

Appendix A Geospatial ordinates and depth (mbgl) of groundwater level at sampling locations.

Location No.	Location Name	Latitude (N)	Longitude (E)	Altitude (m) above MSL	PRM Water Table Depth (mbgl)	POM Water Table Depth (mbgl)
L1	Fresarganj	21°33'36.36"	88°14'57.80"	5	10.2	10.8
L2	Laxmipur	21°33'44.36"	88°15'20.54"	4	10.3	11.0
L3	Purba Amravati	21°33'58.19"	88°16'15.05"	4	10.5	11.3
L4	Bijoybati	21°34'42.40"	88°16'24.63"	3	10.3	10.8
L5	Narayanitala	21°35'40.64"	88°15'46.54"	5	10.7	10.7
L6	Purba Bijoybati	21°35'26.91"	88°16'26.09"	5	9.6	10.2
L7	10-mile bus stand	21°37'40.00"	88°15'31.24"	5	10.7	10.9
L8	Haripur Temple	21°38'30.00"	88°17'12.12"	4	10.9	10.9
L9	Kali Temple	21°38'05.19"	88°15'21.04"	3	11.3	11.7
L10	Shibrampur	21°39'01.73"	88°15'26.62"	5	11.7	12.2
L11	Chandanpidi south	21°39'58.00"	88°17'58.06"	4	WNO	WNO
L12	Rajnagar	21°40'09.16"	88°15'02.34"	3	10.9	10.9
L13	Radhanagar	21°41'31.25"	88°14'04.36"	4	12.2	11.8
L14	South Durgapur	21°41'15.85"	88°12'43.46"	3	11.5	11.9
L15	Devnagar	21°43'13.00"	88°12'54.08"	5	10.9	11.3
L16	Namkhana Girls School	21°43'59.02"	88°14'35.11"	5	11.2	11.7
L17	Dwarikanagar	21°43'03.24"	88°15'54.65"	4	11.2	12.0
L18	Madanganj	21°44'29.76"	88°14'56.95"	5	WNO	WNO
L19	Girls College	21°44'36.98"	88°14'22.74"	4	10.8	11.2
L20	Namkhana Bazar Area	21°45'30.91"	88°14'02.30"	3	10.9	11.5
L21	Patigunia ferry ghat	21°37'18.03"	88°13'24.21"	2	10.2	10.9
L22	Baghdanga Kusumtala	21°39'57.10"	88°11'30.34"	4	10.3	11.8

**WNO = Well cannot be opened*

Appendix B Pearson's correlation matrix (PrM).

	pH	EC	TDS	TH	Na ⁺	K ⁺	Ca ⁺²	Mg ⁺²	HCO ₃ ⁻	Cl ⁻	SO ₄ ⁻²	NO ₃ ⁻
pH	1											
EC	-0.38	1										
TDS	-0.33	0.98***	1									
TH	0.20	-0.75***	-0.75***	1								
Na ⁺	-0.23	0.87***	0.88***	-0.74***	1							
K ⁺	0.28	-0.80***	-0.78***	0.89***	-0.77***	1						
Ca ⁺²	0.18	-0.67***	-0.67***	0.94***	-0.63**	0.72***	1					
Mg ⁺²	0.05	-0.17	-0.18	0.06	-0.26	0.42*	-0.26	1				
HCO ₃ ⁻	-0.25	0.38	0.43*	-0.20	0.59**	-0.29	-0.06	-0.42*	1			
Cl ⁻	-0.12	0.55**	0.53*	-0.44*	0.34	-0.51*	-0.46*	0.09	-0.38	1		
SO ₄ ⁻²	0.37	-0.35	-0.33	0.55**	-0.28	0.43*	0.54**	-0.03	-0.42	0.21	1	
NO ₃ ⁻	-0.08	0.03	0.06	0.32	0.25	0.17	0.44*	-0.41	0.76***	-0.54**	-0.007	1

*Non-significant $p > 0.05$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix C Pearson's correlation matrix (PoM).

	pH	EC	TDS	TH	Na ⁺	K ⁺	Ca ⁺²	Mg ⁺²	HCO ₃ ⁻	Cl ⁻	SO ₄ ⁻²	NO ₃ ⁻
pH	1											
EC	0.30	1										
TDS	0.58**	0.63**	1									
TH	-0.39	-0.63**	-0.57**	1								
Na ⁺	0.36	0.86***	0.64**	-0.80***	1							
K ⁺	-0.63**	-0.73***	-0.67***	0.85***	-0.85***	1						
Ca ⁺²	-0.462*	-0.11	-0.17	0.61**	-0.33	0.52*	1					
Mg ⁺²	-0.07	-0.69***	-0.56**	0.68***	-0.70***	0.58**	-0.14	1				
HCO ₃ ⁻	0.22	0.35	0.35	-0.69***	0.47*	-0.59**	-0.41	-0.48*	1			
Cl ⁻	-0.02	0.59**	0.24	0.02	0.46*	-0.06	0.35	-0.29	-0.32	1		
SO ₄ ⁻²	-0.04	-0.58**	-0.49*	0.48*	-0.74***	0.53*	-0.15	0.74** *	-0.19	-0.49*	1	
NO ₃ ⁻	0.54**	0.43*	0.51*	-0.36	0.57**	-0.64**	-0.408	-0.08	0.08	0.23	-0.42*	1

*Non-significant $p > 0.05$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix D Standards of drinking water and weightage factor.

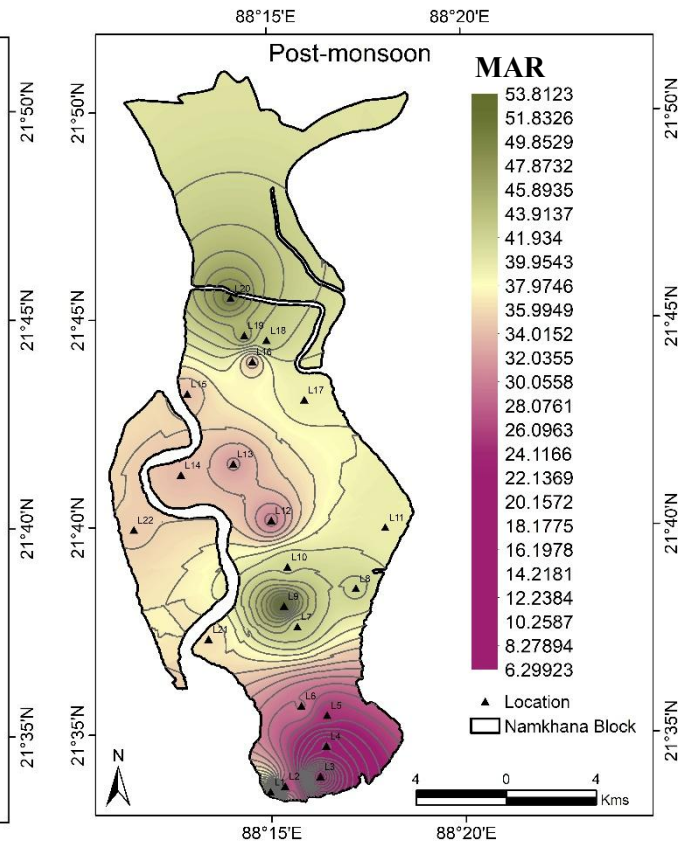
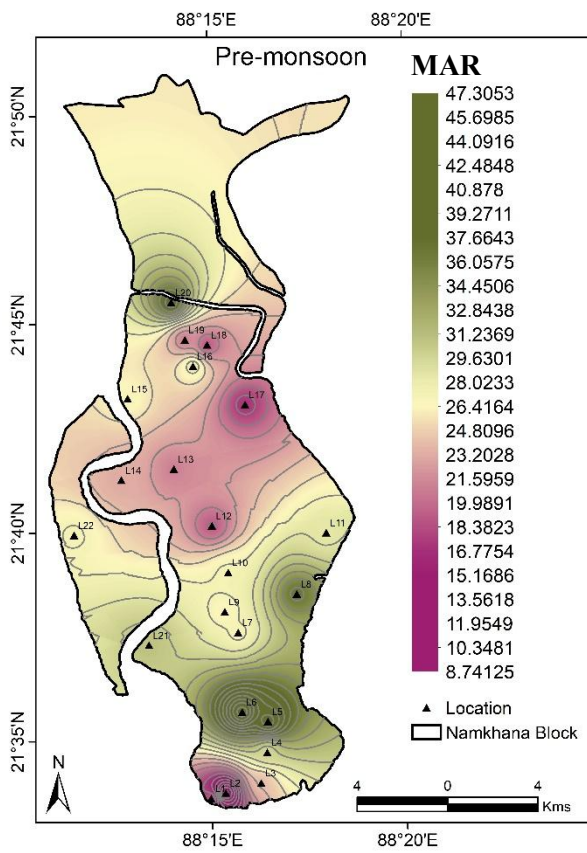
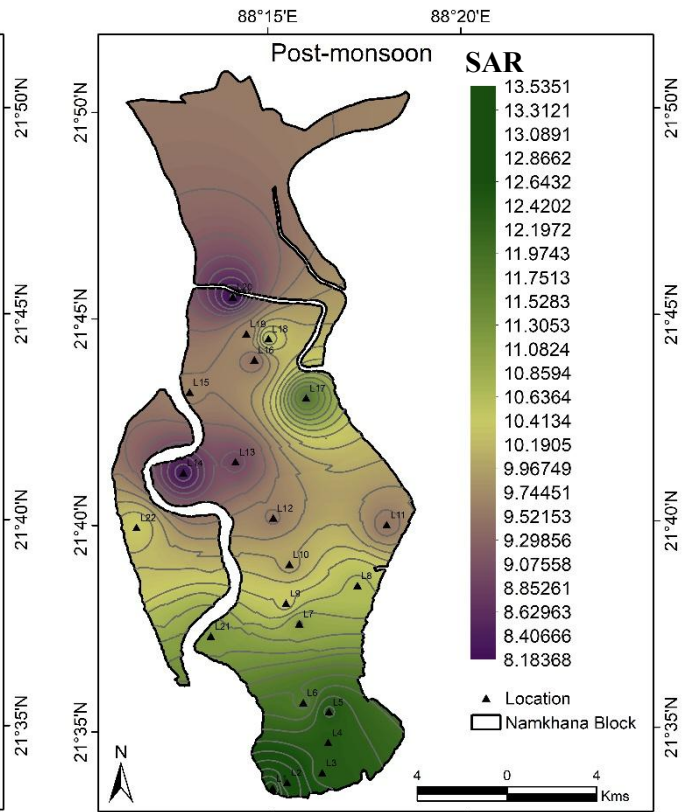
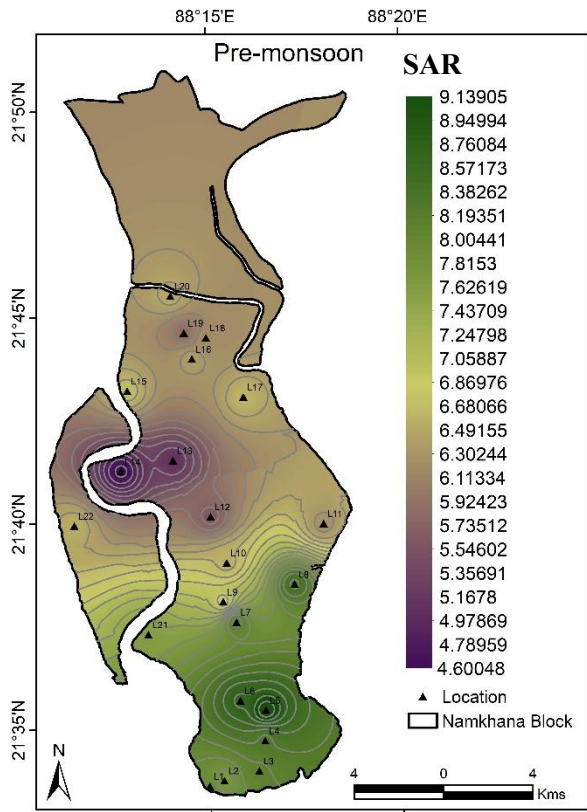
Sr. No	Parameters	Standard permissible /acceptable value for each parameter (S _n)	Value of <i>K</i> (Proportionality Constant)	Weightage factor/Unit Weight (W _n)
1	pH	6.5	4.075	0.627
2	TDS	500		0.008
3	Calcium	75		0.054
4	Magnesium	30		0.136
5	Chloride	250		0.016
6	Sulphate	150		0.027
7	Nitrate	45		0.091
8	Total Hardness	200		0.020
9	Total Alkalinity	200		0.020

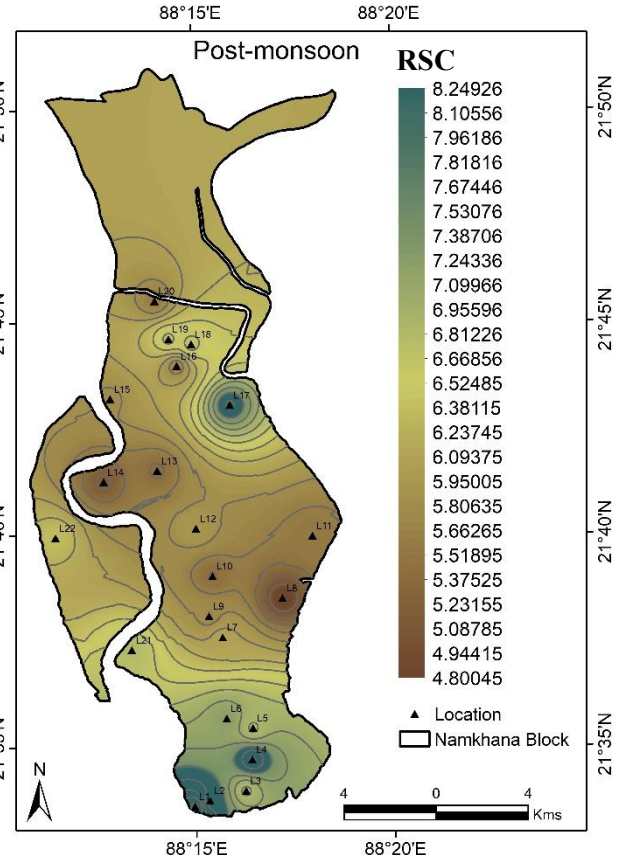
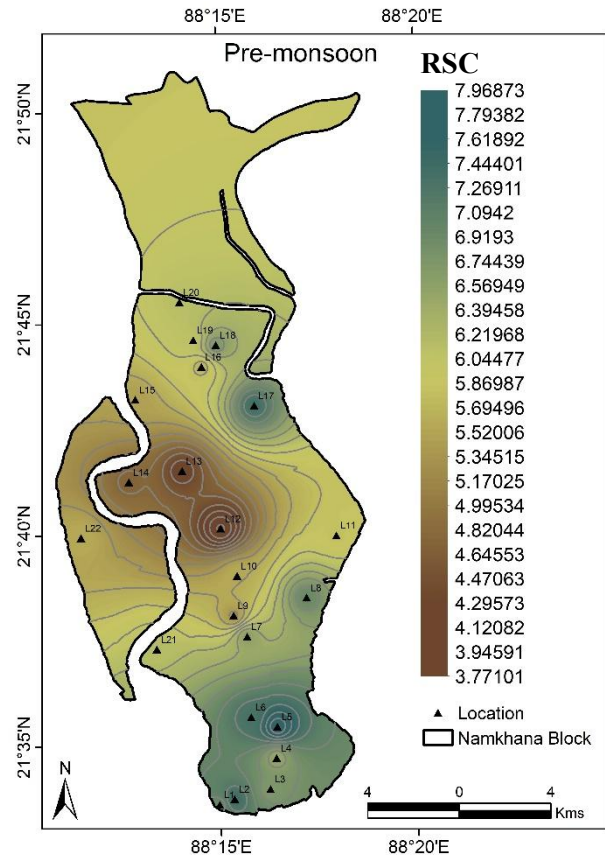
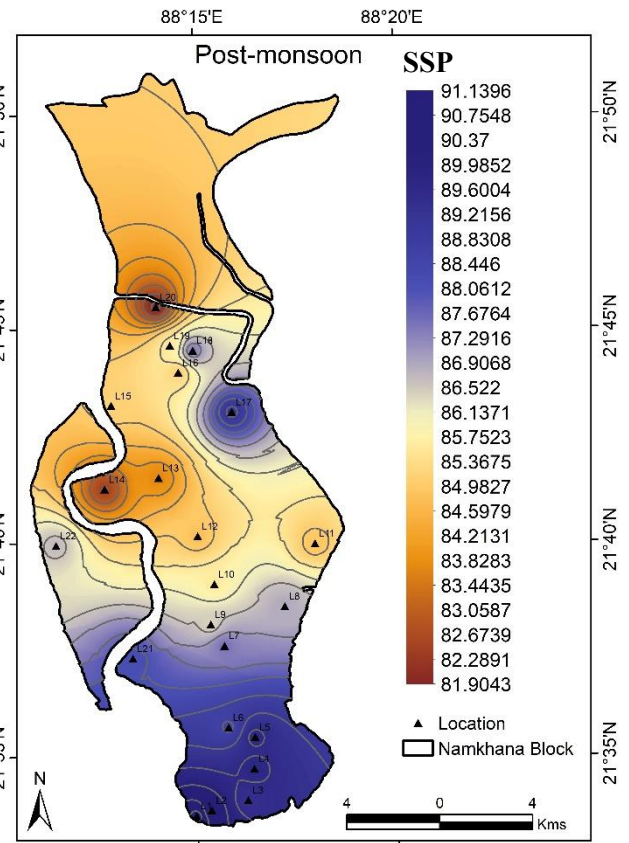
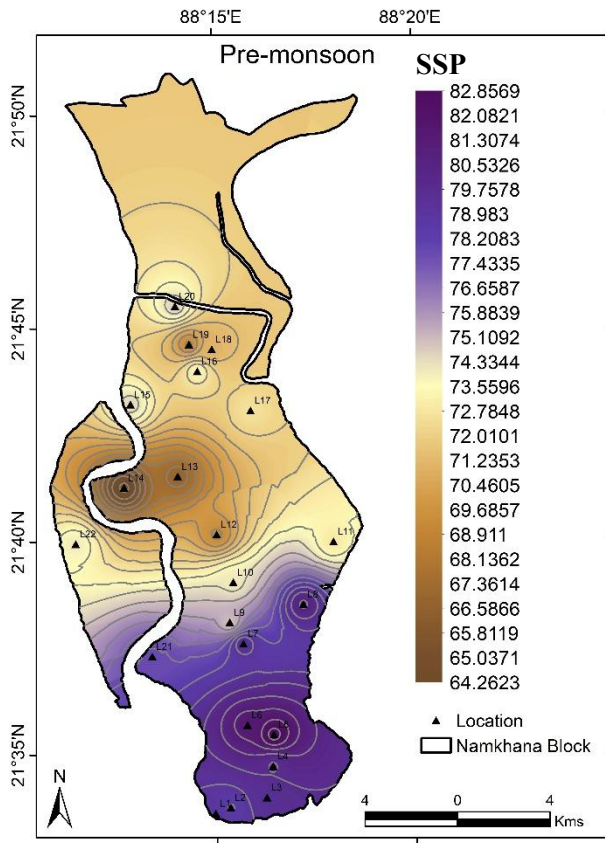
Appendix E WQI of the studied water (Weight Arithmetic Indexing Method, after (Chatterjee & Raziuddin, 2002)).

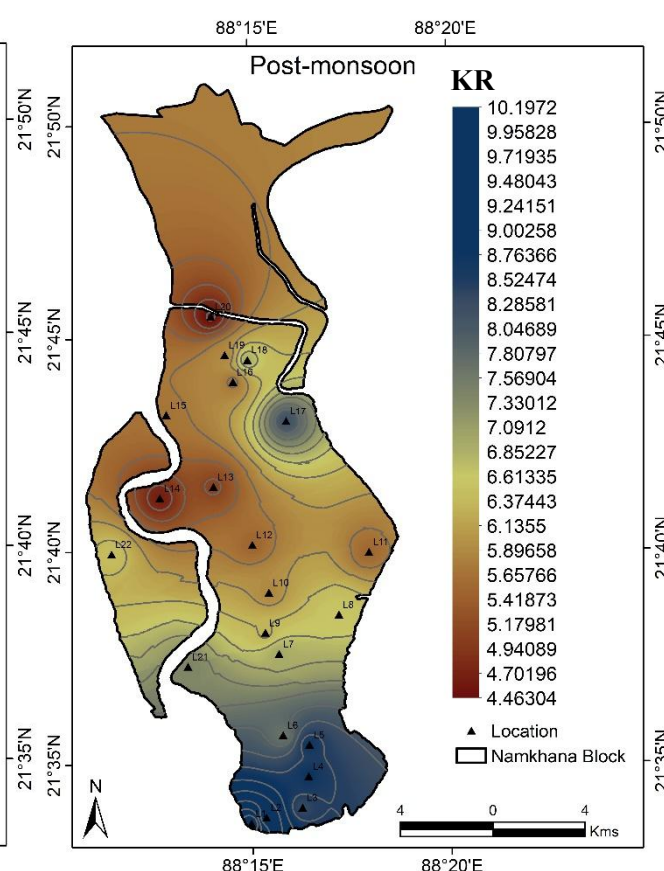
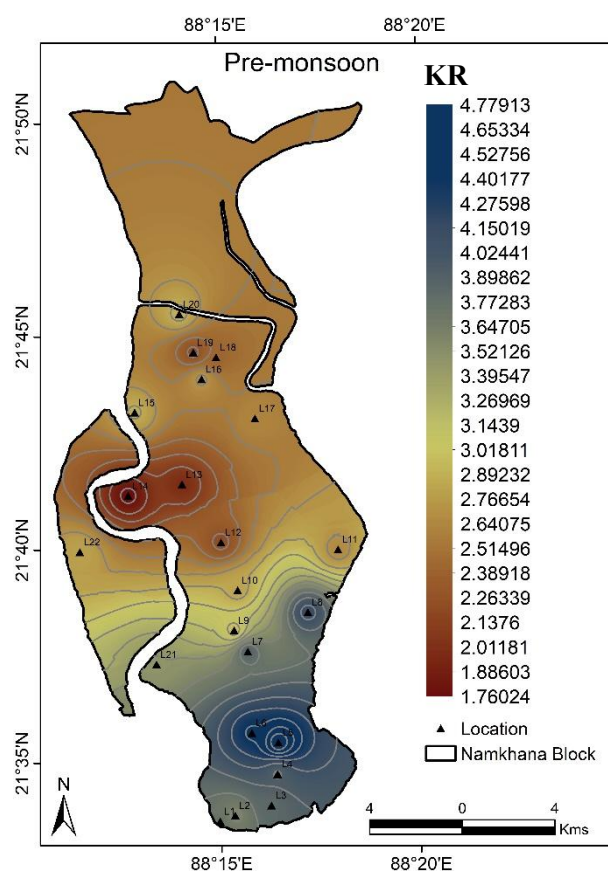
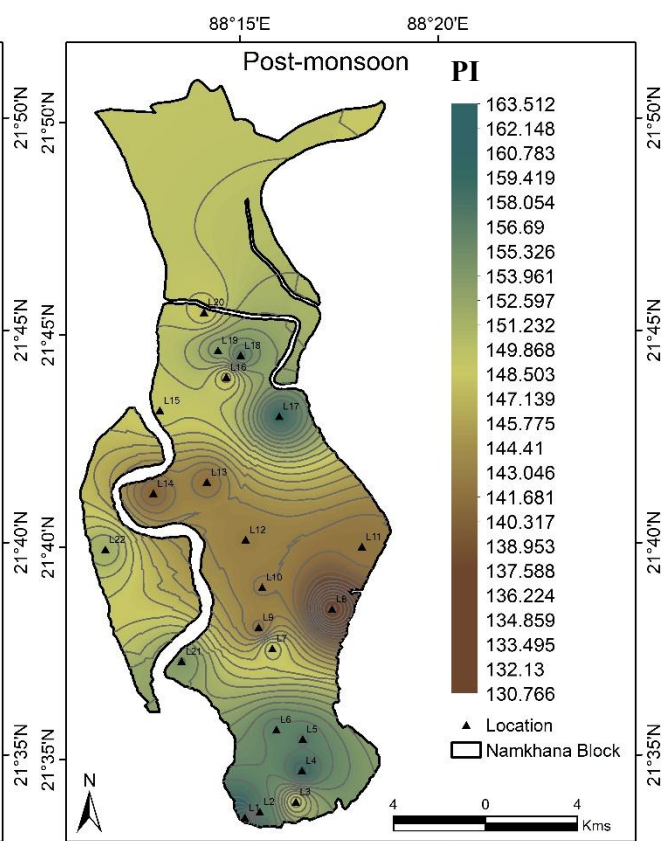
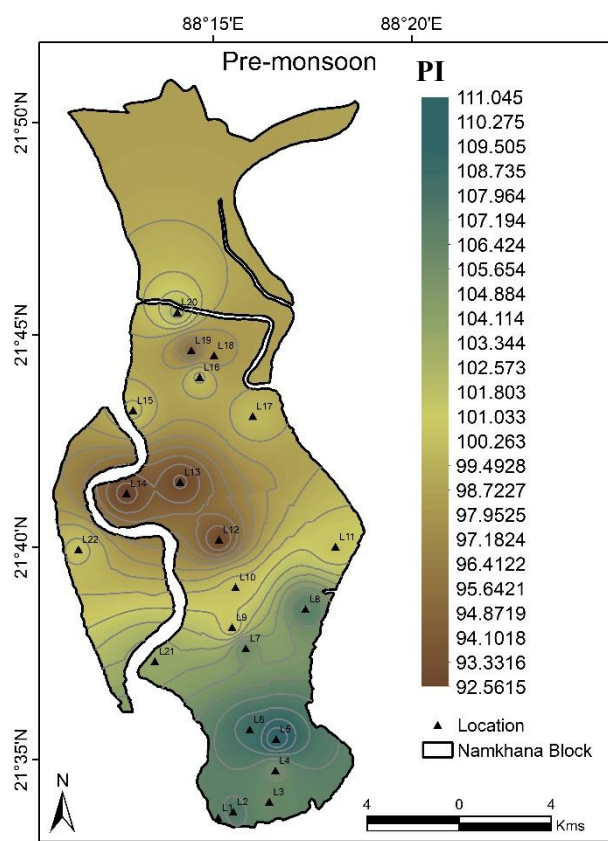
WQI Value	Rating of Water Quality	Grading	No of Samples (PrM)	% samples (PrM)	No of Samples (PoM)	% of Samples (PoM)
0-25	Excellent	A	0	0	0	0
26-50	Good	B	0	0	0	0
51-75	Poor	C	0	0	2	9.1
76-100	Very Poor	D	22	100	20	90.9
>100	Unsuitable	E	0	0	0	0

Appendix F Zones of irrigation suitability analysis.

Zones	Irrigation suitability
C1-S1	Low salinity and low sodium content. Water in this zone is suitable for the irrigation of all crops.
C2-S1	Medium salinity and low sodium content. Water in this zone is suitable for the irrigation of most crops.
C3-S1	High salinity and low sodium content. Water in this zone is suitable for the irrigation of salt-tolerant crops only.
C3-S2	High salinity and high sodium content. Water in this zone is not suitable for irrigation purposes.







Appendix G. The suitability of irrigational water analysis in the Namkhan block based on the different indices (i) SAR; (ii) MAR; (iii) SSP; (iv) RSC; (v) PI; and (vi) KR.

Reference

Gibbs, R. J. (1970). Mechanisms Controlling World Water Chemistry. *Science*, 170(3962), 1088–1090. <https://doi.org/10.1126/science.170.3962.1088>