

Lecture 15 - 16: GIS Data Sources and Applications in Bangladesh

By:

Md. ESRAZ-UI-Zannat

Assistant Professor

Department of Urban and Regional Planning
Khulna University of Engineering and Technology
(KUET), Khulna-9203, Bangladesh



Date: 19 March 2015



ACKNOWLEDGEMENT

These slides are aggregations for better understanding of the topic mentioned in the previous slide . I acknowledge the contribution of all the authors and photographers from where I tried to accumulate the info and used for better presentation.

TOPICS TO BE COVERED BY THIS PRESENTATION

- Location of Bangladesh in World Map
- GIS in Bangladesh
- Organization Applications
- GIS Applications in Bangladesh
- Major GIS User Organizations
- Organizations with Prominent Spatial data in Bangladesh
- Major Field of GIS Applications in Bangladesh
- Projection Systems Used by different Organizations
- Variation of Areas and Lengths in Different Projection System
- Historic Data Assessment in BD
- List of GIS Agencies Investigated during 2008
- Present Status of GIS Resources: GIS Software
- GIS Resources: GIS Professionals
- Bangladesh Agricultural Research Council (BARC)
- Bangladesh Bureau of Statistics (BBS)

3

TOPICS TO BE COVERED BY THIS PRESENTATION

- Local Government Engineering Department (LGED)
- Bangladesh Water Development Board (BWDB)
- Department of Public Health Engineering (DPHE)
- Center for Environmental and Geographic Information Services (CEGIS)
- Department of Land Records and Survey (DLRS)
- Soil Resource Development Institute (SRDI)
- Survey of Bangladesh (SoB)
- Geological Survey of Bangladesh (GSB)
- Bangladesh Inland Water Transport Authority (BIWTA)
- Roads and Highway Department (RHD)
- Space Research and Remote Sensing Organization (SPARRSO)
- Institute of Water Modelling (IWM)
- Capital Development Authority (RAJUK)
- Flood Prone Area

4

TOPICS TO BE COVERED BY THIS PRESENTATION

- Other Organizations/Institutions/Companies
- Organizations/Institutions/Companies are yet to use GIS
- Government Mandate
- Major Drawbacks of Spatial Database Infrastructure
- International Cooperation
- National GIS Policy
- Free GIS Database for Bangladesh
- Free GIS Database (Global)
- Useful Website Links

5

LOCATION OF BANGLADESH IN WORLD MAP



6

MAP OF BANGLADESH



Total Area: **147,570 sq.km**



Bangladesh is located in South Asia and can be located on a map using the geographic coordinates of **24°N, 90°E**

North-South Extent: **20°N, 26°N**

North-South Extent: **88°E, 92°E**

~ falling within two UTM Zone (45N and 46N)

7

GIS IN BANGLADESH

The use of GIS application in Bangladesh started in **1991** by **ISPAN** (Irrigation Support Project for Asia and the Near East) for the FAP-19 (Flood Action Plan-19) project

At present there are over **50** GIS installations in the country

8

GIS IN BANGLADESH

At the beginning, most of the GIS installations were **donor supported and operated by foreign experts** with limited local personnel

Now the situation has changed, a number of government and non-government organizations have installed GIS with **their own finance and are operated by local expert**

9

ORGANIZATION APPLICATIONS

The application of GIS is new in Bangladesh because of its:

1. Higher Hardware Installation Cost and
2. Lack of Expertise

10

GIS APPLICATIONS IN BANGLADESH

In Bangladesh there is a growing application of GIS which is presently used in the following sector:

- Land Inventories
- The Population Census
- Urban Planning
- Forestry
- Petroleum and Gas Exploration Industries
- Utilities
- Transportation Systems
- Agriculture
- Soil Research
- Geological Survey
- Many More

11

MAJOR GIS USER ORGANIZATIONS

LGED – Local Government Engineering Department

BADC – Bangladesh Agricultural Development Corporation

BARC – Bangladesh Agricultural Research Council

BBS – Bangladesh Bureau of Statistics

BWDB – Bangladesh Water Development Board

CEGIS – Center for Environmental and Geographical Information Services

SOB – Survey of Bangladesh

SPARRSO – Space Research and Remote Sensing Organization

IWM – Institute of Water Modelling

RHD – Roads and Highway Department

SRDI – Soil Resources Development Institute

GSB – Geological Survey of Bangladesh

12

MAJOR GIS USER ORGANIZATIONS

DLRS – Department of Land Records and Survey

DPHE – Department of Public Health

DWASA – Dhaka Water and Sewerage Authority

FFWC – Flood Forecasting Warning Center of BWDB

KDA - Khulna Development Authority

RDA – Rajshahi Development Authority

WARPO – Water Resources Planning Organization

NGOs – BCAS, CARE, CNRS, etc

Universities – BUET, DU, JU, RU and KU etc.

13

ORGANIZATIONS WITH PROMINENT SPATIAL DATA IN BANGLADESH

Organization	Name of Map	Scale
Bangladesh Water Development Board (BWDB)	Contour maps with spot elevation	1:15,840 (4 inch = 1 mile)
Department of Public Health Engineering (DPHE)	Arsenic concentration map	
Center for Environmental and Geographic Information Services (CEGIS)	Flood extent map	1:250,000
	Crop damage map	1:50,000
	Arsenic map	
Local Government Engineering Department (LGED)	Thana base map	1:50,000
	Road map	
	Socio-economic Infrastructure map	
Department of Land Records and Survey (DLRS)	Thana Map	1 inch = 1 mile
	Mouza Map	16 inch = 1 mile

14

ORGANIZATIONS WITH PROMINENT SPATIAL DATA IN BANGLADESH

Organization	Name of Map	Scale
Soil Resource Development Institute (SRDI)	Soil Resources map Soil Salinity map Agricultural Landuse map	1:50,000
Survey of Bangladesh (SoB)	Bangladesh map Guide map Topographical map Aerial Photograph Miscellaneous map	At different scale (e.g. 1:5,000; 1:10,000; 1:50,000; 1:1,000,000)
Geological Survey of Bangladesh (GSB)	Geological map Gravity map Magnetic map	

15

ORGANIZATIONS WITH PROMINENT SPATIAL DATA IN BANGLADESH

Organization	Name of Map	Scale
Bangladesh Inland Water Transport Authority (BIWTA)	Navigation Route map	1:1,000,000
Roads and Highway Department (RHD)	RHD Road Network map RHD Bridges and Culverts	
Space Research and Remote Sensing Organization (SPARRSO)	Satellite images (e.g. NOAA, GMS etc.)	
Bangladesh Agricultural Research Council (BARC)	Soil and Land Resources map Land type map Agro-climatic map District, Upazila, Union, Mouza map	1:250,000 1:50,000

16

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Bangladesh Bureau of Statistic (BBS)	Population and Demographic maps and database	To develop census based population and demographic data in GIS database format
Local Government Engineering Department (LGED)	Rural Development	To develop GIS based thana base maps & rural infrastructures database for rural development.
Department of Forest (DoF)	Forest maps	To prepare forest maps for site specific matching resource.

17

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Rajdhani Unnayan Katripakkha (Rajuk) Chitagong Development Authority (CDA) Khulna Development Authority (KDA) Rajshahi Development Authority (RDA)	Urban Planning	To prepare thematic maps for urban land use planning at scales ranging from strategic (1:50,000) to detailed (1:3960) using spatial and attribute data.
Department Centre for Advanced Studies (BCAS)	Resources management	To assess the vulnerability of coastal areas to climatic change. To Apply GIS in environmental, resources management etc.

18

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Institute of Water Modelling (IWM)	Natural Resources Management and Environmental Analysis	<p>Water Modelling, Flood management, coast management.</p> <p>To apply GIS in environmental, impact assessment, socio-economic analysis and natural, agricultural, water resources management for sustainable development.</p> <p>To assess the vulnerability of coastal areas to climatic change.</p> <p>GIS application in disaster management and community risk assessment.</p>

19

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Center for Environmental and Geographic Information Services (CEGIS)	Natural Resources Management and Environmental Analysis	<p>To apply GIS in environmental, impact assessment, socio-economic analysis and natural, agricultural, water resources management for sustainable development.</p> <p>To assess the vulnerability of coastal areas to climatic change.</p> <p>GIS application in disaster management and community risk assessment.</p>

20

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Dhaka University (DU) Rajshahi University (RU) Jahangirnagar University (JU) Khulna University (KU)	Education and Training	To develop degree oriented academic curricula at graduate and post graduate level To accomplish research works To create training opportunities

MAJOR FIELD OF GIS APPLICATIONS IN BANGLADESH

Organization	Major Field of GIS Application	Major GIS related Activities
Bangladesh Agricultural Research Council (BARC)	Agricultural research and development planning	To apply GIS in agricultural resources management for sustainable development. To apply GIS for land suitability assessment for growing crop. To apply GIS in disaster management in agriculture.

PROJECTION SYSTEMS USED BY DIFFERENT ORGANIZATIONS

Organization	Projection system
IWM, CEGIS	BTM = Bangladesh Transverse Mercator
BARC	BTM = Bangladesh Transverse Mercator LCC = Lambert Conformal Conic
BUET	UTM = Universal Transverse Mercator BTM = Bangladesh Transverse Mercator
JU	UTM = Universal Transverse Mercator BTM = Bangladesh Transverse Mercator LCC = Lambert Conformal Conic
LGED	LCC = Lambert Conformal Conic
BIWTA	UTM = Universal Transverse Mercator
SRDI	LCC = Lambert Conformal Conic

23

VARIATION OF AREAS AND LENGTHS IN DIFFERENT PROJECTION SYSTEM

Projection	Area of Bangladesh (sq km)	Road length (km) of Teknaf-Tentulia
Bangladesh Transverse Mercator (BTM)	139,813.28	954.82
Lambert Conformal Conic (LCC)	139,798.03	954.87
Universal Transverse Mercator (UTM)	140,072.54	955.58

24

HISTORIC DATA ASSESSMENT IN BD

1. GIS Installation Summary of Bangladesh 1991; under ISPAN project
2. GIS Installation Summary of Bangladesh 1996; under EGIS-I project
3. GIS related Data Inventory under National Water Resources Database (NWRD) Project, Phase I, 1999
4. GIS related Data Inventory under National Water Resources Database (NWRD) Project, Phase II, 2003
5. Data Inventory under Integrated Coastal Resources Database (ICRD) project, 2005

25

GIS INSTALLATION SUMMARY OF BANGLADESH 1994; UNDER ISPAN PROJECT, 1994

GIS Software	No. of Organization	Name of Organization
PC ArcInfo	10	SPARRSO, BBS, BCAS, CDA, DDC, DU, FAP 25, ISPAN, LGED, NMIDP, RAJUK
ArcView	4	CDA, DDC, LGED, RAJUK
Idrisi	5	BCAS, DDC, LGED, RAJUK, ISPAN
ERDAS	2	SPARRSO, ISPAN

GIS user organization = 11 Nos.

26

GIS INSTALLATION SUMMARY OF BANGLADESH UNDER EGIS-I PROJECT, 1996

GIS Software	No. of Organization	Name of Organization
PC ArcInfo	16	BBS, BCAS, BUET, DDC, RAJUK, DOE, DU, EGIS, Forest Department, RHD, LGED, NMIDP, DDC, SPARRSO, SRDI, SWMC
ArcView	6	DOE, EGIS, RHD, LGED, NMIDP, SRDI,
Idrisi	11	BARC, BCAS, BUET, DDC, DOE, DU, EGIS, LGED, NMIDP, RU, SPARRSO,
ERDAS	2	SPARRSO, ISPAN
ER MAPPER	1	BUET

GIS user organization = 20 Nos

11 → 20

27

GIS AGENCY INVENTORY IN 1999 (NWRD PHASE-I)

GIS user Organizations	Numbers
BADC, BARC, BBS, BIWTA, BWDB, CWASA, DoF, DoE, DoFo, DPHE, DWASA, EGIS, GSB, LGED, NMIDP, RHD, RRI, SoB, SPARRSO, SRDI, SWMC, UNICEF, WARPO	23

GIS user organization = 23 Nos.

20 → 23

28

**GIS AGENCY INVENTORIED IN 2003
(NWRD PHASE-II)**

GIS user Organizations	Numbers
BADC, BARC, BBS, BIWTA, BIWTC, BMD, BPC, BRTA, BSCIC, BTMC, BWDB, CEGIS, CERP, DAE, DLRS, DMB, DoF, DoE, DoFo, DOL, DPHE, DWASA, ERD, GSB, IUCN, IWM, LGED, PDB, REB, RRI, SRDI, BTTB, BUET, RHD, RRI, SoB, SPARRSO, SRDI, UNICEF, WARPO	39

23 → 39

LIST OF AGENCIES INVENTORIED UNDER ICRD 2005

GIS user Organizations	Numbers
BADC, BARC, BBS, BHWDB, BIDS, BIWTA, BIWTC, BMD, BPC, BR, BRRRI, BRTA, BSCIC, BTMC, BWDB, BUET, BTTB, CARE, CCC, CDA, CDSP, CEGIS, CERP, CPA, CWASA, DoE, DAE, DLRS, DMB, DoF, DoE, DoFo, DOL, DPHE, DoH, DSHE, DMB, DWASA, ERD, GSB, IUCN, KDA, IWM, Marine Institute, MES, Mongla Port Authority, Petro Bangla, LGED, PDB, REB, RRI, SRDI, RHD, RRI, SoB, SPARRSO, SRDI, UNICEF, WFC, WARPO	61

39 → 61

LIST OF GIS AGENCIES INVESTIGATED DURING 2008

SL. No.	Organization	Type	SL. No.	Organization	Type
1	BBS	Government	17	JU	Educational Institute
2	BARC	Government	18	BCAS	Private Organization
3	BWDB	Government	19	BIWTA	Government
4	CEGIS	Institute	20	BMD	Government
5	DLRS	Government	21	BUET	Educational Institute
6	DoFo	Government	22	CNRS	Private Organization
7	IWM	Institute	23	CWASA	Government
8	LGED	Government	24	DoE	Government
9	SoB	Government	25	DPHE	Government
10	SPARRSO	Government	26	DWASA	Government
11	SRDI	Government	27	IUCN	International
12	WARPO	Government		Agency	
13	GSB	Government	28	RAJUK	Government
14	RHD	Government	29	RRI	Government
15	BADC	Government	30	RU	Educational Institute
16	DU	Educational Institute	31	UNICEF	UN agency

31

PRESENT STATUS OF GIS RESOURCES: GIS SOFTWARE

GIS Software	No. of Organization	Name of Organization
PC ArcInfo	20	BARC, BBS, BCAS, BUET, CARE, CEGIS, CNRS, DCC, DLRS, BWDB, Forest Department, IWM, JU, KDA, LGED, RDA, RHD, RU, SRDI, SPARRSO
ArcView	23	BADC, BARC, BBS, BMD, BCAS, CARE, CEGIS, CNRS, DoF, DCC, DWASA, BWDB, Forest Department, IWM, JU, KDA, KU, LGED, RDA, RHD, RU, SRDI, WARPO
ERDAS	9	BADC, BBS, CARE, CEGIS, Forest Department, IWM, JU, KU, LGED,
ArcGIS	15	BADC, BARC, BBS, BMD, CARE, CEGIS, BWDB, GSB, IWM, JU, KU, LGED, RHD, RU, SRDI
ILWIS	3	GSB, BUET, JU
Map Info	2	BUET, CEGIS,

32

GIS RESOURCES: GIS PROFESSIONALS

Organization	Total	Trained
BADC	24	
BARC	3	
BBS	13	13
BWTA	2	2
BMD	8	8
BCAS	4	3
BNUS	4	3
CARE - Bangladesh	2	1
CEGIS	26	26
CNRS	5	3
DoF	5	3
WRE, BUET	6	
DCC	3	
Disha WASA	6	6
DLRS	13	13
FFWC, BWDB	4	
Forest Department	4	2
GSB	32	24
IWPM, BUET	26	10
IWM	11	10
JU	18	7
KDA	8	6
KU URIP	21	9
LGED	23	22
RDA	4	1
RHD	6	6
SPDI	8	6
SPARRSO	46	46
WARPO	23	

Major GIS Organizations

- SPARRSO - 46
- CEGIS - 26
- LGED - 25
- IWM - 10
- BARC - 3
- BMD - 8

Trained Professionals
246 out of 362

CEGIS CDMP

33

BANGLADESH AGRICULTURAL RESEARCH COUNCIL (BARC)

BARC is executing a project entitled '**Utilization of Agro-ecological Zones Database and Installation of GIS for Agricultural Development**' initiated in **1996**

To create a **National Agriculture Land Information System Database** in GIS environment

34

BANGLADESH AGRICULTURAL RESEARCH COUNCIL (BARC)

- 1. The Land Resources Inventory Application**
- 2. Soil/Land Type Mapping Model**
- 3. Climatic Modeling**
- 4. Hydrologic Modeling**
- 5. Crop Suitability Model**

35

Map Products from AEZ-GIS System of BARC

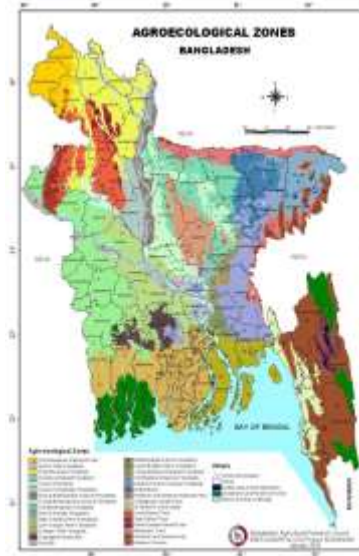
36

Agro-ecological Zone

An Agroecological Zone represents an area with unique combination of Physiographic, Soil, Hydrological and Agroclimatic characteristics. Overlay of successive layers of this information eventually figures in the agro-ecological zones. Altogether, 30 Agroecological Zones (Regions) were identified in Bangladesh. These regions again, due to differences in soils and/or land levels in relation to flooding were sub-divided into 88 sub regions.

Agro ecosystem characterization provide a unique basis for the rational planning of agricultural research, extension and development.

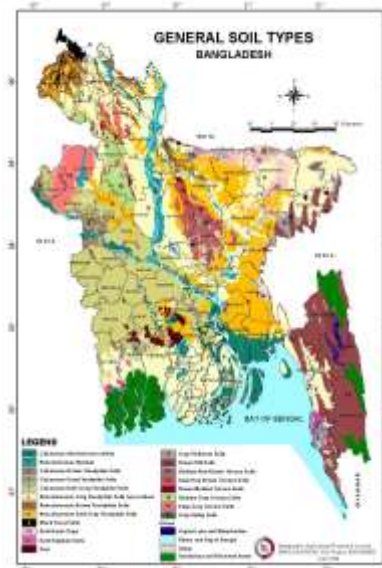
- ❑ Agricultural potential
- ❑ Climatic variability
- ❑ Diversity & Complexity
- ❑ Development constraints
- ❑ Agricultural development possibilities
- ❑ Ecological hazards
- ❑ Agricultural research needs



37

General Soil Types

A General Soil Type is a group of soils which are broadly similar in appearance and characteristics because they have developed in response to similar environmental factors such as climate, physiography and drainage. Soils form the second element in defining and differentiating agroecological regions and subregions. Soil conditions determine such important properties for plant growth as moisture supply and root aeration as well as nutrient supply.

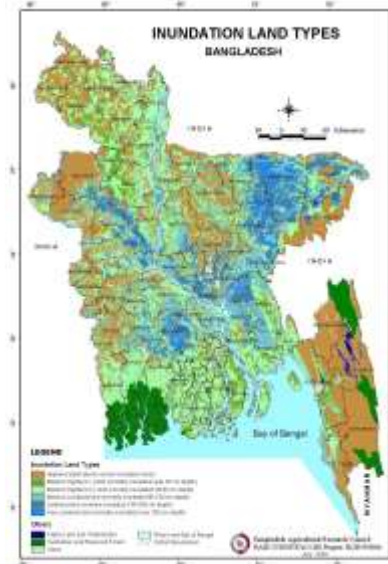


38

Inundation Land Type

Under rainfed condition, besides all other factors, the depth and duration of inundation of land in the monsoon season and residual moisture status of soils in the dry season largely govern the crops and cropping patterns of the country. Land that stay above normal inundation level and hold good residual soil moisture in the winter, are extensively used for wide range of both seasonal and perennial crops. While those, which are subject to inundation in the rainy season, are restricted to seasonal crops only. The prospects for rabi crops on those land however, depend on the residual soil moisture status. Six land classes are shown below based on flood depth.

- Highland (H) : land which is above normal flood-level.
 Medium Highland 1 (MH1) : Land which normally is flooded up to 30 cm deep during flood season.
 Medium Highland 2 (MH2) : land which normally is flooded up to between 30 cm to 90 cm deep during the flood season.
 Medium (M) : land which normally is flooded up to between 90 cm to 180 cm deep during the flood season.
 Lowland (ML) : land which normally is flooded up to between 180 cm to 300 cm deep during the flood season.
 Lowland (L) : land which normally is flooded up to between 180 cm to 300 cm deep during the flood season.

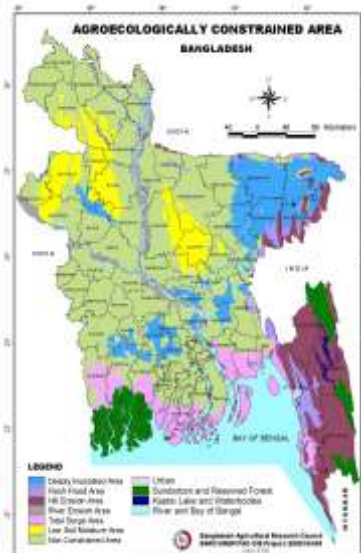


39

Agro-ecologically Constrained Area

This map is produced to provide some insight in characterizing areas with different levels of both biophysical and socioeconomic limitations so that due considerations are given in local development interventions. The methodology actually involved in characterizing and delineating areas with unique combination of factors constraining especially agricultural development. Seven constrained classes shown on the map are:

- Deeply inundated Area
- Flash Flood Area
- Hill Erosion Area
- River Erosion Area
- Tidal Surge Area
- Low Soil Moisture Area
- Non constrained Area

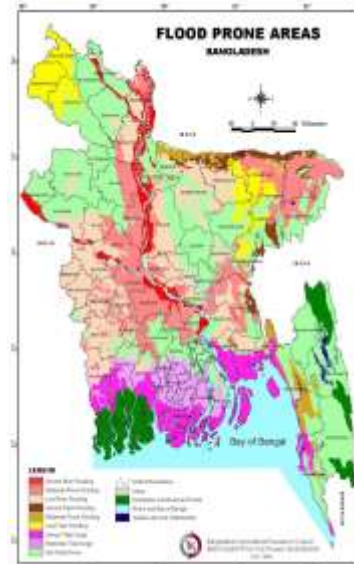


40

Flood Prone Area

Flood prone areas are frequently subject to flood hazard. Again, flood in Bangladesh occurs mainly due to two reasons: one-by overtopping of the riverbanks; and the other due to heavy run-off from the higher sites due to torrential rainfall. Based on these reasons, flood has been broadly classified into two groups (i) River Flood Hazard and (ii) Flash Flood Hazard. Nine classes shown on the map are:

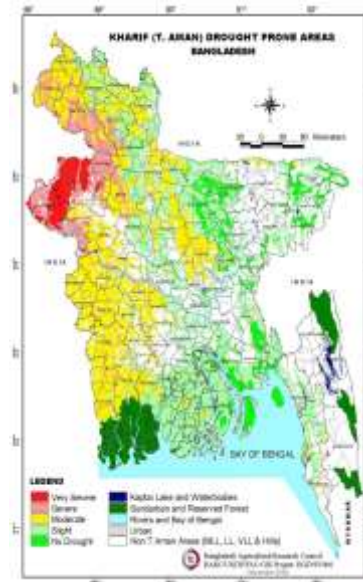
- » Severe River Flooding
- » Moderate River Flooding
- » Low River Flooding
- » Severe Flash Flooding
- » Moderate Flash Flooding
- » Low Flash Flooding
- » Severe Tidal Surge
- » Moderate Tidal Surge
- » Non Flood Prone



41

Drought Prone Area Map

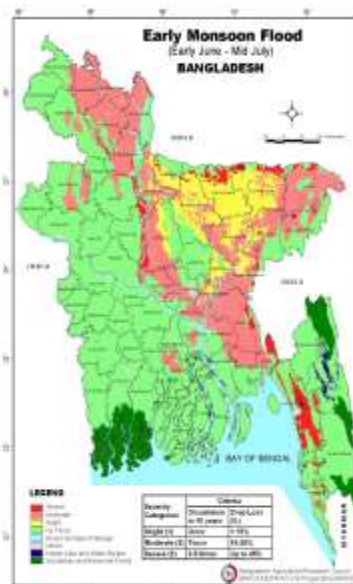
Drought in general sense refers to an agroecological condition when precipitations together with residual soil moisture fail to meet the water requirements of standing agricultural crops. From this fact it is apparent that drought is the result of adverse climatic condition together with unfavourable soil and hydrological characteristics.



42

Early Monsoon Map

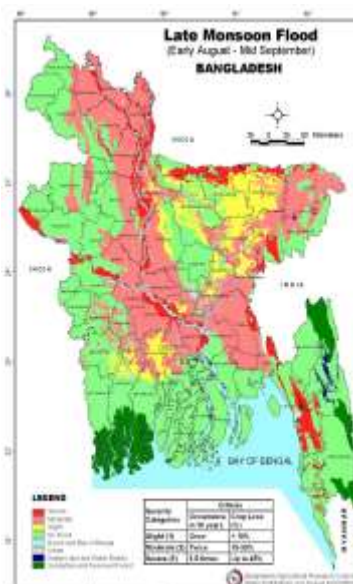
Early Monsoon Flood in Bangladesh usually occurs between early June to mid July and affects mostly Aus, Jute and some times T.aman crops at varying degrees depending upon the severity of flood and the growth stages of the affected crops. According to the degree of damage, three categories were recognized, such as – *Severe*, *Moderate* and *Slight*.



43

Late Monsoon Map

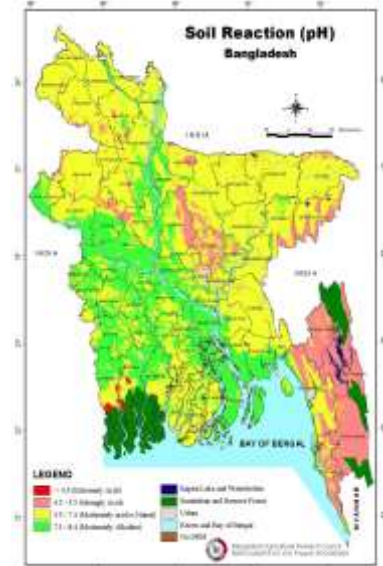
Late monsoon Floods in Bangladesh occurs generally between early August and mid-September which coincides with the harvesting time of Kharif-I (Aus and Jute) crops and transplanting of Aman paddy and also already transplanted Aman paddy at the early to active vegetative growth stages.



44

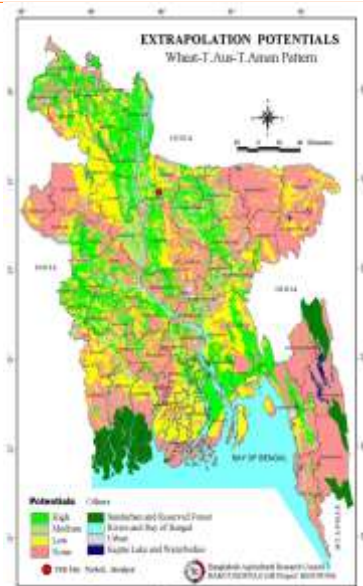
Soil Reaction

Soil Reaction or Soil pH refers to the soil acidity/alkalinity which is closely related to the availability of plant nutrients. Extremely acid or strongly alkaline soil reactions are equally harmful for almost all crops. Generally, slightly acid through neutral to mildly alkaline soil reaction permit optimum performance of all crops of Bangladesh. So a classification was made for soil reactions prevailing in the country keeping in view the tolerance limit by the growing crops.



Extrapolation FSR Technology

The extrapolation of a particular technology means to show the suitability rating extrapolated all over the country based on the characteristics (i.e Soil permeability, soil texture, land type, salinity, Drainage, Soil reaction, land Slope, Available Soil moisture & Climatic Characteristics) of the site where it is developed.



Crop Suitability

The chickpea suitability map is produced based on Agroedaphic and Agroclimatic factors. Eleven agroedaphic factors (**Soil**: Soil Permeability, Effective Soil Depth, Available Soil Moisture, Nutrient Status, Soil Reaction (pH), Soil Salinity, Soil Consistency, Drainage; **Inundation**: Depth of inundation, Flood hazards; and **Landform**: Slope) of Land Resources Information System of BARC were considered for crop suitability analysis. Agroclimatic factors (temperature and PET) which influence crop growth in relation to crop phenology and photosynthesis were also considered in suitability analysis for chickpea. The land suitability map for Chickpea is produced considering both agroedaphic and agroclimatic factors.

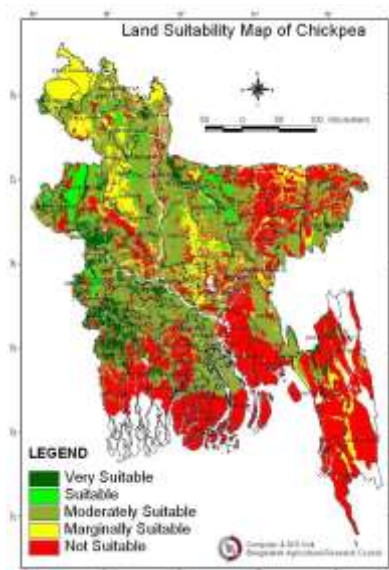
Very suitable: > 80 percent of maximum attainable yield (MAT)

Suitable: 60-80 percent of MAT

Moderately suitable: 40-60 percent of MAT

Marginally suitable: 20-40 percent of MAT

Not suitable: < 20 percent of MAT



47

BANGLADESH BUREAU OF STATISTICS (BBS)

This organization is using GIS to provide:

Census-based population and demographic data

Making large scale *mouza* maps and thematic maps

Creating user service facility

48

LOCAL GOVERNMENT ENGINEERING DEPARTMENT (LGED)

Upazila/thana base maps

District maps and road maps of the country

All these maps contain various layers including **administrative boundaries, physical infrastructure, educational institutions, settlement patterns, agriculture and socio-economic infrastructures**

49

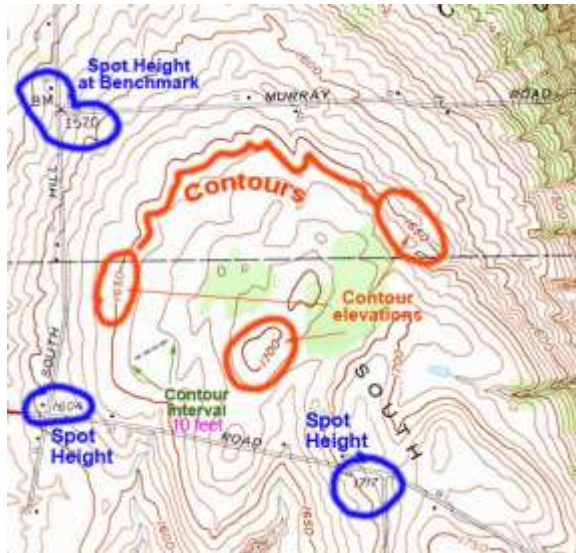
LOCAL GOVERNMENT ENGINEERING DEPARTMENT (LGED)



Map: Upazila Map

50

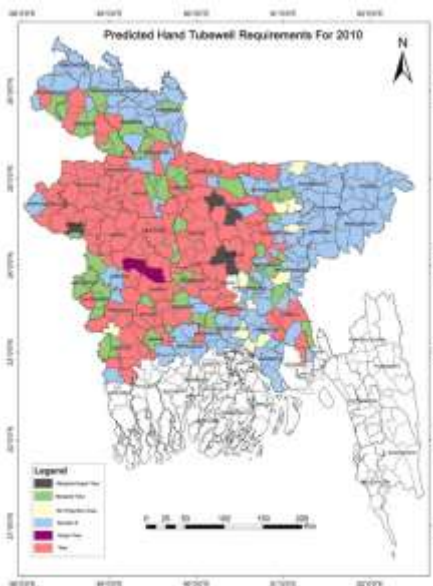
BANGLADESH WATER DEVELOPMENT BOARD (BWDB)



Map: Contour Map

51

DEPARTMENT OF PUBLIC HEALTH ENGINEERING (DPHE)



Map: Predicted Hand Tubewell Requirements

52

CENTER FOR ENVIRONMENTAL AND GEOGRAPHIC INFORMATION SERVICES (CEGIS)



Map: FCDI Projects

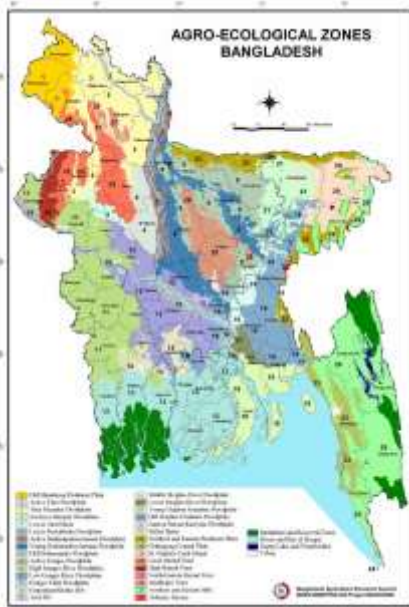
53

DEPARTMENT OF LAND RECORDS AND SURVEY (DLRS)



54

SOIL RESOURCE DEVELOPMENT INSTITUTE (SRDI)



Map: Soil Resources Map

55

SURVEY OF BANGLADESH (SOB)



Map: Map of Bangladesh

56

ROADS AND HIGHWAY DEPARTMENT (RHD)



Map: RHD Road Network Map

59

SPACE RESEARCH AND REMOTE SENSING ORGANIZATION (SPARSSO)

The successful projects of SPARRSO in this regard are

Crop Assessment

Forest Cover Mapping

Shrimp Culture Potentiality Mapping

Census Mapping

Monitoring of Ecological Changes, and

Landuse Mapping

60

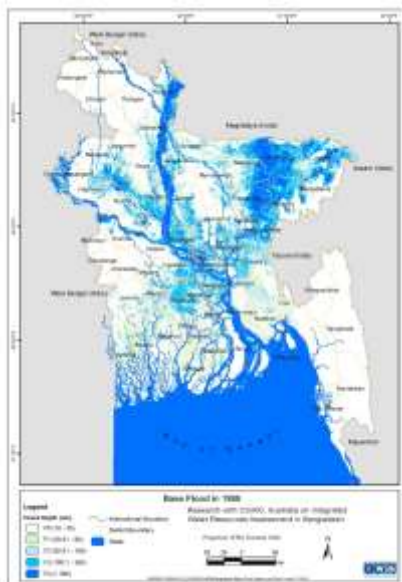
SPACE RESEARCH AND REMOTE SENSING ORGANIZATION (SPARRSO)



Image:
Satellite
Image of
Bangladesh

61

INSTITUTE OF WATER MODELLING



Flood Map

62

CAPITAL DEVELOPMENT AUTHORITY (RAJUK)

Installed GIS in 1993

The main field of GIS application is **urban planning**

Mapping and data management for development planning of **Dhaka Metropolitan Area**

63

DETAILED AREA PLAN (DAP)

The Detailed Area Plan (DAP) is third and last tier of Development Plan for Dhaka City

DAP area is 1528 sq. km

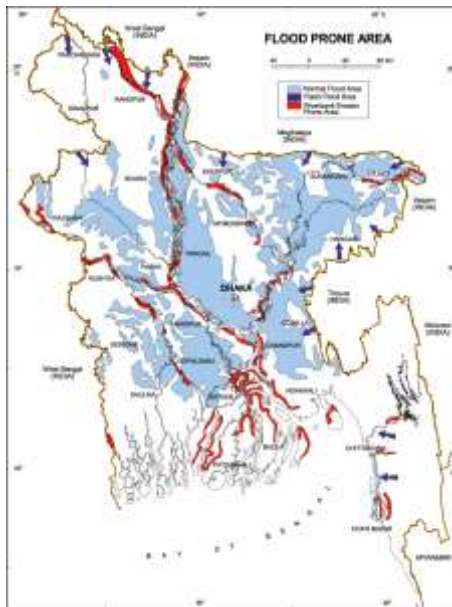
64

DETAILED AREA PLAN (DAP)



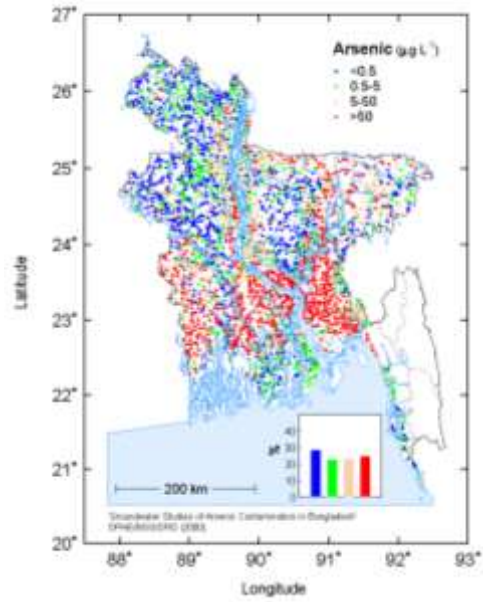
65

FLOOD PRONE AREA



66

ARSENIC CONTAMINATION MAP



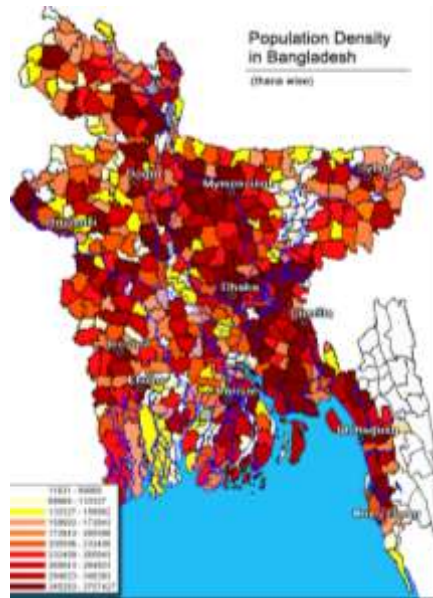
67

MALARIA ENDEMIC DISTRICTS



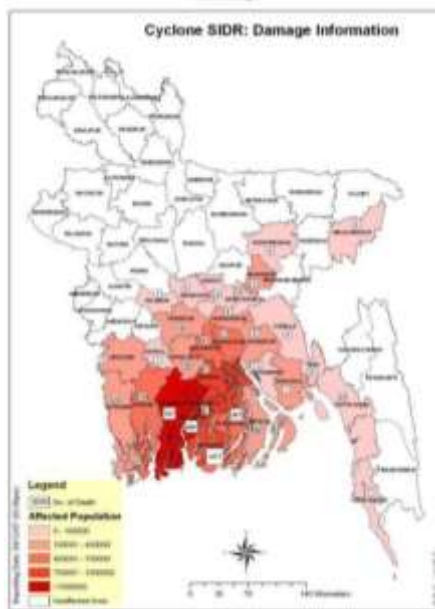
68

POPULATION DENSITY MAP



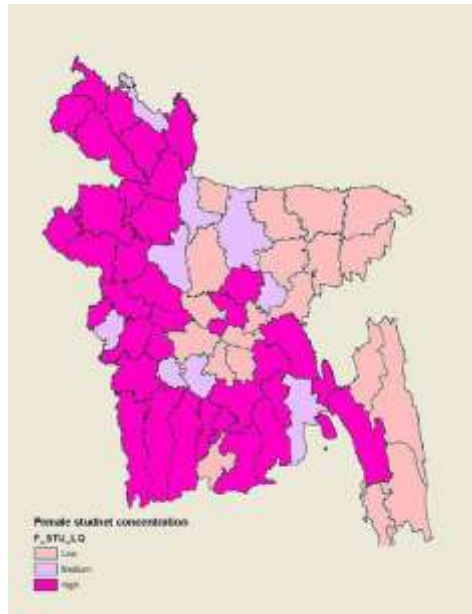
69

CYCLONE SIDR DAMAGE MAP



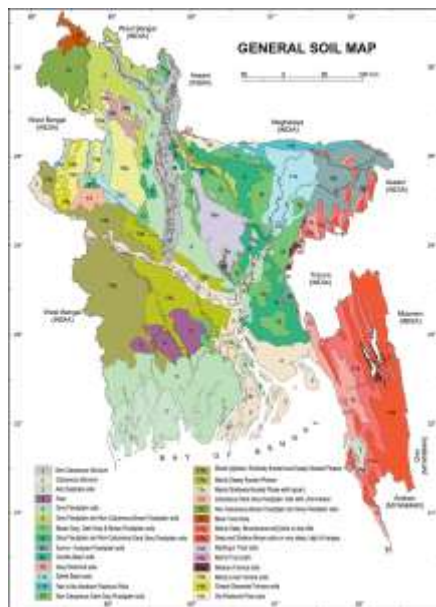
70

FEMALE STUDENT CONCENTRATION MAP



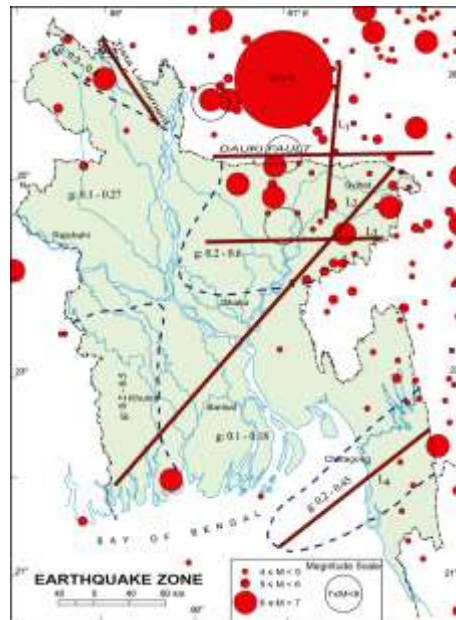
71

GENERAL SOIL MAP



72

EARTH QUAKE MAP



73

OTHER ORGANIZATIONS/INSTITUTIONS/COMPANIES

International Centre for Diarrhoea Disease Research, Bangladesh (ICDDR,B)

Telecom Organizations (Say Grameen Phone, etc.)

Almost all the **universities of Bangladesh** installed GIS

74

ORGANIZATIONS/INSTITUTIONS/COMPANIES ARE YET TO USE GIS

Many Government Organizations

The Bangladesh Armed Forces (three uniformed military services of Bangladesh: the Bangladesh Army, the Bangladesh Navy and the Bangladesh Air Force)

Many Municipalities (Pourashava)

75

GOVERNMENT MANDATE

Present Bangladesh Government set mandate to use GIS in every Government Offices where it requires.

76

MAJOR DRAWBACKS OF SPATIAL DATABASE INFRASTRUCTURE

1. Different organizations/ institutions/ are working within the **same jurisdiction area** and **preparing the same maps** in different purposes/projects
2. There is **no active collaboration** among the organizations/ institutions
3. **Accessibility to data/maps/information** is very difficult in most of the cases

77

OTHER DRAWBACKS

1. The use of **different data formats and different projection systems**
2. Lack of **data-metadata standards**
3. Lack of **standard guidelines** for acquiring, processing and quality control of GIS data
4. **Corruption** at decision making level
5. Lack of Project/Plan **Implementation**

78

INTERNATIONAL COOPERATION

1. European Commission
2. United Nations Development Programme (UNDP)
3. Department for International Development (DFID)
4. Japan International Cooperation Agency (JICA)
5. Danish International Development Agency (DANIDA)
6. World Bank
7. Asian Development Bank (ADB) and so on.

79

NATIONAL GIS POLICY

Draft Guideline for Data Sharing Protocol and National GIS Data Policy

Workshop held on LGED Head Quarter, Dhaka on
Wednesday, **22 October 2008**

80

NATIONAL GIS POLICY

Draft National GIS Policy Guideline

Bangladesh National Spatial Data Infrastructure (BNSDI)

Sharing of geospatial data among government, the private and non-profit sectors

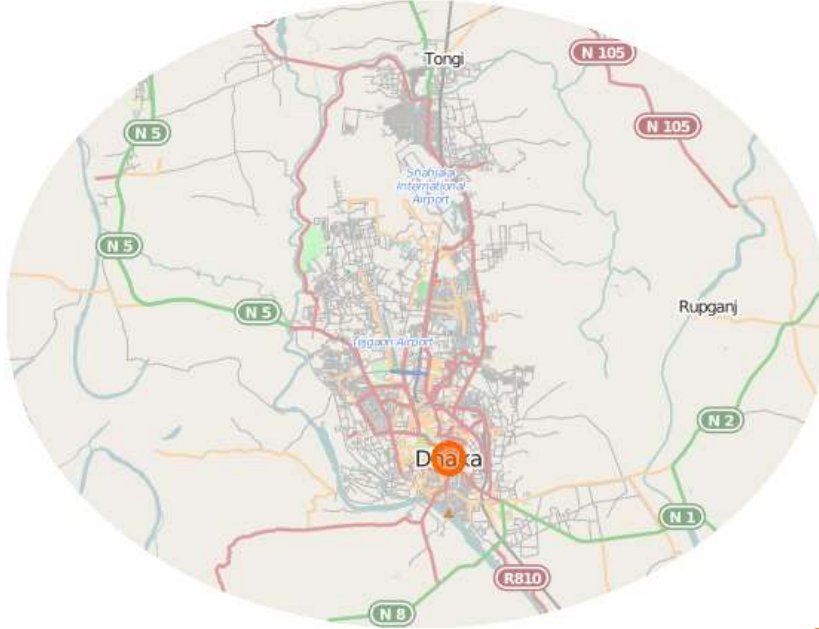
81

FREE GIS DATABASE FOR BANGLADESH

1. Open Street Map
2. USGS
3. ASTER 30m DEM
4. SRTM Data

82

OPEN STREET MAP



83

OPEN STREET MAP



84

WHAT STARTS HERE CHANGES THE WORLD
THE UNIVERSITY OF TEXAS AT AUSTIN

Libraries

University of Texas Libraries ...celebrating the life of the mind.

About the Libraries | Research Tools | Library Services | Resources for You | Ask a Map Question

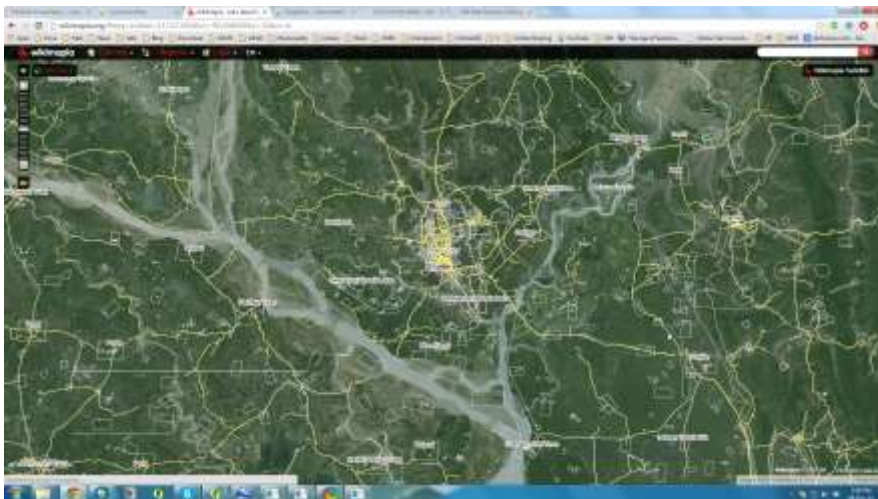
Home > Finding Information > PCL Map Collection > India and Pakistan AMS Topographic Maps

- <http://www.lib.utexas.edu/maps/ams/india/>



85

DATA SOURCES (WIKIMAPIA) - [HTTP://WIKIMAPIA.ORG/](http://wikimapia.org/)



86

FREE GIS DATABASE (GLOBAL)

Phillipine Database: <http://philgis.org/freegisdata.htm>

Philippine GIS Data Clearinghouse
www.philgis.org
Your source of free GIS data for the Philippines

Home
Free GIS Data
Free GIS Software
Desired GIS Data
Wantlist

Free GIS Data
Click this page always for new data uploads.

Public has been open since 1st November 2010 and is currently enhanced to comply with the [OpenStreetMap Attribution License](#). You can view the [OpenStreetMap Attribution License](#), [Creative Commons Attribution License](#), [GPL v3.0 License](#), [GNU Free Documentation License](#) and [GNU General Public License](#) on the [OpenStreetMap Attribution License](#) page.

To download, click on the highlighted data file. Save it. Then use free [QGIS](#) software to unzip the file.

Group 1: Country Vector and Raster Datasets

Dataset	Description	File Size	File Format	Dataset Information	Download
PHILIPPINE BOUNDARIES	Country, region, province, municipal and barangay boundaries	2,136 KB	Shapefile	2007-2014	Download
PHILIPPINE BOUNDARIES (ZIP)	Country, region, province, municipal and barangay boundaries	2,136 KB	Shapefile (ZIP)	2007-2014	Download
PHILIPPINE BOUNDARIES (GPKG)	Country, region, province, municipal and barangay boundaries	2,136 KB	GeoPackage	2007-2014	Download
PHILIPPINE BOUNDARIES (GDB)	Country, region, province, municipal and barangay boundaries	2,136 KB	Geodatabase	2007-2014	Download
PHILIPPINE BOUNDARIES (GML)	Country, region, province, municipal and barangay boundaries	2,136 KB	Geography Markup Language	2007-2014	Download
PHILIPPINE BOUNDARIES (KML)	Country, region, province, municipal and barangay boundaries	2,136 KB	Keyhole Markup Language	2007-2014	Download
PHILIPPINE BOUNDARIES (JSON)	Country, region, province, municipal and barangay boundaries	2,136 KB	JavaScript Object Notation	2007-2014	Download
PHILIPPINE BOUNDARIES (XML)	Country, region, province, municipal and barangay boundaries	2,136 KB	Extensible Markup Language	2007-2014	Download

FREE GIS DATABASE (GLOBAL)

- <http://www.humanitarianresponse.info/applications/data/datasets>

CHAD: Admin Level 1 Boundaries

Summary:
Chad Administrative Boundaries Level 1 (Region)

Dataset Date: 24 Oct 2014
Last updated date: 25 Oct 2014

Dataset Language(s): French
Dataset Type: Areas (polygons)

Dataset Files:
[CHAD_Admin1_fm_ortho.zip](#)
[CHAD_Admin1_Poly_ortho.shp](#)

NIGERIA: Settlements (villages, towns, cities)

Summary:
All settlement places of Nigeria

Dataset Date: 24 Oct 2014
Last updated date: 24 Oct 2014

Dataset Language(s): English
Dataset Type: Points

Dataset Files:
[nigeria_settlements_fm_ortho.zip](#)
Instructions: <https://www.nga.aizil/Pages/Privacy.aspx>

USEFUL WEBSITE LINKS

- Humanitarian Response → <http://cod.humanitarianresponse.info/>
- OpenStreetMap Data → <http://openstreetmapdata.com/>
- Worldwide Digital Elevation Model
→ http://eros.usgs.gov/#Find_Data/Products_and_Data_Available/GMTED2010
- Global administrative areas → <http://www.gadm.org/>
- World Bank data → <http://data.worldbank.org/>
- World Resources Institute → <http://www.wri.org/publications/data-sets>
- EuroStat → <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home>
- European Environmental Agency data → <http://www.eea.europa.eu/data-and-maps>
- Eden Data portal → <http://www.edenextdata.com/>
- Climate data → http://www.wmo.int/pages/prog/wcp/wcdmp/databases/index_en.html
- Resources collection → <http://freegisdata.rtwilson.com/>
- Spanish SDI portal → <http://www.idce.es/>

91

TOPICS COVERED BY THIS PRESENTATION

- Location of Bangladesh in World Map
- GIS in Bangladesh
- Organization Applications
- GIS Applications in Bangladesh
- Major GIS User Organizations
- Organizations with Prominent Spatial data in Bangladesh
- Major Field of GIS Applications in Bangladesh
- Projection Systems Used by different Organizations
- Variation of Areas and Lengths in Different Projection System
- Historic Data Assessment in BD
- List of GIS Agencies Investigated during 2008
- Present Status of GIS Resources: GIS Software
- GIS Resources: GIS Professionals
- Bangladesh Agricultural Research Council (BARC)
- Bangladesh Bureau of Statistics (BBS)

92

TOPICS COVERED BY THIS PRESENTATION

- Local Government Engineering Department (LGED)
- Bangladesh Water Development Board (BWDB)
- Department of Public Health Engineering (DPHE)
- Center for Environmental and Geographic Information Services (CEGIS)
- Department of Land Records and Survey (DLRS)
- Soil Resource Development Institute (SRDI)
- Survey of Bangladesh (SoB)
- Geological Survey of Bangladesh (GSB)
- Bangladesh Inland Water Transport Authority (BIWTA)
- Roads and Highway Department (RHD)
- Space Research and Remote Sensing Organization (SPARRSO)
- Institute of Water Modelling (IWM)
- Capital Development Authority (RAJUK)
- Flood Prone Area

93

TOPICS COVERED BY THIS PRESENTATION

- Other Organizations/Institutions/Companies
- Organizations/Institutions/Companies are yet to use GIS
- Government Mandate
- Major Drawbacks of Spatial Database Infrastructure
- International Cooperation
- National GIS Policy
- Free GIS Database for Bangladesh
- Free GIS Database (Global)
- Useful Website Links

94

What
WE
Have
Learnt
Here

·
·
???

95

Courtesy:

- 1. Mollah Md. Awlad Awlad Hossain**
Head, GiS Division, CEGIS
- 2. Md. Abeer Hossain Chowdhury**
Bangladesh Agricultural Research Council
- 3. Bayes Ahmed**
Presentation on Status and Perspectives of GIS Application in Bangladesh
- 4. Rejaur Rahman**
Director, GPAD

96



*Thank You
for being with me*

