



Bogra Pourashava

# Scenario-based Earthquake Contingency Plan of Bogra Pourashava Area

November 2014



Scenario based Earthquake Contingency Plan of  
Bogra Pourashava Area

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# Abbreviations

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ADPC	Asian Disaster Preparedness Center
AIT	Asian Institute of Technology
BBS	Bangladesh Bureau of Statistics
BDRCS	Bangladesh Red Crescent Societies
BGB	Border Guard Bangladesh
BIWTC	Bangladesh Inland Water Transport Corporation
BP	Bangladesh Police
BPDB	Bangladesh Power Development Board
BR	Bangladesh Railway
BRTC	Bangladesh Road Transport Corporation
BTCL	Bangladesh Telecommunication Company Ltd.
CBOs	Community Based Organizations
CDMP	Comprehensive Disaster Management Programme
CSO	Civil Surgeon Office
CSOs	Civil Society Organizations
DC	Deputy/ District Commissioner
DDM	Department of Disaster Management
DoF	Department of Food
DPHE	Department of Public Health Engineering
DRRO	District Relief and Rehabilitation Office
DSW	Department of Social Welfare
EOC	Emergency Operation Center
EU	European Union
FSCD	Fire Service and Civil Defence
HAZUS	Hazard of United States
ICS	Incident Command System
INGOs	International Non-Government Organizations
INSARAG	International Search and Rescue Advisory Group
LGED	Local Government Engineering Department

MoDMR	Ministry of Disaster Management And Relief
NGOs	Non-Government Organizations
NSET	National Society of Earthquake Technology
PDMC	Pourashava Disaster Management Committee
PWD	Public Works Department
RAB	Rapid Action Battalion
RHD	Roads and Highway Department
SOP	Standard Operation Procedure
UN	United Nations
UNDP	United Nations Development Programme
VDP	Village Defence Party

# Section-01: Introduction

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## 1.1 Background

Over the past decades, urbanization in Bangladesh has been rapidly taking place without proper planning and guidance. As a result many of the urban centers have developed haphazardly. These urban centers are fast growing and influence the economic developments of the country. A strong earthquake affecting a major urban center in Bangladesh may result in widespread damage; high numbers of fatalities; destroying buildings, other physical infrastructure and facilities; and may have disastrous consequences for the entire nation. In the aftermath of a catastrophic earthquake and subsequent aftershocks there will be a massive requirement of response efforts. The conventional response efforts and available capabilities will be quickly overwhelmed. For an effective response to a severely damaged area, immediate life-saving and life-sustaining measures entailing unique solutions will be required. In these circumstances, a city-level Contingency Plan is needed to ensure better response towards earthquake hazard. Contingency Planning is a management tool used to analyze the impact of potential crises so that adequate and appropriate arrangements are made in advance to respond in a timely, effective and appropriate way to the need of affected populations.

Realizing this, Comprehensive Disaster Management Programme (CDMP) under the Ministry of Disaster Management and Relief of the People's Republic of Bangladesh has taken initiative to reduce the ever increasing earthquake risk in the country and minimize the damages and loss of lives through proper preparedness and mitigation measures. Under CDMP Phase-I (2006-2010), earthquake risk assessment was carried out in three major cities- Dhaka, Chittagong and Sylhet. The corresponding preparedness activities mainly the scenario based earthquake Contingency Plans were also prepared (National, City-level for Dhaka, Chittagong and Sylhet, and Nine Agency-level) with the aim to create an efficient and effective collaborative approach to emergency response and management with the participation of all level stakeholders. After the successful completion of the first phase, CDMP has initiated its phase-II (CDMP-II) for carrying out similar earthquake risk and damage assessment and subsequent development of scenario based Contingency Plan for Rangpur, Dinajpur, Mymensingh, Tangail, Bogra and Rajshahi Municipalities/ City Corporations areas as well as to develop scenario based ward-level spatial Contingency Plan for Dhaka, Chittagong and Sylhet City Corporation areas. The programme is supported by the United Nations Development Programme (UNDP), UKaid from the Department for International Development (DFID), European Union (EU), Norwegian Embassy, Swedish Sida and Australian AID. Asian Disaster Preparedness Center (ADPC), Thailand in association with National Society for Earthquake Technology (NSET), Nepal; Asian Institute of Technology (AIT), Thailand; and OYO International Corporation, Japan have provided technical assistance to CDMP for carrying out the earthquake risk and damage assessment and subsequent development of scenario based Contingency Plans for these Municipalities/ City Corporations areas.

## 1.2 Need of Earthquake Contingency Plan for Bogra Town

Bogra is a northern district of Bangladesh, in the Rajshahi Division (**Map-1**). It is called the gateway to the north Bengal. It is one of the old cities of the country and was founded as a Town in 1850. Bogra occupies an important place in the legendary and the earlier historical annals of Bengal. In the



ancient period, it was a part of the territory of the Pundras or Paundras, which was known by the name of Pundravardhana. Bogra municipality was established in 1884. Currently, Bogra Municipality consists of 12 wards and has an area of 18.85 sq. km. The town has a population of 379117 and growing at a rate of 1.20 percent (BBS, 2011). Bogra is known as the industrial town of the North Bengal. Constructions of the Jamuna Multipurpose Bridge had enhanced all kinds of trade and commerce in Bogra. The town is famous for its cultural activities.

In the generalized tectonic map of Bangladesh, Bogra is located in the medium risk zone. The earthquake risk of the Bogra Town is growing with every passing moment because of the unabated growth of human settlement and industrial and other economic activities. The rapid increase in vulnerability of the town is evident from rapid urbanization, population growth, population migration and development of major economic zones in and around Bogra. Major causes behind such ever increasing earthquake risk are the haphazard urbanization and sub-standard construction of buildings, residential houses and other infrastructures without any consideration of underlying earthquake risk. The geotechnical and geophysical investigation under CDMP- II shows that almost 80% of the soil in Bogra Municipality area is dense/ stiff soil and rest 20% is loose/ soft soil which has high to very high liquefaction susceptibility. The foundations and supports of structures built on this highly liquefiable sediment can fail, causing damage or destruction during major earthquakes in town. In these circumstances, a Contingency Plan is needed for ensuring better response towards earthquake hazard.

### **1.3 Purpose**

The Bogra Municipality Earthquake Contingency Plan establishes a coordinated strategy to ensure that adequate decisions and preparations are made for an anticipated earthquake. The purpose of the plan is to increase the efficiency and effectiveness of disaster response management in Bogra Municipality through the clarification of goals, operational frameworks, coordination mechanisms, procedures, roles, responsibilities, and actions. It also aims to ensure the participation of all city-level stakeholders and maximum utilization of available resources, optimization of efforts by first responder agencies in order to save lives; provide humanitarian assistances; and restore the lifeline facilities to bring normalcy within fastest possible time.

While developed before an earthquake, the plan focuses on immediate emergency response activities typically taking place within the first 72 to 96 hours following a damaging earthquake.

The Plan describes the “who, what, where, when, and how” of a holistic response framework activated at the city-level. It also provides a structure for coordination and optimum utilization of national resources.

### **1.4 Goals and Objectives**

The ultimate goal of this earthquake Contingency Plan is to minimize the adverse effects (e.g. loss of lives, damage of property, and the disruption of critical facilities and services) of potential earthquakes in the country or in the Bogra Municipality by establishing and implementing a holistic response framework.

The following objectives were set to achieve this goal:

**Objective 1:** Strengthen the ability of city-level first responder agencies involved in disaster management to effectively and efficiently prepare, respond, and recover from disasters by clarifying roles and responsibilities, developing an organizational structure, and building capacity.

**Objective 2:** Establish effective vertical and horizontal coordination mechanisms that are functional both before and after a disaster.

**Objective 3:** Strengthen the city-level response framework including integral components such as the Emergency Operations Center, the cluster system, and urban community volunteers.

**Objective 4:** Use scenarios and spatial analysis during the Contingency Planning process to identify probable risk, forecast future need, and anticipate gaps in capacity.

**Objective 5:** Promote a culture of community readiness and preparedness through city-level plan advocacy and institutionalization.

**Objective 6:** Establish and maintain a fully operational Contingency Planning process including plan development, implementation, monitoring and evaluation, and maintenance.

## 1.5 Intended Users of the Plan

The primary users of this Contingency Plan will be the city-level agencies, departments and organizations these are responsible for saving human-lives, providing humanitarian assistance, and restoring the lifeline facilities and utility system, protecting properties and preserving the environment. These agencies can be grouped into First Responder, Second Responder, and Other Support agencies.

**'First Responder Agencies'** refers to those agencies and individuals who are responsible to save life, protect property and preserve environment in the early stages of an incident, including emergency service providers i.e. response management, search and rescue, fire safety, public health, clinical care, shelters, relief and supplies, and other skilled support personnel (such as equipment operators) that provide immediate support services during emergency operations. For this Contingency Plan, following agencies are identified as first responder agencies in Bogra Town:

- Bogra Municipality
- Fire Service & Civil Defence, Bogra
- Bangladesh Army, Bogra Cantonment
- Civil Surgeon Office, Bogra and Ziaur Rahman Medical College Hospitals, Bogra
- Department of Disaster Management (at DC Office), Bogra

**'Second Responder Agencies'** consists of utility and life line agencies/ departments (water supply, electricity, gas supply, telecommunications, waste disposal etc.), transportation systems agencies (road, rail and air), and security, law and order maintain agencies. These include,

- Water Supply and Sewerage Authority (Bogra Municipality)
- Bangladesh Power Development Board, Bogra
- Bangladesh Telecommunication Company Ltd., Bogra

- Paschimanchal Gas Company Ltd., Bogra
- Roads and Highway Department, Bogra
- Bangladesh Police, Bogra
- Ansar and VDP, Bogra

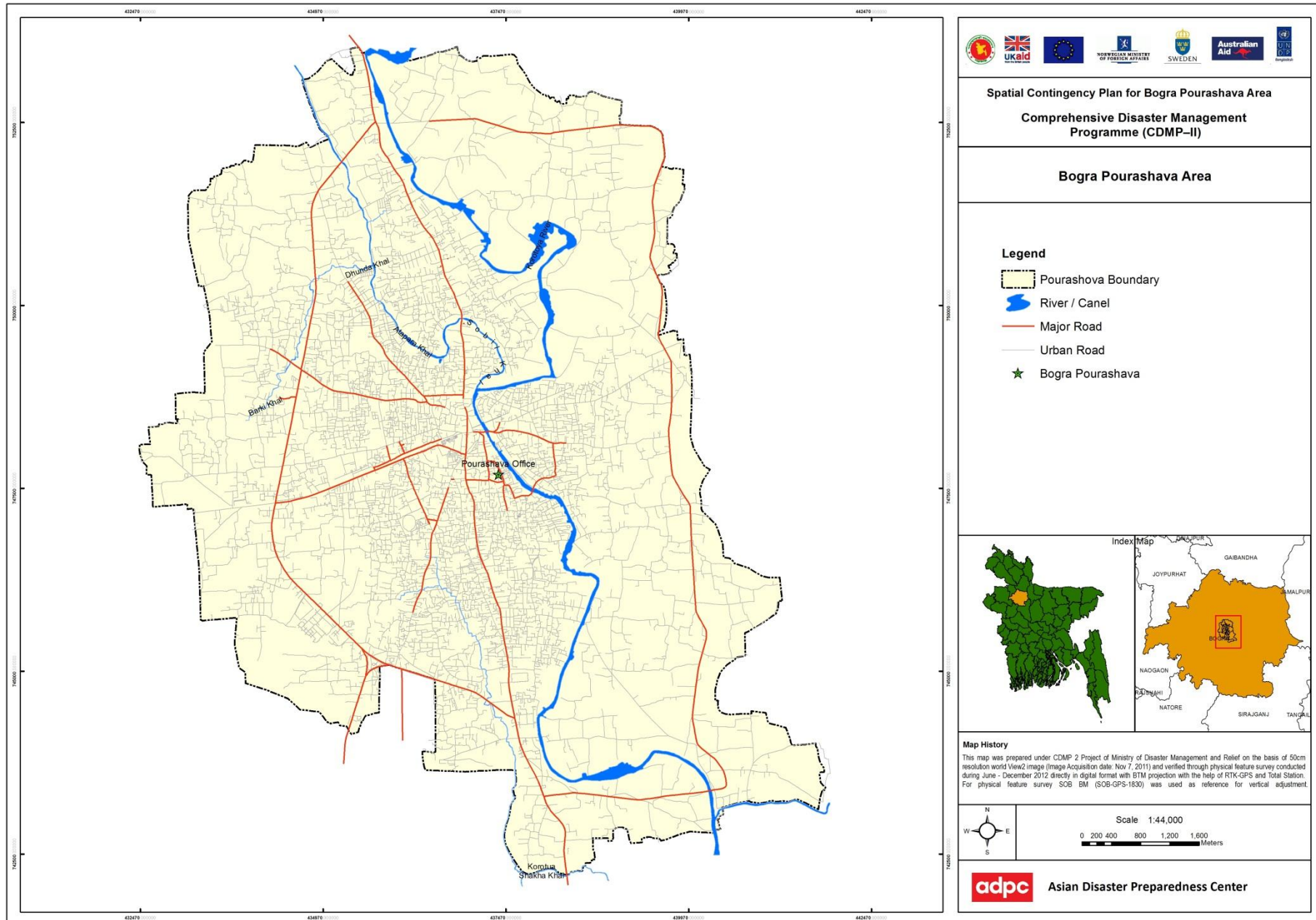
Other agencies such as Govt. Agencies and Departments, Public Works Departments, NGOs and INGOs working in the area, Electronic and Print Media, Community Based Organizations (CBOs), Civil Society Organizations (CSOs), Academia, Development Partners, Private sectors, etc. will provide support for plan implementation.

The ultimate beneficiaries would be the communities at risk in Bogra Municipality.

## **1.6 Plan Limitations**

The earthquake Contingency Plan has following limitations:

- The Bogra Municipality earthquake Contingency Plan will not, and cannot, address all circumstances.
- The plan assumes that the involved agencies will have adequate authority and capacity to deal with assigned tasks as granted through appropriate policies and legal instruments.
- Agencies involved in Contingency Plan implementation process may need additional resources in terms of qualified manpower, technical as well as financial resources to undertake assigned tasks.
- The contingency management process in this plan is linked to a specified time lag to become fully functional as an integrated system.
- Capable and committed staff with appropriate financial resources, facilities, equipment and supplies is required to implement an effective, long-term program based on the Action Plan.



Map 1 Bogra Pourashava Area

## Section 02: Plan Development, Implementation and Maintenance

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### 2.1 Legal Provisions, Authority and Planning Responsibility

The Disaster Management Act 2012 grants the Government of Bangladesh the authority to formulate the National Disaster Management Policy to elaborate the provisions of the Act. Within the National Disaster Management Policy, the Ministry of Disaster Management and Relief (MoDMR) is granted the overall responsibility for coordinating disaster management efforts across all agencies. One of the priority activities listed in the National Disaster Management Policy is to establish a Contingency Planning framework. With this authority, the MoDMR with the involvement of city-level stakeholders through CDMP has developed this Earthquake Contingency Plan for Bogra Municipality.

### 2.2 Plan Context

The Earthquake Contingency Plan for Bogra Municipality is developed under the Comprehensive Disaster Management Programme, Phase II, in 2014. The plan is developed to complement the existing national disaster management policies, plans including the National Disaster Management Policy; the Disaster Management Act 2012; the National Plan for Disaster Management 2010-2015; the Standing Orders on Disaster 2010; and National Earthquake Contingency Plan 2009 (revised in 2012). The National Earthquake Contingency Plan provides the broader framework to address the response activities during an earthquake emergency in the country, while the Earthquake Contingency Plan for Bogra Municipality aims to minimize the adverse effects of potential earthquakes by establishing and implementing a holistic response framework at town level.

### 2.3 Planning Assumptions

This Contingency Plan for Bogra Municipality has been developed with following assumptions in the background:

- Earthquakes are impact type events and provide no warning preventing any pre-event response activities.
- Earthquakes within the town will cause large numbers of deaths and injuries and extensive damage and destruction of buildings, emergency facilities and infrastructures.
- There is likelihood of secondary effects following an earthquake or aftershocks which may include fire, flood, liquefactions, subsidence, damming of rivers, and dam failure, release of hazardous and toxic chemicals, etc.
- Strong aftershocks will continue for several days resulting in further damages and losses
- Large numbers of displaced people will be in need of shelter, welfare, relief assistance, medical care, etc.
- Access to affected areas will be severely restricted due to debris, road damage, bridges and culverts collapse, etc.



- Many national and international response and humanitarian organizations other than the government institutions will also be involved during response and recovery to earthquake disaster.

## 2.4 Planning Process

The Earthquake Contingency Plan for Bogra Municipality is developed under CDMP-II through a collaborative effort among city-level disaster management and first responder agencies as well as other relevant agencies, departments and organizations. Several formal and informal meetings were held during which key stakeholders were identified and invited to participate in the Contingency Planning Process. Plan contributors include:

- Bogra Municipality
- Department of Disaster Management (at DC Office), Bogra
- Fire Service and Civil Defence, Bogra
- Bangladesh Army, Bogra Cantonment, Bogra
- Civil Surgeon Office, Bogra
- Bangladesh Power Development Board, Bogra
- Bangladesh Telecommunication Company Ltd., Bogra
- Paschimanchal Gas Company Ltd., Bogra
- Bangladesh Police, Bogra
- Bangladesh Ansar and VDP, Bogra
- Public Works Department, Bogra

Early in the planning process an Orientation Meeting was organized under the leadership of the Municipality that plays key roles in earthquake disaster risk management. During the orientation meeting, a Working Group comprising technical experts and representatives from city-level main stakeholder agencies was formed to lead the Contingency Plan preparation process as well as plan updates and regular monitoring of its implementation.

In February 2014, the Municipality organized a Training Workshop on Preparation of Contingency Plan with regard to Earthquake for Bogra Municipality in participation of the Working Group members. On the first day of the training workshop, the group was trained about the step-by-step earthquake Contingency Plan preparation process, and on the second day, the group participated in a day-long workshop and drafted the Contingency Plan for Bogra Municipality. The results of the earthquake risk assessment and potential losses and damages for Bogra Municipality area conducted under CDMP-II and the city-level Contingency Planning template developed under CDMP-I in 2009 and revised under CDMP-II in 2012 were supplied to the group in the workshop.

A validation/sensitization workshop was organized under the leadership of the Municipality in participation of all city-level stakeholders to ensure that the plans addressed all emergency activities and issues concerns as well as to sensitize stakeholders about the Contingency Plan activities and facilitate their wider involvement and participation in emergency response. Then the draft plan was revised and finalized by incorporating the feedbacks from sensitization workshop.

## 2.5 Implementation Strategy

### Responsibility

The Bogra Municipality shall undertake the leadership responsibility for implementation of the Earthquake Contingency Plan. The Municipality Disaster Management Committee and Municipality Disaster Response Coordination Group will be the operational arm of the Municipality tasked with coordinating operations for achieving the Plan's goal and objectives. The City-level Emergency Operation Center (EOC), first responder agencies, and clusters (as described in **Section 4**) will also play key roles in plan implementation.

### Timeframe

Different portions of the Plan are meant to be implemented at different phases of the disaster management cycle:

**Preparation Phase (before a disaster strikes):** The Plan was developed during "blue skies" so that there was ample time to make sound decisions without the chaos of an emergency situation. Regular updates should take place cyclically according to the Periodic Review and Update Process as described in **Section 2.6**. Additionally, the actions strategies included in **Section 5** and the actions to support the plan implementation as described in **Section 7** should be implemented before a disaster.

**Immediate Response Phase (typically the initial 72 to 96 hours after a major earthquake event):** The Plan will be activated when there is an earthquake emergency. At this time the Operational Framework will be activated and the City-level EOC will assume its Response Phase roles as described in **Section 4**. First responder agencies and cluster leads will be responsible for implementing the action strategies described in **Section 5**. Once the immediate response has stabilized and focus has shifted from the operational priorities as described in **Section 6**, the Municipality will deactivate the plan.

**Later Response and Recovery Phases (after 72 hour of a major earthquake event):** Although the Plan is no longer activated, it should be updated after a major earthquake event. Monitoring and evaluation of the plan may also continue into the Recovery Phase. Additionally, some city level advocacy and plan institutionalization should be implemented at this time.

## 2.6 Monitoring and Evaluation

Regular monitoring and evaluation enables changes in direction, refinement of approaches and elimination of unproductive activities. Monitoring and evaluation of the plan as a whole should be done annually under the leadership of the Municipality and following any earthquake events during which the plan is activated. Benchmarks and/or evaluation criteria developed during "blue skies" and revised shortly after a declaration of a state of disaster would be useful tools for monitoring the progress and success of response activities.

## 2.7 Periodic Review, Update and Management

The Contingency Plan may need not to be activated, unless the anticipated situation does arise. However, the plan may become outdated due to social, economic, organizational and other changes. Contingency Plan is a living document and should be updated on a regular basis to ensure that the

information is current. During rapidly changing situations, plans will need to be updated more frequently; whereas under normal circumstances, less frequent updating will be sufficient. Keeping the Contingency Plan current and relevant is a challenging task, but can be achieved by scheduling regular reviews.

- The plan should be reviewed and revised, as necessary, on an annual basis to ensure that the information is current.
- Every 5 years the plan should receive a major revision based on earthquake risk assessment in which the risk scenarios, spatial analysis, and maps are revised to reflect the current local situation.
- Plan should receive a major update after an earthquake event during which the plan was activated.
- The Municipality should initiate the revision/ modification process and will engage Municipality Disaster Management Committee and other agencies/departments with relevant responsibilities.
- Each revision of the plan should be authorized by the Municipality and any change or revision to this plan should be shared with relevant responsible agencies/ departments.

## Section 03: Earthquake Scenarios and Planning Assumption

### 3.1 Earthquake Threat in Bangladesh

Geographically Bangladesh is located close to the boundary of two active plates: the Indian plate in the west and the Eurasian plate in the east and north. Several major active faults, e.g. the Madhupur fault, the plate boundary fault (the northern extension of subduction fault) and the Dauki Fault, are also inferred in Bangladesh. These faults may generate large earthquakes over Ms 8. However, the nature, detailed location, and the faulting history on these faults are not well known yet (Morino, 2009). In the past, there were several earthquakes that caused severe damages to life and properties in this region. Some of the major earthquakes around the region includes the 1548 earthquake, the 1664 earthquake, the 1762 earthquake, the 1869 Cachin earthquake (Ms 7.5), the 1885 Bengal earthquake (Ms 7.0), the 1897 Great Indian earthquake (Ms 8.4), and the 1918 Srimangal earthquake (Ms 7.6) (Banglapedia; Oldham, 1883; Ambraseys, 2004; Bilham and Hough, 2006; etc.). Although, Bangladesh did not experience with any major earthquake since more than 100 years but the geological settings and the historical evidences of earthquake may mean that Bangladesh has a high risk of major earthquake occurrence in near future (CDMP, 2009).

### 3.2 Earthquake Risk Assessment and Developing the Scenarios

Under CDMP-II, probabilistic earthquake risk assessment was carried out for Bogra Municipality area using HAZUS model for analyzing potential damages and losses from different earthquake scenarios. HAZUS is a regional loss estimation model that was developed by the United States' Federal Emergency Management Agency (FEMA) and National Institute of Building Sciences (NIBS).

Considering the likely earthquake threat in Bangladesh, following three different scenarios (**Table-3.1**) have been developed based on different return periods(both short and longer) to identify the possible damage to buildings, infrastructures, utility services and facilities and casualties in Bogra Municipality area under CDMP-II.

**Table 3.1: Selected earthquake scenarios**

Scenario	Description
Scenario-1	An earthquake of 43 years return period originated from Dauki Fault with 7.9 Ms
Scenario-2	An earthquake of 475 years return period originated from Dauki Fault with 7.9 Ms
Scenario-3	An earthquake of 2475 years return period originated from Dauki Fault with 7.9 Ms

### 3.3 Impact of Probable Earthquakes and Loss Estimation

#### Building Damage

**Table 3.2: Expected damage to buildings in Bogra Municipality due to three scenarios**

Scenarios	Total Number of Buildings	Number of Building Damage		
		Moderate	Extensive	Complete
Scenario-1	91,349	1,113	21	0
Scenario-2	91,349	24,273	3,110	61
Scenario-3	91,349	41,186	12,974	684

It is estimated that none of buildings of Bogra Municipality area will completely be damaged due to an earthquake of 43 years return period originated from Dauki Fault. During the event, about 21 buildings will likely be extensively damaged and 1,113 moderately damaged. About 61 buildings will likely be completely damaged and 3,110 buildings will likely be extensive damaged due to an earthquake of 475 year return period originated from same fault. An earthquake of 2475 years return period originating from Dauki Fault will likely be completely damaged about 648 buildings and extensive damaged 12,974. The possible concrete and masonry building damage due to scenario-2 earthquake are shown in **Map B-1&Map B-2** in the **Annex-B**.

#### Casualties and Injuries

The estimates of the number of people that will likely be injured and killed by the earthquake are broken down into four severity levels that describe the extent of the injuries. The levels are described as follows:

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated
- Severity Level 4: Victims are killed by the earthquake

The casualty estimates are provided for two times of day: 2:00 AM (night-time) and 2:00 PM (day-time). These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum and the 2:00 PM estimate considers that the educational, commercial, and industrial sector loads are maximum.

**Table 3.3: Expected casualties and injuries in Bogra Municipality area due to three scenarios**

Scenarios	Time	Level of Injuries			
		Level-1	Level-2	Level-3	Level-4
Scenario-1	2:00 AM	29	2	0	0
	2:00 PM	30	2	0	0
Scenario-2	2:00 AM	472	48	1	24
	2:00 PM	510	53	1	23
Scenario-3	2:00 AM	1,284	152	9	238
	2:00 PM	1,414	172	12	235



During scenario-1 earthquake at night-time, none of the inhabitants will likely be killed immediately or will likely be required hospitalization that can become life threatening if not promptly treated in Bogra Municipality area. About 2 people will likely be required hospitalization but are not considered life-threatening. Another 29 people will likely be required medical attention such as first aid or some kind of treatment. Similarly about 24 people will likely be killed, 1 people will likely be needed to hospitalize on a critical condition, 24 people will likely be needed to hospitalize on moderate injuries, and about 472 people will likely be required medical attention if the scenario-2 earthquake occurred during night-time. Scenario-3 at night-time will likely be killed 238, about 9 people will likely be needed to hospitalize on a critical condition, about 152 people will likely be required taking admission in hospital with moderate injuries, and about 1,248 people will likely be required primary medical attention.

### ***Essential Facilities Damage***

During three scenario earthquakes, essentials facilities such as major hospitals and clinics, educational institutions, fire service stations, police stations, and other government and communal structures located within the Municipality will likely be damaged ranging from at least slight to complete. The expected damage to the buildings of essential facilities due to three scenario earthquakes is given in **Table 3.4**.

**Table 3.4 Expected damage to building of essential facilities due to three scenario earthquakes**

Scenarios	Essential Facilities	Total Structure	At Least Moderate Damage	Complete Damage	With 50% functionality on day1
<b>Scenario-1</b>	School	750	0	0	750
	Hospital	110	0	0	110
	Fire Station	1	0	0	1
	Police Station	30	0	0	30
<b>Scenario-2</b>	School	750	61	0	147
	Hospital	110	4	0	6
	Fire Station	1	0	0	0
	Police Station	30	2	0	0
<b>Scenario-3</b>	School	750	652	0	0
	Hospital	110	82	0	0
	Fire Station	1	0	0	0
	Police Station	30	27	0	0

The estimation shows that in Bogra Municipality area, none of the buildings of essential facilities will likely be damaged with less than 50% functionality on day-1 in the aftermath of scenario-1 earthquake. Due to scenario-2 earthquake, about 61 educational and 4 hospital/clinic buildings will likely be moderately damaged. Similarly, about 652 educational, 82 hospital/clinics and 27 police

station buildings will likely be moderately damaged due to scenario-3 earthquake in the Municipality area but none of the buildings of essential facilities will likely be at least 50% functional on day1. The probability of functionality of education, health and other critical facilities at day-1 due to scenario-2 earthquake are shown in **Map B-3, Map B-4&Map B-5** in the **Annex-B**.

### **Transportation and Utility System Damage**

Transportation system and utility facilities such as highway, railway, bus terminal, ferry terminal, electrical power, communication, etc. located within Bogra Municipality will likely be damaged ranging from at least slight to complete due to all three scenario earthquake. The expected damage to transportation system and utility facilities within the Municipality due to three scenario earthquakes is given in **Table 3.5**. The probability of functionality of road network and transportation facilities at day-1 due to scenario-2 earthquake is shown in **Map B-6&Map B-7** in the **Annex-B**.

**Table 3.5 Expected damage to transportation and utility system due to three scenario earthquakes**

Scenarios	System	Component	Total	Moderate Damage	Complete Damage	At least 50% Functional	
						Day 1	Day 7
Scenario-1	Highway	Segments	6,644	0	0	6,644	6,644
		Bridges	37	0	0	37	37
	Railway	Segments	10	0	0	10	10
		Facilities	4	0	0	4	4
	Bus Terminal	Facilities	70	70	1	0	69
	Ferry Terminal	Facilities	0	0	0	0	0
	Potable Water		12	0	0	12	12
	Electrical Power	Facilities	410	0	0	0	0
Communication	Facilities	129	8	0	129	129	
Scenario-2	Highway	Segments	6,644	0	0	6,644	6,644
		Bridges	37	0	0	37	37
	Railway	Segments	10	0	0	10	10
		Facilities	4	0	0	4	4
	Bus Terminal	Facilities	70	52	0	59	70
	Ferry Terminal	Facilities	0	0	0	0	0
	Potable Water		12	0	0	12	12
	Electrical Power		410	0	0	0	0
Communication		129	105	0	121	129	
Scenario-3	Highway	Segments	6,644	0	0	6,644	6,644
		Bridges	37	0	0	37	37
	Railway	Segments	10	0	0	10	10
		Facilities	4	4	0	2	4
	Bus Terminal	Facilities	70	52	0	59	70
	Ferry Terminal	Facilities	0	0	0	0	0
	Potable Water		12	11	0	0	12
	Electrical Power		410	0	0	0	0
Communication		129	105	0	121	129	

The expected damage to utility pipelines within the Municipality due to three scenario earthquakes is given in **Table-3.6**. The assessment shows that there will likely to occur 8 leaks and 2 breaks to water supply pipelines and 10 leaks and 2 breaks to gas supply network due to scenario-2 earthquake. Similarly, there will likely to occur at least 24 leaks and 6 breaks to water supply pipelines and 28 leaks and 7 breaks to gas supply network due to scenario-3 earthquake.

**Table 3.6 Expected damage to utility pipelines due to three scenario earthquakes**

System	Scenario 1			Scenario 2			Scenario 3		
	Total Pipeline Length (km)	No. of Leaks	No. of Breaks	Total Pipeline Length (km)	No. of Leaks	No. of Breaks	Total Pipeline Length (km)	No. of Leaks	No. of Breaks
Potable Water	124	1	0	124	8	2	124	24	6
Waste Water	0	0	0	0	0	0	0	0	0
Natural Gas	146	1	0	146	10	2	146	28	7

### ***Earthquake-Induced Fires***

Fires often occur after an earthquake. Several fire incidents may occur after a major earthquake in Bogra Municipality area which can burn out of control. **Table-3.7** provides the number of ignitions and probable damage due to earthquake-induced fires in different scenarios.

**Table 3.7: Expected earthquake-induced fires and probable damage**

Scenarios	Probable Impacts		
	No. of Ignition	Population to be Affected	Economic Damage (thousand USD)
Scenario-1	3	167	0
Scenario-2	6	270	1000
Scenario-3	7	2,702	14000

In Bogra Municipality, it is estimated that there will likely to cause 3 ignitions which will displace about 167 people due to scenario-1 earthquake. Scenario-2 earthquake will likely to cause 6 ignitions and displace 270 people. Similarly, scenario-3 will likely to cause 7 ignitions that will displace about 2,702 people.

### ***Debris Generation***

In the aftermath of the scenario earthquakes, huge volume of debris will likely be generated due to damage of buildings and infrastructures. **Table-3.8** shows the expected debris generation in Bogra Municipality due to three scenario earthquakes.

**Table 3.8: Expected debris generation in the Municipality area due to scenario earthquakes**

Scenarios	Debris Generation		
	Total (Thousand Ton)	% Concrete and Steel	% of Brick, Wood and Others
Scenario-1	20	16	84
Scenario-2	430	50	50
Scenario-3	1,320	65	35

In Bogra Municipality area, about 20 thousand tons of debris will likely be generated from Scenario-1 earthquake. In case of Scenario-2 and Scenario-3 earthquakes, there will likely to generate about 430 thousand tons and about 1,320 thousand tons of debris respectively.

### 3.4 Estimation of Resource Needs and Analysis of Resources Availability

As an earthquake of 475-years return period represents the parameters of design-based earthquake, **Scenarios-2** at 2:00 AM (night-time) has been taken as the basis for estimating the resource needs, spatial analysis of available resources and capacities, and preparing the Contingency Plan.

#### ***Search and Rescue***

Approximately, 780 people will likely be trapped (both in injured and dead condition) inside the collapsed buildings out of which some will come out by themselves, some will be assisted by community volunteers, and some may require medium to highly specialized search and rescue. As per the INSARAG Guidelines, approximately 370 victims (50%) can be extricated by the community themselves or with the light search and rescue teams, whereas another 50% (approximately 370) victims will likely to require assistance of specialized search and rescue teams.

The specialized search and rescue capacity mainly exists with the Bangladesh Army, Fire Services and Civil Defense (FSCD) and Bangladesh Red Crescent Societies (BDRCS). Currently, there is only one FSCD stations within Bogra Municipality area which will primarily be responsible for conducting specialized search and rescue operation along with Bogra Cantonment and BDRCS during an earthquake emergency in the town. The available resources and capacities of FSCD Bogra are given in **Table A-1** and **Table A-2** in **Annex-A**. The Urban Community Volunteer trained by FSCD for Bogra Town will provide all support to the specialized team for search and rescue operation. List of these volunteers with detailed information is given in **Table A-3** in **Annex-A**. The location of FSCD and other key emergency agencies in Bogra Town is shown in **Map C-1** in **Annex-C**.

#### ***Immediate Evacuation Spaces***

It is estimated that about 5,615 populations will likely be displaced due to building collapse. These populations will need to be evacuated immediately to the nearest open spaces. Total 5,615 sq. m. spaces will be required (considering @ 1 sq. m. /person as standard) to accommodate the displaced people for immediate evacuation purpose (assembly after the scenario earthquake).

The open spaces available in Bogra Municipality include smaller areas ranging from hundreds to thousands sq. m. The smaller spaces are appropriate only for immediate evacuation purposes, whereas only bigger ones (larger than 5,000 sq. m. which can accommodate more than 100 families) are considered as appropriate for temporary shelter purpose. Currently, there is about 23,060 sq. m. of open spaces within Bogra Municipality area that can be used for immediate evacuation purpose. The lists of these open spaces that can be used for immediate evacuation purposes and their population holding capacities are given in **Table A-4** in **Annex-A** and their locations are shown in **Map C-2** in **Annex-C**. The smaller open spaces/ playgrounds available within the compound of educational institutions and other institutional areas are not included in the list.

The available open spaces within the Municipality area are sufficient for immediate evacuation for the required number of displaced population. About 17,445 additional people can be accommodated in these spaces for immediate evacuation purpose from surrounding areas of the Municipality.



### **Evacuation Routes**

The list of proposed evacuation routes that can be used for safe evacuation of the population from different areas are given in **Table A-5** in **Annex-A** and shown in **Map C-3** in **Annex-C**. Only the roads of 6m and above width are usually considered for safe evacuation, because other smaller urban roads inside the municipality will likely to have higher possibilities of blockage due to road damage itself or due to falling debris from damaged buildings. However, the existing road network of 6m and above width within Bogra Municipality area is not evenly distributed and not well connected. Therefore, the existing roads of 4m to 6m width are also considered as evacuation routes that can be used for operating small vehicles, ambulance and small equipment to ensure the search, rescue and evacuation operation at every corner of the municipality.

### **Fire Control**

The analysis shows that that Scenario-2 earthquake will result in multiple conflagrations immediately. There will likely be at least 6 ignitions that can burn out of control due to insufficient capacity of FSCD, delay of fire-fighting agency and/or limited access to the affected areas, and lack of water sources. The locations of water supply sources within the Municipality are shown in **Map C-4** in **Annex-C**.

In the aftermath of the earthquake and subsequent aftershocks there will be a massive requirement of response efforts from FSCD for both fire-fighting and search and rescue operation. The conventional response efforts and capabilities of only one FSCD station within Bogra Municipality will likely to be overwhelmed.

### **Health Facilities**

Currently, there are 44 major hospitals and clinics within Bogra Municipality area with total 943 hospital beds available for use. The list of hospitals, clinics and other medical facilities and their capacities are given in **Table A-6** in **Annex-A** and locations are shown in **Map C-5** in **Annex-C**. Scenario-2 earthquake will likely to cause moderate to severe damage to many hospital buildings that would result in only 444 hospital beds (47%) being available on the first day of the earthquake. However, this total will not actually be available for earthquake victims, because some of these will be pre-occupied by regular patients. Assuming 50% will be already occupied by regular patients; actual available number of beds for earthquake victims will be 222.

The estimation shows that approximately 49 people will require hospitalization immediately after the Scenario-2 earthquake. Hence, a total of 173 more beds will be available for the treatment of other regular patients and other injured.

### **Emergency Shelters**

It is estimated that approximately 5,615 populations of Bogra Municipality will likely to be displaced due the Scenario-2 earthquake. However, all these displaced population may not require shelters to be provided by government and relief organizations. Part of them will take shelter at their relatives' and friends' houses, or may rent out spaces in remaining buildings (undamaged for partially damaged). It is assumed that approximately 50% of the displaced population will manage their shelters by their own. Remaining 50% population will require shelters provided by government and relief organizations.

According to SPHERE standard for emergencies (2011), 45 sq. m. per person surface area is required for emergency shelter purpose. However, realizing the scarcity of open spaces in cities and towns of Bangladesh, 45 sq. m. per household is used as the required minimum standard to calculate the space need for shelter. Using the average household size in the country is 4.8 persons (BBS, 2008,) the possible shelter requirement is calculated for the displaced population. Hence, total 26,325 sq. m. shelter spaces for approximately 585 households will need to be provided by government and relief organizations.

After an earthquake, open spaces such as parks, playgrounds, recreational centers etc. are potential shelter areas for the homeless population. Available open spaces (bigger than 5000 sq. m. which can accommodate more than 100 families) are proposed for emergency temporary shelter purpose. The list of these proposed shelter sites and their capacities are given in **TableA-7** in **Annex-A** and locations are shown in **Map C-6** in **Annex-C**.

Existing educational buildings (e.g. school, college, universities, etc.) and communal buildings (e.g. community centers, auditorium, etc.) can also be used as temporary sheltering purpose depending on the season as well as their level of functionality after the earthquake. The locations of educational and communal buildings available within Bogra Municipality area are shown in **MapC-7** in **Annex-C**.

#### ***Relief Services (food, nutrition and other relief)***

The requirements of food and other relief items for the people living in shelter camps in different locations of Bogra Municipality have been calculated for daily and monthly requirement using SPHERE standards for emergencies (2011) and given in **Table A-8** in **Annex-A**. Based on current production in Bangladesh, four types of food items such as wheat flour, rice, lentil and vegetable oil are taken as the most common foods. These are also appropriate food for storage and distribution during earthquake disasters.

#### ***Water Supply, Sanitation and Hygiene***

Average water use for drinking, cooking and personal hygiene in any household is at least 15 liters per person per day. Likewise, for excreta disposal purpose, one toilet is required for a maximum of 20 people. Assuming this as a minimum requirement, the total quantity of water and total number of toilets required in different shelter camps is calculated and given in **Table A-9** in **Annex-A**.

#### ***Transportation***

One of the immediate actions related to road transportation network, after an earthquake, is to open some key roads facilitating urban search and rescue. Search and rescue equipment are needed to be transported to different locations for the effective rescue of the trapped people. The direct damage to the road network and the heavy damage to the buildings indicate that most of the roads get either directly damaged or get blocked due to debris.

In Bogra Municipality area, around 430 thousand tons of debris will likely to be generated from Scenario-2 earthquake. If the debris tonnage is converted into an estimated number of truckloads, it will require about 17,200 truckloads (@25 tons per truck) to remove the debris. The location of fuel re-filling stations within the Municipality that can be used for vehicle re-fueling purpose are shown in **Map C-8** in **Annex-C**.

### ***Security and Welfare***

General security to the affected area as well as emergency shelter camps is also needed to be provided according to the national standards and the capacity of the police, RAB and Ansar in the town.

The estimation shows that during Scenario-2 earthquake at night-time, about 23 people will likely be killed immediately in Bogra Municipality area. These dead bodies need to be managed properly at proper locations and as per the proper cultural and religious norms.

## Section 04: Operational Framework

### 4.1 Overview of Operational Framework

The earthquake response operation in the town will be carried out through a Town-level response framework to standardize the activities of first responder agencies. The basis of this response framework will be the establishment of a multi-tiered Town-level Emergency Operation Center (EOC) and functional response cluster system.

#### Establishment and Activation of EOC:

A Town-level Emergency Operation Center (EOC) will be established and activated to support and coordinate the emergency response activities.

#### Box 4.1: Requirements for establishment of a Town-level EOC

- An EOC is a physical location where disaster response and recovery activities are authorized, coordinated, and monitored during and after a disaster event.
- A dedicated office space in the Municipality building is the best suitable place for EOC.
- The EOC should be equipped with uninterrupted communication facilities, including VHF, HF, mobile telephone, satellite telephone, landline telephone, fax facilities, internet connection, computers, and GIS capability as well as response kits and personal protective equipment.
- It will function for 24 hours a day and establish a staff roster system to ensure adequate personnel are available at all times.

The major functions of the EOC are:

- Ensure effective management and coordination of all elements involved in emergency response operation.
- Establish communications with National EOC, first responder agencies, other government agencies, hospitals and clinics, private sector agencies, national and international NGOs, and donor agencies to support response operations with required physical and financial resources.
- Act as a focal point for the receipt, timely collection, analysis and dissemination of vital information concerning the event.
- Monitor and assess the progress of on-going response and recovery activities to provide a more complete operational picture to National EOC, concerned government agencies, and media.

#### Functional Response Cluster System:

In the immediate aftermath of a major earthquake and its impact in the town, there will be huge tasks related to emergency response, such as damage and need assessment, control of fire, search and rescue of trapped population, treatment of injured, providing shelters and relief supplies to displaced people, restoration of critical facilities, public security and welfare, etc. Experience shows that many of these response activities are complex and need to be implemented by a number of

different agencies. All these stakeholders need to work together in a systematic and coordinated manner so that their capacities and resources are best utilized for optimum and efficient response.

Because of this, the earthquake response and recovery activities that are being implemented at EOC will be organized in accordance to the functional cluster system which has been used by the United Nations since the early 2000s. This system is used to assign leadership, strengthen partnerships, and ensure more predictability and accountability in disaster response by clarifying the division of labour among agencies and better defining their roles and responsibilities within the key sectors of the response. During the Contingency Planning Process, several formal and informal small consultative meetings were held with key stakeholders to discuss modifying the standard UN clusters to suit Bangladesh's unique disaster management framework. The modified clusters include:

- Command and Coordination
- Search, Rescue and Evacuation
- Healthcare Services
- Logistics Support and Relief Services (Food, Nutrition and Other Relief)
- Shelter (Including camp management)
- Water Supply, Sanitation and Hygiene
- Transportation (Road, Rail, Air and Sea)
- Security and Welfare
- Immediate Recovery - Restoration of Urban Services

## 4.2 Phases of EOC Operations

The capacity of the Town-level EOC will fluctuate throughout the different disaster phases. During the non-emergency phase (preparation phase) the EOC will have limited permanent staffs that will be responsible for maintaining the physical EOC space and equipment. The permanent staff will also be responsible for organizing drills and simulations for first responder agencies so that they are familiar with the EOC structure and prepared to relocate operations there at the on-set of a disaster. Once there is an emergency, the capacity of the EOC will expand and representatives from first responder agencies will move to the EOC to manage their agencies' and relevant cluster's response activities. During the recovery phase as response activities taper off, the EOC will again resize and different personnel may be stationed there to lead recovery activities.

The priorities of the EOC personnel during the different disaster phases include:

Disaster Phases	Priority Activities
<b>Pre-disaster Phase</b>	<ul style="list-style-type: none"> <li>• Maintaining the physical EOC space and equipment</li> <li>• Monitoring and evaluation for ensuring readiness among first responder agencies through a readiness reporting system</li> <li>• Capacity building of agencies/individuals</li> <li>• Resource mobilization and distribution to cope up with the resource constraints of first responder agencies</li> <li>• Managing the plan for EOC expansion in a disaster situation</li> <li>• Maintaining a database of manpower, resources, equipment, etc. for use in emergency situations</li> </ul>

	<ul style="list-style-type: none"> <li>• Maintenance of web-based emergency response plan updating system</li> </ul>
<b>During Disaster Phase</b>	<ul style="list-style-type: none"> <li>• Emergency coordination, command, and response management</li> <li>• Providing technical assistance to first responder agencies and cluster leads to ensure an efficient recovery mechanism</li> <li>• Conducting damage assessment and need analyses</li> <li>• Keeping records (on damages, losses, and response needs) in order to meet the needs of the affected and provide necessary information for assistance (including cash appeals) to external agencies</li> <li>• Implementing disaster response activities</li> <li>• Reviewing and monitoring of progress of disaster response activities and reporting to Government authorities</li> </ul>
<b>Post-disaster Phase</b>	<ul style="list-style-type: none"> <li>• Developing a plan for phasing out response activities when no longer necessary and then phasing out response activities when appropriate</li> <li>• Implementing a plan for phasing out response activities undertaken by first responder agencies</li> <li>• Undertaking priority actions in partnership with service agencies (such as gas, electricity, water, telecom, etc.) for the restoration of critical facilities and urban services</li> <li>• Preparing to hand over functional responsibilities in relation to coordination, command, and management to agencies responsible for recovery activities</li> <li>• Developing a structure for handing over management to permanent recovery planning agencies</li> <li>• Reviewing and monitoring the progress of response activities</li> <li>• Carrying out an evaluation of response management so that shortcomings can be integrated in the review process of the National Earthquake Contingency Plan</li> </ul>

### 4.3 Leadership and Operational Structure of Town-level EOC

The Town-level EOC will be operated under the leadership of the Municipality with the full support and active participation of Municipality Disaster Management Committee (PDMC) and the Municipality Disaster Response Coordination Group as stated in the Standing Order on Disaster.

The EOC will be led by the Municipality Mayor as the EOC Chief/Commander and assisted by the Coordinator, Operation Officer, Panel of Technical Experts and Administrative System.

The operational function of the EOC will be organized under the responsibility of following desks:

Desk	Responsibilities
<b>Planning</b>	<ul style="list-style-type: none"> <li>• The Planning Desk is primarily involved in evaluating the disaster situation, determining objectives, providing overall strategic and policy directions, establishing unified actions across the city, deciding which resources should be used to achieve disaster response in the most efficient and cost-effective</li> </ul>

	manner, and liaison with PDMC, Municipality, National EOC and international agencies (if necessary).
<b>Coordination</b>	<ul style="list-style-type: none"> <li>The Coordination Desk is responsible for acting as a focal point for receiving all incoming information, including reports of damages, casualties, and requirements from the affected areas, processing and analyzing the information, and disseminating to the public and media.</li> </ul>
<b>Operation</b>	<ul style="list-style-type: none"> <li>The Operation Desk is responsible for conducting tactical field operation to carry out response activities as per the plan, including the overall coordination among field-level technical response clusters, and ensuring operational continuity.</li> </ul>
<b>Logistic</b>	<ul style="list-style-type: none"> <li>The Logistic Desk provides support to supply resources and all other logistic services needed to meet the incident needs. It is also responsible for coordinating and making request for additional support from National Authorities, first responder agencies, other government agencies, and private sector agencies as needed from field-level technical response teams.</li> </ul>
<b>Finance and Administration</b>	<ul style="list-style-type: none"> <li>This desk monitors costs related to incident management. It provides accounting, procurement, time recording, and cost analyses.</li> </ul>

These desks and the EOC administrative system are responsible for maintaining the operations of the EOC and sustaining an environment which enables the clusters to implement the response and recovery activities. The EOC will provide situational information to the clusters as it becomes available. It will also exchange information with National EOC on a regular basis.

During emergency, the EOC will house a number of technical team as per the functional response clusters. Each team will lead by a first responder agency with relevant mandates, and consisting of selected members (trained and experienced in respective fields of response or support activities) from support agencies/departments as well as urban community volunteers. Cluster leadership and membership has been designated and actions are outlined in **Section 5**.

#### 4.4 Role and Organization of Urban Volunteers

Fire Service and Civil Defence (FSCD) is one of the lead government agencies which remain alert for 24 hours a day to manage any disaster in Bangladesh. However, the total manpower of FSCD is not adequate in respect of necessity. Considering the earthquake risk in the country, FSCD with the support of CDMP has initiated to train the community volunteers on disaster management especially on earthquake so that they can serve the people in case of any disaster before the arrival of professionals even they can assist the professionals after their arrival. Bogra Town has a trained volunteer group of about 256 persons to provide immediate assistance to carry out light search and rescue operation and fast aid support to injured persons. As a local resource, this volunteer group will be used in a number of support roles to augment emergency operations. Detailed information of urban community volunteers to work for response activities in Bogra Town is given in the **Table A-3** in **Annex-A**.

## **4.5 Coordination with Internal Agencies**

During an emergency, in the interest of speed and simplicity in disaster response management, coordination should be carried out at the lowest possible level of the government organization, with minimum reorganization of local disaster management committees. Hence, to decentralize the responsibilities during an earthquake emergency, coordination among town-level government organizations will be carried out as per the structure of Local Disaster Coordination Group (Municipality and District) as placed in the Standing Order on Disaster (SOD).

While not physically present at the EOC, supporting agencies play a critical role in disaster management at the Town-level. They are cluster members and work with the first responder agencies who serve as cluster leaders to implement response and recovery activities. Close coordination within the clusters (vertically among leadership and members and horizontally among members) is imperative to prevent both gaps in service and redundancy. Relationships between cluster members should be fostered during the preparation phase and continued throughout response and recovery phases. Each cluster should form its own system of communication and meeting structure which should be tailored to the level of coordination needed. Some supporting agencies may be responsible for a variety of tasks which necessitate membership in more than one cluster. These agencies will be obligated to meet the requirements of cluster membership for each and should designate staff to participate accordingly.

In addition to activities undertaken by cluster-specific lead and support agencies, private sector plays a critical role in emergency management. These roles may include being an impacted organization, a response resource, a partner in preparedness, and/or a component of the economy. There should be communication and coordination with the private sector to provide support through public-private partnerships, associations, and contractual agreements in responding to and recovering from a major earthquake

## **4.6 Coordination with External Agencies**

The Town-level EOC will notify the National EOC of any shortfall of resources and support needed. The National EOC will direct resources available at national, divisional and other Town-level to assist the affected town.



## Section 05: Action Strategies

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Cluster-wise action strategies comprising detailed activities before, during and after a major earthquake in Bogra Municipality area and responsible lead and support agencies are described below:

**CLUSTER 1: COMMAND AND COORDINATION**

<b>Lead Agency</b>		Bogra Municipality
<b>Support Agencies</b>		DC Office, Army, FSCD, DDM, BP, RAB, Ansar & VDP, BGB, Media, CSO, PDB, BTCL, PGCL, PWD, RHD, BR
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To prepare a framework for integrated response efforts by formulating a well-coordinated system for reduction of impacts of potential earthquake events</li> </ul>
<b>Activities</b>		<b>Support Agencies</b>
<b>Pre-Disaster Phase</b>	Development of Standard Operation Procedure (SOP)	FSCD, Army, BP, Ansar & VDP, RAB, BGB
	Establishment of City level 24/7 Emergency Operation Centre and participate in EOC operations and reporting of readiness	FSCD, Army
	Setting up earthquake Incident Command Systems (ICS) in place (establishment, training and capacity building) where appropriate	FSCD, BP, Ansar & VDP, RAB, BGB
	Organizing ICS training and nominate representatives to participate in ICS established at various levels	FSCD, BP, Ansar & VDP, BGB
	Development of a disaster event response reporting system by stakeholder agencies (impacts, resource needs, actions by them for reducing the impact, difficulties, opportunities etc.) during earthquake	DC Office, BP, Ansar & VDP, RAB, BGB
	Promotion of informal education on earthquake Contingency Plan operations at all levels and conduct simulations	NGO's
	Development of guidelines for media agencies on reporting disaster events, procedures for public information dissemination related to emergency declaration, announcements and warnings on aftershocks, and disseminate public awareness and advocacy material to support Contingency Planning and implementation	DC Office, National and Local Electronic and Print Media
<b>Emergency Response Phase</b>	Facilitating mobilization of earthquake incident command system where necessary under the command of Army and networking with organizations under ICS	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Executing operation surveillance continuously covering all the earthquake affected areas	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Mobilization of ICS teams at lower level command structure	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL, Local Newspapers
	Facilitating coordination of logistic supply management	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Assisting authorities for communications with media in relation to information dissemination on welfare of victims, missing and found, results on damage assessment surveys, results on need assessment surveys and	DC Office, DDM, National and Local Electronic and Print Media

Early Recovery Phase	facilitate media coverage by media agencies on reporting earthquake event	
	Facilitating public information dissemination related to emergency declaration, announcements and warnings on aftershocks and repeat of occurrences of other collateral hazards due to aftershocks	DC Office, DDM, National and Local Electronic and Print Media
	Coordinating Operation Surveillance to reduce impacts due to aftershocks	AFD, FSCD, DRR, Office of Civil Surgeon, BPDB, Office of Deputy Commissioner
	Facilitating coordination of logistic supply management and deployment of resources to affected areas, IDP camps etc.	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Conducting Post disaster Evaluation of performance of <ul style="list-style-type: none"> <li>earthquake incident command system and recommend improvements</li> <li>performance of National EOC and improvement where necessary</li> </ul>	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Facilitating continuation of EOC operations and periodic reporting during early recovery period to EOC on involvement of all first responder organizations in earthquake event management and for necessary assistance	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL
	Facilitating media coverage by media agencies on reporting of post-earthquake disaster event situation analysis and facilitate public information dissemination related to emergency declaration, announcements and warnings on aftershocks and possible impacts due to collateral hazards	Local electronic and print media
	Assisting authorities for communications with media in relation to information dissemination on welfare of victims, Missing and found, results on damage assessment surveys, results on need assessment surveys	DC Office, DDM, Local Electronic and Print media
	Review of the Contingency Plans under the Cluster - Emergency Operations- Overall Command and Coordination and revise the same to include suitable modifications to improve the performance	DC Office, FSCD, Army, DDM, Office of Civil Surgeon BP, BR, BPDB, BTCL, PGCL

**CLUSTER 2: SEARCH, RESCUE AND EVACUATION**

<b>Lead Agency</b>		Fire Service and Civil Defence (FSCD), Bogra
<b>Support Agencies</b>		DC Office, Army, FSCD, DRRO, BP, RAB, Ansar & VDP, BGB, Media, CSO, PDB, BTCL, PGCL, PWD, RHD, BR, BDRCS
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To prepare effective plan for emergency services (search, rescue, evacuation, first aid, fire safety etc.) by ensuring inter-agency coordination at city level</li> <li>To build capacity of concerned agencies and develop guidelines in the light of national and international practice</li> </ul>
<b>Activities</b>		<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Developing guidelines for urban search and rescue	Army, FSCD, BP, DC Office
	Cataloguing/procurement of equipment for special search & rescue, and develop procedure for ensuring access	FSCD, Army, Office of Civil Surgeon, BDRCS
	Capacity building for creating special units for urban search and rescue from collapsed buildings, infrastructure, medical first response	FSCD, Army, Office of Civil Surgeon, BDRCS
	Capacity building of community first responder groups in search and rescue operations, medical first response	FSCD, Army, Office of Civil Surgeon, BDRCS
	Developing medico-legal procedure for identification and tagging of dead bodies with health group	FSCD, Army, Office of Civil Surgeon, BDRCS, NGOs
	Ensuring fire safety preparations (through pre-positioning of fire hydrants, fire stations, developing data base of sources of water, storage of material etc.)	FSCD, DC Office, BPDB, BTCL, PGCL
	Pre-positioning of tools , equipment and accessories, get the civil authorities to develop inventories of such equipment available for use during earthquakes	Army, FSCD, DC Office, RHD, BR, BPDB, BTCL, PGCL
	Preparing resource inventory (equipment, tools, accessories and manpower etc.) and Procurement of necessary tools and equipment for urban search and rescue operations to fill the agency level gaps	FSCD, Army, Office of Civil Surgeon, DDM, BP, Ansar & VDP, BR, BPDB, BTCL, PGCL
	Preparing guidelines for logistic supply management and deployment of resources	FSCD, Army, Office of Civil Surgeon, DDM, BP, Ansar & VDP, BR, BPDB, BTCL, PGCL
	Capability assessment of agencies who could be involved in search and rescue operations	Army, FSCD, Office of Civil Surgeon, BDRCS, BP
<b>Emergency</b>	Carry out the inter-agency coordination to optimize the efforts of search and rescue teams by providing necessary guidance and inputs.	FSCD, Army, BP, Ansar & VDP, BDRCS
	Coordination with national and international teams engaged in search and rescue and coordination of	FSCD, Army, Office of Civil Surgeon,

	information supply and feedback	BDRCS, DC Office
	Mobilizing special teams of search and rescue from collapsed buildings and infrastructure	FSCD, Army, Office of Civil Surgeon, BDRCS, DC Office
	Mobilizing necessary additional manpower, tools and equipment for search and rescue operation from other stations located outside the affected area	FSCD, Army, Office of Civil Surgeon, BDRCS, BP
	Mobilizing community based social volunteer networks and trained first responders from unaffected areas to support the search and rescue parties	FSCD, Ansar & VDP
	Make arrangements to obtain resource inventory and data base for search and rescue operations and provide information based on the spatial data on rapid loss estimation	FSCD, Army, Office of Civil Surgeon, BP, DDM
Early Recovery Phase	Networking with organizations and mobilize support for search and rescue operations in areas which are difficult to reach	FSCD, Army, Office of Civil Surgeon, BP, DDM, NGOs
	Mobilizing community based social volunteer networks and trained community first responder groups to assist special units mobilized for search and rescue from collapsed buildings and infrastructure	FSCD, BP, BDRCS, Ansar & VDP, Office of Civil Surgeon
	Make arrangements to access resource inventory items for search and rescue operations and mobilize support of external groups for search and rescue operations	Army, DDM, NGOs, Office of Civil Surgeon
	Monitoring and evaluation of <ul style="list-style-type: none"> <li>Post disaster performance evaluation of special units mobilized for search and rescue from collapsed buildings and infrastructure</li> <li>Inter-agency coordination functions</li> <li>All relevant emergency services in operation in earthquake affected areas aiming at reducing the human casualties</li> </ul>	FSCD, AFD, Office of Civil Surgeon, DDM, BP, Ansar & VDP
	Review of the Contingency Plan under the Cluster - Search Rescue and Evacuation and revise the same to include suitable modifications to improve the performance	FSCD, AFD, Office of Civil Surgeon, DDM, BP, Ansar & VDP

**CLUSTER 3: HEALTH SERVICES**

<b>Lead Agency</b>		Office of Civil Surgeon, Bogra																																				
<b>Support Agencies</b>		Municipality, Army, FSCD, DDM, BP, BDRCS, Hospital and Clinic Authorities, Medical College, Civil Societies, Media, NGOs																																				
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To minimize human casualties by establishing an efficient medical first response system in areas with high seismic risk</li> <li>To enhance the hospital emergency medical care through development of hospital preparedness plans</li> <li>To build capacity for setting up a well-organized mass casualty treatment system</li> <li>To develop epidemic surveillance system to prevent outbreak of epidemics during post-earthquake period</li> </ul>																																				
		<table> <tr> <th colspan="2">Activities</th><th>Support Agencies</th></tr> <tr> <td rowspan="10">Pre-disaster Phase</td><td>Hospital preparedness planning and training on Hospital Preparedness for emergency operations</td><td>Municipality, BDRCS, NGOs</td></tr> <tr> <td>Methodology development for handling of dead and missing during earthquakes and emergencies</td><td>Army, BDRCS, Municipality</td></tr> <tr> <td>Developing networks with private &amp; government hospitals within the area and in the neighborhood for support during emergencies like earthquakes</td><td>Army, Municipality, Hospitals and Clinics</td></tr> <tr> <td>Developing alert system for hospital staff including doctors to report for work during emergencies such as earthquakes</td><td>Army, Municipality, Hospitals and Clinics</td></tr> <tr> <td>Setting up of 24/7 State of the art ambulance services</td><td>Army, FSCD, Municipality, Hospitals and Clinics</td></tr> <tr> <td>Identifying needs for pre-positioning of medicine, temporary hospitals etc. and obtain the necessary resources</td><td>Army, FSCD, Municipality, NGOs</td></tr> <tr> <td>Methodology development for epidemic surveillance and control</td><td rowspan="2">Army, FSCD, BDRCS</td></tr> <tr> <td>Conduct operation surveillance training for all First Responder Organization for quick mobilization in earthquake events</td></tr> <tr> <td>Impart training to community medical first responders within the city and develop a database</td><td>Army, FSCD, BDRCS</td></tr> <tr> <td>Methodology development for estimation of casualty and human injury</td><td>Army, FSCD, Municipality</td></tr> <tr> <td rowspan="6">Emergency Response Phase</td><td>Methodology development for estimation of livestock, number of injured people and casualty</td><td>Army, FSCD, Municipality</td></tr> <tr> <td>Mobilizing health teams for providing emergency medical care to displaced persons.</td><td>Army, FSCD, DDM, NGOs</td></tr> <tr> <td>Activating the alert system for hospital staff and voluntary groups to report to hospitals and medical centers as planned</td><td>Hospital and Clinic authorities, Medical Colleges</td></tr> <tr> <td>Mobilizing health teams to provide first aid to displaced and injured when and where necessary</td><td>FSCD, NGOs, BDRCS</td></tr> <tr> <td>Mobilizing health teams for setting up of temporary hospitals in suitable locations, when and where necessary to treat injured and sick after the earthquake</td><td>Army, Municipality</td></tr> <tr> <td>Mobilizing pre-positioned medical facilities , Mobile Hospitals etc. to treat injured and sick</td><td>Army, FSCD, Municipality</td></tr> </table>	Activities		Support Agencies	Pre-disaster Phase	Hospital preparedness planning and training on Hospital Preparedness for emergency operations	Municipality, BDRCS, NGOs	Methodology development for handling of dead and missing during earthquakes and emergencies	Army, BDRCS, Municipality	Developing networks with private & government hospitals within the area and in the neighborhood for support during emergencies like earthquakes	Army, Municipality, Hospitals and Clinics	Developing alert system for hospital staff including doctors to report for work during emergencies such as earthquakes	Army, Municipality, Hospitals and Clinics	Setting up of 24/7 State of the art ambulance services	Army, FSCD, Municipality, Hospitals and Clinics	Identifying needs for pre-positioning of medicine, temporary hospitals etc. and obtain the necessary resources	Army, FSCD, Municipality, NGOs	Methodology development for epidemic surveillance and control	Army, FSCD, BDRCS	Conduct operation surveillance training for all First Responder Organization for quick mobilization in earthquake events	Impart training to community medical first responders within the city and develop a database	Army, FSCD, BDRCS	Methodology development for estimation of casualty and human injury	Army, FSCD, Municipality	Emergency Response Phase	Methodology development for estimation of livestock, number of injured people and casualty	Army, FSCD, Municipality	Mobilizing health teams for providing emergency medical care to displaced persons.	Army, FSCD, DDM, NGOs	Activating the alert system for hospital staff and voluntary groups to report to hospitals and medical centers as planned	Hospital and Clinic authorities, Medical Colleges	Mobilizing health teams to provide first aid to displaced and injured when and where necessary	FSCD, NGOs, BDRCS	Mobilizing health teams for setting up of temporary hospitals in suitable locations, when and where necessary to treat injured and sick after the earthquake	Army, Municipality	Mobilizing pre-positioned medical facilities , Mobile Hospitals etc. to treat injured and sick	Army, FSCD, Municipality
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	Activating the alert system for hospital staff and voluntary groups to report to hospitals and medical centers as planned	Hospital and Clinic authorities, Medical Colleges																																				
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	Mobilizing pre-positioned medical facilities , Mobile Hospitals etc. to treat injured and sick	Army, FSCD, Municipality																																				

	Mobilizing support from other hospitals (Private hospitals, hospitals located elsewhere etc) when and as needed and coordinate with private and International Medical Teams to optimize their contributions to national efforts in saving lives and treatment of critically injured.	Hospital and Clinic authorities, FSCD, NGOs
	Mobilizing medical first responders within the city to assist field medical teams, Hospitals and Medical Clinic authorities	Hospital and Clinic authorities, Army, FSCD, SCC
	Mobilizing trained Triage teams to affected city wards and control points, transportation of injured to hospitals	Hospital and Clinic Authorities, Municipality
	Mobilizing ambulance services to transport sick and injured	Hospital and Clinic authorities, Army, FSCD, Municipality
	Mobilize health teams for tagging of dead bodies and locating missing during the earthquake	Army, BP, FSCD
	Get assistance from qualified professionals to conduct rapid damage assessment of all health infrastructure within the city and identify suitability for usage for treatment of injured and sick	Army, FSCD, Municipality
	Establishing counseling centers	Municipality, NGOs
Early Recovery Phase	Continue providing emergency medical care to displaced persons.	Army, DDM, Municipality
	Conduct the M&E and performance evaluation of Health cluster activities and introduce necessary modifications to improve the performance	Army, FSCD, DDM, BDRCS, NGOs
	Conducting evaluation of performance of medical first responder groups and improve the methodology for training and simulations	NGOs, Medias
	Conducting the evaluation of ambulance services to transport sick and injured during emergencies and introduce modifications to improve the services	NGOs, Hospital and clinic authorities
	Continue assistance to authorities in mortuary services(such as identifying dead & missing, issue of death certificates for disposed and inventorying and maintenance of records etc)	Army, FSCD, DDM, NGOs, BDRCS
	Follow medico-legal procedure for identification and tagging of bodies, disposal of dead bodies	BP, Army, FSCD, Municipality, NGOs
	Conducting evaluations of the level of preparedness & performance during emergency by all hospital and medical institutions	Army, Medias, Civil Society
	Conducting review of the Contingency Plan for the Health Cluster agencies and revise to integrate the improvements	Army, FSCD, DDM, Municipality

**CLUSTER 4: LOGISTICS SUPPORT AND RELIEF SERVICES (FOOD, NUTRITION AND OTHER RELIEF)**

<b>Lead Agency</b>	Bogra Municipality	
<b>Support Agencies</b>	DC Office, Army, DDM, DoF, District Food Office, BP, Ansar and VDP, BGB, BDRCS, FSCD, NGOs, INGOs	
<b>Primary Objectives</b>	<ul style="list-style-type: none"> <li>To conduct survey for assessing and analyzing damages and estimating needs</li> <li>To ensure provision of necessary essential facilities for displaced population after emergencies</li> <li>To ensure provision of food and nutrition, logistic supply to displaced population based on need assessment</li> <li>To coordinate with international and local NGOs, donor agencies to supplement the government welfare assistance to IDPs</li> </ul>	
	<b>Activities</b>	<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Networking with various stakeholders and development of system for reporting the stocks of supplies and resources (funding agencies, NGOs & INGOs for identification of resources, improved coordination relief material distribution) and maintain a database	DDM, DoF, BDRCS
	Developing guidelines, data formats and carry out capacity building for damage analysis and need assessment	DC Office, Army
	Developing guidelines and disseminate information on <ul style="list-style-type: none"> <li>Logistic supply management and deployment of resources</li> <li>Maintaining of temporary or permanent emergency shelters</li> <li>Distribution of welfare items and food</li> <li>Quality assurance for food and nutrition</li> <li>Setting up welfare camps by all agencies</li> </ul>	Army, BDRCS
	Developing guidelines for community mobilization to increase the community participation in relief distribution and camp management	DDM, FSCD, Army, BDRCS, Ansar & VDP
	Establishing warehouses for store of government supplies of welfare items food and supplementary items	DC Office, Army, DDM
	Ensuring government resources for buying additional welfare items food and supplementary items	DC Office, DDM
	Developing guidelines for rehabilitation of physically handicapped disabled and vulnerable groups	DDM, NGOs
	Developing inventory of agencies within the city who possess stocks of welfare items, food and nutrition, temporary shelter and camps, water purification plants, generators, cooking facilities etc. to be used in case of emergencies	DC Office, DDM, Army, BDRCS
<b>Emergency</b>	Preparation of necessary documentation for preparation of flash appeals in collaboration with NEOC	Army, DDM, BDRCS
	Conducting damage analysis and need assessment survey in affected areas and preparation of estimates of items and other urgent needs for obtaining donor support for external contributions. Networking with various stakeholders (funding agencies, NGOs & INGOs for mobilization of contributions, improved	DC Office, DDM, Army, FSCD, NGOs



	coordination of relief material distribution)	
	Setting up temporary camps to house IDPs and provide other essential items (such as Food, Nutrition and other Relief), Mobilize support from NGOs, INGOs for providing assistance to IDPs	DC Office, DDM, Army, BDRCS, NGOs
	Mobilization of community social volunteer groups through Local Governments, CBOs and NGOs to assist setting up of camps for IDPs ,maintenance of camps etc.	Army, DDM, Ansar & VDP, BDRCS
	Networking with ministries, departments, district authorities, donor agencies, NGOs and INGOs for mobilization of support for supply and distribution of relief material and welfare items. Supply of food and supplementary items through DC, government departments, other district authorities for distribution to victims. Conduct surveys for quality assurance for food and distribution	DC Office, Army, DDM, Ansar & VDP, BGB
	Liaise with relevant govt. agencies, line departments, district authorities, civil society agencies to ensure welfare of other victims(those who are living in their own, those who are with friends and relatives etc.) and food supply	DC Office, Army, Ansar & VDP
	Assisting other stakeholder agencies such as NGOs and INGOs for supply of food and supplementary items to displaced when and where necessary through assistance in national level procurement, import of items, custom clearance, transportation to affected areas etc.	Army, DC Office
Early Recovery Phase	Evaluating of overall performance of Cluster - Relief Services (Food, Nutrition and other Relief)	Army, DDM, BP
	Networking with ministries, departments, district authorities, donor agencies ,NGOs & INGOs and assistance for efficient coordination for distribution of relief material welfare items	DDM, DC Office
	Conducting routine surveys for quality assurance for food and nutrition distributions carried out by government and non-government agencies	DDM, DC Office, Army
	Periodic Stock taking of central Godowns to carry out qualitative and quantitative assessment of food items and facilitate efficient distribution	DC Office, DDM, District Food Office, NGOs, INGOs
	Periodic visits to welfare camps and monitoring and evaluation of compliance of guidelines for maintenance of welfare camps by all agencies	DDM, DC Office, Army
	Providing necessary assistance in documentation, tax payment if applicable and custom clearance etc. to other stakeholder agencies such as NGOs and INGOs for continues supply of food and supplementary items to displaced located in camps for IDPs	DDM, DC Office, Army
	Assisting all agencies providing welfare , food and nutrition support for transportation and distribution of supplies to victims when and where necessary	DDM, Army, INGOs
	Reviewing Contingency Plan for the Cluster - Relief Services (Food, Nutrition and other Relief) and revise if necessary to introduce measures to improve performance	DDM, Army, NGOs, INGOs, BDRCS

**CLUSTER 5: SHELTER**

<b>Lead Agency</b>	Bogra Municipality	
<b>Support Agencies</b>	DC Office, Army, DDM, DoF, District Food Office, BP, Ansar and VDP, RAB, BGB, PWD, Department of Social Welfare (DSW), NGOs	
<b>Primary Objectives</b>	<ul style="list-style-type: none"> <li>To ensure temporary shelter for displaced after disaster events such as Earthquakes and provision of basic facilities to the same</li> </ul>	
	<b>Activities</b>	<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Preparing plan for temporary shelter provision and management	DDM, Army, DC Office, BP
	Identification of potential open air sites appropriate for temporary shelters for displaced population and conduct capacity assessment of these open air sites	DDM, Army, DC Office, BP
	Identification of earthquake-resistant educational buildings (school, college, universities, etc.) and communal buildings (community centers, auditorium) that can be used as temporary shelters, and conducting capacity assessment of these buildings	PWD, DDM, Army, DC Office
	Determining the ownership of these sites and buildings and enter into pre-agreements if relevant	PWD, DDM, Army, DC Office
	Assessing the need for pre-positioned family tents, communal kitchen materials and utility services (water supply, electricity, toilet facilities, etc.) for identified temporary shelters, and maintain stocks of standby emergency shelter items/equipment for quick mobilization during establishment of temporary shelter	DDM, Army, DC Office, BP
	Determination of special need and maintain the provision for most vulnerable group (gender, children, disable and elderly people).	DDM, Army, DC Office, BP, DSW
	Preparing security plan for temporary shelter camps	BP, DDM, Army, DC Office
<b>Emergency Response Phase</b>	Activating the plan for temporary shelter provision and management	BP, DDM, Army, DC Office
	Estimating the number of homeless due to earthquake, according to all available sources who need temporary shelters.	DDM, Army, DC Office, BP
	Determining immediate needs in terms of shelters to include: open air sites, educational and communal buildings and other specific needs according to season.	DDM, Army, DC Office, BP
	Assessing the condition of identified shelter sites and buildings after earthquake that can be used for temporary shelters.	PWD, DDM, Army, DC Office, BP
	Setting up and manage tented camps / community shelters and ensure the distribution of temporary shelter stock to the people of greatest need.	DDM, Army, DC Office, BP, NGOs
	Estimating the needs in terms of essential household items, fuel for cooking, relief items, water supply, sanitation and hygiene and ensure the supply according to the need	DDM, Army, DC Office, BP, NGOs
	Ensuring the special needs for most vulnerable group (gender, children, disable and elderly people).	DDM, Army, DC Office, BP, DSW
	Implementing the shelter security plan	BP, RAB, Ansar and VDP, BDB

	Liaise with camp management team, to meet the needs on an on-going basis and obtain periodic situation reports and review the progress on shelter management	DDM, Army, DC Office, BP
Early Recovery Phase	Conducting survey of temporary shelter set up for IDPs for qualitative improvement	DDM, Army, DC Office, BP
	Review of on-going shelter requirements for medium and long term (number of homeless, state of buildings, coping strategies of beneficiaries, specific needs according to time of the year, etc.)	DDM, Army, DC Office, BP
	Establishing plan for medium/ long term needs including time frame and transition strategy	DDM, Army, DC Office, BP
	Developing early recovery Plans for setting up new Settlement programs and rehabilitation of partially damage settlement and housing for supply of permanent shelter for affected.	DDM, Army, DC Office, BP
	Reviewing Performance of Cluster - Shelter and introduce modifications to the Contingency Plan for better performance in future.	DDM, Army, DC Office, BP

**CLUSTER 6: WATER SUPPLY, SANITATION AND HYGIENE**

<b>Lead Agency</b>		Bogra Municipality
<b>Support Agencies</b>		DPHE, Army, FSCD, DDM, DC Office, Office of Civil Surgeon, NGOs, INGOs
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To provide safe drinking water, sanitation facilities and hygiene services during earthquake disaster.</li> <li>To restore the water supply system immediately after earthquake disaster.</li> <li>To control epidemics and provide immunization</li> </ul>
<b>Activities</b>		<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Developing procedure for vulnerability assessment of water supply system and other infrastructure facilities, sewerage & drainage systems by respective managers	DPHE
	Developing Contingency Plans for water and sanitation sector, waste management systems at all levels covering earthquake prone agencies by respective managers	DPHE
	Identification of water sources and other infrastructure elements most likely to survive earthquake	DPHE
	Pre-positioning of water supply deep wells to be used during emergencies	DPHE
	Developing minimum standards for drinking water supply and issue guidelines to public, NGOs, INGOs and other civil society organizations	DPHE
	Developing guidelines for close surveillance in epidemic outbreak and conduct of preparedness measures such as immunization programs, awareness programs to prevent epidemic outbreaks	Office of Civil Surgeon, Army, FSCD
	Developing guidelines with water and sanitation group for minimum sanitation levels to be maintained in temporary shelter set up for IDPs	DPHE
	Facilitating alternate systems for emergency water supplies such as transportation by container trucks, bowsers etc.	DPHE, FSCD
	Promoting household level long term water conservation methods such as rain water harvesting, water softening and SODIS techniques for water purification	DPHE
<b>Emergency Response Phase</b>	Activating the Contingency Plans for water and sanitation sector at all levels covering earthquake affected areas	DPHE, Army, FSCD
	Observe the emergency water supply needs and communicate to relevant stakeholders	DPHE, Army, FSCD
	Conducting close surveillance in epidemic outbreak in affected areas due to problems connected with water and sanitation and make remedial actions	DDM, Army, FSCD, Civil Surgeon Office
	Conducting rapid damage assessment of water supply, sewerage & drainage system and initiate actions for restoration	DPHE, DDM, Army, FSCD
	Assisting authorities to maintain water supply and sanitation facilities within welfare camps set up for	DPHE, DDM, Army, FSCD

	victims	
	Implementing sanitation management system in the temporary shelter for the benefit of victims in affected areas	DPHE, DDM, Army, FSCD
	Arrangements for quality check of water sources, bottled water and disposable water containers	Army, DPHE, NGOs, INGOs
Early Recovery Phase	Carrying out performance evaluation of response actions under Cluster -Water Supply, Sanitation and Hygiene and introduce suitable modifications to Contingency Plan to improve the performance	Office of Civil Surgeon, DDM, DPHE
	Observing and facilitating the emergency water supply needs and communicate to relevant stakeholders	DPHE, DC Office
	Conducting close surveillance in epidemic outbreak in affected areas due to problems connected with water and sanitation and make remedial actions	Office of Civil Surgeon, DPHE
	Conducting Damage Assessment survey for water supply facilities and develop plans to restore and rehabilitate the facilities at all levels covering earthquake affected areas	DPHE
	Conduct periodic quality check of water sources, portable water containers and disposal of waste	DPHE

**CLUSTER 7: RESTORATION OF CRITICAL FACILITIES AND UTILITY SERVICES**

<b>Lead Agency</b>	Bogra Municipality	
<b>Support Agencies</b>	PWD, BPDB, BTCL, PGCL, DPHE, DC Office, DDM, Army, FSCD, Office Civil Surgeon, Universities, NGOs, Private Sectors	
<b>Primary Objectives</b>	<ul style="list-style-type: none"> <li>To identify the critical urban services and facilities vulnerable to earthquakes and strengthening the same to a higher safety level</li> <li>To ensure efficient restoration of utilities and services after earthquakes such as supply of water, telecommunication facilities, electricity, gas and, waste disposal etc.</li> <li>To ensure provision of basic facilities to the temporary shelters for displaced population after earthquake events</li> <li>To prevent outbreak of fire due to malfunctioning of utilities such as gas, electricity supply etc.</li> <li>To ensure prevention of environmental disorder due to release of hazardous waste and material</li> </ul>	
	<b>Activities</b>	<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Conducting scenario based need assessment survey for emergency services in earthquake prone urban areas and report to authorities	DDM, PWD, Office of Civil Surgeon, BPDB, BTCL, PGCL, DPHE
	Developing methodology for vulnerability assessment of buildings and infrastructures and loss estimation to identify high risk areas	DDM, PWD, Office of Civil Surgeon, BPDB, BTCL, PGCL, DPHE
	Developing procedure for restricting or preventing entry into damaged buildings	BP, Ansar & VDP, RAB, BGB
	Conducting vulnerability assessment of important government buildings , critical facilities, infrastructures and utility systems	DDM, PWD, Office of Civil Surgeon, BPDB, BTCL, PGCL, DPHE
	Preparing location maps and collect other information related to pre-positioned essential facilities to be used during earthquakes	DDM, PWD, Office of Civil Surgeon, BPDB, BTCL, PGCL, DPHE
	Developing guidelines for spatial planning & land use control (for emergency evacuation and provision of temporary shelters both in developed & undeveloped areas) and revise land use Plans to create/preserve open spaces within urban areas, create more parks, recreational areas , green areas suitable for emergency evacuations, create essential facilities such as water , electricity, telecommunication, gas, etc.	PWD, LGED, DC Office, DDM
	Developing guidelines for recovery planning at various levels based on sector needs and special vulnerable groups (gender, elder persons, children, etc.) through integration of earthquake risk management principles	DDM, PWD, Office of Civil Surgeon, BPDB, BTCL, PGCL , DPHE, NGOs
	Identification of evacuation routes in high risk areas and take actions to improve access to inaccessible areas for S&R actions	FSCD, Army, BP
	Conducting meetings with utilities sub-committee for enhanced preparedness measures to be undertaken by utility agencies to minimize impacts and to prevent malfunctioning of services during emergencies	BPDB, BTCL, PGCL, DPHE
	Maintenance of stocks of most essential spare parts and service personnel for attending to large scale emergencies such as earthquakes	BPDB, BTCL, PGCL, DPHE

	Developing guidelines for vulnerability assessment of utilities and conduct training for utility sector staff for undertaking vulnerability assessments	BPDB, BTCL, PGCL, DPHE
	Capacity building of utility sector for Contingency Planning and planning for restoration of facilities and implement Response Capacity Assessment programs for reduction of impacts on utility sector and develop efficient response capacity	BPDB, BTCL, PGCL, DPHE
	Designing and implementing projects for pre-positioning of emergency water, electricity, gas supply, and telecommunication services for critical areas	BPDB, BTCL, PGCL, DPHE
	Developing procedure for post-earthquake damage assessment of all essential utilities within the city	BPDB, BTCL, PGCL, DPHE
	Provisions of utility services for buildings identified as temporary shelters, and maintain stocks of standby emergency shelter items/equipment for quick mobilization during establishment of temporary shelter(stand-by generators, temporary camps etc.)	BPDB, BTCL, PGCL, DPHE
	Identification of all possible sources of hazardous waste/hazardous material release during emergencies and conduct awareness programs to prevent environmental and societal impacts due to release of hazardous substance during emergencies such as earthquakes	Relevant Industries, Business enterprises
	Holding discussion with Private institutions(Business sector, Industries etc.) to create awareness on Contingency Planning to reduce losses and casualties in work places and provide necessary technical assistance and conducting mock drill etc. for Contingency Planning	Relevant Industries, Business enterprises
Emergency Response Phase	Immediately activating the plan for shut off of all supplies of gas, electricity, waste disposal etc. at all shut off points.	BPDB, BTCL, PGCL, DPHE
	Mobilizing pre-positioned/stand by essential emergency support units and facilities (boreholes for emergency water supply, search and rescue stores at community level, stand-by generators, mobile kitchens, water supply and purification units, mobile hospitals, etc.)	BPDB, BTCL, PGCL, DPHE, Office of Civil Surgeon, Army, FSCD, BP, Ansar & VDP
	Carrying out rapid damage assessment of critical facilities like city buildings and suitability check for using as temporary offices	PWD, Army, FSCD
	Facilitating provision of basic facilities to temporary camps set up for IDPs	BPDB, BTCL, PGCL, DPHE
	Mobilizing teams for rapid damage assessment of housing units and dwellings and issue certificate for occupation after earthquake event	PWD, DC Office, DDM
	Providing assistance for rapid damage assessment of buildings belong to first responder agencies such as Army, FSCD, Hospitals, Critical Government Buildings to prevent occupation of unsafe buildings	PWD, DC Office, DDM
	Liaise with private institutions (Business sector, Industries etc.) for activating the Contingency Plans to conduct rapid damage assessments to work places and provide necessary technical assistance	Relevant Industries, Business enterprises

	Undertaking restoration work and actions by utility agencies to re-establish supply of power, gas, etc. to critical agencies(hospitals, AFD, Police, evacuation camps so on)	BPDB, BTCL, PGCL, DPHE, Army, FSCD, School, College, Universities, DDM
	Conducting rapid damage assessment survey of utility supply systems and restoration of supply to critical facilities (such as hospitals, police, Army, Fire Service, etc.) Organize project teams to conduct rapid damage assessment of all essential utilities within the city by utility managers	BPDB, BTCL, PGCL, DPHE, Army, FSCD, Universities, DDM
	Mobilizing pre-positioned emergency utility supply services for critical areas	BPDB, BTCL, PGCL, DPHE, Army, FSCD, DDM, NGOs
	Obtaining periodic situation reports and review the progress on activation of Contingency Plans and restoration of services by utility agencies	BPDB, BTCL, PGCL, DPHE
Early Recovery Phase	Conducting survey of temporary shelter set up for IDPs for qualitative improvement of shelter for IDPs	DDM, Army
	Developing early recovery Plans for setting up new settlement programs and rehabilitation of partially damaged settlement and housing for supply of permanent shelter for affected.	DDM, PWD, DC Office
	Conducting damage assessment survey of all utilities and prepare plans to restore and rehabilitate supply of power, water, gas, to affected areas	BPDB, BTCL, PGCL, DPHE, Universities
	Integrating mitigation and preparedness programs in recovery planning by utility agencies for reduction of future earthquake impacts during restoration of facilities	BPDB, BTCL, PGCL, DPHE
	Assisting restoration of all essential utilities and services within the city by utility managers	BPDB, BTCL, PGCL, DPHE
	Providing periodic situation reports on the status of restoration of services and review the progress	BPDB, BTCL, PGCL, DPHE
	Reviewing of the Performance of Cluster – Restoration of critical facilities and utility services and introduce modifications to the Contingency Plan for better performance in future.	DDM, PWD, BPDB, BTCL, PGCL, DPHE
	Phase by phase restoration of disrupted electricity, gas, water supply and telecommunication through assessment of degree of damage	BPDB, BTCL, PGCL, DPHE
	Conducting rapid damage assessment survey and issue of certificates to house owners and owners of other buildings (business enterprises, shops, commercial centers, inductees, garment factories, hotels, etc.) for ensuring suitability for occupation after the earthquake	PWD, DC Office
	Carrying out planning operations for systematic cleaning, removal and transportation of debris, identify dump sites	Private Sectors
	Conducting a review of performance of the Cluster - Restoration of critical facilities and utility service and revise the Contingency Plan accordingly	Universities



**CLUSTER 8: TRANSPORTATION**

<b>Lead Agency</b>		Bogra Municipality
<b>Support Agencies</b>		RHD, LGED, BRTC, BIWTC, BR, DDM, FSCD, Army, BP, Office of Civil Surgeon
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To identify vulnerabilities of transportation infrastructures to earthquakes and strengthening the same to a higher safety level</li> <li>To restore the transport system immediately after earthquake events for mobilization of resources to the affected areas</li> </ul>
<b>Activities</b>		<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Developing guidelines for vulnerability assessment of transport systems and conduct vulnerability assessment and strengthen transportation system and transport infrastructure	RHD, LGED, BRTC, BIWTC, BR
	Developing emergency teams for restoration of facilities	RHD, LGED, BRTC, BIWTC, BR
	Studying alternate transport arrangements in case of earthquakes and develop route map	RHD, LGED, BRTC, BIWTC, BR
	Developing coordination arrangements between different transport authorities (road, air, sea) to function during emergencies	RHD, LGED, BRTC, BIWTC, BR
	Developing Contingency Plans for city level transportation systems to avoid high risk areas	RHD, LGED, BRTC, BIWTC, BR, BP
	Making arrangements for storage of essential spare parts	RHD, LGED, BRTC, BIWTC, BR
	Making arrangements to fabricate temporary bridges	Army, RHD, LGED
<b>Emergency Response Phase</b>	Taking action by transport authorities to restore the transportation systems to reach critical areas for search and rescue teams and supply of relief	RHD, LGED, BRTC, BIWTC, BR, DDM, FSCD, Army, BP, Office of Civil Surgeon
	Conducting rapid damage assessment survey and reporting by transport authorities for obtaining cooperation of other agencies for restoration of transportation systems.	RHD, LGED, BRTC, BIWTC, BR, DDM
	Mobilization of resources for activation of alternate transport arrangements	RHD, LGED, BRTC, BIWTC, BR, DDM, BP, Ansar & VDP
	Notification of accessible routes after the earthquake event based on the rapid assessment and issue of updates regularly after restoration of additional routes	RHD, LGED, BRTC, BIWTC, BR, DDM, BP, Ansar & VDP
<b>Early Recovery Phase</b>	Conducting damage assessment survey of transport systems due to impact of occurrence of earthquake and collateral hazards and develop Plans for restoration of transport systems to higher seismic safety.	RHD, LGED, BRTC, BIWTC, BR, DDM
	Assisting actions by transport authorities to identify alternate routes for transportation of essential relief supplies, food stocks, welfare items etc.	RHD, LGED, BRTC, BIWTC, BR, DDM, Army
	Commencing rehabilitation of damaged transport infrastructure and facilities, rail roads, main roads, river ports	RHD, LGED, BRTC, BIWTC, BR
	Reviewing of the performance of Cluster - Transportation during the emergency response period and revise the Contingency Plan to improve the performance	RHD, LGED, BRTC, BIWTC, BR, DDM

**CLUSTER 9: SECURITY AND WELFARE**

<b>Lead Agency</b>		Bangladesh Police, Bogra
<b>Support Agencies</b>		DC Office, DSW Army, FSCD, Ansar & VDP, RAB, BGB, Municipality
<b>Primary Objectives</b>		<ul style="list-style-type: none"> <li>To maintain the law and order situation during earthquake emergencies</li> <li>To arrange security during emergencies to ensure safety of citizens and protection of properties</li> <li>To control the movement of population and traffic during emergencies</li> </ul>
<b>Activities</b>		<b>Support Agencies</b>
<b>Pre-disaster Phase</b>	Developing a comprehensive plan for security arrangements for citizens and protection of properties, business and industries as well as for maintenance of law and order to be adopted during earthquake emergencies	Army, Ansar & VDP, RAB, BGB, Municipality
	Developing a comprehensive plan for traffic control during emergencies	Ansar & VDP, RAB, BGB, Municipality
	Developing guidelines for control of entrance into damaged buildings, and restrict access to affected areas by unauthorized persons	FSCD, Ansar & VDP, RAB, BGB, Municipality
	Developing guidelines for evaluation of security planning and operations for maintenance of law and order during emergencies	DC Office, FSCD, Ansar & VDP, RAB, BGB, Municipality
	Assisting development of procedures for handling of destitute and orphans	DC Office, Municipality, NGOs, DSW
	Assisting in promotion of social security systems (insurance Schemes, micro credit, etc.)	DC Office, DSW, NGOs, Life Insurance companies
	Developing guidelines for integrating fire hazard management as a component of earthquake response and early recovery actions especially concerning temporary shelter, government buildings, private buildings, business enterprises, and utilities services	Municipality, Army, DDM, NGOs
	Developing procedures for management and maintenance of information on dead and missing	Municipality, DC Office, DSW, Army, FSCD, Office of Civil Surgeon
	Developing procedures for burial of dead, funeral rights, mortuary services etc.	Municipality, DC Office, DSW, Army, FSCD, Office of Civil Surgeon, Ansar & VDP, RAB, BGB
<b>Emergency Response</b>	Activating the security plan for citizens and protection of properties, business and industries as well as for maintenance of law and order	Army, Ansar & VDP, RAB, BGB, Municipality
	Activating the Plan for traffic control during emergencies	Ansar & VDP, RAB, BGB, Municipality
	Exercise control of entrance into damaged buildings, and restrict access to affected areas by unauthorized persons	FSCD, Ansar & VDP, RAB, BGB, Municipality

	Conducting periodic monitoring and evaluation of security operations for maintenance of law and order during emergencies	DC Office, Army, FSCD, Ansar & VDP, RAB, BGB, Municipality
	Activating the Plan for handling of destitute and orphans	DC Office, Municipality, DSW, NGOs
	Assisting in documentation and fulfillment of other needs to benefit the beneficiaries of social security systems such as insurance Schemes, micro credit, etc.	DC Office, DSW, NGOs, Life Insurance companies
	Carrying out the Plans for prevention and control of fire hazard due to main shock and aftershocks in temporary shelters, government buildings, private buildings, business enterprises, utilities & Services	Municipality, Army, DDM, NGOs
	Carrying out the plan for management and maintenance of information on dead and missing	Municipality, DC Office, Army, FSCD, Office of Civil Surgeon
	Carrying out the procedures for burial of dead, funeral rights, mortuary services etc.	Municipality, DC Office, Army, FSCD, Office of Civil Surgeon, Ansar & VDP, RAB, BGB
Early Recovery Phase	Reviewing the performance of implementation of Security Plan and arrangements during earthquake emergency for safety of citizens and protection of Government & Private Property, Business and Industries as well as for maintenance of law and order to be adopted during emergencies such as earthquakes	Army, Ansar & VDP, RAB, BGB, Municipality
	Reviewing the performance of implementation of plan for traffic control during emergencies	Ansar & VDP, RAB, BGB, Municipality
	Carrying out evaluation of security planning and operations for maintenance of law and order during Earthquake emergency	DC Office, Army, FSCD, Ansar & VDP, RAB, BGB, Municipality
	Conducting review of the Contingency Plan under Cluster – Security and Welfare and introduce suitable modifications in revising the Plan to improve the performance	DC Office, DSW, Army, FSCD, Ansar & VDP, RAB, BGB, Municipality

## Section 06: Operational Priorities

### 6.1 Initial Response Goals and Objectives (First 72 hours)

The primary response goal is to save maximum number of lives in case of an earthquake and stabilize the event within first 72 hours. The priority objectives are,

- Delivering immediate search and rescue services and evacuate people to safe locations.
- Providing immediate medical assistance and life-saving and life-sustaining medical services to the victims.
- Providing fatality management services and returning deceased to their loved ones.
- Stabilizing or eliminating damaged buildings and infrastructures to minimize health and safety threats and stabilizing and restoring the essential infrastructures to functional condition.
- Ensuring temporary shelters including provision of adequate food, water and sanitation facilities to the displaced population.
- Providing overall safety and security and maintaining law and order.

### 6.2 Priority Actions by Timeframe

#### a. Priority actions at the Initial Response Phase (First 4 and 8 hours)

First 4 hours		Respond to the immediate known effects of the earthquake
Responsible Clusters	Priority Actions	
Command and Coordination	<ul style="list-style-type: none"> <li>• Activate Emergency Operation center (EOC)</li> </ul>	
	<ul style="list-style-type: none"> <li>• Identify potential sites for evacuation centers to accommodate displaced population while emergency shelters are being opened.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Identify at-risk populations, notify them and begin to evacuate if warranted.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Assess the condition and status of critical facilities such as municipality office, DC office, fire service offices, hospitals and clinics, police stations, etc.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Identify vulnerable buildings or infrastructures that are threatening to impacted area and nearby community that may be affected by cascading effects and secondary hazard and take initiative to stabilize or eliminate immediately.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Assess the condition of emergency communication system.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Begin public information dissemination regarding personal protection actions, safe congregation points, and community assistance needed.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Complete an initial damage assessment of the municipality, identifying areas affected, major incidents, and operational status of critical services.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Create consolidated situation assessment and declare a state of emergency.</li> </ul>	

Search Rescue and Evacuation	<ul style="list-style-type: none"> <li>• Mobilize specialized search and rescue team including urban community volunteer and assist immediate life-saving rescue operations.</li> </ul>
	<ul style="list-style-type: none"> <li>• Direct and suppression of existing fires and anticipated fire spread based on conditions.</li> </ul>
Health Services	<ul style="list-style-type: none"> <li>• Deploy emergency medical services to major incidents.</li> </ul>
	<ul style="list-style-type: none"> <li>• Establish casualty collection points and field medical camps for on-scene treatment</li> </ul>
	<ul style="list-style-type: none"> <li>• Identify and triage people who have critical injury that require acute medical care and limit the on-scene treatment to non-acute care.</li> </ul>
Security and Welfare	<ul style="list-style-type: none"> <li>• Deploy law enforcement resources to support response and maintain law and order.</li> </ul>
	<ul style="list-style-type: none"> <li>• Provide overall security and access control for the affected area and security for search and rescue operation.</li> </ul>

First 12 hours		Assemble resources for sustained response and for providing basic services to the community
Responsible Clusters		Priority Actions
Command and Coordination		<ul style="list-style-type: none"> <li>• Assess critical resource shortfalls and begin requesting support through National EOC.</li> </ul>
		<ul style="list-style-type: none"> <li>• Open evacuation centers/ spaces.</li> </ul>
		<ul style="list-style-type: none"> <li>• Initiate a regular status reporting and resource requesting process between local EOC, major incident commands, and National EOC.</li> </ul>
		<ul style="list-style-type: none"> <li>• Monitor and address challenges regarding patient load balancing between hospitals and the related patient transport system.</li> </ul>
Shelter		<ul style="list-style-type: none"> <li>• Assess conditions at designated emergency shelter sites and estimate the number of displaced population who need emergency shelters.</li> </ul>
		<ul style="list-style-type: none"> <li>• Set up tented camps and ensure the distribution of emergency shelter stock to the people of greatest need.</li> </ul>
		<ul style="list-style-type: none"> <li>• Assess conditions of educational and communal buildings that can be used for emergency shelter purpose based on the requirements and season.</li> </ul>
Relief, Food and Nutrition, Water Supply and Sanitation, Restoration of Utility Services		<ul style="list-style-type: none"> <li>• Begin to supply beds, food, water and sanitation, medical support, cooking facilities, electricity and telecommunication facilities in emergency shelters.</li> </ul>
Transportation		<ul style="list-style-type: none"> <li>• Assess condition of transportation system and identify alternatives for moving critical resources into the municipality.</li> </ul>
		<ul style="list-style-type: none"> <li>• Designate primary evacuation routes, implement debris clearance and recover routes.</li> </ul>
Security and Welfare		<ul style="list-style-type: none"> <li>• Establish perimeter control around unsafe areas and security at</li> </ul>

	critical facilities.
	<ul style="list-style-type: none"> <li>Implement an access permit system to prioritize and the limit the access and traffic control system.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify people with special support requirements (people with disability, children, aged people, female, etc.) and ensure that their needs are met.</li> </ul>
	<ul style="list-style-type: none"> <li>Determine if a curfew should be established.</li> </ul>

#### b. Priority actions at the Intermediate Response Phase (Through 24, 48 and 72 hours)

Through 24 hours		Consolidate system for sustaining emergency response operations
Responsible Clusters		Priority Actions
Command and Coordination		<ul style="list-style-type: none"> <li>Commit resources to support public safety by assisting incoming employees and gathering/distributing convergent resources from less-affected parts and national resources.</li> </ul>
		<ul style="list-style-type: none"> <li>Conduct outreach for situation status and resource needs for affected facilities needing support, including ancillary medical institutions, educational institutes, commercial buildings, and sites of historic/cultural significance.</li> </ul>
		<ul style="list-style-type: none"> <li>Initiate regular news briefings to inform residents on response operations, steps that can be taken, services available to them, ongoing rumor control efforts, and ways in which the community can help.</li> </ul>
Shelter		<ul style="list-style-type: none"> <li>Designate staging areas and begin planning to accommodate support personnel.</li> </ul>
Transport		<ul style="list-style-type: none"> <li>Ensure that an adequate system is in place to fuel and maintain generators for providing power to critical facilities.</li> </ul>
Security and Welfare		<ul style="list-style-type: none"> <li>Establish temporary morgues and begin process of collecting remains.</li> </ul>
		<ul style="list-style-type: none"> <li>Establish Family Assistant Centers and provide guidance and public messaging about the Family Assistance Centers and dead body collection points.</li> </ul>

Through 48 hours		Stabilize support for affected areas and secure unaffected areas for resumption of services
Responsible Clusters		Priority Actions
Command and Coordination		<ul style="list-style-type: none"> <li>Process ongoing logistical resource requests for emergency services needs to support incident management.</li> </ul>
		<ul style="list-style-type: none"> <li>Make arrangements for the EOC to assume responsibility for supporting incoming aid and convergent resources, relieving field-level public safety workers to focus on providing sustained rescue, firefighting, paramedic, and law enforcement services.</li> </ul>
		<ul style="list-style-type: none"> <li>Anticipate and support initial damage assessment visits by National officials wanting to confirm the immediate and long-term recovery needs of the municipality for their out-of-area</li> </ul>

	resources.
Relief, Food and Nutrition, Water Supply, Sanitation and Hygiene	<ul style="list-style-type: none"> <li>Establish a distribution network for drinking water and food for persons who are not residing in mass care facilities but are without basic services.</li> </ul>
Water Supply, Sanitation and Hygiene	<ul style="list-style-type: none"> <li>Implement the emergency drinking water plan.</li> </ul>

<b>Through 72 hours</b>		<b>Begin transition from immediate emergency response efforts to sustained operations.</b>
<b>Responsible Clusters</b>	<b>Priority Actions</b>	
Command and Coordination	<ul style="list-style-type: none"> <li>Re-evaluate mass care needs in light of any ongoing aftershocks and subsequent damage.</li> </ul>	
	<ul style="list-style-type: none"> <li>Establish the Donations Management Branch and the Human Resources Branch in the logistics section of the EOC to facilitate the handling of volunteers and donations.</li> </ul>	
	<ul style="list-style-type: none"> <li>Participate in discussions with Department of Disaster Management and MoDMR on assessing services that residents will require to recover from the disaster.</li> </ul>	
	<ul style="list-style-type: none"> <li>Review incident status reports to prioritize incident commands that can begin suspending emergency response operations and transition to sustained response and recovery operations.</li> </ul>	
Health Services	<ul style="list-style-type: none"> <li>Support hospital and other medical facility re-supply efforts.</li> </ul>	
Shelter	<ul style="list-style-type: none"> <li>Establish shelter support coordinator teams and evaluate the shelter sites to identify site damage, site security, critical support requirements including shelter management personnel, adequacy of feeding and medical care arrangements, shelter demographics (gender, children, medical needs, language barriers, disability needs).</li> </ul>	
Security and Welfare	<ul style="list-style-type: none"> <li>Establish plans for how to provide care for people with special support requirements that cannot be met in congregate care shelters.</li> </ul>	
	<ul style="list-style-type: none"> <li>Review and enhance security plans to maintain public order.</li> </ul>	

### **c. Priorities actions at the Initial Recovery Phase (After 72 hours but before end of first week)**

Days 3 through 7 at the initial recover phase, EOC will perform following activities outlined below. Some of these actions may occur immediately or in phases; actions must be identified and prioritized based on overall need and resources available to respond.

- Establish plan and begin widespread safety/damage assessment of public infrastructure, such as roads and sidewalks, bridges, tunnels and retaining walls.
- Establish teams to visit shelters to identify people that require special support that need to be relocated into other types of care facilities and to identify site modifications that should be made to better accommodate residents with sight, hearing, mobility or other limitations.
- Begin locating and opening relief supply and food distribution points other than the evacuation centers/shelters.

- Establish and implement mental health counseling for people whose relatives have been killed and homes have been damaged.
- Establish portable toilet sanitation stations around the municipality and related cleaning and pumping program.
- Coordinate with the business community regarding the time of their business resumption activities.
- Begin widespread safety/damage inspections of homes and businesses.
- Produce, regularly update, and distribute a disaster “Fact Sheet” to the media, people in shelters, field response personnel, and residents.
- Ensure that air quality, hazardous materials spills, and other environmental situations are monitored and risks are addressed.
- Evaluate the need to designate specific routes into the municipality for critical relief supplies.
- Ensure that all the food at emergency shelter/evacuation centers, feeding sites, and disaster kitchens are safe and hygienic.
- Begin planning for the relocation of displaced population.
- Implement a process to allow limited entry (where safe) for recovery of personal items.

### **6.3 Sustained Operations**

As the third 24-hour period concludes, the EOC should be supporting three primary areas of operation:

- Ongoing rescue operations and other emergency measures.
- Transitioning near-complete response efforts to sustained emergency operations, typically addressing remaining earthquake effects that do not require public safety technical skills.
- Preparing for ongoing major recovery efforts focusing on restoration of services.



## Section 07: Actions to Support Plan Implementation

Preparing Contingency Plans should not be viewed as a static activity with a defined start and finish. It should be an on-going process integrated into the agencies' daily strategies and tasks. To ensure the Contingency Plan as a useful tool that enables quick and appropriate decision-making during disasters, capacity building and public awareness should be continued in order to:

- i) Familiarize the people with the plans;
- ii) Inspire acceptance of in the documents; and
- iii) Prepare agencies and population to implement the plans in response to a major earthquake.

### 7.1 Capacity Building/ Training

In reference to this Contingency Plan, capacity building refers to increasing the ability of responsible agencies, departments, organizations, and individuals to successfully implement the plan and respond to a major earthquake in timely manner. It also includes ensuring that there is adequate and capable manpower that considers maintaining the plan a priority. **Table-7.1** includes a number of training and education programs aimed at a variety of audience who play a critical role in earthquake response. These audiences include administration and technical personnel, field officers, NGOs, business community, selected community leaders and volunteers. Introducing and continuing to engage these parties in earthquake management concepts can help ensuring that this Contingency Plan will be successfully implemented in the event of a major earthquake.

**Table-7.1: List of training and education programs for building capacity to implement the plan**

Activity	Target Group	Delivery Method	Responsible Departments/ Agencies/ Ministries
Contingency Plan Development	First Responder Agencies	Training Workshops	Respective Departments/ Agencies and Ministries
	Utility services agencies and lifeline agencies	Training workshop/Guidelines	Respective Departments/ Agencies and Ministries
	Other agencies	Issue Guideline for Contingency Planning	DDM, Respective Departments/ Agencies and Ministries
	Ward/Community level	Issue Guideline for Contingency Planning and training to undertake planning at ward	Municipality, DDM

Activity	Target Group	Delivery Method	Responsible Departments/ Agencies/ Ministries
		level	
	Private sector institutions, banks, industries, factories	Issue Guideline for Contingency Planning	DDM
Training in EOC functions	DDB, Other government agencies	Issue SOPs	DDM
Training on Incident Command System (ICS)	Army, Stakeholders within Municipality area	Town level Training workshops	Municipality, DDM
Training on Damage assessment and need analysis(DANA)	Municipality, DRRO, other town level relevant stakeholders	Town level Training workshops	DDM
Earthquake Response simulations/table top exercises	Health Service, FSCD, Army, DRRO, Municipality	Town level Training workshops	Municipality, DDM, Respective Departments/ Agencies
Professional First responder courses (Collapse Building Search & Rescue, Medical First Responder training)	Army, FSCD, Auxiliary forces	Training	DDM, Respective Departments and Ministries
Hospital Preparedness for emergencies	Health services and town level hospitals	Training	Civil Surgeon Office, DG Health Services, Respective Ministry
Community level first responders	Community Volunteer groups in the town	FSCD training course on community first responders	FSCD
Restoration of Utility services	Field teams attached to utility agencies	Training programs designed by utility agencies	Respective Departments/ Agencies and Ministries
Restoration of life line facilities	Field teams attached to lifeline agencies	Training Workshops	Respective Departments/ Agencies and Ministries

## 7.2 Exercises and Simulations

It is important that the Earthquake Contingency Plan is exercised prior to a disaster event so that first responder agencies are familiar with their roles and responsibilities and are comfortable coordinating with one another. Exercise and simulations are useful tools that can provide an

example of working in a stressful post-disaster environment with time constraints. The after-action reviews of exercises and simulations provide an excellent opportunity to evaluate both the strengths and weaknesses of a plan. The lessons learned from exercise and simulations can be incorporated into the Contingency Plan with necessary updates and modifications for improvement of the plan. It is also a useful way of keeping plans fresh, especially during extended disaster-free periods. Exercise and simulations of the Earthquake Contingency Plan could also be helpful in the development of agency level plans because they would inspire agencies to think further about their own individual actions.

### **7.3 Public Awareness and Education**

Family members, neighbours and community people are always the first to arrive on the scene when a disaster occurs. Lack of awareness or low understanding of risk can be the result of inadequate capacity of local community to understand the risk environment and inefficient response. Educating those whose lives or homes might be at risk during a disaster is a critical component of Contingency Planning. Public awareness campaigns generate community support for the implementation of earthquake Contingency Plans, and encourage those who are engaged in response activities at community level and to mobilize community support.

Through a variety of public education programs, those threatened by a potential disaster will learn about what to expect and what they will be asked to do, or how they may participate during an earthquake emergency. An effective public awareness and education campaign requires the coordinated efforts of all the stakeholders such as the government officials and community members, media, scientific and technical experts, business leaders and development workers, civil society groups etc.

A wide array of channels of communication is available for public awareness campaigns with different target groups:

- Face-to-face: meeting, seminar, workshop, conference, march, exhibition, demonstration, training, exchange visit, planning
- Mass media: television, radio, newspaper, cinema
- Distributed print material: leaflet, pamphlet, brochure, booklet, guideline, case study, newsletter, journal, research paper, report
- Folk media: story, drama, dance, song, puppet, music, street entertainment
- Audio-visual: video, audio, multi-media, artwork, photograph, slide show, model, map
- Stand-alone print: billboard, poster, banner, warning sign, flood water level marker
- Postal: direct mailing
- People: community leader, volunteer, project worker, head of women's group
- Electronic media: website, e-mail, e-mail discussion lists, electronic conferencing, distance learning platform, SMS etc.
- Exercises and simulations
- School awareness programs

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## Annex-A: Available Resources and Capacities

**Table A-1: Available and required manpower of FSCD, Bogra**

Sl. No.	Staff Designation	No. available	Additional need
1	Senior station officer	1	No
2	Station officer	1	No
3	Leader	2	No
4	Driver	5	No
5	Fireman	22	No
6	Cook	1	No
7	Sweeper	1	No
<b>Total</b>		<b>33</b>	

**Table A-2: Available and required vehicles, tools and equipment of FSCD, Bogra**

Vehicles/Tools	Purpose	Available Number	Additional Need
Water Tender	All	2	
Tana Gari	All	2	
Ambulance	All	2	
Two wheeler	All	1	1
Hosepipe pipe	Fire	50	
Succession Hosepipe	Fire	15	
Succession range/key	Fire	4	
Portable Generator	All	1	
Smoke ejector	All	1	1
Breathing apparatus	All	4	6
Face mask	All	8	
Lock cutter	Rescue	2	2
Brunch pipe	Fire	8	
Foam making brunch pipe	Fire	3	
Spreader	Rescue	1	1
Ram jack	Rescue	1 set	1 set
Air lifting bag	Rescue	1	1
Rotary rescue saw	Rescue	1	1
Rotary hammer drill	Rescue	1	1
Ladder	Rescue	2	2
Portable Pump	All	4	

Vehicles/Tools	Purpose	Available Number	Additional Need
Foam trolley	Fire	1	
Strainer	fire	8	
Fireman exe	All	Not Available	
Fireman suit	Fire	20	20
Hit protective suit	Fire	2	2
Gum boot	All	20	10
Helmet	All	25	10
Extinguisher	Fire	10	10
Search light	All	0	20

**Table A-3: List of urban community volunteer in Bogra City**

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
1	Md. Abdul Razzak	15	01744774221	01710357107	Bogra fire station
2	Md. Abdullah Abu Saief	10	01916674186	01716030434	Bogra fire station
3	Md. Fazlul Haque	13	01920034314	01922983389	Bogra fire station
4	Md. Momenul Islam	14	01743945252	01735959322	Bogra fire station
5	Md. Iomanur Rahman	0	01717954495	01617954495	Bogra fire station
6	Md. Mahomudul Haque	12	01963448210	01191465878	Bogra fire station
7	Mst. Lucky Aktar	12	01712748311	01739838708	Bogra fire station
8	Mst. Ferduse Begum	12	01835608448	01750222514	Bogra fire station
9	Tazma Sultana	12	01749963432	01711941114	Bogra fire station
10	Mst. Momotaz Mohol	12	01759427041	01821630741	Bogra fire station
11	Md. Mamunur Rashid	14	01767533163	01719923926	Bogra fire station
12	Md. Mostofa Kamal	12	01750222514	01198375059	Bogra fire station
13	Md. Ashrafuzzaman Bhuiyan	12	01673036329	01714844133	Bogra fire station
14	Mst. Anita Mousumi	20	01728747505	01745367563	Bogra fire station
15	Mst. Asfea Khutun	12	01738428746	01557393670	Bogra fire station
16	Abdul Alim	10	01715319459	01716936400	Bogra fire station
17	Md. Kamruzzaman	0	01737664511	01828081012	Bogra fire station
18	Sharifa Shahana	17	01949123886	01762382235	Bogra fire station
19	Shuryea Pervin	18	01922972176	01724240872	Bogra fire station
20	Rumana Rahman	17	01767208559	01554754224	Bogra fire station
21	Md. Anisur Rahman	20	01921598357	01912190597	Bogra fire station
22	Md. Tanjilur Rahman	12	01739625645	01962108125	Bogra fire station
23	Md. Lemon Shake	1	01737742952	01845648629	Bogra fire station
24	Md. Ariful Islam	10	01751349946	01915755176	Bogra fire station
25	Md. Raju Islam	12	01755445551	01723945633	Bogra fire station
26	Md. Hasanur Rahman	15	01722408109	01914368685	Bogra fire station
27	Md. Ahsan Kabir	15	01713868525	01722523045	Bogra fire station
28	Mst. Zahanara Aktar	4	01741456157	01922349457	Bogra fire station
29	Mst. Farzana Aktar	7	01557032517	01735460366	Bogra fire station

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
30	Md. Mahadi Hasan	14	01747832554	01724121995	Bogra fire station
31	Mst. Mahmuda Khatun Moon	0	01776319933	01738161933	Bogra fire station
32	Zinat Ara Akut	9	01773351484	01714462730	Bogra fire station
33	Mst. Rokhsana Akter Konok	7	01735460344	01964304003	Bogra fire station
34	Mst. Moslema Khatun	7	01735460344	01964304003	Bogra fire station
35	Md. Ruhul Amin	0	01916444955	01771503015	Bogra fire station
36	Saddam Hossain	15	01738562198	01736267035	Bogra fire station
37	Md. Ali Hosan	10	01737790099	01710455261	Bogra fire station
38	Md. Rafiuddarajat	12	01714844133	01671907879	Bogra fire station
39	Md. Mostafizur Rahman	6	01728355369	01710815654	Bogra fire station
40	Rubel Hosin	0	01722979126	01733117519	Bogra fire station
41	Md. Faridul Islam	0	01710790024	01914171582	Bogra fire station
42	Md Rayhan Sorkar	0	01723185015	01729312028	Bogra fire station
43	Md. Omar Faruk	0	01736504819	01925637417	Bogra fire station
44	Ahammad Al Raji	15	01717522364	01720121325	Bogra fire station
45	Md. Shoyeb Al Mostofa	18	01731195692	01712914933	Bogra fire station
46	Md. Zolfekar Azad	0	01734022385	01920441646	Bogra fire station
47	Md. Zobayer Hakim	8	01719423841	01558474682	Bogra fire station
48	Md. Shohel Rana	15	01737896440	01683585179	Bogra fire station
49	Md. Sohel Rana	15	01723281504	01823245018	Bogra fire station
50	Md. Zahangir Hasan	12	01835039774	01716245845	Bogra fire station
51	Md. Rabiul Awal	11	01740020034	01735499721	Bogra fire station
52	Most. Fatima Khatun Moyna	11	01752234010	01961254900	Bogra fire station
53	Md. Hasanujjaman	0	01721464862	01197113329	Bogra fire station
54	Md. Hazrat Ali	11	01746903018	01197035129	Bogra fire station
55	Md. Kamruzzaman	1	01753245841	01733876204	Bogra fire station
56	Rakibuzzaman	20	01752043209	01744892950	Bogra fire station
57	Md. Nakib	8	01738717805	01820883387	Bogra fire station
58	Md. Israfil Rahman	1	01728248095	01768141616	Bogra fire station
59	Md. Abdur Rahman Reko	11	01758622000	01680611944	Bogra fire station
60	Md. Alomgir Hossain	5	01739936659	01965821159	Bogra fire station
61	Md. Shiqur Rahman	20	01719203152	01715917451	Bogra fire station
62	Md. Zahidul Islam	10	01729447432	01920404440	Bogra fire station
63	Md. Mehedi Hasan	8	01920185789	01761209597	Bogra fire station
64	Md. Menhazul Islam	16	01926601489	01923888099	Bogra fire station
65	Md. Ruhul Amin Raju	13	01939547060	01753630310	Bogra fire station
66	Mst. Tania Akter Tammi	8	01739936907	01716961146	Bogra fire station
67	Mst. Akhi Khatun	8	01766183032	01775900209	Bogra fire station
68	Mst. Anju Ara	8	01745328783	01739594399	Bogra fire station
69	Afiya Anjuman	8	01711467253	01945789058	Bogra fire station
70	Md. Kamruzzaman	20	01762910142		Bogra fire station
71	Mst. Mowjia Yeasmin	20			Bogra fire station
72	Md. Atikur Rahman	20	01729839847	01920955493	Bogra fire station

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
73	Laboni Akter	5	01925447134	01768672194	Bogra fire station
74	Rakib Ahammed	15	01744517175	01724021950	Bogra fire station
75	Mst. Rumana Akter	5	01674188053	01745910244	Bogra fire station
76	Rofa Islam	5	01746903205		Bogra fire station
77	Ruma Khatun	5	01943611720	01734936533	Bogra fire station
78	Mst. Fatema Khatun	0	01714940228	01966528560	Bogra fire station
79	Mst. Perven Akther	5	01713739553	01761184719	Bogra fire station
80	Mst. Suraya Akter Sucona	5	01713739553	01761184719	Bogra fire station
81	Mst. Shilpi Begum	4	01961298075	01922109058	Bogra fire station
82	Md. Rasel Pramanik	13	01713710052	01922096111	Bogra fire station
83	Md. Sahabul Alam	20	01763469188	01942243903	Bogra fire station
84	Md. Kafil Uddin	20	01731744868	01917356373	Bogra fire station
85	Mst. Sumiya Akter	5	01821888123		Bogra fire station
86	Sharmin Akter	5	01754966899	01942064162	Bogra fire station
87	Mst. Sanjida Akter	13	01766052705	01741454783	Bogra fire station
88	Sharmin Akter	8	01729829771		Bogra fire station
89	Md. Rafiqul Islam	13	01714463147	01724106753	Bogra fire station
90	Shika Rani	5	01728324373	01728540580	Bogra fire station
91	Md. Abdur Rahman	10	01714623230	01815530519	Bogra fire station
92	Mst. Farzana Yesmin	0	01816675871	01716281554	Bogra fire station
93	Md. Abdul Khaled	8	01915708952	01732261177	Bogra fire station
94	Mst. Rahena Ratun	13	01719736544	01774158135	Bogra fire station
95	Alamgir Hossain	8	01747771866	01928649071	Bogra fire station
96	Mst. Sharmin Akter	5	01759051383	01746898528	Bogra fire station
97	Md. Sajedul Islam Saju	8	01917123453	01764992661	Bogra fire station
98	Md. Abdur Rafi	10	01710455261	01911455261	Bogra fire station
99	Md. Iqbal Ur Rahman	0	01713091448	01769112636	Bogra fire station
100	Md. Mostafizur Rahaman	0	01714083569		Bogra fire station
101	Md. Jalilur Rahman	0	0172630589	01769112650	Bogra fire station
102	Md. Khabiruz Aman	0	01716417870	01769112650	Bogra fire station
103	Md. Ajibul Islam	0	01767119707	01769112650	Bogra fire station
104	Md. shahidur rahman sohel	0	01728557386	01769112650	Bogra fire station
105	Md. rakibul islam	0	01733845568	01769112650	Bogra fire station
106	Md. Tridip Kurmar Sarkar	0	01712742745	01710906599	Bogra fire station
107	S. M Zakir Hossain	0	01712980542	01745485252	Bogra fire station
108	Md. Ali Dalim	0	01719851901	01769112650	Bogra fire station
109	Md. Towhidur Rahman	0	01733187796	01769112650	Bogra fire station
110	Md. Suruzzaman	0	01712922352	01735540235	Bogra fire station
111	Md. Ibrahim Khalil	0	01746007970	01769112650	Bogra fire station
112	Md. Abu Taher	0	01815169192	01769112650	Bogra fire station
113	Md. Nazrul Islam	0	01734342735	01553117895	Bogra fire station
114	Md. Sohal Rana	0	01556775630	01769112650	Bogra fire station
115	Md. Abdul Salam Mondal	0	01735864568	01769112650	Bogra fire station



Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
116	Md. Shafiqul Islam	0	01731198824	01769112650	Bogra fire station
117	Md. Saidur Rahman	0	01734666286	01769112650	Bogra fire station
118	Md. Masum Ali	0	01718834242	01769112194	Bogra fire station
119	Md. Kabir Hossain	0	01718601040	01769112650	Bogra fire station
120	Md. Abul Kalam	0	01556534165	01769112680	Bogra fire station
121	Md. Abu Bakker Siddique	0	01919869585	01769112648	Bogra fire station
122	Md. Rakibuzzaman	0	01197260259	01769112650	Bogra fire station
123	Md. Abdul Halim Khan	0	01710643668		Bogra fire station
124	Akman	0	01722112415	01769112650	Bogra fire station
125	Md. Atiqur Rahman	0	01718328331	01715701312	Bogra fire station
126	S. MKuddus	0	01556627190	01769112650	Bogra fire station
127	Md. Masum	0	01745396185		Bogra fire station
128	Md. Nazrul Islam	0	01729304427	01769112648	Bogra fire station
129	Md. Rawuf Sarkar	0	01749965001	01769112648	Bogra fire station
130	Md. Jahidul Islam	0	01966612635	01769112650	Bogra fire station
131	Md. Zakir Hossain	0	01712395469	01819924827	Bogra fire station
132	Md. Sarwar Hossain Munshi	0	01739137459	01769112650	Bogra fire station
133	Meron Miah	0	0174585955	01769112650	Bogra fire station
134	Md. Abdul Zabber	0	01739331605	01769112650	Bogra fire station
135	Md. Mofizul Islam	0	01754518529		Bogra fire station
136	Md. Alim Uddin	0	01813341480	01729112650	Bogra fire station
137	Md. Rokib Uddin	0	01710638941	01769112650	Bogra fire station
138	Mohammad Rubel	0	01937505687	01769112650	Bogra fire station
139	Ma. Alamgir Sarder	0	01736099610	01769112650	Bogra fire station
140	Md. Bablu Mia	0	0183807291	01769112650	Bogra fire station
141	Jashim Uddin	0	01736694346	01769112646	Bogra fire station
142	Md. Wahed Ali	0	01720156310	01769112650	Bogra fire station
143	Md. Billal Hossin	0	01721609332	01716661107	Bogra fire station
144	Md. Anisuzzaman Khokan	0	01925815174	01769112650	Bogra fire station
145	Md. Farhad Hossain	0	01963629838	01769112648	Bogra fire station
146	Md. Nurul Haider Rashed	0	01845497005	01769112648	Bogra fire station
147	Md. Abul Kashem	0	01717181297	01769112650	Bogra fire station
148	Md. Shariful Islam	0	01736089328	01769112650	Bogra fire station
149	Md. Abdul Hannan	0	01712969678	01769112650	Bogra fire station
150	Md. Zakir Hossain	0	01557358202	01769112650	Bogra fire station
151	Md. Kamal Hossain	0	01837872002	01769112650	Bogra fire station
152	Md. Alamgir Sarker	0	01741133169	017362906387	Bogra fire station
153	Md. Robiul Momen	0	01963629793	01769112650	Bogra fire station
154	Md. Maksudur Rahman	0	01966612638	01769112650	Bogra fire station
155	Md. Abdul Motin Khan	0	01724349188	01726006045	Bogra fire station
156	Md. Billal Hossain	0	01736247868	01732386830	Bogra fire station
157	Nusrat Jahan	11	01740020034	01773914997	Bogra fire station
158	Mis. Amely	11	01928324081	01196183088	Bogra fire station

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
159	Md. Tauhidul Islam	20	01725543749	01738494586	Bogra fire station
160	Md. Shahinoor Rahman	13	01740428154	01752043209	Bogra fire station
161	Mrs. Antaran	1	01773102777	01727703498	Bogra fire station
162	Md. Gousoul Azam	15	01746902075	01962109279	Bogra fire station
163	Md. Iqbal Hossain	15	01729998683	01827447789	Bogra fire station
164	Miss. Lotifa Parvin	11	01934969874	01838122117	Bogra fire station
165	Miss. Arifa Sultana	13	01754185851	01712445812	Bogra fire station
166	Md. Maksudul Haque	15	01962109436	01683138558	Bogra fire station
167	Khursed Alam	20	01732143066	01942151227	Bogra fire station
168	Md. Lemon Miah	20	01734356004	01726316729	Bogra fire station
169	Mst. Tahmina Akther	11	01726927803	01735252792	Bogra fire station
170	Md. Al Amin Hossain	20	01916951776	01747082468	Bogra fire station
171	Md. Shafayet Bin Islam	12	01718442872	01718541425	Bogra fire station
172	Md. Atiqur Rahaman	0	01717451355	01717517209	Bogra fire station
173	Md. Shahadot Hossen	14	01712678093	01735321693	Bogra fire station
174	Md. Hasanur Rahaman	12	01737336299	01912118204	Bogra fire station
175	Md. Abul Kalam	12	01745333198	01722378492	Bogra fire station
176	Md. Atikur Rahman	12	01717329398	01719777701	Bogra fire station
177	Rebeka Sultana	8	01723294275	01718788816	Bogra fire station
178	Md. Al Mahmudur Rahman	8	01737595767	01714923868	Bogra fire station
179	Md. Abdur Rouf Sarkar	1	01728359900	01912948542	Bogra fire station
180	Mst. Unjila Khatun	20	01773745836	01729812550	Bogra fire station
181	Zannatul Fardouse	15	01716389267	01721726705	Bogra fire station
182	Shahena Akter	7	01723984883	01922132128	Bogra fire station
183	Md. Ariful Islam	8	01724393183	01920027058	Bogra fire station
184	Rokaiya Islam	8	01767147925	01917652449	Bogra fire station
185	Nurun Nahar	11	01711162116	01746898219	Bogra fire station
186	Md. Mahfuzur Rahman	4	01723715951	01834709166	Bogra fire station
187	Md. sorifur Rahman	8	01722979540	01677707152	Bogra fire station
188	Mst. Jannatun Maowa	7	01749231526	01763933462	Bogra fire station
189	Mst. Saima Khatun	11	01925278410	01967434649	Bogra fire station
190	Tumpa Moni	1	01753245841	01733876204	Bogra fire station
191	Md. Zannatun Naim	12	01911434955	01734940976	Bogra fire station
192	Md. Mahbub Rahman	8	01719252908	01772942178	Bogra fire station
193	Md. Toufik Ahmed	12	01913360211	01815387785	Bogra fire station
194	Arzena khatun	5	01762987618	01759051383	Bogra fire station
195	Md. Rejaul Alam	2	01767434671	01915840903	Bogra fire station
196	Md. Rubel Rana	0	01722535131	01751156264	Bogra fire station
197	Md. Rakibul Hasan	8	01750107638	01729829771	Bogra fire station
198	Md. Nur Alam	21	01738779553	01921966451	Bogra fire station
199	Md. Ifteakhar UI Alam	12	01686569060		Bogra fire station
200	Md. Salim Ahamed	12	01928595800	1742432859	Bogra fire station
201	Md. Zaki UI Haque	11	01818477995	01719256236	Bogra fire station

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
202	Md. Faridul Khandakar	8	01737720486	01964635275	Bogra fire station
203	Md. Mahedi hasan Munna	17	01745598547	01758623520	Bogra fire station
204	Md. Zobayar Islam	6	01557421212	01557278128	Bogra fire station
205	Linkon Kumar Das	20	01751074806	01716982980	Bogra fire station
206	Sultan Mohmud	21	01738347948	01721627014	Bogra fire station
207	Tazul Islam Md. Abdul Matin	14	01714512472	01830535194	Bogra fire station
208	Fahmida Sultana	20	01913854240	01719342752	Bogra fire station
209	Maksura Akter	90	01712437191	01729369239	Bogra fire station
210	Mst. Ivey Akther	13	01757449412	01748581600	Bogra fire station
211	Alpona	12	01730615078	01736806978	Bogra fire station
212	Laila Parvin	8	01762375913	01712137316	Bogra fire station
213	Mst. Shahjadi Khatun	11	01937961135	01925450709	Bogra fire station
214	Md. Mosiur Rahman	13	01738135303	01757451292	Bogra fire station
215	Md. Julfikar Rahaman	12	01750278098	01927578200	Bogra fire station
216	Mst. Rajia Sultana	11	01196183088	01928324081	Bogra fire station
217	Md. Zulfikar Islam	8	01737445484	01713868525	Bogra fire station
218	Md. Atiqul Islam	13	01742411147	01743949900	Bogra fire station
219	Md. Al Amin Islam	20	01737560072	01737416361	Bogra fire station
220	Md. Imran Akonda	12	01911914056	01191595830	Bogra fire station
221	Md. Joynal Abedin	4	01737896612	01713868525	Bogra fire station
222	Md. Abu Bakar Siddique	4	01723394052	01912392468	Bogra fire station
223	S. M Soykot	5	01836996686	01714940228	Bogra fire station
224	Md. Morshed Alam	12	01762300295	01554096318	Bogra fire station
225	Md. Omer Faheni	20	01712466723	01724120903	Bogra fire station
226	Mst. Maksuda Parveen	11	01749303864	01199510623	Bogra fire station
227	Md. Shariful Islam Biddut	16	01713335939	01833106848	Bogra fire station
228	Md. Rakibul Islam	1	01733876204	01753245841	Bogra fire station
229	Mrs. Sultana Aktar	17	01728360341	01725340791	Bogra fire station
230	Md. Abu Tahe Shamim	14	01713727911	01724626060	Bogra fire station
231	Md Abdul Mannan	20	01749456869	01729839847	Bogra fire station
232	Md. Jewel Hossain	15	01710610682	01746499489	Bogra fire station
233	Md. Ahsan Habib	20	01723715234	01737559993	Bogra fire station
234	Rashedul Islam	15	01734175386	01739821686	Bogra fire station
235	Md. Mirazul Islam	15	01743575299	01728500775	Bogra fire station
236	Md. Nasim Alom	12	01816183771	01916800511	Bogra fire station
237	Md. Shamimul Islam	13	01751276520	01751270012	Bogra fire station
238	Md. Rabiul Islam	0	01719738812	01735633236	Bogra fire station
239	Shafinur Owahid	0	01756507907	01813740820	Bogra fire station
240	Razat Chowhan	6	01722670699	01767056715	Bogra fire station
241	Md. Palash Rahman	3	01918502938	01917064784	Bogra fire station
242	Md. Shamim Hossain	20	01733876437	01914911173	Bogra fire station
243	Md. Safiul Islam Sakib	11	01755143844	01736334939	Bogra fire station
244	Md. Sohel Rana	12	01752019688	01918048451	Bogra fire station

Sl. No	Participant Name	Ward No	Contact no.1	Contact no.2	Attached Fire Station
245	Md. Hafiz	13	01710054372	01758622225	Bogra fire station
246	Md. Manik Mia	20	01719134181	01916536085	Bogra fire station
247	Md. Entaz Hossain	20	01728463630	01916775198	Bogra fire station
248	M. A Aziz	12	01712739290	01743214740	Bogra fire station
249	Md. Shojib Sheikh	5	01714940228	01710987689	Bogra fire station
250	Md. Borhan Ali	12	01732021159	01934147796	Bogra fire station
251	Md. Sohel Rana	0	01722535131	01754158407	Bogra fire station
252	Md. Nura Ferdous	20	01725184085	01726187396	Bogra fire station
253	Md. Zohurul Islam	13	01765954436	01919844602	Bogra fire station
254	Md. Mehedi Hasan	21	01743019999	01718995889	Bogra fire station
255	Polash Chandra Sutrodhor	3	01719417058	01761383932	Bogra fire station
256	Mst. Minu Akter	8	01742075962	01737545381	Bogra fire station

**Table A-4: List of available open spaces within the Municipality to be used for immediate evacuation**

Sl.	Name of the open space	Location (Ward no.)	Area (sq. m.)	Population holding capacity (@1 sq. m./ person)	Total displaced population	Additional population that can be accommodate from surrounding areas
1	BIAM Model School & College Playground	01	3,984	3,984	5,615	17,445
3	Poura Shishu Park	03	551	551		
5	Roushan Shah Anwarul Ulum Hafizia Madrasa	05	501	501		
6	Circuit House Playground	07	3,063	3,063		
8	Shishu Park	07	993	993		
10	MS Club Playfield-1	11	3,604	3,604		
11	Fakir Uddin School & College Playground	16	3,481	3,481		
12	Momota Ideal School Playground	17	755	755		
14	Rajapur Primary School Playground	19	2,670	2,670		
15	Bogra College Playground	20	2,528	2,528		
16	Ulka Playground	21	3,600	3,600		
<b>Total</b>			<b>23,060</b>	<b>23,060</b>		

**Table A-5: The list of proposed evacuation routes that can be used for safe evacuation**

Road name	Road type	Road width (m)
Dhaka-Bogra Highway	Pucca	11 - 20
Aziz Ahmed Taki Road	Pucca	6 - 19
Modhuban Road	Pucca	6 - 10
Rajshahi-Bogra Highway	Pucca	6 - 12
Road 501	Pucca	6 - 9
Matidail Banani Ester Bypass	Pucca	7 - 11
Bogra Second Bypass	Pucca	8 - 10
Station Road	Pucca	6 - 10
Rangpur Road	Pucca	12 - 20
Carmichael Road	Pucca	6 - 11
Bogra Paschim Bypass	Pucca	11 - 14
Gohail Road	Pucca	6 - 9
College Road	Pucca	17 - 18
Upsohor Road	Pucca	6 - 20
Shantahar Road	Pucca	7 - 9

Table A-6: List of major hospitals/clinics within Bogra Municipality and their capacities

Sl. No.	Name of Hospital	Location	Capacity						Availability of Contingency Plan	Emergency contact number
			No. of Beds	Doctors	Nurses	Paramedics Staff	Other Staff	Other Available Facilities		
1	Mother and Child welfare center	Rahman Nagar,Bogra	20	2	6	0	13	OT, Ambulance, Generator	No	051-65876, 01711-869682
2	Mohammad Ali Hospital	Thontonia, Bogra Sadar	250	73	164	0	124	OT-6, X-ray, Pathological lab, Generator, Blood bank	No	01730-324830
3	Sharmin Clinic	Natai para, Bogra	20	4	6	0	22	OT, Generator, X-ray, Pathological lab	No	051- 51324, 01711- 890555
4	Maleka Nursing home and Diagnostic Center	Sherpur Road,Bogra	25	12	18	3	48	OT-2, X-ray, Generator, Pathological lab	No	051-78370 01718-881897
5	Sandhani General Hospital and Diagnostic Center.	Jaleswaritola, Bogra	10	3	7	3	12	OT, Generator, Pathological Lab)	No	01719-423070 01710-849724
6	Al Amin Chikitsa Kendra	Sherpur Road.Bogra	10	4	6	1	13	OT, X-ray, Generator, Pathological Lab	No	01711-186865
7	Asha Health Care Nursing General Hospital.	Sherpur Road, Bogra	20	3	5	1	8	OT-1, X-ray, Generator. Pathological Lab	No	01759-083330 01712-051935
8	Rakhi Diagnostic and Clinic	Tetultala ,Bogra	10	2	6	2	7	OT, X-ray, Generator, Pathological Lab	No	01738-991133
9	Desh Hospital and Diagnostic Complex	Tetultala, Bogra	10	3	3	2	10	OT, X-ray, Generator, Pathological Lab	No	01718-788598
10	Sristy General Hospital and Diagnostic Center	Sherpur Road, Bogra	10	2	4	0	14	OT, Generator, Pathological Lab	No	051-61535 01915-486504
11	Suversa Clinic	Kandugari, Bogra	10	3	4	2	12	OT, Generator	No	051-78484 01718-809988
12	Ma O Shisu Hospital and Diagnostic Center	Sherpur Road, Bogra	10	3	3	2	5	OT, Generator, Pathological Lab	No	01721-115775
13	United General Hospital and Diagnostic	Sherpur Road Colony, Bogra	20	3	9	0	40	OT, X-ray, Generator. Pathological Lab	No	051-65420 01775-444344 01775-444343

Sl. No.	Name of Hospital	Location	Capacity						Availability of Contingency Plan	Emergency contact number
			No. of Beds	Doctors	Nurses	Paramedics Staff	Other Staff	Other Available Facilities		
14	Saccha Sheba Hospital	Korotoa Colony, Bogra	10	2	4	1	9	OT, Pathological Lab, Generator	No	01724-553057
15	Saik General Hospital/Saik Digital Diag. Lab	Thonthonia, Bogra	45	10	32	13	120	OT-2, X-ray, Generator, Pathological Lab	No	051-63760 01936-005870 01936-005871
16	Bogra General Hospital Pvt.Ltd	Thonthonia, Bogra	13	2	3	0	7	OT, Generator	No	01716-514858
17	Rowshan Diagnostic and Clinic	Thonthonia, Bogra	10	3	6	3	18	OT, Generator, Pathological Lab	No	01723-055903
18	TB Hospital	Upasohor, Bogra	20	2	6	1	6		No	051-67177
19	Doctors Plus	Namaz Ghar	30	7	14	1	34	OT-2, Generator	No	051-66444 01744-828282
20	Nazma General Hospital	Khandar, Bogra	10	3	7	1	6	OT, Generator, Pathological Lab	No	01717-051393
22	Ma Clinic	Khandar, Bogra	10	3	5	2	11	OT, Generator	No	01712-034633
23	Life Care Hospital	Khandar, Bogra	10	2	6	0	12	OT, Generator, Pathological Lab, X-ray	No	051-60619 01712-770023 01822-887173
24	Sirajam Munira Clinic	Khandar, Bogra	10	3	6	0	12	OT, Generator Pathological Lab	No	01711-416124
25	Brac Clinic	Khandar Bazar, Bogra	10	3	4	1	13	OT, Pathological Lab, Generator	No	01729-070057 01718-892312
26	Khandar Clinic	Khandar, Bogra	10	2	3	0	10	OT, Generator, X-rays, Pathological Lab	No	01713-712372 01761-341377
27	Nazma Medimate Nursing Home	Boral Road, Bogra	10	2	6	0	15	Generator	No	051-60072 01712-685757
28	Islami Hospital and Diagnostic Center	Sherpur Road, Bogra	20	6	12	2	34	OT-2, X-ray, Generator, Pathological Lab	No	01915-485275
29	Modern Nursing Home.	Sutrapur, Bogra	10	2	4	2	5	OT, Generator	No	01712-247112
30	Akota General Hospital	P.T.I More, Bogra	10	2	4	2	12	OT, Generator,	No	01748-934558

Sl. No.	Name of Hospital	Location	Capacity						Availability of Contingency Plan	Emergency contact number
			No. of Beds	Doctors	Nurses	Paramedics Staff	Other Staff	Other Available Facilities		
								Pathological Lab		
31	Shanto Poly Clinic.	Thonthonia, Bogra	10	3	6	0	8	OT, Generator	No	051-51790 01711-123947
32	GSA Model Clinic	Thonthonia, Bogra	10	2	6	1	8	OT, Generator	No	051-78653 01718-220536
33	Doctors Clinic and Diagnostic Center	Sherpur road, Bogra	20	9	36	3	100	OT-3, X-ray, Pathological Lab, Generator	No	051-66224 01716-106796
34	Grameen GC Eye Hospital	Banani, Bogra	50	5	35	30	35	OT-4, Pathological Lab, Generator	No	051-78525 01721-757604
35	NewAnupam Hospital.	Thonthonia, Bogra	10	3	3	0	8	OT, Generator, Pathological Lab	No	01771-376751
36	Padma Clinic and Diagnostic Center	Sherpur Road, Bogra	10	3	6	0	15	OT, Generator, Pathological Lab	No	051-64412 01768-984817
37	Shamsun Nahar Clinic	Sherpur Road, Bogra	40	15	25	15	80	OT-4, Generator	No	051-64860 01751-893546
38	Bogra Diabetic Hospital.	Nowabbari Road, Bogra	30	7	15	0	175	OT-2, X-ray, Generator, Pathological Lab	No	051-63591
39	Shapla Clinic.	BCIC Area, Bogra	20	3	4	2	6	OT-, Generator	No	051-73763 01711-310922 01716-288282
40	Adarsha Madokashakti Niramoy Kendra	Godar para, Bogra	10	2	0	2	2	Generator	No	051-69433 01711-465143
41	Doctors Diagnostic and Clinic Center Ltd.	Mofiz Paglar more, Bogra	20	4	18	2	80	OT-2, X-ray, Generator, Pathological Lab	No	051-61074 01711-890501
42	Nazma General Hospital and Diagnostic Center	Gohail Road, Bogra	20	6	12	0	22	OT, Generator, Pathological Lab	No	01717-051393



Sl. No.	Name of Hospital	Location	Capacity						Availability of Contingency Plan	Emergency contact number
			No. of Beds	Doctors	Nurses	Paramedics Staff	Other Staff	Other Available Facilities		
43	Sabina General Hospital and Diagnostic Center.	Dakskhin Thonthonia, Bogra	20	6	12	1	44	OT, Generator, Pathological Lab	No	051-69261 01712-260591
44	Sonali General Hospital	Colony Bazar, Bogra	10	3	6	0	12	OT, Generator	No	051-60274 01711-451825

**Table A-7: List of proposed shelter sites and their capacities**

Sl.	Name of the open spaces	Location	Area (sq. m.)	Population holding capacity (@45 sq. m./ family)	Total Surplus (families can be accommodate from surrounding areas)
1	Altafunnesa Playground	Ward No-07	10,778	240	Total families requiring temporary shelter are: 585  So, the surplus is $2,897 - 585 = 2,312$
2	Ansar-VDP Training Center Playground	Ward No-11	5,574	124	
3	Bogra Police Line Pared Ground	Ward No-12	16,992	378	
4	Bogra Zila School Playground	Ward No-07	8,205	182	
5	Coronation Institute School & College Playground	Ward No-03	8,151	181	
6	Deaf and Dumb School Playground	Ward No-10	9,287	206	
7	GBB Playground	Ward No-08	7,403	165	
8	Hazrat Ommar Faruk(R)Islami Academy School Playground	Ward No-01	5,242	116	
9	Manik Chalk High School Playground	Ward No-19	5,024	112	
10	Mohammad Ali Public Museum & Park	Ward No-07	5,553	123	
11	MS Club Playfield	Ward No-11	8,321	185	
12	Shah Sultan Govt. College Playground	Ward No-12	7,857	175	
13	Shakpala C & B Park	Ward No-14	26,138	581	
14	Vocational Training Center Playground	Ward No-04	5,849	130	
<b>Total</b>			<b>130,374</b>	<b>2,897</b>	<b>2,312</b>

**Table A-8: Food requirements in different shelter camps**

Name of shelter sites	Population holding capacity	Tentative Daily Food Requirement (most common food items) in Metric Tons				Tentative Monthly Food Requirement (most common food items) in Metric Tons			
		Wheat Flour (@100gms)	Rice (@250gms)	Lentils (@150ms)	Vegetable Oil (@35gms)	Wheat Flour	Rice	Lentils	Vegetable Oil
Altafunnesa Playground	1152	0.13	0.29	0.17	0.04	3.80	8.64	5.18	1.21
Ansar-VDP Training Center Playground	595	0.07	0.15	0.09	0.02	1.96	4.46	2.68	0.62
Bogra Police Line Pared Ground	1814	0.20	0.45	0.27	0.06	5.99	13.61	8.16	1.91
Bogra Zila School Playground	874	0.10	0.22	0.13	0.03	2.88	6.55	3.93	0.92
Coronation Institute School & College Playground	869	0.10	0.22	0.13	0.03	2.87	6.52	3.91	0.91
Deaf and Dumb School Playground	989	0.11	0.25	0.15	0.03	3.26	7.42	4.45	1.04
GBB Playground	792	0.09	0.20	0.12	0.03	2.61	5.94	3.56	0.83
Hazrat Ommor Faruk(R)Islami Academy School Playground	557	0.06	0.14	0.08	0.02	1.84	4.18	2.51	0.58
Manik Chalk High School Playground	538	0.06	0.13	0.08	0.02	1.77	4.03	2.42	0.56
Mohammad Ali Public Museum & Park	590	0.06	0.15	0.09	0.02	1.95	4.43	2.66	0.62
MS Club Playfield	888	0.10	0.22	0.13	0.03	2.93	6.66	4.00	0.93
Shah Sultan Govt. College Playground	840	0.09	0.21	0.13	0.03	2.77	6.30	3.78	0.88
Shakpala C & B Park	2789	0.31	0.70	0.42	0.10	9.20	20.92	12.55	2.93
Vocational Training Center Playground	624	0.07	0.16	0.09	0.02	2.06	4.68	2.81	0.66
<b>Total</b>	<b>13,910</b>	<b>1.53</b>	<b>3.48</b>	<b>2.09</b>	<b>0.49</b>	<b>45.90</b>	<b>104.33</b>	<b>62.60</b>	<b>14.61</b>

**Table A-9: Water and toilet requirements in different shelter camps**

Name of Shelter Sites	Population holding capacity	Water Requirement in the Shelter Camp in Cubic Meters (@15 Lt. per capita per day)		No. of Toilets (max 20 person per toilet)
		Daily	For 3 days	
Altafunnesa Playground	1152	17.28	51.84	58
Ansar-VDP Training Center Playground	595	8.93	26.78	30
Bogra Police Line Pared Ground	1814	27.21	81.63	91
Bogra Zila School Playground	874	13.11	39.33	44
Coronation Institute School & College Playground	869	13.04	39.11	43
Deaf and Dumb School Playground	989	14.84	44.51	49
GBB Playground	792	11.88	35.64	40
Hazrat Ommor Faruk(R)Islami Academy School Playground	557	8.36	25.07	28
Manik Chalk High School Playground	538	8.07	24.21	27
Mohammad Ali Public Museum & Park	590	8.85	26.55	30
MS Club Playfield	888	13.32	39.96	44
Shah Sultan Govt. College Playground	840	12.60	37.80	42
Shakpala C & B Park	2789	41.84	125.51	139
Vocational Training Center Playground	624	9.36	28.08	31
<b>Total</b>	<b>13910</b>	<b>208.65</b>	<b>625.95</b>	<b>696</b>

## Annex-B: Earthquake Hazard and Risk Maps

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**Map B-1: Possible concrete building damage map due to scenario-2 earthquake**

**Map B-2: Possible masonry building damage map due to scenario-2 earthquake**

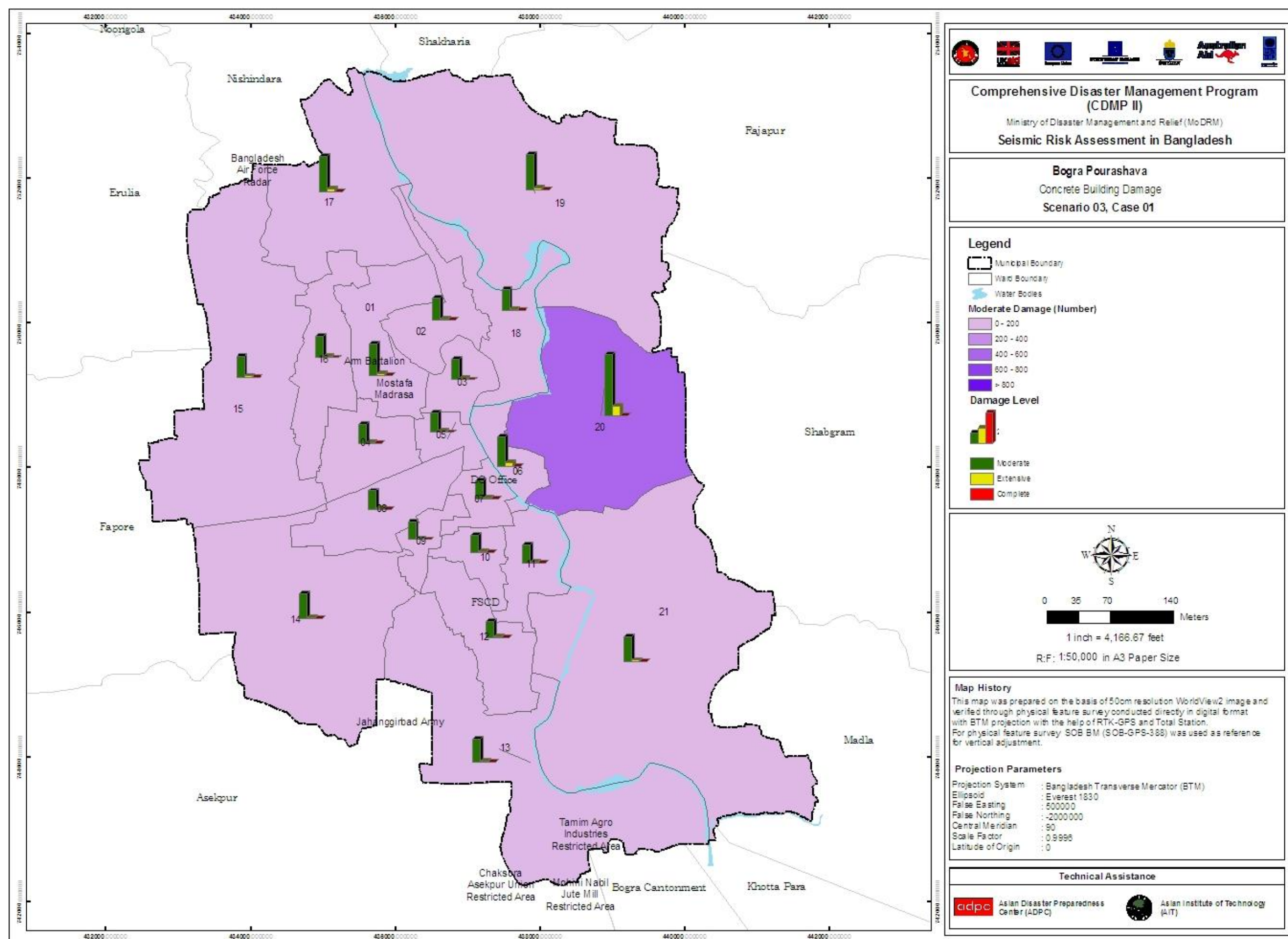
**Map B-3: Probability of functionality of education facilities at day-1 due to scenario-2 earthquake**

**Map B-4: Probability of functionality of health facilities at day-1 due to scenario-2 earthquake**

**Map B-5: Probability of functionality of critical facilities at day-1 due to scenario-2 earthquake**

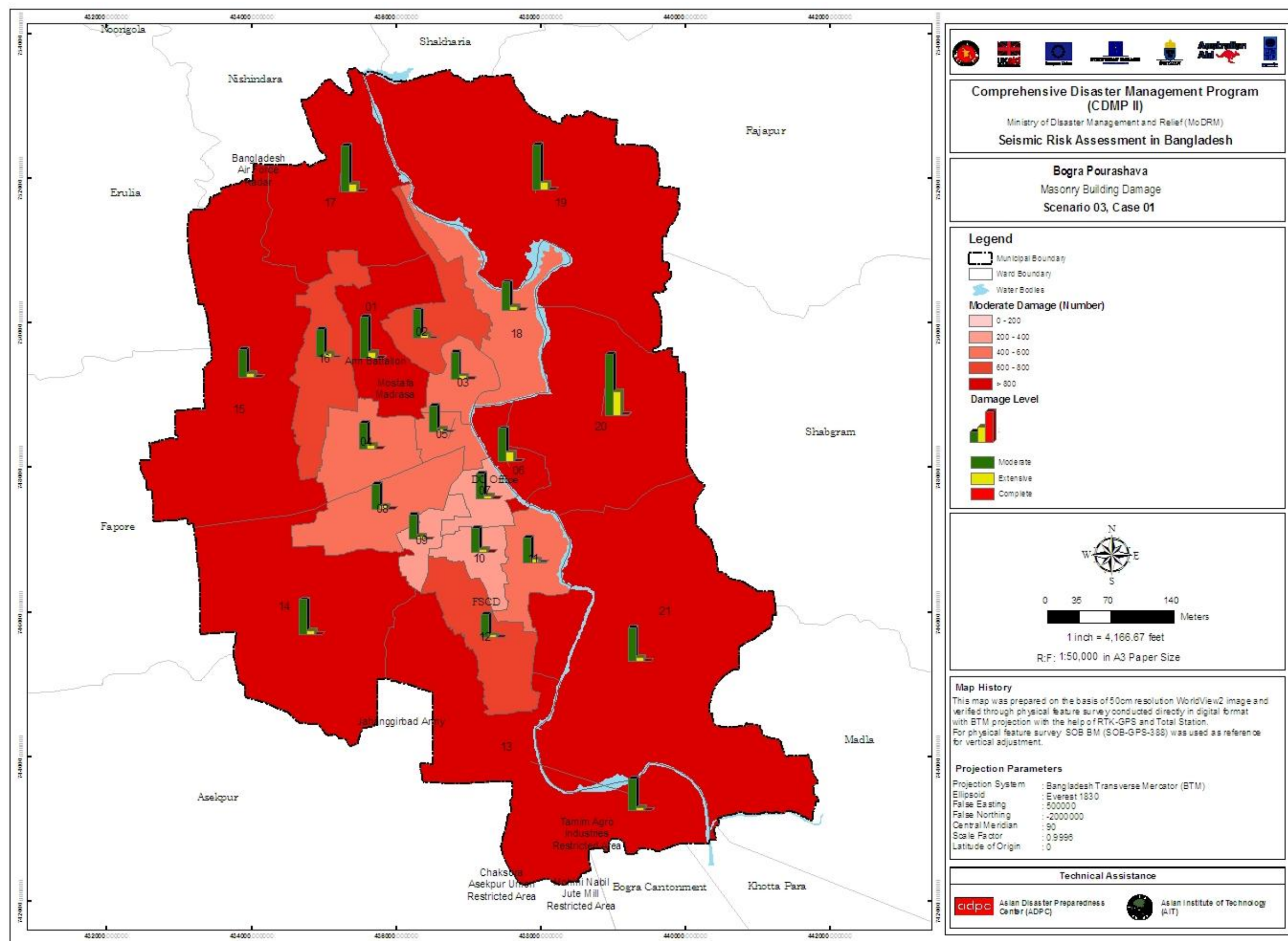
**Map B-6: Probability of functionality of road network at day-1 due to scenario-2 earthquake**

**Map B-7: Probability of functionality of transportation facilities at day-1 due to scenario-2 earthquake**

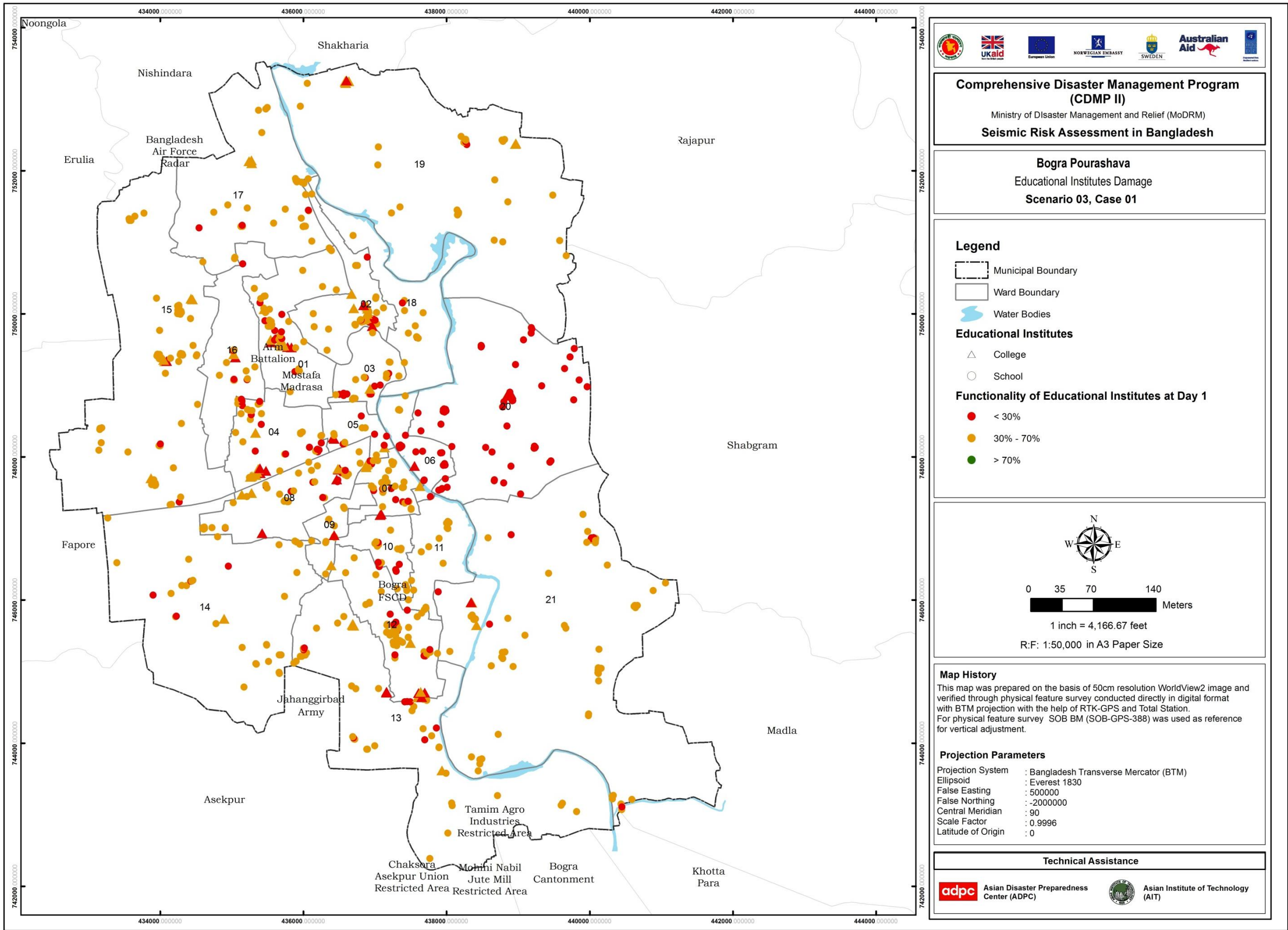


Map B-1: Possible concrete building damage map due to scenario-2 earthquake



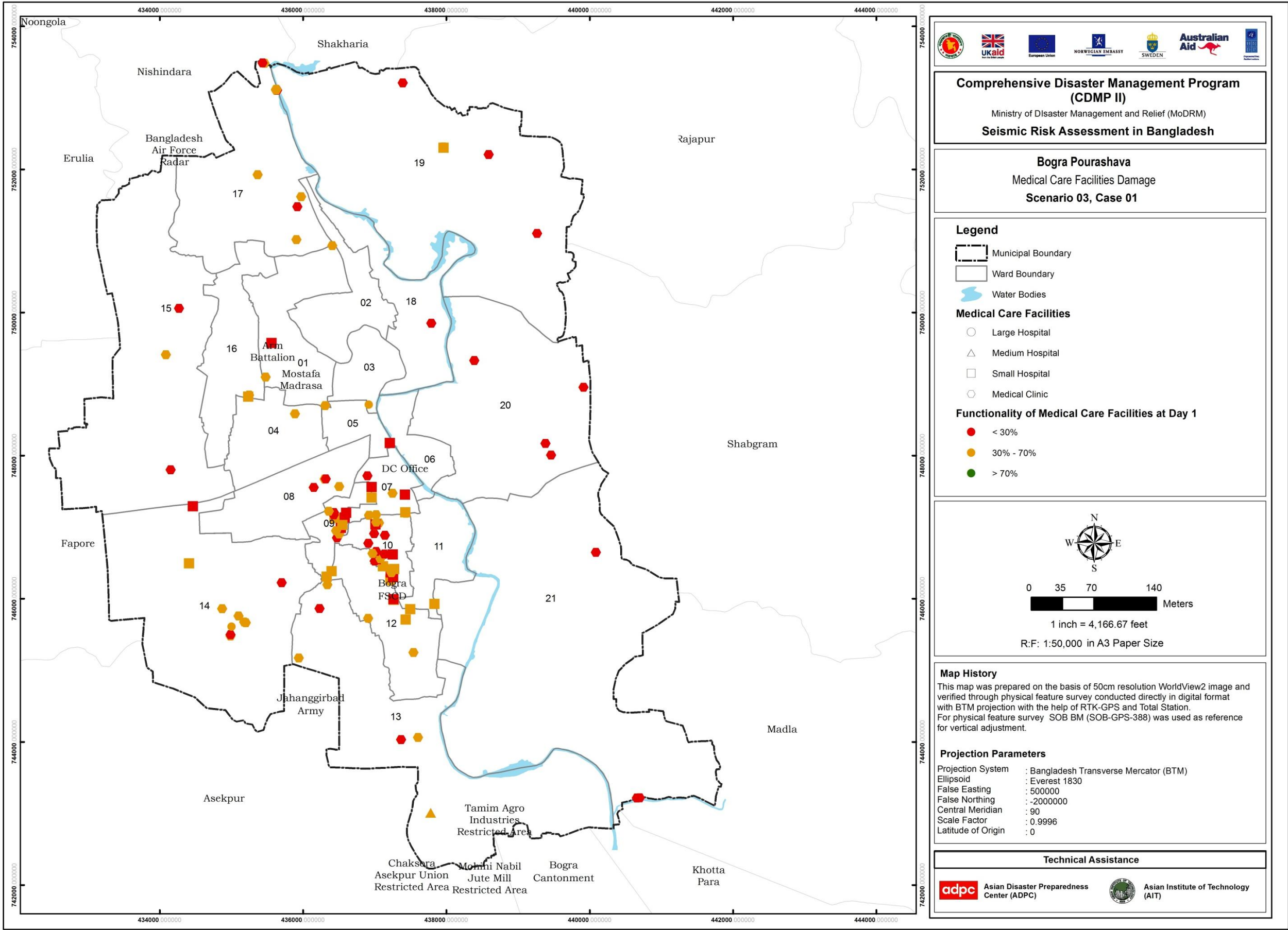


Map B-2: Possible masonry building damage map due to scenario-2 earthquake

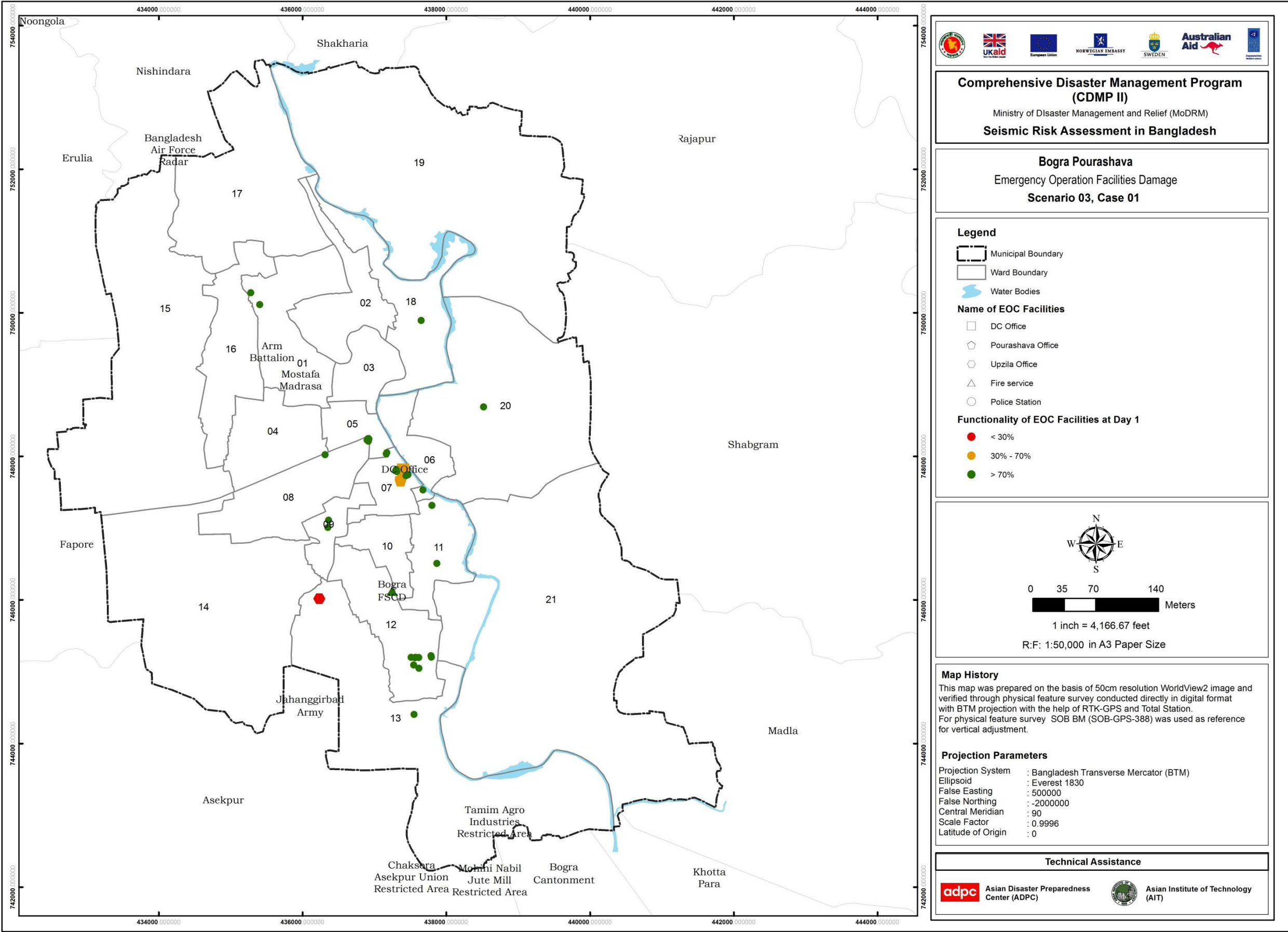


Map B-3: Probability of functionality of education facilities at day-1 due to scenario-2 earthquake

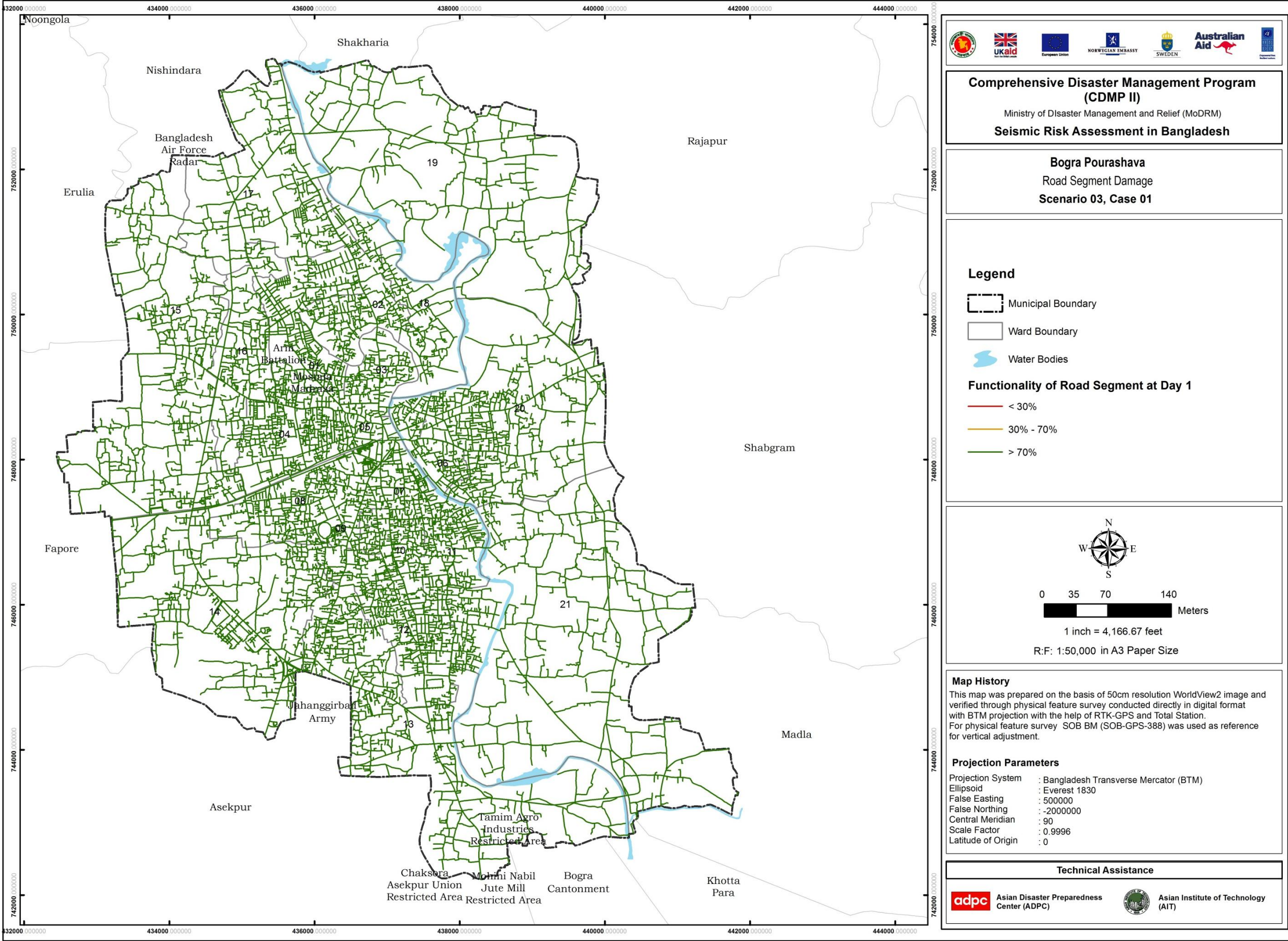




Map B-4: Probability of functionality of health facilities at day-1 due to scenario-2 earthquake

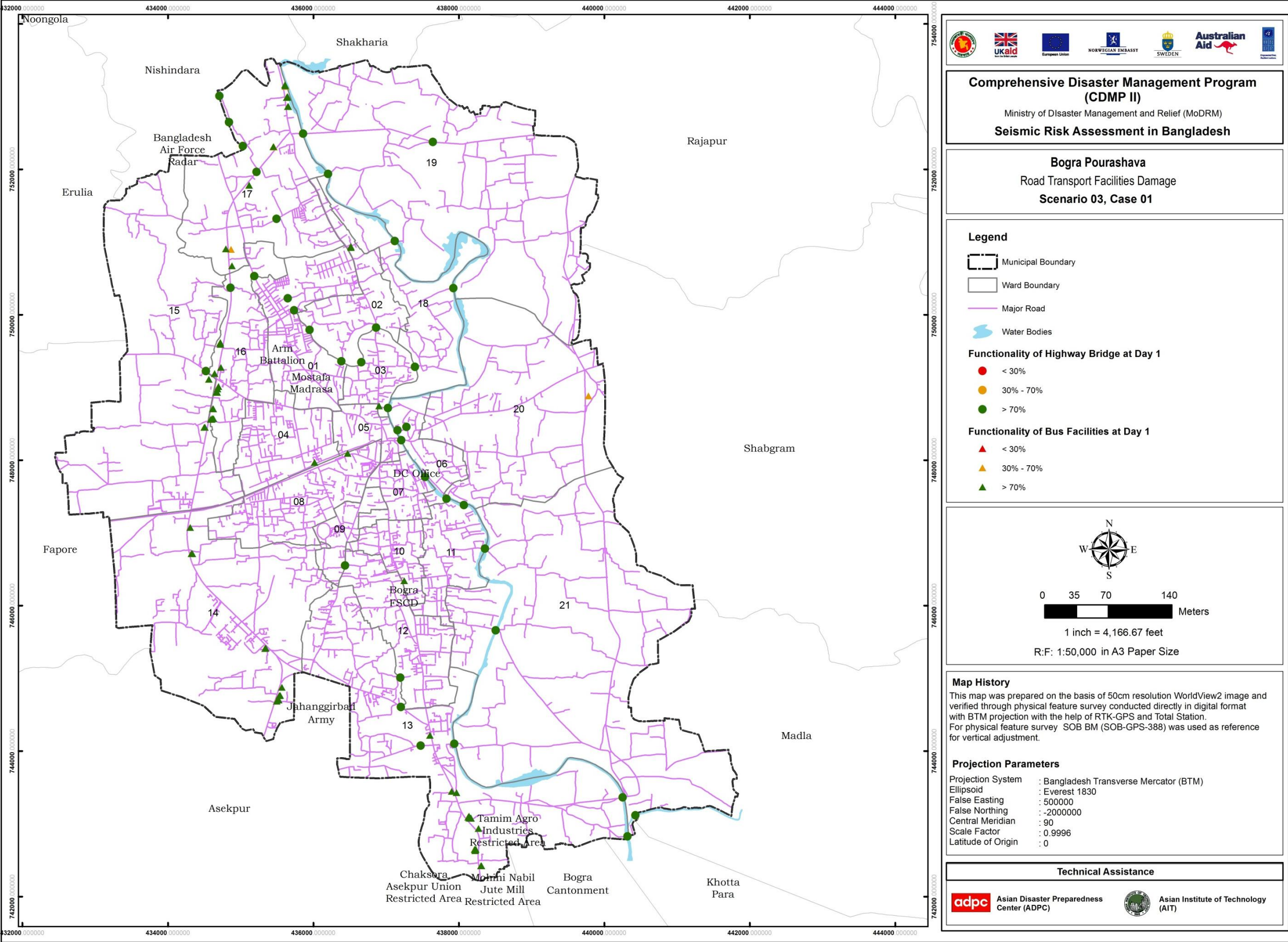






Map B-6: Probability of functionality of road network at day-1 due to scenario-2 earthquake





Map B-7: Probability of functionality of transportation facilities at day-1 due to scenario-2 earthquake

## Annex-C: Contingency Planning Maps

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**Map C-1: Location of key emergency agencies in Bogra Town**

**Map C-2: Location of proposed immediate evacuation spaces**

**Map C-3 Proposed evacuation routes**

**Map C-4: Location of water supply sources**

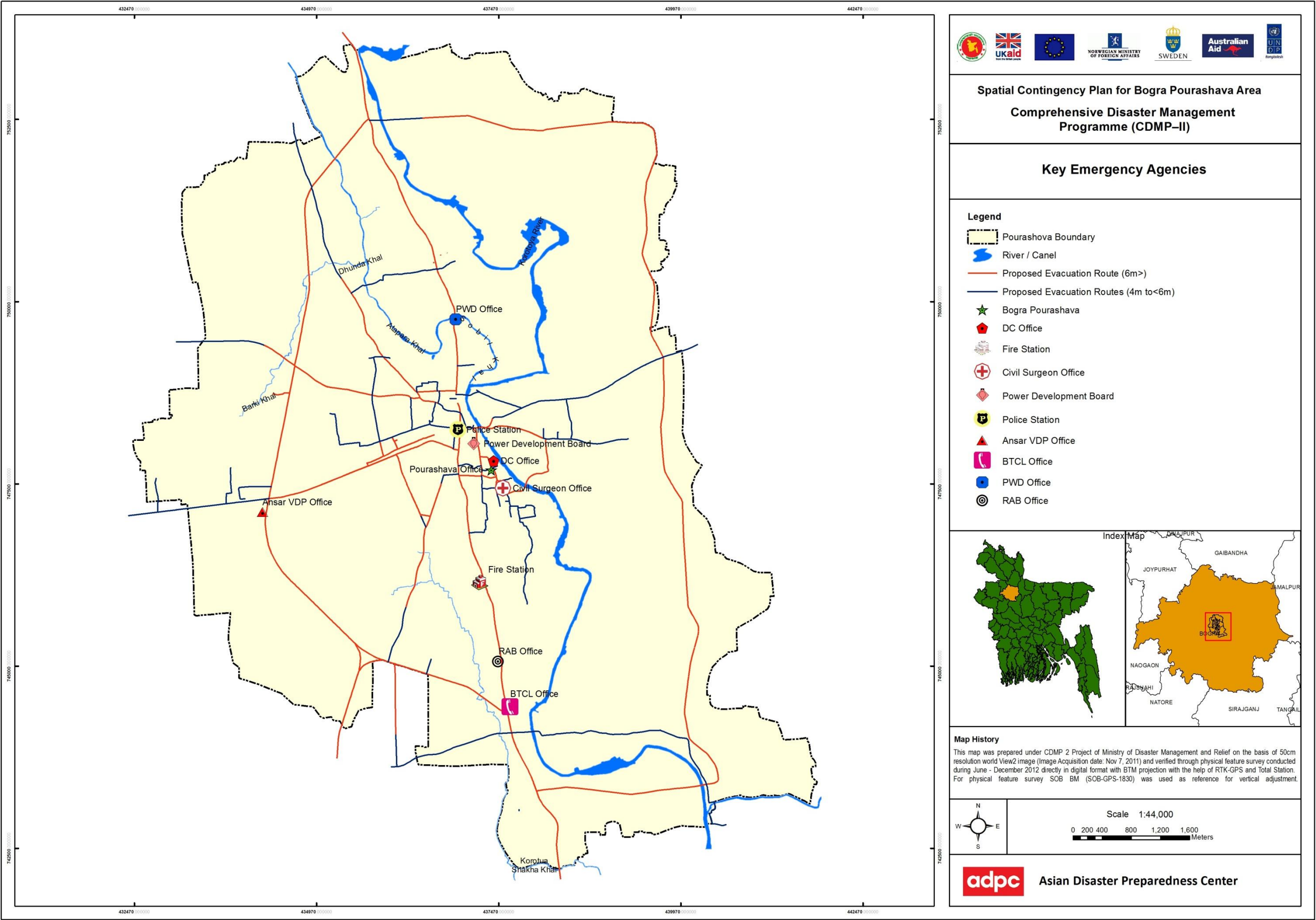
**Map C-5: Location of major hospitals and clinics**

**Map C-6: Location of proposed shelter sites (open spaces)**

**Map C-7: Locations of educational and communal buildings available**

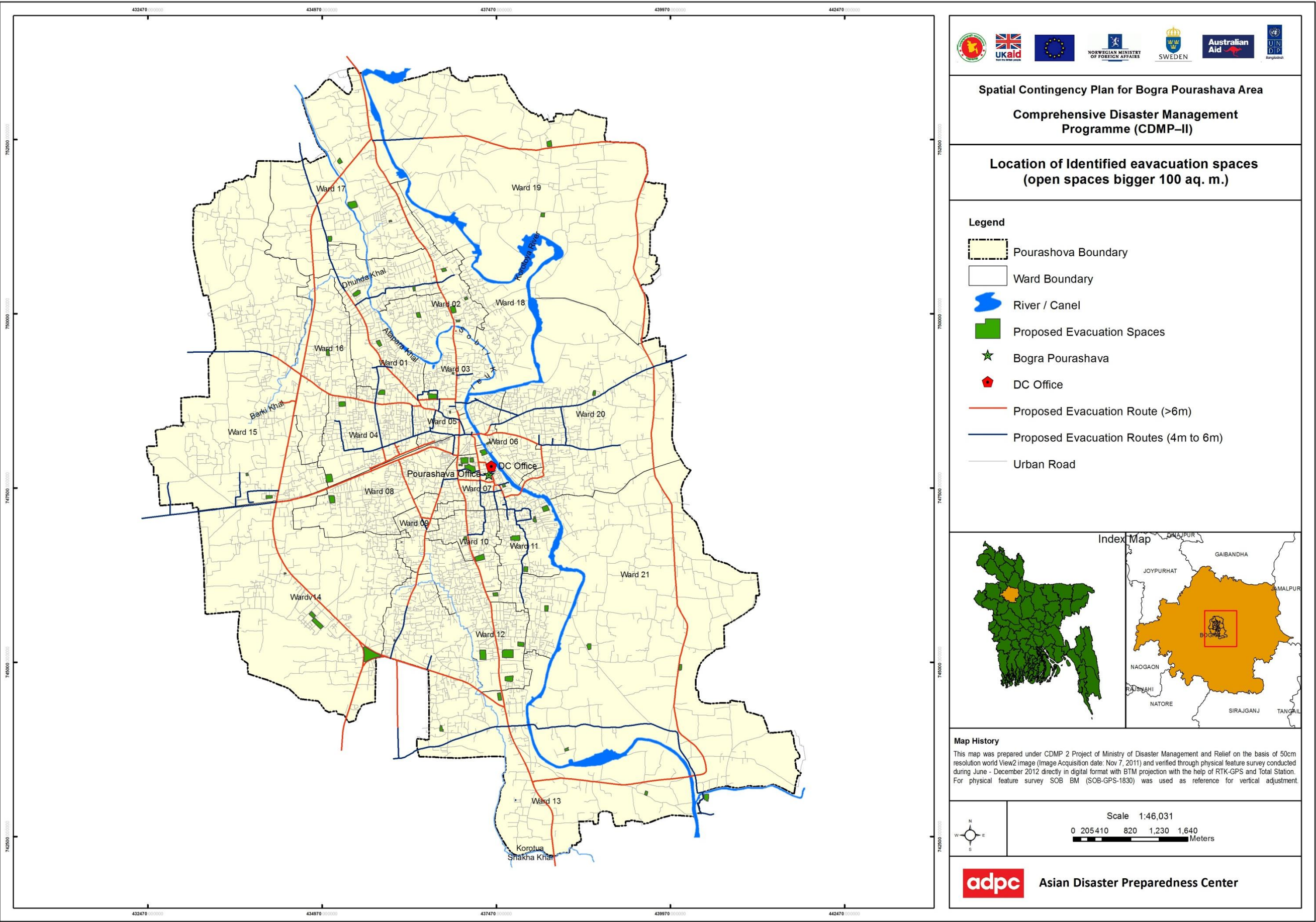
**Map C-8: Location of fuel re-filling stations**





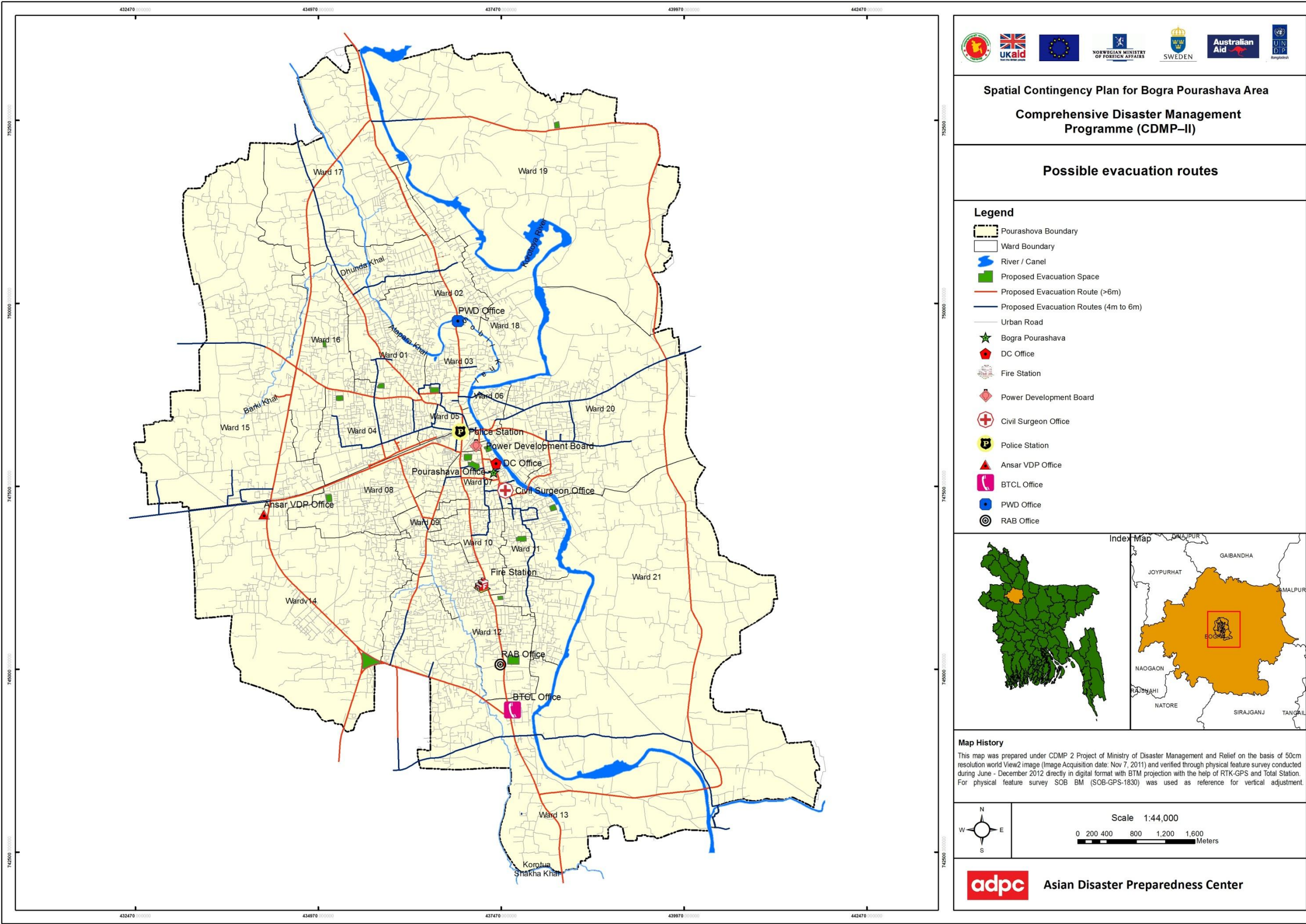
Map C-1: Location of key emergency agencies in Bogra City





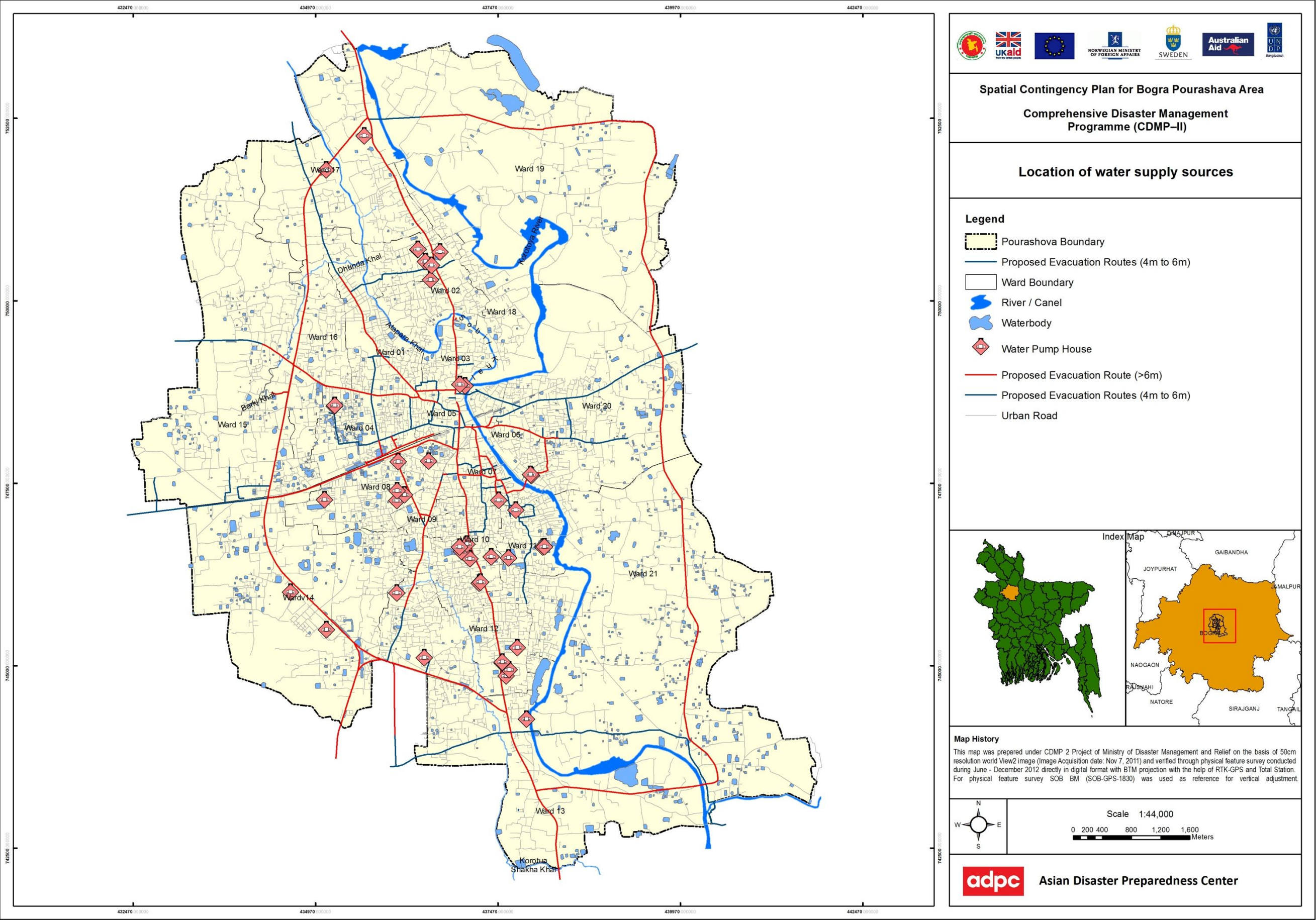
Map C-2: Location of proposed immediate evacuation spaces





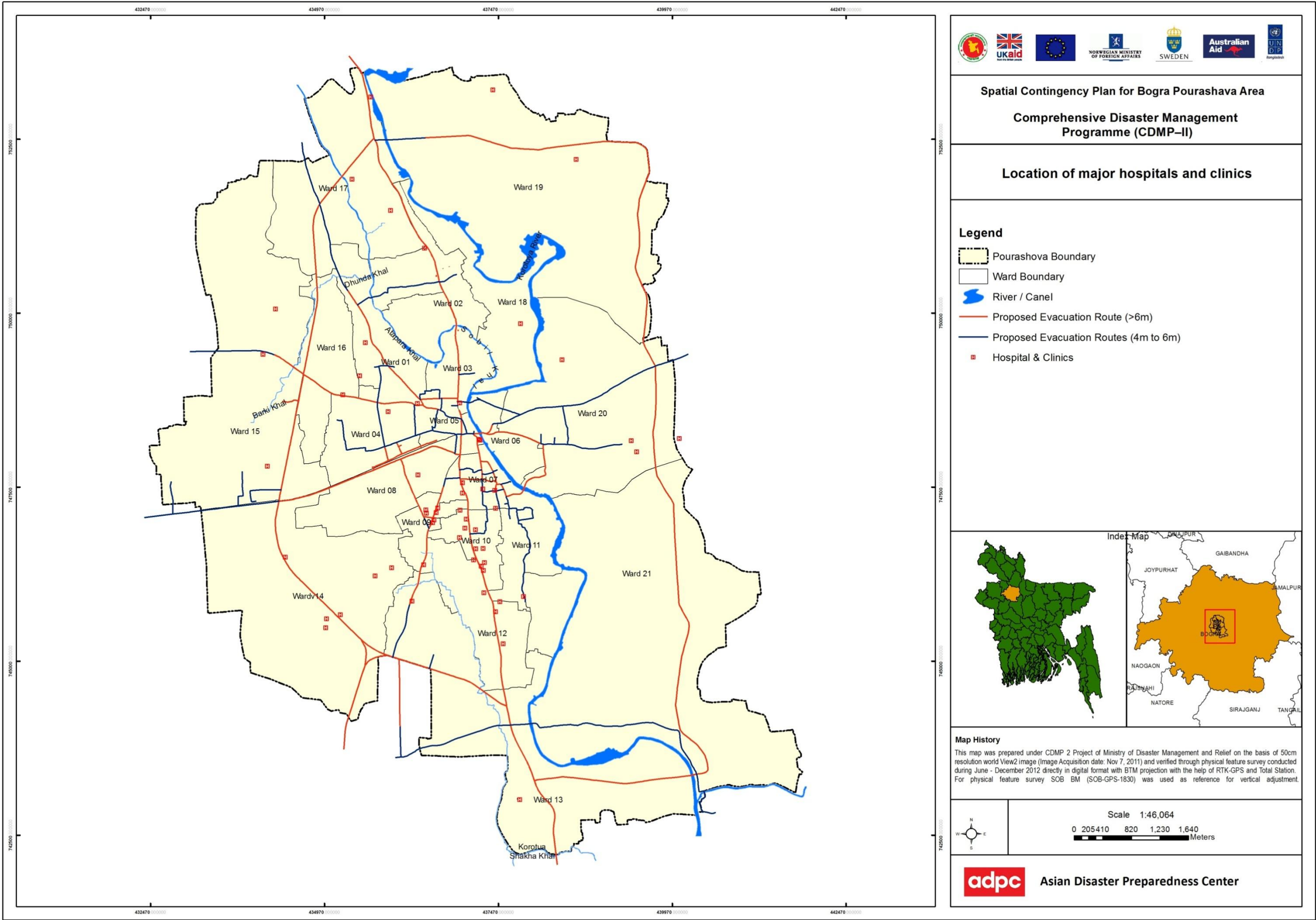
Map C-3 Proposed evacuation routes



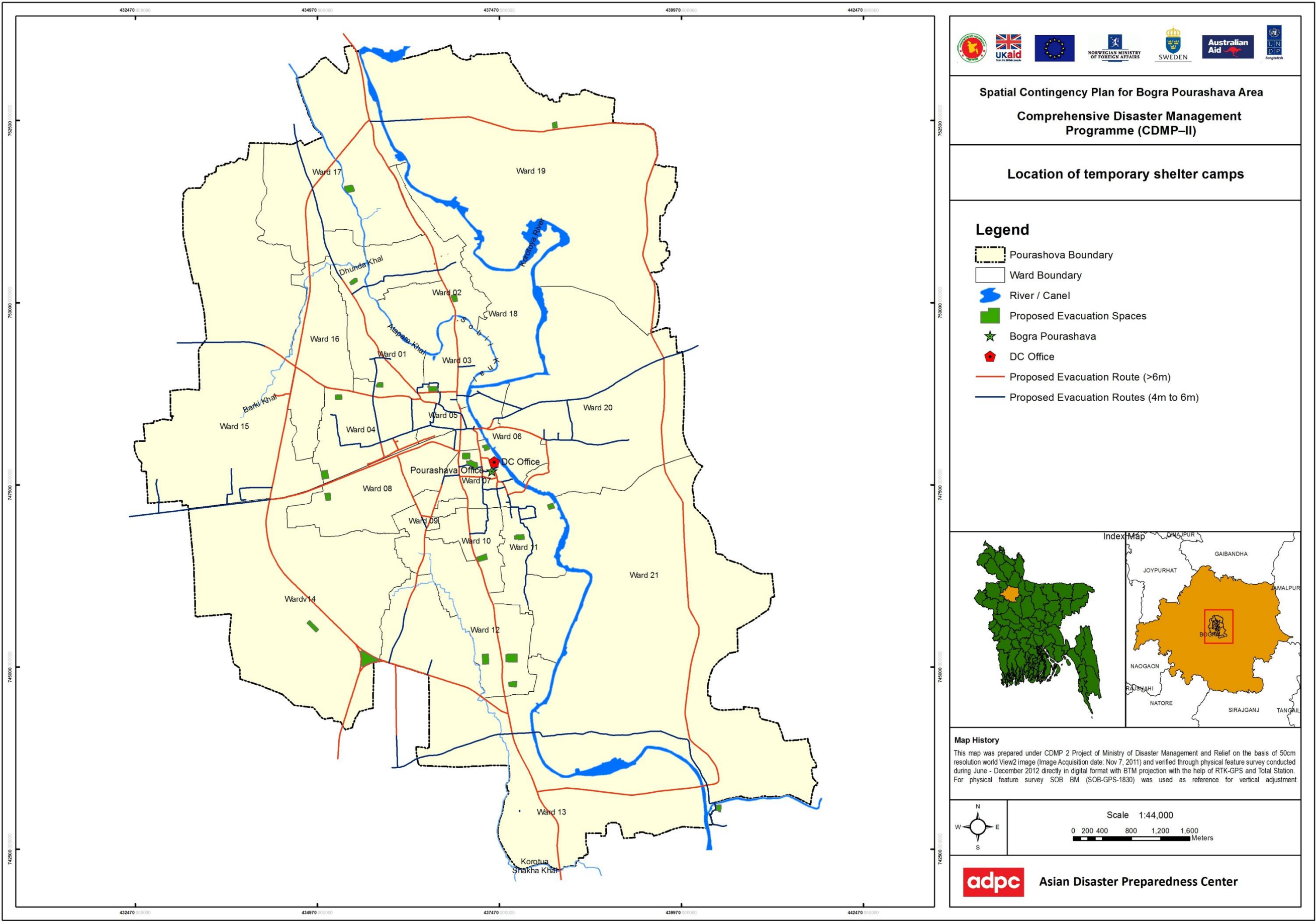


Map C-4: Location of water supply sources



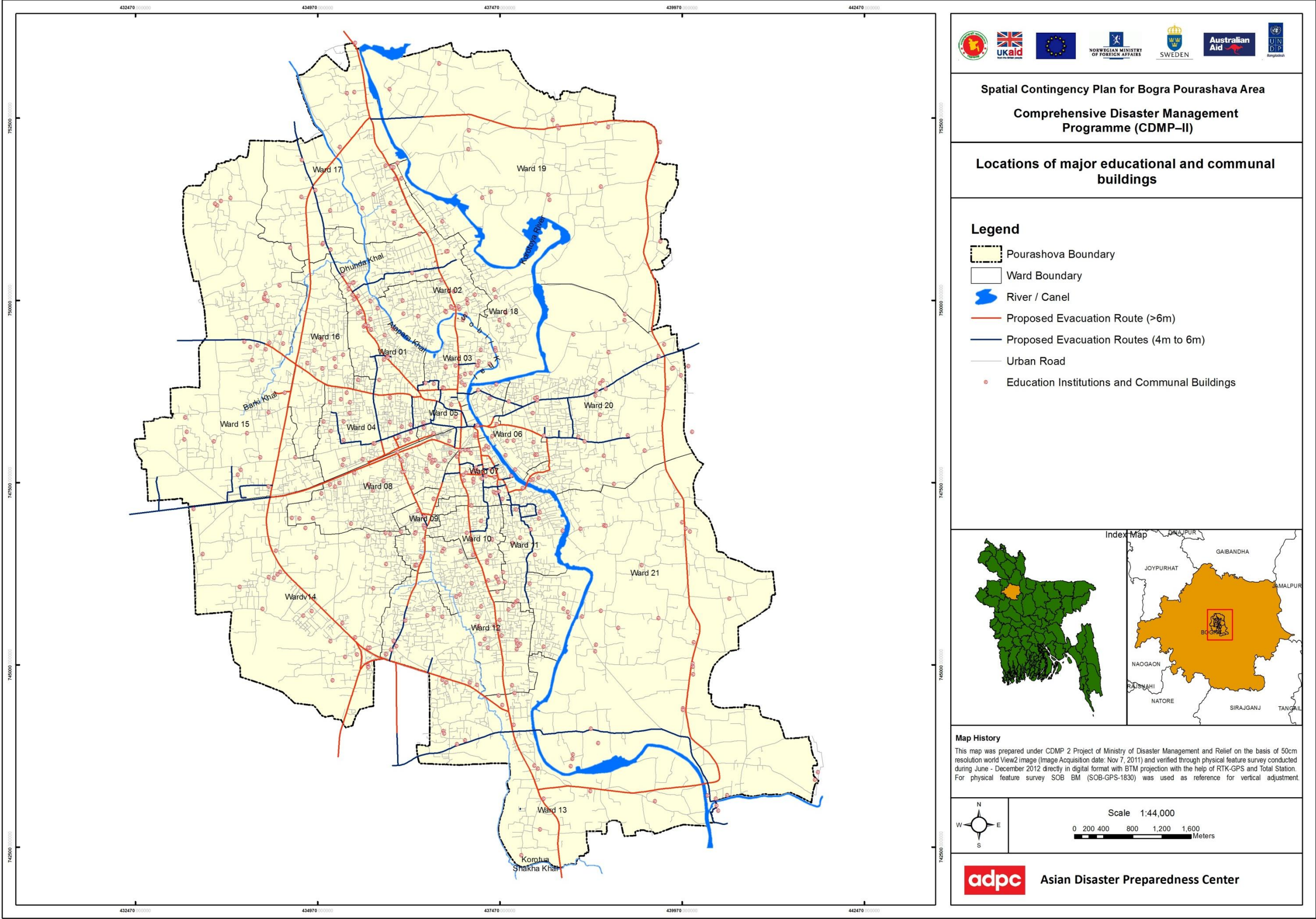


Map C-5: Location of major hospitals and clinics



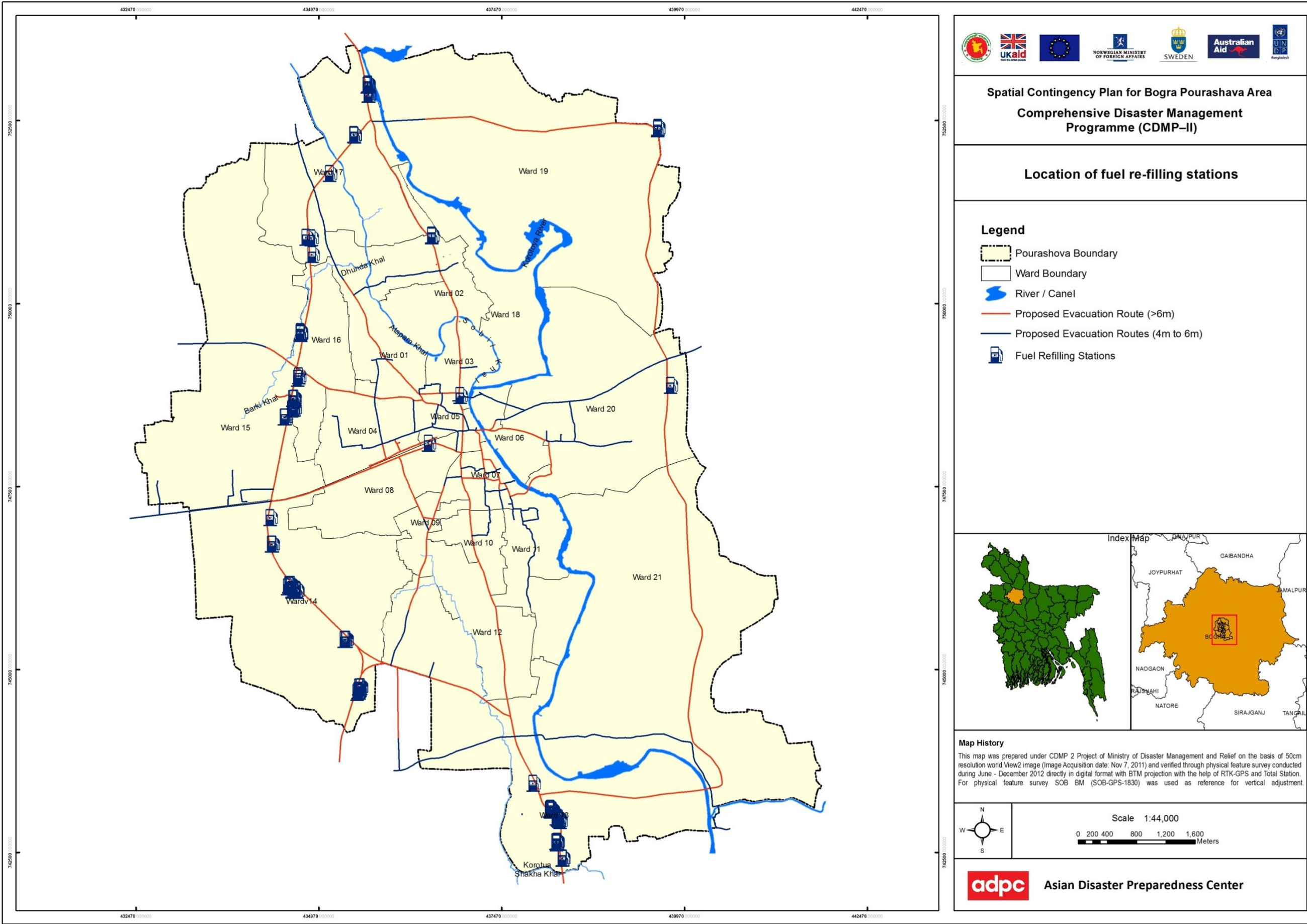
Map C-6: Location of proposed shelter sites (open spaces)





Map C-7: Locations of educational and communal buildings available





Map C-8: Location of fuel re-filling stations



## Comprehensive Disaster Management Programme (CDMP II)

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

Technical Assistance



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