CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

RFP II.2: Inventory and cataloging of geological data sources, types and availability

Report on

Development of final geological data catalog considering earthquake data

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Appendix A: List of geological maps and data layers

Annex A: Hardcopy geological data catalog/Atlas

Acronyms

BADC	Bangladesh Agricultural Development Corporation
BBA	Bangladesh Bridge Authority
BBS	Bangladesh Bureau of Statistics
BIWTA	Bangladesh Inland Water Transport Authority
BMD	Bangladesh Meteorological Department
BTM	Bangladesh Transverse Mercator
BUET	Bangladesh University of Engineering and Technology
BUTM	Bangladesh Universal Transverse Mercator
BWDB	Bangladesh Water Development Board
CDA	Chittagong Development Authority
CDMP	Comprehensive Disaster Management Programme
CEGIS	Center for Environmental and Geographic Information Services
CHT	Chittagong Hill Tracts
DGPS	Differential Global Positioning System
DLG	Digital line graph standard format
DMIC	Data Management Information Center
DU	University of Dhaka
EC	European Commission
GIS	Geographic Information System
GoB	Government of Bangladesh
GPS	Global Positioning System
GSB	Geological Survey of Bangladesh
KDA	Khulna Development Authority
LGED	Local Government Engineering Department
MoFDM	Ministry of Food and Disaster Management
NGO	Non Governmental Organization
NWRD	National Water Resources Database
RDA	Rajshahi Development Authority
RFP	Request for Proposal
RU	Rajshahi University
SoB	Survey of Bangladesh
ToR	Terms of Reference
UNDP	United Nations Development Programme
USGS	United States Geological Survey
WARPO	Water Resources Planning Organization
WASA	Water Supply and Sewerage Authority
WGS	World Geodetic System

Executive Summary

The Ministry of Food and Disaster Management (MoFDM) is implementing a programme called the Comprehensive Disaster Management Programme (CDMP) with support from the United Nations Development Programme (UNDP), UK Department for International Development - Bangladesh (DFID-B) and the European Commission (EC). CDMP has been designed to strengthen the Bangladesh disaster management system and, more specifically, to achieve a paradigm shift from reactive response to a proactive risk reduction culture.

CDMP has adopted a holistic approach, embracing processes of hazard identification and mitigation, community preparedness and integrated response efforts, where relief and recovery activities are planned within an all-risk management framework. CDMP aims to raise the capacities of communities at-risk and to lower their vulnerability to specific hazards through executing different programmes under a well-defined framework.

Under the CDMP framework, there are several components, Component 4a-Earthquake and Tsunami Preparedness being an important one. Different activities (sub projects) have also been initiated under component 4a, one of which is the "Geological data inventory and cataloging of geological data" project. The major activities carried out under this project are (i) data collection and organization of collected data (ii) conversion of soft and hardcopy data into a standard GIS format, and (iii) capturing, processing of data and database development, (iv) data quality checking, (v) development of a geological data catalog software, (vii) deployment of the data catalog software to CDMP, and (viii) documentation.

This report describes the activities of **development of final geological data catalog considering earthquake data** for the sub-package II.2 entitled "Geological Data Inventory".

The developed **geological data catalog** could be incorporated into DMIC of CDMP for efficient disaster management planning activities. The different types of geological and relevant data presented in the catalog/atlas could be used by planners and decision makers for disaster risk reduction and management. The web-enabled GIS-based geological data catalog software developed under this project would also be very helpful for geologists, disaster managers and planners in disaster management and risk reduction planning activities. The data collected under other projects of CDMP could be uploaded into the developed software to enhance the geological and geo-hazard related database of CDMP for national benefit.

Other relevant organizations especially GSB, University of Dhaka, BUET, Rajshahi University, RDA, KDA, KCC, DCC, and RAJUK could contribute a lot in the developed geological data catalog through providing data or metadata to CDMP for geo-hazard assessment for the benefit of Bangladesh Furthermore, the GIS-based data layers that have been prepared could be used by different organizations for emergency disaster planning activities during disaster related emergencies.

Chapter 1

Introduction

1.1 Project Background

The Ministry of Food and Disaster Management (MoFDM) is implementing a programme called the Comprehensive Disaster Management Programme (CDMP) with support from the United Nations Development Programme (UNDP), UK Department for International Development - Bangladesh (DFID-B) and the European Commission (EC). CDMP has been designed to strengthen the Bangladesh disaster management system and, more specifically, to achieve a paradigm shift from reactive response to a proactive risk reduction culture.

CDMP has adopted a holistic approach, embracing processes of hazard identification and mitigation, community preparedness and integrated response efforts, where relief and recovery activities are planned within an all-risk management framework. CDMP aims to raise the capacities of communities at-risk and to lower their vulnerability to specific hazards through executing different programmes under a well-defined framework.

Under the CDMP framework, there are several components, Component 4a-Earthquake and Tsunami Preparedness being an important one. Different activities (sub projects) have also been initiated under component 4a, one of which is the "Geological data inventory and cataloging of geological data" project. The project has been accomplished through different major activities such as (i) need assessment of geological data, (ii) identification of data sources, types and availability, (iii) collection and reporting of soft and hardcopy geological data (iv) conversion of hard and softcopy geological data into standard format, (iv) development of interim geological data catalog in hardcopy and digital format and (v) development of final geological data catalog taking into consideration earthquake data

It can be mentioned that this report describes the activities of **development of interim geological data catalog in hardcopy and digital format** for the sub-package II.2 entitled "Geological Data Inventory".

1.2 Objective of this activity

The overall aim of this activity was to develop a hardcopy and digital geological data catalog to enrich and strengthen the DMIC database for facilitating geo-hazard assessment for disaster management. It can be mentioned that the developed catalog will be stored in the DMIC server of CDMP for enabling users to conduct different geo-hazard assessments and for management and planning of risk reduction activities. The specific objectives of this activity were:

- 1) to prepare a well organized geological database to be stored in DMIC
- 2) to prepare an interim hardcopy and digital geological data catalog
- 3) to develop a web-enabled and GIS-based geological data catalog software
- 4) to prepare a technical report on interim geological data catalog

1.3 Outputs and Deliverables

According to the Terms of Reference (ToR) provided by CDMP the outputs and deliverables of the activity consist of a technical report, an atlas and a geological database. The specified deliverables of this activity are:

- A report describing the activities of geological data catalog development
- Atlas/geological data catalog
- A geological database focusing on earthquake and other geo-hazards

1.4 Structure of this report

This report mainly focuses on the development of a geological data catalog in hardcopy and digital format. Chapter 1 of the report contains the introduction and background. The overall methodology of this assignment is described in Chapter 2 and Chapter 3 deals with the geological data catalog software development for disaster management. The conclusions and recommendations are presented in Chapter 4.

Chapter 2

Development of data catalog considering earthquake data

2.1 Introduction

A geological data catalog is a kind of central data repository that contains well-organized thematic information. Such a repository or catalog of geological data, therefore, carries substantial benefits for planners, decision makers, disaster managers and the broader research community. The geological data catalog will also foster collaborative research and encourage the use and analysis of data for different types of geo-hazard assessments, disaster management and planning activities. CDMP has the mission to facilitate dissemination and sharing of geological and geo-hazard related information among government and non-governmental organizations for disaster risk reduction and management for the greater benefit of the country. This GIS based geological catalog has been developed using data collected from different relevant organizations. The catalog containing both hard and softcopy geological data has been prepared for better understanding of geological data and maps for disaster management and planning activities. Furthermore, a web-enabled and GIS-based geological data catalog software has been developed which will be useful for geologists, geo-scientist, natural resources planners and decision makers for efficiently and effectively implementing their disaster risk reduction and management activities.

2.2 Methodology

A systematic process and approaches have been followed to develop the geological data catalog. The major activities carried out under this project were (i) data collection and organization of collected data (ii) conversion of soft and hardcopy data into a standard GIS format, and (iii) capturing, processing of data and database development, (iv) data quality checking, (v) development of interim geological data catalog, (vi) development of final geological catalog considering the earthquake data (vii) development of geological data catalog software, (viii) deployment of data catalog software to CDMP, and (ix) documentation. For better understanding the methodology, a simple flow diagram is presented in Figure 2.2.1 and a brief description of the different steps of the methodology is given below:



Figure 2.2.1: Flow diagram of the methodology

2.2.1 Data collection and organization of collected data

Geological and relevant data were collected from different organizations through questionnaire surveys. It is to be mentioned that two questionnaire surveys were carried out, one under the project "Assess state of information systems and facilitate geo-hazard information sharing among the GoB and NGO GIS platforms" for GIS data compatibility assessment and the other under the project "Inventory and cataloging of geological data" for assessing the availability of geological and geo-hazard related data. The data collected from different organizations (e.g. GSB, DU, RU, BUET,

LGED, BWDB, WARPO and others) were systematically organized and categorized into different groups. The major data groups were Borehole, Earthquake, Geology, Hazard, Landuse, Morphology, Soil, etc. The sample list of data layers with their respective groups is presented in Table 2.2.1. Detail list of geological data layers those have been used in geological data preparation are presented in **Appendix** –**A**.

Data group	Name of data set				
Borehole	Borehole locations maintained by BWDB/BADC/GSB/BUET etc				
Borehole	Depth-wise lithology of borehole of Holocene sediments in Gulshan lake, Dhaka				
Borehole	Geotechnical/subsoil investigation data for different bridges				
Earthquake	Earthquake epicenters in and around Bangladesh				
Earthquake	Earthquake map of BMD from 1918-1984				
Earthquake	Possible earthquake induced liquefaction hazard map of Dhaka city				
Earthquake	Seismic zones of Bangladesh developed by the Bangladesh National Building				
	Code, 1993				
Flood	Area affected by 1998 flood in Dhaka city				
Flood	Flood affected area in Bangladesh since 1953				
Flood	Flooded areas - April 1991 cyclone				
Geology	Engineering geological map of Dhaka city (Source: WASA, 1991)				
Geology	Faults and tectonic contacts of Bangladesh				
Geology	Generalized neotectonic setting of the GBM delta				
Geology	Major tectonic elements of the Bengal Basin				
Geology	Regional Bouguer anomaly map of Pirganj and adjoining area, Rangpur				
Geology	Regional geologic and tectonic setting of the Barind area, Bengal Basin				
Geology	Structural map of Chittagong and CHT, 1979				
Geology	Surface fault map				
Geology	Surface geology map of Bangladesh				
Geology	Tectonic map of Bangladesh and overpressure zone				
Hazard	Expansive soil hazard map of Dhaka city				
Hazard	Foundation failure hazard map of Dhaka city				
Hazard	Possible subsidence hazard map of Dhaka city				
Landuse	Current landuse map of Keraniganj upazila, Dhaka				
Morphological	Morphogeological map of Tanore and Mohanpur upazilas				
Other	Khulna Development Authority landuse map				
Other	Landforms of Dhaka city (Source: modified after WASA, 1991)				
Other	Mineral resources map of Keraniganj upazila, Dhaka				
Other	Storm water drainage and flood control master plan				
Physiographic	Generalized physiographic map of Bangladesh				
Soil	Generalized soil data of southwest region				

 Table 2.2.1: Sample data layers under different data groups

2.2.2 Conversion of hard and softcopy data into standard GIS format

Conversion of geological data into standard GIS format was one of the major and important activities of the project. It is to be mentioned that both the hard and softcopy data were collected under this project for developing the geological data catalog. The hardcopy data were scanned to convert them

into digital format. The scanned data were then geo-referenced using the standard procedure of ArcGIS.

Both the geo-referenced scanned maps and collected digital data were converted into standard GIS format and kept in the BTM projection system as major organizations are using that system. Moreover, those data were also converted into the BUTM projection system, as BUTM with WGS84 datum has been recommended as the standard and common projection system for Bangladesh under the project "Assess the state of information systems and facilitate geo-hazard information sharing among GoB and NGO GIS platforms". It can be mentioned that all GIS software (especially ArcGIS) has the option to transform different data layers from one projection system to another. The conversion of hard and softcopy data into standard GIS format has been described in detail in the report "Conversion of geological data into standard formats" that has been submitted to CDMP.

2.2.3 *Capturing, processing and database development*

After digital conversion and projection of geological data, data capturing activities were carried out to prepare GIS data layers on geological data. The data were captured through the on-screen digitization process in the ArcGIS platform. After capturing and digitization, the necessary correction and editing were performed. The necessary attributes (district, upazila or union name etc.) were then incorporated into the softcopy of GIS data by using the spatial join process of the ArcGIS system. The BBS geocode database was considered as the standard for the attribute data. Finally, a well-organized and GIS-based geological database was developed for CDMP. The report " Conversion of geological data into standard formats" that has been submitted to CDMP contains the details about the capturing, processing of data and database development.

2.2.4 Quality checking of data

For the production of quality GIS data it is essential to maintain a quality control process during data capturing and data preparation. Therefore, quality control was executed at every step of GIS data based geological preparation. The quality control of data was done in different ways such as, (i) through manual validation by visual checking, (ii) using DGPS corrected satellite images, (iii) using NWRD databases, (iv) using mouza database of CEGIS etc. and (v) through GPS survey.

Manual data verification: This is one of the more accurate and comparatively authentic procedures for data quality checking, which verifies accuracy and completeness of a spatial database. The manual data verification procedures followed under this project included (i) checking the quality of hardcopy maps, (ii) visual checking of data in the computer through zooming at different scales, (iii) creating check plots, and (iv) field checks and measurements. To minimize operator errors, GIS Analysts, GIS Specialists and other senior project professionals were also involved in checking the quality of GIS data during data capturing activities.

Using DGPS corrected satellite images: CEGIS has DGPS corrected 6-meter resolution IRS images for the whole of Bangladesh from 2000 and onward. These images were used for quality checking of some data layers. Furthermore, CEGIS has also 1-meter resolution IKONOS and 0.65 meter QuickBird images for some specific areas. These high-resolution images were also used for quality checking of some data layers (Figure 2.2.2). Furthermore, geo-referenced scanned maps were also compared with those available DGPS corrected images to obtain accurate data.



Figure 2.2.2: Sample of quality checking

Using the NWRD database: CEGIS has developed a National Water Resources Database (NWRD) for the Water Resources Planning Organization (WARPO). The database consists of more than 400 data layers. It includes data on administrative boundary, river and waterbodies, roads, environmental and natural disaster data, groundwater and surface water data, lithological data layers etc. Some of these data were updated using DGPS corrected IRS images. Data on administrative boundaries, rivers and lithological data were used to check the quality and completeness of the developed geological data under this project. Furthermore, non-spatial attribute data were also checked using the BBS geocode database, which is stored in NWRD.

GPS survey: A Global Positioning System (GPS) is also used in the field to determine exact locations. A GPS is a highly accurate technology that uses earth-orbiting satellites to determine geographic locations. GPS is used to check the positional accuracy of different spatial data such as borelog location, well location, infrastructure location etc. Under this project borelog and lithological data were collected from different organizations. However, it is very difficult to check the quality (including positional accuracy) of these borelog data due to the lack of quality documentation. Therefore, a sample GPS survey was conducted to check the positional accuracy of some of the borelog data provided by private housing companies.

2.2.5 Development of interim geological data catalog

For efficient disaster management, especially geo-hazard assessment, a well-organized geological data catalog is essential. After developing the GIS based geological database a well-organized interim geological data catalog /atlas was prepared using this database. A brief description of the each of the datasets on lineages, purposes, sources of data, projection system and tabular information etc, are presented in the catalog. The different thematic and informative maps are presented in the draft catalog/atlas that has been delivered to CDMP for their comments. The catalog contains maps on surface and subsurface geology, engineering geology, faults, generalized tectonic, Bouguer anomaly, earthquake risk zones, cyclone risk, possible land subsistence, possible foundation failure hazard, subsoil investigations (borehole with lithology), earthquake induced liquefaction hazard, urban development plan (including structural plan) and city drainage etc. Furthermore, the catalog also contains a list of geological and geo-hazard related reports, journals, thesis and articles.

2.2.6 Development of final geological data catalo considering earthquake data

After getting the feedback the final geological data catalog has been developed in consultation with CDMP. It is to be mentioned that the final catalog has been developed taking into consideration of the earthquake related data developed for CDMP. The catalog contains the maps is almost same as the interim catalog but emphasis has been given on earthquake related data. Some sample maps of catalog have been presented in Figure 2.2.3 to Figure 2.2.5. The different thematic and informative maps, list of earthquake related journal, report, thesis and articles are presented in the Atlas/hardcopy catalog (**Annex-A**).







Figure 2.2.4: Borehole locations with lithological information



Figure 2.2.5: Isoseismic lines of major earthquakes in and around Bangladesh

2.2.7 Development of Geological Data Catalog Software

For effective geo-hazard and disaster management planning activities in Bangladesh and to facilitate dissemination and exchange of proper information among planners, disaster managers and decision makers, a GIS-based web-enabled geological catalog system has been developed under this project. The web-based system has been developed with the aim that all relevant users (GOs and NGOs) could have access to the system through the Internet or intranet based on their access authorization. The system has been developed using open source software development tools to reduce the cost and licensing obligations. The user interfaces, input/output formats have been designed and developed in consultation with CDMP. The higher-level steps to develop the system included: System design, Database design, Interface design and System development.

The software framework development task included conceptualization of software framework and identification of software elements and users. The identified major elements of the software were (i) data explorer, (ii) knowledge base, (iii) map browser, (iv) scanned documents, (v) digital catalog, (vi) other links and (vii) search options etc. It has been identified that the major users of this software would be: ministries, DMB, CDMP, Geological Survey of Bangladesh (GSB), universities, NGOs and other relevant organizations. The major tasks accomplished for the software development are (i) review of existing available catalog framework, (ii) software framework development, (iii) software development of draft version of the catalog software to CDMP for feedback and (iv) development of final version of the software. A detailed description of the software development is given in Chapter 3. A brief description of the different interfaces of the developed software is given below:

Review of existing catalog framework

The different geological data catalogs available in international organizations such as USGS, British Geological Survey (BGS), and European Organization etc. have been reviewed to develop the geological data catalog for Bangladesh. The interfaces of those geological data catalogs are presented in the different figures below:



Figure 2.2.6: Geological Data Catalog of US Geological Survey



Figure 2.2.7: Geological Data Viewer of US Geological Survey

British Geological Survey	
	Home Contacts Enquiries Help & Information Site Map Downloads Search BGS
About BGS	Search the BGS Digital Data Catalogue
 What's New Products & Shopping 	To list the contents of the catalogue by dataset, please select a topic:
 Publications catalogue Bookshop online GeoReports online 	Geohazard Data Products Go
 Historical OS maps online Digital data catalogue Digital mans 	Alternatively, please type in all, or part, of one keyword.
 Borehole ordering GeoSure 	Go
 Geochemical atlases Licensing BGS data BGS Science 	
 BGS Science BGS Services 	Back to the Digital Data Catalogue Home Page
Information & Data	
 Popular Geology and Education 	
Search BGS	
Hosted Sites	
 Most visited pages 	

Figure 2.2.8: Geological Data Catalog of British Geological Survey



Figure 2.2.9: European Geological Data Catalog

Software framework development

The geological data catalog software is crucial for the management of geological and geo-hazard related databases. The developed software will help disaster managers, geologists and planners in effective disaster management and planning activities. The framework of the software was designed through consultation with CDMP and relevant stakeholders.

The developed draft software is a web-based dynamic software having facilities to explore data, predefined maps, relevant reports and journals, and for printing maps, document etc. The software has different important features such as The identified major elements of the software were (i) data explorer, (ii) knowledge base, (iii) map browser, (iv) scanned documents, (v) digital catalog, (vi) other links and (vii) search options etc. A detailed description of the software features is given in Chapter 3.

Software (draft version) development and deployment

The draft version of the software has been developed in ASP.Net and an open source GIS (postGRE SQL) server has been used for compatibility with the DMIC database of CDMP. The draft version of the software will be deployed in the DMIC server to get feedback for further update. A consultation workshop will be organized to get feedback on the draft version of the software.

Final software development and deployment

After getting feedback from CDMP and the consultation workshop, necessary modifications will be made and the final version of the software will be developed and deployed in CDMP.

2.2.8 Deployment of Geological Data Catalog Software to CDMP

The draft version of the developed software has been deployed in CDMP for their comments and suggestions. The software will be updated based on the comments and suggestions and the final catalog will be deployed in the CDMP server.

2.2.9 Documentation

A comprehensive technical report has been prepared mentioning the data catalog development methodology, software development, conclusions and recommendations. A well-defined user manual of the data catalog software has also been developed to run the software smoothly.

Chapter 3 Geological Data Catalog Software Development

3.1 Introduction

A well-organized and user-friendly geological data catalog could play a vital role in disaster management planning and risk reduction activities. With the developed software, the user will be able to assess geological data available in the data repository, enabling planners to identify the data needed for specific geo-hazards. The user interfaces and framework of the software have been designed and developed in consultation with CDMP.

The software framework development task included conceptualization of the software framework and identification of the software elements and users. The identified major elements of the software were data input, data browsing, query and report generation and mapping etc. It has been identified that the major users of this software are: CDMP, DMB, GSB, universities and other related organizations. The developed software has different interfaces are (i) data explorer, (ii) knowledge base, (iii) map browser, (iv) scanned documents, (v) digital catalog, (vi) other links and (vii) search options etc. The main interface of the geological data catalog software has presented in Figure 3.1.1. Brief descriptions of the different components of the developed software are given different subsequent sections of this chapter.



Figure 3.1.1: The main interfaces of the geological data catalog software

3.2 Data Explorer

To view the map data this interface is designed, user can perform the basic GIS operation like Overlay, zoom, and identity with this interface. In the left side the spatial data layers is displayed in tree structure. User just click on a data layers name the corresponding maps with legend will be displayed in the right side of this interface. User can add more than one data layers with click on the other data layers. The data explorer interface of the geological data catalog software is presented in Figure 3.2.1.



Figure 3.2.1: The data explorer interface of the geological data catalog software

3.3 Knowledge base

This interface has been designed to view the knowledge based documents such as geological and geohazard related journals, report, articles, research thesis and different scientific publications. The knowledge base interface of the geological data catalog software is presented in Figure 3.3.1.



Figure 3.3.1: The knowledge base interface of the geological data catalog software

3.4 Map browser

An user-friendly mapping interface has been developed to display maps with facilities of adding legends, labels and symbols. The tool has a generic map view area where the user can add different data layers from the data layer trees This interface can be used to generate maps for reports. The viewed map can be printed through a printing interface button. The Map browser supports the GIS ESRI shape file (shp) format. The map browser interface of the geological data catalog software is presented in Figure 3.4.1.



Figure 3.4.1: The map browser interface of the geological data catalog software

3.5 Scanned documents

A substantial amount of hardcopy data was collected from different sources such as the Geological Survey of Bangladesh (GSB), Geology Department, University of Dhaka, Department of Geology and Mining, Rajshahi University, Khulna Development Authority (KDA), Chittagong Development Authority (CDA), Rajshahi Development Authority (RDA), Bangladesh Bridge Authority (BBA), Bangladesh University of Engineering and Technology (BUET) and Khulna City Corporation (KCC) etc. The hardcopy data includes (i) hardcopy maps, (ii) maps in reports, and (iii) maps in published articles and journals etc. These hardcopy data were scanned for further digital conversion to develop the geological data catalog. Further, CEGIS has few scanned coastal area maps. These scanned maps have been incorporated under this interface for further use and for assessing the quality of source maps and data. The scanned documents interface of the geological data catalog software is presented in Figure 3.5.1.



Figure 3.5.1: The scanned documents interface of the geological data catalog software

3.6 Digital catalog

It has earlier been mentioned that a well-organized digital atlas/catalog has been developed for CDMP comprises with different thematic maps. Those maps were converted into JPEG format and uploaded into the data catalog software for further usages. The digital catalog interface of the geological data catalog software is presented in Figure 3.6.1.



Figure 3.6.1: The digital catalog interface of the geological data catalog software

3.7 Metadata

There are two options under metadata modules are (i) metadata entry and (ii) metadata browser. The metadata entry option will allow the user to entry description of a newly entered data set and will allow editing the data description of the existing data set. Only Database Administrator will be able to enter and modify the metadata. The metadata browser will allow all users to see metadata information of existing data sets. The metadata browser interface of the geological data catalog software is presented in Figure 3.7.1.



Figure 3.7.1: The metadata browser interface of the geological data catalog software

3.8 Other links

Different important information such as metadata, geological/geo-hazard related research outputs and geo-hazard assessment tools/software are available in different websites. Addresses of those websites are incorporated under the other links tab. Further websites of GSB, different universities, research and geo-hazard mapping related organization has also linked herewith. The other link interface of the geological data catalog software is presented in Figure 3.8.1.

🧭 Geological Data Catalog : Links - Windows Internet Explorer									
💽 🗢 🙋 http://fal/geodatacat/Link	s/Default.aspx		🖌 🛃 🔀 Google	P-					
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Home Data Explorer	Map Browser Knowledge Base	Scanned Documents	Digital Catalog Meta data	Links Search					
		About the Links		<u>^</u>					
Data Explorer Map Browser		Short Description about	Links						
Knowledge Base Scanned Documents Digital Catalog	Category 1	CEGIS	Center for Environmental and Geographi Services.	c Information					
Meta Data		GSB	A description of the web site goes here.						
<u>Links</u> <u>Search</u>		USGS	A description of the web site goes here.						
		Linked site name	A description of the web site goes here.						
		Linked site name	A description of the web site goes here.						
	Category 2	Linked site name	A description of the web site goes here.	_					
		Linked site name	A description of the web site goes here.						
		Linked site name	A description of the web site goes here.						
		Linked site name	A description of the web site goes here.	×					
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Figure 3.8.1: The metadata browser interface of the geological data catalog software

3.9 Download

The 'Download' option interface will allow users to download or export the data and predefined maps for their usage in reports and as well as planning purposes. The download interface of the geological data catalog software is presented in Figure 3.9.1.

3.10 Search

Search interface has been designed to search the different maps, data layers, reports, journals, articles and research papers with simple keywords.



Figure 3.9.1: The download interface of the geological data catalog software

Chapter 4 Conclusion and Recommendation

A geological data catalog has been developed following sequential steps such as (i) data collection and organization of collected data (ii) conversion of soft and hardcopy data into a standard GIS format, and (iii) capturing, processing of data and database development, (iv) data quality checking, (v) development of a geological data catalog, (vi) development of a geological data catalog software, (vii) deployment of the data catalog software to CDMP, and (viii) documentation.

It is to be mentioned that the geological data catalog has been developed in hardcopy as well as digital format using collected data from heterogeneous sources. Based on the experience of developing the geological data catalog, the following conclusions and recommendations can be made.

Conclusion

- The geological data catalog, prepared both in hardcopy and digital format, is comprehensive and well organized and can be used by planners and decision makers for planning purposes.
- The geological data catalog has been prepared using data and information collected from major sources such as GSB, Department of Geology, University of Dhaka, Department of Geology and Mining, University of Rajshahi, BWDB, BUET, CDA, KDA, RDA etc.
- The quality of some hardcopy geological maps/data that were collected from different sources was very poor. The conditions of some of those maps were comparatively poor, so attempts were made to improve them using GIS, RS data and technologies available at CEGIS. Therefore, the quality of the developed catalog for some data sets could not be improved much.
- Many geological and related hardcopy maps and a substantial amount of data were available in published reports and journals. The conditions of some of those maps were comparatively poor, so attempts were made to improve them using GIS, RS data and technologies available at CEGIS.
- Some important information such as on scale, projection systems, projection parameters, and date of data production or update were not mentioned in many hardcopy maps. Furthermore, there is no good documentation on the hardcopy data sets. Therefore, the geological data sets could not be described clearly in the hardcopy geological data catalog.
- There are some digital data sets collected from CEGIS, NWRD (WARPO), USGS website, KDA, that are of comparatively good quality. Therefore, these data sets are clear enough in the catalog and should be very useful to the users.
- The web-enabled GIS-based geological data catalog software developed under this project would be very helpful for geologists, disaster managers and planners in disaster management and risk reduction planning activities.

Recommendations

• The web-enabled GIS-based geological data catalog software developed under this project could be updated through organizing a consultation workshop with CDMP and relevant stakeholders.

- Data collected under other projects of CDMP could be uploaded into the developed software to enhance the geological and geo-hazard related database of CDMP for national benefit.
- Other stakeholders especially GSB, University of Dhaka, BUET, Rajshahi University, RDA, KDA, KCC, DCC, and RAJUK could contribute a lot in the developed geological data catalog through providing their data or metadata to CDMP for geo-hazard assessment for the benefit of Bangladesh.

Appendix .	A: List	of geol	ogical	maps and	data	layers
T T T T						

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
1	BADC	Borehole	Borelog data	Digital	Bangladesh	Questionnaire survey
$\frac{1}{2}$	Bangladesh Bridge Authority	Borehole	Borehole, Lithology, SPT, Geological map of Jamuna river area	Hardcopy	Dunghudesh	Bangladesh Bridge Authority
3	BUET (BNUS)	Earthquake	After Earthquake: Wari Area, Sutrapur	Digital	Wari Area, Sutrapur	Questionnaire survey
4	BUET (BNUS)	Earthquake	Before Earthquake: Wari Area, Sutrapur	Digital	Wari Area, Sutrapur	Questionnaire survey
5	BUET (BNUS)	Earthquake	Earthquake Data of Bangladesh	Digital	Bangladesh	Questionnaire survey
6	BUET (BNUS)	Earthquake	Proposed seismic zoning map of Bangladesh, 2002	Digital	Bangladesh	Questionnaire survey
7	BUET (BNUS)	Earthquake	Seismic zonation of Dhaka	Digital	Dhaka	Questionnaire survey
8	BUET (BNUS)	Geology	Surfacial Geology of Dhaka	Digital	Dhaka	Questionnaire survey
9	BUET (BNUS)	Other	Economic loss (in Million USD) for Dhaka	Digital	Dhaka	Questionnaire survey
10	CEGIS	Hazard	Cyclone affected areas	Digital	Bangladesh	CEGIS
11	CEGIS	Hazard	Cyclone vulnerable zone map	Hardcopy	Sitakunda, Chittagong	GIS Technology for Disaster Management - A Pilot Study, May 1995, FAP 19
12	CEGIS	Hazard	Multi hazard data (River bank erosion & bed siltation, flood hazard data, salinity, thunder bolt, drought, exess rainfall, hailstorm, water logging, cold spell etc.)	Digital	7 upazilas	CEGIS
13	CEGIS	Hazard	River bank erosion data	Digital	Bangladesh	CEGIS
14	CEGIS	Hazard	Tarnado affected areas	Digital	Bangladesh	CEGIS
15	Chittagong Development Authority	Flood	Flooded areas - April 1991 cyclone	Hardcopy	Chittagong city	CDA - Chittagong stormwater drainage and flood control master plan
16	Chittagong Development Authority	Other	Chittagong SMA density zones	Hardcopy	Chittagong city	CDA - Chittagong stormwater drainage and flood control master plan

SL	Organization	Data group	Data set name	Data	Data extent	Data source
17	01.14	0.1	TT1 1 1 1 1 1	Format	<u></u>	
17	Chittagong	Other	Flooded areas during normal	Hardcopy	Chittagong city	CDA - Structural Plan
	Development		monsoon period			
10	Authority	0.1		TT 1	01.14	
18	Chittagong	Other	Stormwater drainage and flood	Hardcopy	Chittagong city	CDA - Chittagong stormwater drainage and flood control
	Development		control master plan			master plan
10	Authority	0.1	<u>0 1 1</u>	TT 1	01.14	
19	Chittagong	Other	Structural plan map	Hardcopy	Chittagong	CDA - Structural Plan
	Development				Metropolitan	
- 20	Authority	0.1	TT 1 1	TT 1	area	
20	Chittagong	Other	Urban area plan	Hardcopy	Chittagong city	CDA - Urban Development Plan
	Development					
- 21	Authority Demostration of	Develop	Derehole (Deer TW of DWDD &	Handaama	Manilanan' Cadan	Comercial Marries of Marilesoni Sadar Unavilla for
21	Coology & Mining	Dorenoie	DDIE) leastion of Manikaani aadar	пагасору	Internet Sauar	Use n Davidorment P. So. (Hon'o) Port. in Son (2004)
	Debiogy & Winning,		upozile		Opazina	orban Development B.Sc. (Holl's) Fart -IV Sep.(2004)
22	Department of	Borahola	Borehole location man in Khulna city	Hardcony	Khulna city	Urban Geology of Khulna City Area With Emphasis on
22	Geology & Mining	Dorenoie	area	Hardcopy	Rhuma City	Environmental Hazards M Sc Thesis Dilin Kumar Adhikari
	RU		area			Environmental Hazards W.Se. Thesis Dhip Kunai Adiikan
23	Department of	Borehole	Generalized stratigraphic succession	Hardcopy	Tanore &	Geomorphological Mapping of Parts of Tanore and
	Geology & Mining,		of the Bogra slope, 1980		Mohonpur	Mohanpur Upazilla B.Sc. (Hon's) Part - iv (2002)
	RU				upazilla.	
					Rajshahi	
24	Department of	Borehole	Lithological cross sections along	Hardcopy	Manikganj Sadar	Geomorphological Mapping of Manikganj Sadar Upazilla for
	Geology & Mining,		profiles of Manikganj sadar upazila		Upazilla	Urban Development B.Sc. (Hon's) Part -iv Sep.(2004)
	RU				-	
25	Department of	Borehole	Lithostratigraphic cross section along	Hardcopy	Khulna city	Urban Geology of Khulna City Area With Emphasis on
	Geology & Mining,		East-West direction in Khulna city			Environmental Hazards M.Sc. Thesis Dilip Kumar Adhikari
	RU		area			
26	Department of	Borehole	Location map of engineering	Hardcopy	Khulna city	Urban Geology of Khulna City Area With Emphasis on
	Geology & Mining,		boreholes in Khulna city area for SPT			Environmental Hazards M.Sc. Thesis Dilip Kumar Adhikari
	RU		zonation map			
27	Department of	Borehole	Vertical Sequence of Barind Clay	Hardcopy	Study area	Geological mapping using Remote Sensing techniques in and
	Geology & Mining,		Residuum at Dariapur , Godagari,			around Rajshahi city, Bangladesh M.Sc. Thesis (1999)
	RU		Rajshahi District			

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
28	Department of Geology & Mining, RU	Earthquake	Major tectonic zones, basement faults and the epicenter of an earthquake	Hardcopy	Bangladesh	Study of Textural, Mineralogical and Pertophysical Properties of Sediments in and around Monglaport, Khulna, Bangladesh M.Sc. Thesis
29	Department of Geology & Mining, RU	Earthquake	Observed maximum seismic intensity map based on data upto 1975	Hardcopy	Bangladesh	Urban Geology of Khulna City Area With Emphasis on Environmental Hazards M.Sc.Thesis Dilip Kumar Adhikari
30	Department of Geology & Mining, RU	Flood	Flood affected area in Bangladesh since 1953	Hardcopy	Bangladesh	Urban Geology of Khulna City Area With Emphasis on Environmental Hazards M.Sc.Thesis Dilip Kumar Adhikari
31	Department of Geology & Mining, RU	Geology	Generalized Physiographic map of Bangladesh	Hardcopy	Bangladesh	Thesis, B. Sc, 2007 - Rainfall Trend, Evapotranspiration of Major Crops and Net Irrigation Requirement of Rice Durinng Pre and Post- Implementation of BIADP in Chapai Nawabgonj District -M. Arafath Ali
32	Department of Geology & Mining, RU	Geology	Generalized stratigraphic succession of Chittagong-Tripura Folded Belt	Hardcopy		Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006
33	Department of Geology & Mining, RU	Geology	Geological map of Khulna city	Hardcopy	Khulna city	Urban Geology of Khulna City Area With Emphasis on Environmental Hazards M.Sc.Thesis Dilip Kumar Adhikari
34	Department of Geology & Mining, RU	Geology	Geological map of Rajshahi city area	Hardcopy	Rajshahi city	Thesis, M. Sc, 1999 - Geological Mapping Using Remote Sensing Techniques in and around Rajshahi City, Bangladesh
35	Department of Geology & Mining, RU	Geology	Geomorphological data of Manikganj sadar	Hardcopy	Manikganj Sadar Upazilla	Geomorphological Mapping of Manikganj Sadar Upazilla for Urban Development B.Sc. (Hon's) Part -iv Sep.(2004)
36	Department of Geology & Mining, RU	Geology	Geotechnical Zonation map of Khulna city	Hardcopy	Khulna city	Urban Geology of Khulna City Area With Emphasis on Environmental Hazards M.Sc.Thesis Dilip Kumar Adhikari
37	Department of Geology & Mining, RU	Geology	Isopach map of the lower part of the Upper Bhuban Formation (Gas sand- 2)	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006

SL	Organization	Data group	Data set name	Data	Data extent	Data source
		<u> </u>		Format	<u> </u>	
38	Department of	Geology	Isopach map of the middle Bhuban	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seigmic and Well Log Date: A Case Study of Greater
	RU		Formation			Bakhrahad Structure Bangladesh M Sc. 2006
	RU					Bakinabad Structure, Bangladesh M.Se., 2000
39	Department of	Geology	Isopach map of the Tipam Sandstone	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		Formation			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
40	Department of	Geology	Isopach map of the upper Marine	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		Shale Formation			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
41	Department of	Geology	Isopach map of the upper part of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		upper Bhuban Formation (Gas sand-			Seismic and Well Log Data: A Case Study of Greater
	RU		1)			Bakhrabad Structure, Bangladesh M.Sc., 2006
42	Department of	Geology	Major Tectonic Elements of The	Hardcopy	Bangladesh	Study of Textural, Mineralogical and Pertophysical Properties
	Geology & Mining,		Bengal Basin			of Sediments in and around Monglaport, Khulna, Bangladesh
	RU					M.Sc. Thesis
43	Department of	Geology	Morphogeological map of Tanore and	Hardcopy	Tanore &	Geomorphological Mapping of Parts of Tanore and
	Geology & Mining,		Mohanpur upazılla		Mohonpur	Mohanpur Upazilla B.Sc. (Hon's) Part - IV (2002)
	KU				upazilia, Raishahi	
44	Department of	Geology	Physiographic units of south west	Hardcopy	SW region	Thesis, RU, Dilip Kumar Adhikari: Urban Geology of
	Geology & Mining,		region		C	Khulna City area with emphasis on environmental hazards
	RU					
45	Department of	Geology	Principal Tectonic elements of the	Hardcopy	Bangladesh	Thesis, RU, Dilip Kumar Adhikari: Urban Geology of
	Geology & Mining,		Bengal Basin (after Raeimann, 1993)			Khulna City area with emphasis on environmental hazards
46	RU Department of	Geology	Quatenary Deltic Arcs in Bangladesh	Hardcopy	Bangladesh	Study of Textural Mineralogical and Pertophysical Properties
10	Geology & Mining.	Geology	(Schematic)	manacopy	Dunghudesh	of Sediments in and around Monglaport, Khulna, Bangladesh
	RU		· · · ·			M.Sc. Thesis
47	Department of	Geology	Regional Geologic and Tectonic	Hardcopy	Barind area	Hydrological Investigation in The Mahananda Valley, Barind
	Geology & Mining,		setting of the Barind area, Bengal			Area, Bangladesh Using Geophysical Well Log B.Sc.
	RU		Basin			(Hon's) Part - iv (2004)
SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
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48	Department of Geology & Mining, RU	Geology	Regional Tectonic setting of Bangladesh	Hardcopy	Bangladesh & surroundings	Thesis, B. Sc Well Log Interpretation of Miocene Sequences in Feni-1, Feni Structure, Bangladesh
49	Department of Geology & Mining, RU	Geology	SPT Zonation map from 10 to 15 m depth of Khulna city	Hardcopy	Khulna city	Urban Geology of Khulna City Area With Emphasis on Environmental Hazards M.Sc.Thesis Dilip Kumar Adhikari
50	Department of Geology & Mining, RU	Geology	Surface relief map on the top of the lower Bhuban formation	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006
51	Department of Geology & Mining, RU	Geology	Surface relief map on the top of the lower part of the upper Bhuban formation (gas sand-2)	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006
52	Department of Geology & Mining, RU	Geology	Surface relief map on the top of the middle Bhuban formation	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006
53	Department of Geology & Mining, RU	Geology	Surface relief map on the top of the Tipam sandstone formation	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006
54	Department of Geology & Mining, RU	Geology	Tectonic map of Bangladesh and adjoining areas (Source: Guha, 1978, GSB, 1990, Reiman 1993)	Hardcopy	Bangladesh & surroundings	Thesis, B. Sc, 2007 - Rainfall Trend, Evapotranspiration of Major Crops and Net Irrigation Requirement of Rice Durinng Pre and Post- Implementation of BIADP in Chapai Nawabgonj District -M. Arafath Ali
55	Department of Geology & Mining, RU	Geology	Tectonic map of Bangladesh, 1990	Hardcopy	Bangladesh	Thesis, M. Sc, 1999 - Geological Mapping Using Remote Sensing Techniques in and around Rajshahi City, Bangladesh
56	Department of Geology & Mining, RU	Geology	Time Structure map on the top of the lower part of the Upper Bhuban Formation (Gas sand-2)	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of Seismic and Well Log Data: A Case Study of Greater Bakhrabad Structure, Bangladesh M.Sc., 2006

SL	Organization	Data group	Data set name	Data	Data extent	Data source
		<u> </u>		Format	<u> </u>	
57	Department of	Geology	Time Structure map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	RU		I Ipain Sandstone Formation			Bakhrabad Structure, Bangladesh, M.Sc. 2006
	KU					Dakinabad Structure, Dangradesh M.Sc., 2000
58	Department of	Geology	Time Structure map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		Upper Marine Shale			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
59	Department of	Geology	Time Structure map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		upper part of the Bhuban Formation			Seismic and Well Log Data: A Case Study of Greater
	RU		(Gas sand-1)			Bakhrabad Structure, Bangladesh M.Sc., 2006
60	Department of	Geology	Time Struture map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		Eocene Formation			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
61	Department of	Geology	Time Struture map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		lower Bhuban Formation			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
62	Department of	Geology	Time Struture map on the top of the	Hardcopy	Bakhrabad area	Thesis, RU, Abu Reza Md. Towfiqul Islam - Interpretation of
	Geology & Mining,		middle Bhuban Formation			Seismic and Well Log Data: A Case Study of Greater
	RU					Bakhrabad Structure, Bangladesh M.Sc., 2006
63	Department of	Other	Generalized soil data of south west	Hardcopy	South west	Thesis, RU, Dilip Kumar Adhikari: Urban Geology of
	Geology & Mining,		region		region	Khulna City area with emphasis on environmental hazards
	RU					
64	Department of	Borehole	Borehole locations and lines of	Hardcopy	Dhaka city	Thesis: Geology, DU - Some aspects of quarternary geology
65	Geology, DU	Doroholo	geological cross section	Handaany	Culaban laka	of Dhaka city - Md.Harunur Rashid, 1993
05	Geology DU	Dorenoie	Holocene sediments in Gulshal lake	пансору	Dhaka	of Dhaka city. Md Harmur Pashid 1003
	Geology, DO		area, Dhaka		Dilaka	of Dilaka etty - Mu.Harunur Kasinu, 1995
66	Department of	Earthquake	Earthquake Cataloging data	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		(Historical)		surroundings	
67	Department of	Earthquake	Earthquake Cataloging data	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		(Instrumental)		surroundings	

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
68	Department of	Earthquake	Earthquake epicenters in and around	Hardcopy	Bangladesh	Subsurface Characterization & Earthquake Hazard
	Geology, DU		Bangladesh (USGS/NEIC (PDE)			Assessment of Dhaka City Constraints from Geophysical
			1973)			Investigation (2005)
69	Department of	Earthquake	Earthquake map of BMD from 1918-	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		1984		surroundings	
70	Department of	Earthquake	Earthquake map of data compiled	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		from 1548-2008		surroundings	
71	Department of	Earthquake	Earthquake map of IRIS from 1964 -	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		2008 (epicenters)		surroundings	
72	Department of	Earthquake	Earthquake map of USGS from 1973-	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		2008 (epicenters)		surroundings	
73	Department of	Earthquake	GPS and Seismitic network in	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		Bangladesh		surroundings	
74	Department of	Earthquake	Historical Earthquakes in and around	Hardcopy		Subsurface Characterization & Earthquake Hazard
	Geology, DU		Bangladesh (from 1762 to 1971)			Assessment of Dhaka City Constraints from Geophysical
						Investigation (2005)
75	Department of	Earthquake	Isoseismal of major earthquakes in	Hardcopy	Bangladesh	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		and around Bangladesh			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
76	Department of	Earthquake	Possible earthquakes induced	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		liquifaction hazard map of Dhaka city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
77	Department of	Earthquake	Seismic velocity location map of	Hardcopy	Dhaka city	Subsurface Characterization & Earthquake Hazard
	Geology, DU		Dhaka city			Assessment of Dhaka City Constraints from Geophysical
						Investigation (2005)
78	Department of	Earthquake	Seismicity of Bangladesh	Digital	Bangladesh &	Questionnaire survey
	Geology, DU				surroundings	
79	Department of	Earthquake	Seismicity of Southern Asia	Digital	Southern Asia	Questionnaire survey
	Geology, DU					
80	Department of	Earthquake	Seismotectonic regionalizatipon	Hardcopy	Bangladesh	Geophysical & Geochemical Signatures & Its Geotectonic
	Geology, DU		scheme of Bangladesh			Significance of the Eastern Folded Belt (EFB) of the Bengal
						Basin- Author: Mohammad Abdul Haque (2001) DU
81	Department of	Earthquake	Strong earthquakes experienced in	Digital	Bangladesh &	Questionnaire survey
	Geology, DU	•	Bangladesh	J	surroundings	- •

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
82	Department of	Flood	Area affected by 1998 flood in Dhaka	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
83	Department of	Geology	Aeromagnetic map of Bangladesh-	Hardcopy	Bangladesh	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		1983			of Dhaka city - Md.Harunur Rashid, 1993
84	Department of	Geology	Basement Fault map	Digital	Bangladesh &	Questionnaire survey
	Geology, DU				surroundings	
85	Department of	Geology	Engineering Geological map of	Hardcopy	Dhaka city	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		Dhaka city (WASA, 1991)			of Dhaka city - Md.Harunur Rashid, 1993
86	Department of	Geology	Env. Geology map for sustainable	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		land development & planning of			Dhaka City for Geohazard Mitigation and Development
			Dhaka city			Planning, 1999
87	Department of	Geology	Fault line of Chittagong and CHT	Hardcopy	Chittagong and	Thesis, M. Sc, Geology, DU - Geological and structural
	Geology, DU				CHT	studies of Chittagong and CHT using LandSAT imageries
						and arieal photographil, Author: Md. Monirul Islam
88	Department of	Geology	Fault zone map of Dhaka region	Hardcopy	Dhaka region	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		(source: WASA, 1991)			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
89	Department of	Geology	Generalized structural style of	Hardcopy	Chittagong and	Geophysical & Geochemical Signatures & Its Geotectonic
	Geology, DU		Eastern Folded Belt (EFB)		CHT	Significance of the Eastern Folded Belt (EFB) of the Bengal
						Basin- Author: Mohammad Abdul Haque (2001) DU
90	Department of	Geology	Geological Cross-section along	Hardcopy	Hajaribag -	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		Hajaribag - Shyampur (Dhaka city)		Shyampur	of Dhaka city - Md.Harunur Rashid, 1993
	5	<i>a</i> 1	<u> </u>		(Dhaka city)	
91	Department of	Geology	Geological Cross-section along	Hardcopy	Shamoli - Manda	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		Shamoli - Manda (Dhaka city)		(Dhaka city)	of Dhaka city - Md.Harunur Rashid, 1993
92	Department of	Geology	Geological map of Chittagong and	Hardcopy	Chittagong and	Thesis: Imtiaz Ahmed, Geology, DU, 1985 - Overpressure
	Geology, DU		CHT (Source: Akther, 1979)		CHT	Phenomenon it's geologic controls in Bangladesh gas fields
						with particular refernce to the Sitakunda test drilling
		~ .				
93	Department of	Geology	Geological map of Dauki river and	Hardcopy	Tamabil - Dauki	Geological and Geotechnical Studies on the borders of Sylhet
	Geology, DU		Rangpani chara area		area	District, Bangladesh- Author:
						Md. Khairul Kabir (1995) DU

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
94	Department of	Geology	Geological map of Dhaka city	Hardcopy	Dhaka city	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		(source: WASA, 1991)			of Dhaka city - Md.Harunur Rashid, 1993
95	Department of	Geology	Geological map of Madhupur Tract	Hardcopy	Madhupur tract	Influence of Geology on Hydrology of the Madhupur Tract-
	Geology, DU		and Jamuna Floodplain (Kaliakair-			Jamuna Floodplain Transition- Author: Farhana
			Dhamrai)			Rahman(1998) DU
96	Department of	Geology	Geological Map of The Comilla	Hardcopy	Comilla region	Geoelectric Resistivity Survey and Hydrochemical Survey for
	Geology, DU		Region			Sub-surface Geological Study and Ground Water Potentiality
						Study in Comilla Kotwali Thana- Author: Md. Shahjahan
						(1997) DU
97	Department of	Geology	Geomorphic map with Landfills	Hardcopy	Dhaka city	Subsurface Characterization & Earthquake Hazard
	Geology, DU					Assessment of Dhaka City Constraints from Geophysical
						Investigation (2005)
98	Department of	Geology	Geomorphological units of	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		Bangladesh		surroundings	
99	Department of	Geology	Geotectonic map of the Bengal Basin	Hardcopy	Bangladesh	Geoelectric Resistivity Survey and Hydrochemical Survey for
	Geology, DU					Sub-surface Geological Study and Ground Water Potentiality
						Study in Comilla Kotwali Thana- Author: Md. Shahjahan
						(1997) DU
100	Department of	Geology	GPS data on 3D motions of the Plate	Digital	Bangladesh &	Questionnaire survey
	Geology, DU	~ .	movement		surroundings	
101	Department of	Geology	Location map showing the electrical	Hardcopy	Dhaka city	Subsurface Characterization & Earthquake Hazard
	Geology, DU		imaging sites and the direction of the			Assessment of Dhaka City Constraints from Geophysical
			imaging in the investigated area			Investigation (2005)
102	Department of	Geology	Location man showing vertical	Hardcony	Dhaka city	Subsurface Characterization & Farthquake Hazard
102	Geology DU	Geology	electrical sounding (VSE) sites in the	madoopy	Dhaka ony	Assessment of Dhaka City Constraints from Geophysical
	0001055, 20		investigated area			Investigation (2005)
103	Department of	Geology	Paleogeographic map of the Bengal	Hardcopy		The Subsurface Geology of Maddhapara & Its Adjoining
	Geology, DU	8,	Basin during Miocene after M. Alam	FJ		Areas of Dinajpur District, Bangadesh- Mashrur Zaman
			(1990)			(1999) DU
104	Department of	Geology	Peak ground acceleration (PGA) map	Hardcopy	Dhaka city	Subsurface Characterization & Earthquake Hazard
	Geology, DU	2.	of Dhaka city		-	Assessment of Dhaka City Constraints from Geophysical
			-			Investigation (2005)
105	Department of	Geology	Physiographic map of Dhaka city	Hardcopy	Dhaka city	Thesis Title: Urban Geology of Dhaka City for Geohazard
	Geology, DU					Mitigation and Development Planning

SL	Organization	Data group	Data set name	Data	Data extent	Data source
		~ .		Format		
106	Department of	Geology	P-wave velocity of the top layer (Vp0	Hardcopy		Subsurface Characterization & Earthquake Hazard
	Geology, DU		m/s) and the layer below the top layer			Assessment of Dhaka City Constraints from Geophysical
107	Department of	Caalaar	(vp1 m/s)	Handaany	Danaladaah	Investigation (2005) Thesis: Coology, DU, Some concerts of questionness, coology
107	Geology DU	Geology	Regional geologic and tectomic	пагасору	Daligiadesii	of Dhaka city. Md Hermur Pachid 1002
	Geology, DU		(after Khondoker, 1987)			of Dhaka city - Md.Haruhur Kashid, 1995
108	Department of	Geology	Regional tectonic and physiographic	Digital	Bangladesh &	Questionnaire survey
	Geology, DU		setup of Bangladesh		surroundings	
109	Department of	Geology	Schematic basement structural	Hardcopy	Northern part of	The Subsurface Geology of Maddhapara & Its Adjoining
	Geology, DU		contour map of Garo - Rajmahal gap		Bangladesh	Areas of Dinajpur District, Bangadesh- Mashrur Zaman
110	Demontry and of	Caslanu	Shoon more real asites of the terr large	Handaama		(1999) DU
110	Geology DU	Geology	Shear wave velocity of the top layer $(Vn0 m/s)$ and the layer below the top	пагасору		Assessment of Dhake City Constraints from Coophysical
	Geology, DO		(vpo h/s) and the layer below the top layer (Vp1 m/s)			Investigation (2005)
111	Department of	Geology	Sketch map of formation pressure	Hardconv	Bangladesh	Thesis: Intiaz Ahmed Geology DU 1985 - Overpressure
	Geology, DU	Geology	Chanbeat 3000 M. Presumed depth of	manacopy	Dunghudebh	Phenomenon it's geologic controls in Bangladesh gas fields
			abnormal pressure zones, 1982			with particular reference to the Sitakunda test drilling
			1			
112	Department of	Geology	Structural features of Bengal Basin	Hardcopy	Bangladesh	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		(source: WASA, 1991)			of Dhaka city - Md.Harunur Rashid, 1993
113	Department of	Geology	Structural map of Chittagong and	Hardcopy	Chittagong and	Thesis, M. Sc, Geology, DU - Geological and structural
	Geology, DU		CHT		CHT	studies of Chittagong and CHT using LandSAT imageries
						and arieal photographiI, Author: Md. Monirul Islam
114	Department of	Geology	Structural map of Chittagong and	Hardcopy	Chittagong and	Thesis: Imtiaz Ahmed, Geology, DU, 1985 - Overpressure
	Geology, DU		CHT, 1979		CHT	Phenomenon it's geologic controls in Bangladesh gas fields
						with particular refernce to the Sitakunda test drilling
115	Department of	Geology	Surface Fault map	Digital	Bangladesh &	Questionnaire survey
	Geology, DU	Cology	Surree Fuur map	Digitul	surroundings	Questionnaire surrey
116	Department of	Geology	Techtonic map of Bangladesh and	Hardcopy	Bangladesh	Thesis: Imtiaz Ahmed, Geology, DU, 1985 - Overpressure
	Geology, DU		overpressure zone			Phenomenon it's geologic controls in Bangladesh gas fields
						with particular refernce to the Sitakunda test drilling

SL	Organization	Data group	Data set name	Data	Data extent	Data source
117	Desertes of	Castan	Testan's demonstration Demonstration	Format	Demotoria	
11/	Department of	Geology	1 ectonic elements of Bangladesn,	Hardcopy	Bangladesh	Geological and Geotechnical Studies on the borders of Sylnet
	Geology, DU		1991			District, Bangladesn- Autnor:
110	Demontry and of	Castan	Testeria Eastures of anotae Dhales	Handaama	Creater Dhales	Md. Knairul Kabir (1995) DU
118	Department of	Geology	l'ectoric Features of greater Dhaka	нагасору	Greater Dhaka	Influence of Geology on Hydrology of the Madhupur Tract-
_	Geology, DU		district		District	Rahman(1998) DU
119	Department of	Geology	Tectonic features of the Madhupur	Hardcopy	Madhupur Tract	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		Tract (source: modified after Morgan & McIntire, 1959)			of Dhaka city - Md.Harunur Rashid, 1993
120	Department of	Geology	Tectonic map of Bangladesh (Source:	Hardcopy	Bangladesh	Thesis: Imtiaz Ahmed, Geology, DU, 1985 - Overpressure
	Geology, DU	23	Guha, 1978)	1.7	e	Phenomenon it's geologic controls in Bangladesh gas fields
						with particular refernce to the Sitakunda test drilling
121	Department of	Geology	Tectonic map of Bangladesh, 1980	Hardcopy	Bangladesh	Thesis, Geology, DU - Geology & Hydrology of the
	Geology, DU					Quarternary Saline Aquifers in Muradnagar thana &
						adjoining area, comilla & B Baria - Md.Kamrul Hasan, 1993
122	Department of	Geology	Tectonic skatch map of Bangladesh	Hardcopy	Bangladesh	Thesis: Imtiaz Ahmed, Geology, DU, 1985 - Overpressure
	Geology, DU		and surrounding areas (source:			Phenomenon it's geologic controls in Bangladesh gas fields
			Gansser, 1964)			with particular refernce to the Sitakunda test drilling
123	Department of	Hazard	Expansive soil hazard map of Dhaka	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
124	Department of	Hazard	Flood hazard map of Dhaka city	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU					Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
125	Department of	Hazard	Foundation failure hazard map of	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		Dhaka city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
126	Department of	Hazard	Possible subsidance hazard map of	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		Dhaka city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
127	Department of	Hazard	Water logging (rain induced) hazard	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		prone areas of Dhaka city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
128	Department of	Other	Fills on natural drainage system of	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		Dhaka city			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
129	Department of	Other	Landforms of Dhaka city (Source:	Hardcopy	Dhaka city	Thesis: Geology, DU - Some aspects of quarternary geology
	Geology, DU		modified after WASA, 1991)			of Dhaka city - Md.Harunur Rashid, 1993
130	Department of	Other	Planned and unplanned land	Hardcopy	Dhaka city	Thesis, Geology, DU, Nur A Shams - Urban Geology of
	Geology, DU		development and housing areas			Dhaka City for Geohazard Mitigation and Development
						Planning, 1999
131	DPHE	Hazard	Arsenic contamination	Digital	Bangladesh	DPHE
132	GSB	Borehole	A generalized vertical section of	Hardcopy		Geology of Barguna District, Bangladesh by Sirajur Rahman
			sediments of the Beach deposit.			Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
133	GSB	Borehole	A generalized vertical section of	Hardcopy		Geology of Barguna District, Bangladesh by Sirajur Rahman
			sediments of the channel deposit.			Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
134	GSB	Borehole	A generalized vertical section of	Hardcopy		Geology of Barguna District, Bangladesh by Sirajur Rahman
			sediments of the channel deposit.			Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
135	GSB	Borehole	Borehole locations of Maddypara,	Hardcopy	Maddyapara,	Geology of Madhyapara Area, Dinajpur District, Bangladesh
			Dinajpur		Dinajpur	(Vol-5, Part-2, 1987)
136	GSB	Borehole	Borehole locations of Rangpur &	Hardcopy	Rangpur &	Petrographic Study of Some Core Samples of Basement
			Dinajpur area		Dinajpur	Rocks Collected from Different Drill holes of Northern Part
					Districts	of Bangladesh (Vol-10, Part-5, 2004)
137	GSB	Borehole	Clacium Carbonat Percentage of	Hardcopy	Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District,
			limestone from bore holes of			Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985.
			Bhangerghat area .			(Rec.GSB. Vol-4, Pt-2)
138	GSB	Borehole	Diagramatic beach profile (a) Winter	Hardcopy		Geology of Barguna District, Bangladesh by Sirajur Rahman
			time and (b) Summer time.			Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
139	GSB	Borehole	Geological log of GDH-31	Hardcopy	Dariapara,Gaiba	Subsurface Geology of Dariapur Area, Gaibandha,
					ndha	Bangladesh, by Q.M.Arifur Rahman, Pradip Kumar Sen
					Sadar,Gaibandha	Gupta and Md. Nehal Uddin, 1997. (Rec. GSB. Vol-8, Pt-4)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
140	GSB	Borehole	Geological log of GDH-31,Dariapur	Hardcopy	Gaibandha.	Subsurface Geology of Dariapur Area, Gaibandha, Bangladesh, by Q.M.Arifur Rahman, Pradip Kumar Sen Gupta and Md. Nehal Uddin, 1997. (Rec. GSB. Vol-8, Pt-4)
141	GSB	Borehole	Lithological data	Hardcopy	Tahirpur, Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District, Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
142	GSB	Borehole	Lithological data	Hardcopy	Tahirpur, Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District, Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
143	GSB	Borehole	Lithological data	Hardcopy	Tahirpur, Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District, Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
144	GSB	Borehole	Lithological data	Hardcopy	Tahirpur, Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District, Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
145	GSB	Borehole	Total reserves_of limestone showing different blocks with their volume and reserves of limestone of Bhangerghat.	Hardcopy	Sunamganj	Limestone Deposits of Bhangerghat, Sunamganj District, Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
146	GSB	Borehole	Vertical section of sediments in the Barguna District showing the deposits Mangrove swamp (MSD), Chenier (CRD) and Beach (BD).	Hardcopy	Barguna District	Geology of Barguna District, Bangladesh by Sirajur Rahman Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
147	GSB	Borehole	Vertical section of sediments in the Barguna District showing the deposits of channel (CD) and lower tidal flat (LTD).	Hardcopy	Barguna District	Geology of Barguna District, Bangladesh by Sirajur Rahman Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
148	GSB	Borehole	Vertical section of sediments in the Barguna District showing the deposits of Natural levee (NLD).	Hardcopy	Barguna District	Geology of Barguna District, Bangladesh by Sirajur Rahman Khan, 2003. (Rec. GSB. Vol-10, Pt-3)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
149	GSB	Borehole	Vertical section of sediments in the Barguna District showing the deposits of Upper tidal flat (UTD).	Hardcopy	Barguna District	Geology of Barguna District, Bangladesh by Sirajur Rahman Khan, 2003. (Rec. GSB. Vol-10, Pt-3)
150	GSB	Earthquake	Depth contour Map of Archean Basement Complex (Velocity 4250- 6750m/sec) in the phulbari - Barapukuria area, Dinajpur as Interpreted from Seismic Refraction Survey.	Hardcopy	Phulbari- Barapukuria, Dinajpur	Seismic Refraction Survey in Phulbari-Barapukuria Area, Dinajpur District, Bangladesh, by M. Noor Islam and K.M.Shamsul Arefin, 1995. Rec. (GSB. Vol-9, Pt-2)
151	GSB	Earthquake	Depth contour Map of third Subsurface Horizon(velocity 3000- 4000 m/sec) in the phulbari - Barapukuria area, Dinajpur as Interpreted from Seismic Refraction Survey.	Hardcopy	Phulbari- Barapukuria, Dinajpur	Seismic Refraction Survey in Phulbari-Barapukuria Area, Dinajpur District, Bangladesh, by M. Noor Islam and K.M.Shamsul Arefin, 1995. Rec. (GSB. Vol-9, Pt-2)
152	GSB	Earthquake	Earthquake zoning map of Bangladesh	Digital	Bangladesh	BNBC
153	GSB	Earthquake	Location map of the Seismic refraction profile in Phulbari- Barapukuria area, Dinajpur	Hardcopy	Phulbari- Barapukuria, Dinajpur	Seismic Refraction Survey in Phulbari-Barapukuria Area, Dinajpur District, Bangladesh (Vol-9, Part-2, 1995)
154	GSB	Earthquake	Seismic zones of Bangladesh developed by BNBC, 1993	Hardcopy	Bangladesh	Geology of Barguna District, Bangladesh (Vol-10, Part-3, 2003)
155	GSB	Geology	Abridged lithological log of GDH-45.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
156	GSB	Geology	Abridged lithological log of GDH-45.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
157	GSB	Geology	Abridged lithological log of GDH-46.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
158	GSB	Geology	Abridged lithological log of GDH-47.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
159	GSB	Geology	Abridged lithological log of GDH-48.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
160	GSB	Geology	Aeromagnetic interpretation map showing the magnetic body in the west of the Barapukuria coal deposit area	Hardcopy	Barapukuria,Din ajpur	Detailed Gravity and Magnetic Profiling Surveys over Barapukuria Coal Basin Area, Dinajpur District, Bangladesh, by Idris Miah and Md. Noor Alam, 1996. (Rec.GSB. Vol-9, Pt-1)
161	GSB	Geology	Assessment units map of Bangladesh	Digital	Bangladesh	GSB and USGS
162	GSB	Geology	Auger Holes Columner Sections in the Bagherhat area.	Hardcopy	Bagerhat District.	Geology of the Southern Parts of Khulna and Bagherhat Districts, Bangladesh, by Md. Anwarul Azeem and Md. Khalequzzaman,1994. (Rec.GSB. Vol-9, Pt-3)
163	GSB	Geology	Auger Holes Columner Sections in the southern part of Khulna and Bagherhat District.	Hardcopy	Part of the Khulna & Bagerhat	Geology of the Southern Parts of Khulna and Bagherhat Districts, Bangladesh, by Md. Anwarul Azeem and Md. Khalequzzaman,1994. (Rec.GSB. Vol-9, Pt-3)
164	GSB	Geology	Basement level (high & low) of Maddyapara, Dinajpur	Hardcopy	Maddyapara, Dinajpur	Geology of Madhyapara Area, Dinajpur District, Bangladesh (Vol-5, Part-2, 1987)
165	GSB	Geology	Bathymetric contours of Bay of Bengal	Digital	Bay of Bengal	GSB and USGS
166	GSB	Geology	Bouguer anomaly contour map of Dinajpur and part of Rangpur District Bangladesh, showing khalaspir basin and three surrounding highs.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
167	GSB	Geology	Bouguer gravity anomaly map of Bangladesh, 1990	Digital	Bangladesh	GSB and USGS

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
168	GSB	Geology	Correlation of sendimentary facies in drillholes GDH-45,46,47 and 48.	Hardcopy		Geology of Khalaspir Coal Basin, Pirganj, Rangpur, Bangladesh,by Md. Nazrul Islam, Md. Nehal Uddin, Syed Ali Resan, Md. Sultan-Ul-Islam and Md. Wazed Ali, 1992. (Rec.GSB. Vol-6, Pt-5)
169	GSB	Geology	Cyclone surge susceptibility map of a part of Bangladesh.	Hardcopy		Geology of the Hatiya Island, Noakhali District, Bangladesh, by Pradip Kumar Sen Gupta and Sirajur Rahman Khan,1996. (Rec.GSB. Vol-8, Pt-2)
170	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.	Hardcopy	Bijaypur, Netrakona	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
171	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block- B&C	Hardcopy	Bijaypur, Netrakona	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
172	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-D	Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
173	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-E	Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
174	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-F	Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
175	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-G	Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
176	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-H	Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)

SL	Organization	Data group	Data set name	Data	Data extent	Data source
177	GSB	Geology	Detail Topographical and geological Map of Bijaipur area.showing white clay layers of block-I	Format Hardcopy	Netrakona District.	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh, by M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-3)
178	GSB	Geology	Detailed geological map of Dhalai river channel, Bholaganj, Sylhet	Hardcopy	Dhalai river channel, Bholaganj	Gravel Deposits of Bholaganj and Its Adjoining Areas, Sylhet District, Bangladesh (Vol-5, Part-4, 1988)
179	GSB	Geology	East-west correlation of stratigraphic sequences in the Barapukuria basin.	Hardcopy	Dinajpur District.	Geology and Coal Deposit of Barapukuria Basin, Dinajpur District, Bangladesh, by M. Abu Bakr, Q.M. Arifur Rahman,M.Mahtabul Islam.Md. Khairul Islam, Md. Nehal Uddin,, Sayed Ali Resan, Md. Jamal Haider, Md.Sultan-Ul- Islam, Md. Wazed Ali, Mokbul-E-Ala Chowdhury, Kamrul Hasan Mannan, and A.N.M Hebrul Anam,1996. (Rec. GSB. Vol-8, Pt-1)
180	GSB	Geology	Elevation map of Bangladesh	Digital	Bangladesh	GSB and USGS
181	GSB	Geology	Engineering geological map of Dhaka	Hardcopy	Dhaka city	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
182	GSB	Geology	Engineering geological map of Juldia, Anwara	Hardcopy	Juldia, Anwara, CTG	Slope Instability and Construction Damage at Mercantile Marine Academy, Chittagong District, Bangladesh (Vol-3, Part-1, 1981)
183	GSB	Geology	Fault line data of Maddyapara, Dinajpur	Hardcopy	Maddyapara, Dinajpur	Geology of Madhyapara Area, Dinajpur District, Bangladesh (Vol-5, Part-2, 1987)
184	GSB	Geology	Fault line of Habiganj	Hardcopy	Habiganj	Geology of the Southern Part of Habiganj District, Bangladesh (Vol-10, Part-2, 2003)
185	GSB	Geology	Faults and lineament data of part of Dhaka, Gazipur, Tangail and Mymensingh	Hardcopy	Part of Dhaka, Gazipur, Tangail and Mymensingh	Geology of Madhupur Tract and Its Adjoining Areas in Bangladesh (Vol-5, Part-3, 1988)
186	GSB	Geology	Faults and Tectonic contacts of Bangladesh	Digital	Bangladesh	GSB and USGS
187	GSB	Geology	First vertical derivative of SBA, Dinajpur - Rangpur area	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
188	GSB	Geology	First Vertical derivative of V, Dinajpur-Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
189	GSB	Geology	Flood hazard map of Dhaka	Hardcopy	Dhaka city	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
190	GSB	Geology	Frequency filtred Bouguer anomaly field,Dinajpur-Rangpur area:High- pass field,cut-off wavelength 10 km.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
191	GSB	Geology	Frequency filtred Bouguer anomaly field,Dinajpur-Rangpur area:Low- pass field,cut-off wavelength 10 km.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
192	GSB	Geology	Frequency filtred magnetic field intensity ,Dinajpur-Rangpur area:	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
193	GSB	Geology	Frequency filtred vertical magnetic field intensity ,Dinajpur-Rangpur area: High-pass field,cut-off wavelength 10 km.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
194	GSB	Geology	Generalized Physiographic map of Bangladesh	Digital	Bangladesh	GSB and USGS
195	GSB	Geology	Generalized tectonic map of Bangladesh (Source: GSB, 1990)	Hardcopy	Bangladesh	Petrographic Study of Some Core Samples of Basement Rocks Collected from Different Drill holes of Northern Part of Bangladesh (Vol-10, Part-5, 2004)
196	GSB	Geology	Generalized tectonic map of Bangladesh (source: USGS & GSB, 2001)	Digital	Bangladesh	GSB and USGS
197	GSB	Geology	Generalized Tectonic Map of Bangladesh and adjoining areas.	Hardcopy	Bangladesh	Geological Map and Report of the Western Part of Rajshahi District, Bangladesh, by Md. Anwarul Huq, John.W. Whitney, Sujit Kumar Das and Reshad Md. Ekram Ali, 1991. (Rec. GSB. Vol-6, Pt-1)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
198	GSB	Geology	Geological structural of the Barapukuria basin.(after ANON,1991).	Hardcopy	Dinajpur District.	Geology and Coal Deposit of Barapukuria Basin, Dinajpur District, Bangladesh, by M. Abu Bakr, Q.M. Arifur Rahman,M.Mahtabul Islam.Md. Khairul Islam, Md. Nehal Uddin,, Sayed Ali Resan, Md. Jamal Haider, Md.Sultan-Ul- Islam, Md. Wazed Ali, Mokbul-E-Ala Chowdhury, Kamrul Hasan Mannan, and A.N.M Hebrul Anam,1996. (Rec. GSB. Vol-8, Pt-1)
199	GSB	Geology	Geological data of Baliajuri, Sribardi, Sherpur	Hardcopy	Baliajuri, Sribardi, Sherpur	Glass Sand Deposits of the Balijuri Area, Sherpur District, Bangladesh (Vol-3, Part-4, 1985)
200	GSB	Geology	Geological data of Barguna	Hardcopy	Barguna	Geology of Barguna District, Bangladesh (Vol-10, Part-3, 2003)
201	GSB	Geology	Geological data of Bijoypur, Netrakona	Hardcopy	Bijaypur, Netrakona	White Clay (Kaolin) Deposits of Bijaipur Area, Netrakona District, Bangladesh (Vol-4, Part-3, 1985)
202	GSB	Geology	Geological data of Chauddagram, Comilla	Hardcopy	Chauddagram, Comilla	Glass Sand Deposits of the Chuddagram Area, Comilla District, Bangladesh (Vol-4, Part-5, 1986)
203	GSB	Geology	Geological data of Habiganj	Hardcopy	Habiganj	Geology of the Southern Part of Habiganj District, Bangladesh (Vol-10, Part-2, 2003)
204	GSB	Geology	Geological data of Maddyapara, Dinajpur	Hardcopy	Maddyapara, Dinajpur	Geology of Madhyapara Area, Dinajpur District, Bangladesh (Vol-5, Part-2, 1987)
205	GSB	Geology	Geological data of part of Chittagong & Cox's Bazar district	Hardcopy	Part of Chittagong & Cox's Bazar district	Geology of Satkania-Dulahazara Area, Chittagong and Cox's Bazar Districts, Bangladesh (Vol-7, Part-4, 1998)
206	GSB	Geology	Geological data of part of Gazipur, Tangail and Mymenshing	Hardcopy	Part of Dhaka, Gazipur, Tangail and Mymensingh	Geology of Madhupur Tract and Its Adjoining Areas in Bangladesh (Vol-5, Part-3, 1988)
207	GSB	Geology	Geological log of DH3/70	Hardcopy	Lalghat,Thirpur, Sunamganj.	Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)
208	GSB	Geology	Geological log of DH4/70	Hardcopy	Lalghat,Thirpur, Sunamganj.	Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
209	GSB	Geology	Geological log of DHI/70	Hardcopy	Lalghat,Thirpur, Sunamganj.	Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985.
210	CSB	Geology	Geological Mao of Bhangarghat	Hardcony	Sunamgani	(Rec.GSB. Vol-4, Pt-1) Limestone Deposits of Bhangerghet, Sunamgani District
210	030	Geology	Quarry with Different Blocks of limestone.	Hardcopy	District.	Bangladesh, by Anisur Rahman and M. Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-2)
211	GSB	Geology	Geological map and Sections of Rowangchari-Ruma Area	Hardcopy	Ruma, Bandarban	Geology of Rawangchari-Ruma Area, Bandarban District, Bangladesh (Rec.GSB.Vol-3,Pt-5, 1985)
212	GSB	Geology	Geological map of Bholaganj, Sylhet	Hardcopy	Bholaganj	Gravel Deposits of Bholaganj and Its Adjoining Areas, Sylhet District, Bangladesh (Vol-5, Part-4, 1988)
213	GSB	Geology	Geological map of Chandraghona - Kaptai area, Rangamati	Hardcopy	Chondraghona- Kaptai, Rangamati	Geology of the Chandraghona-Kaptai Area, Rangamati District, Bangladesh (Rec.GSB.Vol-3,Pt-3 ,1985)
214	GSB	Geology	Geological map of Dhaka Region.	Hardcopy	Greater Dhaka District	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
215	GSB	Geology	Geological map of Dhaka, Bangladesh.	Hardcopy		Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
216	GSB	Geology	Geological map of Mirpur, Dhaka	Hardcopy	Mirpur, Dhaka	Black Clay Deposit of Mirpur Area, Dhaka District,Bangladesh (Vol-3, Part-2, 1985)
217	GSB	Geology	Geological map of Panchagarh	Hardcopy	Panchagarh	Geology of Panchagarh District, Rajshahi Division, Bangladesh (Vol-6, Part-2, 1990)
218	GSB	Geology	Geology map southern part of Khulna- Bagerhat	Hardcopy	Part of the Khulna & Bagerhat	Geology of the Southern Parts of Khulna and Bagherhat Districts, Bangladesh (Vol-9, Part-3, 1994)
219	GSB	Geology	Geologycal map of Hatiya, Noakhali	Hardcopy	Hatiya, Noakhali	Geology of the Hatiya Island, Noakhali District, Bangladesh (Vol-8, Part-2, 1996)
220	GSB	Geology	Geomorphological map of Dhaka.	Hardcopy	Dhaka city	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
221	GSB	Geology	Gravity based structural interpretation of Badarganj-Nawabganj hilli and adjoining areas.	Hardcopy	Rangpur & Dinajpur Districts	Gravity and Magnetic Investigations in the Badarganj- Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury, M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol 7, Pt-3)
222	GSB	Geology	Index Map showing the location of Bore holes	Hardcopy	Madhyapara,Din ajpur	Electrical Resistivity Survey to Locate Shallow Basement Features in Phulbari Area, Dinajpur District, Bangladesh, by Idris Miah and Md. Noor Alam, 1991. (Rec.GSB. Vol-6, Pt-3)
223	GSB	Geology	Isopach Map of overburden at lalghat sunamganj.	Hardcopy	Lalghat,Sunamga nj.	a Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)
224	GSB	Geology	Isopach Map of sylhet limestone and of overburden with different limesotne bloke, lalghat sunamganj.	Hardcopy	Lalghat,Sunamganj.	a Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)
225	GSB	Geology	Isopach Map of sylhet limestone at lalghat.	Hardcopy	Lalghat,Sunamga nj.	a Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)
226	GSB	Geology	Land slope map of Juldia, Anwara	Hardcopy	Juldia, Anwara, CTG	Slope Instability and Construction Damage at Mercantile Marine Academy, Chittagong District, Bangladesh (Vol-3, Part-1, 1981)
227	GSB	Geology	Magnatic second derivative map of Pirganj-Gubra Kutubpur-Bara Hazratpur area.	Hardcopy	Rangpur District	. Regional Gravity and Magnetic Investigations in Pirganj- Khalaspir and Adjoining Areas of Rangpur District, Bangladesh (Vol-9, Part-5, 1997)
228	GSB	Geology	Magnetic anomaly contour map of Badarganj - Hilli area.(1984-1985)	Hardcopy	Rangpur & Dinajpur Districts	Gravity and Magnetic Investigations in the Badarganj- Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury, M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol 7, Pt-3)
229	GSB	Geology	Magnetic second derivative Map of Madhayapara-Hilli and adjoining areas.	Hardcopy	Rangpur & Dinajpur Districts	Gravity and Magnetic Investigations in the Badarganj- Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury, M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol 7, Pt-3)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
230	GSB	Geology	Major lineament of part of the Khulna & Bagerhat (Source: Landsat imagery interpretation map of Bangladesh (Hunting Geology and Geophysics Ltd.1981).	Hardcopy	Part of the Khulna & Bagerhat	Geology of the Southern Parts of Khulna and Bagherhat Districts, Bangladesh (Vol-9, Part-3, 1994)
231	GSB	Geology	Map showing principle gravity and magnetic lineaments,Dinajpur- Rangpur area including depth of the top of Basement(B) and Gondwana(G) from drilling, gravity/magnetics and seismic refration/reflection.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
232	GSB	Geology	Map showing principle structural elements and outline of the Gondwana deposits interpreted from gravity and magnetics,Dinajpur- Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
233	GSB	Geology	Map Showing the drill hole locations and probable out line of the Barapukuria coal deposit area.	Hardcopy	Barapukuria,Din ajpur.	Detailed Gravity and Magnetic Profiling Surveys over Barapukuria Coal Basin Area, Dinajpur District, Bangladesh, by Idris Miah and Md. Noor Alam, 1996. (Rec.GSB. Vol-9, Pt-1)
234	GSB	Geology	Map Showing the Typical areas of some important geological units.	Hardcopy	Bangladesh	Stratigraphic Lexicon of Bangladesh, compiled by Mujibur Rahman Khan and M. Mominullah,1988. (Rec. GSB. Vol-5, Pt-1)
235	GSB	Geology	North-South correlation of stratigraphic sequences in the Barapukuria basin .	Hardcopy	Dinajpur District.	Geology and Coal Deposit of Barapukuria Basin, Dinajpur District, Bangladesh, by M. Abu Bakr, Q.M. Arifur Rahman,M.Mahtabul Islam.Md. Khairul Islam, Md. Nehal Uddin,, Sayed Ali Resan, Md. Jamal Haider, Md.Sultan-Ul- Islam, Md. Wazed Ali, Mokbul-E-Ala Chowdhury, Kamrul Hasan Mannan, and A.N.M Hebrul Anam,1996. (Rec. GSB. Vol-8, Pt-1)

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
236	GSB	Geology	Observed maximum intensity map of	Hardcopy		Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka,
			the Indian subcontinent.			Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and
						Nahid Nasrin, 1999.(ESCAP)
237	GSB	Geology	Panel Diagram Showing the Sylhet	Hardcopy	Lalghat,Sunamga	Limestone Deposits of Lalghat, Sunamganj, District,
			Linestone Along with its overburden		nj.	Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985.
			at lalghat			(Rec.GSB. Vol-4, Pt-1)
238	GSB	Geology	Possible relationship between	Hardcopy	Maddyapara,	Geology of Madhyapara Area, Dinajpur District, Bangladesh
			subsurface structures and		Dinajpur	(Vol-5, Part-2, 1987)
			Physiography of Maddyapara and			
			surrounding area, Dinajpur			
239	GSB	Geology	Potential ground subsidence hazard in	Hardcopy	Dhaka city	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka,
			Dhaka.			Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and
240	COD	<u> </u>		** 1	D : : 0	Nahid Nasrin, 1999.(ESCAP)
240	GSB	Geology	Regional Bouguer anomaly map of	Hardcopy	Pirganj &	Regional Gravity and Magnetic Investigations in Pirganj-
			Pirganj and adjoining area, Rangpur		adjoining areas	Khalaspir and Adjoining Areas of Rangpur District,
- 241	COD	0.1		TT 1		Bangladesh (Vol-9, Part-5, 1997)
241	GSB	Geology	Regional Bouguer anomaly map of	Hardcopy	Mithapukur -	Regional Gravity and Magnetic Survey of the Mitapukur-
			ne Mitnapukur - Madarpur area,		Madarpur,	Madarpur Area, Kangpur District, Bangiadesn (Vol-8, Part-5,
242	CSD	Caslary	Rangpur Designal Magnetic Anomaly Man of	Handaama	Rangpur Dan annun Diatniat	1998) Designed Crewity and Magnetic Investigations in Diagoni
242	GSB	Geology	Regional Magnetic Anomaly Map of	нагасору	Rangpur District.	Kegional Gravity and Magnetic Investigations in Pirganj-
			Pirganj and adjoining area.			Ranaspir and Adjoining Areas of Rangpur District,
242	CSD	Caology	Pagional Magnit Anomaly Man of	Uardoony	Mithopulaur	Baligiadesii (V01-9, Part-3, 1997) Bagional Cravity and Magnetic Survey of the Mitenulaur
243	USD	Geology	the Mithepulaur	пансору	Madarpur	Mederbur Area Bangbur District Bangledesh (Vol & Bart 5
			the Withapukut		Nauarpur,	1008)
244	GSB	Geology	Residual Bouquer Anomaly Man of	Hardcony	Mithanukur -	Regional Gravity and Magnetic Survey of the Mitanukur-
277	000	Geology	the Mitanukur	mardeopy	Madarpur	Madarpur Area Rangpur District Bangladesh (Vol-8 Part-5
			the Wittapukur.		Rangnur	1998)
245	GSB	Geology	Residual Gravity anomaly map of	Hardconv	Dinainur	Gravity and Magnetic Investigations in the Badargani-
245	000	Geology	Nawabgani Hilli area	mardeopy	District	Nawabgani-Hilli and Adjoining Areas Rangpur and Dinainur
			Trancogung Thin area.		District.	Districts Bangladesh by M A Rahman N A Chowdhury
						M.N.Hasan, Idris Miah, and M.N.Alam, 1994, (Rec GSB, Vol
						7. Pt-3)
						M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol 7, Pt-3)

SL	Organization	Data group	Data set name	Data	Data extent	Data source
		<u> </u>		Format	<u> </u>	
246	GSB	Geology	Residual Gravity anomaly map of	Hardcopy	Rangpur &	Gravity and Magnetic Investigations in the Badarganj-
			Badarganj - Nawabganj area		Dinajpur	Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur
					Districts	Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury,
						M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol
						7, Pt-3)
247	GSB	Geology	Residual Gravity anomialy map of	Hardcopy	Rangpur District.	. Regional Gravity and Magnetic Investigations in Pirganj-
			Pirganj and adjoining area.			Khalaspir and Adjoining Areas of Rangpur District,
						Bangladesh (Vol-9, Part-5, 1997)
248	GSB	Geology	Results of Chemical analyses of Clay	Hardcopy	Khulna and	Geology of the Southern Parts of Khulna and Bagherhat
			Samples of the Mapped area in		Bagerhat	Districts, Bangladesh, by Md. Anwarul Azeem and Md.
			Khulna and Bagurhat District.		Districts.	Khalequzzaman,1994. (Rec.GSB. Vol-9, Pt-3)
249	GSB	Geology	Results of Chemical analyses of peat	Hardcopy	Khulna and	Geology of the Southern Parts of Khulna and Bagherhat
			samples of the Mapped area in		Bagerhat	Districts, Bangladesh, by Md. Anwarul Azeem and Md.
			Khulna and Bagurhat District.		Districts.	Khalequzzaman,1994. (Rec.GSB. Vol-9, Pt-3)
250	GSB	Geology	Second Derivative of Bouger	Hardcopy	Rangpur &	Gravity and Magnetic Investigations in the Badarganj-
			anomaly map of Badarganj Hilli and		Dinajpur	Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur
			adjoning areas.		Districts	Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury,
						M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol
						7, Pt-3)
251	GSB	Geology	Second Derivative of Bouger	Hardcopy	Rangpur District.	. Regional Gravity and Magnetic Investigations in Pirganj-
			anomaly map of Pirganj and adjoning			Khalaspir and Adjoining Areas of Rangpur District,
			areas.			Bangladesh (Vol-9, Part-5, 1997)
252	GSB	Geology	Second order polynominal residual,	Hardcopy	Dinajpur-	Digital Processing and Interpretation of Gravity and Magnetic
			Bouguer anomaly map.		Rangpur area	Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman,
						Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
253	GSB	Geology	Shows the geological Co-Rellation of	Hardcopy		Sub-surface Geology and Prospect of Mineral Resources in
			EDH-16,18 and 22.			the Patnitola Area, Naogaon District, Bangladesh, by
						Abdullah Manwar and Md. Khurshid Alam, 1998. (Rec.
						GSB. Vol-8, Pt-3)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
254	GSB	Geology	Simple Bouguer anomaly contour map of Badarganj - Hilli area.(1984- 1985)	Hardcopy	Rangpur & Dinajpur Districts	Gravity and Magnetic Investigations in the Badarganj- Nawabganj-Hilli and Adjoining Areas, Rangpur and Dinajpur Districts, Bangladesh, by M.A. Rahman, N.A. Chowdhury, M.N.Hasan, Idris Miah, and M.N.Alam, 1994. (Rec.GSB. Vol 7, Pt-3)
255	GSB	Geology	Simple Bouguer gravity anomaly (SBA) map (Color version) Dinajpur Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
256	GSB	Geology	Simple Bouguer gravity anomaly (SBA) map Dinajpur Rangpur area showing the locations of modeled profiles.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
257	GSB	Geology	Simple Bouguer gravity anomaly (SBA) map Dinajpur Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
258	GSB	Geology	Stratigraphic section along Bandarban-Keranirhat roadside, Bandarban	Hardcopy	Bandarban- Keranihat	Stratigraphic Section, Bandarban Area, Bandarban District, Bangladesh (Vol-10, Part-4, 2003)
259	GSB	Geology	Surface geology map of Bangladesh	Digital	Bangladesh	GSB and USGS
260	GSB	Geology	Tectonic Map of Bangladesh	Hardcopy	Bangladesh	Geology of Madhyapara Area, Dinajpur District, Bangladesh, by Anisur Rahman, 1987. (Rec.GSB.Vol-5,Pt-2)
261	GSB	Geology	Tectonic map of Bangladesh (source: Khan & Akther - 1982)	Hardcopy	Bangladesh	Stratigraphic Lexicon of Bangladesh (Vol-5, Part-1, 1988)
262	GSB	Geology	Tectonic map of Dhaka Region.	Hardcopy	Greater Dhaka District	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
263	GSB	Geology	Topographic map showing location of drill holes at lalghat	Hardcopy	Lalghat,Sunamga nj.	a Limestone Deposits of Lalghat, Sunamganj, District, Bangladesh, by Anisur Rahman and M.Nazrul Islam, 1985. (Rec.GSB. Vol-4, Pt-1)

SL	Organization	Data group	Data set name	Data Format	Data extent	Data source
264	GSB	Geology	Two -Dimensional model studies (manual) of a thick prism on profile M1 M1 of Barahazratpur -Gubra kutubpur area.	Hardcopy	Rangpur District.	Regional Gravity and Magnetic Investigations in Pirganj- Khalaspir and Adjoining Areas of Rangpur District, Bangladesh (Vol-9, Part-5, 1997)
265	GSB	Geology	Urban expansion of Dhaka City form 1858 to 1950.	Hardcopy	Dhaka city	Atlas of Urban Geology, Vol. II, Urban Geology of Dhaka, Bangladesh, by A.T.M Asaduzzaman, Harold Olsan and Nahid Nasrin, 1999.(ESCAP)
266	GSB	Geology	Vertical magnatic field intensity (V) map,Dinajpur-Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
267	GSB	Geology	Vertical magnatic field intensity reduced to pole ,Dinajpur-Rangpur area.	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh, by M.A Rahman, Idris Miah and H.R. Blank, 2000. (Rec. GSB. Vol-10, Pt-1)
268	GSB	Geology	Vertical magnetic field intensity map, Dinajpur - Rangpur area showing the locations of modeled profiles	Hardcopy	Dinajpur- Rangpur area	Digital Processing and Interpretation of Gravity and Magnetic Data, Rangpur-Dinajpur Area, Bangladesh (Vol-10, Part-1, 2000)
269	Journal & Society	Geology	Generalized Neotectonic setting of the GBM delta	Hardcopy	Bangladesh	Oriental Geographer, vol 46, No 2, July 2002 - Bangladesh Geographical Society
270	Journal & Society	Geology	Tectonic active trends derived from tectonic flux characterization	Hardcopy	Bangladesh	Bangladesh Journal of Geology, Vol 20, 2001 - Bangladesh Geological Society
271	Khulna Development Authority	Landuse	Khulna Development Authority landuse map	Hardcopy	Khulna city	KDA
272	Khulna Development Authority	Other	Khulna Development Authority drainage system map	Hardcopy	KDA bnd	KDA
273	LGED	Borehole	Subsoil /borelog profiles of different bridges and hydraulic structures	Hardcopy		LGED
274	OCHA	Hazard	Landslides	Digital	Hathazari, Chittagong	ОСНА

SL	Organization	Data group	Data set name	Data	Data extent	Data source
				Format		
275	Petrobangla	Earthquake	Deep seismic data, borehole logging data	Hardcopy		Petrobangla
276	Petrobangla	Geology	Geological data (deep drilling)	Hardcopy		Petrobangla
277	Private housing	Borehole	Borelogs with SPT value (GPS	Hardcopy	Dhaka city	Creative Soil Investigation
	developers		survey)			-
278	Rajshahi	Geology	Location of fault, lineament, erosion	Hardcopy	Rajshahi city	RDA master plan
	Development		and siltation prone areas of Rajshahi			
	Authority		city			
279	Rajshahi	Landuse	Landuse data of Rajshahi city	Hardcopy	Rajshahi city	RDA master plan
	Development					
	Authority					
280	Rajshahi	Other	Existing landuse of the structure plan	Digital	Rajshahi city	Progress and Service of Govt.& Non-Govt. Organizations for
	Development		area of Rajshahi city			the Development Of Rajshahi Metropolitan City Zahidul
	Authority					Islam M.SC.Sept.2009
281	Rajshahi	Other	Rajshahi Development Authority	Hardcopy	Rajshahi city	RDA master plan
	Development		Functional Master Plan			
	Authority	0.1	DI 1 1 1 1005 2005	** 1	DI I I	
282	RAJUK	Other	Dhaka urban area plan, 1995 - 2005	Hardcopy	Dhaka city	Dhaka Metropolitan Development Plan (1995 - 2015), vol 2
283	RAJUK	Other	Structure Plan, 1995 - 2015	Hardcopy	Dhaka city	Dhaka Metropolitan Development Plan (1995 - 2015), vol 1
284	RHD	Borehole	Geotechnical/subsoil investigation	Hardcopy		RHD
			data for different bridges	1.		
			-			
285	UN, ESCAP	Geology	Geological map of Keraniganj	Hardcopy	Keraniganj	Geology for Land-use Planning in Tropical Deltas, Greater
			upazila, Dhaka		Upazila, Dhaka	Dhaka City (Keraniganj Upazila), Bangladesh (Vol-5, 1991)
286	UN, ESCAP	Landuse	Current landuse map of Keraniganj	Hardcopy	Keraniganj	Geology for Land-use Planning in Tropical Deltas, Greater
			upazila, Dhaka		Upazila, Dhaka	Dhaka City (Keraniganj Upazila), Bangladesh (Vol-5, 1991)
287	UN, ESCAP	Other	Mineral resources map of Keraniganj	Hardcopy	Keraniganj	Geology for Land-use Planning in Tropical Deltas, Greater
			upazila, Dhaka	15	Upazila, Dhaka	Dhaka City (Keraniganj Upazila), Bangladesh (Vol-5, 1991)
			• ·		• '	
288	Variuos	Borehole	Borehole profile location		Bangladesh	
289	WARPO	Borehole	Borehole locations maintained by BWDB/BADC	Digital	Bangladesh	Questionnaire survey

SL	Organization	Data group	Data set name	Data	Data extent	Data sou	irce
				Format			
290	WARPO	Borehole	Lithological information collected by	Digital	Bangladesh	Questionnaire survey	
			BWDB/BADC				
291	WARPO	Earthquake	Point of Epicenter of earthquake with	Digital	Bangladesh	Questionnaire survey	
			magnitudes				
292	WARPO	Earthquake	Seismic risk map of Bangladesh,	Digital	Bangladesh	Questionnaire survey	
			1992				
293	WARPO	Geology	Overall geological (alluvial deposits	Digital	Bangladesh	Questionnaire survey	
			and bed rock) formation of the				
			country				

Atlas: Geological data catalog

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Observed maximum seismic intensity map based on data upto 1975	3	Geological data of Chauddagram, Comilla
Possible earthquakes induced liquifaction hazard map of Dhaka city	4	Geological map of Panchagarh
Seismic velocity location map of Dhaka city	5	Regional Bouguer anomaly map of Pirganj and a
Location map of the Seismic refraction profile in Phulbari-Barapukuria area, Dinajpur	6	Geological map of Chandraghona - Kaptai area,
Major tectonic zones, basement faults and the epicenter of an earthquake	7	Fault line data of Maddyapara, Dinajpur
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Cyclone vulnerable zone map	12	SPT Zonation map from 10 to 15 m depth of Kh
Landslides	13	Env. Geology map for sustainable land developn
Tarnado affected areas	14	Peak ground acceleration (PGA) map of Dhaka c
Cyclone affected areas	15	Tectonic active trends derived from tectonic flux
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Generalized tectonic map of Bangladesh (source: USGS & GSB, 2001)	17	Borehole locations and lines of geological cross
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Population distribution under different earthquake zones







Division	Zone I	Zone II	Zone III
Barisal	8053518		
Chittagong	3386164	19509204	1151162
Dhaka	4587876	17543884	15961051
Khulna	12357843		
Rajshahi	9371604	16558880	7508023
Sylhet			7923219
Total	37757005	53611968	32543454

Isoseismal of major earthquakes in and around Bangladesh











Observed maximum seismic intensity map based on data upto 1975













Possible earthquakes induced liquifaction hazard map of Dhaka city





Location map of seismic velocity in Dhaka city

0 1.5 3	6 Å
Kilometers	W - E
Scale - 1:110,000	¥ S
Prepared by: C≈GIS	Prepared for.
	Map - 5

Seismic refraction profile map of part of Dinajpur district













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

 $\alpha \alpha$	n - n

- Seismic point
- --- Gravity contour
- --- Seismic refraction profile
- Regional highway
- Feeder road type A
- Feeder road type B
- --- Rural road
- Railway

Upazila boundary

Note:

This Location map of the Seismic refraction profile in Phulbari-Barapukuria area, Dinajpur area prepared by Geological Survey of Bangladesh in 1995. This map has been prepared to show the location of Seismic Reflection Profile and Previous Seismic Shot Point of the study area. The purpose of the study was to investigate the subsurface condition of the area.

Usage of geological and associates data: Geological and associates data are used as the tools to the geologist, engineers, environmental planning disaster management and risk reduction planning activities. Geological data are used to (i) interpret the stucture, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust, (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (eg. landslides, earthquake fault zores, areas susceptible to liquefaction, floods, volcances and tsuramis et.) and (vi) identify and determine suitable areas for urb and development.











May 2009

Foundation failure hazard map of Dhaka city















Map of expansive soil hazard in Dhaka city

Inventory and cataloging of geological data

paleontology, and the historical record of the earth's crust, (ii) locate energy resources,

0	1.6	5 3	6	Ň
-		Kilometers		w -{€> e
	Scale -	1:110,000		ŝ
repared by	⊂ C≋	€GIS	Prepared for.	CDMP





Possible subsidance hazard map of Dhaka city













Map of water logging (rain induced) hazard prone areas of Dhaka city



Cyclone vulnerable zone map of Sitakunda upazila, Chittagong district

Landslides map of Hathazari upzaila, Chittagong district













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend







Population distribution under tornado affected areas

	Population (BBS 2001)					
Divis ion	Total	Tornado prone area	Severe Storm area			
Barisal	8179123	1708522	2355967			
Chittagong	24264078	9189384	6416886			
Dhaka	38092810	18381431	9538104			
Khulna	12373638		4850525			
Rajshahi	33474908	3968343	9937464			
Sylhet	7939343	2555566				



Population distribution under cyclone risk areas







District	Population (BBS 2001)				
	Wind Risk	Risk	High Risk	Total pop	
Bagerhat	877609	171809	499616	1549031	
Bandarban	298120			298120	
Barguna	289899	169289	389364	848554	
Barisal	2038756	239759	77452	2355967	
Bhola	126355	42026	1540138	1708522	
Chandpur	1468855			2244923	
Chittagong	5045731	368741	1197669	6612140	
Comilla	1790319			4595557	
Cox'S Bazar	521743	237327	1014639	1773709	
Feni	1096777	70798	72809	1240384	
Gopalganj	653109			1165273	
Jessore	384324			2471554	
Jhalokati	694231			694231	
Khagrachhari	462870			525664	
Khulna	1822338	239646	315236	2378971	
Lakshmipur	1140773	211512	137616	1489901	
Madaripur	506088			1146349	
Narail	151337			698447	
Noakhali	1296000	124920	1156323	2577244	
Patuakhali	627570	180694	652515	1460781	
Pirojpur	919531	168860	22677	1111068	
Rangamati	358175			508182	
Satkhira	1332606	145013	325467	1864704	
Shariatpur	506604			1082300	





Division	No data	No arsenic	0.1% - 25%	26% - 50%	> 50%
Barisal	238	5899	2458	764	543
Chittagong	15261	4900	1350	2582	7201
Dhaka	192	9731	9393	3437	8260
Khulna	1247	2363	4869	6299	5952
Rajshahi	49	25669	6031	1767	939
Sylhet		4467	2795	3089	2070



Generalized Tectonic Map of Bangladesh



Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Division	Barisal	Borga	Faridpur	Hatia	Indo-	Bangpur	Sylhet
	Gravity	Shelf	Trough	Trough	Burman	Platform	Trough
	High				Ranges		
Barisal	9 79 2		516	1768			
Chittagong	6914		871	3592	21837		
Dhaka	727	3571	19085				6567
Khulna	345	1663	13901				
Rajshahi		11449	2402			16544	
Sundarbans	1372		4250				
Sylhet	0	160	115		4317		7788

Divisionwise area in sqkm under major tectone zones

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Geological Data Catalogue



Faults and Tectonic contacts of Bangladesh









Bouguer gravity anomaly map of Bangladesh



Surface geology map of Bangladesh









Alluvial sand	Estuarine deposit
Alluvial silt	Girujan clay
Alluvial silt and clay	Jaintia group
Barail formation	Madhupur Clay residuum
Barind Clay residuum	Mangrove swamp deposit
Beach and dune sand	Marsh clay and peat
Bhuban formation	Old gravelly sand
Bokabill formation	St. Martin limestone
Chandina alluvium	Tidal deltaic deposit
Deltaic sand	Tidal mud
Deltaic silt	Tipam sandstone
Dihing & Dupitila formations	Valley alluvium & colluvium
Dihing formations	Young gravelly







Geological Map of Baliajuri, Sribardi upazila, Sherpur



North America

Sout

World



Projection

False Easting:

Scale Factor.

Ellipsoid: Units:

Geological map of Keraniganj Upazila, Dhaka







Acd - Abandoned channel deposit
Cdla - Channel deposit, Lateral bar
Cdp - Channel deposit, Point bar
Cdt - Channel deposit, Transverse bar
Fbd - Flood basin deposit
Fpd - Flood plain deposit
Lake/Pond, artificial
NId - Natural levee deposit
Oxd - Ox-bow lake deposit













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Thana Abandoned Active natural Flood Madhupur **DI**d levee.flood Channeland Plain Clau natura depression Plain, point & and levee and bar Gally F il I Badda 23.74 10.67 0.01 14.75 2.91 6.49 Cantonment Demra 1.42 16.6 3.27 0.41 Dhanmondi 0.58 0.09 3.13 0.74 Gulshan 2.49 6.84 0.13 Hazaribagh 2.33 0.29 0.94 9.29 Kafrul KamrangirChar 2.56 0.04 0.01 Khilgaon 7.44 11.31 3.61 0.43 Kotwali 1.13 0.93 1.16 Lalbag Mirpur 2.1 0.55 0.12 5.76 0.41 Mohammadpu 4.05 0.19 0.88 2 Motijheel 0.91 3.89 0.01 0.88 Pallabi 11 10.12 6.14 1.46 Bamna 0.27 Sabujbagh 1.75 9,41 0.88 1 Shyampur 0.36 0.48 Sutrapur 1.97 0.97 0.03 Tejgaon 2.03 0.16 7.26 1.27 17.38 2.02 36.81 Uttara

Thana wise morphological unit area in sqkm

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Geomorphological map of Manikganj sadar upazila, Manikganj











Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

 National highway
Union boundary
arcv - Channel bar
csp - Crevasse clay deposits
fb - Flood basin deposits
fp - Floodplain deposits
alrb - Lateral Bar
nl - Natural levee deposits
arpb - Point ban
asc - Seasonal channel

Usage of geological and associates data:

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1.5 Kilometers Scale - 1:115,000 Prepared by: Prepared for. C≋GIS CDMP

Map - 25



Geological map of Madhyapara, Dinajpur



Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness





Usage of geological and associates data:

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May 2009

Geological map of Bholaganj, Sylhet









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness



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Map - 27



Geological map of Chauddagram, Comilla









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

Union boudary
 Flood Plain Deposit
 Glass Sand Lens
 Piedmont Deposit (Qpd)
 Pond
 Red Clay (Prc)

Usage of geological and associates data:

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1.25 2.5 Kilometers Scale - 1:100,000 Prepared by: Prepared for. C≋GIS CDMP

Map - 28





Geological map of Panhagarh District









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

Geo	Geological unit					
	Abandoned-meander fill					
	Active channel-bar deposits					
	Active point-bar deposits					
	Fan surface alluvium					
	Fan terrace alluvium					
	Flood-plain deposits					
	Lake or swamp deposits					
	Relict Tista valley deposits					
	Relict natural-Levee deposits					
	Relict-channel fill					

Usage of geological and associates data:

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3.5 Kilometers Scale - 1:300,000 Prepared by: Prepared for: C≋GIS CDMP





Regional bouguer anomaly map of Pirganj and adjoining area, Rangpur district









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

> CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

— Bauguer anomaly contour



Upazila boundary

Usage of geological and associates data:

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2.5 Kilometers Scale - 1:200,000 Prepared by: Prepared for. C≋GIS CDMP





Geological map of Chandraghona - Kaptai area, Rangamati district









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

> CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness



Geological and associates data are used as the tools to the geologists, engineers, environmentalists, disaster managers and plannes for structural planning, environmental planning disaster management and risk reduction planning activities Geological data are used to (i) interpret the structure, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust, (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (e.g. landslides, earthquake fault zones, areas susceptible to liquefaction, floods, volcances and tsunamis etc.) and (vi) identify and determine suitable areas for urban development.

1.25 2.5 Kilometers Scale - 1:95,000 Prepared by: Prepared for. C≋GIS CDMP





Fault lines map of Maddyapara area, Dinajpur and Rangpur districts









Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

> CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

- Upazila boundary
- Major river
- ----- Khal

Faults line

- --- Fault / Lineament (F)
- G— Fault detected by drilling (DF)
- Gravity fault (GF)
- ---- Magnetic fault (MF)

Usage of geological and associates data:

Geological and associates data are used as the tools to the geologists, engineers, environmentalists, disaster managers and planners for structural planning, environmental planning disaster management and risk reduction planning activities. Geological data are used to (i) interpret the structure, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust, (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (e.g. landslides, earthquake fault zones, areas susceptible to liquefaction, floods, volcances and tsunamis etc.) and (vi) identify and determine suitable areas for urban development.

0	1.5 Scale	3 Kilometers - 1:100,000	6 w~	е s
	Prepared t	^{ay.} SIS	Prepared for.	

Residual Gravity anomaly map of Badarganj - Nawabganj area













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

- 🔺 Upazila HQ
- ---- Rasidual gravity anomaly contour
- --- International boundary
- ---- District boundary
- ----- Upazila boundary
- ---- National highway
- - Regional highway
- 🗕 Railway

Usage of geological and associates data:

Geological and associates data are used as the tools to the geologist, engineers, environmentalists, disaster managers and planners for structural planning, environmental planning disaster management and risk reduction planning activities. Geological data are used to (i) interpret the structure, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (e.g. landslides, earthquake fault zones, areas susceptible to liquefaction, floods, volcances and trunamis etc.) and (vi) identify and determine suitable areas for urb and evelopment.

0	2	4 Kilometel Scale -	rs 1:180,000	8	W S E
	Prep C	ared by: EGI	S		Prepared for:

Мар - 33

Gravity based structural interpretation of Badarganj-Nawabganj hilli and adjoining areas











Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

- Faults
- Deeperbasement
- ---- Shallow basement
- 🔺 🛛 Upazila HQ
- --- International boundary
- ---- District boundary
- ----- Upazila boundary
- ----- National highway
- - Regional highway
- 🗕 Railway

Usage of geological and associates data:

Geological and associates data are used as the tools to the geologist, engineers, environmentalists, disaster managers and planners for structural planning, environmental planning disaster management and risk reduction planning activities. Geological data are used to (i) interpret the structure, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust, (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (e.g. landshdes, earthquake fault zones, areas susceptible to liquefaction, floods, volcances and tsunamis etc.) and (vi) identify and determine suitable areas for urb an development.

0	2.5 + Sc	5 Kilometi ale -	ers 1:216,435	10	W S E
	Prepar	ed by:	S		Prepared for.

Geological map of southern part of Khulna - Bagerhat districts













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness

Legend

Geological unit

ac - Abondoned channel deposits
fb - Flood plain deposits
ms - Mangrove swamp deposits
nl - Natural levee deposits
ol - Oxbow - lake deposits
pb1 - Point bar deposits of past fluviotidal cycle
pb2 - Point bar deposits of present fluviotidal cycle
sb - Sand bar deposits
sc - Stream channel
sw - Swale deposits
tf1 - Tidal flat deposits from baggy
tf2 - Tidal flat deposits from swamp
ud - Undifferentiated depression deposits

Usage of geological and associates data:

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0 4 8	16 V E
Kilometers Scale - 1:265,000	s s
Prepared by:	Prepared for.
C≋GIS	CDMP

















Map - 36

















Environmental Geology map for sustainable land development and planning of Dhaka city











Geological Data Catalogue



Z3*50'0"N

N"0'34" SZ

Z3*40'0"N



Peak ground acceleration (PGA) map of Dhaka city









Borehole location map of Maddypara, Dinajpur district













Geo-hazard Related Maps

Inventory and cataloging of geological data sources, types and availability

CDMP EC-Funded Component 4a Earthquake and Tsunami Preparedness





Usage of geological and associates data:

Geological and associates data are used as the tools to the geologist, engineers, environmentalists, disaster managers and planners for structural planning, environmental planning disaster management and risk reduction planning activities. Geological data are used to (i) interpret the structure, stratigraphy, mineralogy, paleontology, and the historical record of the earth's crust, (ii) locate energy resources, (iii) locate sources of groundwater and mineral deposits (iv) identify areas that may contain potential mineral hazards and geologic hazards (eg. Landshdes, earthquake fault zones, areas susceptible to liquefaction, floods, volcances and tsunamis etc.) and (vi) identify and determine suitable areas for urb an development.

0.5 Kilometers Scale - 1:50,000 Prepared by: Prepared for. C≋GIS CDMP







Current landuse map of Keraniganj Upazila, Dhaka











Mineral resources map of Keraniganj Upazila, Dhaka











Map showing borehole location with lithological information





The borelog / lithological data can be used for study the seismic hazard assessment, Liquefaction hazard modeling and seismic microzonation. It can also be used to locate possible faults that do not reach the surface. Depth of Pliocene base can also be identified from borehole information. Geological characterization of a site or place can be assessed using borehole with standard penetration test (SPT)-N values and other geophysical data. Further, Borehole data is also used to evaluate the geo-technical properties of the subsoil. Another important use of borehole data with detail lithological profile is evaluates the bearing capacity of soil and type of foundation to be suitable for the sub-soil condition for construction purpose.

Lineage of the data layer:

Bangladesh Bridge Authority (BBA) has carried out the subsoil investigation for bridge site and approach road of Buriganga Bridge at Basial area, during the period of 2000. The purposes of this investigation to present in detail of the subsoil information of the proposed bridge area.

Grey loose SILT, trace fir sand, non-plastic (ML) Grey medium dense SILT fine sand, non-plastic (M Grey loose SILT, little fin sand, non-plastic (ML) Grey medium dense fine some silt, non-plastic (SI Grey medium dense SILT fine sand, non-plastic (M Light grey dense fine SAI little silt, non-plastic (SM D 15 Z Light grey very dense fine D 16 some silt, non-plastic (SN Light grey very dense fir D 17 with some medium sand non-plastic (SP-SM) D 18 D 19 ZA Light grey very dense fine SAND, little silt, very trac mica, non-plastic (SP-SM D 20 D 21 Z D 22 D 23

Data source:

Buriganga Bridge at Basila Bangladesh Bridge Authority (BBA)

0.3

Scale -

1:45.000	

Borehole location: BH - 1, Bridge across Buriganga river at Basila, Dhaka

RECORD OF BORING AND TESTING

Existing Ground

Ground Water Le

Date Starting : 13

Date Completion

STRATIFICATION

DESCRIPTION OF SOIL STRATA

Level (EGL) :(+) 4.50 m el : 4.30 m below EGL		LEGE	LEGENO SAND III MICA										
03.2000 Time : 10.00	M.M			CLA	Y		2	SPT+ DISTURBED SAMPLE					
15.03.2000Time : 1.30 P	M	6.0		ORG	ANIC			UNDISTURBED SAMPLE					
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				-	STAND	ARD	PENE	TRATION TEST (SPD					
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	POR	ater)	H	DON PI	ATION	/alu	/alu	GRAPHICAL REPRESENTATION					
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	+												
	5.	- 33	14	26	43	69	41						
	+	1.											
	1203233	- 34.5	14	25	45	70	41						



Map showing borehole location with lithological information

90**°**34'0"E

90°32'0"E

MadanganjBandar

бн-2

Munshiganj Sadar

Lineage of the data layer:

Muktarpur^{BH-3}

BH - 2

90°32'0"E

Legend

Borelog

River

Munshigonj

National highway

Regional highway

Feeder road type - A

Feeder road type - B

Sonardaon Gazaria



Data source:

Dhaleshwari Bridge at Muktarpur Bangladesh Bridge Authority (BBA)

0.5

Scale -

1:75,000

90°34'0"E

May 2009

ceres (EGE) :(+) 4.30 m		LEG	ND	-										
el : 1.60 m below EGL				AN	D		MICA REAL							
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		-												
		- 37.5						+	+		-			
		- 30												







Map showing borehole location with lithological information

2.15

2.10

2 50"N

90°35'0"E

Legend

🖲 Borelog

Char Kajal

90°35'0"E

Upazila boundary

Union boundary

National highway

Regional highway

Feeder road type - A

Feeder road type - B



0	2	4		8
	ĸ	ilomet	ers	
	Sca	1e -	1:226,684	



May 2009





Prepared by:


Map showing borehole location with lithological information



Borelog / Lithology data description

The borelog / lithological data can be used for study the seismic hazard assessment, Liquefaction hazard modeling and seismic microzonation. It can also be used to locate possible faults that do not reach the surface. Depth of Pliocene base can also be identified from borehole information. Geological characterization of a site or place can be assessed using borehole with standard penetration test (SPT)-N values and other geophysical data. Further, Borehole data is also used to evaluate the geo-technical properties of the subsoil. Another important use of borehole data with detail lithological profile is evaluates the bearing capacity of soil and type of foundation to be suitable for the sub-soil condition for construction purpose.

Lineage of the data layer:

Local Government Engineering Department (LGED) of Government Republic of Bangladesh has carried out the subsoil investigation of sub-project Bajuajora Khal, Bhaluka, Mymensingh by the joint consultancy of Development Design Consultants Ltd. and National Soil Engineers during the period of 2007. The purposes of this investigation to find out the ascertain depth, sequence and thickness of various soil strata and boring capacity of the sub-soil for safe and economic design of the proposed structure.

Data source:	0 1.5 3 6	X
Local Government Engineering Department (LGED)	Kilometers	W-C-E
	Scale - 1:220,000	ŝ

Bore F	Iole No	. 01 RL: 10.03m
DEPTH IN METER	THICK- NESS	CLASSIFICATION OF SOIL E.G.L: RL 10.03m
RL 7.83	2.20m	Bluish grey medium plastic CL/ (Soft)
RI	4.10m	Light brown & grey medium plas CLAY. (Very soft)
3.73m		
RL 1.83m	1.90m	Bluish grey medium plastic CLA some fine sand. (Soft)
RL -1.17m	3.00m	Light brown SILT, some fine sar little Clay. (Loose to medium dense)
RL -2.47m	1.30m	Light brown fine SAND, some s trace mica. (Loose)
RL -4.17m	1.70m	Deep yellowish brown fine SAN some silt, trace mica. (Dense)
RL -9.97m	5.80m	Yellowish brown fine SAND, son silt, trace mica. (Very dense)
	DI	

Scale Factor:

0.9996





Map - 048



Map showing borehole location with lithological information



Borelog / Lithology data description

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Lineage of the data layer:

Geological Survey of Bangladesh (GSB) has carried out the surface and subsurface geological investigations at Bhangerhat village under Tahirpur Upazila of Sunamganj district during the period from June 1969 to February 1970 including a borehole in 1982. Purposes of this subsoil / subsurface geological investigation was to find out the extent, thickness and reserve of limestone. CEGIS collected hardcopy data and converted into standard GIS format to prepare geological data catalog.

			GE	olo	GICAL SURVEY OF BANGLADESH		
. O C A 1	ION 90	'S 5 2 '			CO-ORDINATES OPERATION ST	TART	ЕD
ofpillar	119 97 2 1	г			Latitude: 25'11'52''N On 22nd June, 19	70	
/illage:	Bhange	rghat			Longitude: 91'11'20"E HOLE COM PLE	TED	
Jpazila	: Tahirpu	11			Elevation: 7.5 A.M.S.L. On 3rd Feb, 1970		
) is tric (:Sunam	ganj					
		CORING/N Cor	UITHOLOGICAL Description				
914	30			1 to 6	LIMESTONE:Gray, dark gray, pink, hard, compact, massive, fossiliterous limestone, fractured, fracture surface weathers to yellow and contain clay at mica fractured. SANDY LIME STONE: Yellow with gray, hard, compact, massive, fossiliterous limestone,		
15.54	51			7	fractured, sand fine to very fine. M A R L S T O N E : Yellow, hard, com pact, fossiliterous, fractured, contain calcIte	TONE	
18.9	62			9	SANDY LIMESTONE: same as unit 7	SIMES.	
22.86	75			10	SHALE: Gray, dark gray, pink, harh, com pact, m assive, fossiliterous limestone, fractured, fracture surface weathers to yellow and contain clay at mica fractured.	SYLHET	FUCENE
24.69	81			11	MARLSTONE: same as unit 8		
46.95	154			12 to 14	LIMESTONE:Gray, dark gray, hard, compact, massive, fossiliterous, fractured, fracture surface weathers to yellow and contain clay		
60.97	200			15	SHALE: Dark gray, thinly lam inated, fossile, m odrately hard, mudstone bands at place	TURA	

Projection Filipsoid:	Transverse Mercator			
Ellipsoid: Units: Central meridian: Latitude of Origin: False Easting: False Northing: Scale Factor:	WGS84 meters 90° E of Greenwich 0° (the equator) 500,000 m 0 m 0.9996	Data source: Geological Survey of Bangladesh (GSB) Publication (Vol-4 , Part-2 , 1985): Limestone Deposits of Bhangerghat , Sunamganj District , Bangladesh , by Anisur Rahman and M. Nazrul Islam	0 2.5 5 10 Kilometers Scale - 1:205,000	

GOVERNMENT OF BANGLADESH

L I T H O L O G I C A L D E S C R I P T I O N	FORMATION	AGE	REMARKS
sive, fossiliterous limestone, fractured, ture surface weathers to yellow and contain at mica fractured. I DY LIM E STON E: Yellow with gray, hard, pact, massive, fossiliterous limestone, tured, sand fine to very fine. R L STON E: Yellow, hard, compact, siliterous, fractured, contain calcite I DY LIM ESTON E: same as unit 7 LE: Gray, dark gray, pink, harh, compact, sive, fossiliterous limestone, fractured, ture surface weathers to yellow and contain at mica fractured. R L STON E: same as unit 8 E STON E: same as unit 8 E STON E: same as unit 8	SYLHET LIMESTONE	EOCENE	
ι LΕ: Dark gray, thinly lam inated, fossile, Irately hard, mudstone bands at place	TURA		

Prepared for.



Prepared by:



Map showing borehole location with lithological information





Borelog / Lithology data description

The borelog / lithological data can be used for study the seismic hazard assessment, Liquefaction hazard modeling and seismic microzonation. It can also be used to locate possible faults that do not reach the surface. Depth of Pliocene base can also be identified from borehole information. Geological characterization of a site or place can be assessed using borehole with standard penetration test (SPT)-N values and other geophysical data. Further, B orehole data is also used to evaluate the geo-technical properties of the subsoil. Another important use of borehole data with detail lithological profile is evaluates the bearing capacity of soil and type of foundation to be suitable for the sub-soil condition for construction purpose.

hent	: Mrs.	Hosne-a	ra-Begum	Borchole	No.	BH-3	Thre	se)					
Project : Six Storied Apartment Building					epth :	50'-0'		~)					
Location : 115. West Kafrul, Kafrul, Dhaka			G.W.L.	1	1.0"								
				Date		11-07	-2006			-			
ample		Sample		Standard									-
Depth	Depth	Type &	Description of Materials	BORE	Per	netrati	on Tes	st		S.	P. 7	-	
Thick	(in)	Number		400									
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				12	1		1.						
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51.0				- Cilika	1		1.1	1			1		

Data source:

Creative soil Investigations / Private Housing Developers

2.5 Kilometers Scale - 1:200,000

Prepared by: C≋GIS





Map - 050