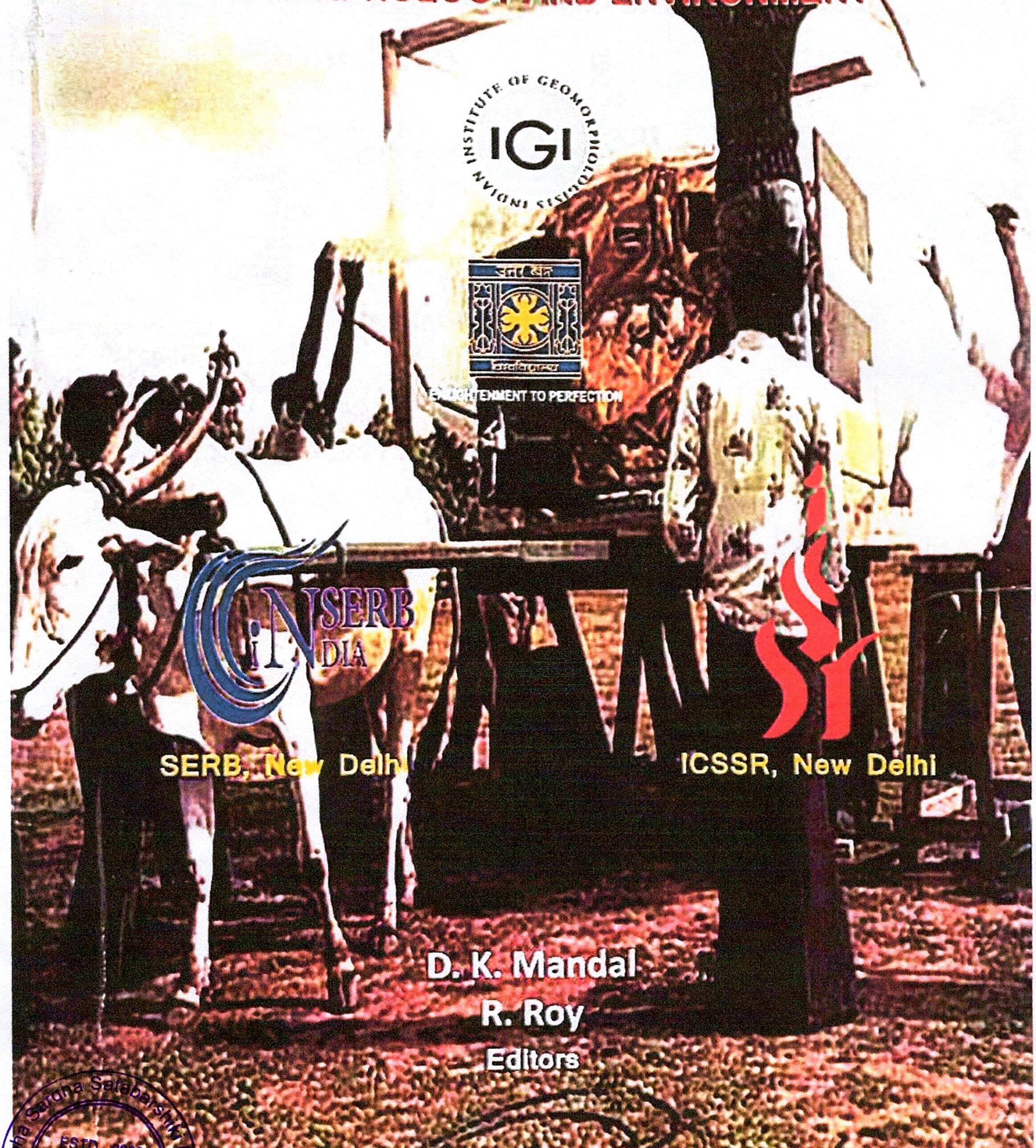
APPLICATIONS OF GEOSPATIAL TECHNOLOGY IN GEOMORPHOLOGY AND ENVIRONMENT



INSTITUTE OF GEOMORPHOLOGISTS INDIAN

IGI

ENLIGHTENMENT TO PERFECTION

SERB, New Delhi

ICSSR, New Delhi

D. K. Mandal

R. Roy

Editors

APPLICATIONS OF GEOSPATIAL TECHNOLOGY IN GEOMORPHOLOGY & ENVIRONMENT

Department of Geography & Applied Geography, University of North Bengal is indebted to the Science and Engineering Research Board (SERB), New Delhi, Indian Council of Social Science Research (ICSSR), New Delhi, Siliguri Jalpaiguri Development Authority (SJDA), Siliguri, North Bengal University, Siliguri for financial support.

Professor D. K. Mandal & Professor R. Roy
Editors

ISBN 978-81-925799-3-1

Published in 2020 in India by the Registrar, University of North Bengal
Raja Rammohunpur, Dist. Darjeeling, West Bengal, 734013

Printed by the Superintendent, North Bengal University Press
Raja Rammohunpur

Climate of Deocharai G.P

The climate of the Deocharai G.P is characterized by a highly humid atmosphere and abundant rains, with the temperature being seldom excessive. The period from June to beginning of October is south west monsoon season, October to mid-November constitute post monsoon season. Winter being November to February and summer being March to May. January is the coldest month with temperature varying between 10.4°C to 24.1°C. April is the hottest month with mean daily maximum temperature 32.5°C and mean daily in minimum of 20.2°C. Lowest temperature up to 3.9°C and maximum temperature 39.9°C have been recorded. The atmosphere is highly humid throughout the year except February to May when relative humidity is as less as 50% to 70%. Average annual rainfall in the Deocharai G.P is 350 cm. About 90% of the annual rainfall is received during the south-west monsoon. June is the rainiest month. On the average there are about 102 rainy days with records of more than 400 cm rainfall in 24 hrs. Deocharai G.P has no large forest area. Agriculture is the main occupation. Paddy, Jute, Tobacco, Potato, Mustard, Vegetables are being the main crops.

Causes of Flood

1. Heavy rainfall average 3500 mm per year
2. Moderate slope
3. Sandy soil
4. Drainage congestion
5. Deforestation
6. Construction of buildings, bridges, roads, rail lines

Affected Populations

Name of Village	Total Population	Population likely to be affected	% of total Population likely to be affected
Balaghat	1370	1000	72.99
Chengmari	1227	760	61.94
Chhat Deocharai	276	276	100
Deocharai	7015	3500	49.89
Jhaljhali	3770	1200	31.83
Krishnapur	5248	1200	22.86
Nepalerkuthi	323	323	100
Santoshpur	2991	2000	66.87
Total	**22220**	**10259**	**46.17**

Affected area

Name of Village	Total Area (hec.)	Area likely to be affected (hec.)	% of Area likely to be affected (hec.)
Balaghat	213.93	150	70.12
Chengmari	247.6	150	60.58
Chhat Deocharai	41.96	41.96	100
Deocharai	844.08	500	50.64
Jhaljhali	784.51	400	50.85
Krishnapur	762.75	300	39.33
Nepalerkuthi	49.47	49.47	100
Santoshpur	403	300	74.44
Total	**3347.3**	**1991.43**	**59.49**

Total 59.49% area of Deocharai GP is flood prone and 46.17% of total population the GP are living in this flood prone area. Chhat Deocharai and Nepalerkuthi villages are fully flood prone villages. But rescue capacity of different schools and flood shelters are only 3800 person or 37.04% of total affected population. There are two flood shelters in this GP and accommodation capacity is 450.

Principal
S.B.S.S. Mahavidyalaya
Goaltore, Paschim Medinipur

Accommodation Capacity in Different Rescue centres

Rescue Centre	Accommodation capacity
Deocharai High School	1000
Balaghat Primary School	200
Karjeepara Primary School	200
Jhaljhali Primary School	250
Boxirkuthi Primary School	300
Chengmari Gope Primary School	250
Krishnapur Ghonanapara 5th Plan	200
Jhaljhali Health sub-centre	200
Kurshamari SSK	150
Deocharai Flood Centr	300
Chowkushi Flood Centre	250
Krishnapur Ghonapara 5th Plan Primary School	200
Total	**3800**

Flood scenario of Deocharai G.P.

ts of flood

l has some good effects or advantages and some bad effects or disadvantages.

effects or disadvantages are:

mages to lives

ss of properties

ss of fertile arable lands

mages in public and civic amenities

eak out of various water borne diseases

nd building by sedimentation

d effects or advantages are:

Alluvial deposition and improvement in soil fertility status

Ground water recharge.

River, lakes, ponds recharge with water

Clearance of stagnant water

Source of water for *kharif* cultivation

Source of water for irrigation in winter cultivation and

Fishing.

od Management

. Construction of dams and ponds.

. Constructions of levees and footwalls,

. Reforestations in flood prone areas,

. Constructions of embankments along the rivers,

. Build up more flood shelters,

. Introducing of proper and real time warning systems

nclusion

od in the Deocharai Gram Panchayet is inevitable due to its location, slope, soil and climatic conditions. od damages cannot be stopped totally. We can minimize the destructive effects of flood by the use of modern hnology and awareness of people who live in flood prone areas and by the proper early warning systems. We n store flood water for recharge of different water bodies. Which can be used for irrigation purposed in dry ason and for fish cultivation. It will bring economic prosperity for the flood victim people.

eferences

andyopadhaya, B. C., 2006: *Cooch Beharer Itihas (History of Koch Bihar)*, Dey's Publishing, Kolkata, pp. 19 – 26.

arman, D., 2007: *Uttarbanger Janajiban O Locachar (People and Culture of North Bengal).*

etal, H. R., 2002: *Flood problems of Malda – A geographical analysis*, Geographical Review of India, Kolkata, Vol. 64, No. 4, pp. 337- 345.

hakraborty, B.P., 2000: *Banya, Prakritir Ek Bhayankar Abhishap (in Bengali)*, Book Front Publication Forum, pp. 5 - 24.

hakraborty, P.K., 1987: *Jalpaiguri Zelar Parichoy (in Bengali)*, Madhupomi, a Sahitya Parishad, Kolkata, pp. 22 - 41.

haudhuri, H.N., 2010: *The Cooch Behar State and It's Land Revenue Settlements*, N.L. Publisher, Shibmandir, pp. 8 -113.

Chorley, R.J. 1969: *Water, Earth and Man*, Methuen and Co. Pvt. Ltd. London, pp. 405 - 455 & 487.

Deb, R., 2002: *North Bengal at a glance* –1st Part, Purbottar Prakashan, Kolkata, pp. 1 -3.

Gangopadhyay, A., 1999: Uttarbanga Parichoy, Granth Tirtha, Kolkata, pp. 23 – 27.

Ganguly, A., 1999: *Uttarbanga Parichoy*, Granthatirtha, Kolkata, pp. 13 -34 & 292 – 299.

Govt. of West Bengal, 2007–2008: *District Disaster Management Plan, Koch Bihar*, pp. 1 – 54.

John, F.G.1911: *Eastern Bengal and Assam District Gazetteers*, Pioneer Press Allahabad, pp. 4 -14.

Keith, R., 1987: *River Channels, Environment and process*, Institute of British Geographers Special Publications, Oxford, U.K. PP.20 - 25.

Majumdar, D.D., 1977: *West Bengal District Gazetteers – Koch Bihar*, B.R. Chakraborty, I.A.S. State Editor, W.B. District Gazetteer and Sec. to the Govt. of W.B.

Mitra, S., 2006: *Cooch Behar*, Yojona, Pratrika Gosthir Bangla Masik Dhanadhanya (in Bengali), pp. 47 - 54.

Mukhopadhayay, S. C., 2008: *Human Investment in River Basin Management*, West Bengal, Institute of Landscape, Ecology and Ekistics, Indian Journal of Landscape system and Ecological Studies, Vol. 31, No. 2, pp. 284 - 296.

Narayan, L.R.A., 1998: *Remote Sensing and Its Application*, University Press, Kolkata, pp.57 - 60.

National Disaster Management Authority & West Bengal Disaster Department, 2010: *Biparjoy Bahasthanar Bishayak* Pustika, (in Bengali), Prism, Sped, VHA, Kolkata, pp. 1-2, 8 – 11 & 16.

Office of the Chief Medical Officer of Health, Cooch Behar, 2007: *Flood contingency plan for Cooch Behar District (Health)*, Cooch Behar, pp. 1- 4.

Pal, N. N., 2003: *Itikathay Cooch Behar (in Bengali)*, Anima Prakashani, Kolkata, pp. 19 - 35.

Reading materials for Training of Trainers under Disaster Risk Management programme, Ministry of Home Affairs Govt. of India, United Nation Development Programme 2007, pp. 1- 45.

Sarkar, S., 1997: *Some consideration on the fluvial dynamics of the River Mahananda*, Siliguri, Geographical Review of India, Vol. 59, No. 1, pp. 11 - 24.

Principal
S.B.S.S. Mahavidyalaya
Goaltore, Paschim Medinipur

Flood Hazards and Management: A Case Study of Deocharai Gram Panchayet, Tufanganj, Koch Bihar District

SANJIT KUMAR SHIL SHARMA
Assistant Professor, Department of Geography, Santal Bidroha Sardha Satabarshiki Mahavidyalaya
Goaltore, Paschim Medinipur

Abstract
Flood is the overflow of channel pattern. Flood is a most common natural calamity in our country. Deocharai Gram Panchayet of Koch Bihar District is much vulnerable for flooding. The two large rivers, Gadadhar and Kaljani are passing over Deocharai. These two rivers are much prone to flood, as rainfall is high in this region. Average rainfall is about 4000 mm. per year. Excessive water passes over these areas when heavy rainfall occurs in the upper stream areas of Himalayan and Terai region. Kaljani-Torsa, Gadadhar Rivers are shallower near Deocharai, due to siltation problems. These are the main reason for flooding in Deocharai. Flood appears nearly every year here. Large flood occurred in 1993, 2001. Havoc destruction occurred here. Amon paddy sapling swept away due to flood. Bank erosion during and after flood appear as another problems for the farmers. Torsa-Kaljani and Gadadhar River swallow up fertile agriculture lands, roads, houses each year. Shifting of river beds also destroy agricultural lands. Sand covers by flood water also change fertile agricultural fields into infertile sandy lands which are not suitable for agriculture. Large flood often harmful for life and properties. Sometimes human beings die by sink in flood water and flooded by foul water. Flood not only harmful for Deocharai. It brings blessing also. Ground water and water bodies recharge through flood water. Agricultural fields became fertile due to alluvial deposition each year. People of this gram panchayet not to leave this area due to fertile agricultural lands and leaving with flood. Flood management practices in this area are mainly on construction of embankments and leaves only. Re-digging the ponds, ox-bow-lakes, *khal bill* and dredging of river can be helpful for holding flood water in rivers and abating flood effects.

Keywords: Flood, vulnerable, siltation, alluvial.

Introduction

Flood is the over flow of channel pattern. Flood is a most common natural calamity in our country. Most of the civilizations of the world developed near the large rivers. Koch Bihar District of West Bengal is one of the most flood prone districts in our country. Heavy rainfall in the upper catchment area of this river is the main reason for flood in this town. Floods are among the most destructive acts of nature. Floods damage to agriculture, houses and public utilities each year in addition to the loss of precious human and cattle lives. Havoc crops, wealth and properties loss every year due to floods as scope of flood management and mitigation is very limited in our like developing country. This paper tries to find out the proper and effective flood management and mitigation programmes to abate flooding effects for the Deocharai Gram Panchayet.

Objectives

The main objectives of the paper are:

1. To find out the causes of flood in Deocharai Gram Panchayet.
2. To find out the destructive effects of flood in the Gram Panchayet.
3. To find out the ways to preventive measures of flood for the Gram Panchayet
4. To draw the mitigation plan for flood of the Gram Panchayet.
5. To make management plan for the flood control of Deocharai Gram Panchayet.

Methodology

The paper consisted with primary as well as secondary data. Primary data collected through the field survey, interview with the local people who are directly suffered with flood and secondary data are collected from various sources like newspapers, souvenirs, and journals. By the careful analysis of all primary and secondary data manual and computerized cartographic techniques are used to prepare this paper.

Santal Bidroha Sardha Satabarshiki Mahavidyalaya ESTD 2005 Goaltore Paschim Medinipur

Principal
S.B.S.S. Mahavidyalaya
Goaltore, Paschim Medinipur