The Research Dialogue

An Online Quarterly Multi-Disciplinary Peer-Reviewed / Refereed Research Journal
ISSN: 2583-438X
Volume-04, Issue-02, July-2025
www.theresearchdialogue.com

"Impact of flood in Balrampur District (U.P.) due to Rapti River"

Dr. Azahruddin
Assistant Prfessor,
Department of Geography,
M.L.K.P.G.college Balrampur, U.P. India- 271201
Email:- azhar3190mlk@gmail.com

Abstract

The present study is focused on the flood situation in Balrampur District of Uttar Pradesh.

The main river of Balrampur District, Rapti, affects the District almost every year but recently in 2022 ,the river broke all of its previous records during October.

From this study, we can understand the recent flood pattern and the inundated areas with the help of Satellite images and maps.

We will also come to know about the steps taken by the local government to overcome this harsh situation.

After analyzing the pattern we can possibly demarcate vulnerable areas and help in channelizing the resources in right direction, to prepare a pre-disaster management measure and, so ensure optimum profitable utilization of resources.

***Keywords**: Balrampur, Rapti, Satellite, Image, map, channelizing, ensure, utilization, resources.*

STUDY AREA

Balrampur District of Uttar Pradesh lies in the **Central Ganga Plain** of India. The Area of this District is of 3349 Sq.km and the boundaries are made by North latitudes

27°03' and 27°52' ; East longitudes 82°01' and 82°45' in the survey of India Degree Sheets 63E and 63I.

It is located in the foothills of Shiwaliks; and surrounded by Nepal in the North and Gonda in the South ,Shrawasti District in the west and Siddharthnagar and Basti District in the east. So the total Geographical Area of the region is 3349 Sq.km.

The total Population of the region according to 2011 Census is 21,48,656. In which males account for 11,14,000 and the female Population is 10,33,000.

The total literate Population is around 868.1(in thousands).

The administrative details of the District are given below -

BLOCK	**TEHSIL**	**BLOCK AREA(Sq.km)**
HARRAIYA SATGHARWA		473.97
BALRAMPUR	BALRAMPUR	430.04
PACHPERWA		375.28
TULSIPUR	TULSIPUR	401.68
GAINSARI		454.26
SRIDUTTGANJ		174.90
UTRAULA	UTRAULA	149.17
GAINDAS BUZURG		147.81
REHRA BAZAAR		225.88
Total Block		2832.99
Total Forest		413.98
Total Rural		3328.62
Total Urban		20.38
Total District		3349.00

Table 1.1

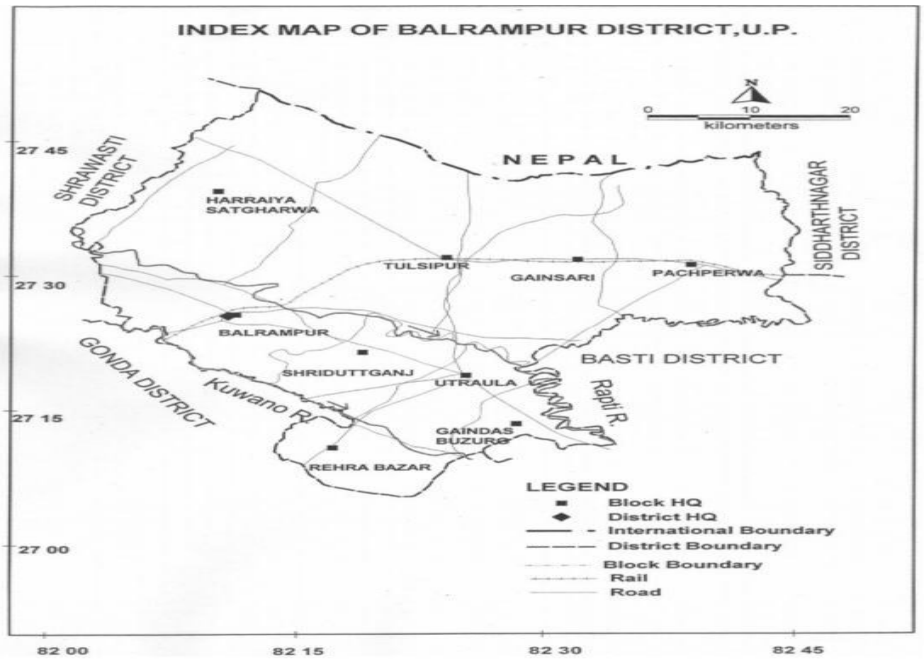

Figure no.01

GEOMORPHOLOGY

Physiography, Geomorphic Feature and Landform

Balrampur mainly include undulating plains. There are two units that can be identified, these are -

- The Upland Plains (Older Alluvium)
- The Lowland Plains (Newer Alluvium)

The elevation of the land plain is from 160m [1]amsl at Bankatwa to 96.5m amsl at Sadulla Nagar,Block Rehra Bazar ; in the North- Western Part and South-Eastern Part respectively.The general slope is from North-West towards the South-East Part.

The existing no of rivers and Streams with the complex network created by them , largely influence and modify the topography.

UPLAND PLAINS

The higher slope of Balrampur that is the Northern Part ,is made by upland and gently undulating Plains.

Made up of Bhabhar formations ,the upland plains, lies just south of Nepal Himalayas and Siwaliks.

From the Geomorphological view, this plain is characterised by Pedimont plains and Pediplains.

The general slope of this area is towards south.

LOWLAND PLAINS : The gentleman slope of Balrampur District mainly comprise of younger alluvium ; this lowland plain is in the south of the upland plain.

Characterised by several sand bars and vast alluvial tracts, because Rapti River flows from this plain .

The meander flood plains occur in the Central Part of the District, all along the Rapti river as well as the other perennial streams(nalas).

These plains are low lying river areas situated between 98m and 110m amsl.

SOIL

In Balrampur District the soils are mainly constituted/comprised with **Matiyar(Clay)** and **Dumat(loamy).**

As Matiyar is of hard clay soil characteristics,so it supports the cultivation of **rice** and it is very fertile.

The second type of soil Dumat, is also fertile ,that supports various types of crops.

Thus type of soils,are the reason behind the high yield in Balrampur District.

In the Northern Part the cover of the soil is generally shallow(moderate) whereas there is a thick soil cover in the South.

CLIMATE AND RAINFALL

Balrampur experiences sub-humid climate and three distinct seasons -

- Summer
- Rainy/Monsoon
- Winter

The climate data gives a view into the drainage and rainfall data of the district.

May is the hottest month with average mean temperature of **34.8°C.**
The coldest month followed bt December with 16.95°C, is **January** of **16.15°C.**

The relative humidity is on the peak in **August** with **81%** , followed by July and September with Nornal value of 75.5%.

The normal annual mean wind speed of the District is **5.16 km/h.** The wind speed of **8.0 km/h** is the maximum normal wind speed in **June ,** whereas **2.6 km/h** is the minimum wind speed in the month of **November.**

The annual normal rainfall (1901-1970) of Balrampur is **976.73 mm.** The maximum rainfall occurs during Monsoon (June to September), having the normal value of **870.67 mm** which is **89.14%** of the Annual precipitation.

Most of the floods occur in this month of heavy rainfall.

July is the wettest month having the normal rainfall of **306.73 mm** followed by August with normal rainfall of 297.77 mm.

DRAINAGE AND IRRIGATION

DRAINAGE

As mentioned earlier the Rapti, is the major River of Balrampur. This river flows from North-West to the South-West plains.

The district has been divided into two parts ,by Rapti river. The North Part consist of large number of temporarily flowing Streams like - Dhobania,Kharjhar ,Bhabhar,Bhusailwa and Siriya and some perennial streams(nalas) ; thar flows southwards in the Rapti river.

Suawan and **Kuwano** ,two other tributaries are in the South of the Rapti river.They rub parallel yo Rapti before their confluence in the near Basti District

After observation it is found out thar the 'right bank tributaries of Rapti flows towards south from North' ,and that is south of Rapti are more wandering and generally have ab eastward flow.

Thus we can conclude that, in the Southern Part of the District, the watershed slopes from west to east ; whereas it slopes from North to South in the area North of Rapti.

IRRIGATION

With the technical improvement a really considerable development has been made in the whole of the district.

As the assured source of supplemental irrigation, groundwater has been used for larger part of district.

It can be seen in the reportings of the year 2010-11 when about **89.9%** of the Net Sown Area was irrigated through groundwater resources.

Few minor projects for irrigation and one minor irrigation project that is **Chittorgarh Reservoir Project** can be seen in the district.

Surface irrigation practice is largely in vogue in these areas as well as the adjoining areas.

The total irrigated area in Balrampur district by different sources is **709.76 Sq.km** ,out of which **88%** of the area is irrigated by tube wells, government and private boring; **5.1%** of the area is irrigated by other sources.

OBSERVATION AND MAPPING OF FLOOD IN BALRAMPUR

The Southern lowland plains of Balrampur is prone to floods ,because the Rapti river flows mainly from here. Also Rapti river covers **75 km** of distance in Balrampur. The river collects water from small streams originated from the Himalayan Mountains.

And when there is an excessive rainfall in the Monsoon season ; the vast network of streams ,tributaries and the River system of the whole area got connected.

In result the river system swells up ,and lead the rivers to overflow creating havoc and devastation in the region.

Objective

The objective of flood mapping is to identify the risky areas during floods ,on map. It creates a good data base for efficient flood risk management.

The maps we prepare here can be helpful in flood risk management plans, to prevent loss due to floods, land use management, to get timely information on floods, during rescue operations and in calculating what the lowest allowable construction elevation should be in order to avoid possible flood damages.

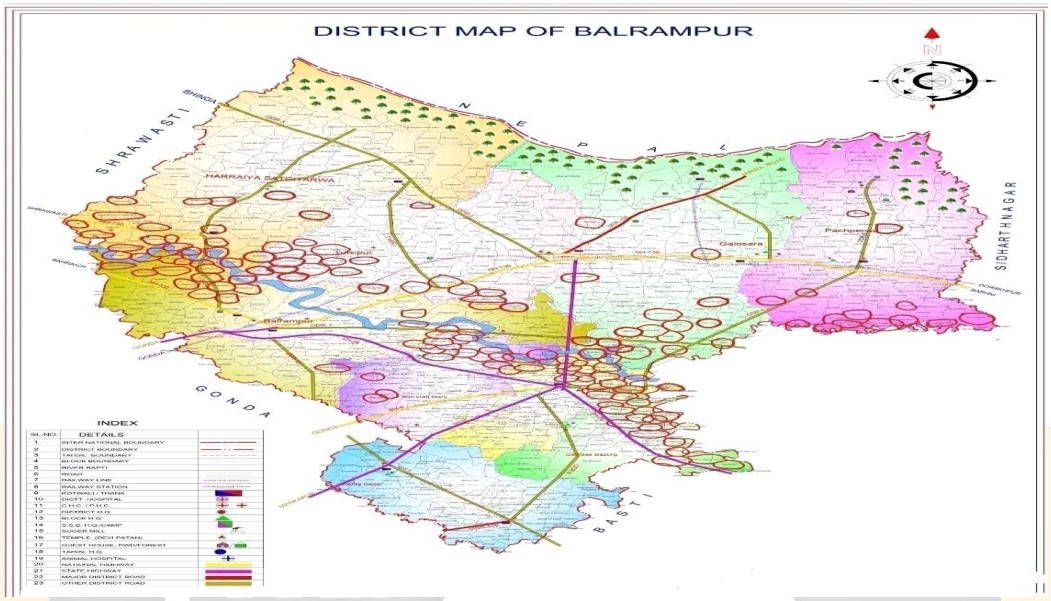

Figure no.02

Affected Areas

In Monsoon, Rapti river receives water from the gullies of Nepal , and the River system swells up in the respected region.

The Northern most Mountain Streams(guliies/nalas) of Rapti situated in Balrampur and Tulsipur Tehsils i.e. Bhabhar, Dhobainia, Siria, Kharjhar and Nakati ; also doubted to create disastrous situation during floods.

River Rapti affects all the three tehsils of the district and; villages of Balrampur and Utraula situated in left of the **Kuwano** river also got heavily flooded during Monsoon.

The district shares **84 km** long border with **Nepal**.

After covering the total distance of 75 km in all the three tehsils of Balrampur, river Rapti enters in **Siddharthnagar district.** Then flowing from **Gorakhpur** and **Devaria** it finally merges with **Ghagra river** near **Kaparwar Ghat.**

The 12 Mountain Streams originating from Nepal fulfill the water requirement of River Rapti, Budhi Rapti and Kuwano. In case of excessive rainfall, the water coming from the streams got overflooded in the near areas and Villages, when the rivers became incapable to hold more water.

When Rapti and Budhi Rapti got overflooded, the situation in the district became disastrous that harms society, cattles, infrastructure and agriculture , indiscriminately.

During floods, in all the three districts **163 villages** on **Low Water Level, 107 villages** on **Medium Water Level** and **136 villages** on **High Water Level** ; **Total 406 villages** got affected.

Affected villages during flood in Balrampur								
Tehsil Balrampur			Tehsil Utraula			Tehsil Tulsipur		
Low Water Level	Mid Water Level	High Water Level	Low Water Level	Mid Water Level	High Water Level	Low Water Level	Mid Water Level	High Water Level
73	**30**	**28**	**59**	**55**	**45**	**31**	**32**	**63**

Table 1.2

Flood Statistics/ River Water Level

(Comparative)

River Water Level (2017 - 2022)	
River	Rapti
Gauge Station	Balrampur (Sisaighat)
Danger Point	104.620 m
[2]HFL 2017	105.540 m
HFL 2018	104.91 m
HFL 2019	105.08 m
HFL 2020	104.480 m
HFL 2021	105.100 m
HFL 2022(**Highest)**	**106.070m**

Table 1.3

A Gauge Station at Sisaighat, is constructed to measure the water level of Rapti River. The above given chart shows different levels of water in Rapti ,in different years.

Thr Danger Point of the river water flow is 104.620 m.

The highest flood Level measured at the Gauge Station in 2017 was of 105.540 m ; the highest flood Level in 2018 was recorded as 104.91 m. Whereas in 2019 the highest

[2] HFL = Highest Flood Level

flood level in Rapti was of 105.08 m and , in 2020 the highest flood Level at Gauge Station gave the reading of 104.480 m.

In 2021 the highest flood level in Rapti was recorded as 105.100 m.

The highest water level is measured in 2022 which is of 106.070 m.

Data of Monthly Average Precipitation (in mm)
Balrampur (2017 - 2022)

Month	2017	2018	2019	2020	2021	2022
Jan	4.56	0.53	0.00	0.00	0.00	0.00
Feb	—	4.68	0.00	0.00	0.00	0.00
Mar	14.27	—	0.00	0.00	0.00	0.00
Apr	5.08	24.81	0.00	0.00	0.00	0.00
May	89.27	56.95	68.34	0.00	185.6	0.00
June	68.83	85.92	154.43	339.2	246.2	15.400
July	260.86	331.01	240.28	219.6	19.2	306.800
Aug	404.54	350.50	181.29	181.29	413.6	551.200
Sep	76.14	69.45	214.14	214.14	137.6	860.600
Oct	22.72	—	0.00	0.00	67.82	1074.060
Nov	—	—	0.00	0.00	0.00	0.00
Dec	—	—	0.00	0.00	0.00	0.00
		—				
Total	**954.27**	**923.85**	**958.18**	**1260.3**	**1070.02**	2802.26

Table 1.4

Table 1.4 shows the data of Monthly Average Precipitation in Balrampur District from 2017 to 2022.

In the year 2017 , August received the highest amount of precipitation that was 404.54 mm ; followed by July that received the precipitation of 260.86 mm.

Conclusion

A similar pattern has been followed in the year 2018 where August received the average precipitation of 350.50 mm and July 331.01 mm.

But in 2019 the maximum average precipitation was measured in the month of July with 240.28 mm ; followed by September that recorded the average monthly

precipitation of 214.14 mm . In this year August ranked third with the average precipitation of 181.29 mm.

While in 2020 the maximum average monthly precipitation, was received by June of 339.2 mm followed by July with 219.6 mm of average precipitation. In this year September ranked third in the average precipitation with 214.4 mm , followed by August having 181.29 mm average precipitation.

Taking a look in the year 2021 , again August restored its position and ranked first with having the maximum average monthly precipitation of 413.6 mm , followed by June and May having the average monthly precipitation of 246.2 mm and 185.6 mm respectively.

And lastly the year 2022 , that have received the maximum precipitation in all these years ; the highest monthly average precipitation was recorded in the month of **October** that was of **1074.260 mm** , followed by **September** with the average precipitation of **860.600 mm.** August ranked third with the average precipitation of 551.200 mm ,followed by July with the average precipitation of 306.800 mm.

The maximum average precipitation is recorded in **2022** with **2802.26 mm** , followed by **2020** with the average precipitation of **1260.3 mm.**

References:

[1] Central Ground Water Brochure (2020-21), District Balrampur Uttar Pradesh India

[2] Central Water Commission, Ministry of Water Resources, Govt. of India.

[3] District Census Handbook Balrampur (2020-21) Uttar Pradesh India.

[4] https://www.floodmap.net.

[5] Flood Management and Information System Centre, Lucknow Uttar Pradesh India.

[6] https://www.environment.fi/en-US.

[7] Irrigation Department, Lucknow, U. P. India., 2008, Flood Protection & Canal Map of U.P.

[8] Mishra, D & Shukla, S., (2020-21) Report on U.P. State Disaster Management Plan on Flood, Remote Sensing Application Center, Lucknow.

[9] National Remote Sensing Centre, ISRO, Dept. of Space, Govt. of India, Hyderabad.

Cite this Article:

Dr. Azahruddin, "*Impact of flood in Balrampur District (U.P.) due to Rapti River*"*The Research Dialogue* An Online Quarterly Multi-Disciplinary Peer-Reviewed & Refereed National Research Journal, *ISSN: 2583-438X (Online), Volume 4, Issue 2, pp.01-09, July 2025. Journal URL: https://theresearchdialogue.com/*

THE RESEARCH DIALOGUE

An Online Quarterly Multi-Disciplinary
Peer-Reviewed & Refereed National Research Journal
ISSN: 2583-438X
Volume-04, Issue-02, July-2025
www.theresearchdialogue.com
Certificate Number July-2025/01
Impact Factor (RPRI-4.73)

Certificate Of Publication

This Certificate is proudly presented to

Dr Azahruddin

for publication of research paper title

"Impact of flood in Balrampur District (U.P.) due to Rapti River"

Published in 'The Research Dialogue' Peer-Reviewed / Refereed Research Journal and

E-ISSN: 2583-438X, Volume-04, Issue-02, Month July, Year-2025.

Dr. Neeraj Yadav
Executive Chief Editor

Dr. Lohans Kumar Kalyani
Editor-in-chief

Note: This E-Certificate is valid with published paper and the paper must be available online at www.theresearchdialogue.com

INDEXED BY