Geoinformatics in water resource management at Micro watershed level; Dangra a Case, West Bengal

Presented by Kartic Bera

In Collaboration with:
Dr. Jatisankar Bandyoapadhyay

Department of Remote Sensing & GIS
Vidyasagar University, Midnapore, West Bengal :: India

Content

Introduction

Water are the greatest gift of nature. This resources must be conserved and maintained carefully for environmental protection and ecological balance. Land degradation reduces the world's fresh water reserves, river flow rates and lower ground water levels which lead to the silting up of estuaries, reservoirs, salt water intrusion, interfere with the operation of reservoirs and irrigation channels, increase coastal erosion and pollution of water by suspended particles and stalinization, thus affecting human and animal health. Solution to all these problems is watershed management.

Water resources development needs very careful analysis of the upper catchments to the lower stretch of a watershed otherwise scattered local level surface/ ground water management in the upstream is likely to affect negatively the recharge in the downstream of a river.

Multi dataset is required for micro watershed wise water resources management. Simulate of water scarcity zones, drainage character, surface runoff and sediment transport during rainfall events and evaluate the land capabilities and suitability's of it for multi criteria evaluation based final action plan tacking. It is essential to identify areas most susceptible to demographic stretcher for best management practices on these areas and assessment of BMP implementation effectiveness on water amiability improvement through monitoring strategies.

Location of Study area

SUB- WATERSHED BOUNDARY OF UPPER BEKO WATERSHED
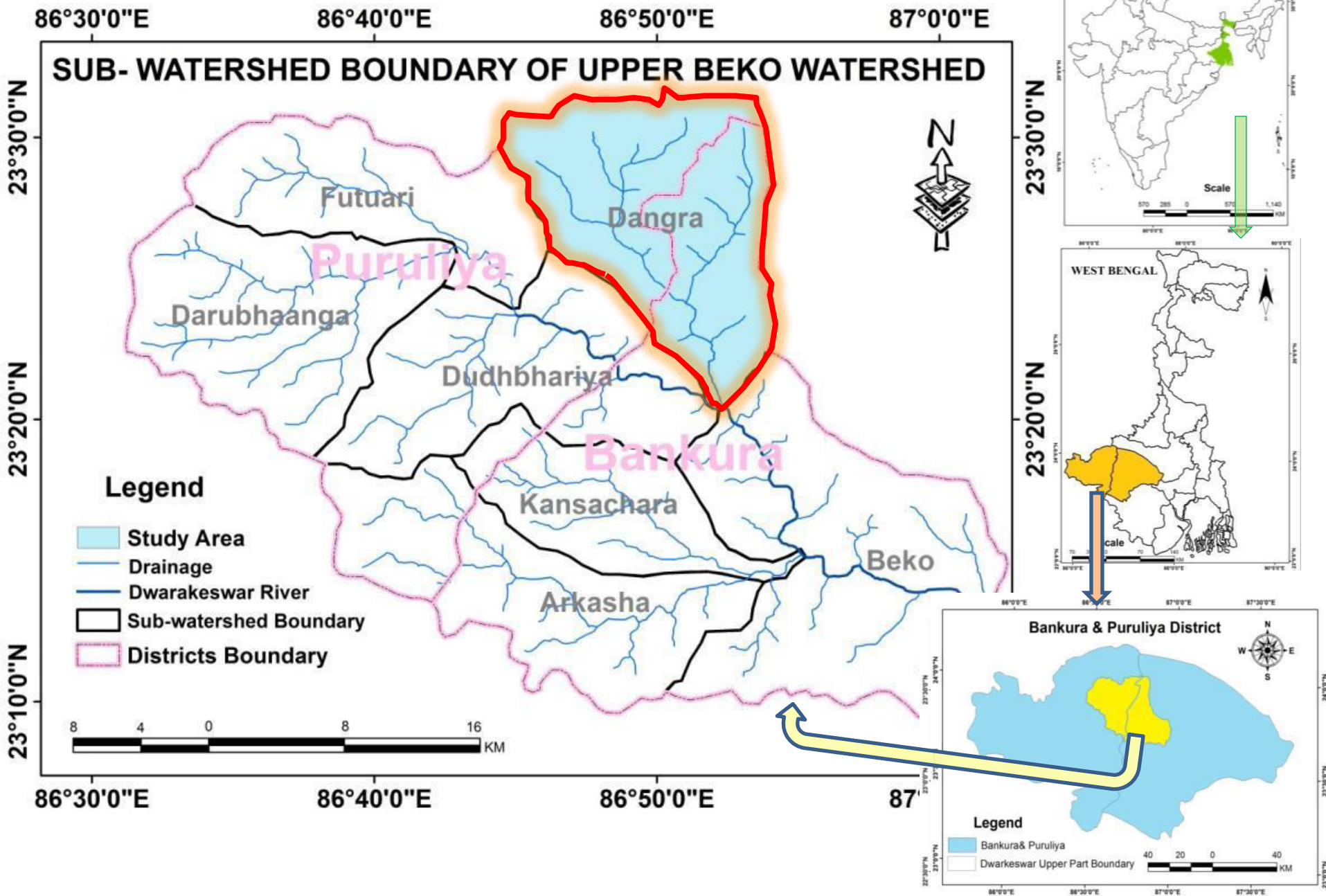
Study Area Micro watershed Codification

Sub watershed	Mini watershed	Micro watershed	
		Code	**Number**
Dangra (2A2C8C)	2A2C8C1	2A2C8C1a ----2A2C8C1f	6
	2A2C8C2	2A2C8C2a ----2A2C8C2d	4
	2A2C8C3	2A2C8C3a----2A2C8C3c	3
	2A2C8C4	2A2C8C4a----2A2C8C4d	4
	2A2C8C5	2A2C8C5a---- 2A2C8C5d	4
	2A2C8C6	2A2C8C6a----2A2C8C6d	4
	2A2C8C7	2A2C8C7a----2A2C8C7d	4

Aim & Objectives

Aim: Micro watershed wise Water Resource Management for sustainable development.

Objectives:

➤ To prepare drainage net work map.

➤ To delineate and coded micro-watershed boundary.

➤ To prepare various thematic map.

➤ Different physiographic parameter based prioritization.

➤ Societal perspective based prioritization.

➤ Micro watershed wise action plan taking for sustainable development.

INTEGRATED WATERSHED DEVELOPMENT

OBJECTIVES

Economic Growth, Basic Needs, Ecological Balance

INFORMATION NEED

Natural Physical Resources	Contemporary technology	Socio-Economic & Demographic data
- SOIL - GEOLOGY - GEOMORPHOLOGY - GROUNDWATER - LANDUSE / LANDCOVER - RAINFALL AND CLIMATE - DRAINAGE & WATERSHED - SLOPE, ASPECT & ALTITUDE - TRANSPORT NETWORK AND SETTLEMENT	- AGRICULTURE - WATER MANAGEMENT - GROUNDWATER EXPLORATION - ANIMAL HUSBANDARY - FISHRIES - MINERAL EXPLORATION - HOUSING AND CONSTRUCTION - ENERGY & POWER ENGINEERING - HEALTH & SANITATION - WATER HARVESTING	**SPATIAL ANALYSIS OF SOCIO ECONOMIC DATA** - SOCIAL PROFILE - DEMOGRAPHIC PROFILE - CULTURAL PROFILE - ECONOMIC STATUS

THEMATIC MAP INFORMATION	NATURAL/PHYSICAL RESOURCE	PEOPLES NEED & PROGRAMMES REGION IDENTIFICATION
INTEGRATION OF MULTI-THEMATIC INFORMATION (Composite Land Development Unit)	BASED DEVELOPMENT POSSIBILITY RESOURCES REGIONS	* Socially backward Areas/People * Economically backward Areas/People * Areas lacking basic amenities

RESOURCES MANAGEMENT DECISIONS-SPECIFIC PLANS/PROJECTS

DEMONSTRATION OF TECHNOLOGY	IMPLEMENTATION	TRAINING/RETRAINING OF USERS

EVALUATION AND FEED BACK

Materials used for Study

TYPE OF DATA	YEAR OF PUBLISED	SOURCE
IRS-P6, LISS-III Spatial Resolution =23.5 Meter.	Swath=114 KM. Row & Path = 55 & 107 Year: 2007, 2008, 2009, 2010, 2011 (Kharif & Rabi Session)	NRSC- Hydrabad
ASTER & SRTM DEM (30 & 90 Meter)	2000 (Path & Row-54/08).	GLCF Website
Geology (Resource Map)	2001	GSI, Kolkata
District Planning Map (**DPMS**)	1991(Bankua) & 1993 (Puruliya)	NATMO & SOI Kolkata
Landform	1999	NATMO (Bankura), Kolkata
Toposheets	1972 (First Edition) (73I/11,14, 15 & 16)	Survey of India (Kolkata)
Sub-Surface / Ground water	3rd & 4th EMI Report	SWID, Kolkata
Meteorological Data	1993 to 2011	Indian Meteorological Department, Kolkata
Village Boundary map And Census data	1961, 1971, 1981, 1991, 2001 & 2011	Census Department , Kolkata
Soil Data	1991	NBSS & LUP, Kolkata
Socio economic data and **Soil Sample**	2010 to 2013	Repetitive field survey.

Methodology of Study

Flow chart of the work

Conclusion

➢Special Information technology has emerged as a powerful techniques for cost effective data acquisition within a short time at periodic intervals.

➢Evaluation of watersheds after the treatments is necessary to find the effect of conservation practices and further planning to control runoff and sediment yield.

➢Most of the villages are in serious condition in dry seasons as do not they have the minimum quantity of water. So assigned high priority for taking immediate action.

➢Due to low availability of water they cannot cultivate therefore economically backward.

➢The sole factor in the success of any water harvesting system is the proper selection of the site, type of structures as per the physiography of the area and the methods to be used.

➢ Nano -watershed wise future study is necessary for local level implementation if micro watershed not covered.

References

Bera Kartic (2013): Geoinformatics in Water scarcity Management by suggest Nala band & Reservoir: Part of Dwarkeswar watershed, West Bengal, India, International Journal of Research in Social Sciences, 3 (1), pp 656-670.

Bera and Bandyopadhyay (2013), Management of Ground Water Using Geoinformatics in Dwarkeswar Watershed of Puruliya District, Indian Cartographer, Vol. 31, pp 265-270.

Bera and Bandyopadhyay (2013), Prioritization of Watershed using Morphometric Analysis through Geoinformatics technology: A case study of Dungra subwatershed, West Bengal, India, Int. Jor. of Advances in Remote Sensing and GIS, 2(1), pp 1-8.

Krishna Murthy Y. V. N. (2013), REMOTE SENSING & GIS APPLICATIONS IN WATERSHED MANAGEMENT, Lecture ppd published in ISRO website on 5th February 2013. http://www.iirs.gov.in/iirs/sites/default/files/pdf/Watershed_Director_IIRS.pdf

THANK YOU
FOR YOUR
KIND ATTENTION

SUGGESTION FOR DEVELOP
MY STUDY
4kbrsgis@gmail.com