

**Table 2** Details of the morphometric investigation of the Narmada River's sub-watersheds

SN	Morphometric parameters of the Basin area (km <sup>2</sup> )	Ruddi Nala 127.2	Gunshi Nala 145.88	Chakrar Nadi 125.38	Machhrrar Nala 165.09	Kotrer Nala 123.64
1	Stream order	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>
2	Stream no.	1 <sup>st</sup> order, 3576; 2 <sup>nd</sup> order, 830; 3 <sup>rd</sup> order, 180; 4 <sup>th</sup> order 34; 5 <sup>th</sup> order 10; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 4145; 2 <sup>nd</sup> order, 872; 3 <sup>rd</sup> order, 205; 4 <sup>th</sup> order 48; 5 <sup>th</sup> order 11; 6 <sup>th</sup> order 3 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 3403; 2 <sup>nd</sup> order, 753; 3 <sup>rd</sup> order, 159; 4 <sup>th</sup> order 40; 5 <sup>th</sup> order 12; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 4530; 2 <sup>nd</sup> order, 999; 3 <sup>rd</sup> order, 223; 4 <sup>th</sup> order 50; 5 <sup>th</sup> order 7; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 1332; 2 <sup>nd</sup> order, 743; 3 <sup>rd</sup> order, 170; 4 <sup>th</sup> order 34; 5 <sup>th</sup> order 9; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1
3	Stream length (Lu)	1 <sup>st</sup> order, 560.82; 2 <sup>nd</sup> order, 240.05; 3 <sup>rd</sup> order, 111.95; 4 <sup>th</sup> order 36.9; 5 <sup>th</sup> order 34.61; 6 <sup>th</sup> order 15.38 and 7 <sup>th</sup> order 11.31	1 <sup>st</sup> order, 655.89; 2 <sup>nd</sup> order, 234; 3 <sup>rd</sup> order, 118.53; 4 <sup>th</sup> order 50.58; 5 <sup>th</sup> order 29.35; 6 <sup>th</sup> order 15.96 and 7 <sup>th</sup> order 27.27	1 <sup>st</sup> order, 10.91; 2 <sup>nd</sup> order, 12.12; 3 <sup>rd</sup> order, 112.56; 4 <sup>th</sup> order 46.99; 5 <sup>th</sup> order 27.96; 6 <sup>th</sup> order 13.58 and 7 <sup>th</sup> order 9.92	1 <sup>st</sup> order, 692.06; 2 <sup>nd</sup> order, 278.59; 3 <sup>rd</sup> order, 147.71; 4 <sup>th</sup> order 72.65; 5 <sup>th</sup> order 24.66; 6 <sup>th</sup> order 8.09 and 7 <sup>th</sup> order 19.37	1 <sup>st</sup> order, 510.45; 2 <sup>nd</sup> order, 222.86; 3 <sup>rd</sup> order, 97.61; 4 <sup>th</sup> order 48.06; 5 <sup>th</sup> order 25.83; 6 <sup>th</sup> order 15.2 and 7 <sup>th</sup> order 11.47
4	Mean stream length	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.29; 3 <sup>rd</sup> order, 0.66; 4 <sup>th</sup> order 1.08; 5 <sup>th</sup> order 3.46; 6 <sup>th</sup> order 7.69 and 7 <sup>th</sup> order 11.13	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.26; 3 <sup>rd</sup> order, 0.57; 4 <sup>th</sup> order 1.05; 5 <sup>th</sup> order 2.66; 6 <sup>th</sup> order 5.32 and 7 <sup>th</sup> order 27.27	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.28; 3 <sup>rd</sup> order, 0.7; 4 <sup>th</sup> order 1.17; 5 <sup>th</sup> order 2.33; 6 <sup>th</sup> order 6.79 and 7 <sup>th</sup> order 9.92	1 <sup>st</sup> order, 0.152; 2 <sup>nd</sup> order, 0.27; 3 <sup>rd</sup> order, 0.66; 4 <sup>th</sup> order 1.45; 5 <sup>th</sup> order 3.25; 6 <sup>th</sup> order 4.04 and 7 <sup>th</sup> order 19.37	1 <sup>st</sup> order, 0.153; 2 <sup>nd</sup> order, 0.29; 3 <sup>rd</sup> order, 0.57; 4 <sup>th</sup> order 1.47; 5 <sup>th</sup> order 2.87; 6 <sup>th</sup> order 7.6 and 7 <sup>th</sup> order 11.48
5	Stream length ratio (RL)	II/I=0.225; III/II= 0.224; IV/III=0.189; and V/IV=0.294; VI/V=0.200; VII/VI=0.50	II/I=0.21; III/II= 0.24; IV/III=0.23; and V/IV=0.23; VI/V=0.27; VII/VI=0.33	II/I=0.21; III/II=0.21; IV/III=0.25; and V/IV=0.3; VI/V=0.167; VII/VI=0.5	II/I=0.22; III/II=0.21; IV/III=0.22; and V/IV=0.22; VI/V=0.14; VII/VI=0.29; VIII/VII=0.50	II/I=0.22; III/II=0.21; IV/III=0.23; and V/IV=0.20; VI/V=0.26; VII/VI=0.22; VIII/VII=0.50
6	Bifurcation ratio (Rb)	1 <sup>st</sup> and 2 <sup>nd</sup> =4.45; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.46; 3 <sup>rd</sup> and 4 <sup>th</sup> =5.29; 4 <sup>th</sup> and 5 <sup>th</sup> =3.40, 5 <sup>th</sup> and 6 <sup>th</sup> =5.00 & 6 <sup>th</sup> and 7 <sup>th</sup> =2.00	1 <sup>st</sup> and 2 <sup>nd</sup> =4.75; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.25; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.27; 4 <sup>th</sup> and 5 <sup>th</sup> =4.36, 5 <sup>th</sup> and 6 <sup>th</sup> =3.67 & 6 <sup>th</sup> and 7 <sup>th</sup> =3.00	1 <sup>st</sup> and 2 <sup>nd</sup> =4.63; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.62; 3 <sup>rd</sup> and 4 <sup>th</sup> =3.97; 4 <sup>th</sup> and 5 <sup>th</sup> =6, 5 <sup>th</sup> and 6 <sup>th</sup> =2	1 <sup>st</sup> and 2 <sup>nd</sup> =4.53; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.48; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.46; 4 <sup>th</sup> and 5 <sup>th</sup> =7.14, 5 <sup>th</sup> and 6 <sup>th</sup> =3.50 & 6 <sup>th</sup> and 7 <sup>th</sup> =2	1 <sup>st</sup> and 2 <sup>nd</sup> =4.47; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.37; 3 <sup>rd</sup> and 4 <sup>th</sup> =5; 4 <sup>th</sup> and 5 <sup>th</sup> =3.78, 5 <sup>th</sup> and 6 <sup>th</sup> =4.50 & 6 <sup>th</sup> and 7 <sup>th</sup> =2
7	Drainage density (D)	7.95	7.76	7.45	7.53	7.53
8	Drainage frequency (Fs)	36.21	36.23	34.71	35.21	34.62
9	Drainage texture ratio (Rt)	47.16	50.38	59.95	59.94	60.39
10	Circulatory ratio (Rc)	0.28	0.27	0.49	0.36	0.51
11	Form factor (Rf)	0.14	0.09	0.22	0.14	0.07
12	Elongation ratio (Re)	2.33	2.13	2.58	2.49	1.9
13	Relative relief	393	260	327	337	309
14	Relief ratio (Rh)	63.46	26.5	71.65	49.4	37.4
15	Ruggedness no. (Rn)	15.06	8.4	12.8	12.6	12.2

  

SN	Morphometric parameters of the Basin (km <sup>2</sup> )	Sukhmer Nala 200.27	Kanai Nala 167.07	Siligi Nadi 161.91	Banari Nala 51.33	Dandana Nala 226.15
1	Stream order	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 8 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 8 <sup>th</sup>	1 <sup>st</sup> to 8 <sup>th</sup>

2	Stream no.	1 <sup>st</sup> order, 5610; 2 <sup>nd</sup> order, 1193; 3 <sup>rd</sup> order, 278; 4 <sup>th</sup> order 61; 5 <sup>th</sup> order 14; 6 <sup>th</sup> order 4 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 4670; 2 <sup>nd</sup> order, 1002; 3 <sup>rd</sup> order, 222; 4 <sup>th</sup> order 48; 5 <sup>th</sup> order 6; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1; 8 <sup>th</sup> order 1	1 <sup>st</sup> order, 4629; 2 <sup>nd</sup> order, 961; 3 <sup>rd</sup> order, 212; 4 <sup>th</sup> order 45; 5 <sup>th</sup> order 11; 6 <sup>th</sup> order 3 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 1482; 2 <sup>nd</sup> order, 299; 3 <sup>rd</sup> order, 74; 4 <sup>th</sup> order 16; 5 <sup>th</sup> order 5; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1; 8 <sup>th</sup> order 1	1 <sup>st</sup> order, 6579; 2 <sup>nd</sup> order, 1402; 3 <sup>rd</sup> order, 310; 4 <sup>th</sup> order 71; 5 <sup>th</sup> order 15; 6 <sup>th</sup> order 3; 7 <sup>th</sup> order 1; 8 <sup>th</sup> order 1
3	Stream length	1 <sup>st</sup> order, 819.4; 2 <sup>nd</sup> order, 323.11; 3 <sup>rd</sup> order, 182.39; 4 <sup>th</sup> order 78.82; 5 <sup>th</sup> order 32.26; 6 <sup>th</sup> order 12.3 and 7 <sup>th</sup> order 27.03	1 <sup>st</sup> order, 685.55; 2 <sup>nd</sup> order, 280.52; 3 <sup>rd</sup> order, 148.43; 4 <sup>th</sup> order 54.32; 5 <sup>th</sup> order 41.12; 6 <sup>th</sup> order 19.63; 7 <sup>th</sup> order 5.6 and 8 <sup>th</sup> order 0.03	1 <sup>st</sup> order, 657.24; 2 <sup>nd</sup> order, 240.93; 3 <sup>rd</sup> order, 17.05; 4 <sup>th</sup> order 66.61; 5 <sup>th</sup> order 24.53; 6 <sup>th</sup> order 10.23; 7 <sup>th</sup> order 30.94	1 <sup>st</sup> order, 199.33; 2 <sup>nd</sup> order, 79.1; 3 <sup>rd</sup> order, 41.08; 4 <sup>th</sup> order 18.11; 5 <sup>th</sup> order 10.38; 6 <sup>th</sup> order 5.15; 7 <sup>th</sup> order 7.42; 8 <sup>th</sup> order 0.02	1 <sup>st</sup> order, 910.55; 2 <sup>nd</sup> order, 348.42; 3 <sup>rd</sup> order, 169.91; 4 <sup>th</sup> order 97.78; 5 <sup>th</sup> order 44.97; 6 <sup>th</sup> order 34.38; 7 <sup>th</sup> order 17.97; 8 <sup>th</sup> order 0.08
4	Mean stream length	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.27; 3 <sup>rd</sup> order, 0.65; 4 <sup>th</sup> order 1.29; 5 <sup>th</sup> order 2.3; 6 <sup>th</sup> order 3 and 7 <sup>th</sup> order 23.03	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.28; 3 <sup>rd</sup> order, 0.67; 4 <sup>th</sup> order 1.13; 5 <sup>th</sup> order 6.85; 6 <sup>th</sup> order 9.81; 7 <sup>th</sup> order 5.6 and 8 <sup>th</sup> order 0.03	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.25; 3 <sup>rd</sup> order, 0.55; 4 <sup>th</sup> order 1.48; 5 <sup>th</sup> order 2.23; 6 <sup>th</sup> order 3.41 and 7 <sup>th</sup> order 30.9	1 <sup>st</sup> order, 0.13; 2 <sup>nd</sup> order, 0.26; 3 <sup>rd</sup> order, 0.55; 4 <sup>th</sup> order 1.13; 5 <sup>th</sup> order 2.07; 6 <sup>th</sup> order 2.57; 7 <sup>th</sup> order 7.42 and 8 <sup>th</sup> order 0.02	1 <sup>st</sup> order, 0.13; 2 <sup>nd</sup> order, 0.24; 3 <sup>rd</sup> order, 0.54; 4 <sup>th</sup> order 1.37; 5 <sup>th</sup> order 2.99; 6 <sup>th</sup> order 11.46; 7 <sup>th</sup> order 17.97; 8 <sup>th</sup> order 0.08
5	Stream length ratio	II/I=0.21; III/II=0.23; IV/III=0.22; and V/IV=0.23; VI/V=0.29; VII/VI=0.25	II/I=0.21; III/II=0.22; IV/III=0.22; and V/IV=0.13; VI/V=0.33; VII/VI=0.5, VIII/VII=1,	II/I=0.21; III/II=0.22; IV/III=0.21; and V/IV=0.24; VI/V=0.27; VII/VI=0.33	II/I=0.20; III/II=0.24; IV/III=0.21; and V/IV=0.31; VI/V=0.4; VII/VI=0.5; VIII/VII=0.1	II/I=0.21; III/II=0.22; IV/III=0.22; and V/IV=0.21; VI/V=0.2; VII/VI=0.33; VIII/VII=1
6	Bifurcation ratio	1 <sup>st</sup> and 2 <sup>nd</sup> =4.70; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.29; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.56; 4 <sup>th</sup> and 5 <sup>th</sup> = 4.36, 5 <sup>th</sup> and 6 <sup>th</sup> =3.50 & 6 <sup>th</sup> and 7 <sup>th</sup> = 4	1 <sup>st</sup> and 2 <sup>nd</sup> =4.66; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.51; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.63; 4 <sup>th</sup> and 5 <sup>th</sup> =8, 5 <sup>th</sup> and 6 <sup>th</sup> =3 & 6 <sup>th</sup> and 7 <sup>th</sup> =2, 7 <sup>th</sup> and 8 <sup>th</sup> =1	1 <sup>st</sup> and 2 <sup>nd</sup> =4.82; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.53; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.71; 4 <sup>th</sup> and 5 <sup>th</sup> =4.09, 5 <sup>th</sup> and 6 <sup>th</sup> =3.67 6 <sup>th</sup> and 7 <sup>th</sup> = 3	1 <sup>st</sup> and 2 <sup>nd</sup> =4.95; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.04; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.62; 4 <sup>th</sup> and 5 <sup>th</sup> =3.2, 5 <sup>th</sup> and 6 <sup>th</sup> =2.5; 6 <sup>th</sup> and 7 <sup>th</sup> =2; 7 <sup>th</sup> and 8 <sup>th</sup> =1	1 <sup>st</sup> and 2 <sup>nd</sup> =4.69; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.52; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.37; 4 <sup>th</sup> and 5 <sup>th</sup> =4.73, 5 <sup>th</sup> and 6 <sup>th</sup> =5; 6 <sup>th</sup> and 7 <sup>th</sup> =3; 7 <sup>th</sup> and 8 <sup>th</sup> =1
7	Drainage density	7.37	7.39	7.09	7.03	7.18
8	Drainage frequency	35.76	35.63	36.21	36.63	37.06
9	Drainage texture ratio	73.13	63.79	63.36	41.95	68.9
10	Circulatory ratio	0.43	0.39	0.38	0.52	0.31
11	Form factor	0.16	0.09	0.09	0.15	0.08
12	Elongation ratio	2.7	2.21	2.21	1.87	2.34
13	Relative relief	343	411	379	276	416
14	Relief ratio	45.33	37	32.57	67.98	25.973
15	Ruggedness no.	11.72	11.9	9.76	8.96	9.824

SN	Morphometric parameters of the Basin (km <sup>2</sup> )	Baghora Nala 521.125	Banjar Nadi 356.41	Mahodar Nala 67.04	Balai Nadi 219.36	Dhuma Nala 85.69
1	Stream order	1 <sup>st</sup> to 9 <sup>th</sup>	1 <sup>st</sup> to 9 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 9 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>
2	Stream no.	1 <sup>st</sup> order, 14742; 2 <sup>nd</sup> order, 3160; 3 <sup>rd</sup> order, 731; 4 <sup>th</sup> order 181; 5 <sup>th</sup> order 41; 6 <sup>th</sup> order 8; 7 <sup>th</sup> order 2; 8 <sup>th</sup> order 1; 9 <sup>th</sup> order 1	1 <sup>st</sup> order, 9975; 2 <sup>nd</sup> order, 2174; 3 <sup>rd</sup> order, 512; 4 <sup>th</sup> order 127; 5 <sup>th</sup> order 29; 6 <sup>th</sup> order 9; 7 <sup>th</sup> order 3; 8 <sup>th</sup> order 1; 9 <sup>th</sup> order 1	1 <sup>st</sup> order, 1940; 2 <sup>nd</sup> order, 418; 3 <sup>rd</sup> order, 96; 4 <sup>th</sup> order 26; 5 <sup>th</sup> order 4; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 6315; 2 <sup>nd</sup> order, 1311; 3 <sup>rd</sup> order, 298; 4 <sup>th</sup> order 69; 5 <sup>th</sup> order 14; 6 <sup>th</sup> order 4 and 7 <sup>th</sup> order 1; 9 <sup>th</sup> order 1	1 <sup>st</sup> order, 2468; 2 <sup>nd</sup> order, 502; 3 <sup>rd</sup> order, 105; 4 <sup>th</sup> order 26; 5 <sup>th</sup> order 9; 6 <sup>th</sup> order 2; 7 <sup>th</sup> order 1;
3	Stream length	1 <sup>st</sup> order, 2148.8; 2 <sup>nd</sup> order, 873.96; 3 <sup>rd</sup> order, 439.8; 4 <sup>th</sup> order 189.45; 5 <sup>th</sup> order 107.68; 6 <sup>th</sup> order 61.57; 7 <sup>th</sup> order 31.54; 8 <sup>th</sup> order 16.03; 9 <sup>th</sup> order 0.06	1 <sup>st</sup> order, 1555.26; 2 <sup>nd</sup> order, 608.33; 3 <sup>rd</sup> order, 300.28; 4 <sup>th</sup> order 134.76; 5 <sup>th</sup> order 47.08; 6 <sup>th</sup> order 20.59; 7 <sup>th</sup> order 16.49; 8 <sup>th</sup> order 0.68	1 <sup>st</sup> order, 273.35; 2 <sup>nd</sup> order, 102.36; 3 <sup>rd</sup> order, 52.96; 4 <sup>th</sup> order 32.96; 5 <sup>th</sup> order 8.78; 6 <sup>th</sup> order 11.93; 7 <sup>th</sup> order 2.88; 8 <sup>th</sup> order 0.02	1 <sup>st</sup> order, 911.02; 2 <sup>nd</sup> order, 337.96; 3 <sup>rd</sup> order, 186.98; 4 <sup>th</sup> order 84.43; 5 <sup>th</sup> order 39.39; 6 <sup>th</sup> order 37.37; 7 <sup>th</sup> order 10.49; 9 <sup>th</sup> order 0.02	1 <sup>st</sup> order, 479.6; 2 <sup>nd</sup> order, 148.7; 3 <sup>rd</sup> order 78; 4 <sup>th</sup> order 35; 5 <sup>th</sup> order 13.7; 6 <sup>th</sup> order 9.1; 7 <sup>th</sup> order 0.08;

4	Mean stream length	1 <sup>st</sup> order, 0.145; 2 <sup>nd</sup> order, 0.27; 3 <sup>rd</sup> order, 0.60; 4 <sup>th</sup> order 1.04; 5 <sup>th</sup> order 2.62; 6 <sup>th</sup> order 7.69; 7 <sup>th</sup> order 15.77; 8 <sup>th</sup> order 16.03; 9 <sup>th</sup> order 0.06	1 <sup>st</sup> order, 0.16; 2 <sup>nd</sup> order, 0.28; 3 <sup>rd</sup> order, 0.59; 4 <sup>th</sup> order 1.06; 5 <sup>th</sup> order 2.82; 6 <sup>th</sup> order 5.23; 7 <sup>th</sup> order 6.86; 8 <sup>th</sup> order 16.49; 9 <sup>th</sup> order 0.68	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.24; 3 <sup>rd</sup> order, 0.55; 4 <sup>th</sup> order 1.26; 5 <sup>th</sup> order 2.16; 6 <sup>th</sup> order 5.96 and 7 <sup>th</sup> order 2.88	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.26; 3 <sup>rd</sup> order, 0.63; 4 <sup>th</sup> order 1.22; 5 <sup>th</sup> order 2.81; 6 <sup>th</sup> order 9.34; 7 <sup>th</sup> order 1.09 and 8 <sup>th</sup> order 0.02	1 <sup>st</sup> order, 0.19; 2 <sup>nd</sup> order, 0.29; 3 <sup>rd</sup> order, 0.74; 4 <sup>th</sup> order 1.34; 5 <sup>th</sup> order 1.57; 6 <sup>th</sup> order 4.57; 7 <sup>th</sup> order 9.13; 8 <sup>th</sup> order 0.08
5	Stream length ratio	II/I=0.21; III/II=0.23; IV/III=0.25; and V/IV=0.23; VI/V=0.20; VII/VI=0.25; VIII/VII=0.50; IX/VIII=1	II/I=0.22; III/II=0.24; IV/III=0.25; and V/IV=0.23; VI/V=0.31; VII/VI=0.33, VIII/VII=0.33, IX/VIII=1	II/I=0.22; III/II=0.23; IV/III=0.27; and V/IV=0.15; VI/V=0.50; VII/VI=0.50	II/I=0.21; III/II=0.23; IV/III=0.23; and V/IV=0.20; VI/V=0.29; VII/VI=0.25;	II/I=0.20; III/II=0.21; IV/III=0.25; and V/IV=0.35; VI/V=0.22; VII/VI=0.50;
6	Bifurcation ratio	1 <sup>st</sup> and 2 <sup>nd</sup> =4.67; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.32; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.04; 4 <sup>th</sup> and 5 <sup>th</sup> = 4.41, 5 <sup>th</sup> and 6 <sup>th</sup> =5.13; 6 <sup>th</sup> and 7 <sup>th</sup> = 4; 7 <sup>th</sup> and 8 <sup>th</sup> =2; 8 <sup>th</sup> and 9 <sup>th</sup> =1	1 <sup>st</sup> and 2 <sup>nd</sup> =4.59; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.25; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.03; 4 <sup>th</sup> and 5 <sup>th</sup> =4.38, 5 <sup>th</sup> and 6 <sup>th</sup> =3.22 & 6 <sup>th</sup> and 7 <sup>th</sup> =3, 7 <sup>th</sup> and 8 <sup>th</sup> =3; 8 <sup>th</sup> and 9 <sup>th</sup> =1	1 <sup>st</sup> and 2 <sup>nd</sup> =4.64; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.35; 3 <sup>rd</sup> and 4 <sup>th</sup> =3.69; 4 <sup>th</sup> and 5 <sup>th</sup> =6.50, 5 <sup>th</sup> and 6 <sup>th</sup> =2; 6 <sup>th</sup> and 7 <sup>th</sup> = 2	1 <sup>st</sup> and 2 <sup>nd</sup> =4.82; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.40; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.32; 4 <sup>th</sup> and 5 <sup>th</sup> =4.93, 5 <sup>th</sup> and 6 <sup>th</sup> =3.5; 6 <sup>th</sup> and 7 <sup>th</sup> =4	1 <sup>st</sup> and 2 <sup>nd</sup> =4.92; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.78; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.04; 4 <sup>th</sup> and 5 <sup>th</sup> =2.89, 5 <sup>th</sup> and 6 <sup>th</sup> =4.5; 6 <sup>th</sup> and 7 <sup>th</sup> =2;
7	Drainage density	7.42	7.76	7.2	7.33	9.02
8	Drainage frequency	36.2	36	37.1	36.53	36.33
9	Drainage texture ratio	97.32	89.49	48.6	67.42	44.17
10	Circulatory ratio	0.29	0.36	0.5	0.31	0.34
11	Form factor	0.23	0.19	0.2	0.18	0.25
12	Elongation ratio	3.74	3.24	2.2	2.84	2.43
13	Relative relief	457	385	276	285	219
14	Relief ratio	27.85	28.95	62.02	31.81	56.256
15	Ruggedness no.	9.81	9.69	7.99	8.08	9.376

SN	Morphometric parameters of the Basin (km <sup>2</sup> )	Bijana Nala 92.41	Temur Nala 361.64	Narraai Nala 107.89	Imarti Nala 85.51	Newari Nadi 198.58
1	Stream order	1 <sup>st</sup> to 9 <sup>th</sup>	1 <sup>st</sup> to 9 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 7 <sup>th</sup>	1 <sup>st</sup> to 9 <sup>th</sup>
2	Stream no.	1 <sup>st</sup> order, 2598; 2 <sup>nd</sup> order, 560; 3 <sup>rd</sup> order, 134; 4 <sup>th</sup> order 35; 5 <sup>th</sup> order 6; 6 <sup>th</sup> order 2; 7 <sup>th</sup> order 1; 9 <sup>th</sup> order 1	1 <sup>st</sup> order, 10118; 2 <sup>nd</sup> order, 2194; 3 <sup>rd</sup> order, 476; 4 <sup>th</sup> order 112; 5 <sup>th</sup> order 27; 6 <sup>th</sup> order 6; 7 <sup>th</sup> order 1; 8 <sup>th</sup> order 1; 9 <sup>th</sup> order 1	1 <sup>st</sup> order, 3086; 2 <sup>nd</sup> order, 685; 3 <sup>rd</sup> order, 164; 4 <sup>th</sup> order 38; 5 <sup>th</sup> order 8; 6 <sup>th</sup> order 2 and 7 <sup>th</sup> order 1	1 <sup>st</sup> order, 3012; 2 <sup>nd</sup> order, 638; 3 <sup>rd</sup> order, 111; 4 <sup>th</sup> order 23; 5 <sup>th</sup> order 6; 6 <sup>th</sup> order 2; 7 <sup>th</sup> order 1;	1 <sup>st</sup> order, 5557; 2 <sup>nd</sup> order, 1208; 3 <sup>rd</sup> order, 271; 4 <sup>th</sup> order 58; 5 <sup>th</sup> order 16; 6 <sup>th</sup> order 4; 7 <sup>th</sup> order 2; 8 <sup>th</sup> order 1; 9 <sup>th</sup> order 1
3	Stream length	1 <sup>st</sup> order, 362.91; 2 <sup>nd</sup> order, 147.58; 3 <sup>rd</sup> order, 79.56; 4 <sup>th</sup> order 36.17; 5 <sup>th</sup> order 23.66; 6 <sup>th</sup> order 8.19; 7 <sup>th</sup> order 7.10; 9 <sup>th</sup> order 0.36	1 <sup>st</sup> order, 1453.58; 2 <sup>nd</sup> order, 565.57; 3 <sup>rd</sup> order, 305.39; 4 <sup>th</sup> order 146.72; 5 <sup>th</sup> order 85.01; 6 <sup>th</sup> order 35.38; 7 <sup>th</sup> order 32.15; 9 <sup>th</sup> order 0.08	1 <sup>st</sup> order, 433.26; 2 <sup>nd</sup> order, 172.31; 3 <sup>rd</sup> order, 93.27; 4 <sup>th</sup> order 49.92; 5 <sup>th</sup> order 19.4; 6 <sup>th</sup> order 18.42; 7 <sup>th</sup> order 7.99	1 <sup>st</sup> order, 337.58; 2 <sup>nd</sup> order, 136.14; 3 <sup>rd</sup> order, 61.10; 4 <sup>th</sup> order 35.37; 5 <sup>th</sup> order 12.64; 6 <sup>th</sup> order 18.75; 7 <sup>th</sup> order 6.08;	1 <sup>st</sup> order, 332.66; 2 <sup>nd</sup> order, 152.08; 3 <sup>rd</sup> order 68.46; 4 <sup>th</sup> order 44.79 <sup>th</sup> order 18.03; 6 <sup>th</sup> order 15.64; 7 <sup>th</sup> order 15.31; 8 <sup>th</sup> order 0.03
4	Mean stream length	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.26; 3 <sup>rd</sup> order, 0.59; 4 <sup>th</sup> order 1.03; 5 <sup>th</sup> order 3.94; 6 <sup>th</sup> order 4.10; 7 <sup>th</sup> order 7.10; 9 <sup>th</sup> order 0.36	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.25; 3 <sup>rd</sup> order, 0.66; 4 <sup>th</sup> order 1.31; 5 <sup>th</sup> order 3.14; 6 <sup>th</sup> order 5.89; 7 <sup>th</sup> order 32.15; 9 <sup>th</sup> order 0.008	1 <sup>st</sup> order, 0.14; 2 <sup>nd</sup> order, 0.25; 3 <sup>rd</sup> order, 0.56; 4 <sup>th</sup> order 1.33; 5 <sup>th</sup> order 2.42; 6 <sup>th</sup> order 9.21 and 7 <sup>th</sup> order 7.99	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.27; 3 <sup>rd</sup> order, 0.55; 4 <sup>th</sup> order 1.53; 5 <sup>th</sup> order 2.11; 6 <sup>th</sup> order 9.37; 7 <sup>th</sup> order 9.08	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.28; 3 <sup>rd</sup> order, 0.56; 4 <sup>th</sup> order 1.18; 5 <sup>th</sup> order 2.79; 6 <sup>th</sup> order 4.50; 7 <sup>th</sup> order 7.82; 8 <sup>th</sup> order 15.31; 9 <sup>th</sup> order 0.06

5	Stream length ratio	II/I=0.22; III/II=0.24; IV/III=0.26; and V/IV=0.17; VI/V=0.33; VII/VI=0.50;	II/I=0.22; III/II=0.22; IV/III=0.24; and V/IV=0.24; VI/V=0.22; VII/VI=0.17,	II/I=0.22; III/II=0.24; IV/III=0.23; and V/IV=0.21; VI/V=0.25; VII/VI=0.50	II/I=0.21; III/II=0.17; IV/III=0.21; and V/IV=0.26; VI/V=0.33; VII/VI=0.50;	II/I=0.22; III/II=0.22; IV/III=0.21; and V/IV=0.28; VI/V=0.25; VII/VI=0.50; VIII/VII=0.50, IX/VII=1
6	Bifurcation ratio	1 <sup>st</sup> and 2 <sup>nd</sup> =4.64; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.18; 3 <sup>rd</sup> and 4 <sup>th</sup> =3.83; 4 <sup>th</sup> and 5 <sup>th</sup> = 5.83, 5 <sup>th</sup> and 6 <sup>th</sup> =3.0; 6 <sup>th</sup> and 7 <sup>th</sup> = 2.0; 7 <sup>th</sup> and 8 <sup>th</sup> =2;	1 <sup>st</sup> and 2 <sup>nd</sup> =4.61; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.61; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.25; 4 <sup>th</sup> and 5 <sup>th</sup> =4.15, 5 <sup>th</sup> and 6 <sup>th</sup> =4.50; & 6 <sup>th</sup> and 7 <sup>th</sup> =6.0	1 <sup>st</sup> and 2 <sup>nd</sup> =4.51; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.18; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.32; 4 <sup>th</sup> and 5 <sup>th</sup> =4.75, 5 <sup>th</sup> and 6 <sup>th</sup> =4; 6 <sup>th</sup> and 7 <sup>th</sup> = 2	1 <sup>st</sup> and 2 <sup>nd</sup> =4.72; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.75; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.83; 4 <sup>th</sup> and 5 <sup>th</sup> =3.83, 5 <sup>th</sup> and 6 <sup>th</sup> =3; 6 <sup>th</sup> and 7 <sup>th</sup> =2	1 <sup>st</sup> and 2 <sup>nd</sup> =4.60; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.46; 3 <sup>rd</sup> and 4 <sup>th</sup> =4.67; 4 <sup>th</sup> and 5 <sup>th</sup> =3.63, 5 <sup>th</sup> and 6 <sup>th</sup> =4; 6 <sup>th</sup> and 7 <sup>th</sup> =2; 7 <sup>th</sup> and 8 <sup>th</sup> =2; 8 <sup>th</sup> and 9 <sup>th</sup> =1;
7	Drainage density	7.2	7.26	7.36	7.45	7.36
8	Drainage frequency	36.11	35.77	36.93	46.53	35.84
9	Drainage texture ratio	43.99	84.95	50.09	57.32	56.66
10	Circulatory ratio	0.33	0.32	0.36	0.37	0.26
11	Form factor	0.16	0.12	0.13	0.14	0.08
12	Elongation ratio	2.2	2.87	2.17	2.07	2.26
13	Relative relief	181	248	205	193	457
14	Relief ratio	41.41	17.67	32.4	38.2	26.75
15	Ruggedness no.	7.25	7.15	6.96	6.89	9.72

SN	Morphometric parameters of the Basin (km <sup>2</sup> )	Gaur Nadi 212.03
1	Stream order	1 <sup>st</sup> to 7 <sup>th</sup>
2	Stream no.	1 <sup>st</sup> order, 5832; 2 <sup>nd</sup> order, 1251; 3 <sup>rd</sup> order, 288; 4 <sup>th</sup> order 67; 5 <sup>th</sup> order 12; 6 <sup>th</sup> order 3; 7 <sup>th</sup> order 1;
3	Stream length	1 <sup>st</sup> order, 866.48; 2 <sup>nd</sup> order, 361.75; 3 <sup>rd</sup> order, 197.68; 4 <sup>th</sup> order 83.35; 5 <sup>th</sup> order 38.95; 6 <sup>th</sup> order 49.5; 7 <sup>th</sup> order 1.72; 8 <sup>th</sup> order 0.09
4	Mean stream length	1 <sup>st</sup> order, 0.15; 2 <sup>nd</sup> order, 0.29; 3 <sup>rd</sup> order, 0.69; 4 <sup>th</sup> order 1.24; 5 <sup>th</sup> order 3.24; 6 <sup>th</sup> order 16.50; 7 <sup>th</sup> order 1.72; 8 <sup>th</sup> order 0.09
5	Stream length ratio	II/I=0.21; III/II= 0.23; IV/III=0.23; V/IV=0.18; VI/V=0.25; VII/VI=0.33;
6	Bifurcation ratio	1 <sup>st</sup> and 2 <sup>nd</sup> =4.66; 2 <sup>nd</sup> and 3 <sup>rd</sup> =4.34; 3 <sup>rd</sup> and 4 <sup>th</sup> =3.30; 4 <sup>th</sup> and 5 <sup>th</sup> = 5.58, 5 <sup>th</sup> and 6 <sup>th</sup> =4; 6 <sup>th</sup> and 7 <sup>th</sup> = 3.
7	Drainage density	7.54
8	Drainage frequency	35.16
9	Drainage texture ratio	71.53
10	Circulatory ratio	0.4
11	Form factor	0.11
12	Elongation ratio	2.46
13	Relative relief	225
14	Relief ratio	21.48
15	Ruggedness no.	7.23