

Case Study 1 : COVID-19 Pandemic

Table 18: COVID-19 data of 64 districts

Character	District Name	Urban Population*	Total Population*	Area (SqKM)*	Density (per SqKM)*	New Case in 100th day**	Total Case in 100th day**	Slope***	U.Rediness***
Average Increase below Trend Line	Barisal	519016	527017	2536.00	207.81	0	224	3.10	42.68
	Jessore	513552	742898	2592.76	286.53	11	264	3.78	35.09
	Jhenaidah	280192	455932	1972.02	231.20	8	104	1.27	34.92
	Khulna	682780	575116	4162.52	138.17	0	406	4.81	45.54
	Magura	120414	380107	1047.35	362.92	2	66	1.02	32.34
	Narail	112352	272872	984.25	277.24	2	68	0.82	36.11
	Patuakhali	201882	361518	3143.22	115.02	94	230	1.95	33.02
	Rajbari	131819	331631	1141.46	290.53	7	148	2.10	33.64
	Rajshahi	961390	556527	2447.71	227.37	1	91	1.61	44.22
	Sirajganj	436577	561076	2503.97	224.07	0	46	0.95	33.18
Tangail	543785	521104	3367.23	154.76	0	61	0.87	29.74	
Average Increase Close to Trend Line	Bagerhat	195331	294576	4138.44	71.18	5	98	1.36	29.09
	Bandarban	100423	108995	4594.69	23.72	4	77	1.16	29.43
	Barguna	103094	270802	1557.43	173.88	0	87	1.25	22.65
	Bhola	243317	456437	3296.37	138.47	80	197	2.00	23.39
	Bogra	670388	555014	2929.48	189.46	0	269	5.91	36.35
	Brahamanbaria	440874	521994	1917.05	272.29	0	246	3.65	27.96
	Chandpur	435724	465919	1703.61	273.49	51	420	5.52	30.43
	Chuadanga	306157	345922	1146.02	301.85	1	137	2.60	28.46
	Dinajpur	453699	484597	3465.22	139.85	0	184	3.67	29.20
	Faridpur	261565	469410	2037.45	230.39	39	734	9.56	35.18
	Feni	193742	412646	917.69	449.66	25	523	7.26	32.87
	Gaibandha	210524	514696	2174.71	236.67	6	112	1.28	28.95

Character	District Name	Urban Population*	Total Population*	Area (SqKM)*	Density (per SqKM)*	New Case in 100th day**	Total Case in 100th day**	Slope***	U.Rediness***
Average Increase Close to Trend Line	Gopalganj	128705	344008	1469.88	234.04	7	396	6.09	33.40
	Habiganj	244966	345179	2583.17	133.63	0	178	3.36	29.95
	Jamalpur	387869	615072	2062.59	298.20	0	362	5.91	35.37
	Jhalokati	112003	216348	743.47	291.00	43	98	0.90	27.51
	Joypurhat	143910	289058	970.09	297.97	0	183	3.78	29.86
	Khagrachhari	215808	126477	2883.78	43.86	4	88	1.67	22.32
	Kishoreganj	489030	414208	2559.46	161.83	16	550	5.40	29.18
	Kurigram	326494	395207	2254.25	175.32	0	89	1.64	24.30
	Kushtia	235526	502255	1669.12	300.91	6	254	3.63	30.61
	Lakshmipur	250250	684425	1414.06	484.01	1	147	2.66	24.48
	Lalmonirhat	138685	333166	1232.69	270.28	2	55	0.97	25.31
	Madaripur	157810	345764	1151.56	300.26	24	396	4.82	31.77
	Manikganj	128710	309413	1397.10	221.47	0	169	3.41	29.89
	Maulvibazar	208079	360195	2695.21	133.64	1	117	2.42	27.00
	Meherpur	83393	299607	719.91	416.17	1	39	0.76	28.06
	Mymensingh	608262	601766	4342.10	138.59	23	878	13.17	44.84
	Naogaon	275567	405148	3440.18	117.77	0	213	4.77	27.63
	Narsingdi	447645	707525	1165.84	606.88	6	225	1.80	27.06
	Natore	228008	442422	1911.75	231.42	1	78	1.70	27.86
	Nawabganj	320278	591178	1692.57	349.28	0	67	1.60	21.69
	Netrakona	247183	372785	2812.24	132.56	6	308	5.62	30.41
	Nilphamari	289974	435162	1655.01	262.94	0	138	2.73	31.81
	Pabna	387675	590914	2400.76	246.14	11	188	2.40	26.71
	Panchagarh	95149	271707	1405.69	193.29	0	52	1.13	29.21

Case Study 1 : COVID-19 Pandemic

Figure 23: Data of institute of epidemiology, disease control and research (IEDCR) under directorate general of health services (DGHS), Bangladesh

Character	District Name	Urban Population*	Total Population*	Area (SqKM)*	Density (per SqKM)*	New Case in 100th day**	Total Case in 100th day**	Slope***	U.Rediness***
Urban	Pirojpur	182631	262841	1266.60	207.52	69	119	0.89	24.70
	Rangamati	159627	124728	5754.79	21.67	0	86	1.63	30.09
	Rangpur	442713	718203	2315.85	310.13	12	651	11.87	44.47
	Satkhira	197616	460892	3834.04	120.21	9	80	1.63	27.55
	Shariatpur	131044	253234	1245.05	203.39	26	249	3.23	28.37
	Sherpur	188106	497179	1321.71	376.16	0	167	2.57	26.18
	Sylhet	753549	829103	3418.34	242.55	1	677	13.24	38.78
	Thakurgaon	161309	581227	1818.20	319.67	1	75	1.43	29.24
	Rural	Chittagong	3870217	3310027	4798.41	689.82	88	3768	70.27
Comilla		840326	532419	3095.43	172.00	169	1854	27.84	38.96
Cox's Bazar		499011	474465	2336.60	203.06	71	1411	23.24	24.10
Dhaka		9158046	8747042	1469.33	5953.08	438	26239	452.6	77.05
Gazipur		1037574	1820374	1765.13	1031.30	8	1278	20.34	37.81
Munshiganj		186106	383263	947.04	404.70	60	1558	24.19	26.44
Narayanganj		988956	1323600	758.85	1744.22	41	3011	46.26	39.29
Noakhali		496700	549308	3311.80	165.86	30	1057	19.39	25.77
Sunamganj		256117	397642	3681.03	108.02	47	490	5.62	20.66

Data Source: *BBS, 2011,
**DGHS, 2020
***GIS Lab, UDD, 2020

Division	District/City	Total	Division	%	Total Death
Dhaka	Dhaka City	3973	2058	54.72%	90
	Dhaka (District)	109			
	Gazipur	322			
	Kishoreganj	201			
	Madaripur	39			
	Manikganj	22			
	Narayanganj	966			
	Munshigonj	112			
	Narshingdi	151			
	Rajbari	19			
	Faridpur	13			
	Tangail	29			
	Shariatpur	30			
	Gopalganj	45			
Chattogram	Chattogram	75	334	4.60%	2
	Cox's bazar	37			
	Cumilla	99			
	B. Baria	43			
	Khagrachari	2			
	Laksmipur	41			
	Bandarban	7			
	Noakhali	9			
	Feni	6			
	Chandpur	15			
Sylhet	Moulovi Bazar	12	114	1.57%	2
	Sunamganj	29			
	Hobiganj	55			
	Sylhet	18			
Rangpur	Rangpur	38	131	1.80%	
	Gaibandha	21			
	Nilphamari	15			
	Lalmonirhat	3			
	Kurigram	8			
	Dinajpur	21			
	Panchagar	8			
	Thakurgaon	17			
Khulna	Khulna	13	147	2.02%	1
	Jessore	63			
	Bagerhat	2			
	Narail	13			
	Magura	8			
	Meherpur	2			
	Satkhira	2			
	Jhenaidah	19			
Kushtia	16				
Mymensingh	Chuadanga	9	269	3.71%	2
	Mymensingh	145			
	Jamalpur	66			
	Netrokona	32			
Barishal	Sherpur	26	123	1.69%	1
	Barguna	33			
	Bhola	5			
	Barishal	40			
	Potua khali	28			
	Pirojpur	9			
Rajshahi	Jhalokathi	8	111	1.53%	2
	Joypurhat	33			
	Pabna	10			
	Chapainawabganj	2			
	Bogra	19			
	Natore	9			
	Naogaon	15			
Sirajganj	3				

* এ পর্যন্ত সংগৃহীত (প্রাপ্ত) তথ্য অনুযায়ী।

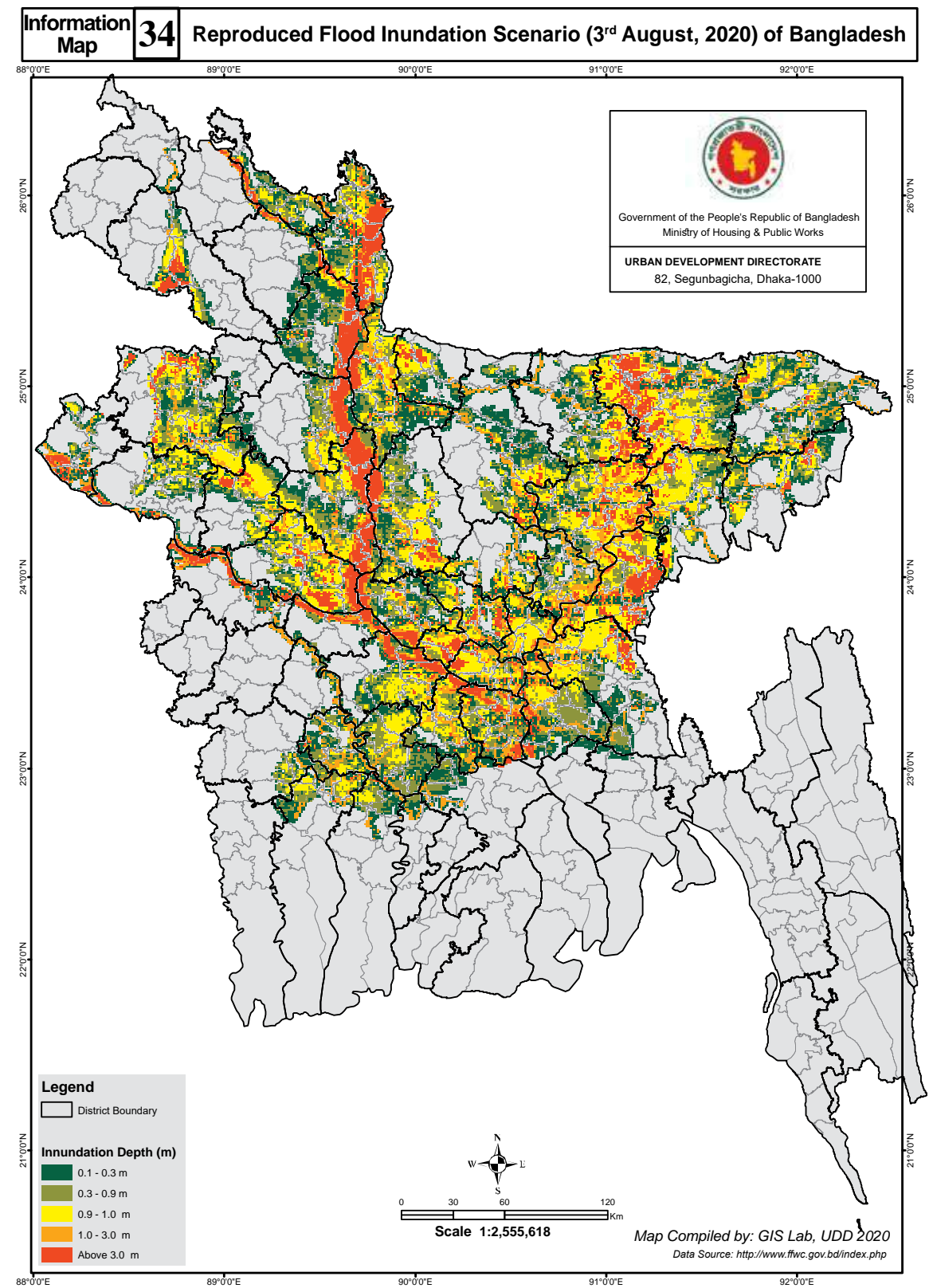
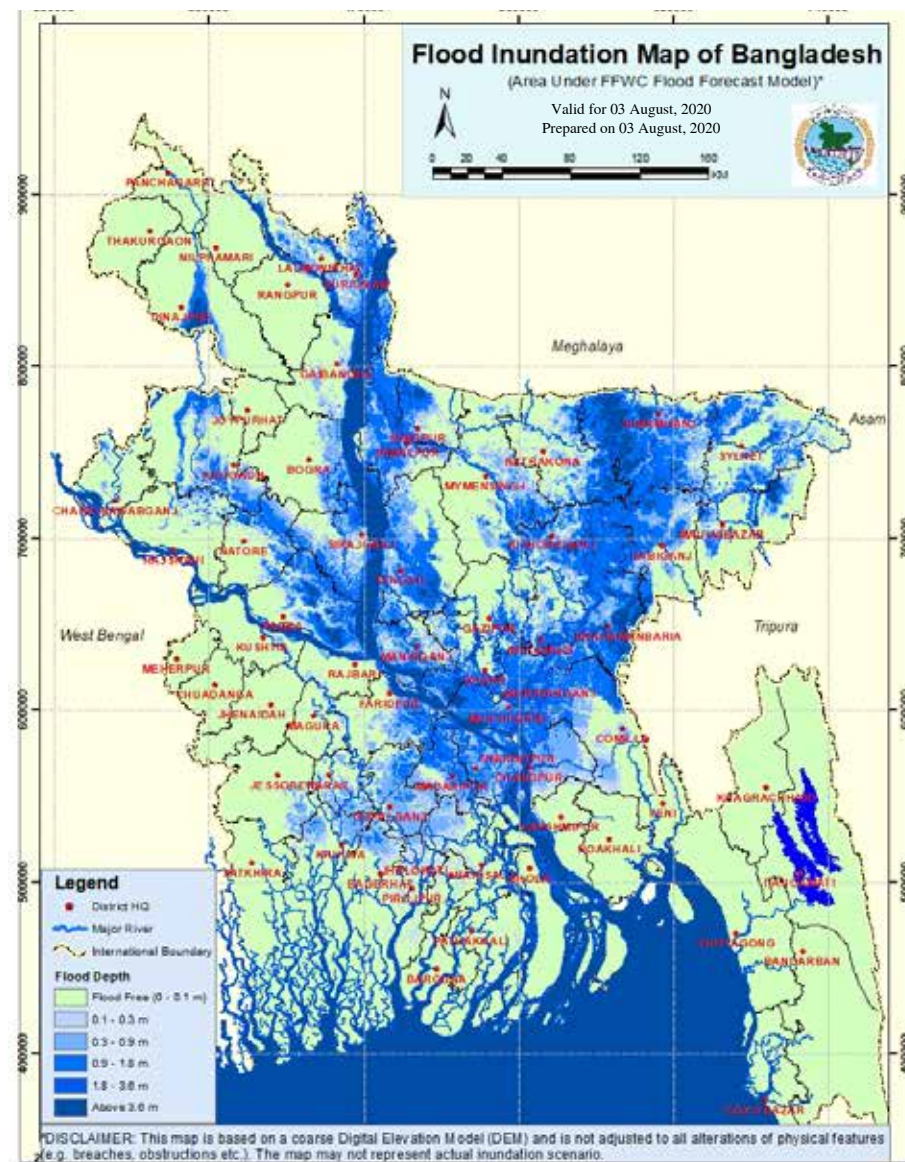
source: <https://iedcr.gov.bd/> Case study 2

Case Study-2

Ecological Sensitivity & Flood of August, 2020 in Bangladesh

FFWC published a flood map of 53,565.04 square kilometer inundated area including rivers and other water bodies on 3rd August of 2020. 340 growth centers among 484 growth centers are affected at the same time. This inundated area is divided by 1km x 1km grid to incorporated the inundation level and flood related sensitivity information.

Figure 24: FFWC published flood inundation map of Bangladesh (3rd August 2020)

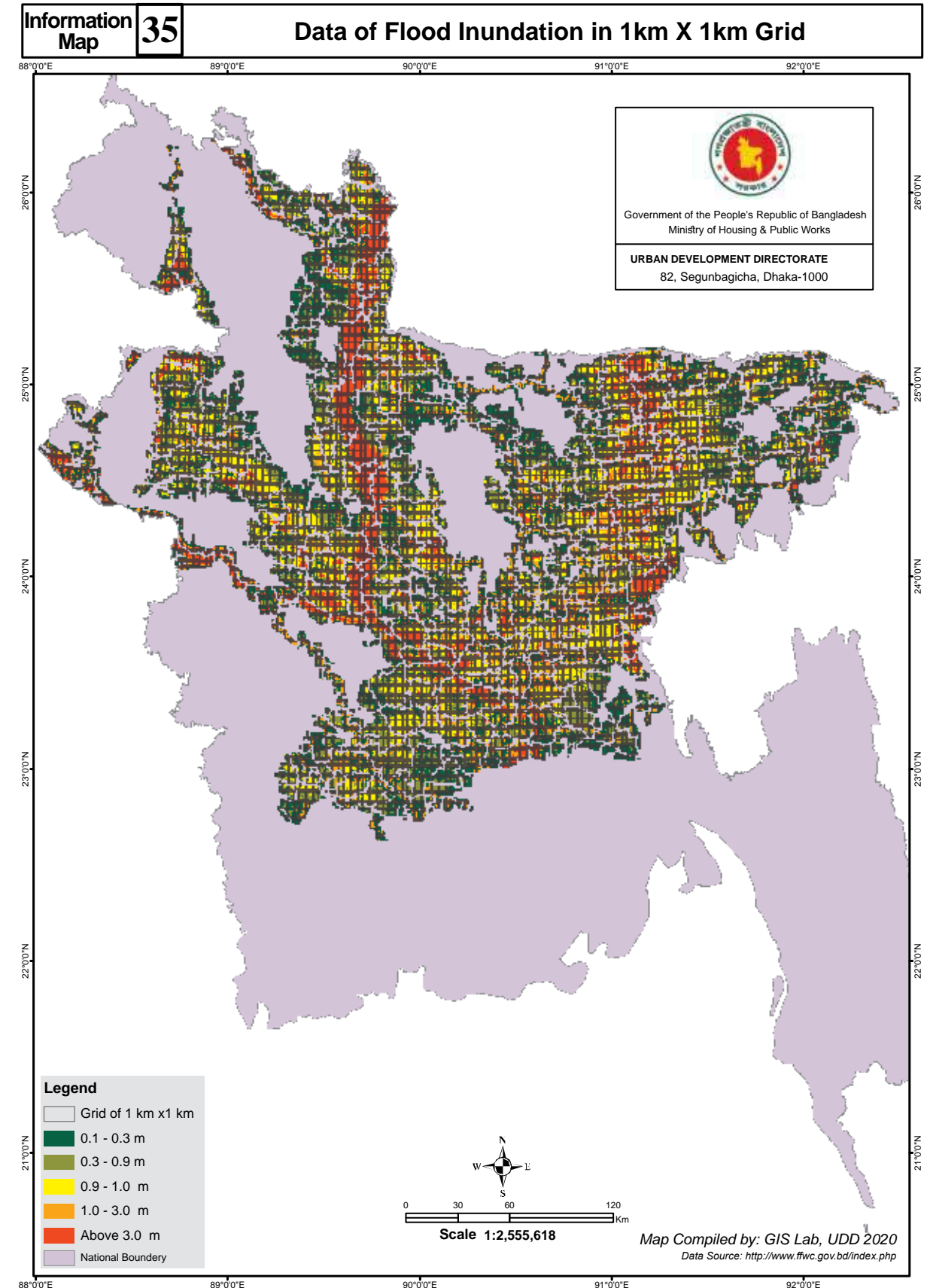


Flood of August, 2020 in Bangladesh

In this case study a grid is classified as intensity level-1, which has majority of inundation depth between 0.1m to 0.3m. The table below shows the detailed classification.

Table 19: Classification of each grid according to flood inundation depth on 3rd August, 2020

Intensity Level	Inundation depth	Number of Grid / Inundated Area (Sq Km)	Percent of Inundated Area
Intensity Level 1	0.1m to 0.3m	12,600	27.66%
Intensity Level 2	0.3m to 0.9m	9,765	21.43%
Intensity Level 3	0.9m to 1.0m	11,188	24.56%
Intensity Level 4	1.0m to 3.0m	5,515	12.10%
Intensity Level 5	Above 3.0m	6,493	14.25%
Total		45,561	100.00%



Case Study 2 : Flood August, 2020

Observation of Flood of August, 2020 in Bangladesh and Comparative Flooding Depth Sensitivity Index

The cross-table below illustrates the detail result of growth center overlay with August, 2020 flood inundation area with flood sensitivity considering flooding depth. The value in the table represents the inundated area in different categories.

Table 21: Crosstabulation of inundation and flood sensitivity (area SqKM)

Flood Sensitivity (Area Sqkm)	Inundation Intensity on 3rd August 2020 (Area Sqkm)					Total
	Intensity Level 1	Intensity Level 2	Intensity Level 3	Intensity Level 4	Intensity Level 5	
Index Level 1	88	50	91	49	47	325
Index Level 2	2,714	1,455	1,115	656	785	6,725
Index Level 3	4,993	3,558	2,802	1,925	2,333	15,611
Index Level 4	3,797	3,593	4,170	1,961	2,037	15,558
Index Level 5	1,053	1,111	3,011	932	1,235	7,342
Total	12,645	9,767	11,189	5,523	6,437	45,561

The value in the Corss-table below represents the percentage of total inundated area in different flooding depth.

Table 22: Crosstabulation of inundation and flood sensitivity (area %)

Flood Sensitivity (%)	Inundation Intensity on 3rd August 2020 (Area %)					Total
	Intensity Level 1	Intensity Level 2	Intensity Level 3	Intensity Level 4	Intensity Level 5	
Index Level 1	0.19	0.11	0.20	0.11	0.10	0.71
Index Level 2	5.96	3.19	2.45	1.44	1.72	14.76
Index Level 3	10.96	7.81	6.15	4.23	5.12	34.26
Index Level 4	8.33	7.89	9.15	4.30	4.47	34.15
Index Level 5	2.31	2.44	6.61	2.05	2.71	16.11
Total	27.75	21.44	24.56	12.12	14.13	100.00

See information map 37

The values on the diagonal represents perfect estimation which is 16.55%. Valued above the diagonal represents higher inundated area identified as lesser sensitive area which is 19.95%. Valued below the diagonal represents lower inundated area identified as higher sensitive area which is 63.50 %.

Observation of Case Study 2

The map represents the cross-tabulated observation in geographical space. There are no major dissimilarities among the flooding depth sensitive area of urban readiness study and inundated area on August, 2020 flooding.

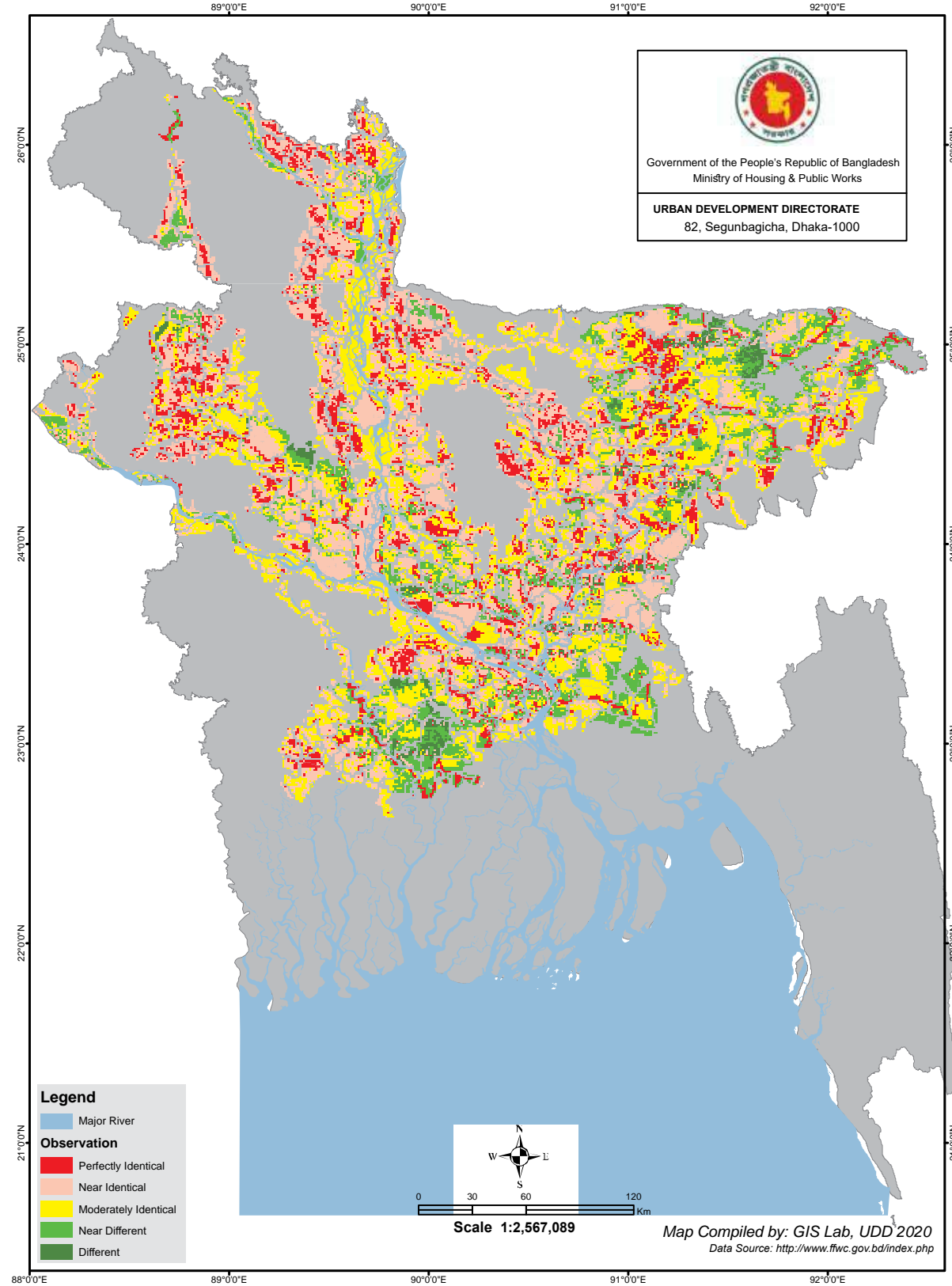
Table 23: Summary table of evaluation

% of Area	Observation	% of Area	Evaluation
16.55	Perfectly Identical	84.98	Identical
36.22	Near Identical		
32.21	Moderately Identical		
12.60	Near Different	15.02	Different
2.41	Completely Different		

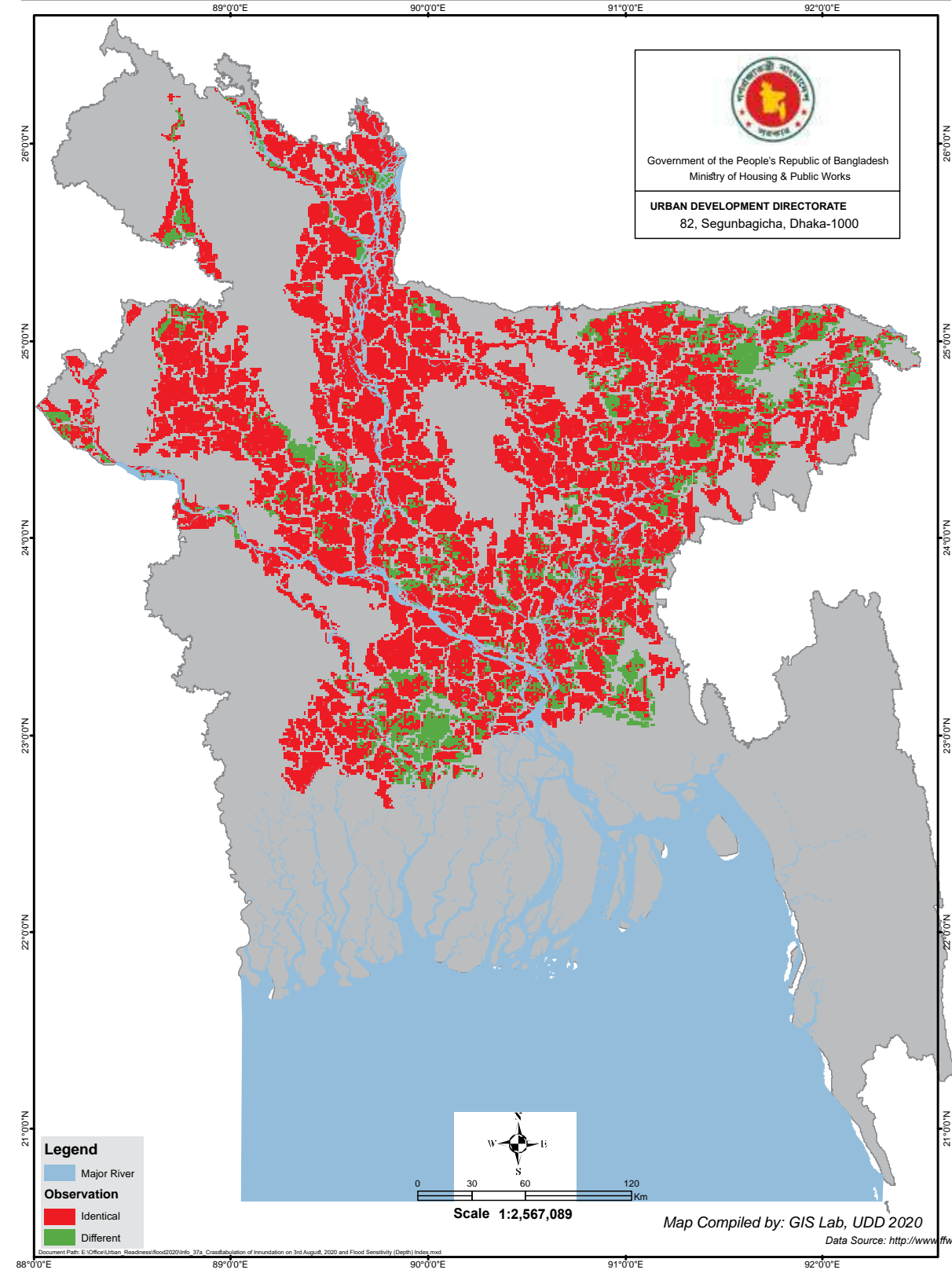
See information map 37 (a)

Summary observation in the table shows there is 84.98% area that shows identical character specified in the flood sensitivity index of urban readiness study.

Information Map **37** Crasstabulation of Innundation on 3rd August, 2020 and Flood Sensivity (Depth) Index



Information Map **37a** Crasstabulation of Innundation on 3rd August, 2020 and Flood Sensivity (Depth) Index





Boat Market
Jointapur Upazila, Sylhet

Picture collected from internet



River Payra
Pathorghata Upazila, Barguna

Picture collected from internet

Bengla New Year Celebration
Dhaka University, Dhaka



Bengla New Year Celebration
Dhaka University, Dhaka

Picture collected from internet