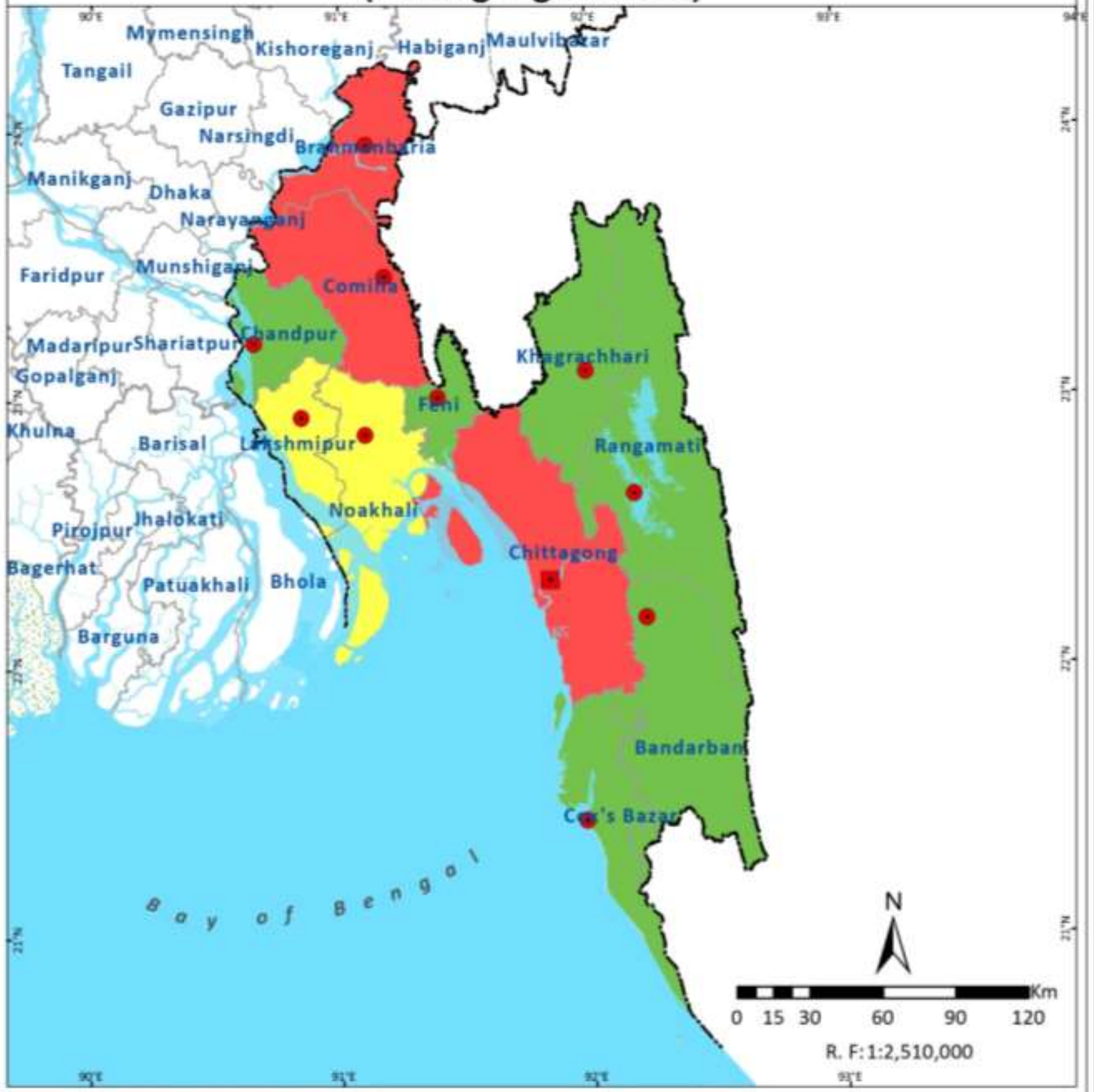
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2012
(Chittagong Division)



Number of Tuberculosis Cases Reported in 2013
(Chittagong Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2012 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2011
(Dhaka Division)

Number of Tuberculosis Cases Reported in 2012
(Dhaka Division)

Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis
- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2012 at district level was used.

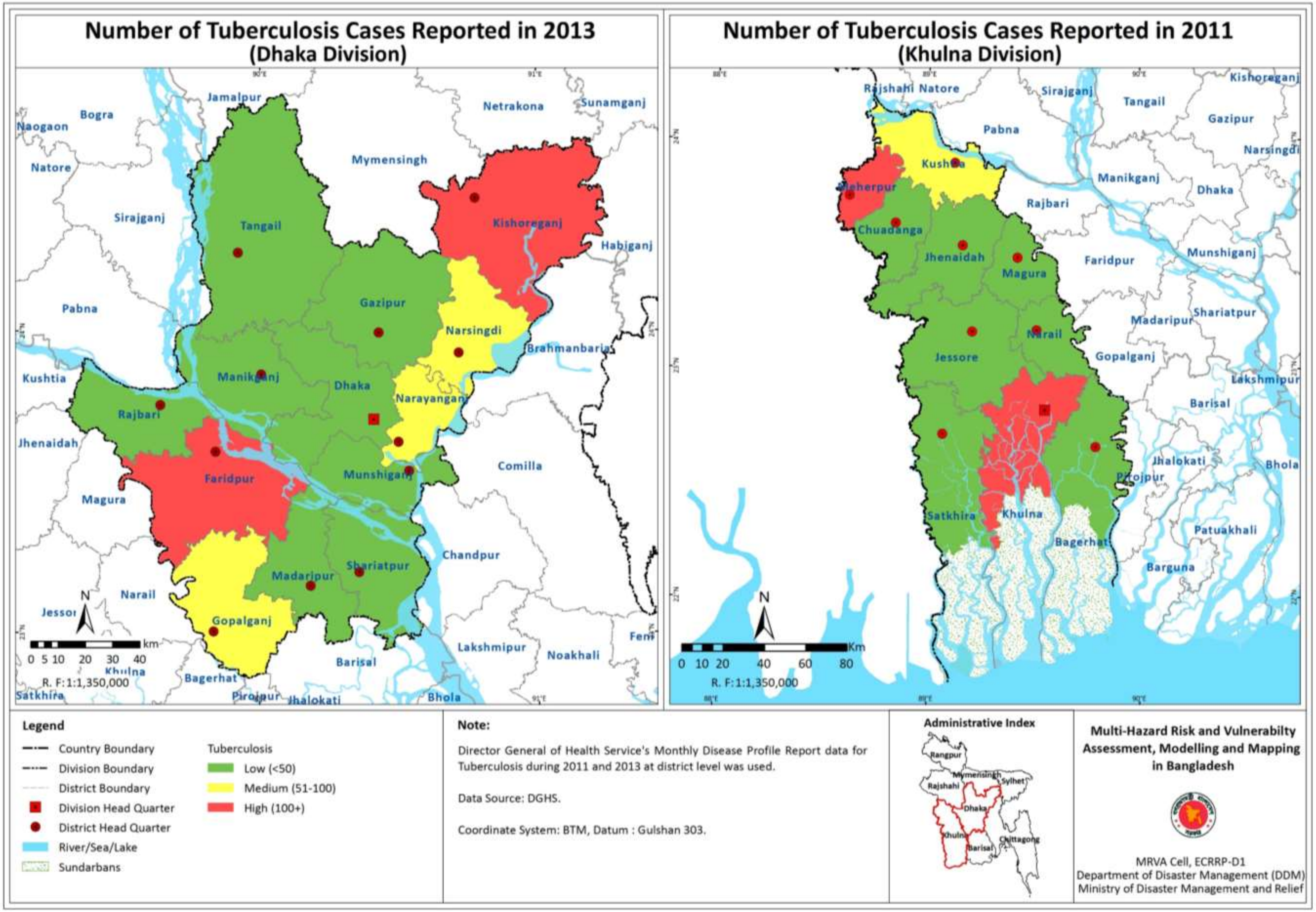
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

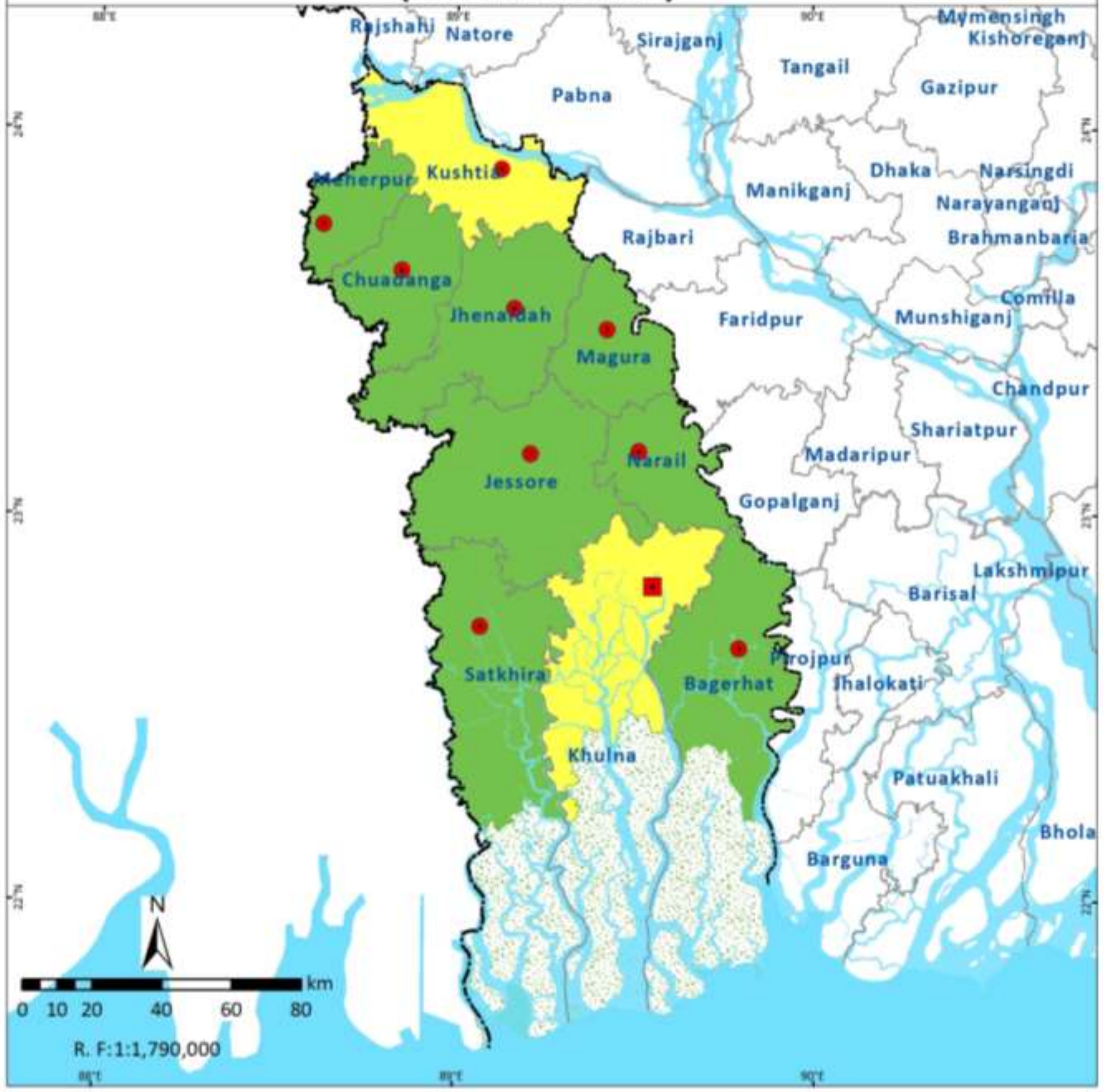
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

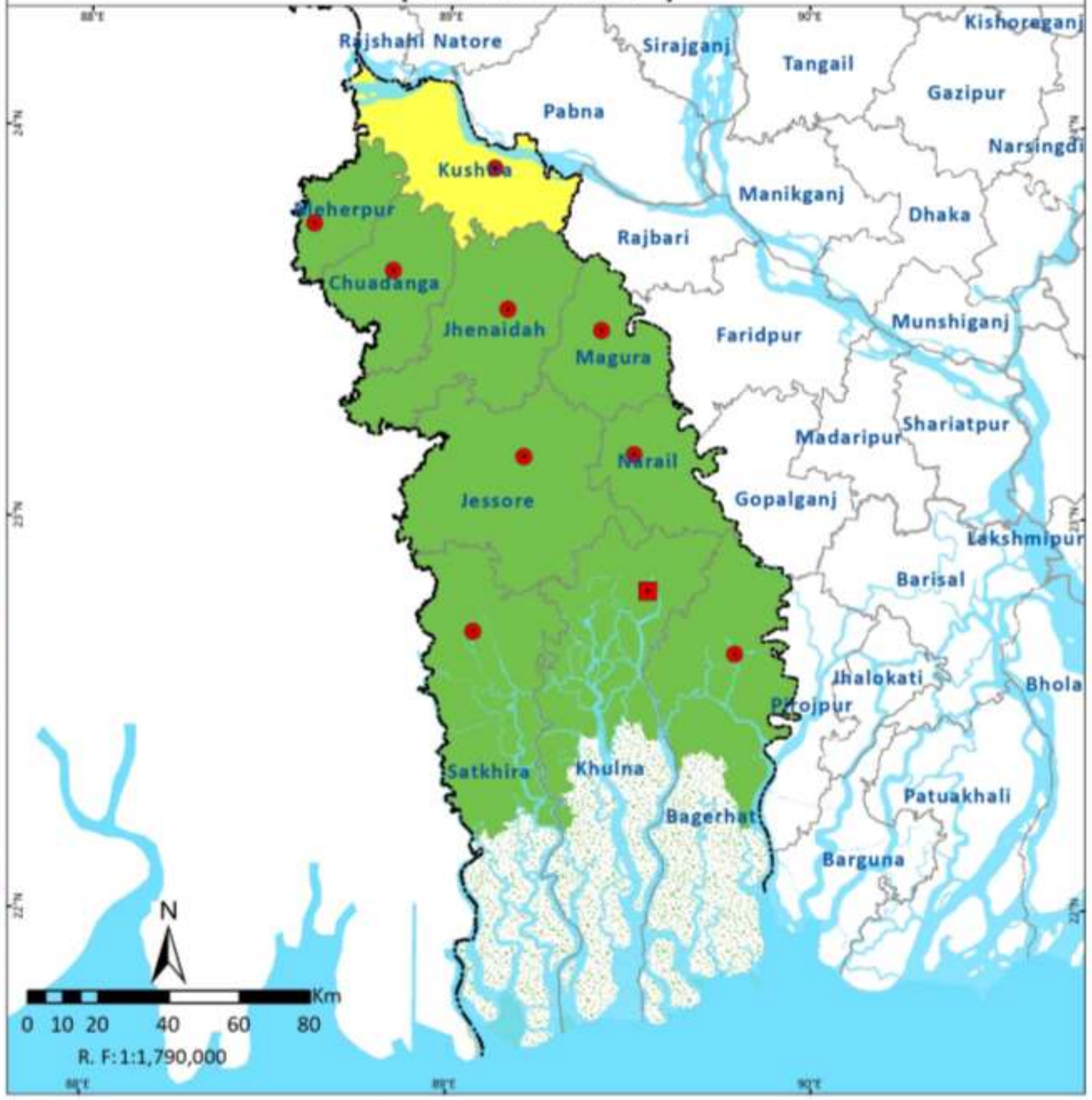
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Tuberculosis Cases Reported in 2013
(Dhaka Division)
Jamalpur
Bogra
Naogaon
Natore
Sirajganj
Pabna
Kushtia
Jhenaidah
Magura
Narail
Jessore
Khulna
Satkhira
Bagerhat
Pirojpur
Jhalokati
Barisal
Bhola
Mymensingh
Netrakona
Sunamganj
Kishoreganj
Habiganj
Tangail
Gazipur
Narsingdi
Brahmanbaria
Manikganj
Dhaka
Narayanganj
Rajbari
Faridpur
Munshiganj
Comilla
Madaripur
Shariatpur
Chandpur
Gopalganj
Lakshmipur
Noakhali
Feni
0 5 10 20 30 40 km
R. F: 1:1,350,000
Number of Tuberculosis Cases Reported in 2011
(Khulna Division)
Rajshahi Natore
Sirajganj
Tangail
Kishoreganj
Pabna
Gazipur
Narsingdi
Kushtia
Meherpur
Manikganj
Dhaka
Rajbari
Chuadanga
Jhenaidah
Magura
Faridpur
Munshiganj
Madaripur
Shariatpur
Narail
Gopalganj
Jessore
Lakshmipur
Barisal
Jhalokati
Bhola
Pirojpur
Satkhira
Khulna
Bagerhat
Patuakhali
Barguna
0 10 20 40 60 80 Km
R. F: 1:1,350,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Tuberculosis
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2013 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Rajshahi
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2012 (Khulna Division)



Number of Tuberculosis Cases Reported in 2013 (Khulna Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2012 and 2013 at district level was used.

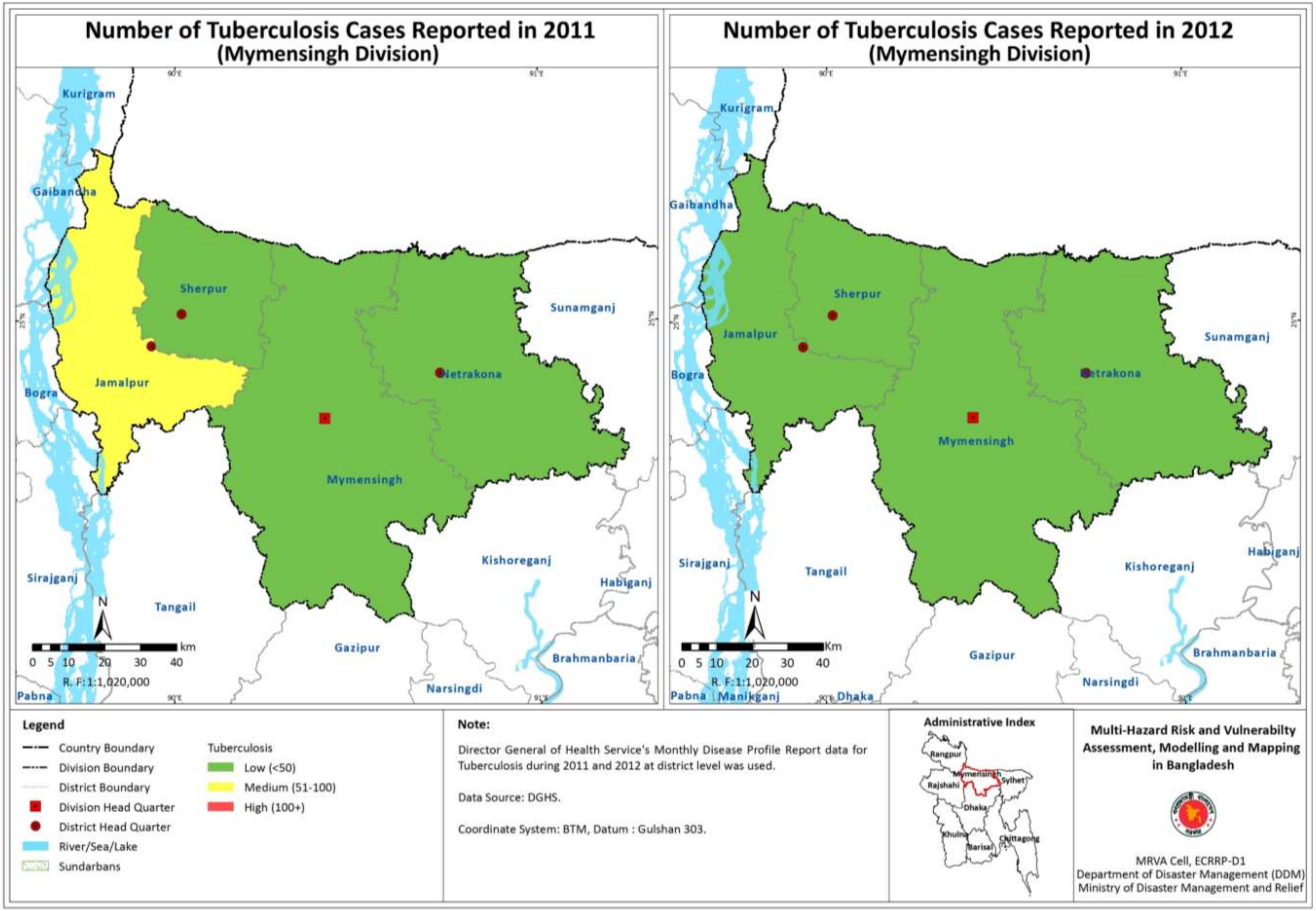
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

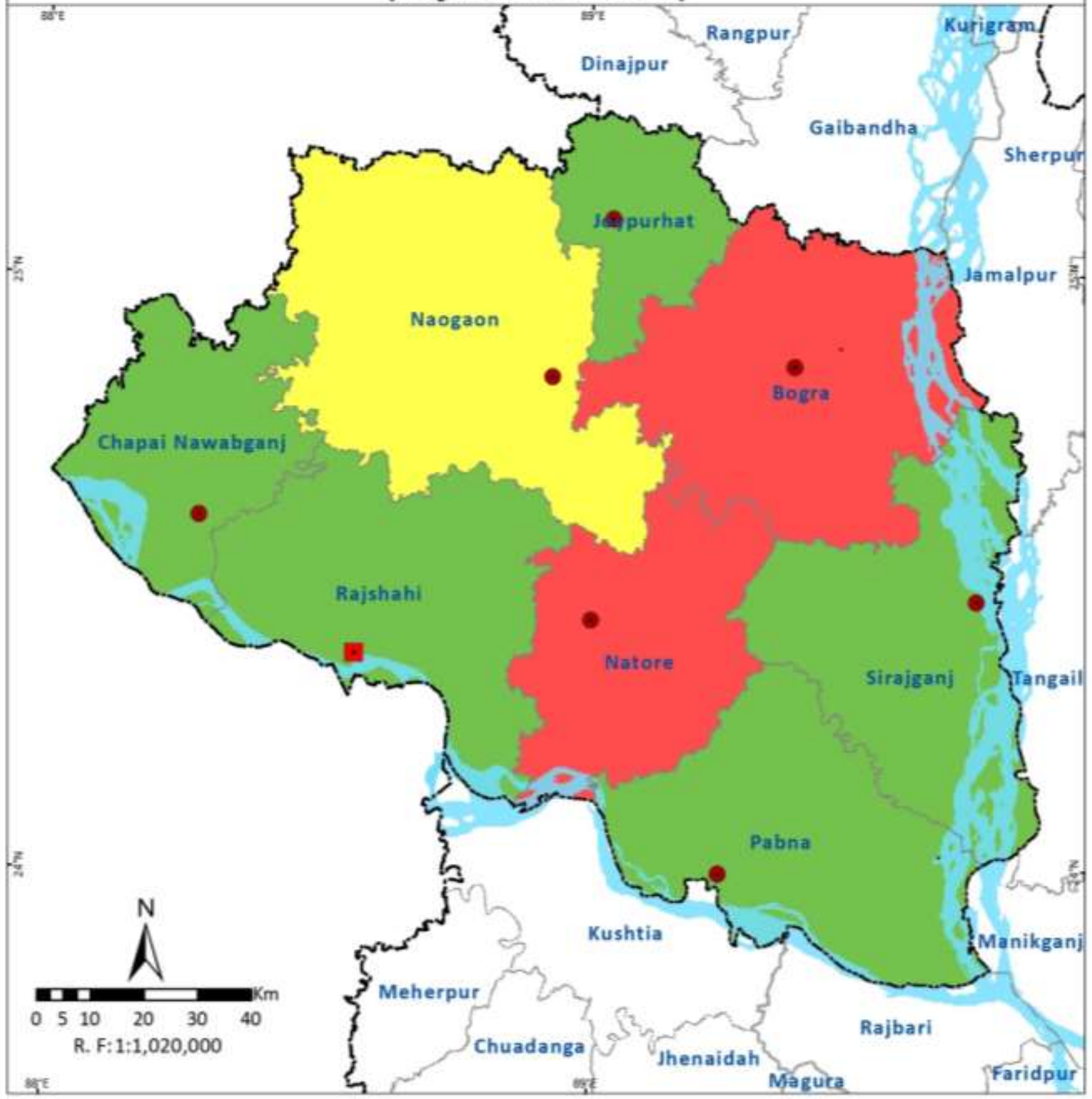
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief


Number of Tuberculosis Cases Reported in 2011
(Mymensingh Division)
Kurigram
Gaibandha
Sherpur
Jamalpur
Bogra
Netrakona
Sunamganj
Mymensingh
Kishoreganj
Habiganj
Sirajganj
Tangail
Gazipur
Brahmanbaria
Narsingdi
Pabna
N
0 5 10 20 30 40
km
R. F: 1:1,020,000
Number of Tuberculosis Cases Reported in 2012
(Mymensingh Division)
Kurigram
Gaibandha
Jamalpur
Sherpur
Bogra
Netrakona
Sunamganj
Mymensingh
Sirajganj
Tangail
Kishoreganj
Habiganj
Gazipur
Brahmanbaria
Narsingdi
Pabna
Manikganj
Dhaka
0 5 10 20 30 40
Km
R. F: 1:1,020,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Tuberculosis
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Mymensingh
Sylhet
Rajshahi
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2013 (Mymensingh Division)

Number of Tuberculosis Cases Reported in 2011 (Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

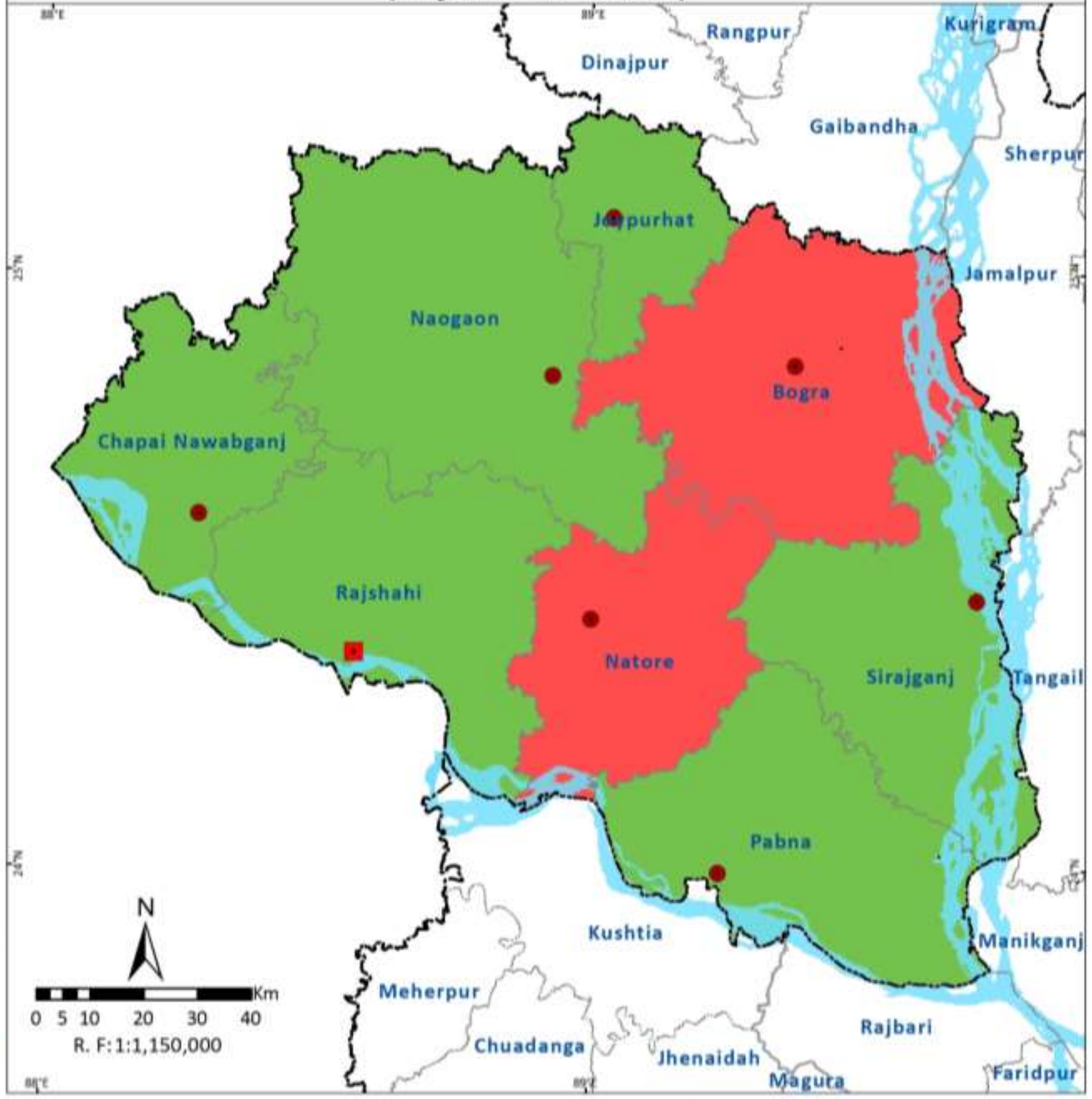
Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2012
(Rajshahi Division)

Number of Tuberculosis Cases Reported in 2013
(Rajshahi Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2012 and 2013 at district level was used.

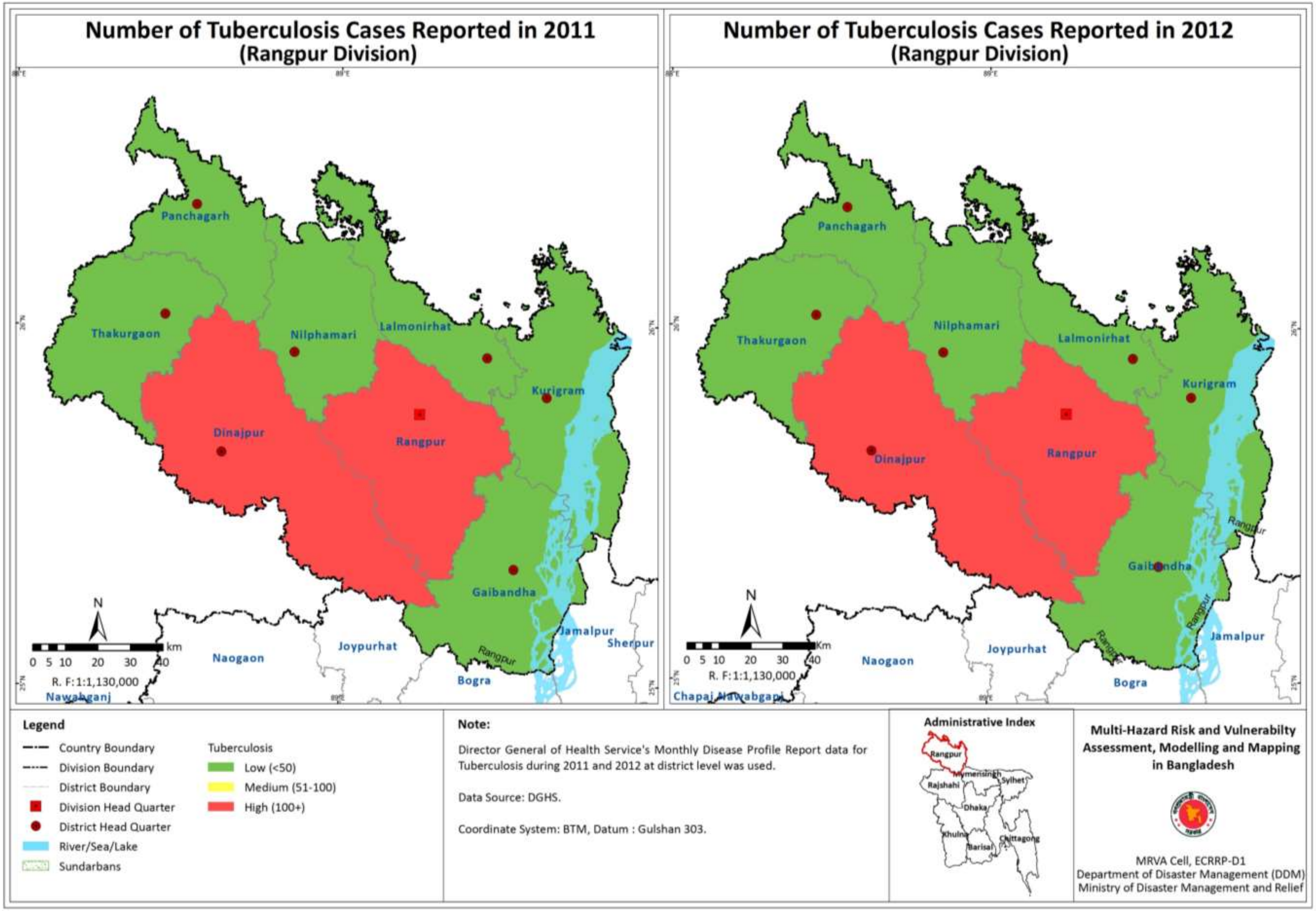
Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

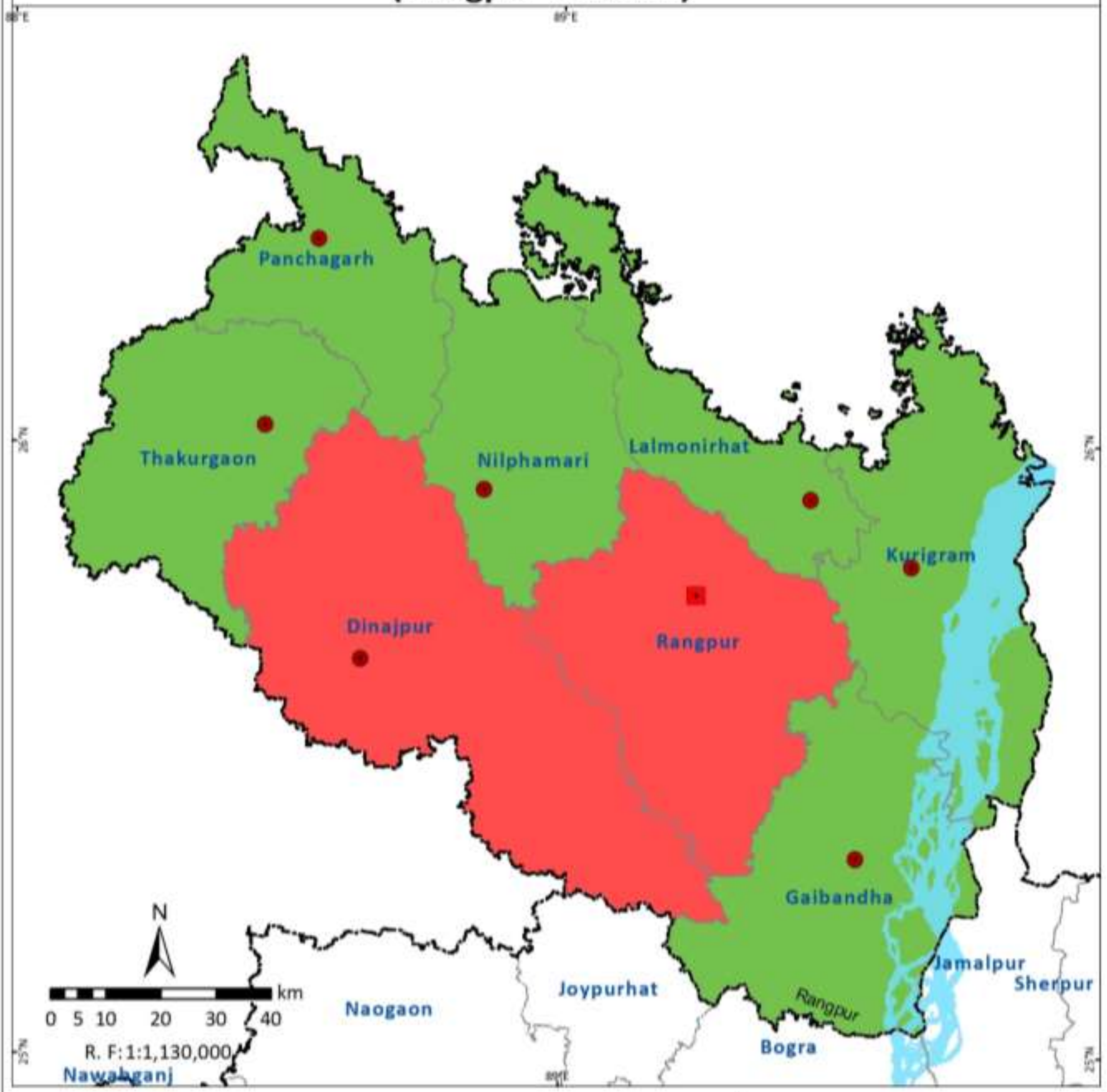
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

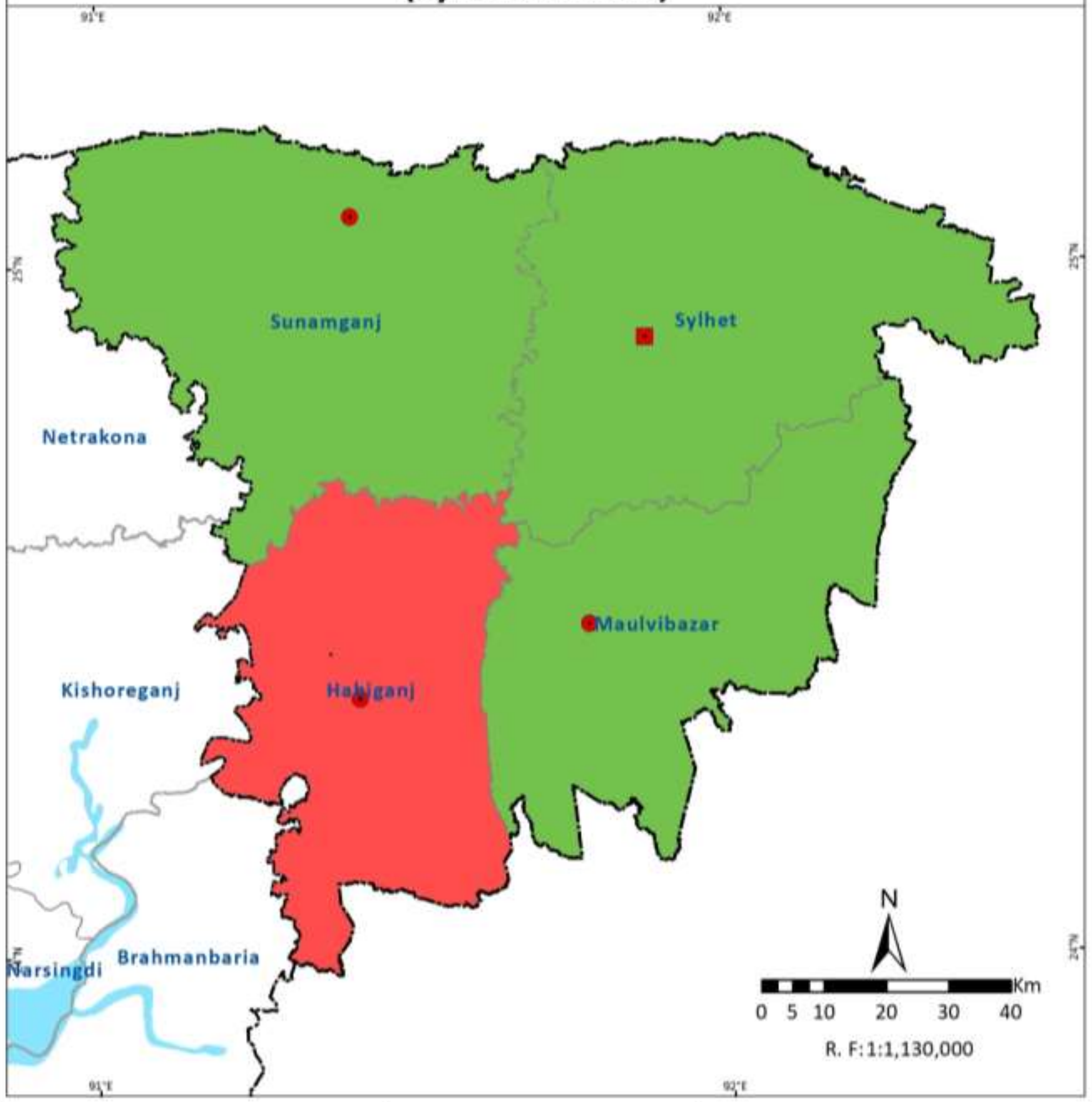


Number of Tuberculosis Cases Reported in 2011
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Sherpur
Naogaon
Joypurhat
Bogra
Nawabganj
N
km
0 5 10 20 30 40
R. F:1:1,130,000
Number of Tuberculosis Cases Reported in 2012
(Rangpur Division)
Panchagarh
Thakurgaon
Nilphamari
Lalmonirhat
Kurigram
Dinajpur
Rangpur
Gaibandha
Jamalpur
Naogaon
Joypurhat
Bogra
Chapai Nawabganj
N
Km
0 5 10 20 30 40
R. F:1:1,130,000
Legend
Country Boundary
Division Boundary
District Boundary
Division Head Quarter
District Head Quarter
River/Sea/Lake
Sundarbans
Tuberculosis
Low (<50)
Medium (51-100)
High (100+)
Note:
Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2012 at district level was used.
Data Source: DGHS.
Coordinate System: BTM, Datum : Gulshan 303.
Administrative Index
Rangpur
Rajshahi
Mymensingh
Sylhet
Dhaka
Khulna
Barisal
Chittagong
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh
MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2013 (Rangpur Division)



Number of Tuberculosis Cases Reported in 2011 (Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2011 and 2013 at district level was used.

Data Source: DGHS.

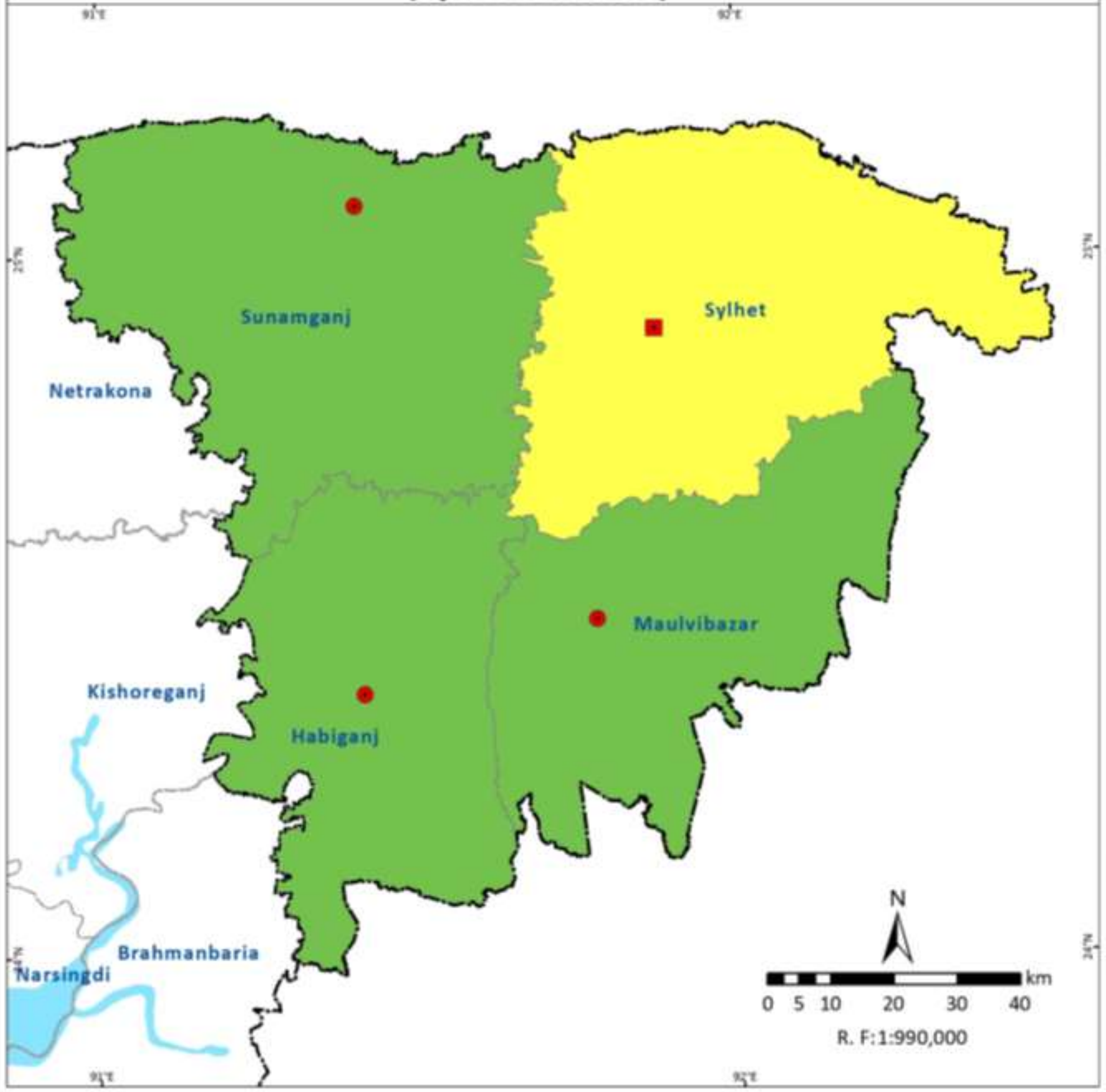
Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

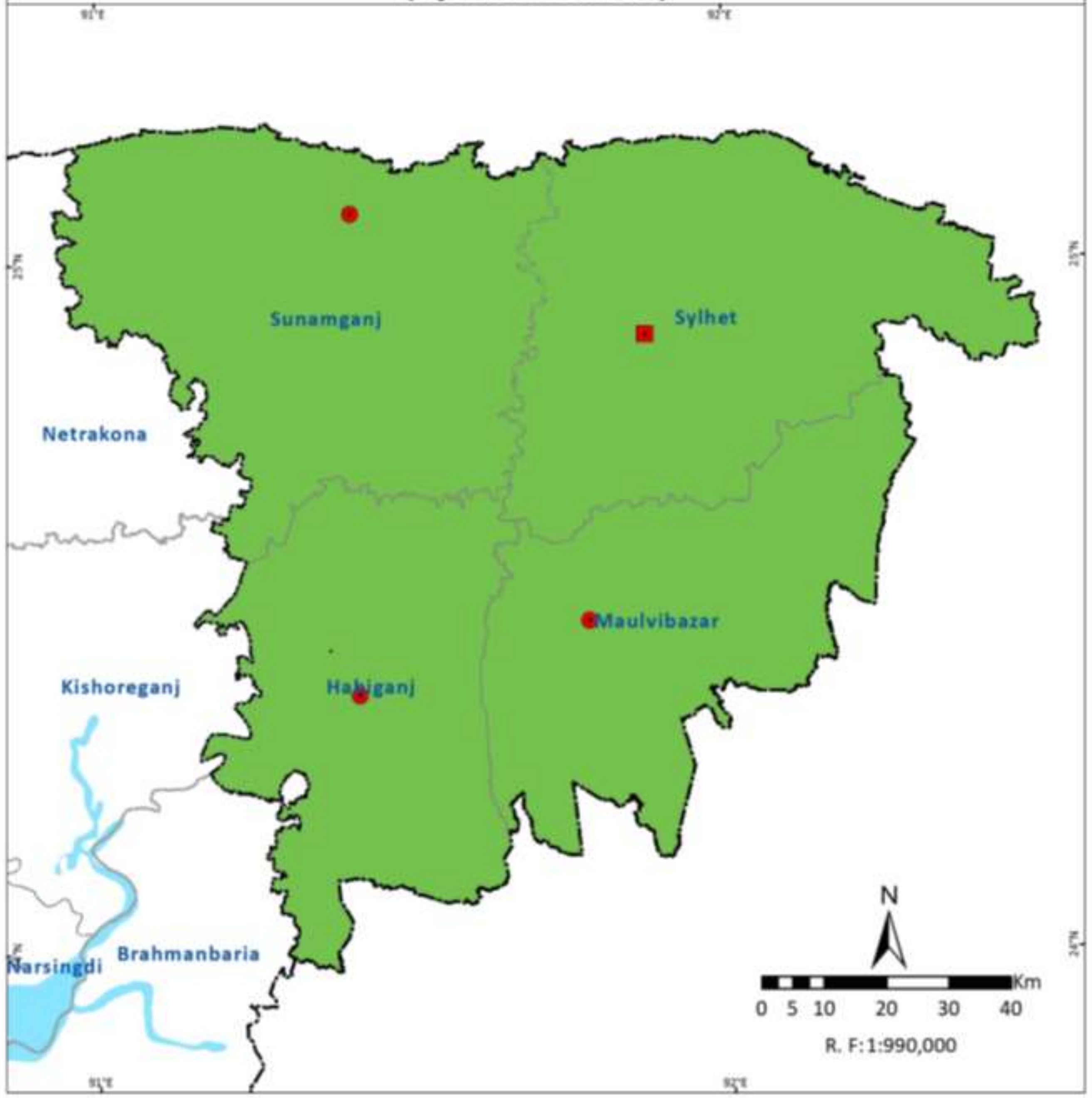
Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

Number of Tuberculosis Cases Reported in 2012 (Sylhet Division)



Number of Tuberculosis Cases Reported in 2013 (Sylhet Division)



Legend

- Country Boundary
- Division Boundary
- District Boundary
- Division Head Quarter
- District Head Quarter
- River/Sea/Lake
- Sundarbans

Tuberculosis

- Low (<50)
- Medium (51-100)
- High (100+)

Note:

Director General of Health Service's Monthly Disease Profile Report data for Tuberculosis during 2012 and 2013 at district level was used.

Data Source: DGHS.

Coordinate System: BTM, Datum : Gulshan 303.

Administrative Index

Multi-Hazard Risk and Vulnerabilty Assessment, Modelling and Mapping in Bangladesh

MRVA Cell, ECRRP-D1
Department of Disaster Management (DDM)
Ministry of Disaster Management and Relief

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Asian Institute of Technology (AIT), Bangkok, Thailand