BANGLADESH COUNTRY REPORT

INTEGRATING STATISTICAL AND GEOSPATIAL INFORMATION SYSTEM: BANGLADESH PERSPECTIVE

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1. INTRODUCTION:

Bangladesh is a country of South Asia with a Population of 156.7 Million (Estimated July 2014) and an area of 147,570 square kilometer. Bangladesh is bordered by India in West & North, India and Myanmar in the East and Bay of Bengal in the South. Bangladesh has been performing rapid progress in socio-economic field in the recent years. It has already achieved MDG Goal 4 and 5 on reduction of child mortality and improvement of maternal health. It is expected to achieve MDG Goal-1" eradicating extreme poverty and hunger" by 2015. Bangladesh is maintaining a steady economic growth over 6.0 percent in the last few years and the volume of GDP is also increasing over the years. The economy is switching over to non agriculture from agriculture and the contribution of agriculture is diminishing gradually. The contribution of agriculture in national GDP stands at 16.0 percent only in FY 2013 and the contribution of industry and service stands at 30.0% and 54.0% respectively. The country's labour force stands at 56.7 million as on 2010 and 47.5% of them are still employed in agriculture.

With the economic growth, the national statistical system is also improving in terms of quality, quantity and timeliness with respect to data collection, processing and dissemination. It is conducting periodic censuses, numerous socio-economic and demographic surveys and other studies to meet the data need of the planners, policy makers, researchers, academics and other users. It is also striving to integrate statistics with geo-spatial information in collaboration with other national organization for preparing sustainable map for national and subnational planning and policy making.

Map of Bangladesh

2. BANGLADESH IN THE GLOBAL ARENA:

As an active member of the United Nations, Bangladesh remains constructively engaged in many international and regional forums, particularly in UN (UNSC, UNSD, UNGGIM, ESCAP, UNSIAP) OIC, SESRIC, SAARC, etc.

Bangladesh regularly joins in the United Nations Statistical Commission (UNSC) meetings and actively try to implement the decisions of the UNSC meetings.

3. INTEGRATION OF STATISTICS WITH GEOSPATIAL INFORMATION SYSTEM: GLOBAL PERSPECTIVE:

The United Nations Statistical Commission and United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) have recognized the need to meet the challenges of managing and effectively integrating geospatial and statistical information nationally and globally. In 2013, in each of their respective annual sessions, "acknowledged the critical importance of integrating geospatial information with statistics and socio-economic data and the development of a geospatial–statistical framework, especially in the context of the on-going debate on the post-2015 development agenda". The Expert Group has been tasked with developing and advancing the implementation of a global statistical-geospatial framework as a standard for the integration of statistical and geospatial information. A key component of this task will be inclusive global consultations and communications with relevant experts in determining the metrics of a statistical-geospatial framework. The Asia Pacific Workshop was a part of this global consultation and the current session will further strengthen the consultation process. In the context of Bangladesh, in addition to other relevant organizations the two national organizations namely Survey of Bangladesh (SOB), the national mapping organization (NMO) of the Ministry of Defense and Bangladesh Bureau of Statistics (BBS), the National Statistical Organization (NSO) of the Statistics and Informatics Division(SID) , Ministry of Planning are closely working to integrate statistics with geospatial information. The core activities of this two national organizations are presented below:

4. NATIONAL MAPPING ORGANIZATION OF BANGLADESH:

Background:

A fundamental role of any government is to provide optimized service to administration planning for economic development, law enforcement, public works and services etc. All these are portrayed on map of different kinds for planning purpose, Survey of Bangladesh (SOB), being the National Mapping Organization (NMO) for Bangladesh had been facilitating all government and non-government stakeholders in particular Armed Forces , SPARRSO and BBS - the NSO

4.1 FUNCTIONS OF SOB:

The main function of SOB are

- Production of Different Series of Topographical and Thematic maps and GIS Database
- Carryout International Boundary Survey between Bangladesh-India (Mizoram Sector) and Bangladesh-Myanmar
- Establishing and Maintaining Geodetic Control Network
- Custodian of Aerial Photographs/ Images of Bangladesh

GEODETIC ACTIVITIES

OF SOB

GROUND CONTROL POINTS (GCP)

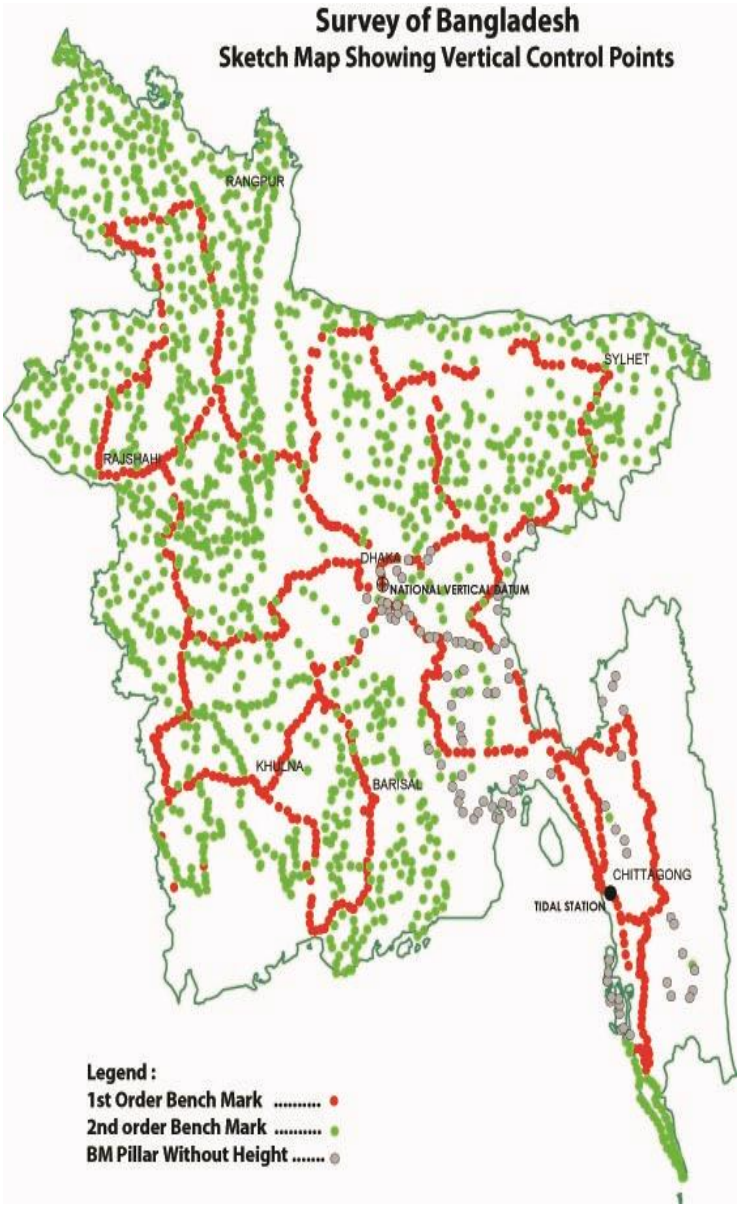
Horizontal Control Points (X,Y)

- 1st Order Horizontal GCP: 267
- 2nd Order Horizontal GCP : 756

Vertical Control Points (Z)

- 1st Order Vertical GCP : 668
- 2nd Order Vertical GCP : 1287

3D Control Points (X,Y, Z) : 627



Total Control Points: 2351

4.2 SURVEY AND MAPPING ACTIVITIES OF SOB

- Aerial Photographs
- Satellite Images
- Aerial Triangulation
- Stereo Plotting
- DTM Generation
- Orthophoto Generation
- Cartographic Database
- GIS Database
- Simplification and Smoothing
- Generalization
- Symbolization
- Printing of Hard Copy Map

4.3 CREATION OF GIS DATA BASE AT SOB AND ITS POTENTIAL USES:

Creation of GIS database is a difficult task in developing country like Bangladesh, among 5 components of SOB human resource development for this job was quite challenging in the initial stage, people now turned into assets after intensive training, topographic sense blended with technological advancement has strengthened the process in producing an excellent and quality GIS database, selection of hardware and software was also a challenging job but capability of SOB has increased now in producing quality maps

4.4 **TYPE OF GIS DATABASE Predicted by GIS:**

SOB produces three types of database

- Topographic database
- Cartographic database for production of maps
- GIS basic database for external users

Specifications are needed to build Geo-database

SOB basic GIS database contains

- 9 Datasets with 74 Layers for 1:25000 scale
- 92 Layers for 1:5000 scale map

AVAILABLE GIS DATA SETS IN SOB:

Sl.	Scale of the maps: 5,000 and 25,000 (Being implemented)	
	Category	**Summary Layers**
1	Administrative Boundary	International, Division, District, Upazila along with Pillars and topographical sheet boundaries
2	Building and Structure	Building, Building Rooftops, Clustered Buildings, Buildup Area, Monuments etc.
3	Facilities	Religious, Education, Health, Governmental facilities etc.
4	Geodetic Control Points	Nationwide Vertical and Horizontal control points
5	Hydrography	River, Wetland, Island/Char-land etc.
6	Industry	Major Industrial locations along with type
7	Relief	Contour, Spot heights etc.
8	Transportation	Road, Railroad, Bridges, Ports etc.
9	Vegetation	Forest, Cultivation and non-cultivation area etc.

USAGE OF GIS DATA OF SOB:

Field of Applications	**Activities**
Agriculture	Monitoring, evaluation and management etc.
Environment	Monitoring, modelling and management for land degradation; weather and climate modelling, prediction and forecasting; river and coastal erosion modelling; flood management etc.
Health	Aerial distribution of different diseases in relation to environmental factors; visualizing changes in the occurrence of a disease over time etc.
Intelligence	Monitoring, tracking, evaluation and management etc.
Forestry	Management, planning; map prepare for site specific matching etc.
Regional/local planning	Development of plans, maintenance, management; infrastructure development programme, land registration etc.
Research & education	Different solutions from personal to national level etc.
Resource	Management, planning, monitoring, recording etc.
Social studies	Demographic trends and developments analysis etc.
Transport network	Planning and management etc.
Military Use	IPB, DMP and other battle planning, terrain analysis, resources planning, deployment, management, monitoring, recording etc.
Others	Thematic mapping, topographical mapping, site and location information, services, consultancy etc.

5. GOVERNMENT'S RECENT INITIATIVE:

- The Vision 2021 of the Hon'ble Prime minister of Bangladesh was launched in the eve of general election 2008 with the focus on the following:
- Use of technology in implementing the promises in education, health, job placement and poverty reduction.
- Underscored a changing attitude, positive thinking and innovative ideas for the success of digital Bangladesh.
- The Philosophy of "Digital Bangladesh" comprises ensuring people's democracy and human rights, transparency accountability, establishing justice and ensuring delivery of government services to the citizens of Bangladesh through maximum use of technology, with the ultimate goal being the overall improvement of the daily lifestyle of general people.
- This includes all classes of people and does not discriminate people in terms of technology.
- Four elements of "Digital Bangladesh" are human resource development, people involvement, civil services and use of information technology in business.
- Geospatial data takes us further ahead to digital Bangladesh by putting digital data back into action by analysing and making timely effective and efficient decision

In this regard the recent initiatives taken by the Government are noteworthy These are:

- Digital Innovation Fair,
- Access To Information (A2I) Program
- Establishment of Union Information and Service Centre (UISC) at lowest tier of local government administration

6. PRESENT TRENDS OF GEOSPATIAL COMMUNITIES:

- In Bangladesh, huge geospatial data is available with various public and private sector organizations, the major part of this data is being produced by public sector organizations to facilitate their mandated responsibilities, these trend indicates that almost every year the demand for Maps and Geospatial data is growing in Bangladesh, prominent organizations of Bangladesh are using GIS facilities in their respective field of application. it is observed that a large number of communities are making GIS database at isolation. This is creating redundancy, inconsistency and duplication of data along with very high initial overhead costs.

7. INTRODUCING BANGLADESH BUREAU OF STATISTICS (BBS), THE NATIONAL STATISTICAL ORGANISATION (NSO) OF BANGLADESH:

Bangladesh Bureau of Statistics (BBS) is the only National Statistical organization (NSO) responsible for collecting, compiling and disseminating statistical data of all the sectors of the Bangladesh economy to meet and provide the data-needs of the users for the national planning and formulating policies by the government. The role of the BBS is providing the necessary statistics for preparing the various national plans and policies for the overall development of the country.

According to recently enacted Statistics Act 2013, BBS is mandated to establish a Integrated Geographical Information System.

BBS is now working closely with SOB and other GIS based organizations towards establishing a integrated geographical information system.

According to National Strategy for Development of Statistics (NSDS), provision has been made for modernizing GIS and developing a wave enabled mapping system with other statistical attributes.

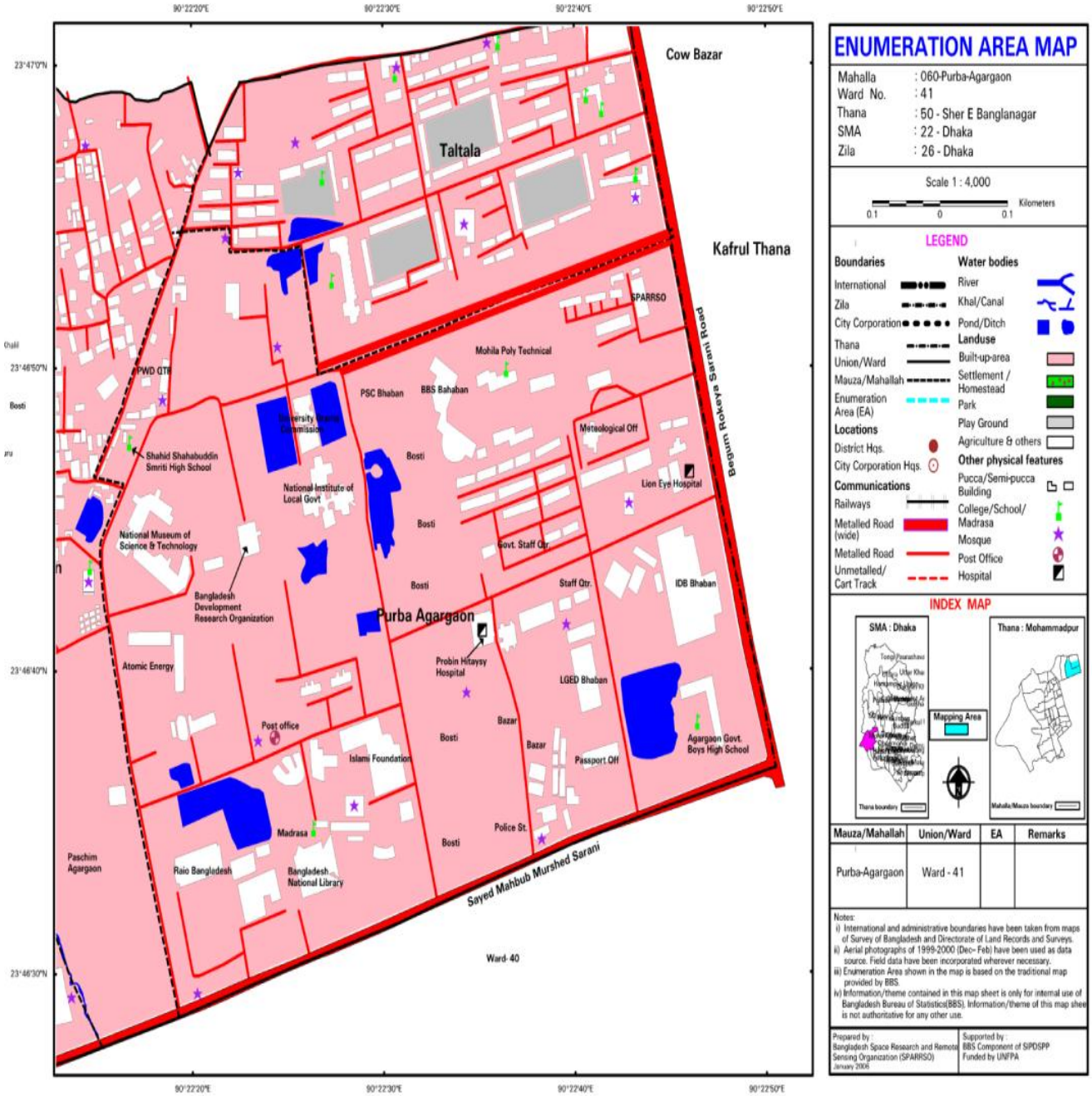
This efforts will help to integrate statistics with geospatial information.

8. ACTIVITIES OF BBS AND SOME OTHER ORGANISATIONS RELATED TO GIS APPLICATIONS:

Bangladesh Bureau of Statistics (BBS):

- BBS Produce Small Area Atlas with Geo Code using Population Census data.
- BBS is using GIS to provide Census Enumeration Area Mapping (Mauza/Mahallah).
- BBS has introduced web-enabled GIS application to produce maps for national & sub-national policy formulation.
- BBS has also prepared poverty maps with data of Population Census 2011and Household Income and Expenditure Survey 2010 (HIES) using Small Area Estimation (SAE) Technique.

BBS is using GIS to provide Census Enumeration Area Mapping (Mauza/Mahallah).



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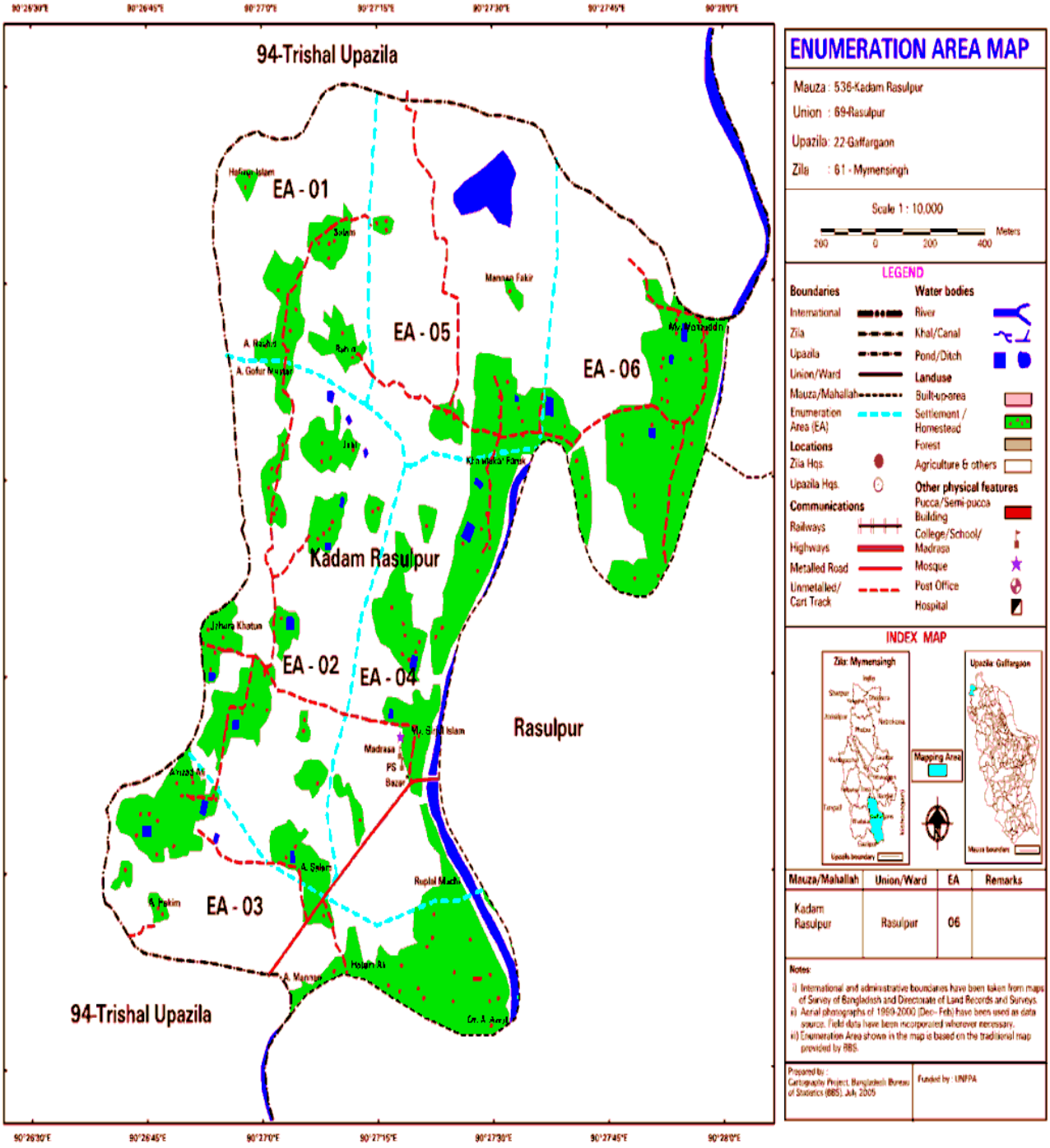
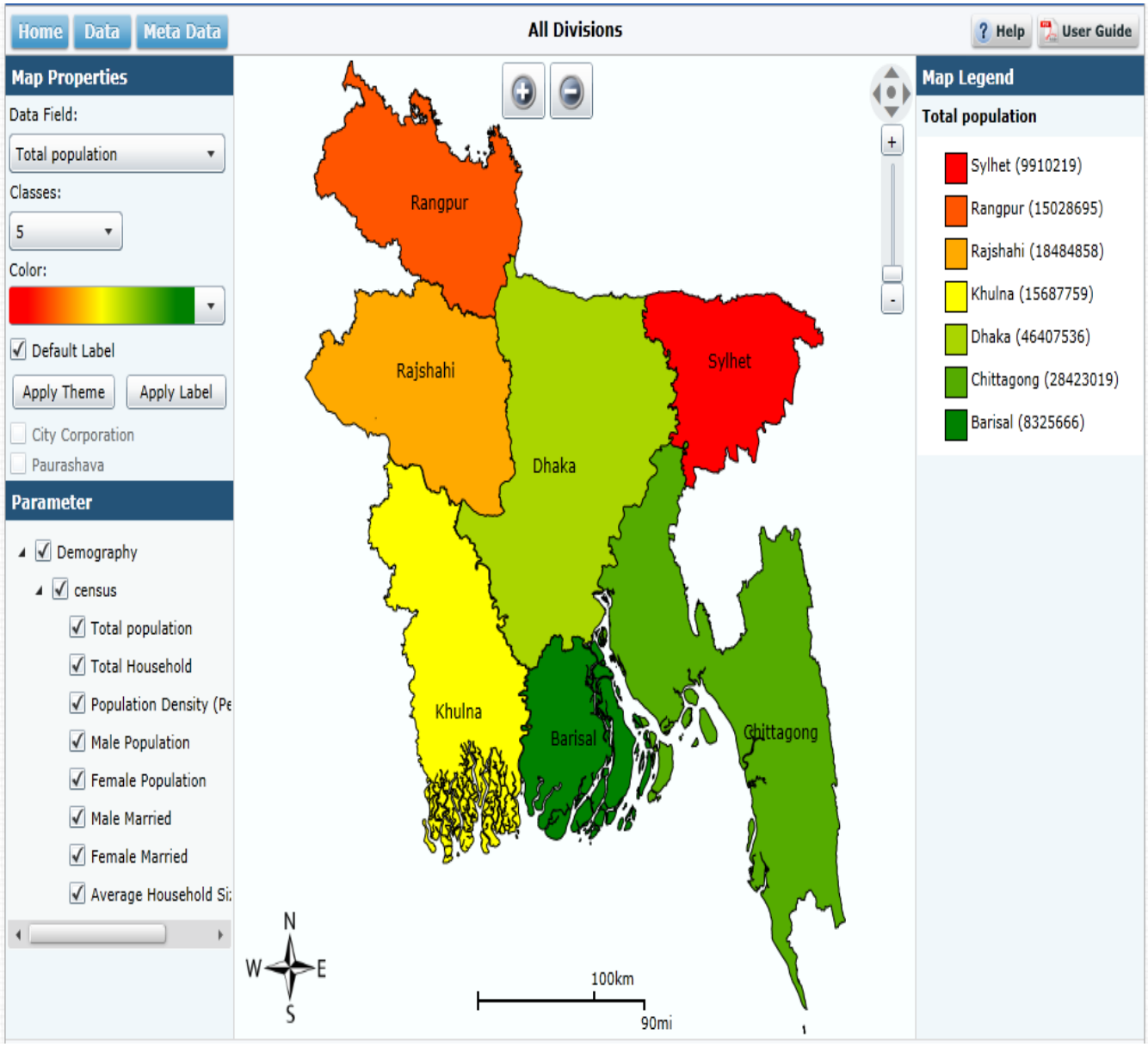
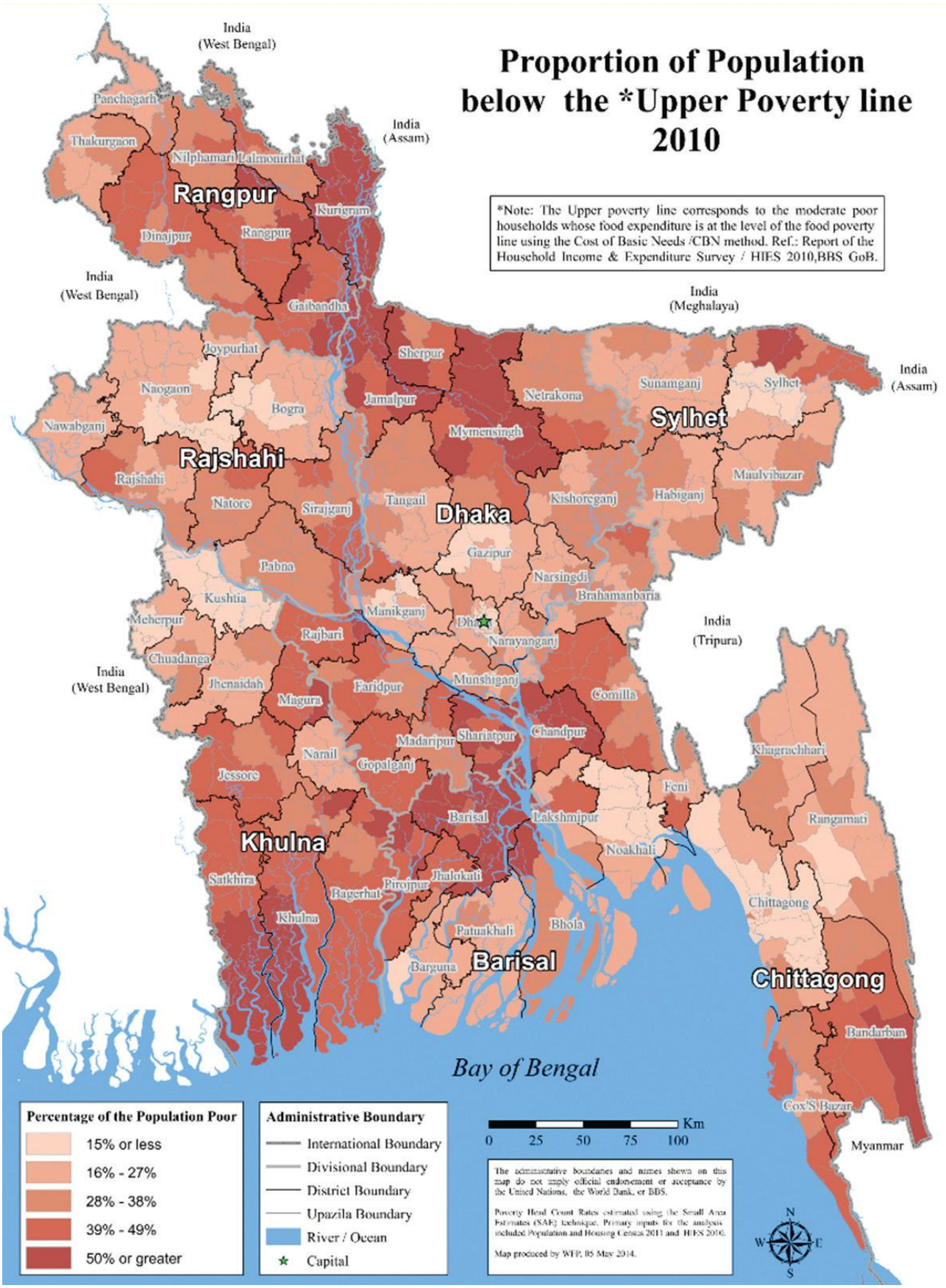


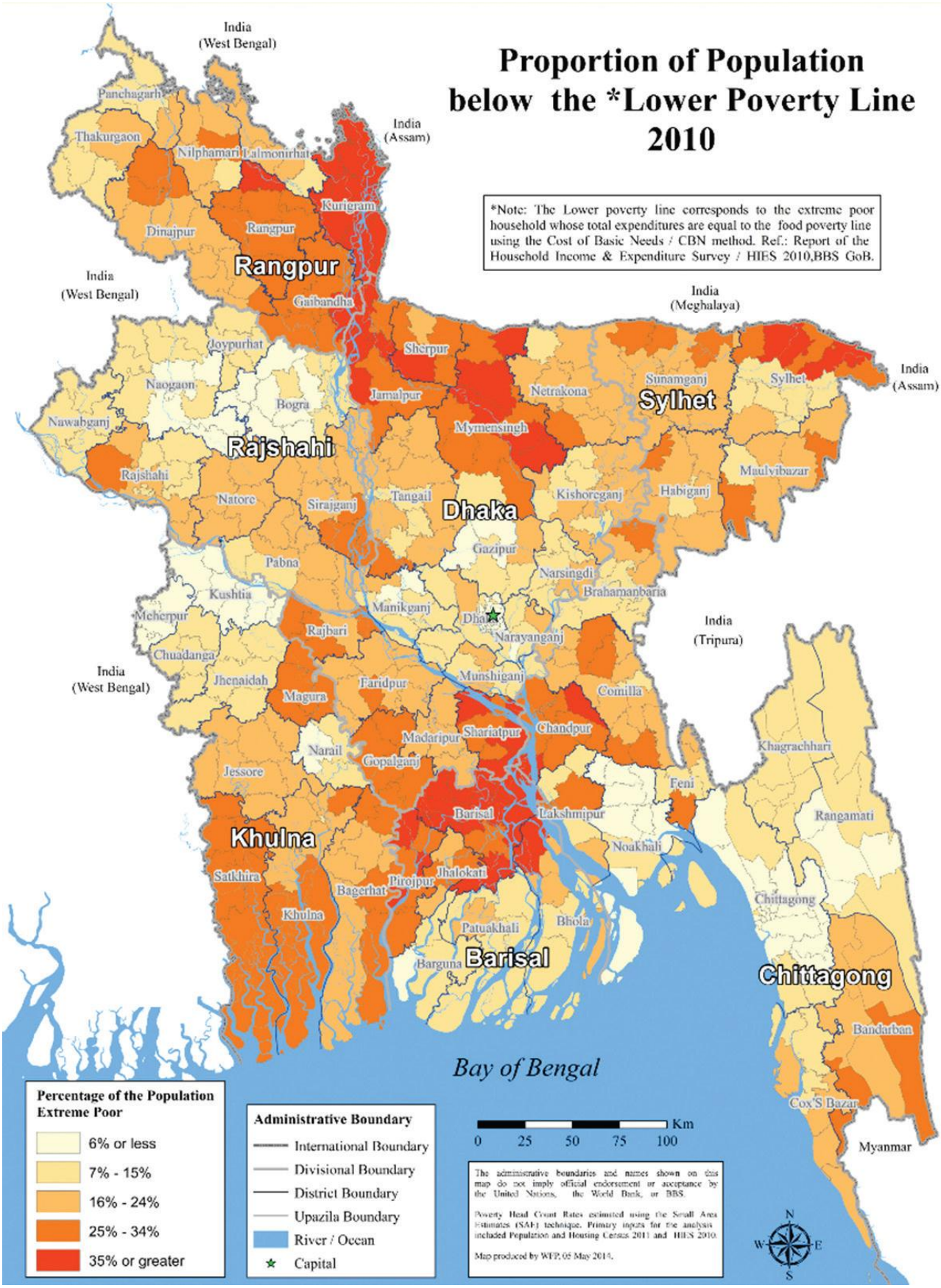
BBS prepared web based thematic maps using Population Census 2011



Bangladesh Poverty Map



Bangladesh Extreme Poverty Map



8.1 Bangladesh Agriculture 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.

8.2. Local Government Engineering Department:

Upazila/Thana base maps, District maps and road maps of the country are produced by LGED. All these maps contain various layers including administrative boundaries, physical infrastructure, educational institutions, settlement patterns, agriculture and socio-economic infrastructures.

8.3 Space Research and Remote Sensing Organization (SPARRSO)

SPARRSO has done a lot of works such as Crop Assessment, Forest Coverage Mapping, Extent of Shrimp Culture, Potentiality Mapping, Monitoring of Ecological Changes, and Land use Mapping etc.

8.4 Social Research and Development Institute (SRDI)

The major activities of SRDI are:

- Soil Survey of the whole country on the basis of aerial photo interpretation, field and laboratory investigation of soils;
- Interpretation of aerial photos, land sat imageries and topographic maps for soil and land use surveys.
- Preparation of various maps and reports on the above-mentioned surveys for publication.

9. CHANLLENGES AND CONSTRAINTS

- Data Standards
- Creation of a GIS Platform
- National Spatial Data Infrastructure (NSDI)
- Integration of Statistics with Geospatial Information
- Formal Legislation for Geospatial Data Usage

10. INTEGRATION OF STATISTICS WITH GEOSPATIAL INFORMATION

The statisticians and related stakeholders will benefit from the provision of services by integrating geospatial and statistical information

- GIS was found to be a useful tool in many different areas of statistics, including
  - ✓ Population Census
  - ✓ Social And Demographic Statistics
  - ✓ Economic Statistics
  - ✓ Environment Statistics

11. RECENT INITIATIVES OF BBS

Co-operation between statistical agencies and mapping agencies is crucial to successful integration and to successful delivery of information. In light of this end in view recently a workshop on GIS based organization was held under the auspices of BBS with the following objectives:

(i) To form a GIS platform to integrate statistics with geospatial information system.
(ii) To make sustainable development maps.

- As government has expanded Statistics Division to Statistics and Informatics Division (SID) to integrate informatics with statistics under a single platform, therefore, it is an important opportunity for SID to coordinate the integration of statistics into geospatial information system.

The stakeholder agreed to work together to integrate statistics with geospatial information under the leadership of SID & BBS of the Ministry of Planning.

12. THE WAY FORWARD

- The Asia Pacific Workshop in Beijing and the Global Forum on Integration of Statistical and Geospatial Information and 4th session of UN-GGIM in New York 4-8 will have a catalytic role towards making global and regional platform to pursue the most of integration.
- Exchange of views and sharing of lessons learnt among participating countries will help in integration of statistics with geospatial information.
- To strengthen the consultation process in Bangladesh in light of the decisions of Global Forum and UN-GGIM for integrating statistical and geospatial information.
- The GGIM processes including the current session of UN- GGIM and the HLF in Beijing (Oct 22-24, 2014) will be watershed events towards crystalizing the vision for integration.