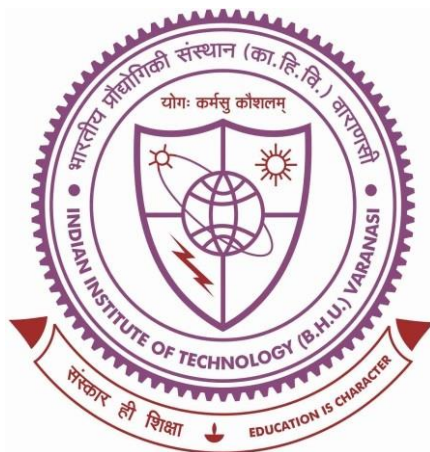


Study and Reconstruction of Quaternary Riverine Wetlands of Gangetic Plain through Systematic Approach



Thesis submitted in partial fulfillment for the
Award of Degree

Doctor of Philosophy

By

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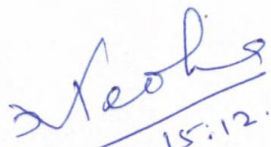
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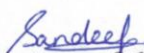
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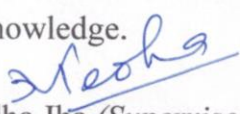
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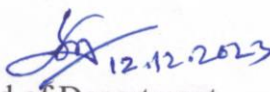
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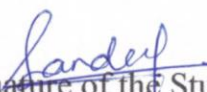
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List of Figures:

Fig. 2.1 International Scenario of wetlands.	18
Fig. 2.2 National Scenario of Wetlands.....	20
Fig. 3.1 The location of the study area shown by crosshatch lies in the interfluvial zone of the Ganga and Sai Rivers, Uttar Pradesh.....	26
Fig. 3.2 Geological and geomorphic map of the study area (after, Sastri et al. 1971; Rao 1973; Singh 1996; Singh 2004). The map shows the geological set-up in reference to lineaments/faults and geological formations. A white-coloured dotted portion in the interfluvial zone of the Ganga and Sai Rivers denotes the study area. The faults in the study area are marked by red coloured lines (SSAFt = Sidhaur–Sandila Fault; LUKFt = Lucknow Fault; FALFt = Faizabad–Lalganj Fault; AZAFt = Azamgarh–Allahabad Fault;) (Singh et al. 2006).....	27
Fig. 3.3 The interfluvial zone of the Ganga and Sai Rivers. Arrow showing the Ramsar wetland sites.....	28
Fig. 3.4 (A) and (B) Show the paleochannel and prominent channels respectively, (C) and (D) photograph of the riverine wetlands, (E) deposition of salt in the soil in the form of white patches and (F) Deposition of salt in the root of plants. X and Y = latitude and longitude.....	30
Fig. 4.1 Illustrates the systematic approach followed in this study.....	31
Fig. 5.1 Flow chart of the methodology.....	36
Fig. 5.2 False colour composite (FCC) image of Landsat 8 OLI bands 7, 5, 3 in RGB of the study area. The riverine wetlands in the form of paleochannels, prominent channels (channel filled with water whole year), ox-bow lakes and meander scars are denoted with yellow colour, cyan colour, and red colour, respectively. The zoomed image of the paleochannel (magenta-coloured hatched box) and prominent channel (orange-coloured hatched box) in the study are shown by (a) and (b), respectively.	37
Fig. 5.3 SRTM DEM data also show continuous and properly interconnected paleochannel (yellow colour), prominent channel (cyan colour) and the series of associated ox-bow lakes and meander scar (red colour). The zoomed images ((a) and (b)) of the depressional feature of the paleochannel (magenta-coloured hatched box) and prominent channel (orange-coloured hatched box) are visualised in a dark tone.....	38
Fig. 5.4 Different band combinations in Landsat-8 (OLI) satellite image.....	39
Fig. 5.5 The black rectangle at the northwest shows the first appearance of hydro-geomorphological features in the form of meanders. The blue, orange, and green lines show the prominent channels (called the Bakulahi River), the discontinuous Paleochannels and ox-	

bow lakes, respectively. Location of coring of samples (Black star), locations of cross-sectional profiling (Red line), location of sediments collected for Optical Stimulated Luminescence (OSL) dating (pink triangle) and the Sidhaur–Sandila Fault (SSAFt), Lucknow Fault (LUKFt), Faizabad–Lalganj Fault (FALFt), and Azamgarh–Allahabad Fault (AZAFt).....41

Fig. 5.6 (A) Arrow-1 Shows the spot from where the first meanders were observed. (B) the Sentinel satellite image shows the three times Sai River’s course diversions at 90 degrees anticlockwise (U-turn). (C) Arrow-2 morphology of channel (D) first appearance of isolated meanders, where resistivity survey was carried out to decipher the hydro-geomorphological features.....42

Fig. 5.7 Photographs show the lab instrument for sieve analysis. (A) Separated sediments in tray for sieve analysis and hydrometer test. (B) The upper arrow shows the grains greater than 0.075 mm passes through sieves of 5.6 mm, 4.0 mm, 2.0 mm, 1mm, 0.425 mm, 0.250 mm, 0.125 mm, 0.075 mm. (C) The lower arrow shows the grains less than 0.075 mm were done by hydrometer test.....44

Fig. 5.8 Classification of soil texture of samples from the study area as per USDA soil texture triangular diagram.....45

Fig. 5.9 Study area is divided into four reaches (Reach-1, Reach-2, Reach-3, Reach-4). Meanders in red coloured boxes in each reach (Reach-1(1a,1b,1c), Reach-2 (2a,2b,2c), Reach-3(3a,3b,3c), and Reach-4 (4a,4b,4c)) shows the selected meanders for calculation of geomorphological parameters.....47

Fig. 5.10 Meanders selected from Reach-1(1a,1b,1c), Reach-2 (2a,2b,2c), Reach-3(3a,3b,3c), and Reach-4 (4a,4b,4c). Rc = radius of curvature and AoC = angle of curvature.....48

Fig. 5.11 The electrical resistivity profiling across the paleochannel at six sites (Wenner array) and corresponding topographic spatial cross-sectional profile using SRTM DEM data along the same line as the electrical resistivity profiling.52

Fig. 5.12 Proportion of gravel, sand, silt, and clay in soil from left bank, middle of channel and the right bank.....56

Fig. 5.13 Field photographs: (A) and (B) show the paleochannels, (C) Red line in the photograph shows the line (across the paleochannel) along which the resistivity survey has been carried out. (D) and (E) photographs show the prominent channels, and (F) Sites from which samples have been taken for the OSL dating. The latitude and longitude of each photograph are shown by X and Y, respectively.....59

Fig. 6.1 Landsat-8 OLI image of the study area. Riverine wetlands in the form of (a) Isolated Ponds/Lakes, (b) Ephemeral and abandoned channels and (c) Oxbow Lake and meander scars

(See the boxes in the remote sensing image for the location). Arrows show the Ramsar sites-1 and Ramsar sites-2.	64
Fig.6.2 Flow chart of the work.....	65
Fig. 6.3 Spatial distribution map of the riverine wetlands in the study area during the (a) post-monsoon (2019) season and (b) pre-monsoon (2020) season.....	66
Fig. 6.4a Spatial distribution map of the riverine wetlands in the study area during the post-monsoon season in the year 2000, 2008, 2014, and 2019.....	67
Fig. 6.4b Spatial distribution map of the riverine wetlands in the study area during the pre-monsoon season in the year 2001, 2009, 2015, and 2020.....	68
Fig. 6.5 Shows the trend of change detection in the areal extent of the channel wetlands and floodplain wetlands during post-monsoon and pre-monsoon.....	70
Fig. 6.6 Shows the land–water threshold values and mean values with a standard deviation of water pixels for the years 2000, 2008, 2014 and 2019.....	71
Fig. 6.7 Showing the standard precipitation index (McKee et al. 1993) on the scale of 12 months (SPI-12) for the years from 1970 to 2020.	72
Fig. 6.8 Showing the rainfall data from 1970 to 2020.	72
Fig. 6.9 Showing the temperature data from 1970 to 2020.....	72
Fig. 6.10 Field photographs showing the various stages of the conversion of riverine wetlands into agricultural lands. (a) & (b) the active channel. (c) & (d) oxbow lakes converted into the riverine wetland. (e), (f), (g), (h), (i) and (j) are the abandoned channels converted into wetlands. (k) The abandoned channel was converted into riverine wetlands and further into upland. (l) upland, finally converted into agricultural land.....	73
Fig. 7.1 Study area: Samaspur wetland in the red line, salt-affected soil as white patches. Soil sampling from white patches soil, Samaspur wetland soil, agricultural soil and salt deposits is shown by blue-coloured diamond-shaped, yellow-coloured triangular-shaped, red-coloured star-shaped, and pink circles, respectively.....	78
Fig. 7.2 Field photographs: (a) and (b) Soil sampling from the Samaspur wetland soil, (c) and (d) soil sampling from white patches soil, (e) and (f) salt deposition in the root of plants.....	79
Fig. 7.3 Flow chart of the work.	80
Fig. 7.4 Proportion of gravel, sand, silt, and clay in soil from white patches soil, Samaspur wetland soil, and agriculture soil.....	84
Fig. 7.5 The United States Department of Agriculture (USDA) soil texture triangular diagram for the samples of white-patches soil, Samaspur wetland soil, and agriculture soil.....	85

Fig. 7.6 The box plots show the range of chemical parameters in white patches soil, Samaspur wetland soil, and agriculture soil and salt.	88
Fig. 7.7 Wide-scan X-ray photoelectron spectrum of salt.....	89
Fig. 7.8 X-ray diffraction (XRD) data and FTIR data of samples from white patches soil (WPS) at a depth of 15cm, 30cm, and 50cm, Samaspur wetland soil (SWS) at a depth of 15 cm from two sites, agricultural soil (AGS) at a depth of 15cm, and salt.....	90
Fig. 8.1 Flow chart showing the steps followed to create modified DEM.....	95
Fig. 8.2 Flow chart showing the detail methodology of SWAT modelling.....	98
Fig. 8.3(a) Original SRTM DEM (b) Modified DEM prepared by lowering the elevation by 3 meters along traces of the Bakulahi River in DEM to revive the Bakulahi River.....	101
Fig. 8.4 Watershed delineated map of the current Bakulahi River basin and the revived Bakulahi River basin.....	102
Fig. 8.5 Monthly discharge of the current Bakulahi River basin and the revived Bakulahi River basin	103
Fig. 8.6 Shows the assessment of Water Balance Components and flow partitioning in the Soil Water and Assessment Tool for (a) the current Bakulahi River and (b) the revived Bakulahi River.....	104
Fig. 8.7 Land use and land cover classified map of the Bakulahi River Basin.....	106
Fig. 8.8 Classification map of groundwater recharge.....	107
Fig. 8.9 (a) the current status of the Bakulahi River in the interfluvial zone of the Ganga and Sai Rivers, (b) drainage system generated when we lowered the elevation by 3 meters along traces of the Bakulahi River.....	111
Fig. 8.10 All stakeholders can be involved in the modelling of the revival of the Bakulahi River.....	112

List of Table:

Table 2.1: Shows the roposed classification of ‘riverine wetlands’, waterlogged areas and other water bodies (after, Sinha, et al. 2017b)	10
Table 5.1: Different band combinations in Landsat-8 (OLI) satellite image and spectral indices.....	40
Table 5.2 shows the electrical resistivity profiling (Wenner array) value at six sites, i.e., PL-1, PL-2, PL-3, PL-4, PL-5, and PL-6.....	51
Table 5.3 Shows the result of the grain size analysis and its description.....	54-55
Table 5.4 Shows the parameters of the hydro-geomorphological features.....	57
Table 5.5 Shows the OSL dating of sediment from the channel at two sites.....	58
Table 6.1 Shos the seasonal variation in areal extent of the riverine wetland during post-monsoon (2019) and pre-monsoon (2020).....	66
Table 6.2 Shows the trend of change detection in the areal extent of the channel wetlands and floodplain wetlands during post-monsoon and pre-monsoon from 2000 to 2019.....	69
Table 7.1. Shows the grain size analysis and the chemical characterisation of soil samples from white patches soil, Samaspur wetland soil, and agriculture soil.....	86-87
Table 7.2 Shows the maximum, minimum, and mean values of soil chemical parameters of white patches soil, Samaspur wetland soil, and agriculture soil.....	88
Table 8.1 Shows the soil Characteristics of the study area.....	97
Table 8.2 Shows the details all hydrological components of the current Bakulahi River and the revived Bakulahi River.....	104

Preface

Wetlands are hydrological landscape units which are permanently or seasonally flooded with water and have distinct flora and fauna. They perform multiple functions such as environment cleansing and maintaining water quality, improving retention of floodwater and controlling soil erosion, and providing habitat for wildlife. Since they provide a wide range of direct and indirect benefits (ecosystem service) to human well-being, they are ecologically more valuable and environmentally more sensitive, therefore an active conservation strategies and management planning becomes important. The wetland systems associated with the rivers or streams are considered as riverine wetlands and generally occur in the floodplain.

The floodplains of Ganges are the home of riverine wetlands. Several of these riverine wetlands are considered as Ramsar sites due to their ecological and environmental importance. To study and reconstruction of quaternary riverine wetlands in the Gangetic floodplain, the interfluvial zone of the Ganga and Sai Rivers has been selected as a representative study area. In the interfluvial zone of the Ganga and Sai Rivers of Gangetic Plain, there is a tract of riverine wetlands in the form of underfit rivers, traces of channels, meander scars and ox-bow lakes in the both upper and lower reaches of currently flowing ephemeral Bakulahi River. A detail investigation through spatio-temporal analyses of these riverine wetlands have not been carried out yet. The present work focuses on the identification, delineation and mapping of riverine wetlands allied with the Bakulahi River. The study also includes the analysis of the distribution and spatio-temporal variation in the areal extent of the riverine wetland in 20 years (2000 to 2019), and the Concurrent impact of degradation of Riverine wetland on the chemical characterisation of soils in the part of interfluve of the Ganga and Sai Rivers. Further a model has been Prepared for the reconstruction of riverine wetlands in the interfluvial zone of the Ganga and Sai Rivers.

The thesis is divided into nine chapters. The details are as follows:

Chapter 1 includes a general introduction to the riverine wetlands, their degradation and revival, and the objectives of the thesis.

Chapter 2 presents a detailed literature review of the work done on the riverine wetlands, their degradation at national and international levels, and the research gaps.

Chapter 3 provides detailed information about the geographic, geological, and geomorphological setting and the climatic conditions of the study area.

Chapter 4 discusses the detailed methodology followed in the thesis.

Chapter 5 deals with the identification, delineation and mapping of the Riverine wetlands of the study area.

Chapter 6 provides a detailed analysis of spatio-temporal changes in the riverine wetlands of the study area.

Chapter 7 deals with the chemical characterisation of the soils of the riverine wetlands and its adjoining area.

Chapter 8 discusses a model for reconstructing riverine wetlands in the study area.

Chapter 9 includes the summary and conclusions of the work.