On the Spot Identification of Flood Inundation Depth from Gridded Data using GPS enabled Smartphone Application to help People fix Plinth Levels of their Houses

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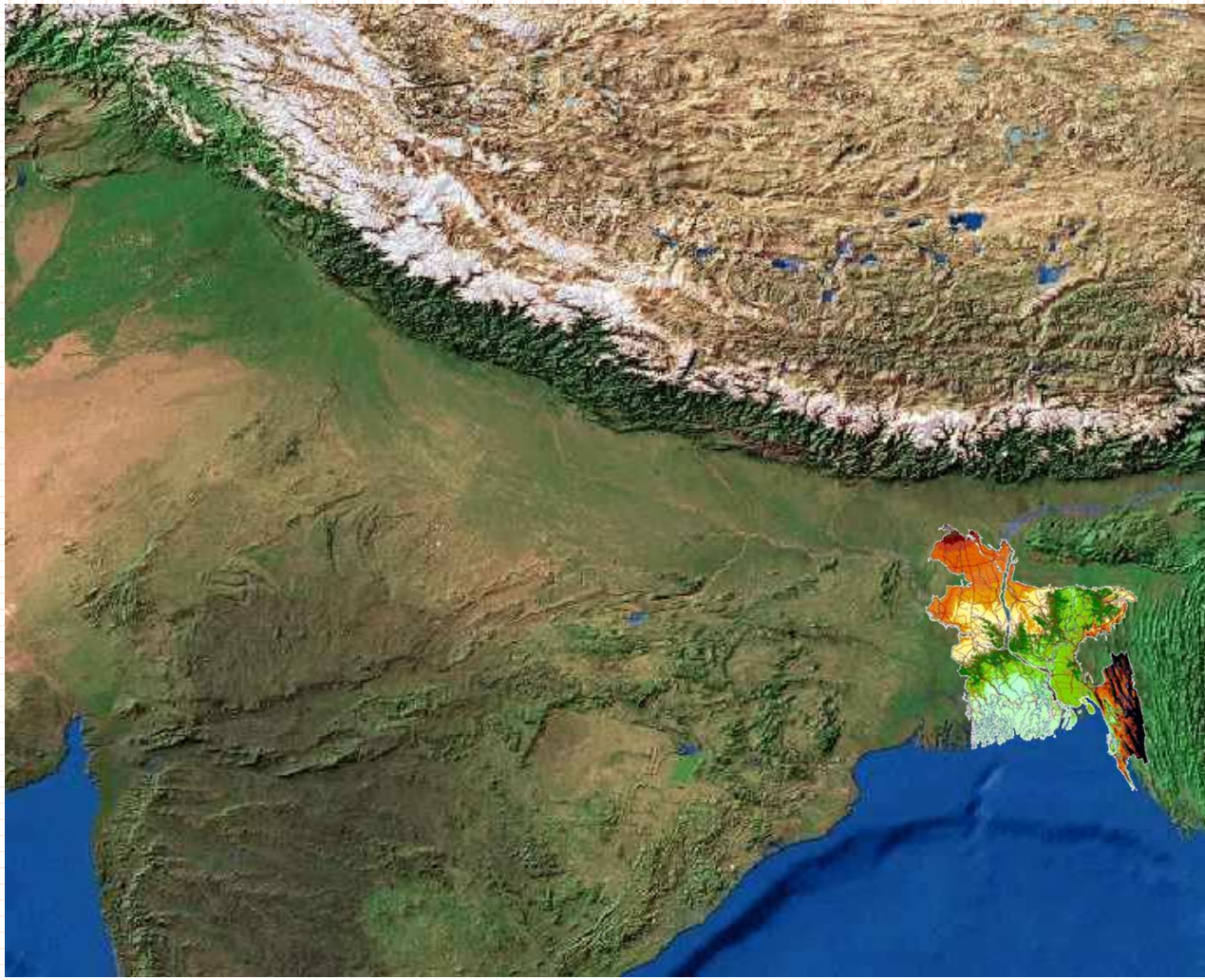
Nepal

Introduction (University of Dhaka)

- *Department of Disaster Science and Management (DSM) is only 4 years old*
- *An outcome of UNDP managed Comprehensive Disaster Management Programme (CDMP)*
- *Blending of science with social aspects*
- *Teachers from multidiscipline – Geology, Geography, Anthropology, Development Studies, Computer Science, Civil Engineering, Urban and Regional Planning, RS & GIS.*
- *Use of Geoinformatics in Disaster Management (19 credits out of 160 (around 12%)*
- *Institute of Space Science and Geomatics is coming soon*

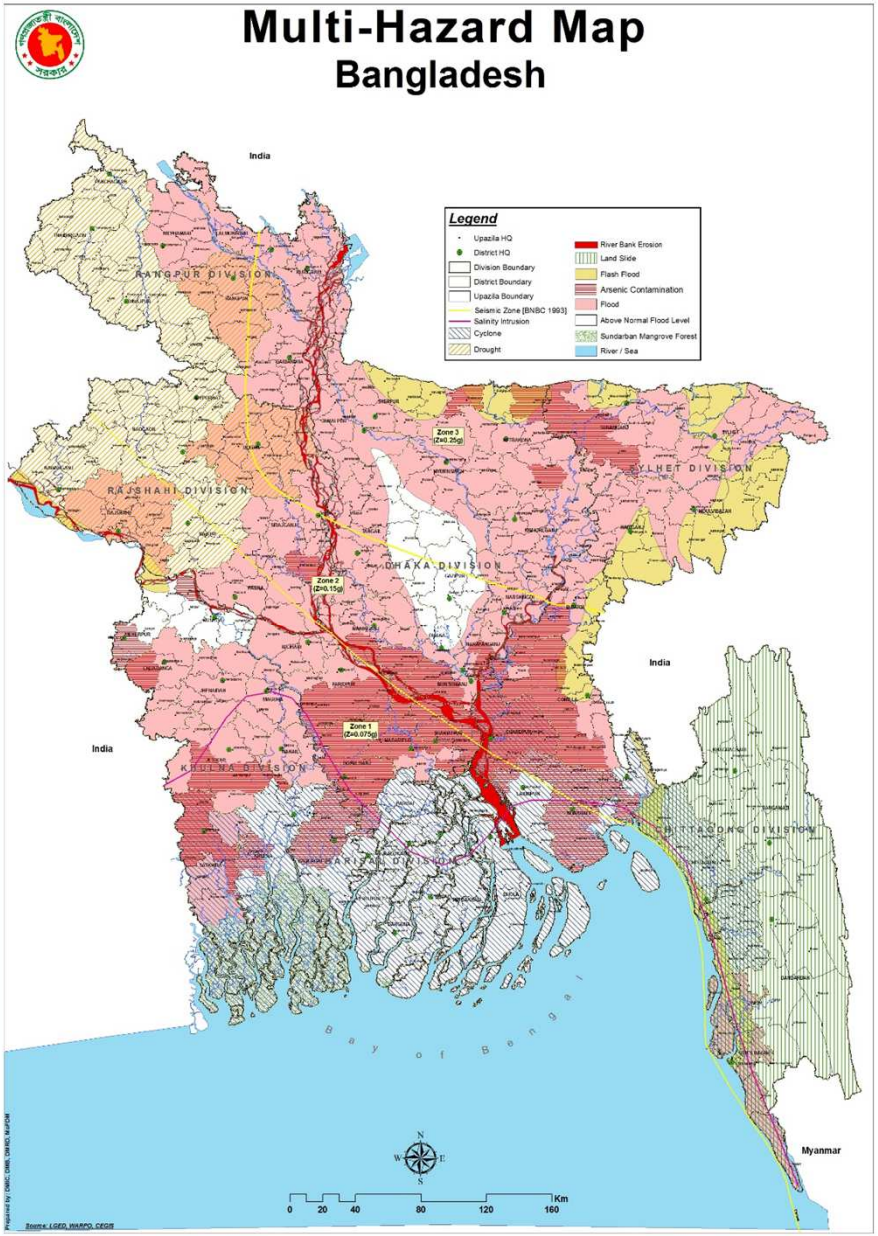
Introduction (Bangladesh)

- *Frequent occurrences of Cyclones, Storm surges, Floods, Tornadoes, Earthquakes, Droughts*
- *Monsoon flooding is an annual event shaping lives and livelihoods.*
- *Climate change is likely to cause significant impact in the disaster scenario*
- *The disaster vulnerable people demonstrates strong coping capacity to face the disaster challenges.*

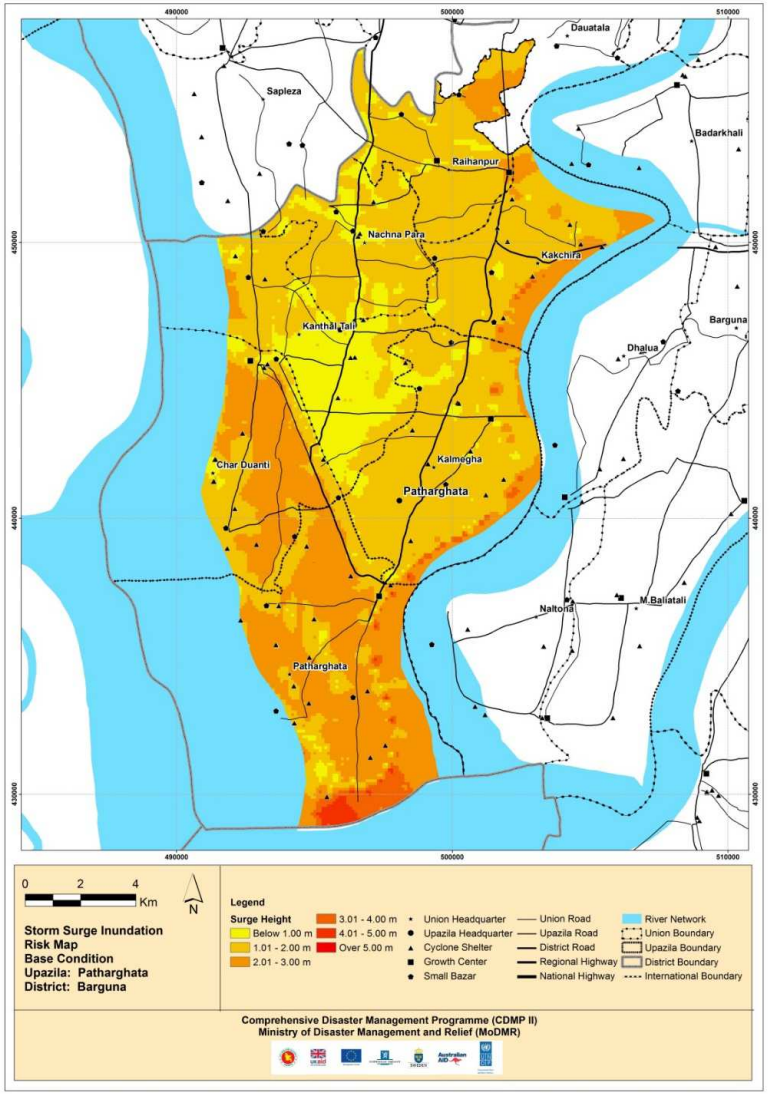


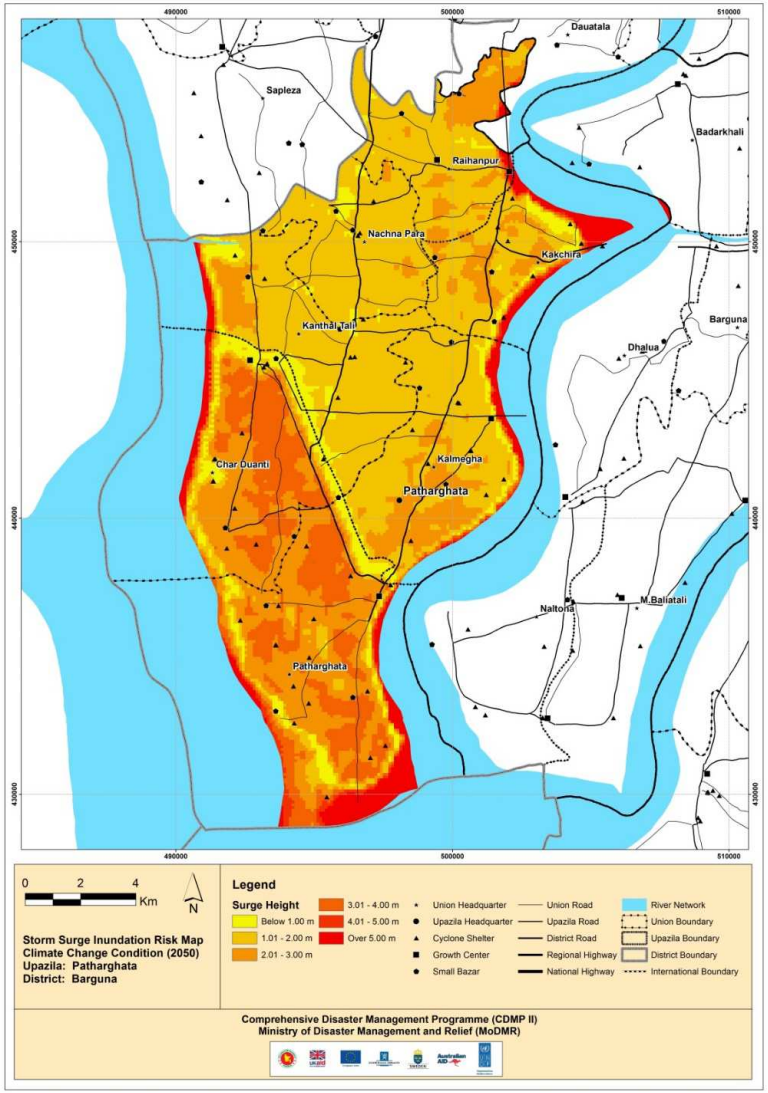
CDMP (*Comprehensive Disaster Management Programme*)

- *A multi-donor project administered by UNDP, Bangladesh has developed many products for Risk and Crisis management*
- *Tried to incorporated DM concept in secondary and university education*
- *Developed, among others,*
  - *Storm Surge Inundation Depth Map,*
  - *Salinity Intrusion Map,*
  - *Flood Inundation Depth Map*

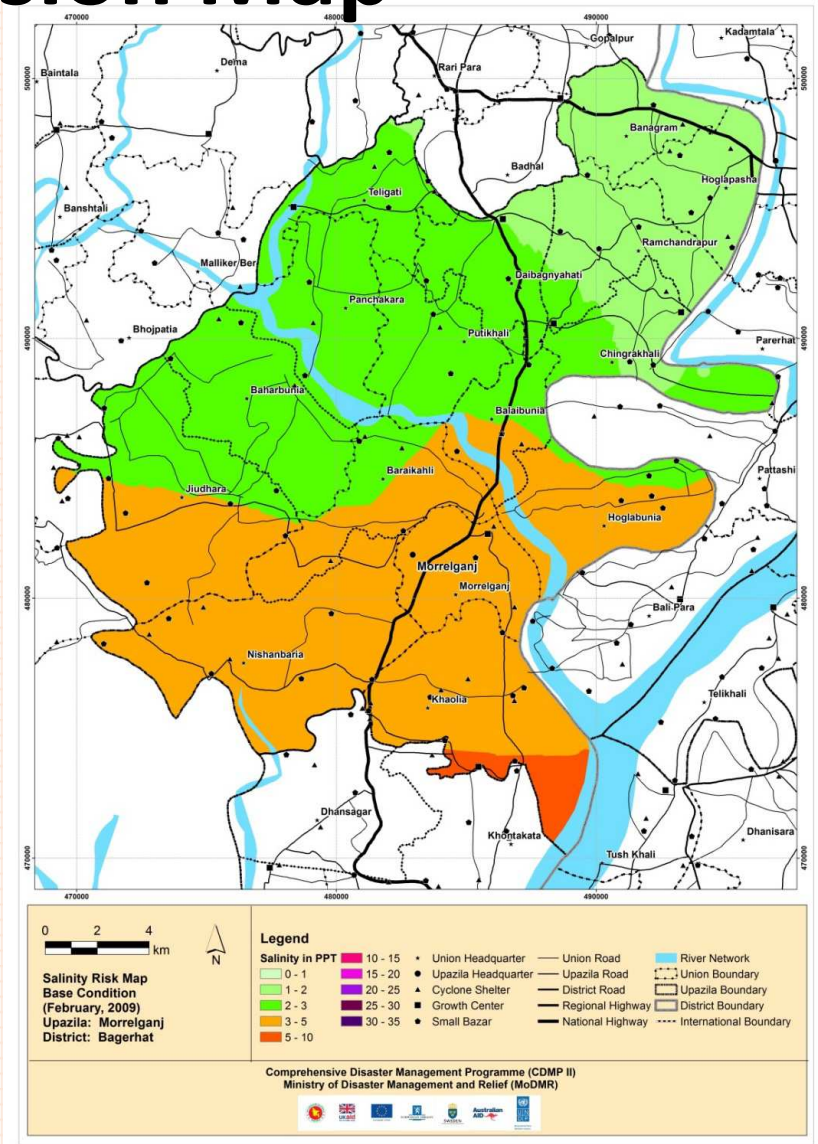


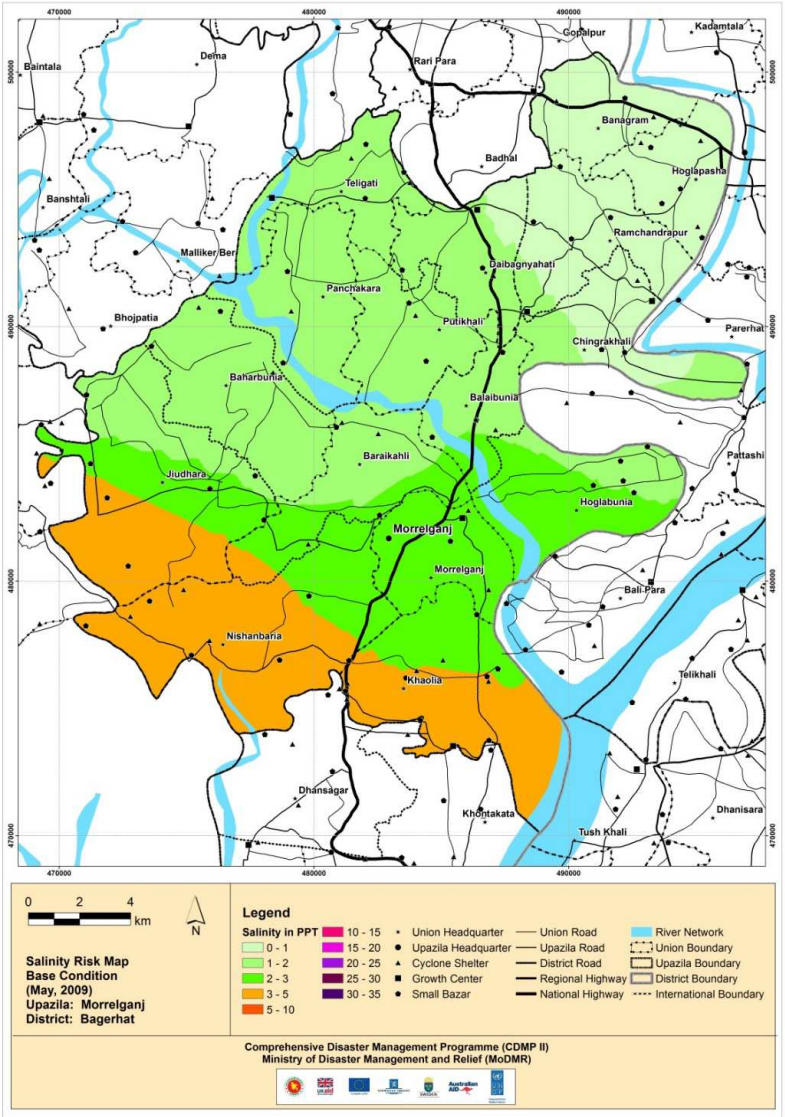
Storm Surge Inundation Depth Map





Salinity Intrusion Map



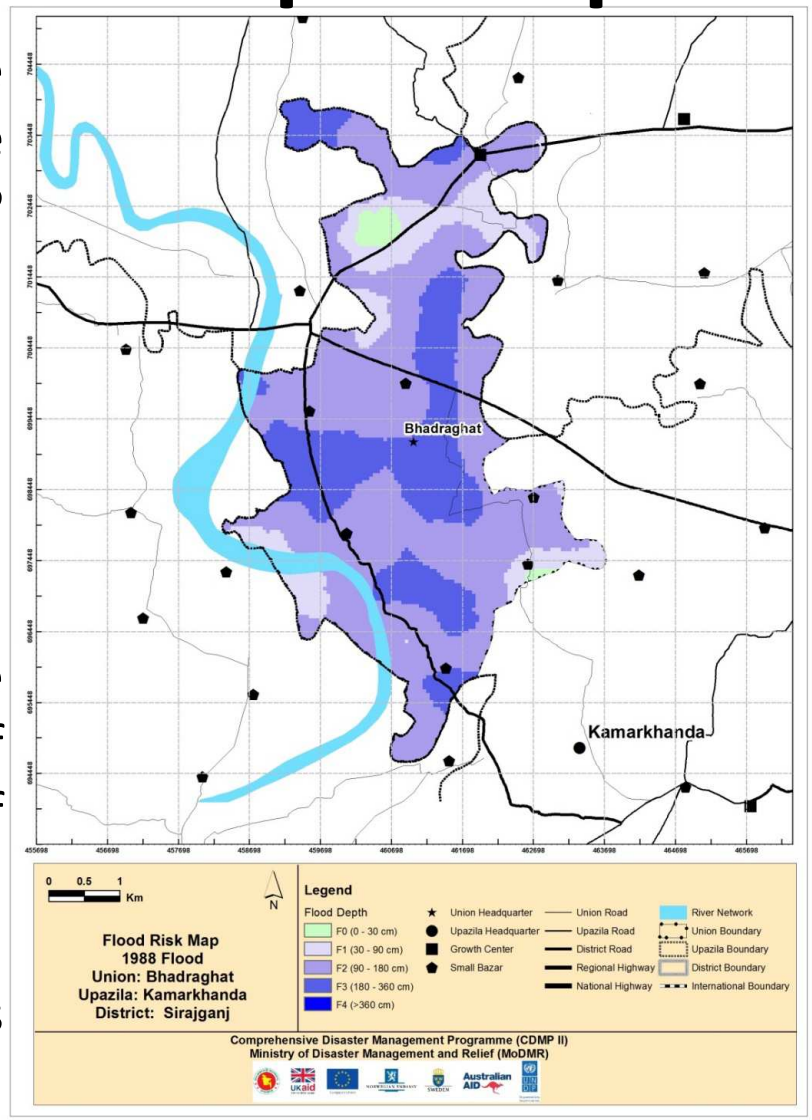


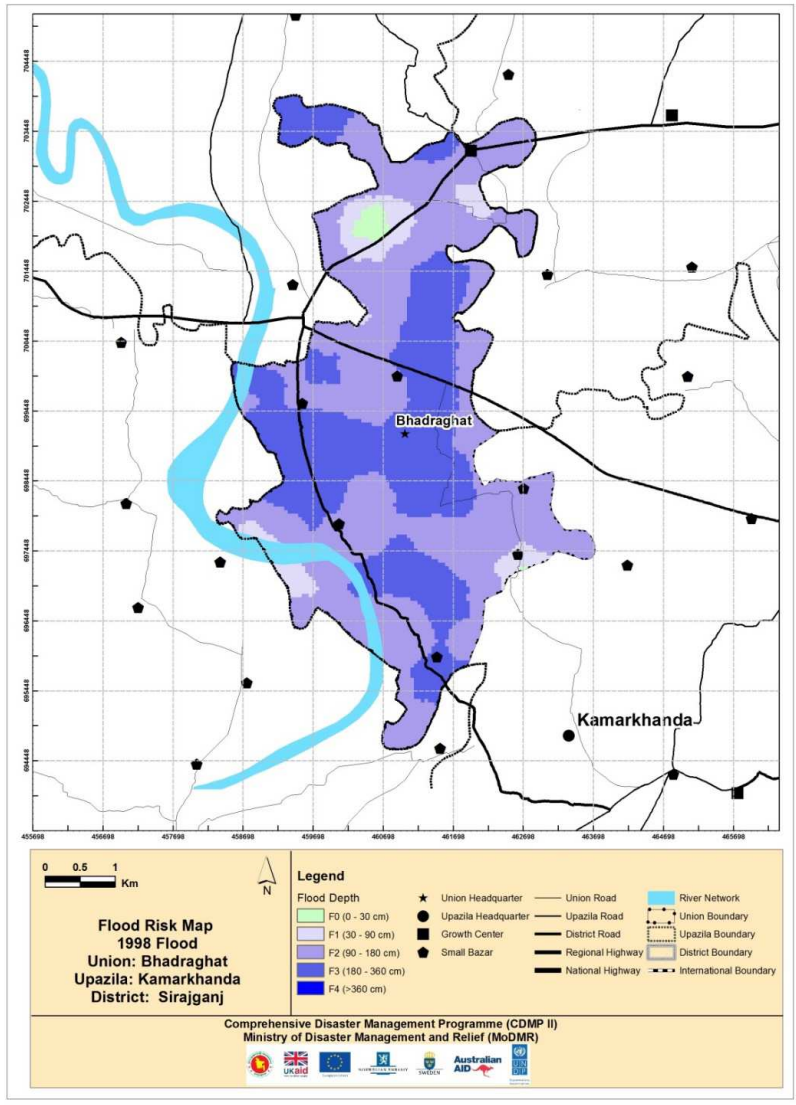
Flood Inundation Depth Map

The flood depths are classified in accordance with the NWMP guidelines.

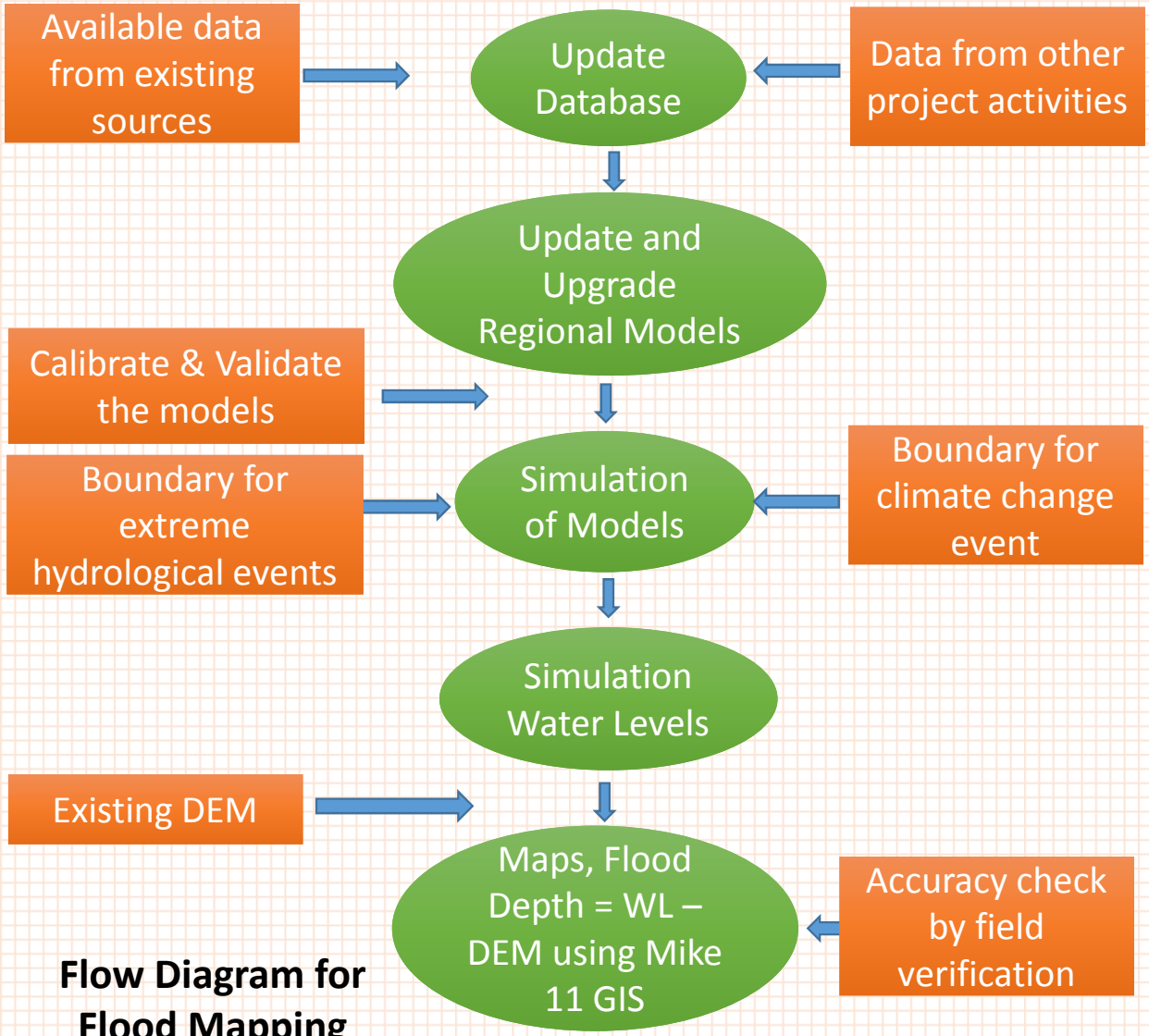
- **F_0 = 0-30 cm**
- **F_1 = 30-90 cm**
- **F_2 = 90-180 cm**
- **F_3 = 180-360 cm**
- **F_4 > 360 cm**

The flood levels are the result of interpolation of monsoon water level of model grids surrounded with the rivers and channels in the locations of interest.

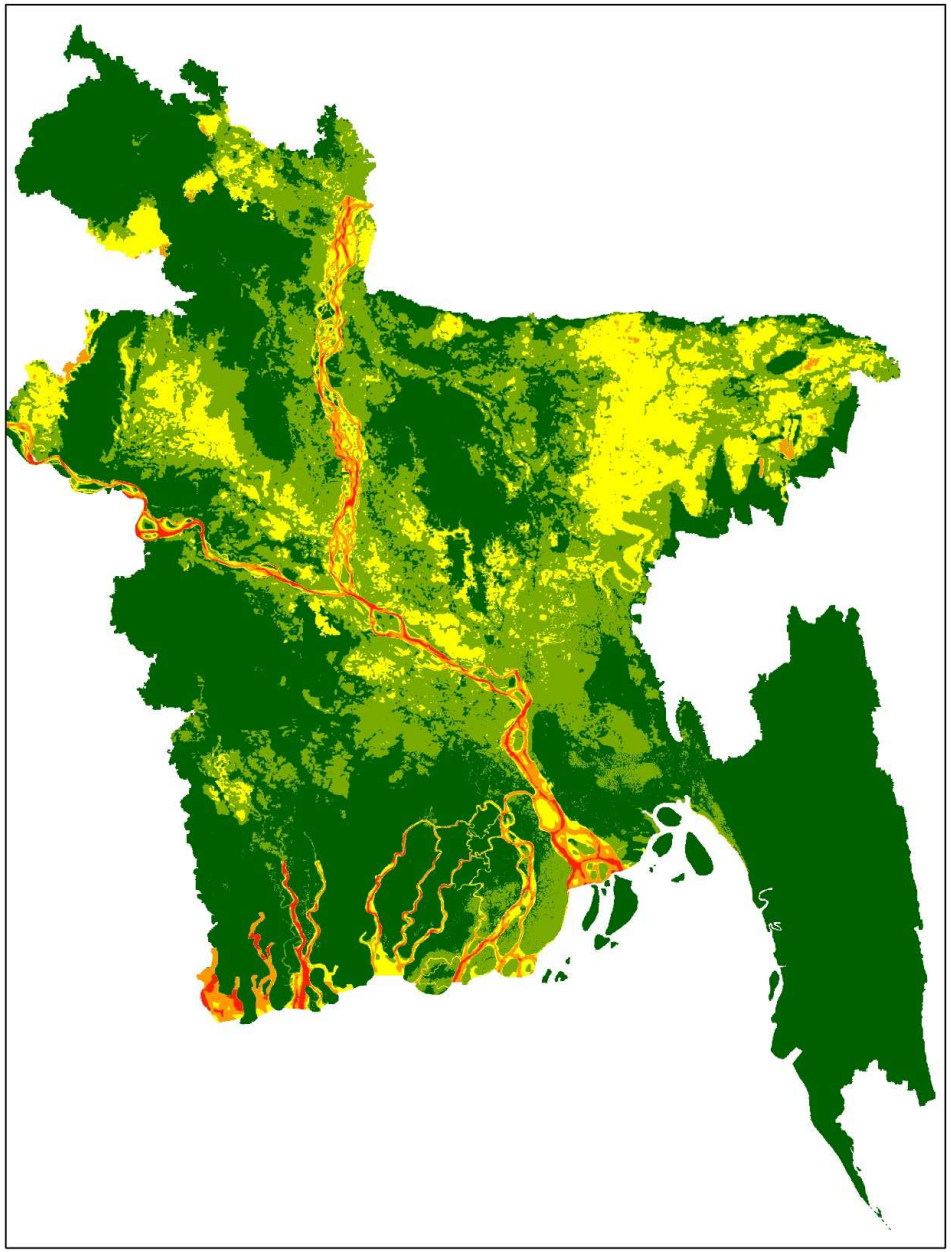




Flood Inundation Depth Map



Flow Diagram for Flood Mapping



Location Based Service

- **GPS enabled Smart Phone to identify on the spot Flood Inundation Depth**.

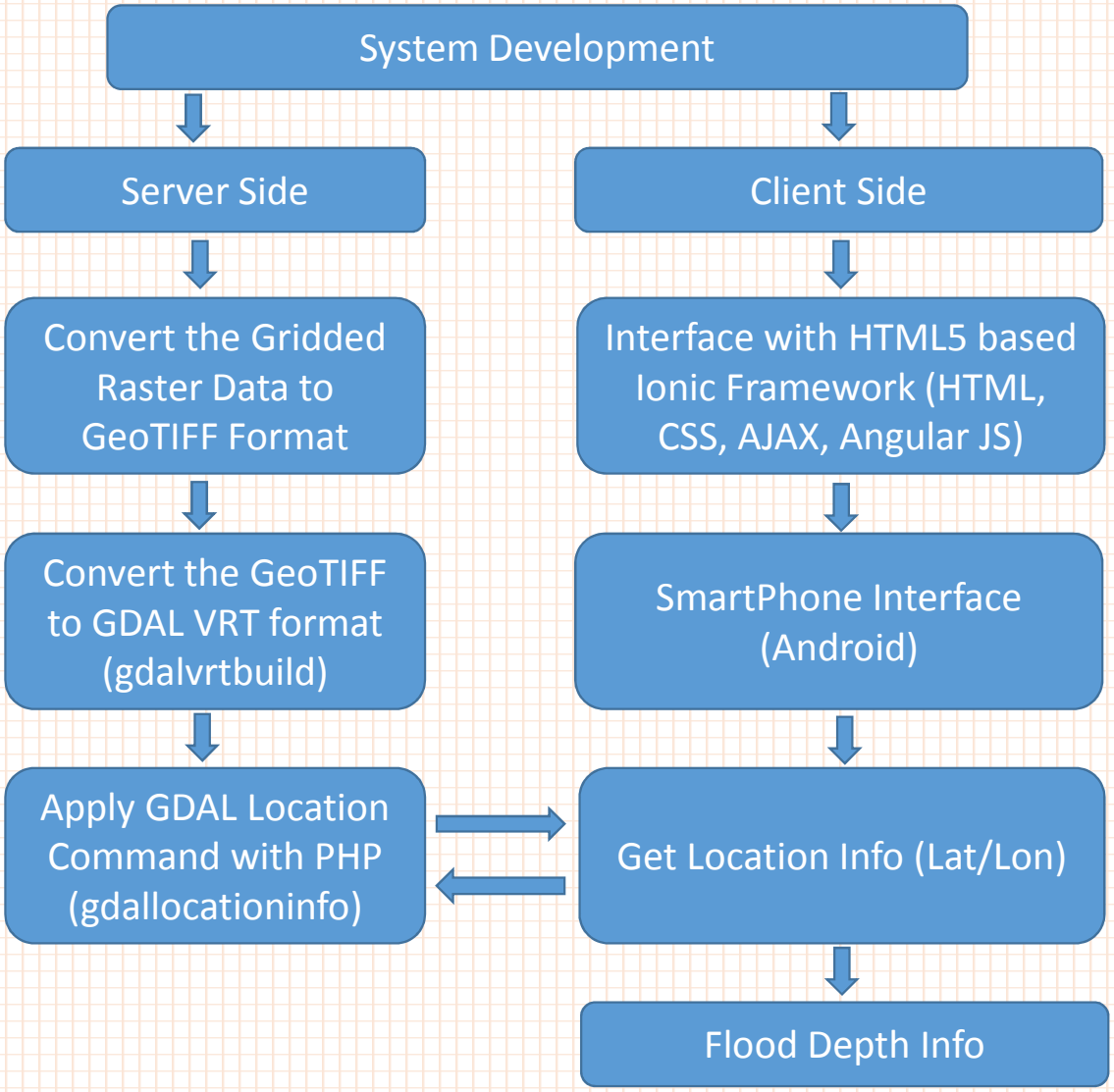
- **System Requirement (Open Source Software/Technology)**

- Smart Phone with GPS Module

- Ionic Framework (HTML5 – easy develop Mobile Interface with minimum coding)

- Linux Server (Ubuntu)

- Only 2 lines GDAL Command



Location Based Service

GPS enabled Smart Phone to identify the on the spot Flood Inundation Depth Map

Flood Inundation Depth

Spot Coordinates | Maps | Help & Credits

Spot Coordinates

Latitude (N): 22.9523691

Longitude (E): 91.1693553

Get Coordinates

Flood Inundation Depth

Depth (cm): 42

Get Depth

Flood Inundation Depth

Spot Coordinates | Maps | Help & Credits

Spot Coordinates

Latitude (N): 22.6523691

Longitude (E): 91.2693553

Get Coordinates

Flood Inundation Depth

Depth (cm): 53

Get Depth

Conclusion & Recommendation

- ✓ This time the system has considered only 1988 Flood
- ✓ The system can be handy for the stakeholders, instead of using hardcopy maps, to implement mitigation interventions like Raising Plinth of the Houses in the Flood Prone Areas.
- ✓ Department of Disaster Management (DDM) and Local NGOs can take the role of extension work
- ✓ Local level Disaster Management Committee can be trained to help the community for using the system
- ✓ The System can be used in other sectors like Road/Bridge/Cyclone Shelter construction

Future Work

- ✓ To be incorporated other Severe Flood Events
- ✓ To be incorporated storm surge and salinity
- ✓ More field verification
- ✓ Engage students to disseminate the technical aspects of the whole system
- ✓ Interface development for i-Phone

End

- ✓ End
- ✓ Thank you