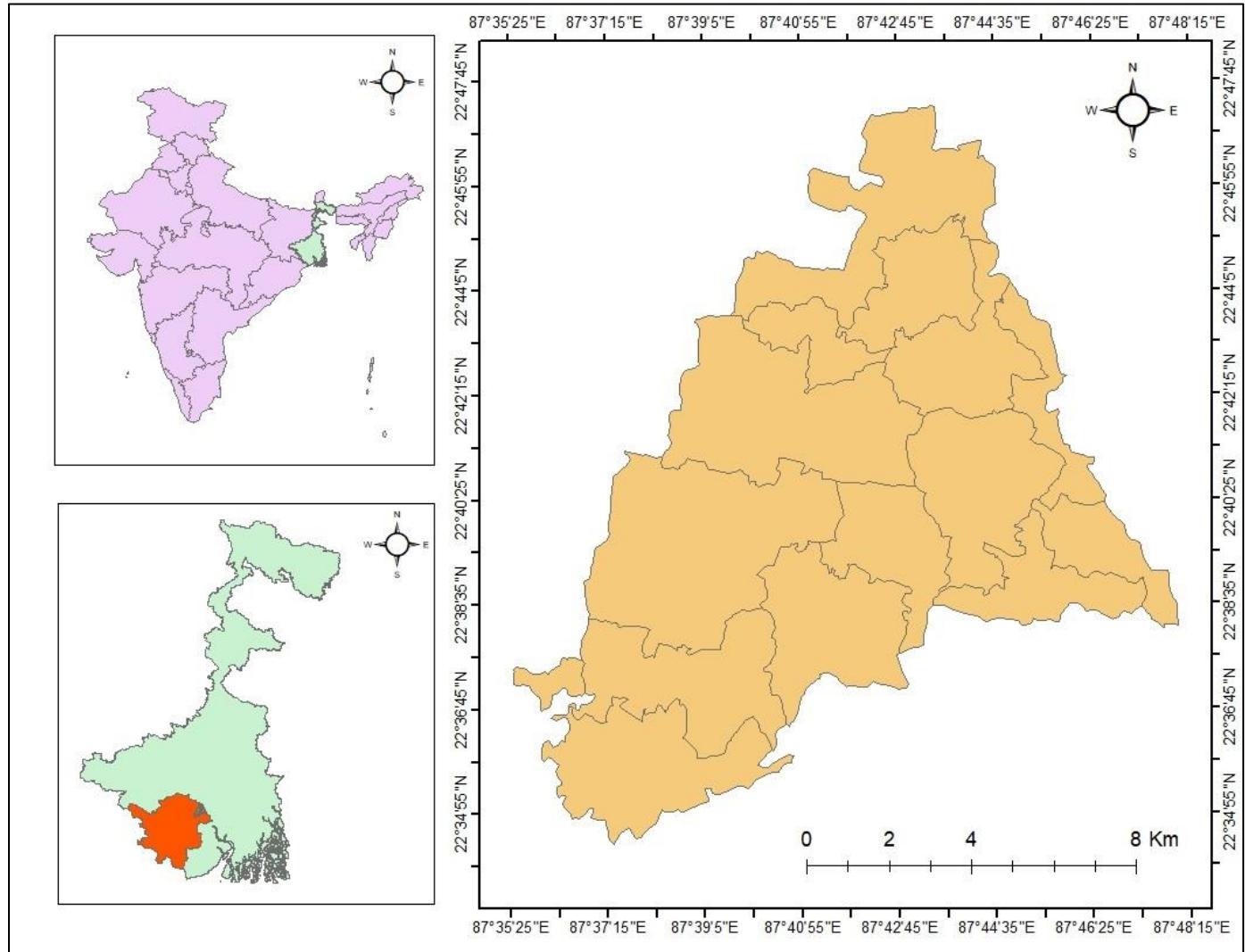


Hackathon

Training Programme on Earth Observation Data Analytics for Disaster
Management focusing on Flood and Drought

10-14th July, 2023

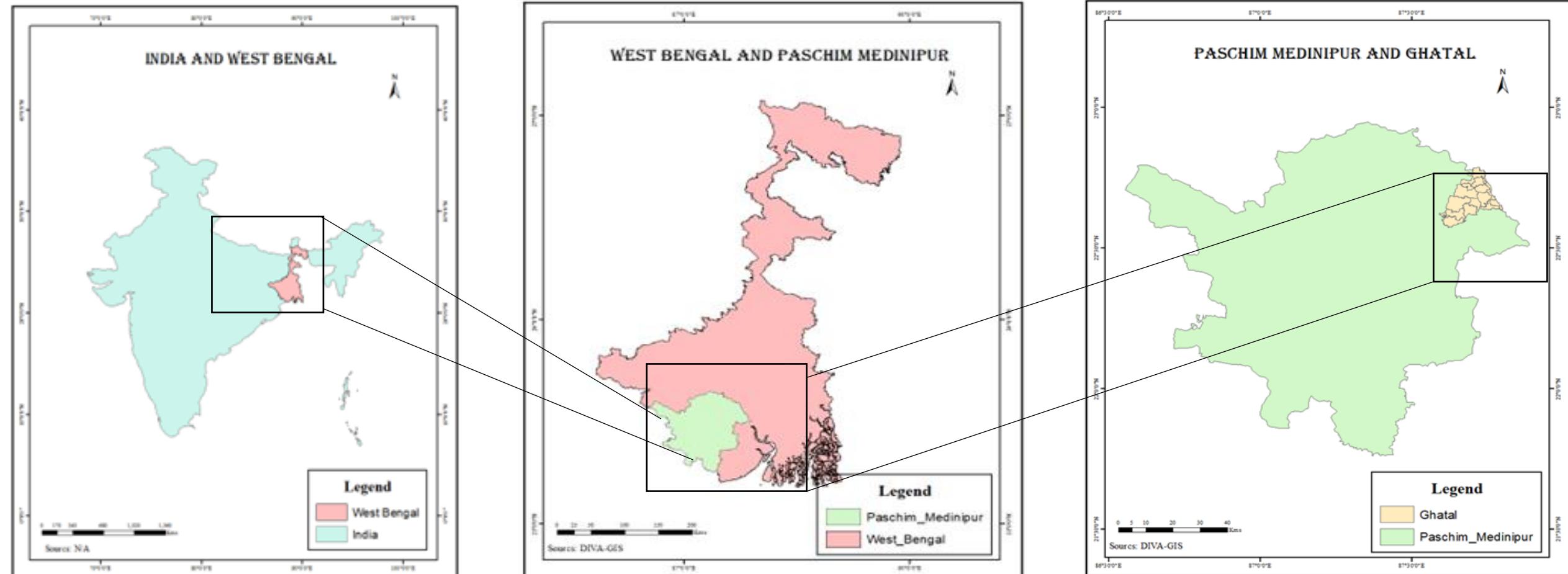


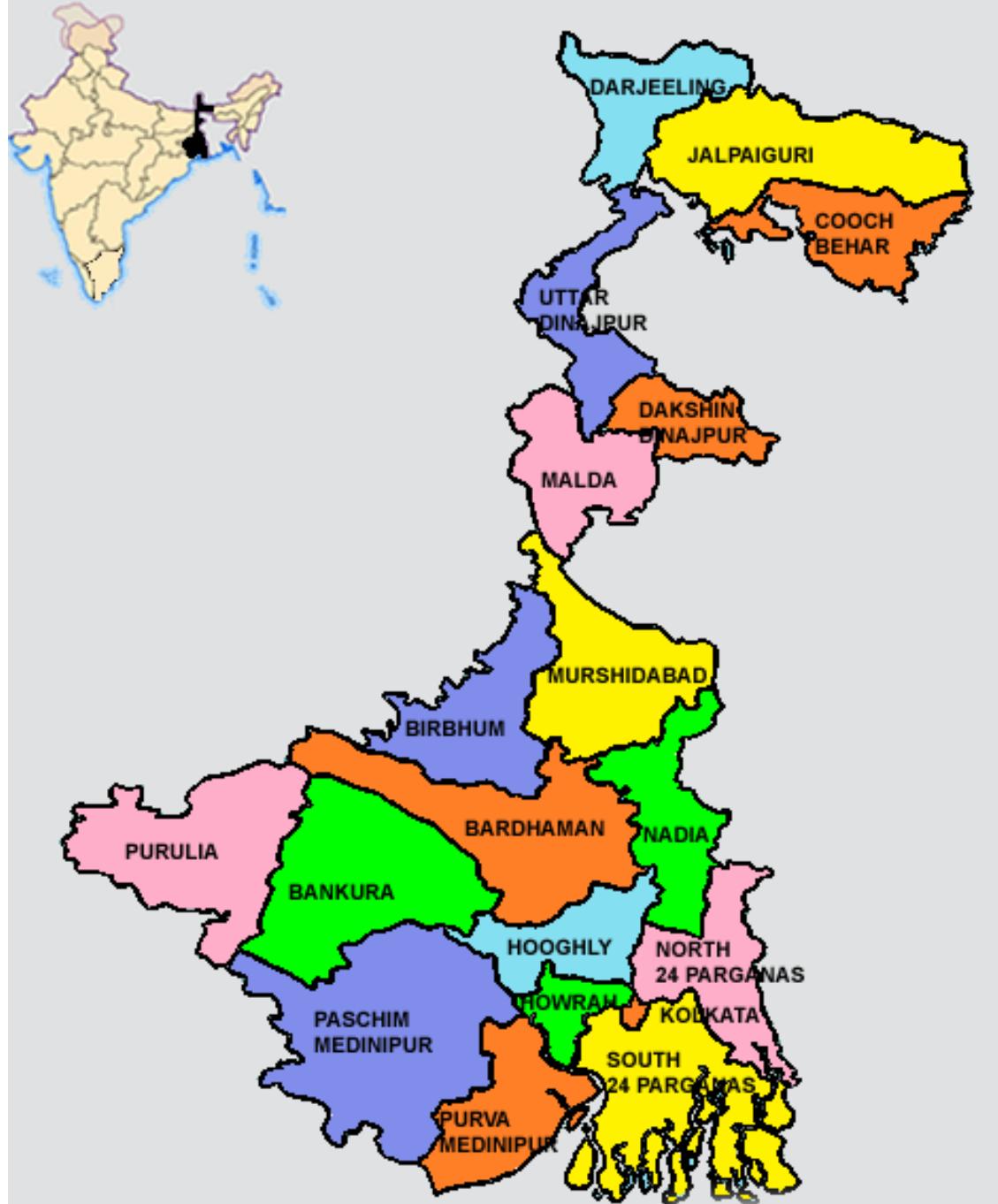
Ghatal CD block has an area of 216.05 km².

Gram panchayats of Ghatal block/ panchayat samiti are: Ajabnagar I, Ajabnagar II, Birsingha, Dewanchak I, Dewanchak II, Irhpala, Mansuka I, Mansuka II, Mohanpur, Monoharpur I, Monoharpur II and Sultanpur.

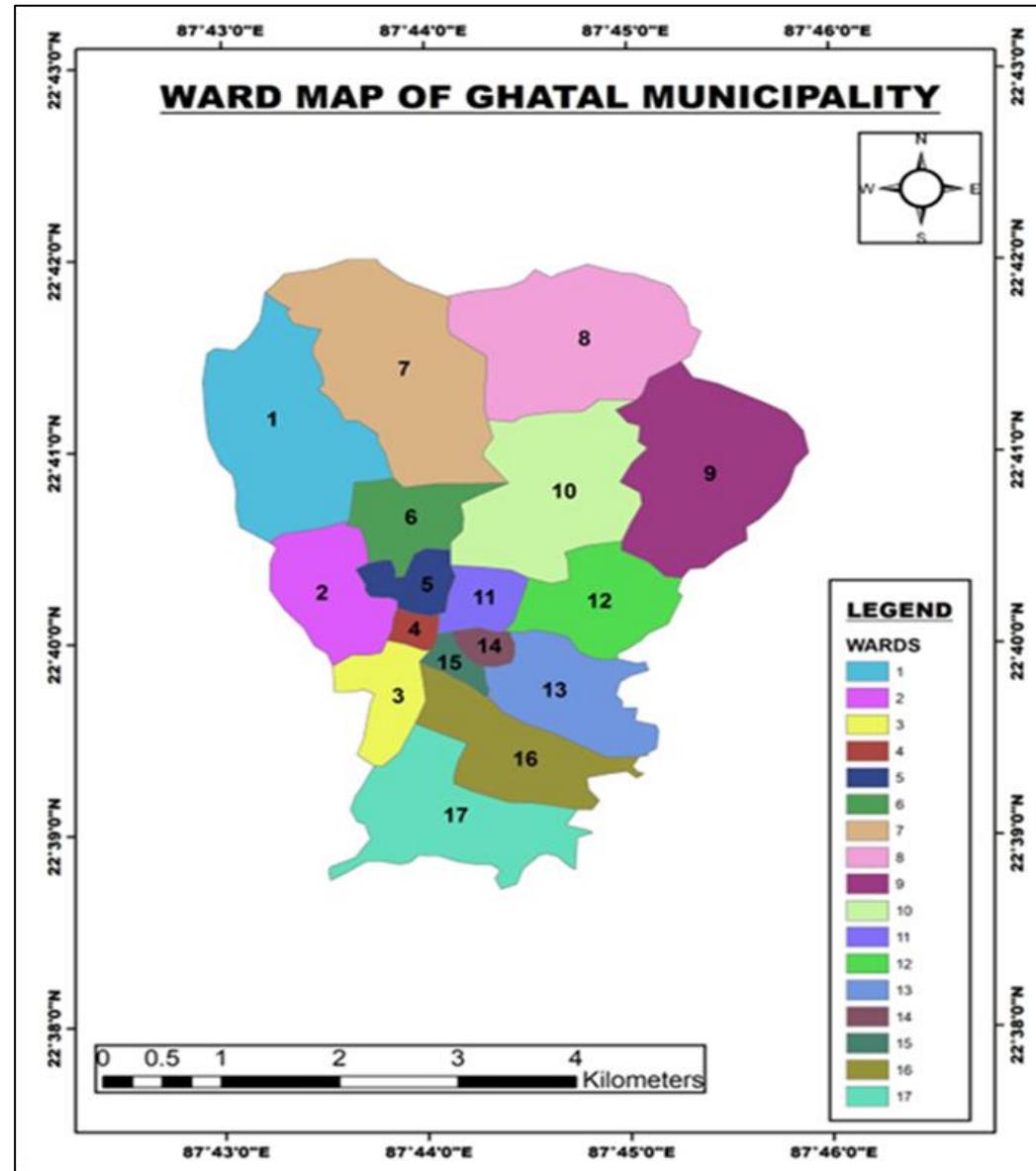
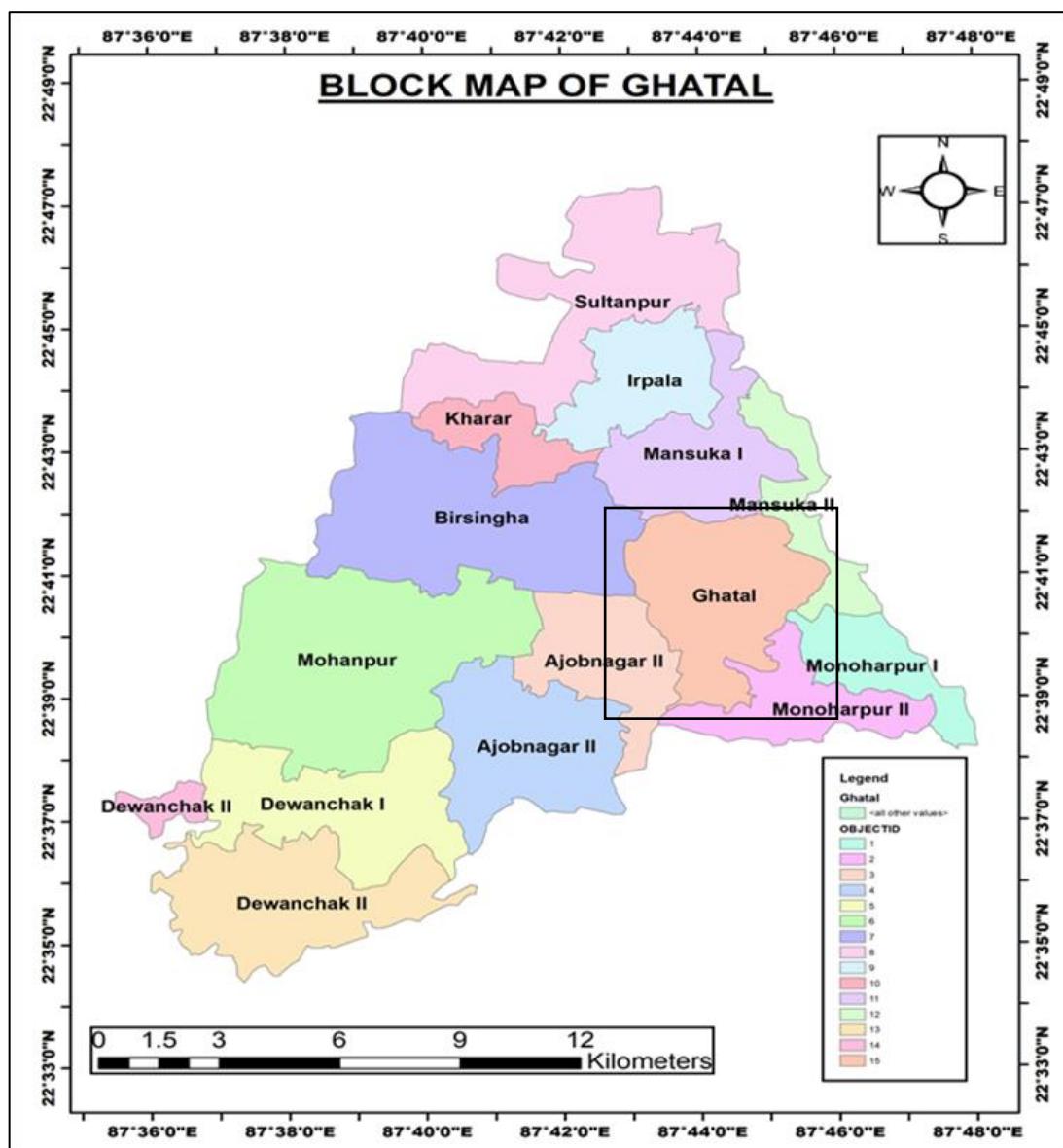
2 Municipalities: Ghatal and Kharar

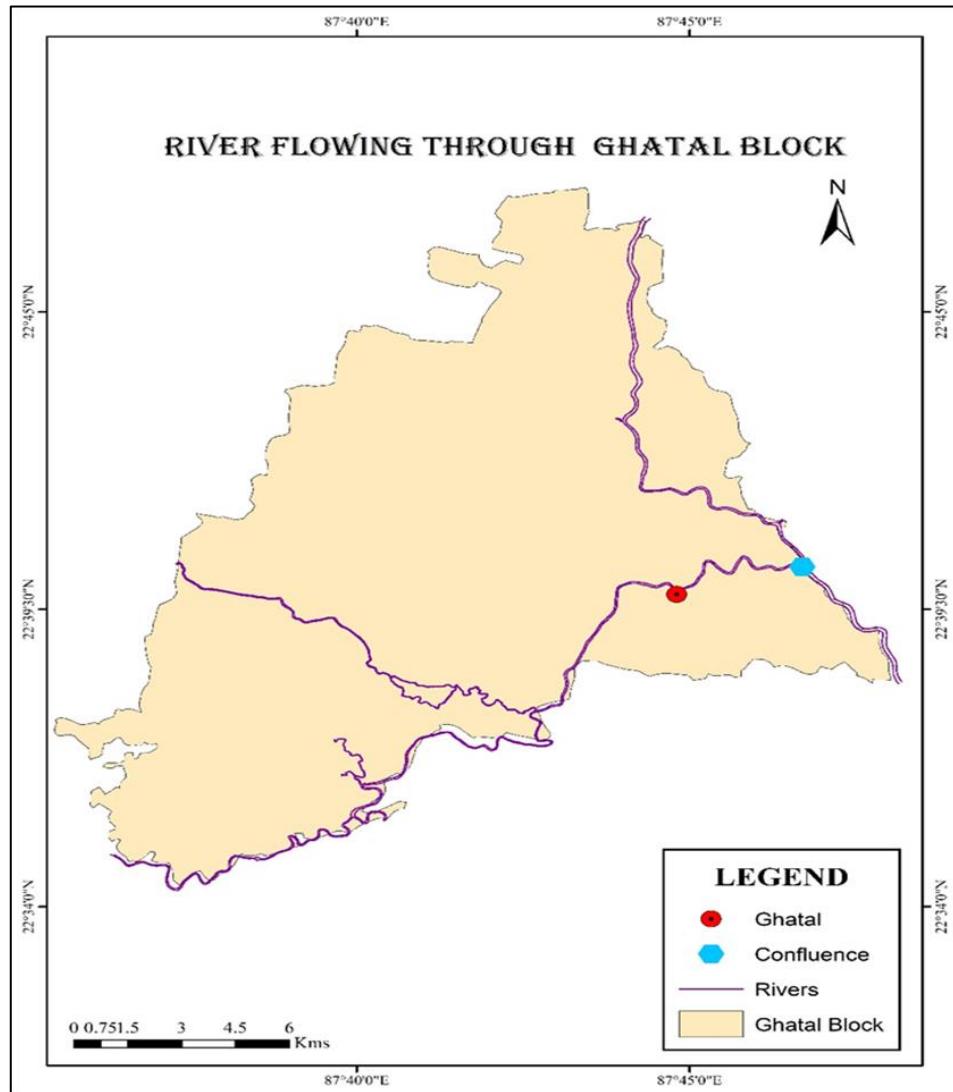
LOCATION MAP





GHATAL BLOCK AND GHATAL MUNICIPALITY



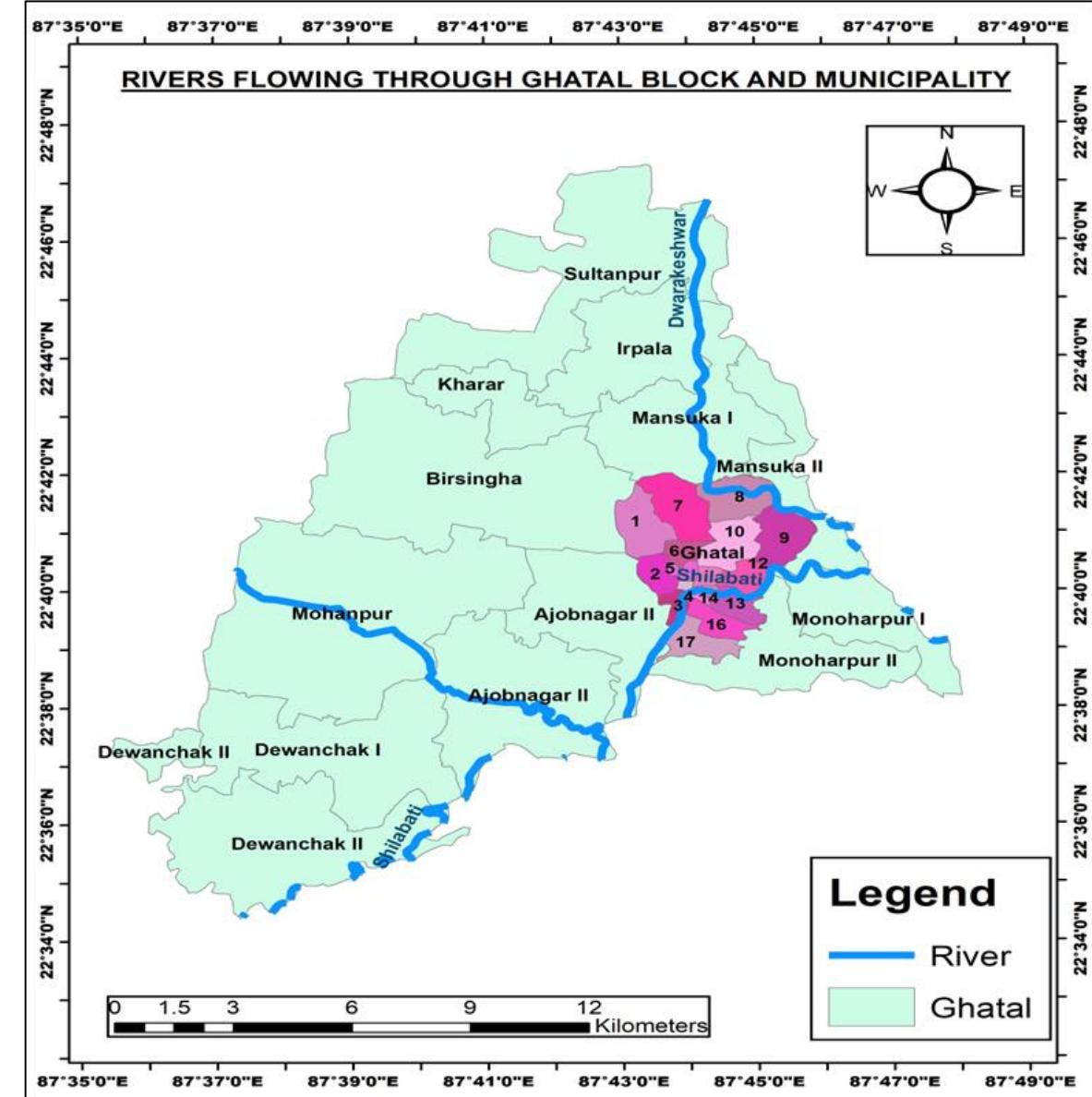
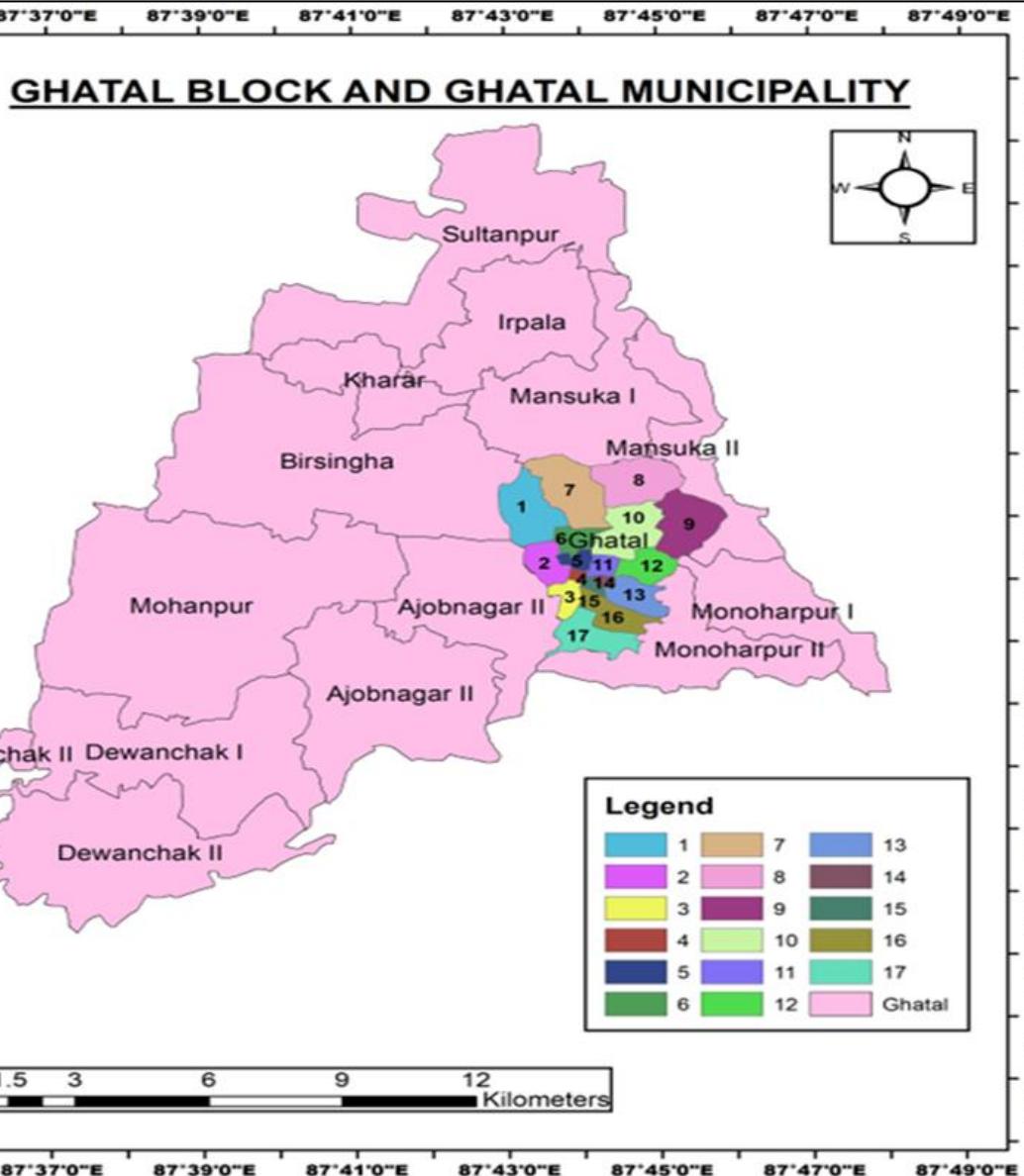


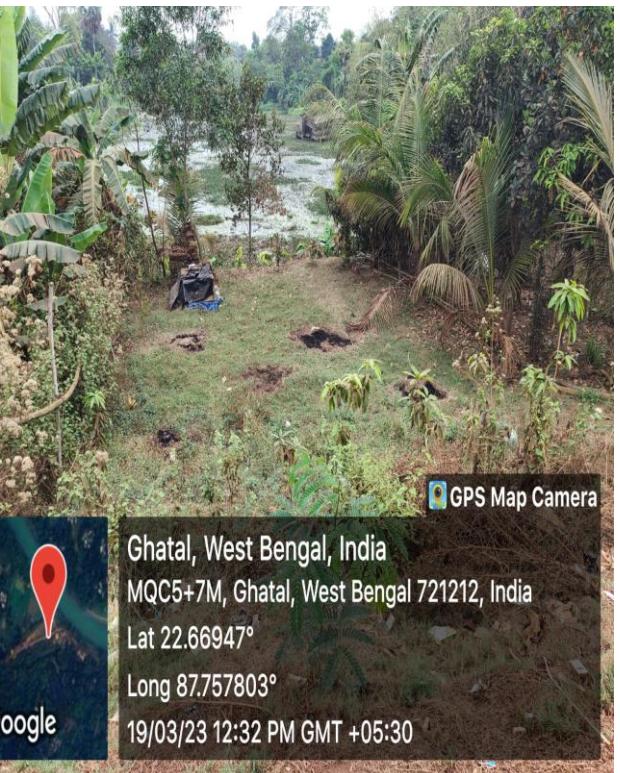
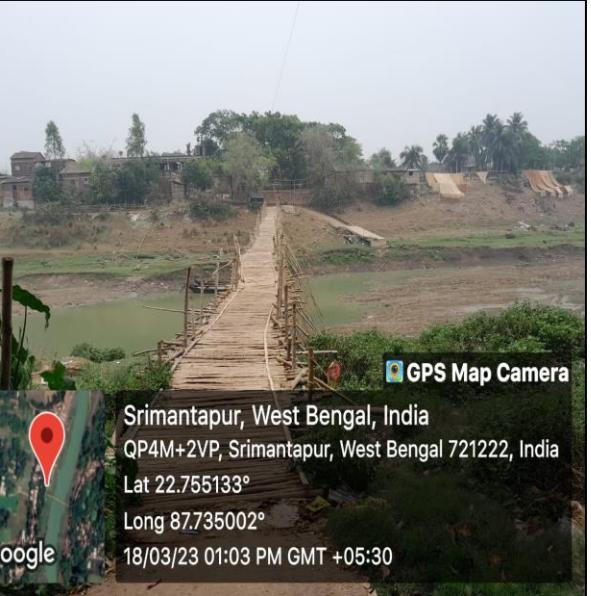
The Shilabati River (also known as Shilai) originates near Chak Gopalpur village of Hura block in the Purulia district of the Indian state of West Bengal.

It flows almost southeasterly through the districts of Bankura and Paschim Medinipur.

The Shilabati joins the Dwarakeswar near Ghatal and afterward is known as Rupnarayan.

It finally joins the Hooghly River, which empties into the Bay of Bengal.

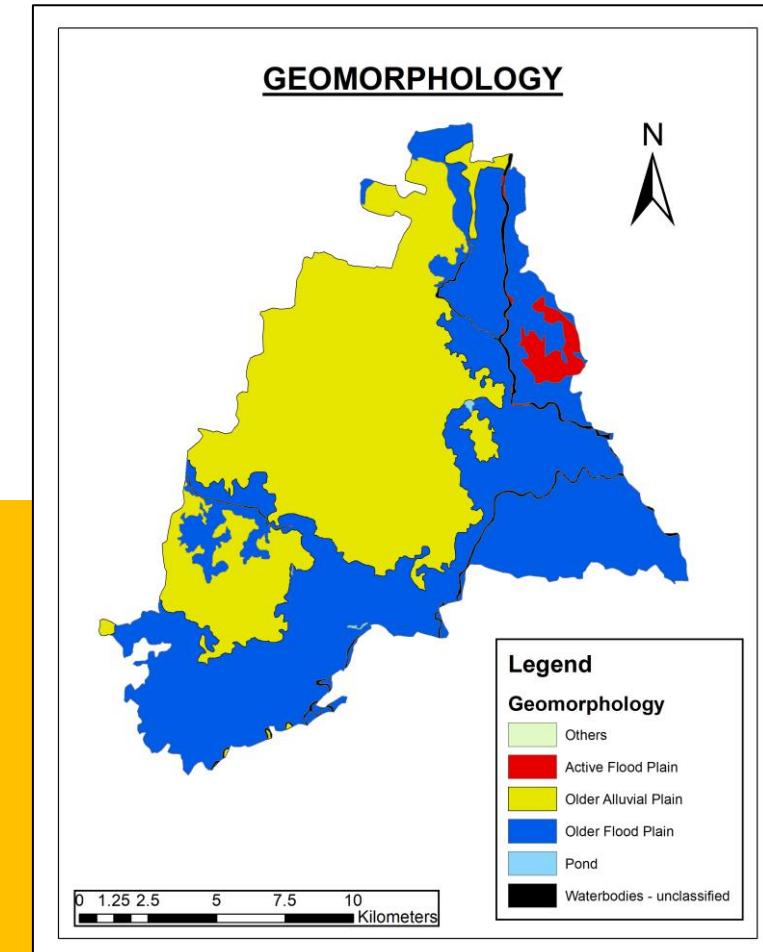
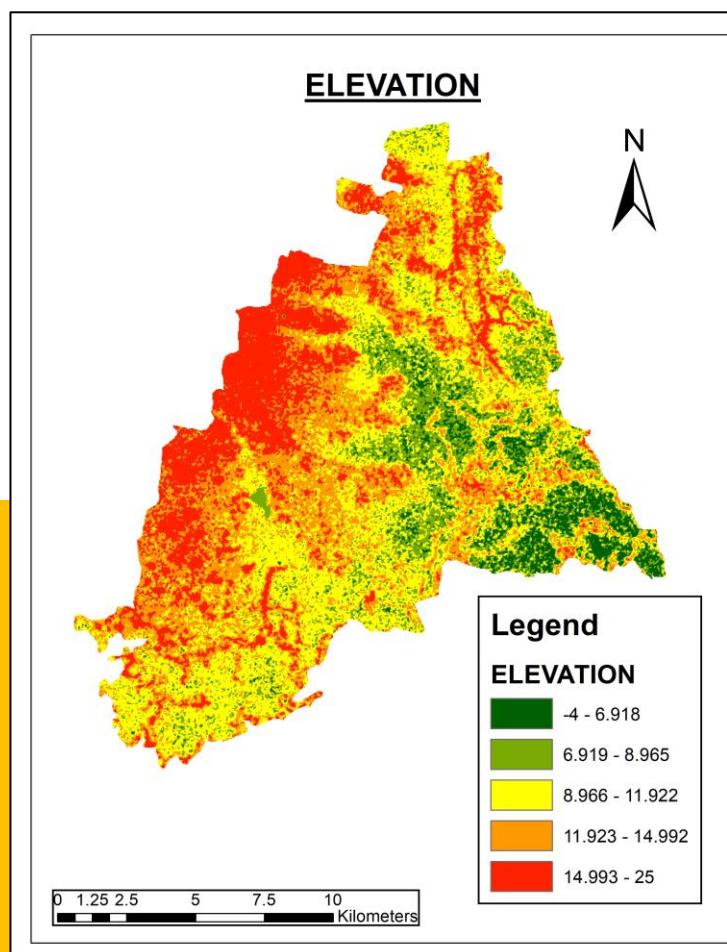
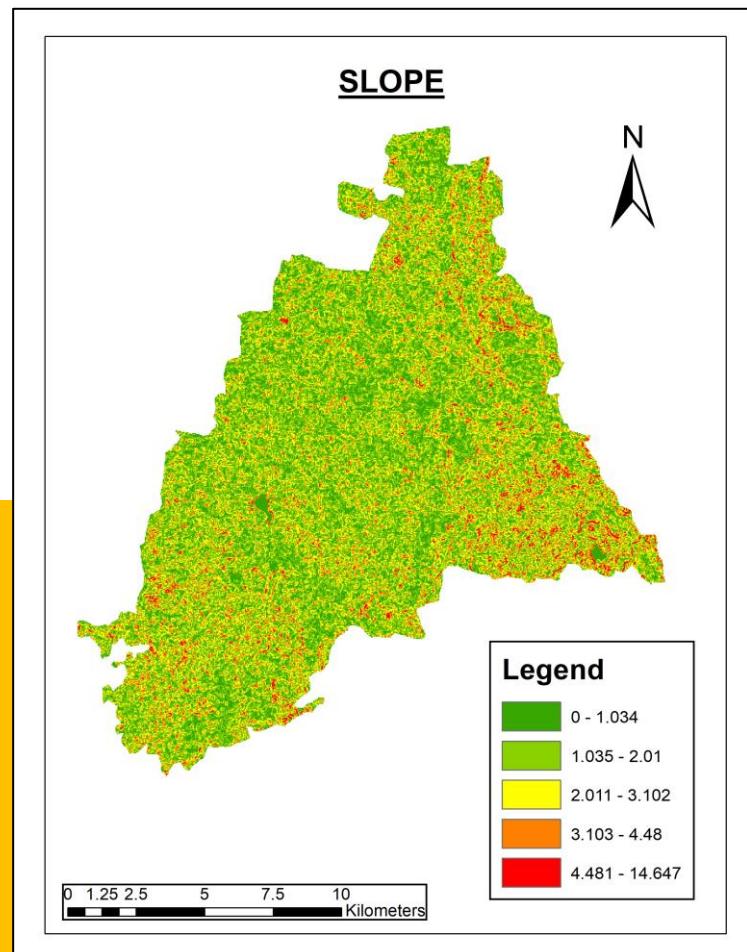




2021 Flood condition



SUSCEPTIBILITY FACTORS



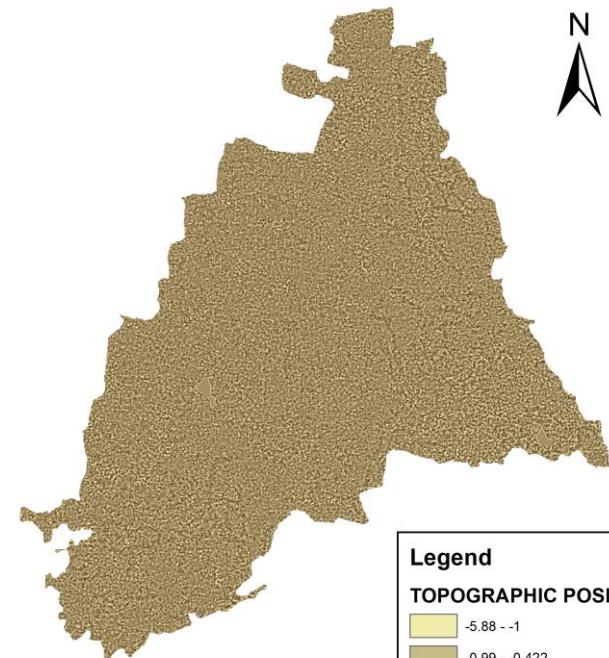
SLOPE

ELEVATION

GEOMORPHOLOGY

SUSCEPTIBILITY PARAMETERS

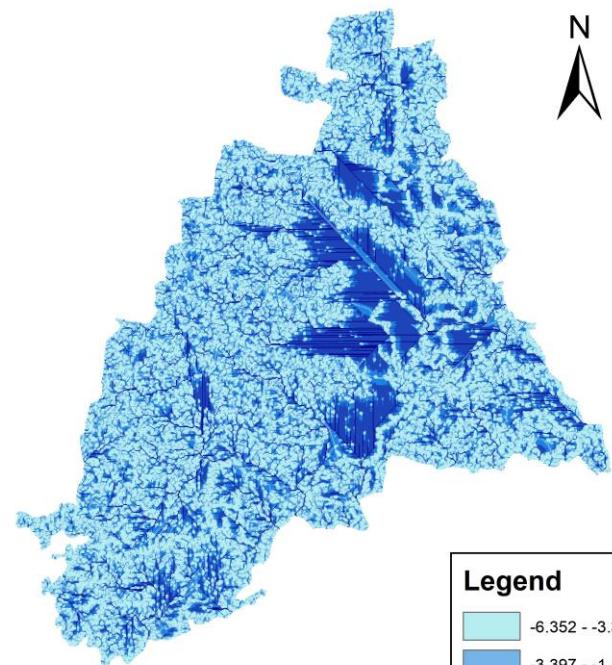
TOPOGRAPHIC POSITION



Legend
TOPOGRAPHIC POSITION
-5.88 - -1
-0.99 - -0.422
-0.421 - -0.213
0.214 - 0.849
0.85 - 7.63

0 1.25 2.5 5 7.5 10 Kilometers

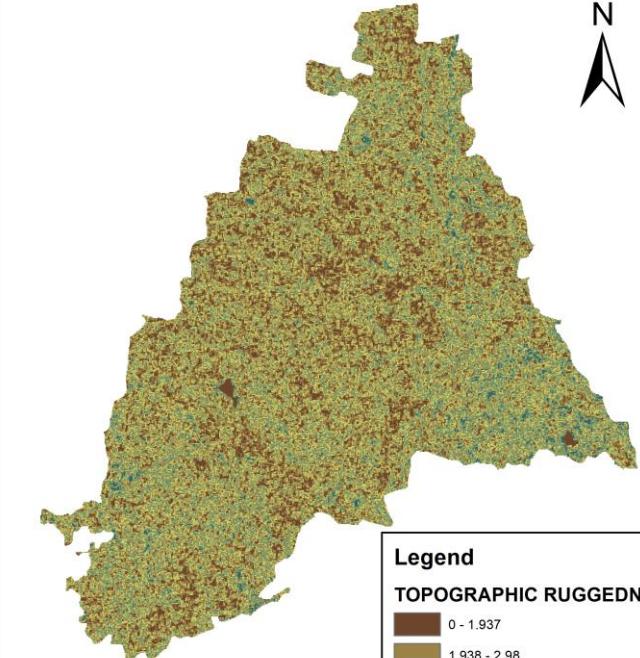
TOPOGRAPHIC WETNESS



Legend
TOPOGRAPHIC WETNESS
-6.352 - -3.398
-3.397 - -1.198
-1.197 - 0.877
0.878 - 3.391
3.392 - 9.678

0 1.25 2.5 5 7.5 10 Kilometers

TOPOGRAPHIC RUGGEDNESS



Legend
TOPOGRAPHIC RUGGEDNESS
0 - 1.937
1.938 - 2.98
2.981 - 3.949
3.95 - 6.929
6.93 - 19

0 1.25 2.5 5 7.5 10 Kilometers

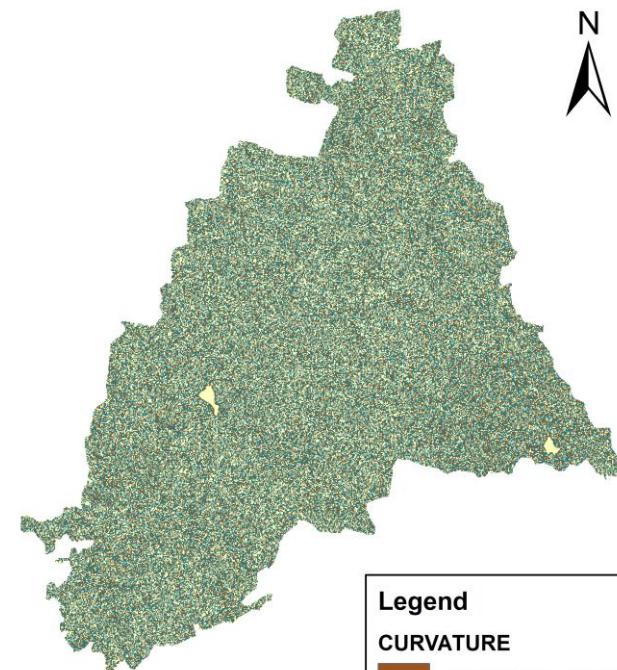
TOPOGRAPHIC POSITION INDEX

TOPOGRAPHIC WETNESS INDEX

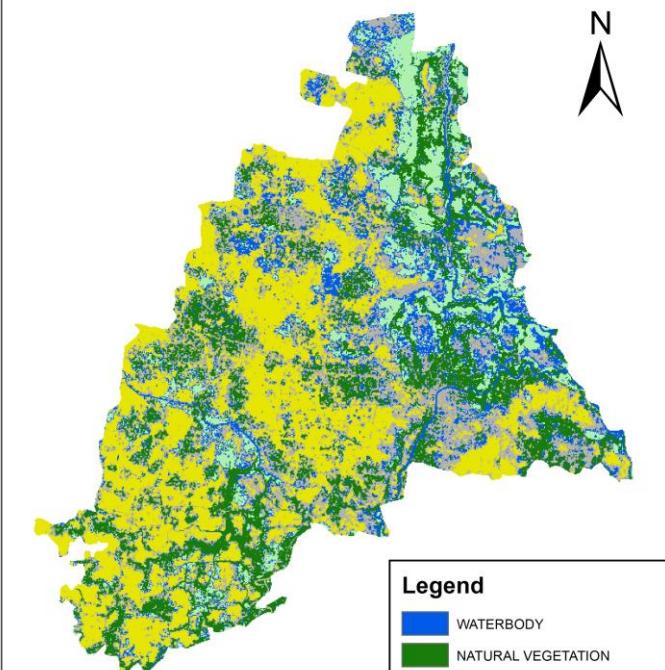
TOPOGRAPHIC RUGGEDNESS INDEX

SUSCEPTIBILITY PARAMETERS

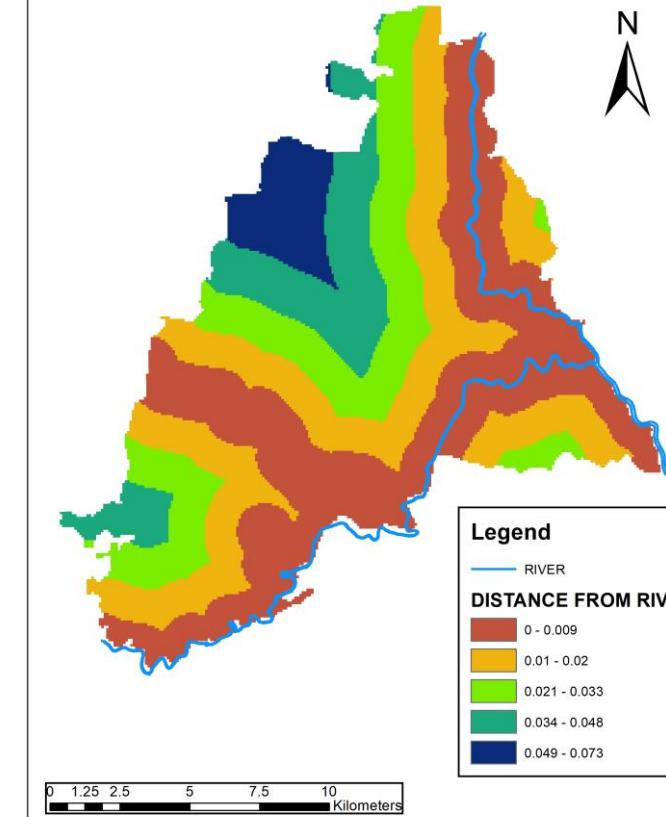
CURVATURE



LANDUSE LANDCOVER MAP(2023)



DISTANCE FROM RIVER



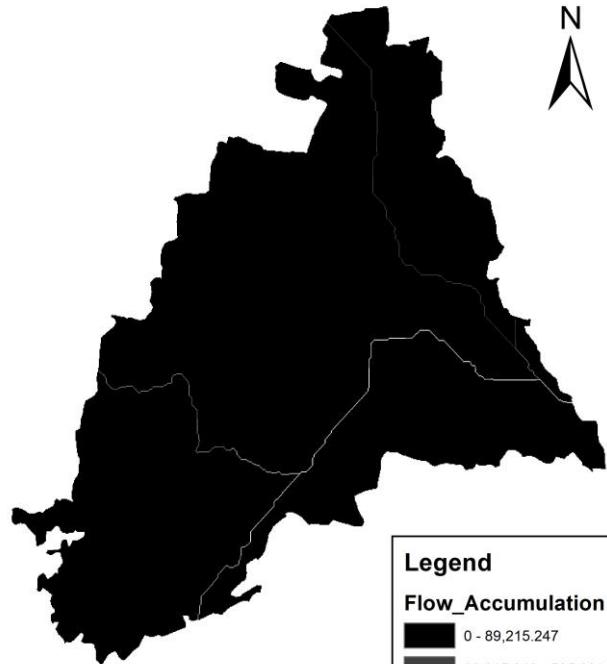
CURVATURE INDEX

**LANDUSE
LANDCOVER MAP**

**DISTANCE FROM
RIVER**

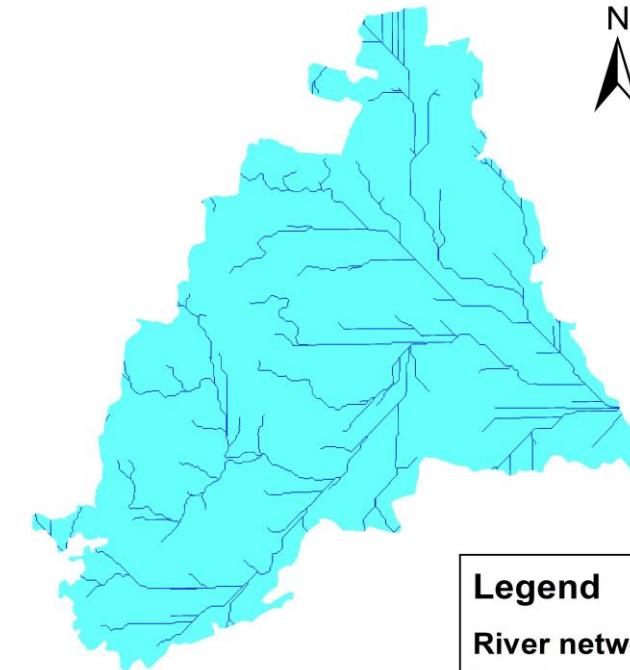
SUSCEPTIBILITY PARAMETERS

FLOW ACCUMULATION



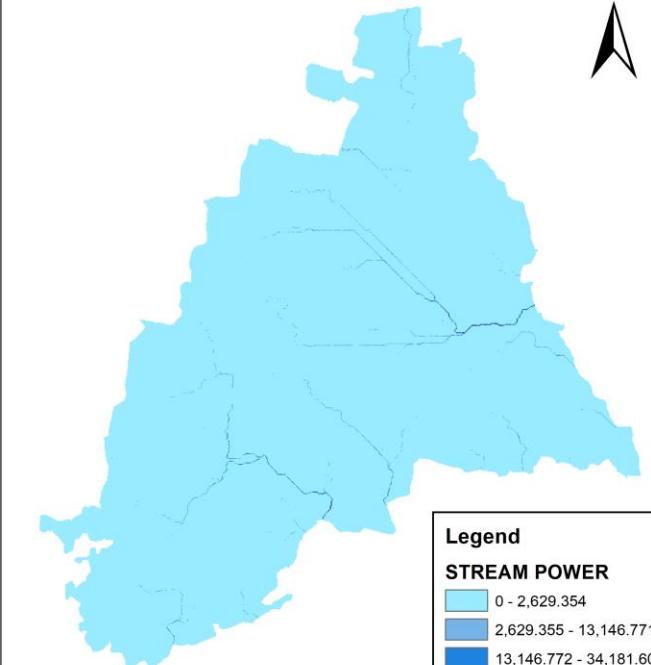
0 1.25 2.5 5 7.5 10 Kilometers

RIVER NETWORK



0 1.25 2.5 5 7.5 10 Kilometers

STREAM POWER



0 1.5 3 6 9 12 Kilometers

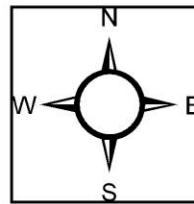
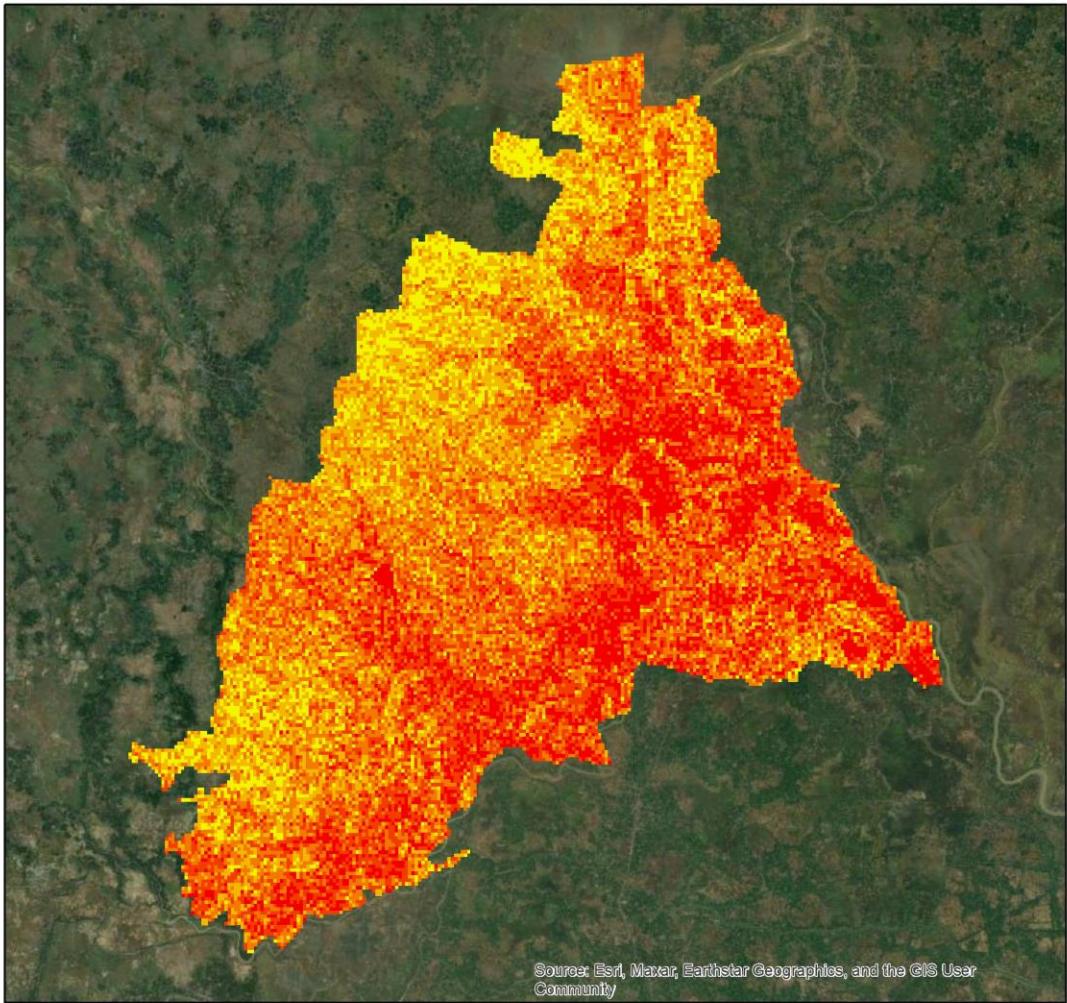
**FLOW
ACCUMULATION**

RIVER NETWORK

**STREAM POWER
INDEX**

FLOOD SUSCEPTIBILITY MODEL

FLOOD SUSCEPTIBILITY MODEL



Calculation for the consistency index (CI):

$$CI = (\lambda_{\max} - n) / (n - 1)$$

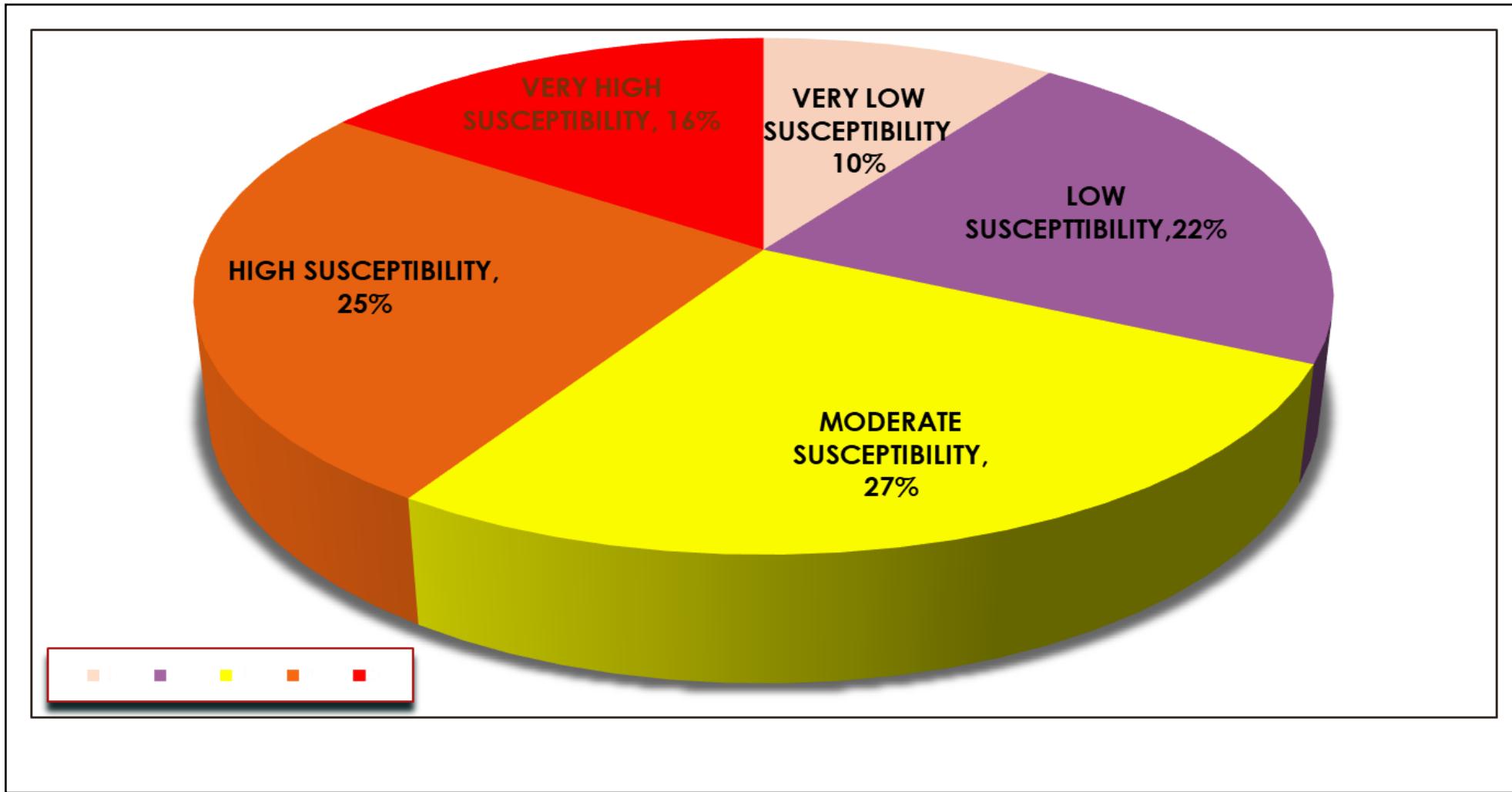
Therefore,

$$CR = CI / RI$$

Where, CR = 0.08 which is < 0.10

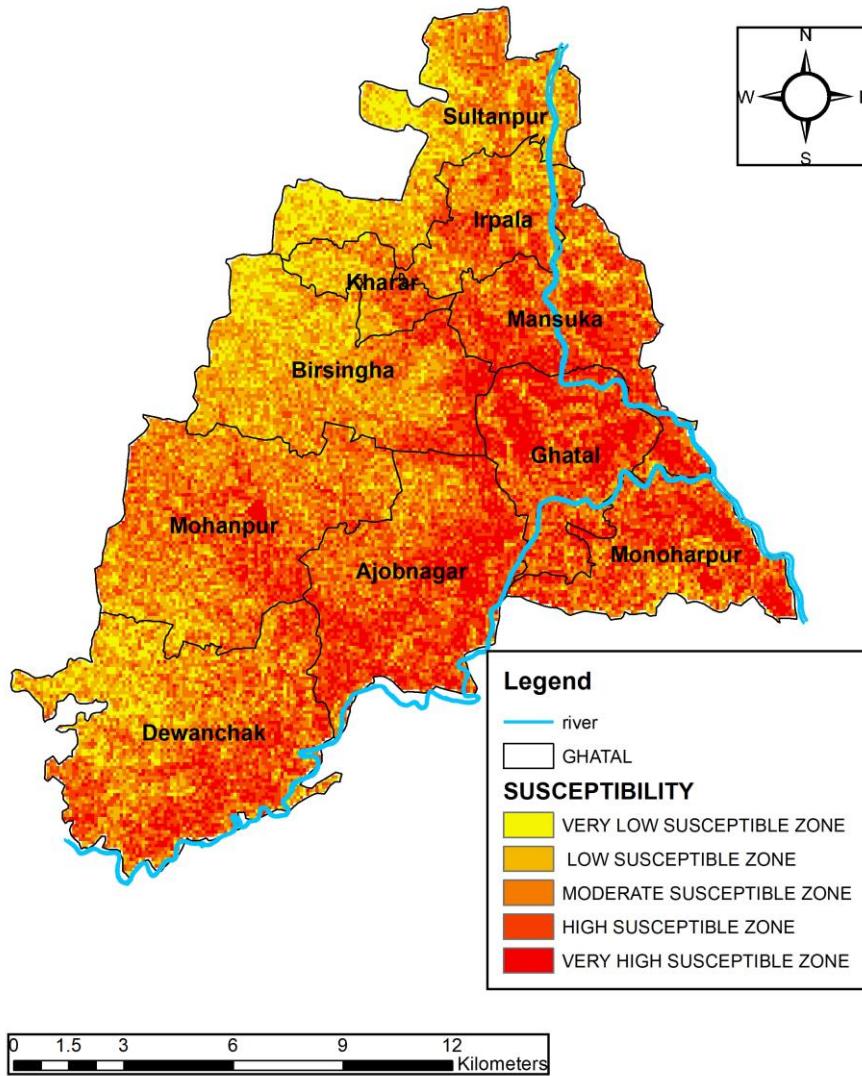
Since the value of 0.08 for the proportion of inconsistency CR is less than 0.10, we can assume that our judgement matrix is reasonably consistent. Hence we may continue the process of decision-making using AHP.

Pie diagram representing the percentage of area under 5 susceptibility category



BLOCKWISE STATISTICS OF SUSCEPTIBILITY PERCENTAGE OF GHATAL:

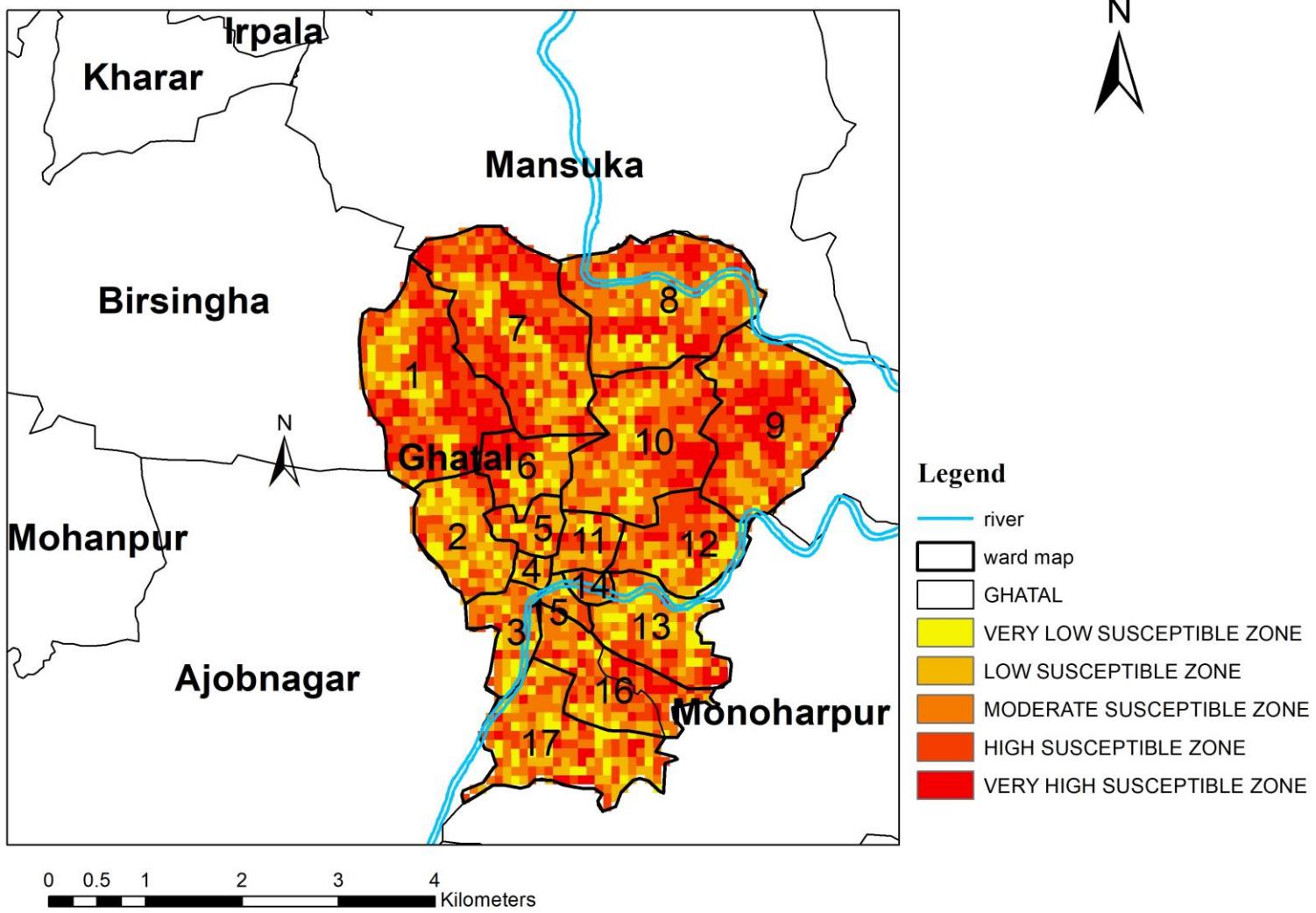
BLOCKWISE SUSCEPTIBLE ZONES



SUSCEPTIBILITY ZONES	AJOBNAGAR	BIRISINGHA	DEWANCHAK	GHATAL
VERY LOW SUSCEPTIBILITY	2.02645651562	16.57945469566	11.95034714919	1.34607034303
LOW SUSCEPTIBILITY	10.27300872503	34.81134673643	23.24847464760	10.68171949629
MODERATE SUSCEPTIBILITY	23.81086405854	28.39438171303	27.54050073631	22.40555796787
HIGH SUSCEPTIBILITY	36.36363636363	13.66014871936	25.58384178416	30.13460703431
VERY HIGH SUSCEPTIBILITY	27.52603433717	6.55466813551	11.67683568274	35.43204515850
IRPALA	KHARAR	MANSUKA	MOHANPUR	
10.18050541517	17.92207792	3.68901229671	7.16820440027	
24.54873646213	32.33766234	12.93137643794	23.13697657912	
30.25270758121	27.53246753	22.61007536690	35.58079015856	
27.94223826713	18.44155844	35.06545021817	26.33073101489	
7.07581227437	3.766233766	25.70408568028	7.78329784716	
MONOHARPUR	SULTANPUR			
	3.42168674699	28.09645597369		
	14.69879518072	34.92875411035		
	23.85542168674	25.68505663133		
	30.02409638554	10.52246985752		
	28.00000000002	0.76726342711		

WARDWISE SUSCEPTIBLE ZONES OF GHATAL MUNICIPALITY

WARDWISE SUSCEPTIBLE ZONES OF GHATAL MUNICIPALITY

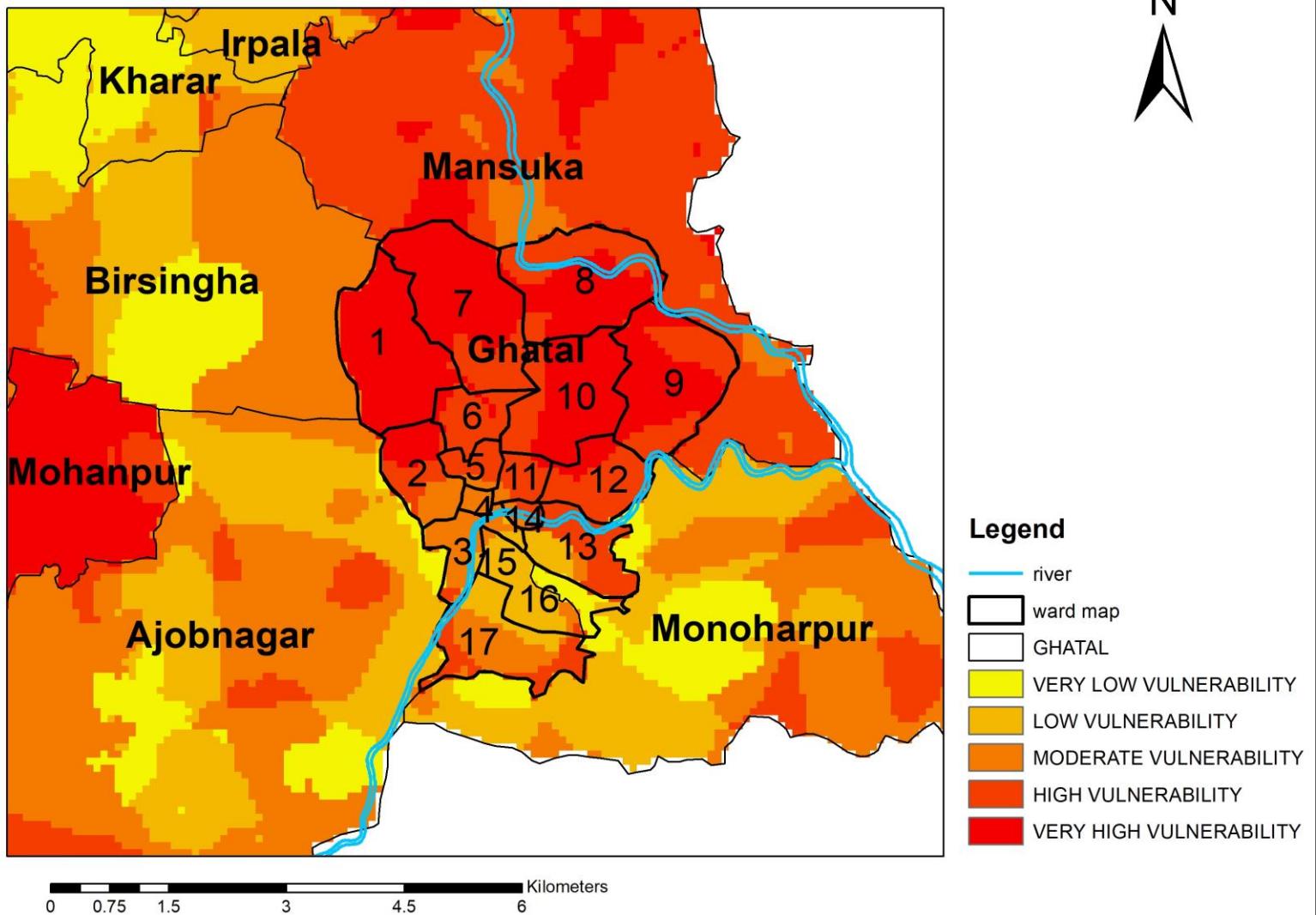


Socio-economic parameters

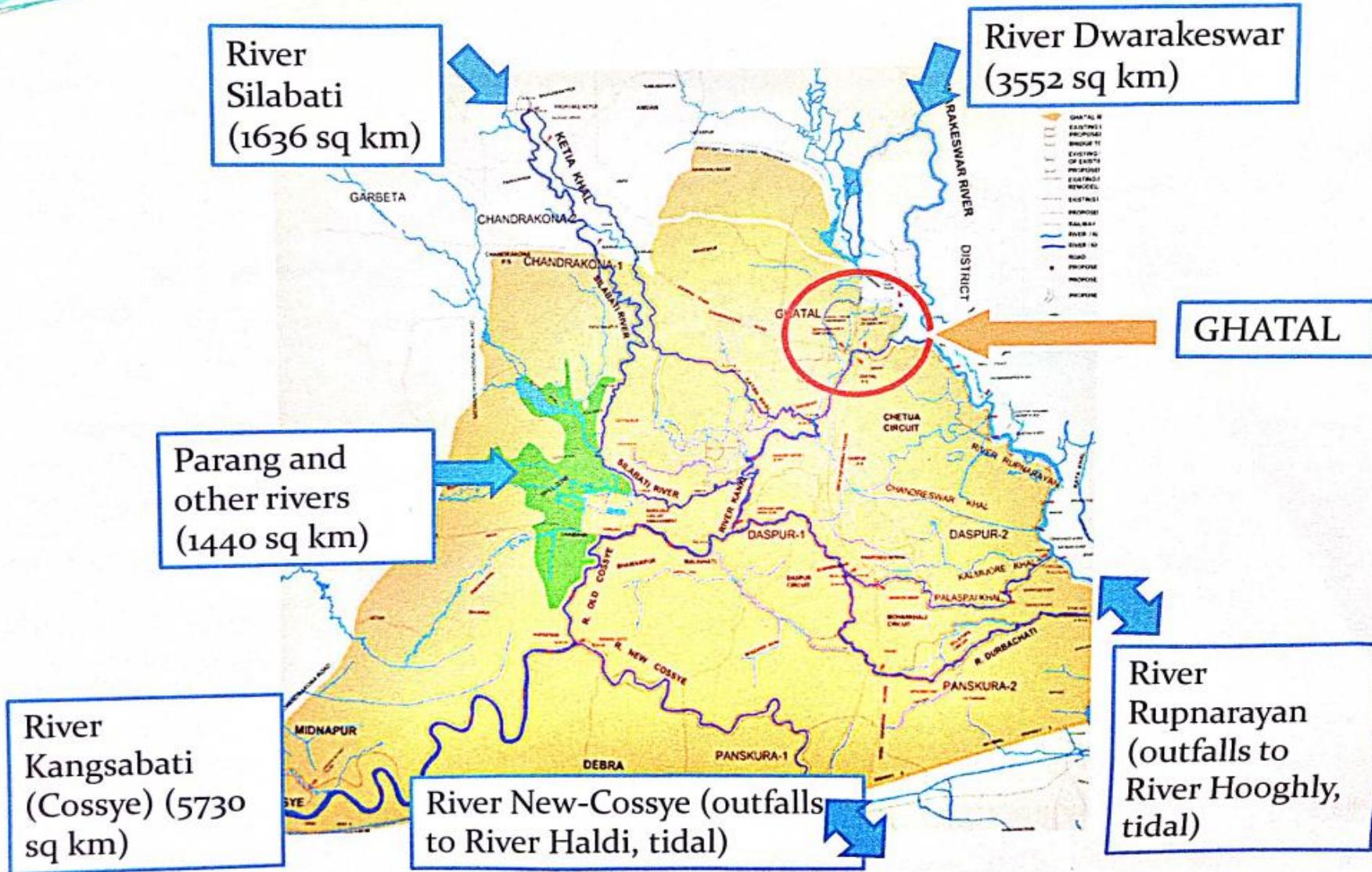
- 1. Population density
- 2. House type
- 3. Population composition (e.g. elderly population, children)
- 4. Literacy and flood awareness etc.

WARDWISE VULNERABLE ZONES OF GHATAL MUNICIPALITY

WARDWISE VULNERABILITY OF GHATAL MUNICIPALITY

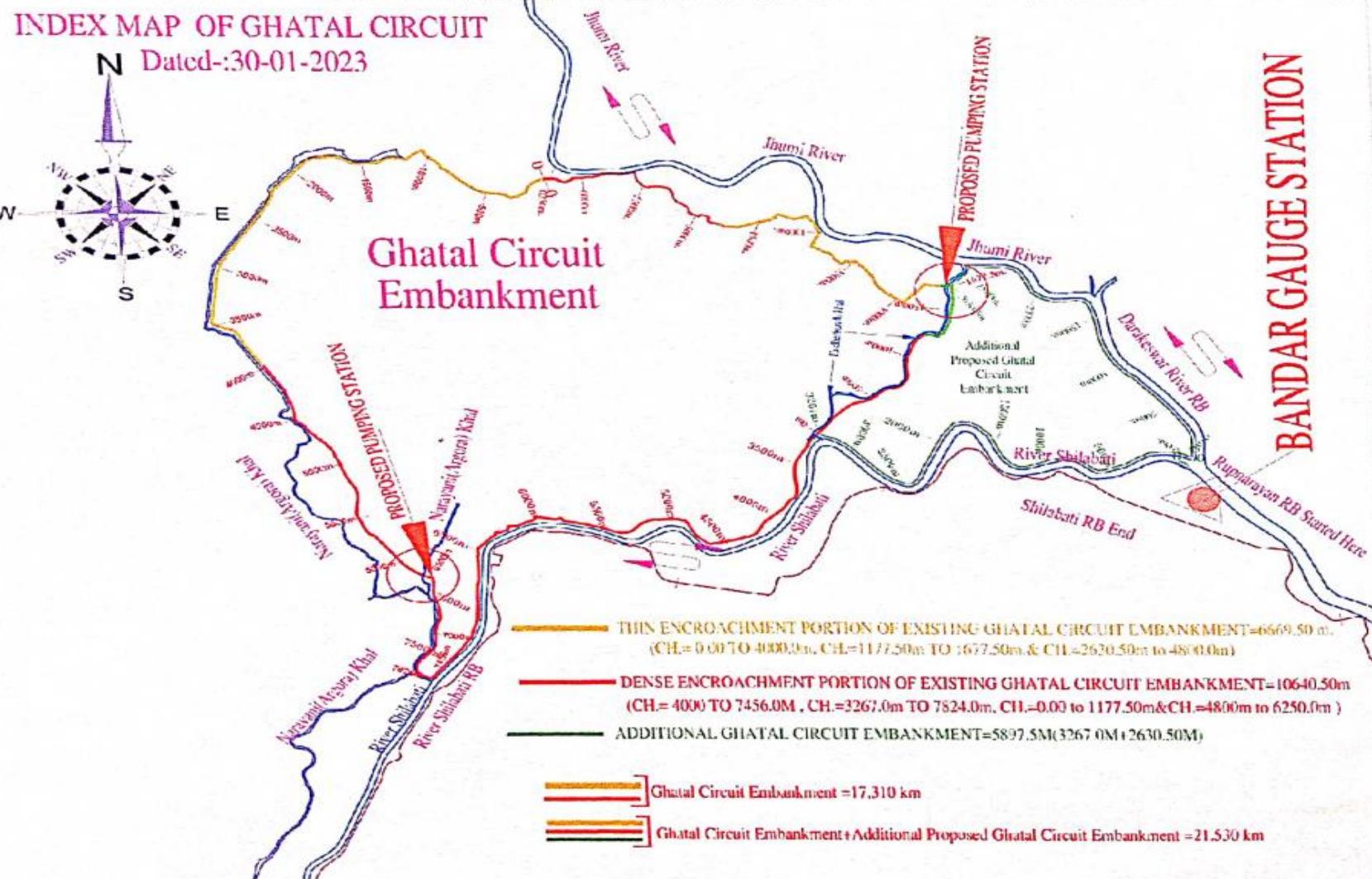


River system of Ghatal Master Plan area



Source : Irrigation
and waterways
department

EXISTING INFRASTRUCTURE OF GHATAL:



Source : Irrigation and waterways department

<p><u>STRENGTHS</u></p> <ul style="list-style-type: none"> 1) Maximum people have their own house funded by government 2) Boats for transportation are available throughout the year 	<p><u>WEAKNESS</u></p> <ul style="list-style-type: none"> 1) Overflow of Shilabati river. 2) Topography of the area is uneven
<p><u>OPPORTUNITIES</u></p> <ul style="list-style-type: none"> 1) Many works are being carried on the Ghatal region, so there is always a chance of improvement of the policies and developmental plans. 2) Ghatal Master Plan 	<p><u>CHALLENGES</u></p> <ul style="list-style-type: none"> 1) No work on the Ghatal circuit embankment has been done since the British period. 2) Since it is entirely a rural area, the poverty level is high.

Structural measures – Is it possible?

- (a) Dams and Reservoirs
- (b) Embankment
- (c) Drainage Improvements
- (d) Diversion of Flood Waters
- (e) Using Natural Detention Basin