

# GIS Based Watershed Management

A DSS for better watershed management



# SCOPE

- Watershed Characterisation
- Input Data – Latest Trends
- Why Geo Enabled Solutions
- Conclusion



Source: <http://conservation-ontario.on.ca/resources/graphics>

# Watershed Characterisation

## Input Data

- Cartographic
- DEM
- Environmental Historical Data
- Environmental Realtime Data
- Point Source Data
- Non – Point Source Data

## Assessment

- Data mining
- Data manipulation
- Data visualisation
- Models
- Reporting

## Decision Making

- Watershed Management
- Stormwater Management
- Total Maximum Daily Load (TMDL)
- Local Flood Plain Management
- Water Quality Management

# Input Data – Latest Trends



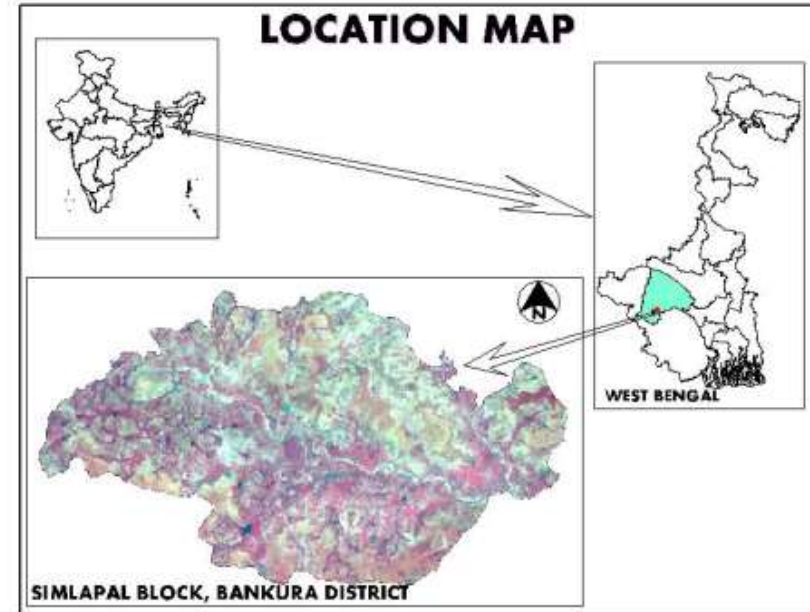
Source: Reson

- Satellite Imagery
- Acoustic Data
- LiDAR
- Realtime data
- Multiple public sources

# Geo Enabled Solutions

Block level Micro Watershed  
Prioritisation Based on  
Morphometric and Runoff  
Parameters

Vijay KGT



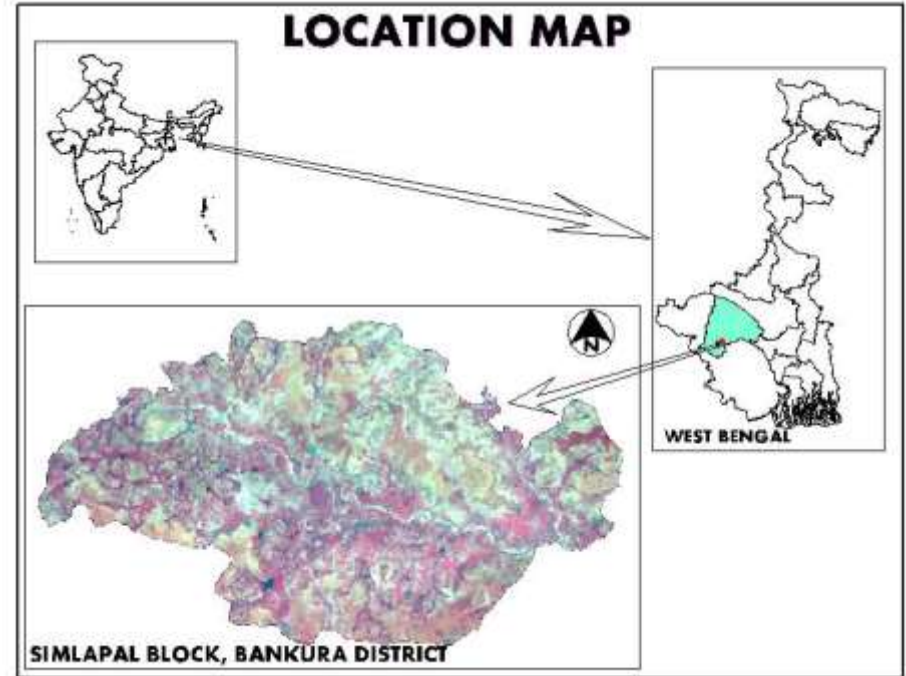
# Geo Enabled Solutions

Simalpal Block in Bankura  
Distt, WB

Average ele. – 57 m (187 Ft)

Rainfall : 1750 mm

Severe summer water crisis



# Geo Enabled Solutions

## INPUTS

SOI Toposheets 1:50,000

IRS LISS I IV satellite imagery with 5m resolution

NBSS soil data

SRTM DEM datasets

Seasonal rainfall data

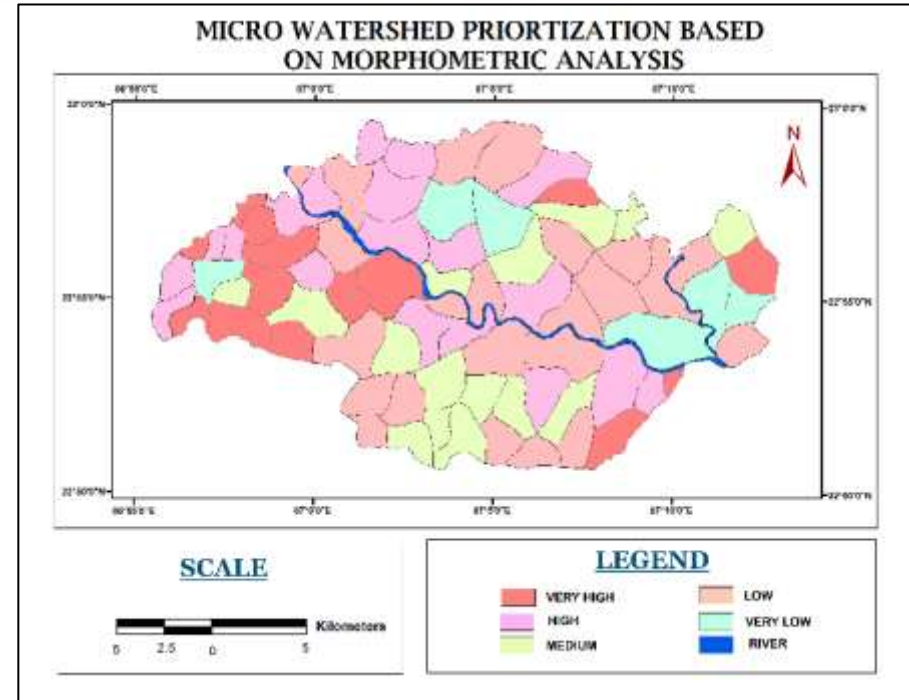


## MORPHOMETRIC ANALYSIS

Linear and Aerial aspects

Priority fixation of watersheds:

- 14 : Very High
- 19 : High
- 15 : medium
- 23 : Low
- 06 : Very Low





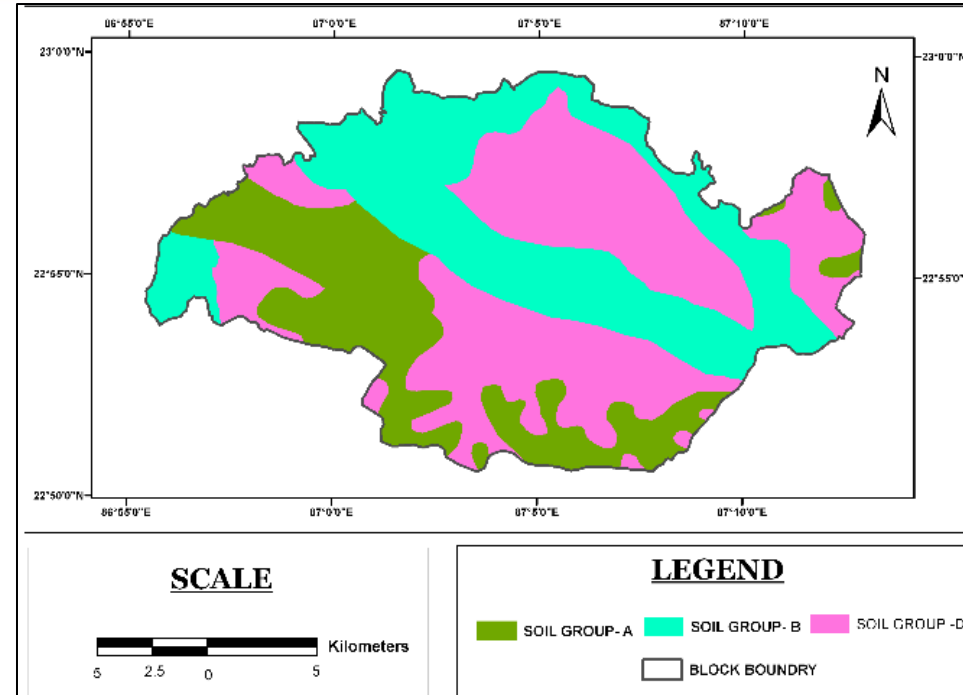
# Geo Enabled Solutions

## HYDROLOGIC ANALYSIS

Infiltration rates, Soil Texture and taxonomic conditions

Hydrologic Soil Groups:

- Group A : Well drained
- Group B : Well to Moderate
- Group C : Moderate to Poor
- Group D : Poorly Drained

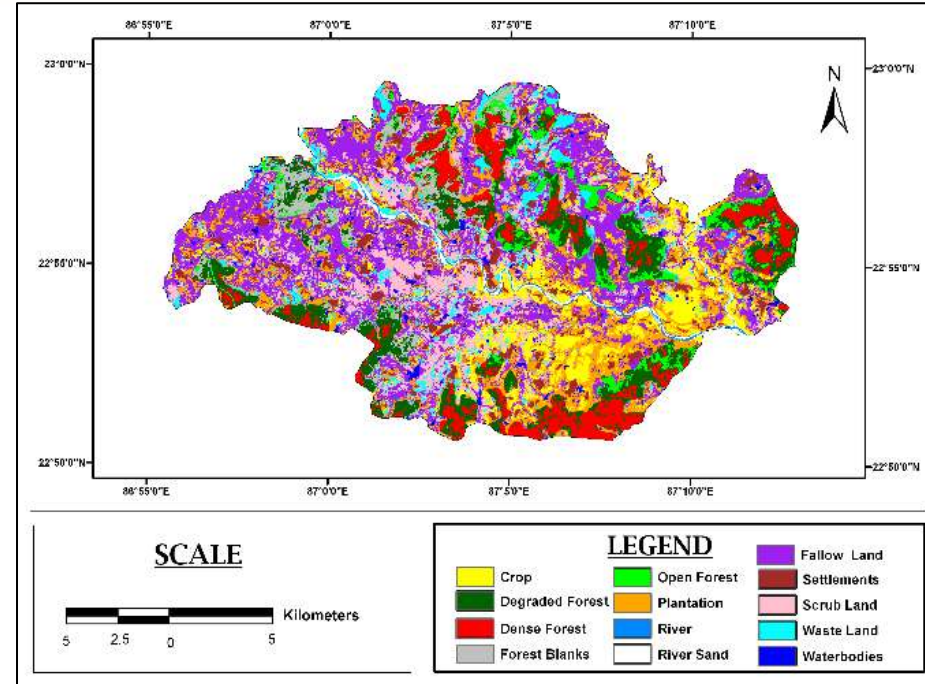


# Geo Enabled Solutions

## LAND USE LAND COVER

LISS IV data, Supervised Hybrid classification techniques to overlay vectorised data

Hydrological Groups + Landuse  
Landcover Curve numbers helps  
calculate the Anti moisture conditions



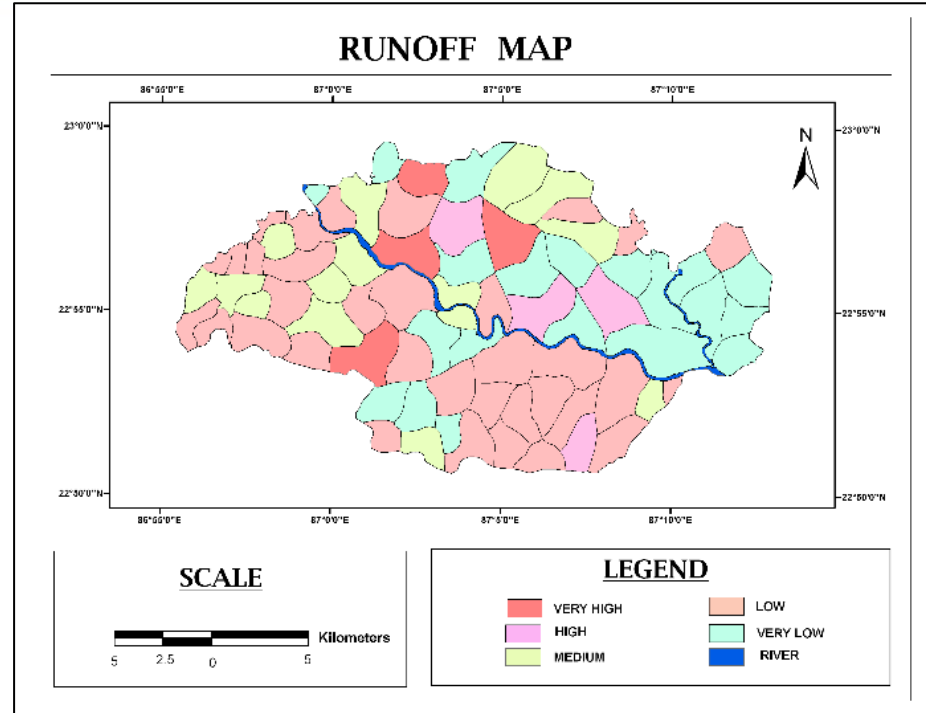
# Geo Enabled Solutions

## RUNOFF

SCS-CN Method

Runoff Prioritisation:

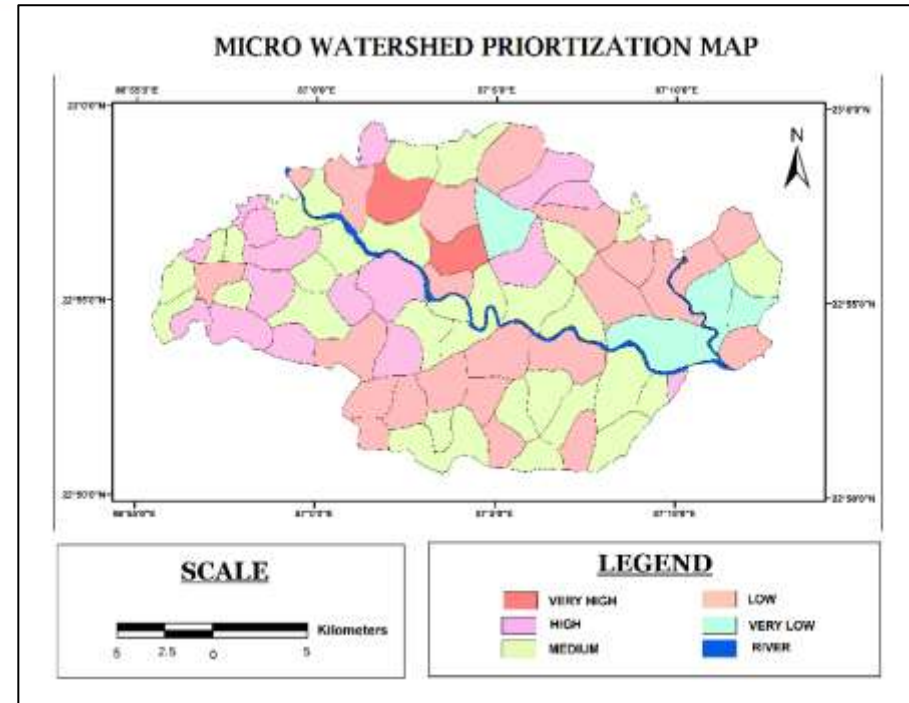
- 04 : Very High Priority
- 04 : High Priority
- 14 : Medium Priority
- 32 : Low Priority
- 23 : Very Low Priority



# Geo Enabled Solutions

## RESULT

The prioritization of Micro-watershed decreases from western side to eastern side because of the slope



# Geo Enabled Environment

Customised geo Enabled Solutions allows the city to

- Prioritise Sotrmwater Infrastructure,
- Drainage system maintenance,
- Track Water quality

Provides Common Framework – Spatial location for watershed management data obtained from various sources

Powerful tool to understand processes and manage potential impacts

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