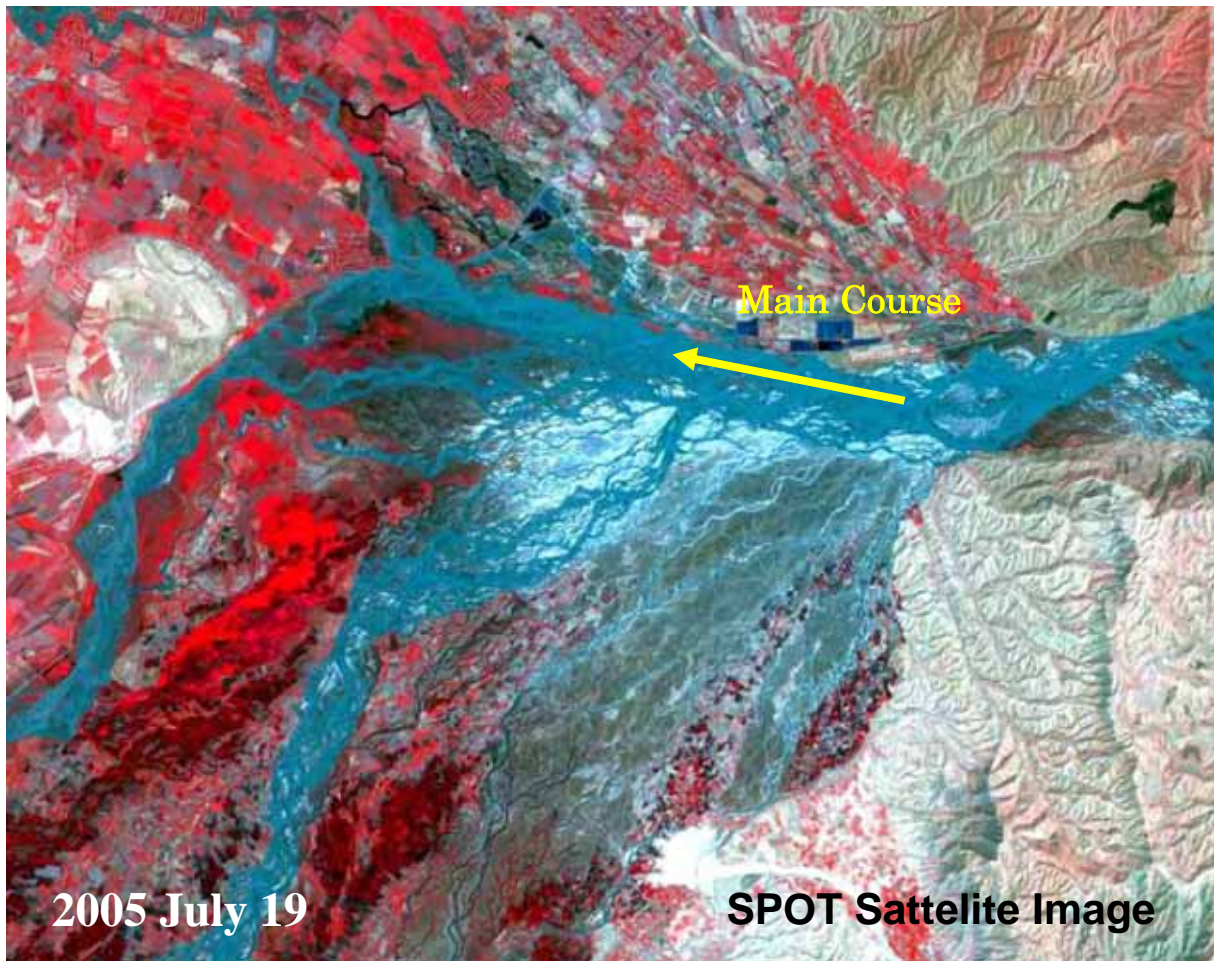
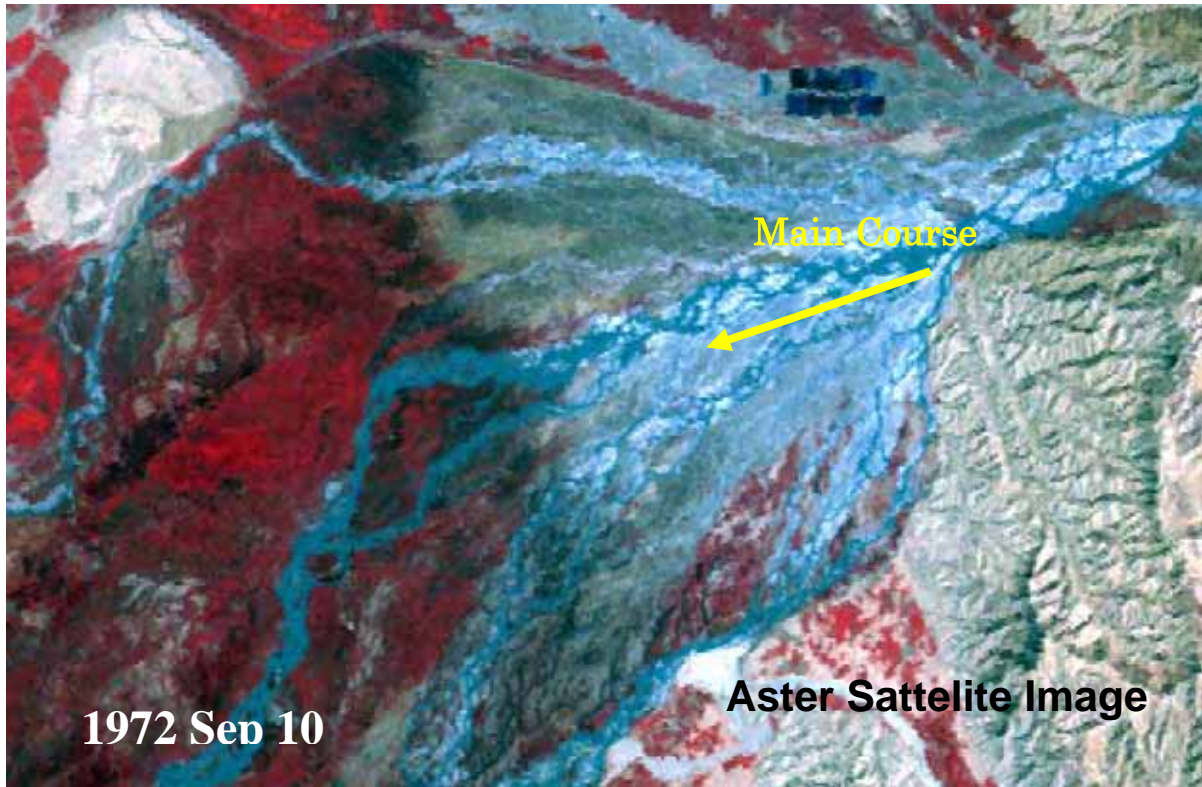


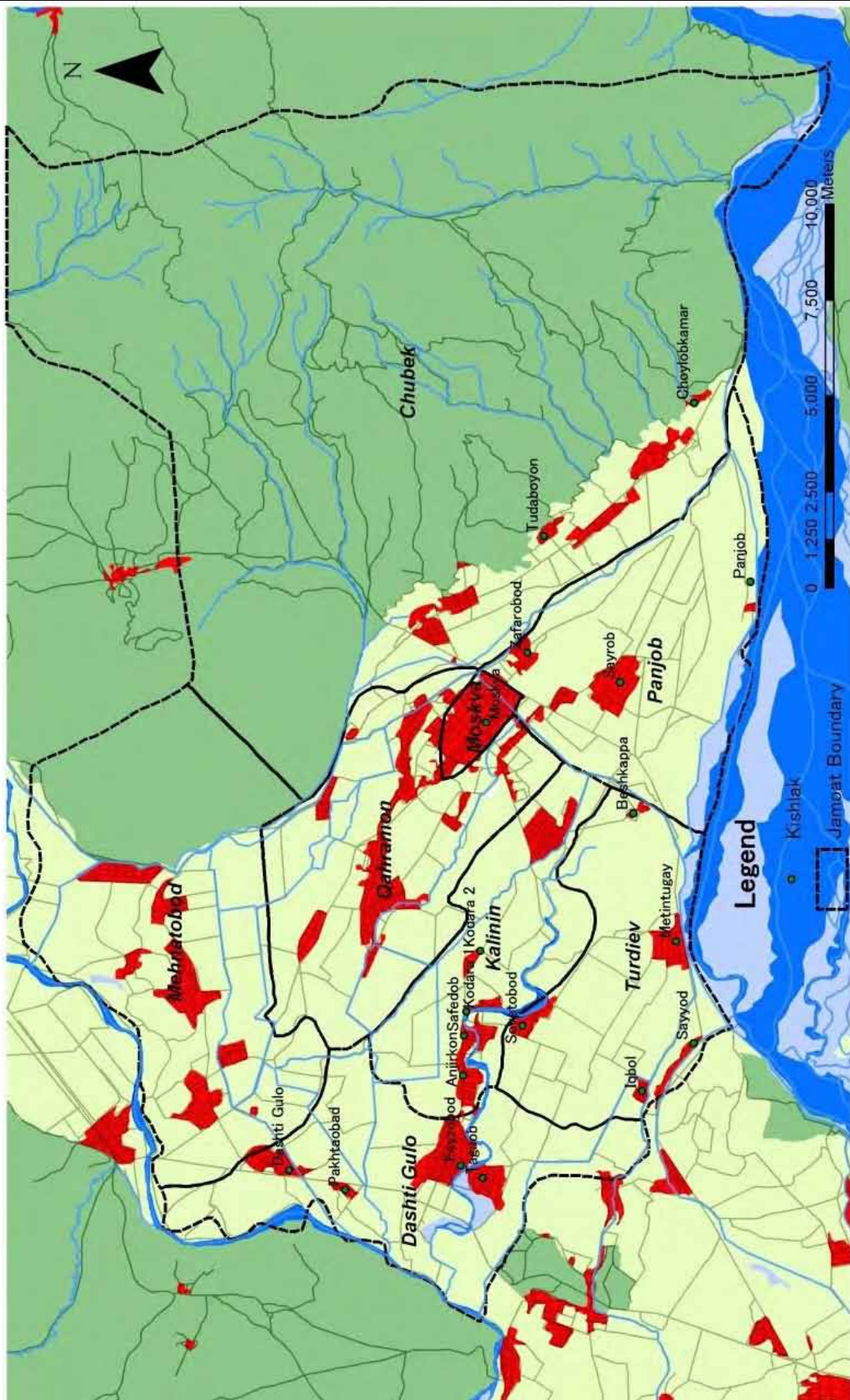
***FIGURES AT THE BACK OF REPORT***



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Fig. 1.1.1 Changing of River Course

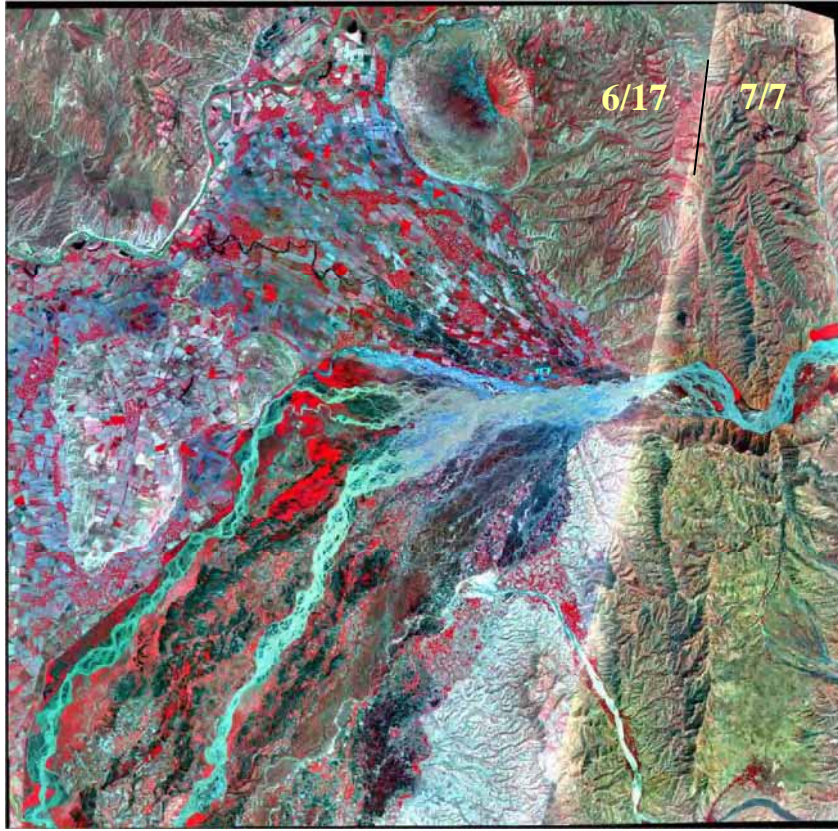


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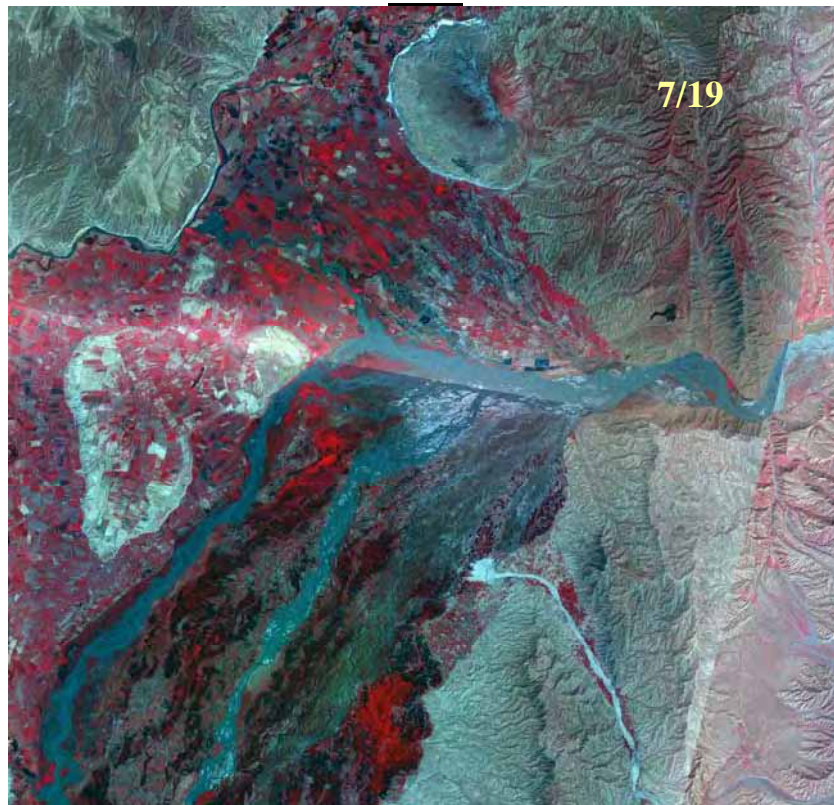
Fig. 1.3.1 Jamoat Boundary

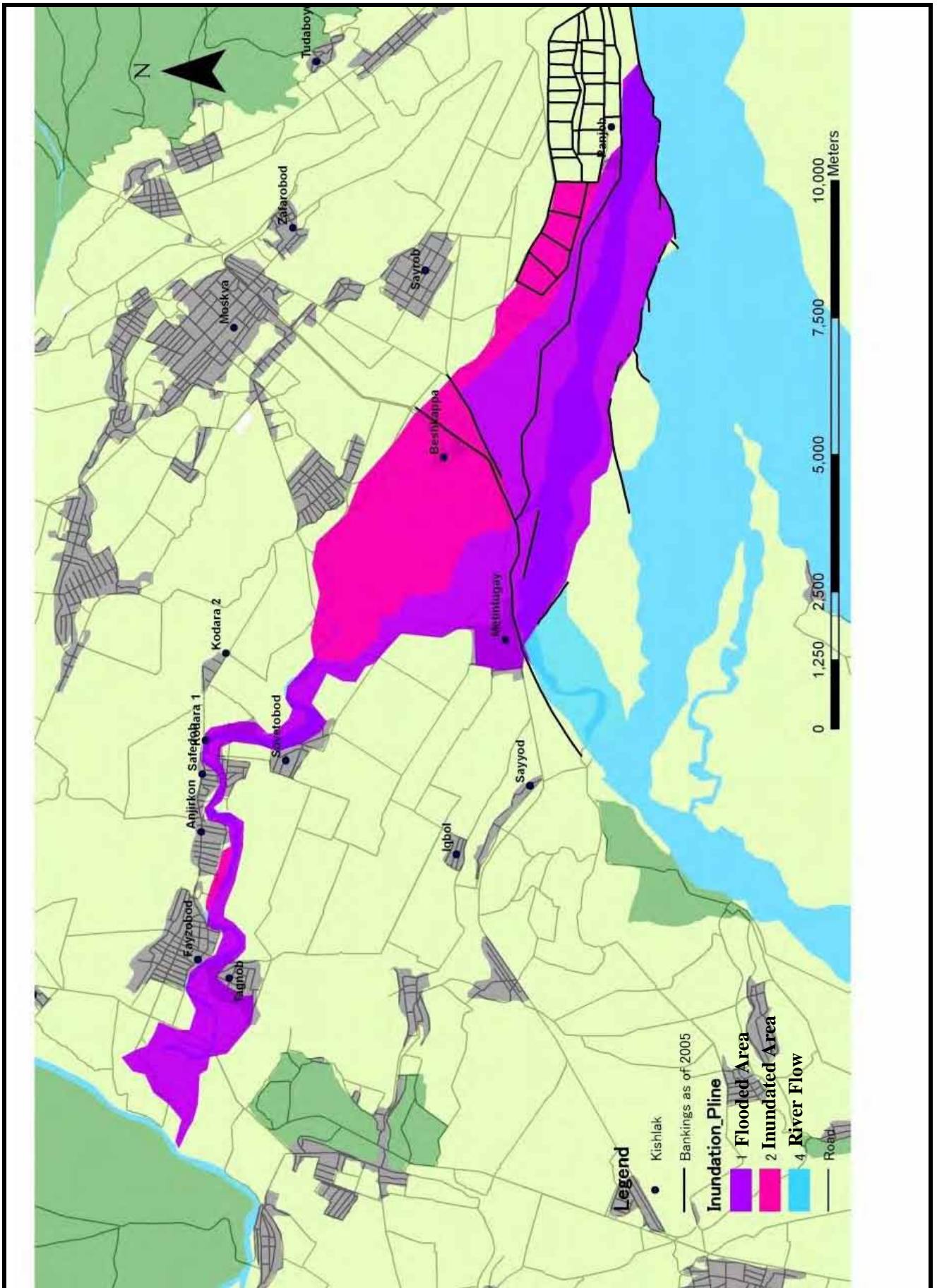
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**Spot**



**Aster**



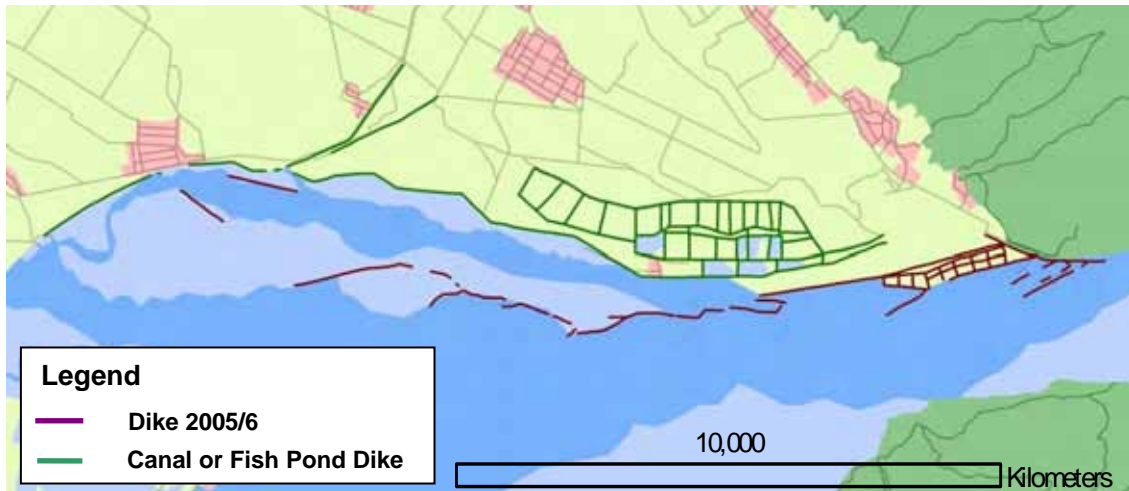


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Fig. 1.3.3 Probable Inundation Area on 2005 Flood

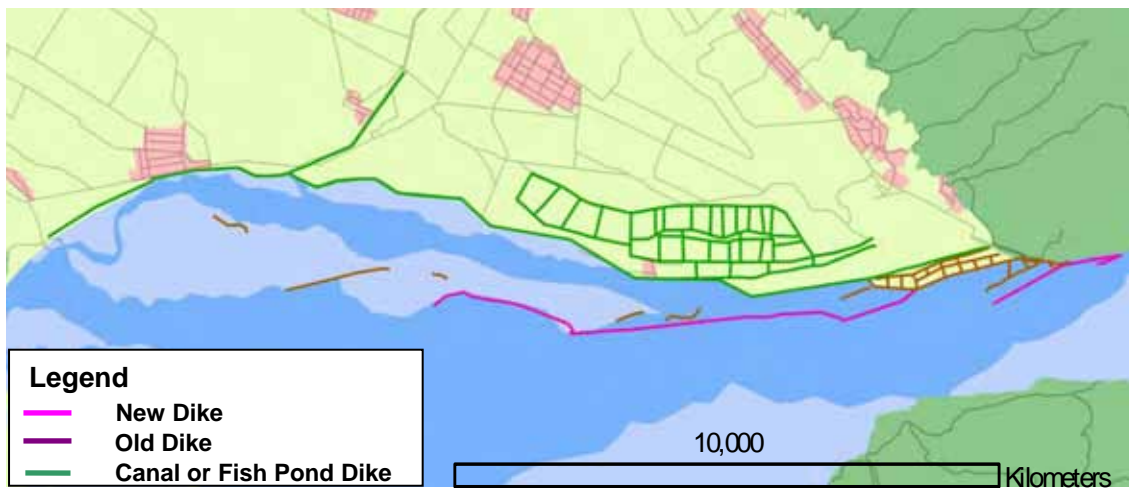
Dike Alignment as of 2005/6/17



Plan of Alignment



Dike Alignment at Present



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Fig. 1.5.1 Existing Main Dike

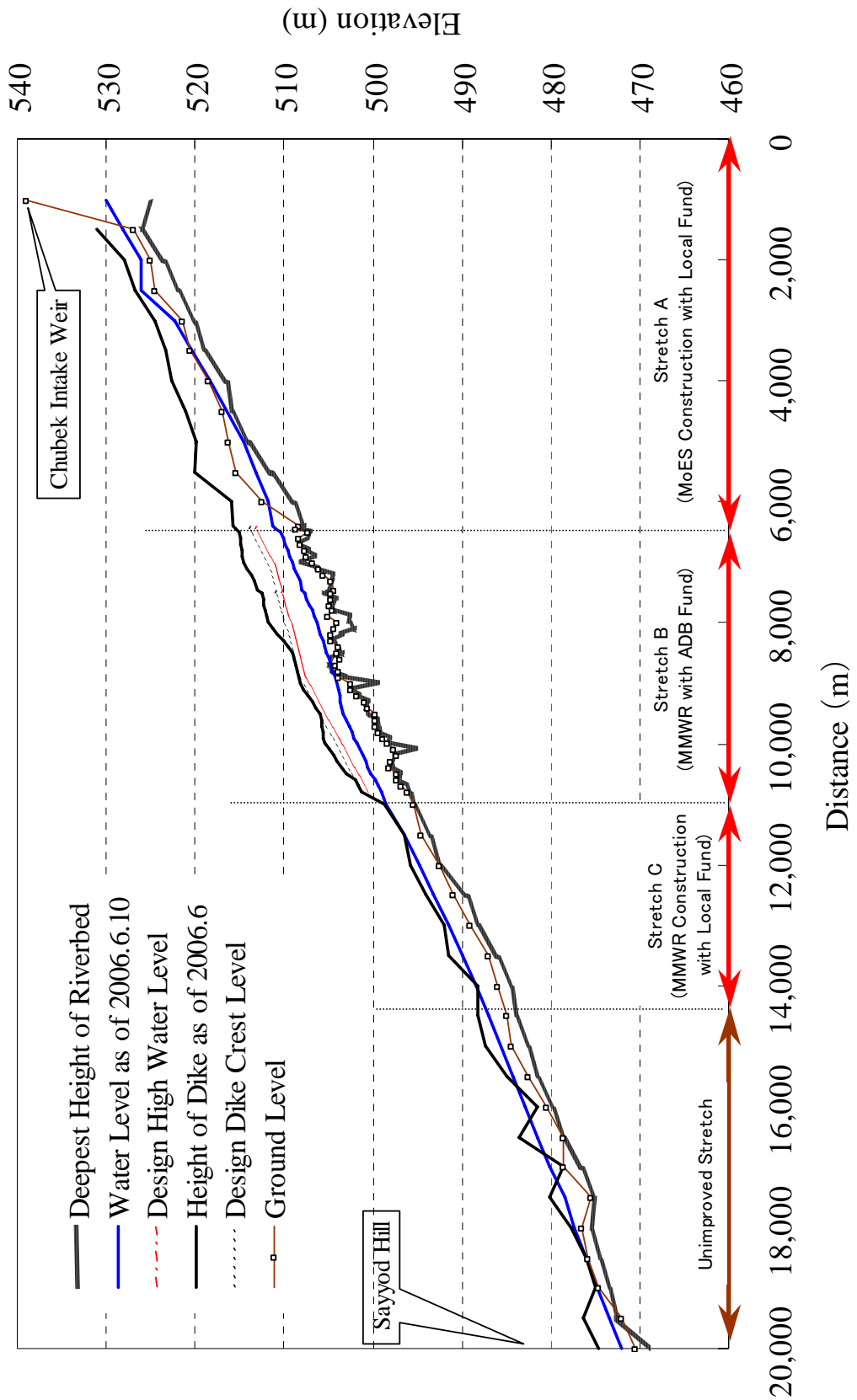


Fig. 1.5.2 Longitudinal Profile

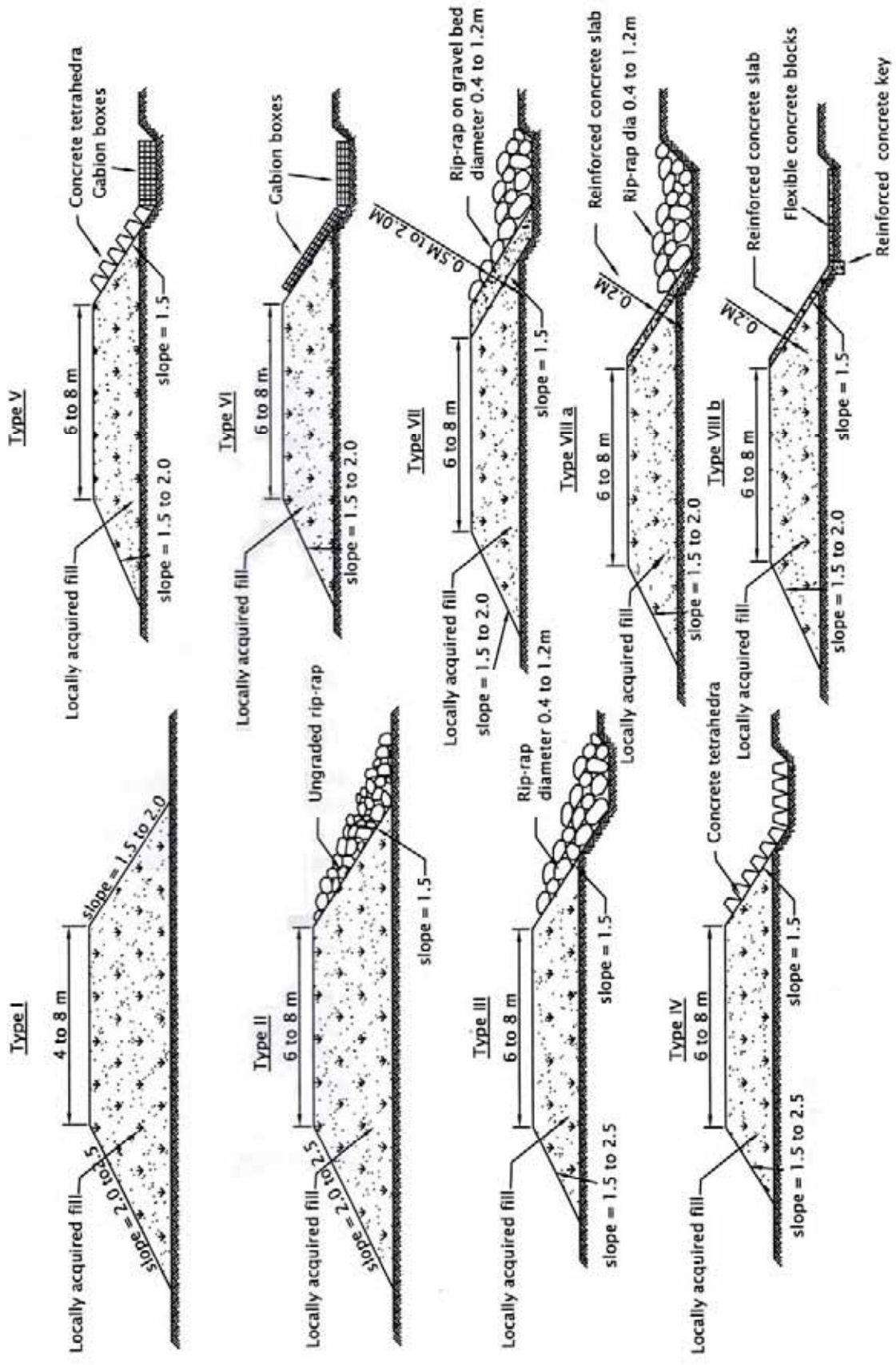
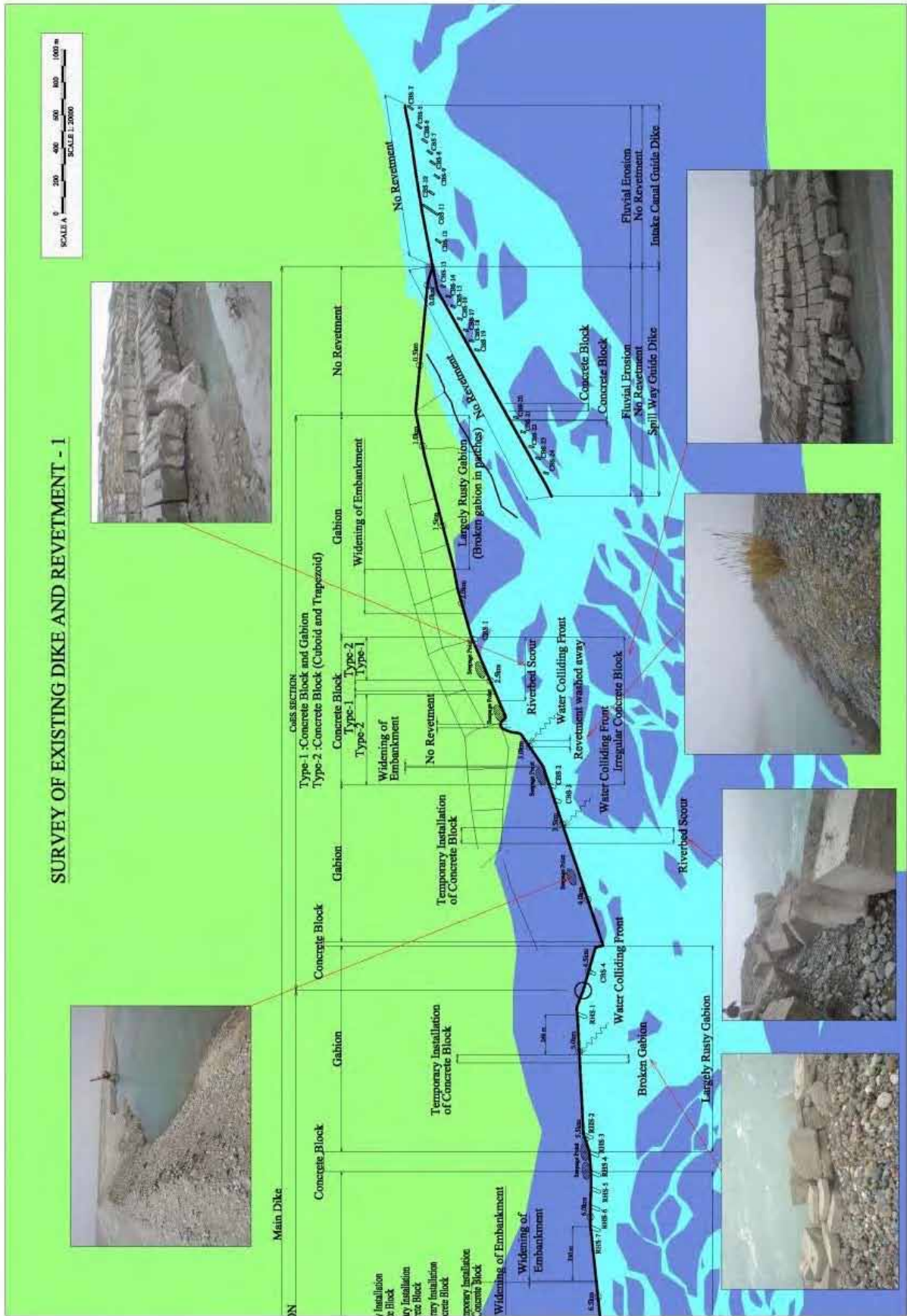


Fig. 1.6.1 Standard Type of Dike

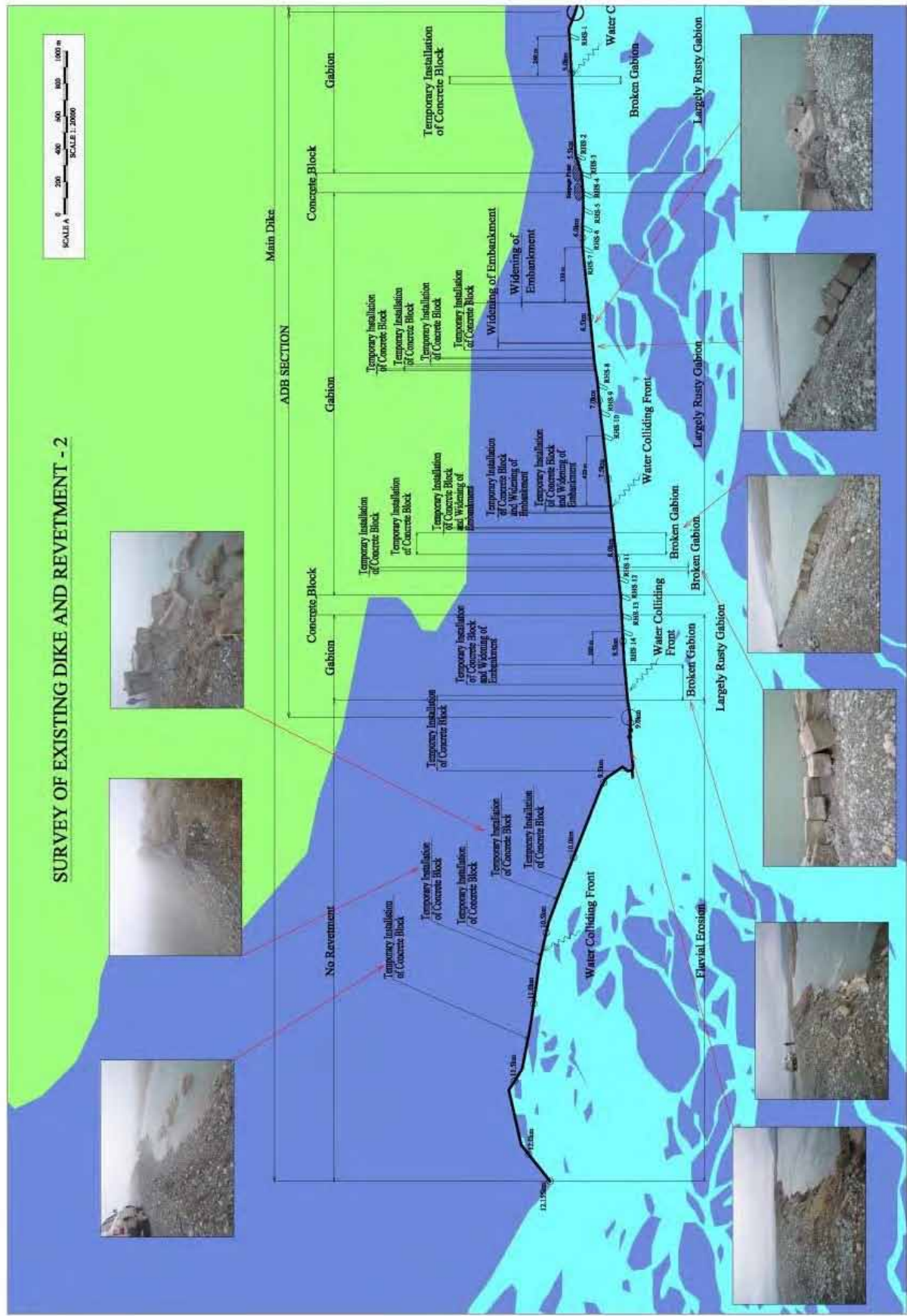




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Fig. 1.6.2 (1) Condition of Existing Dike

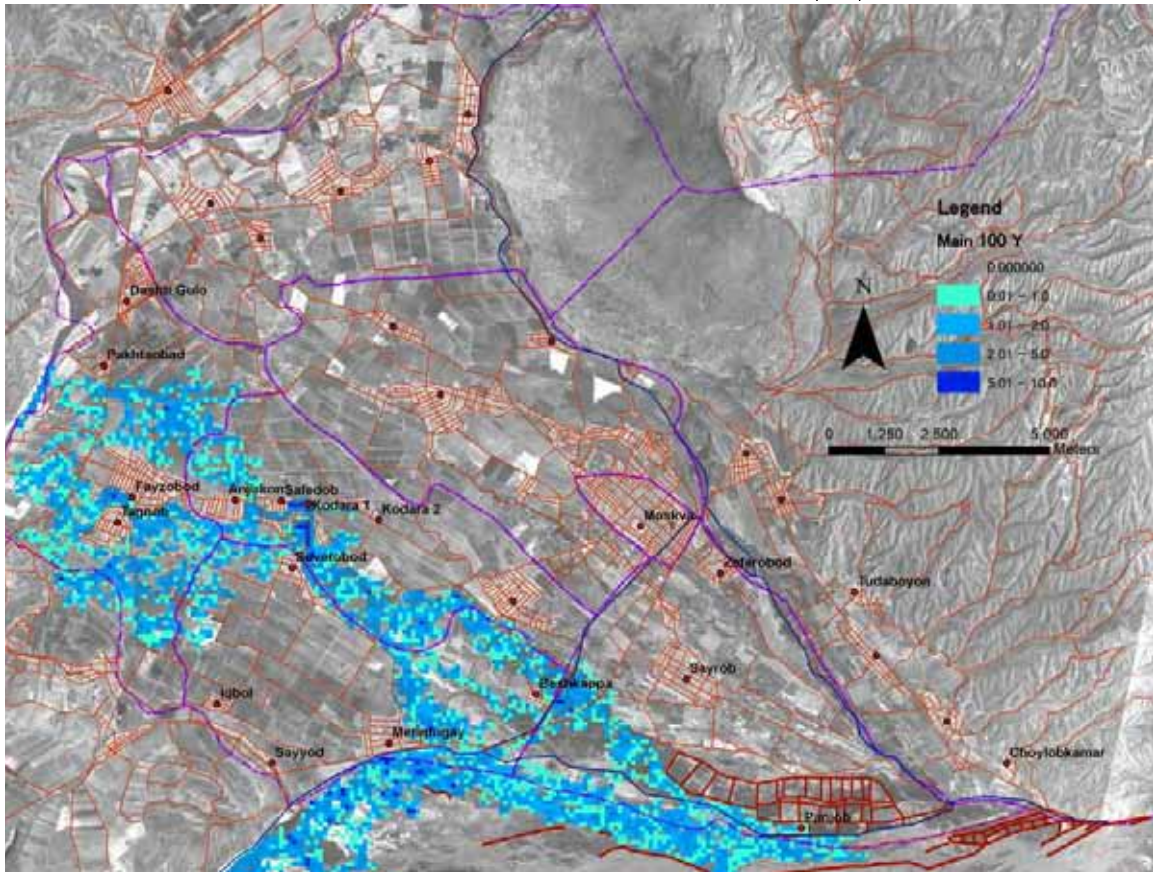
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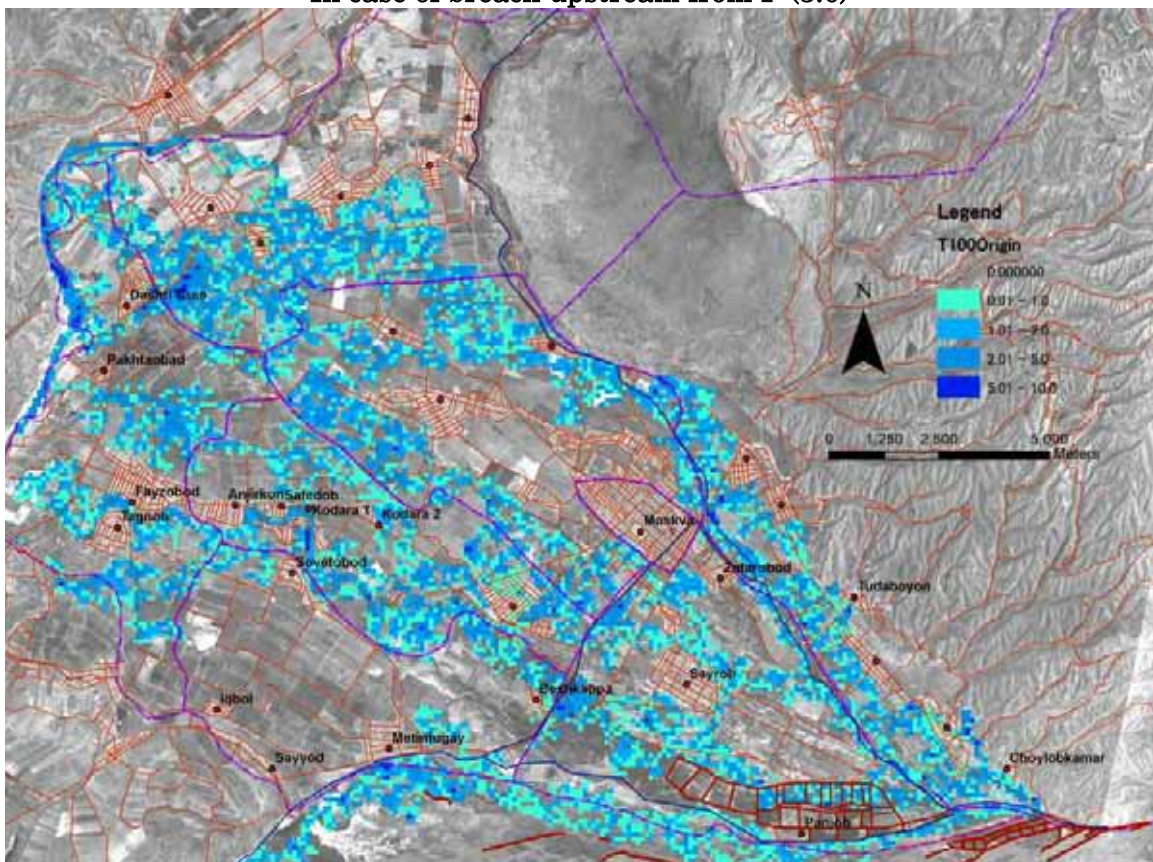
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Fig. 1.6.2 (2) Condition of Existing Dike

In case of breach downstream from P (3.0)



In case of breach upstream from P (3.0)

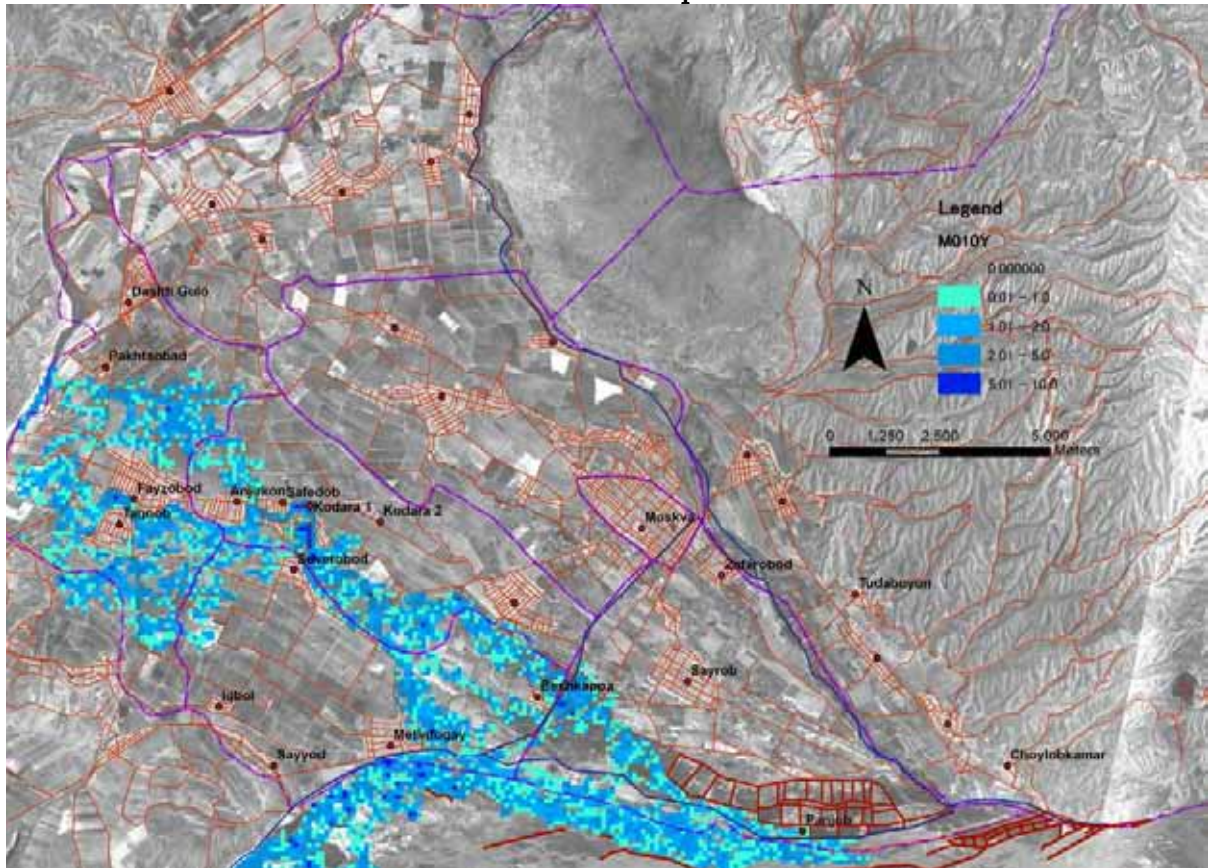


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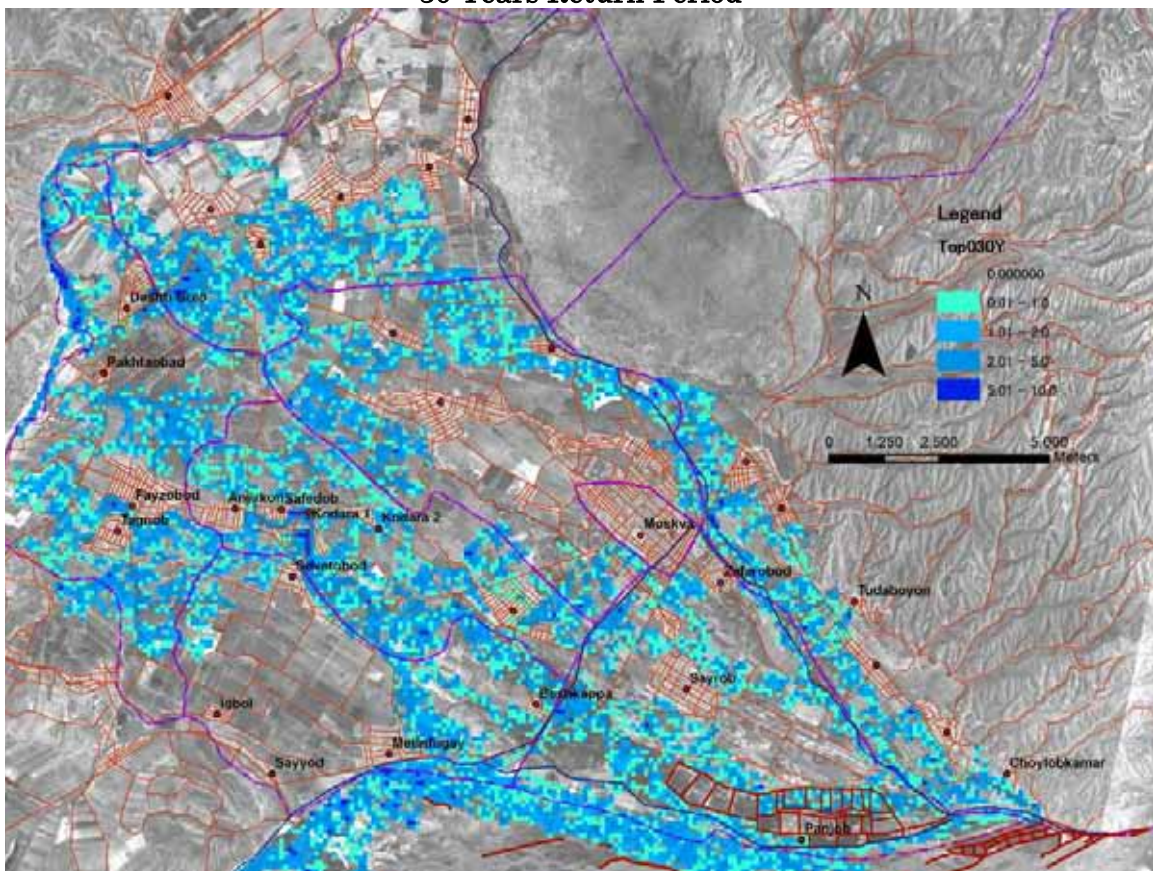
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Fig. 1.8.1 Dynamic State of Flood Flow on Flood Plain

10 Years Return period



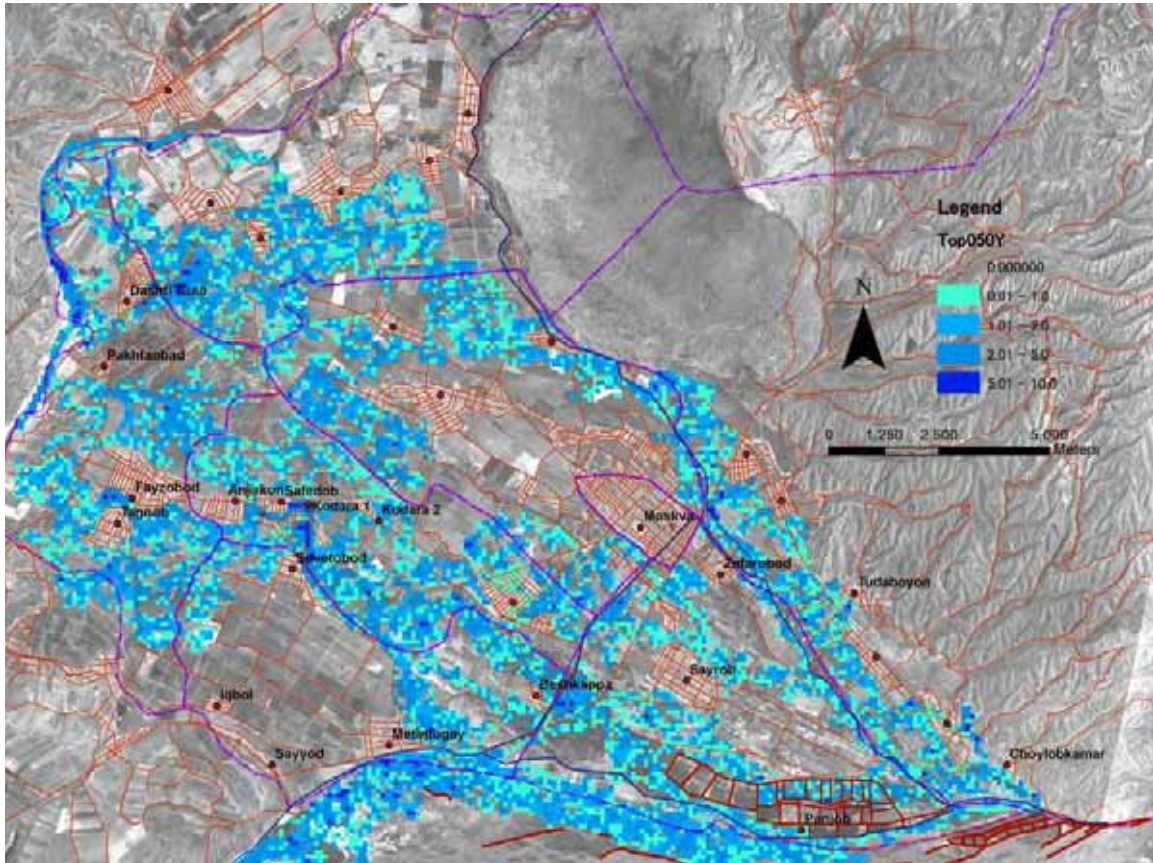
30 Years Return Period



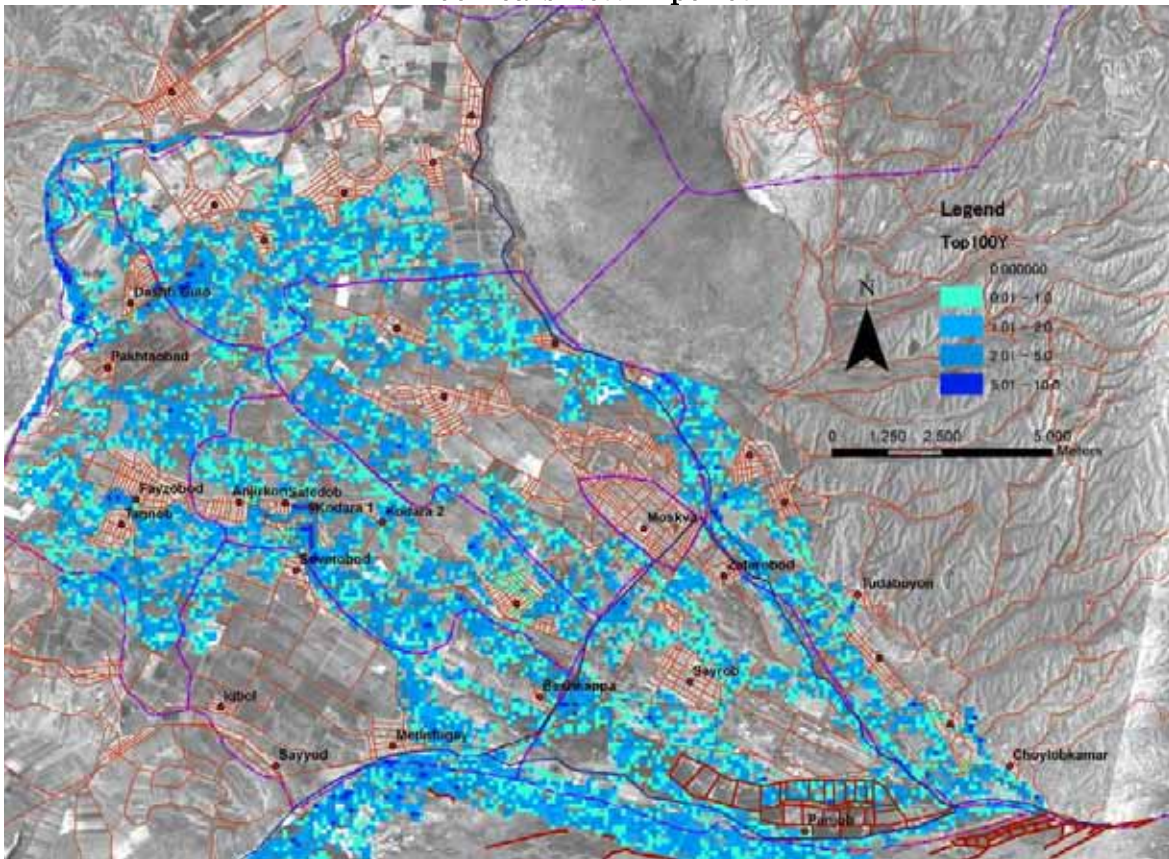
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Fig. 1.8.2 (1) Inundation Area with Each Scale Flood

50 Years Return Period



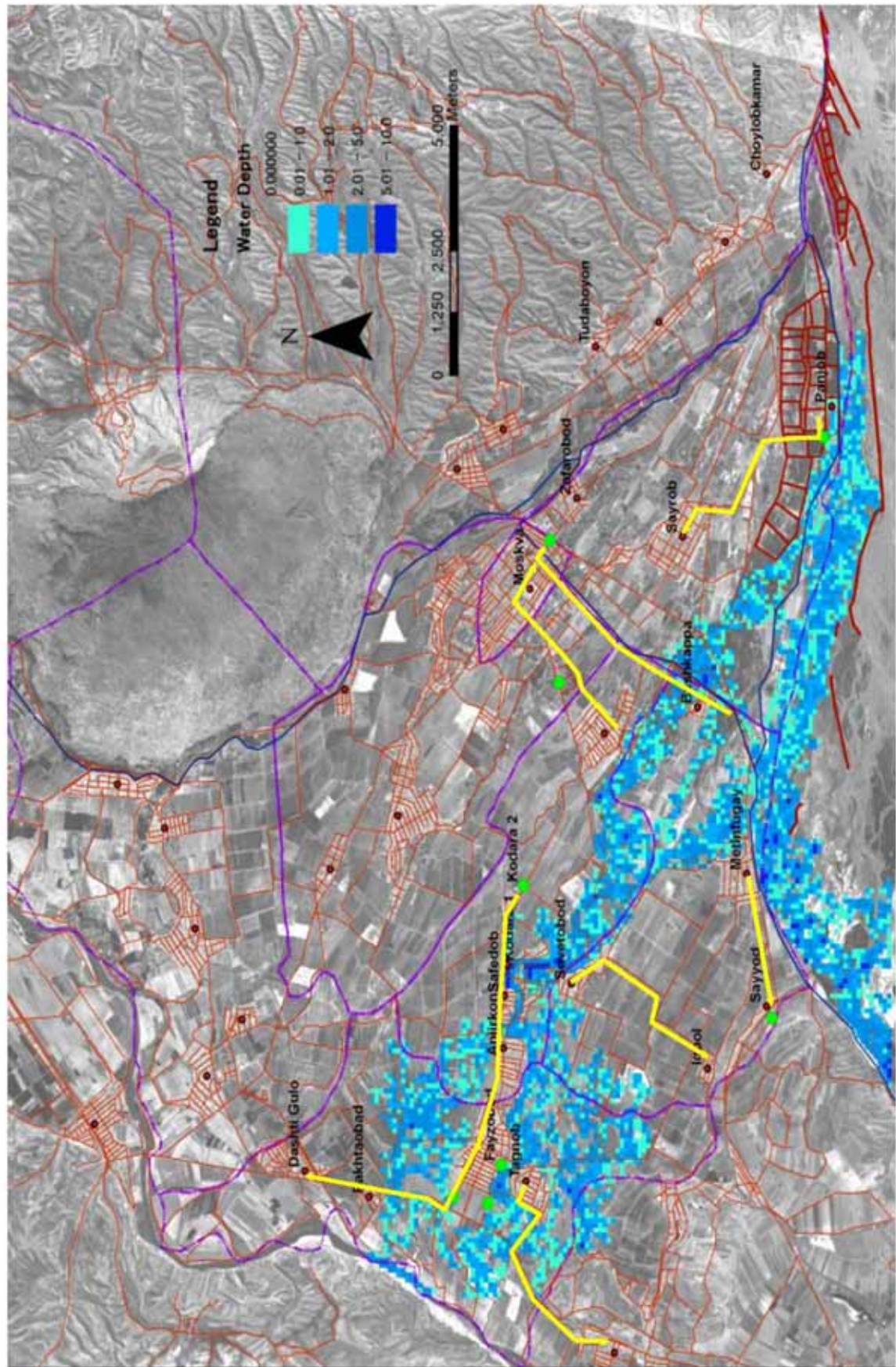
100 Years Return period



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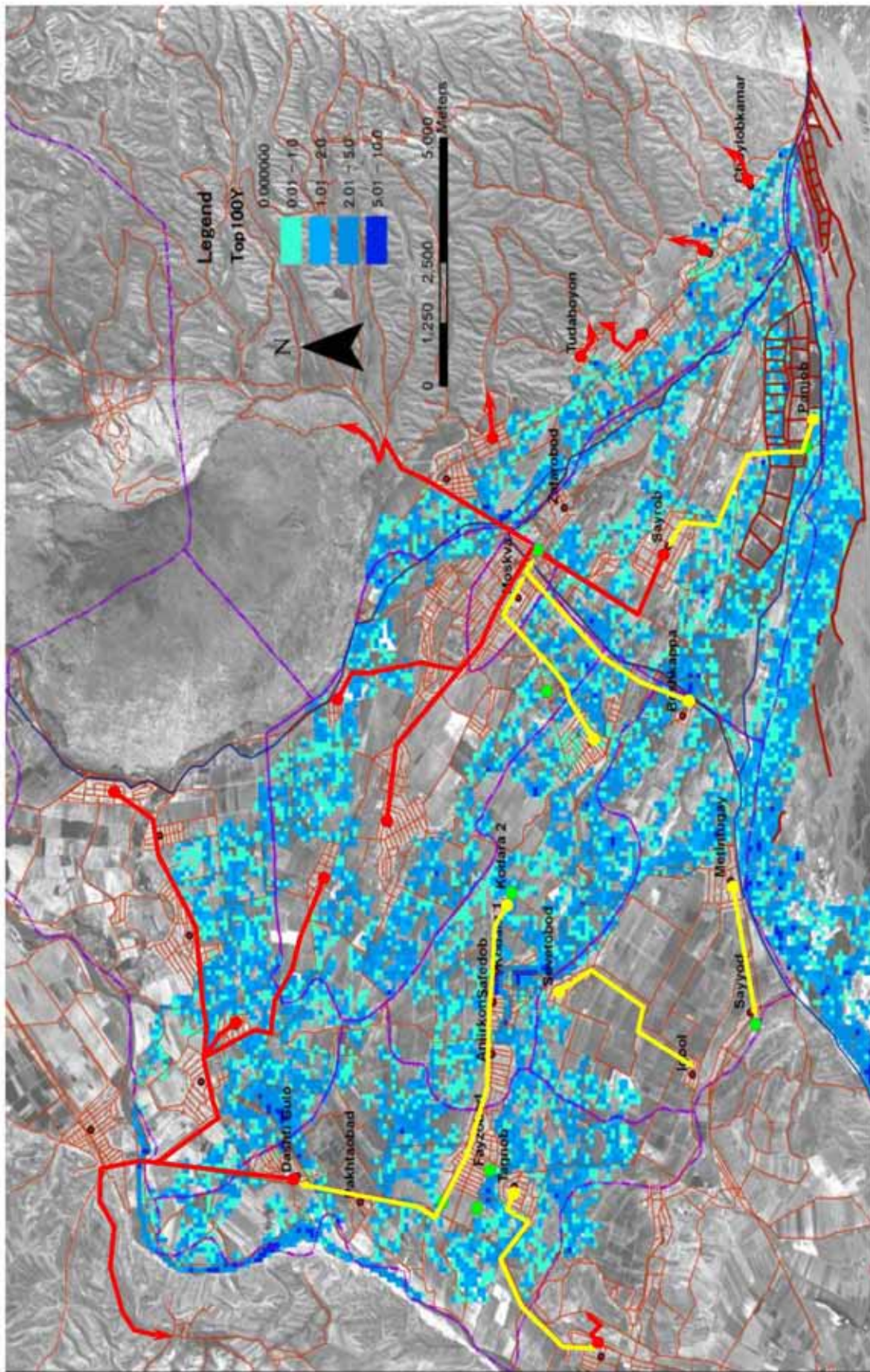
Fig. 1.8.2 (2) Inundation Area with Each Scale Flood



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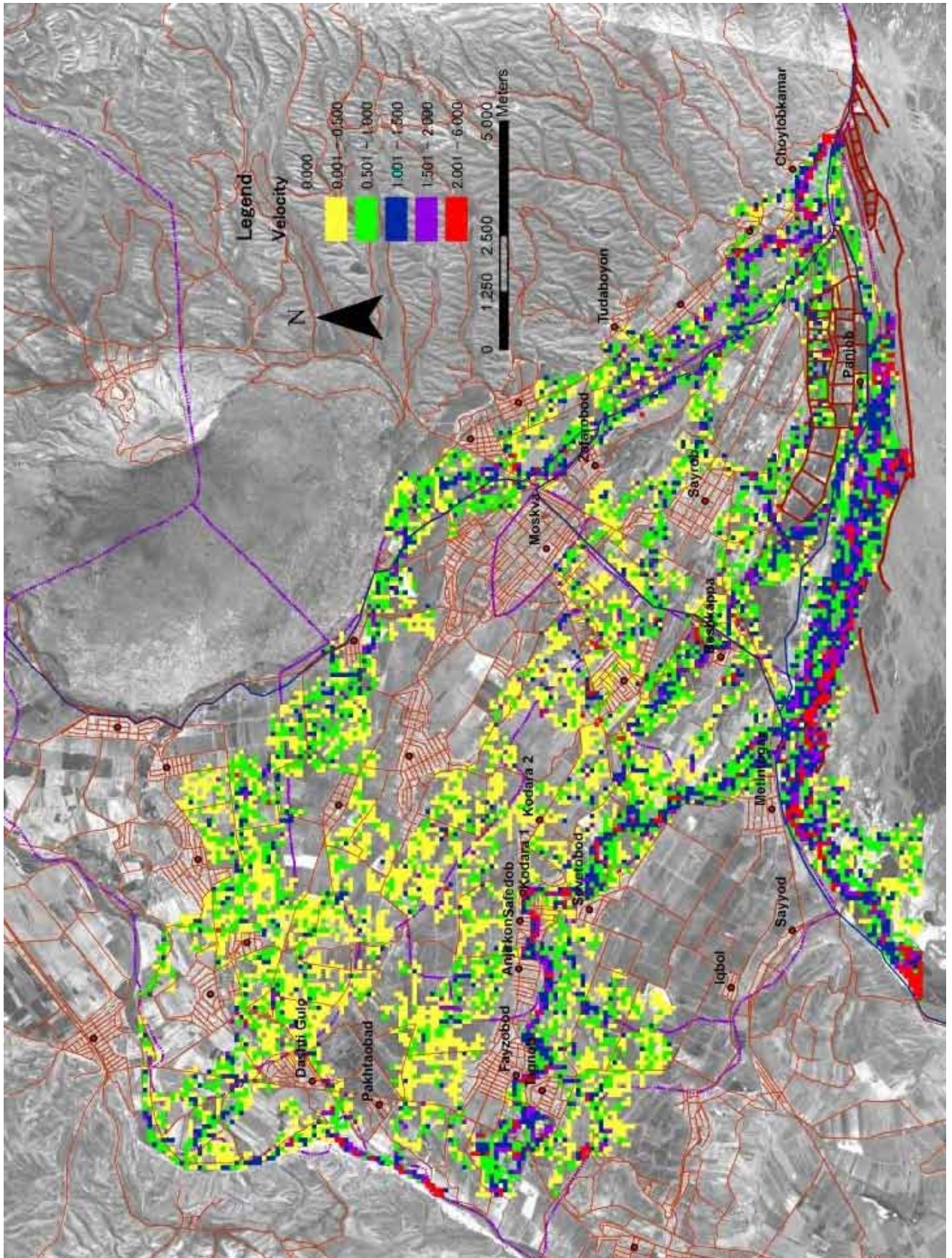
Fig. 1.8.3 (1) Flood Hazard Map (Up to 15 year  
Return Period)



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Fig. 1.8.3 (2) Flood Hazard Map (Over 15 Year Return Period)

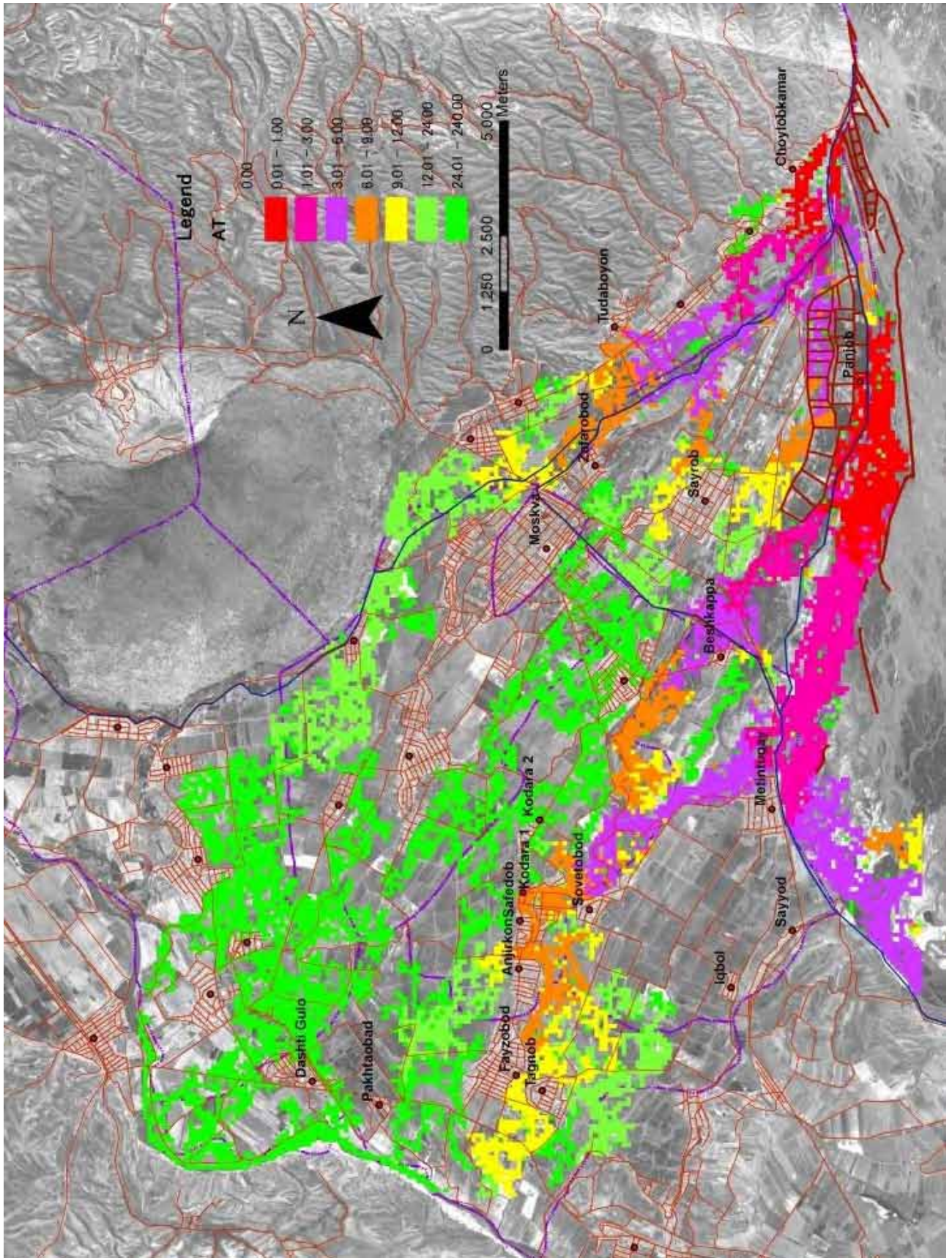


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Fig. 1.8.4 Flood Risk Map (Flood Velocity)



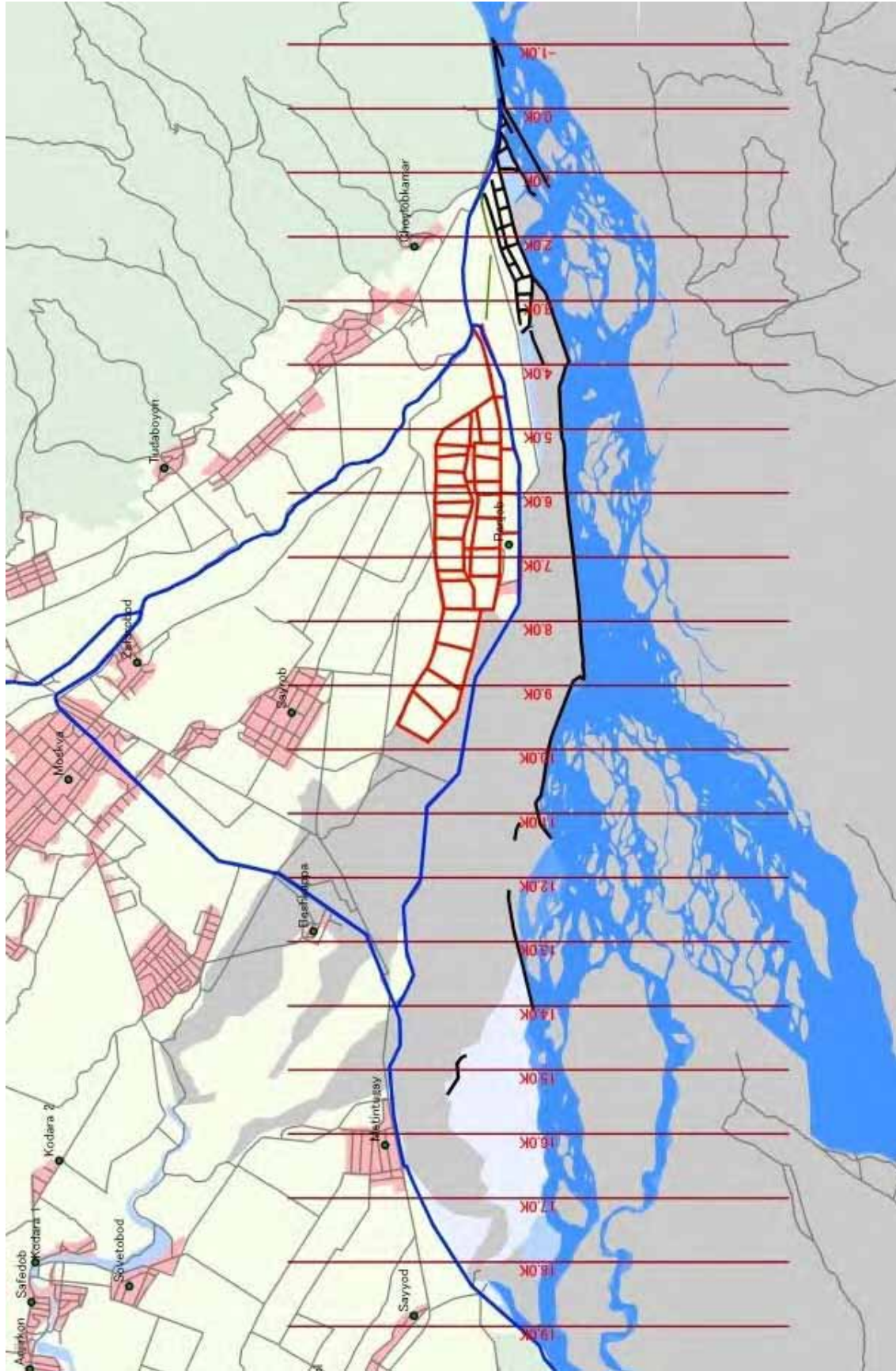


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Fig. 1.8.5 Flood Risk Map (Flood Arrival Time)

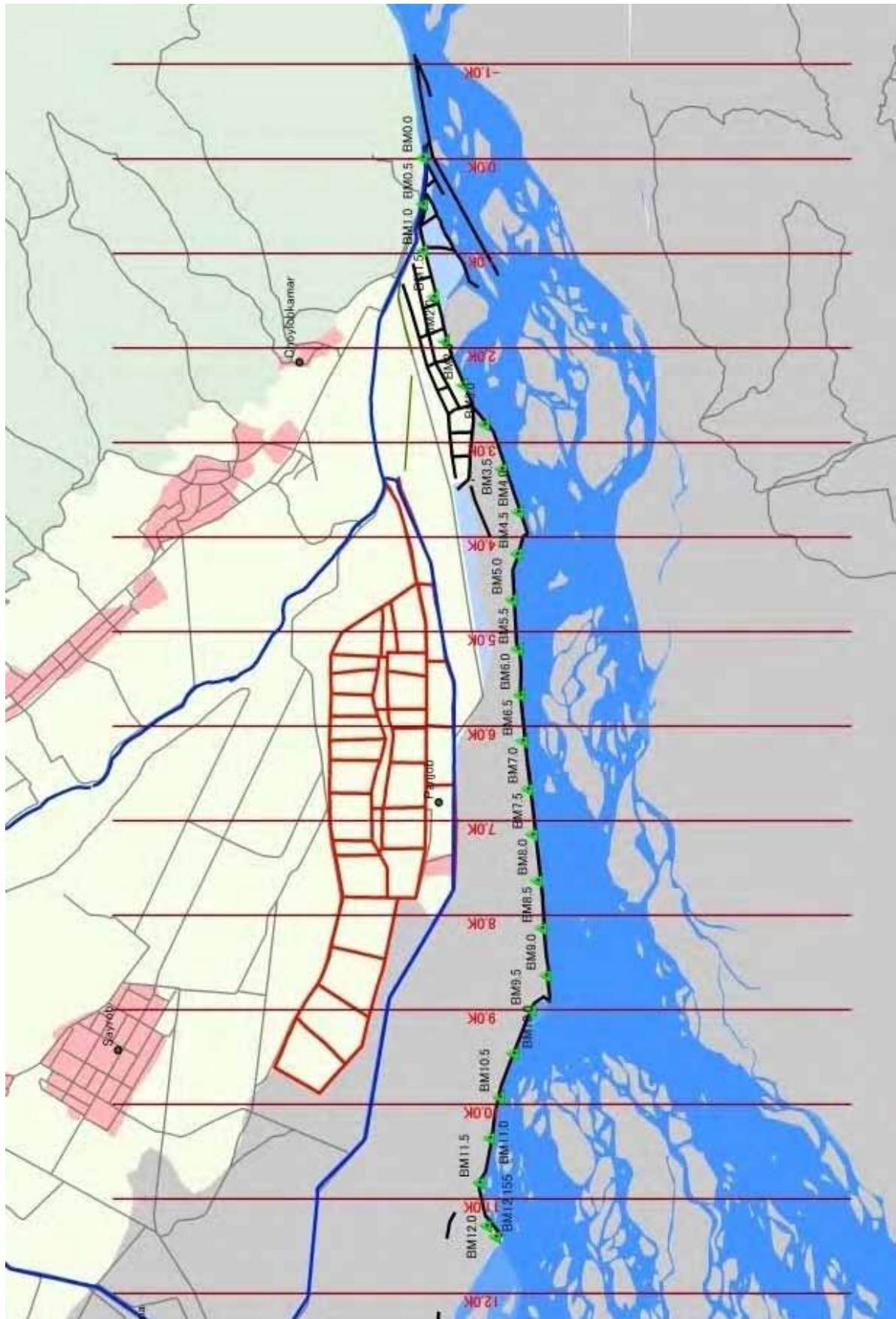




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Fig. 1.9.1 Station Point

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Fig. 1.9.2 Bench Mark and Station Point

LONGITUDINAL SECTION (MAIN DIKE)

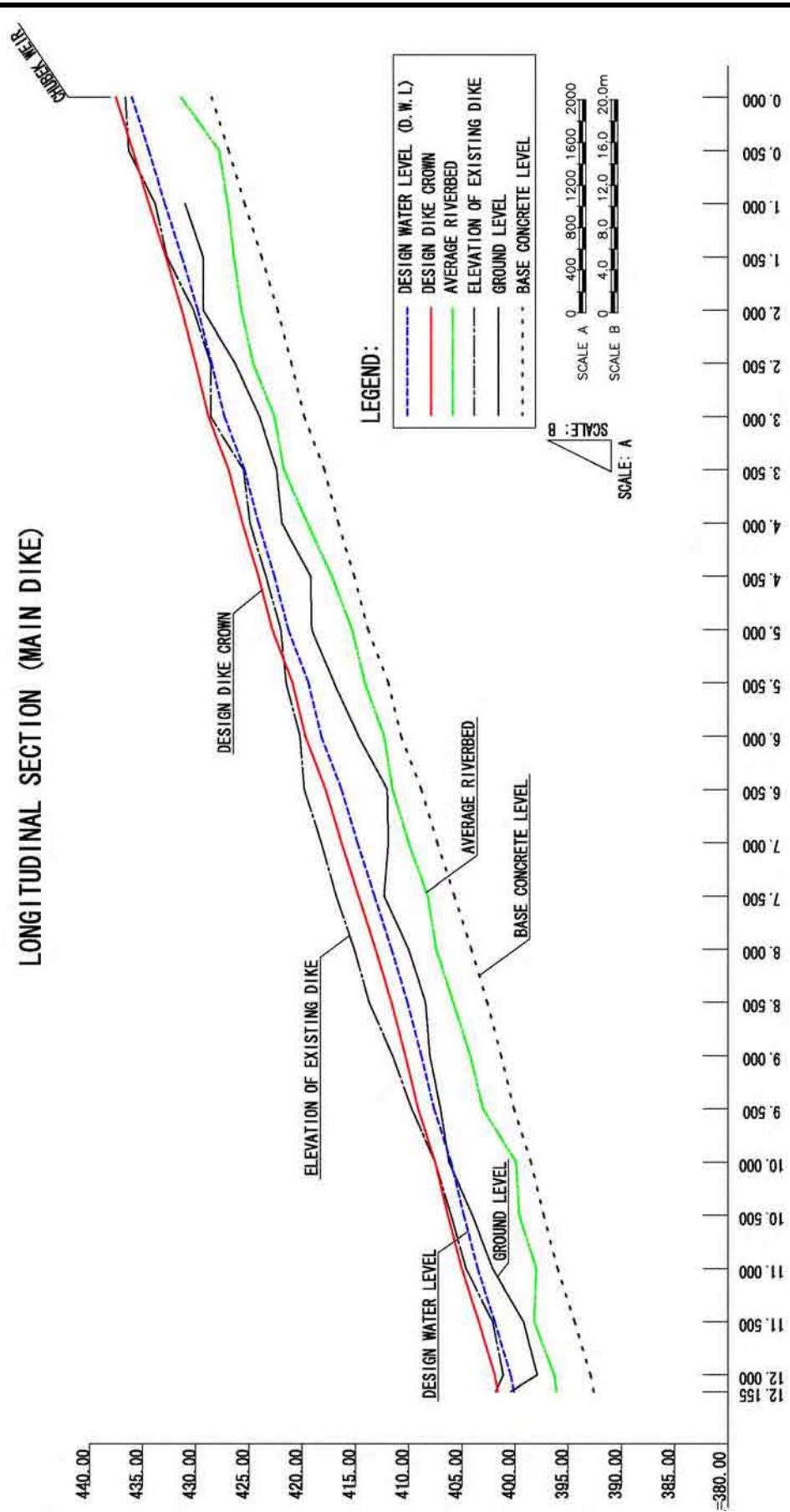
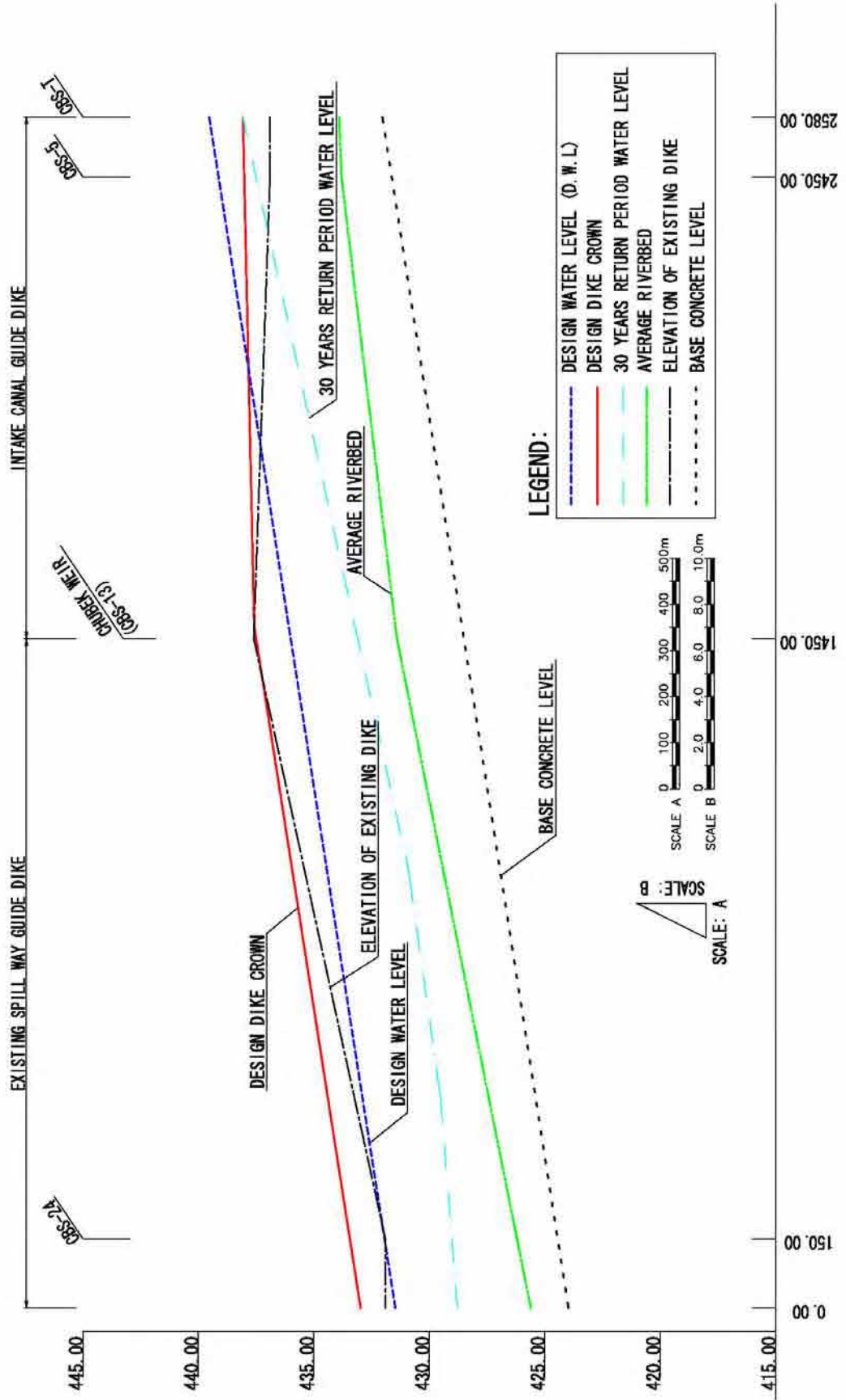


Fig. 1.9.3 (1) Longitudinal Profile ( Main Dike)

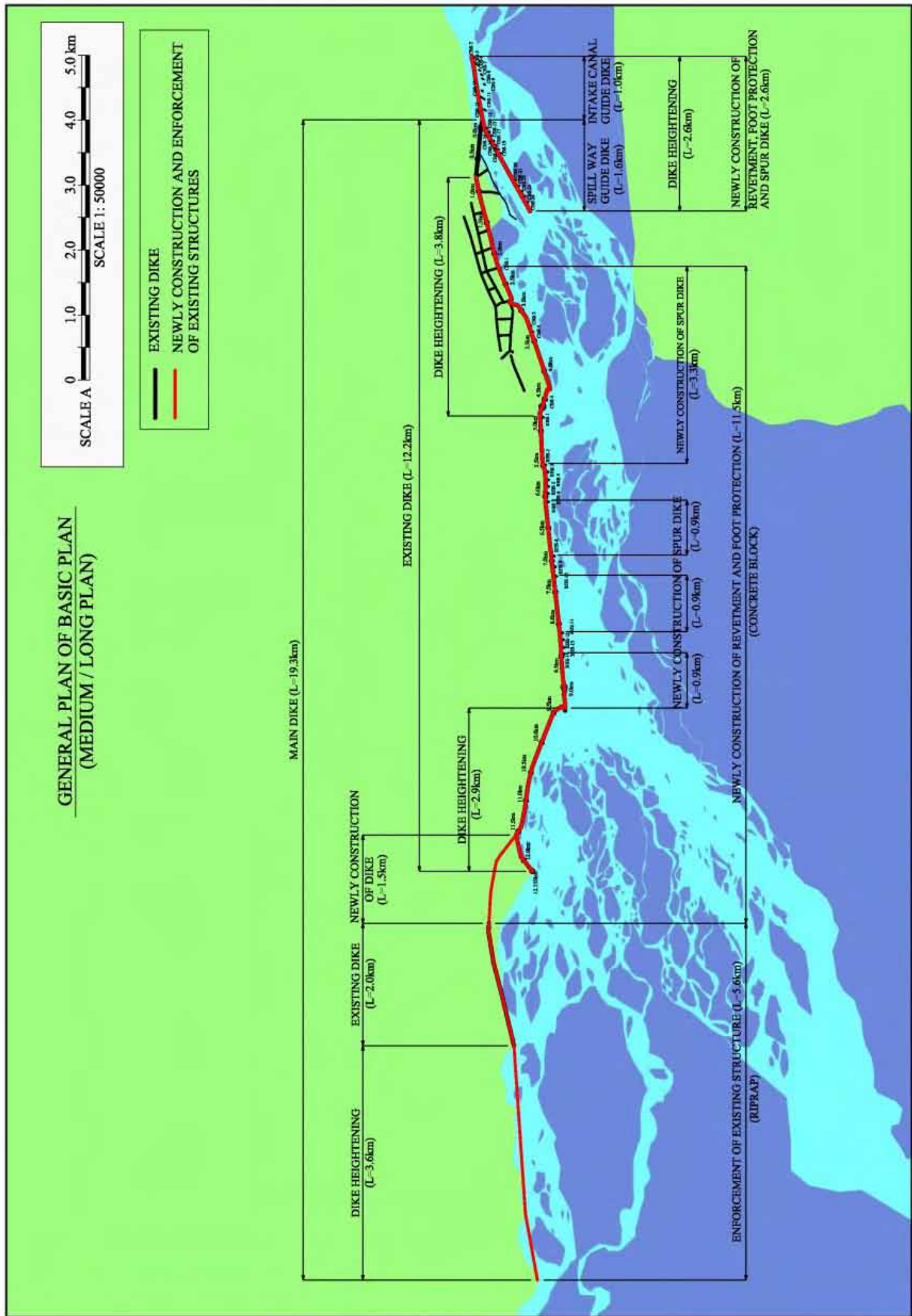
# LONGITUDINAL SECTION (GUIDE DIKE)



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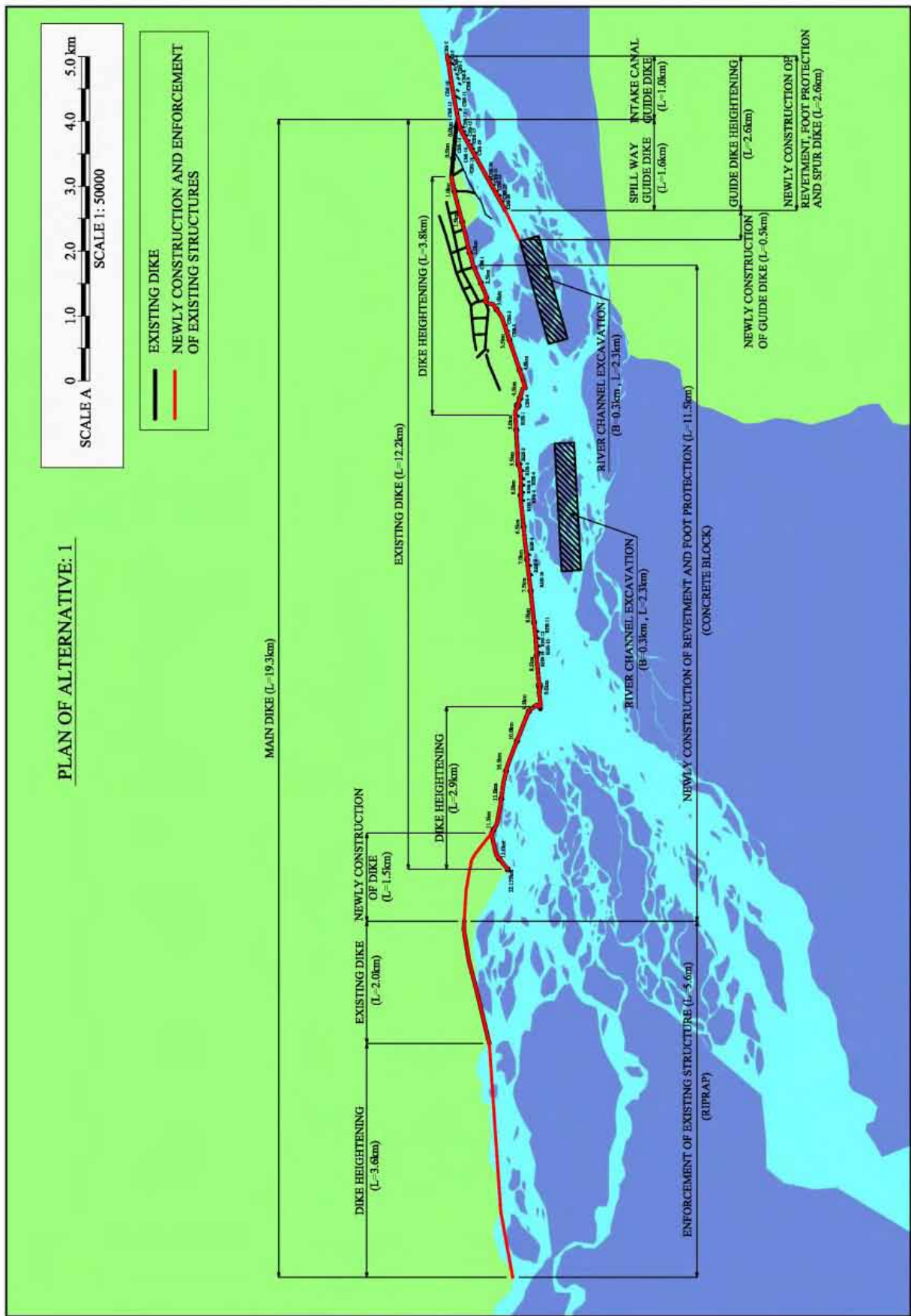
Fig. 1.9.3 (2) Longitudinal Profile (Guide Dike)



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Fig. 1.9.4 Basic Plan for Long-Middle Term

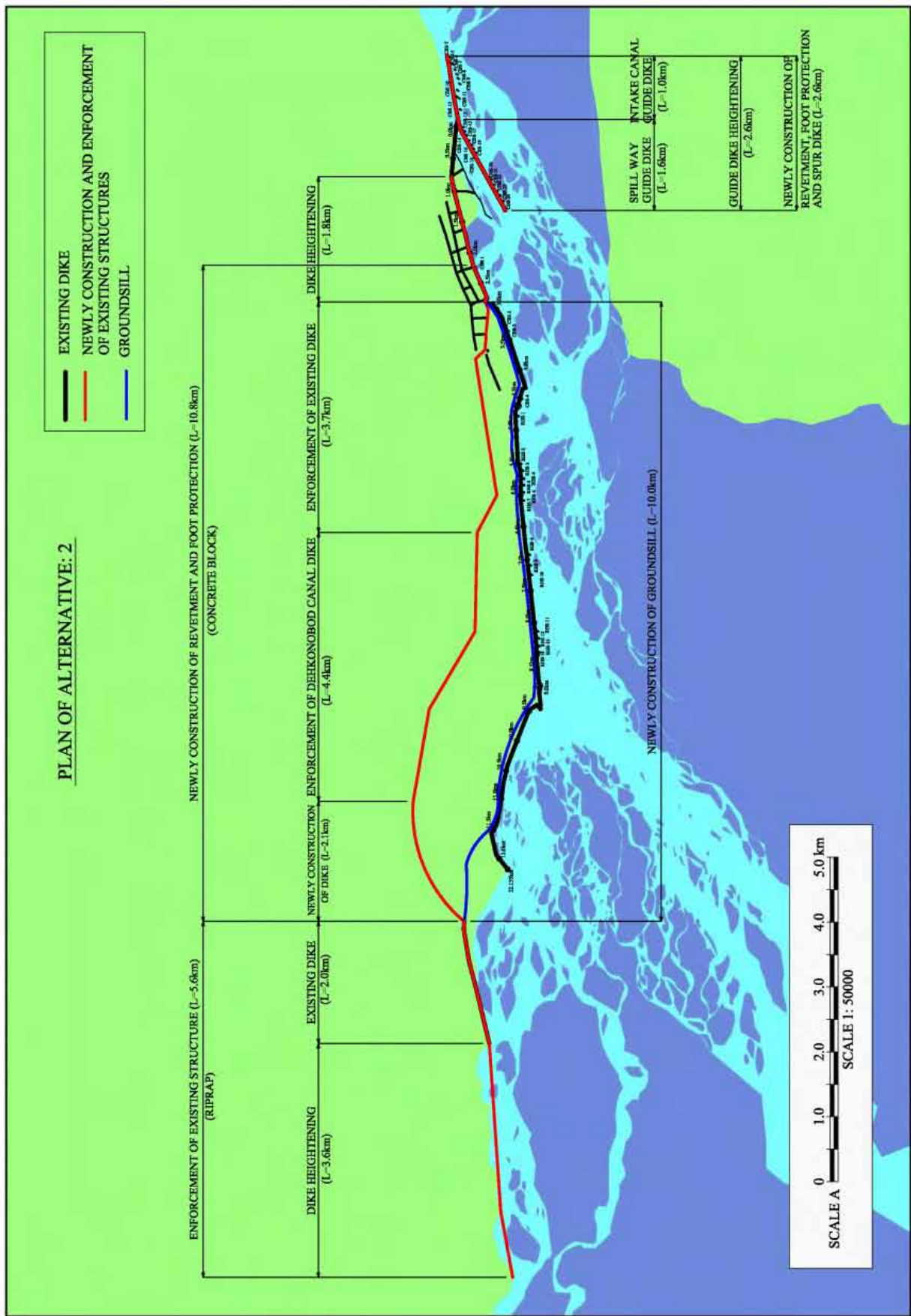


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Fig. 1.9.5 Alternative Plan 1

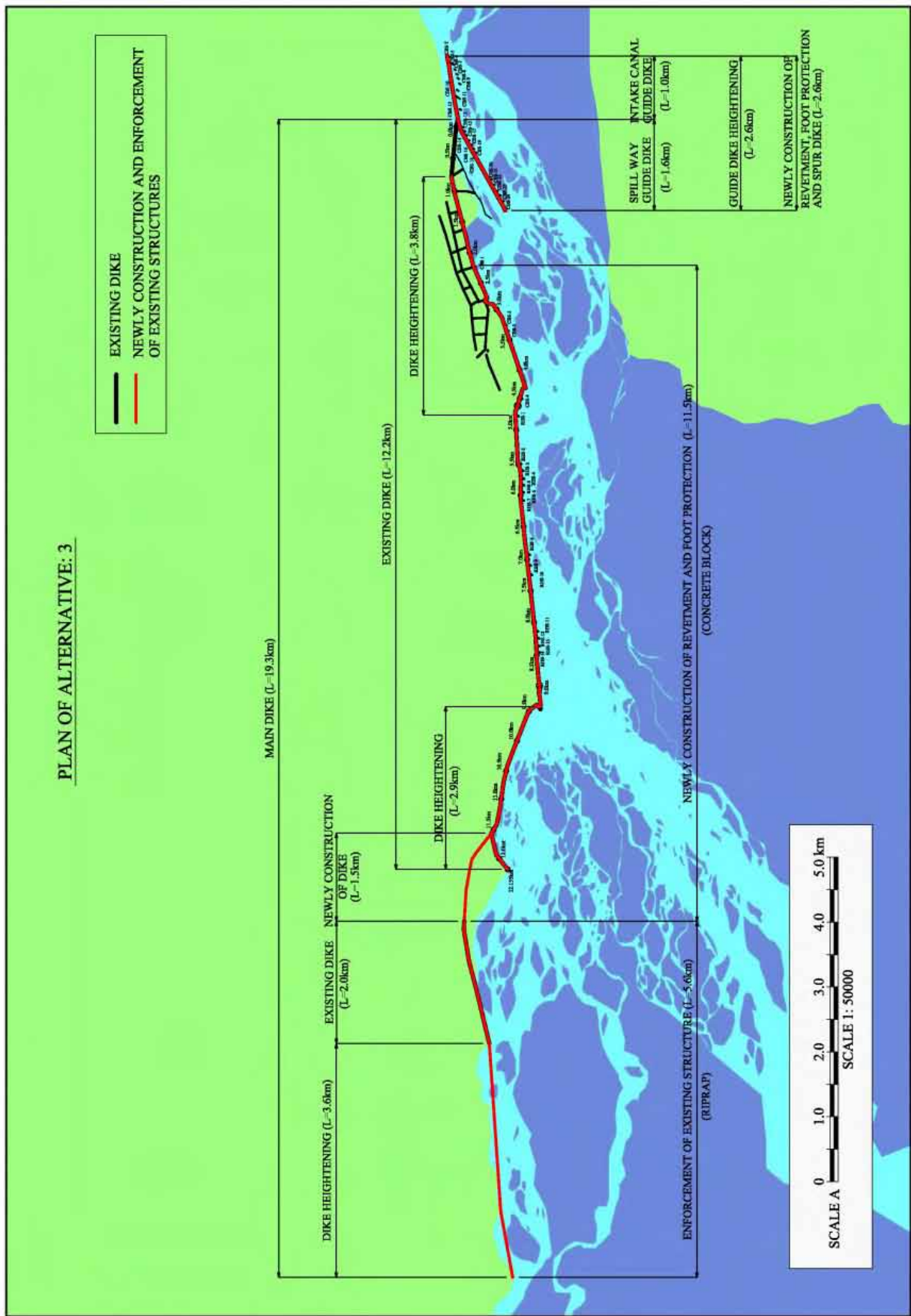




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Fig. 1.9.6 Alternative Plan 2

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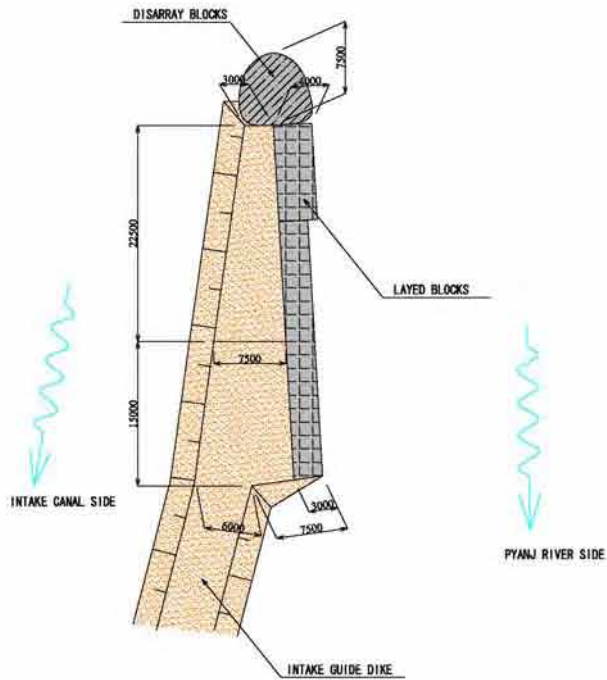


THE STUDY ON NATURAL DISASTER PREVENTION IN PYANJ RIVER

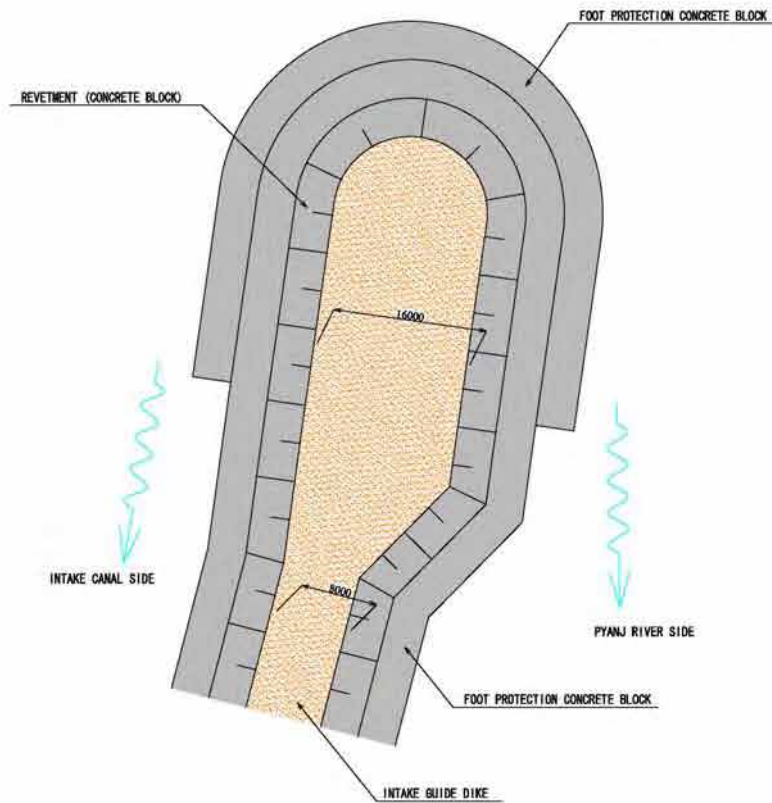
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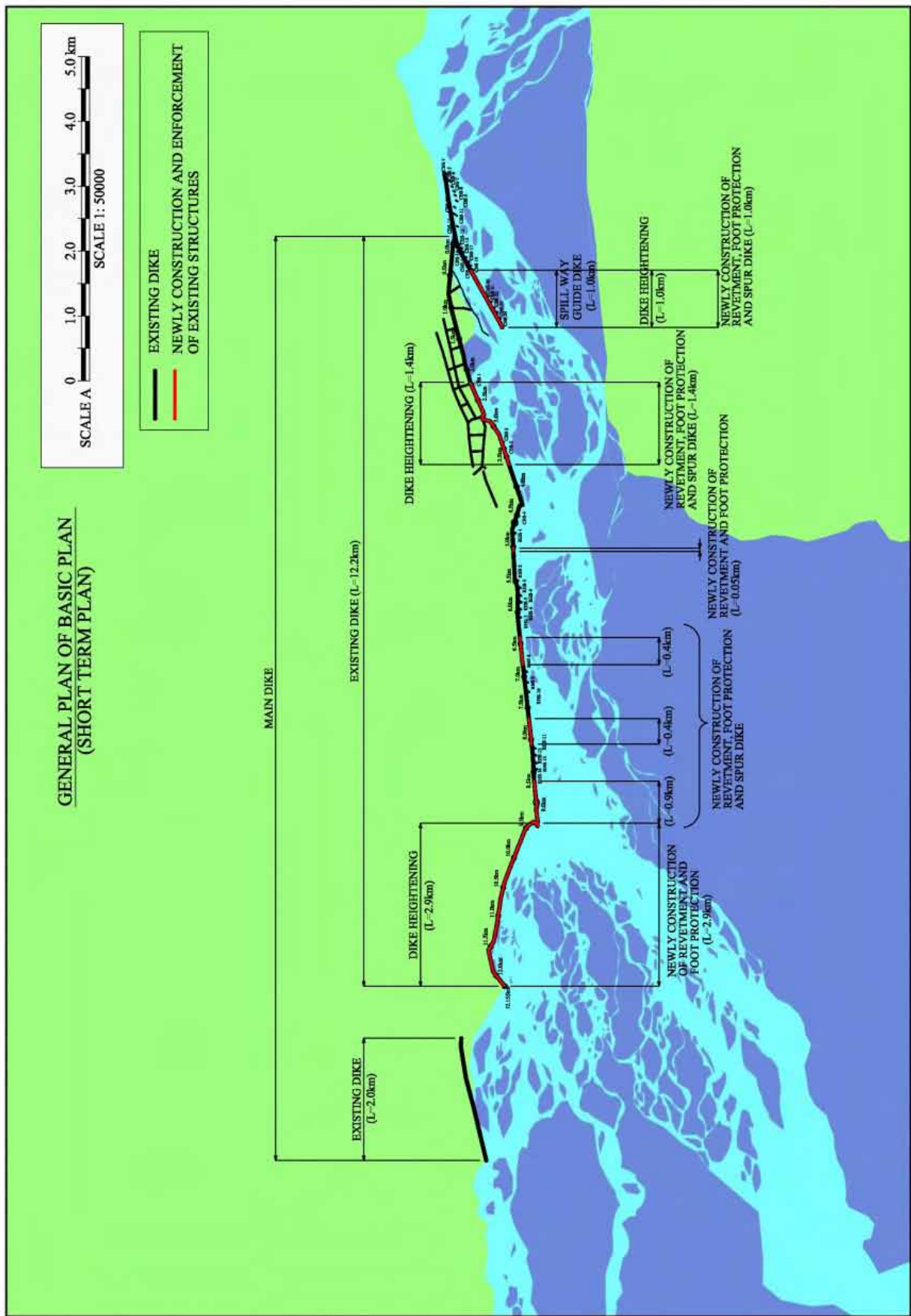
Fig. 1.9.7 Alternative Plan 3

## Existing Condition



## Construction Plan for Master Plan





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Fig. 1.9.9 Short Term Plan for Structural Measure

## ***ANNEXES***

**Table 1. Past Flood Damage (1894-1999)**

No.	Date	Contents
1	1894	Heavy rainfall - mudslide on the river Obicrut a right bank tributary of Zeravshan affecting Aini village
2	1894	Flood on Katasay river including a devastating mudslide caused by heavy rainfall
3	1913	Mudslide in the river Obichagon, Varzob
4	July 28 1934	Heavy rainfall in Khushikat rayon - high flow (230m <sup>3</sup> /sec) in the left bank tributary of the river Varzob including a mudflow
5	July 1945	Flood at Sauksay, the source of River Maksy caused by the outbreak of glacial lake - bridge demolished
6	August 2 1946	Heavy rainfall in the Duamalik rayon. Discharge of the water in a left bank tributary of the Takob reached 400 m <sup>3</sup> /sec
7	April 1952	Heavy rainfall at Semiganch - high flow in rightbank tributary of the river Kafirnigan (213 m <sup>3</sup> /sec)
8	June 20-27 1952	Flood on the River Gurham, a tributary of the Hingou due to the breach of the debris flow dams
9	April 29 1954	Flood on the river Katasay with the discharge reaching 320 m <sup>3</sup> /sec - damage caused in Istaravshan
10	May 4-5 1955	Flood and mudflow on the river Katasay near Istaravshan caused by rainfall discharge reached 615 m <sup>3</sup> /sec - damage caused in Istaravshan
11	1957	Mudslide in the river Obichagon, Varzob
12	April 1959	Floods in Kuramin range, Aktashay
13	June 4 1959	Heavy rainfall in the Takob rayon - flood and mudflow in a left bank tributary of the Varzob reached 230 m <sup>3</sup> /sec
14	July 28 1961	Flood at Darya-Rovand caused by a glacial lake outburst on a Pamir river in the Vanj region.
15	August 2 1961	Flood in the river Obichagon (413 m <sup>3</sup> /sec) a left bank tributary of the River Varzob - Gushari destroyed
16	August 2 1961	Heavy rainfall resulted in a flood on the river Mopol, a left bank tributary of the Varzob - 400000 m <sup>3</sup> of stones were deposited over the road into the Varzob
17	1962	Glacial lake outburst on the Gardjvindara a tributary of the river Ghunt
18	1963	Flood on Vanch River following release of water blocked by movement of glacier. Millions of roubles of damage, including loss of plane from an airfield.
19	Spring 1990	Flood on a tributary of the Varzob caused by rain and snow melt - mudflow down the river Odjuk (maximum discharge of about 160 m <sup>3</sup> /sec) - all bridges were destroyed and the road washed out
20	September 1991	Glacial lake outburst flood (altitude 4680 m) in the headwater river of Khidojeviori in west Pamir - peak discharge was 200 m <sup>3</sup> /sec - Khidojev village in the Roshtqala rayon suffered with 9 houses demolished and 8 damaged, the House of Culture was destroyed as well as the library, smithy, garage, warehouse, two transformers, secondary school, department of sovkhos, all bridges were demolished two tractors lost and cattle killed.
21	May 8 1993	Rogun Hydro Power Plant was washed out
22	May 8 1993	Heavy rainfall at Isfara caused flood with a school, factory, canal and fields all damaged - total cost of the damage was 240 millions of roubles.
23	May 8 1993	Rainfall and snowmelt on the Takob river caused major flood with a peak discharge of 500 m <sup>3</sup> /sec - a road was wash out and all bridges destroyed
24	May 8 1993	Flood on the Varzob river caused by heavy rainfall and snowmelt - peak discharge was 1000 m <sup>3</sup> /sec - damage to all bridges above the dam, the Dushanbe-Khujand road was washed out, offtake channel supplying 3 Hydro Power Plants and water supply was damaged
25	March 1994	Mudflow in Hirmandjou rayon caused by heavy rainfall
26	April 1994	Mudflow in Lahsh rayon caused by heavy rainfall
27	April 1996	Mudflow in Shahrison rayon caused by heavy rainfall and snowmelt
28	April 1996	Heavy rainfall in the Asht rayon caused a mudflow and damaged 60 houses
29	March 1997	Mudflow in Varzob basin caused by heavy rainfall
30	July 1997	Glacial lake outburst floods in Tojikobod rayon and West Pamir
31	1997-1998	Precipitation during winter and spring was 1.5-2 time the usual amount - in some place 3-4 times - mudflow in March, May, April, July
32	April 1998	Heavy rainfall over the southern slope of the Gissar mountain range caused flood damage in Dushanbe, Karotegin, Darvoz, Khatlon, Dushanbe, Lahsh, Kalayhumb, Isambay, Dehavz, Iskanderkul, Gharm
33	May 1998	Heavy rainfall caused flooding in Yahsu river (lower Kaeboztonak). Yahu Dam collapsed and 1500 homes damaged. Extensive other damage in Kulyab and Vose rayons - total estimated damage 22.7 billion roubles.
34	June 1998	Heavy rainfall in Varzob and Tavildara (3 km above the settlement) - bridge destroyed, 500 m of the road damaged, 59 houses destroyed, 3500 fruit trees demolished, 20 ha of the land flooded, 140 cows and 520 sheep killed.
35	June 29 1998	Glacial lake outburst flood caused damage in Vomar-Dara rayon, the Rushon settlement suffered. During the same day a mudflow occurred in Iskanderkul
36	April 1963	Flood on the River Pangazay in Kuramin Range
37	April 14 1963	Flood on the Urtasay Maliy River - tributary of Zeravshan - maximum discharge 166 m <sup>3</sup> /sec
38	June 27 1964	Flood on the river Khushikat - a left bank tributary of the Zeravshan near Aini village
39	July 28 1964	Flood caused by heavy rainfall on the river Daray-Namak a tributary of the Vaksh - maximum discharge 515 m <sup>3</sup> /sec
40	August 9 1965	Flood caused by heavy rainfall on a tributary of the river Pyanj in the Jafar rayon 40 km above Kalaihumb - maximum discharge 315 m <sup>3</sup> /sec
41	May 6-7 1966	Rainfall generated flood on the Takob river a left bank tributary of the river Varzob - maximum discharge 180 m <sup>3</sup> /sec - one girl killed.
42	August 23 1966	Flood on the Zeravshan near Aini village in the Khushakat rayon
43	July 20 1967	Flood in the Vanj rayon, 7 km above Paymasar village - caused by an outburst from the Ravak glacial lake
45	May 1968	Flood at Say Yalidimich a left bank tributary of the Surkhob, 8 km above Gharm - caused by a break in a debris flow dam - volume of the debris flow was 100000 m <sup>3</sup> , the speed of the water in the outburst was 15-20 m/sec and the height of the water was 7 m - Yalidimich village was impacted
46	1968-1969	Heavy snow and rain resulted in debris flows throughout the country
47	1969	Mudslides in the Gharm area - particular damage to Yalidimich and Navdi villages
48	May 1969	Flood on the Pangazay river and Aktashay river both in the Kuramin range
49	April 5 1983	Heavy rains cause loss of 300 cattle and 2,500 ha crops in Tebolay Canal, Kulyab area
50	April 7 1983	Heavy rain causes loss of 20 persons, 600 ha crops, 210 horses and 1km electric line in Devchashma Canal, Dangara area
51	April 12 1985	Pyanj river destroys 700 m of head reach of Surhob canal, damages Chebek canal
52	1985-86	Mudslides in Khujand generate lots of damage
53	March 16 1987 (also reported as May 11 1980)	Flood in Dangara valley caused by a break of the artificial water reservoir - discharge was more than 1000 m <sup>3</sup> /sec in the Sargazon River - the village of Bolo was destroyed with the loss of 53 houses (402 people made homeless), 30 people killed, many farms damaged (486 cows and 1800 poultry animals were killed, 100 ha of wheat destroyed), a bridge and a narrow-gauge railway were completely destroyed
54	1998	Mudflows caused widespread damage - 144 people were killed, 7148 houses affected (1726 destroyed completely) as well as 255 and kindergardens, 88 hospitals and ploio clinics, 1682 km of roads, 721 km of dams, 306 km of irrigation channel, 115 transformers, 96 000 ha of argicultural lands, 8730 cattle- the total cost of the damage was 60 million of roubles.
55	May 1999	Mudslide in Asht rayon:95 houses destroyed
56	July 1999	Flooding in the Kuramin range (Pangazay river);
57	July 1999	Heavy rainfall caused flooding in the Asht rayon - 19 people were killed, 23 people injured, 728 houses damaged (316 destroyed), 2000 people left homeless, 20 bridges destroyed, 18 km of electricity transmission lines damaged, schools, hospitals and farms were damaged
58	August 1999	Flooding in Gorno Badakhshan oblast destroys 250 homes
59	May 2000	Flooding in small right bank tributary of the Ghunt river near varzob village - road washed out, rest home destroyed and 1 person was killed.

Source: ADB report (reference 1)

**Table 2. Past Flood Damage (Source: Department of Protection of Population and Territory)**

Month	Date	Year	District	River	Damaged	Total amount of Damages (USD)
May	24	1999	Kofarnihon	Kofarnihon	700m of coast-protecting structures were washed out. Amount of Damage – 32540,0 USD; 1089,0 hectares of agriculture crops land; Amount of Damage – 990480,0 USD.	10,230,200
July		2000	Khorog City	Gunt	640m of coast-protecting structures were washed out	272,340
May		2000	Shugnan	Pyanj	Damaged – 4 houses. Amount of Damage – 2453,0 USD. 1160m of coast-protecting structures were washed out. Amount of Damage – 11043,0 USD. 5km of car road was damaged. Amount of Damage – 6600 USD	134,960
June		2001	Vanj	Vanjov	192 hectares of forests were damaged	760,000
June		2001	Rushan	Pyanj	2230m of coast-protecting structures were damaged.	830,000
April		2002	Aini	Zarafshon	3 km of coast-protecting structures were damaged. Amount of damage – 15000 USD. 264 km car road was damaged. Amount of damages – 103000 USD. 408 houses were damaged. Amount of damages – 260000 USD. 166,2 hectares of agriculture crops land were damaged. Amount of damages – 45100 USD. Amount of damages of other infrastructures – 143900 USD	567,000
April		2002	Shaartuz	Kofarnihon	380 hectares of agricultural crops land were damaged.	55,930
April		2002	Vose	Surkhob River Kizilsu	55 houses were damaged. Amount of damage – 470 USD. 1,17 km of coast-protecting structure was damaged. Amount of damage – 131400 USD. 0,5 km of car road was damaged. Amount of damage – 20700 USD. 188 hectares of agricultural crops land were damaged. Amount of damages – 8730 USD.	161,300
August		2002	Isfara	Isfara	HTF (Hydrotechnical Facilities – Intake) were damaged.	4,500
August		2002	Asht	Dahansoy	16 km of coast-protecting structures were damaged	317,000
August		2002	Jiikul	Vakhsh	16 houses were damaged. Amount of damages – 26000 USD. 40 hectares of agricultural crops land were damaged. Amount of damages – 6700 USD	32,700
July		2002	Aini	Zarafshon	221 houses were damaged. Amount of damages – 25800 USD. 5 people were died. 54 km car roads were damaged. Amount of damages – 64700 USD. Two(2) bridges were broken. Amount of damages – 20300 USD. 57,7 km canals was damaged. Amount of damages – 190000 USD. 434 hectares of agricultural crops land were damaged. Amount of damages – 27200 USD.	328,000
June		2002	Isfara	Isfara	9,65km of coast-protecting structures were damaged. Amount of damages – 26300 USD. 150km of canals were damaged. Amount of damages – 5620 USD. 244 houses were damaged. Amount of damages – 20,000 USD. 1126 hectares of agricultural crops land were damaged. Amount of damages – 49500 USD. Amount of damages of other infrastructures – 256500 USD. 119,4 km of power lines were damaged. Amount of damages – 6800 USD. 11,4 km water supply lines were damaged. Amount of damages – 14130 USD. 0,8 km of car road was damaged. Amount of damages – 16200 USD.	395,050
June		2002	Asht	Pongozstroy	194 houses were damaged. Amount of damages – 1333674,0 USD. 16,5 km of car road was damaged. Amount of damage – 1300 USD. 1,7 km of power line was damaged. Amount of damage – 39700 USD. 7,6 km canals and hydrotechnical facilities were damaged. Amount of damage – 102242,0 USD. Amount of damages of other infrastructures – 99082,0 USD.	395,998
June		2002	Penjikent	Zarafshon	185 houses were damaged. One (1) person was died. Amount of damages – 227000 USD. 38,7 km of car roads were damaged. Amount of damages – 169000 USD. 6 km canals were damaged. Amount of damages – 262000 USD. 1,6 km of coast-protecting structures were damaged. Amount of damages – 71000 USD.	729,000
June		2002	Vakhsh	Vakhsh	23,9 km of coast-protecting structures were damaged.	897,000
April		2003	Tursunzoda	Karatag	11 houses were damaged. Amount of damages – 14210 USD. 3,6 km of coast-protecting structure was damaged. Amount of damage – 60370 USD. 1645 hectares of agricultural crops land was damaged. Amount of damages – 51750 USD.	126,330
April		2003	Vose	Surkhob River Kizilsu	45 houses were damaged. Amount of damages – 11300 USD. 3 km of car road was damaged. Amount of damage – 2300 USD. 6 bridges were damaged. Amount of damages – 60900 USD. 3,27 km of coast-protecting structure was damaged. Amount of damage – 1162000 USD.	1,236,500
April		2003	Baljuvan	Obimazor	0,515 km of coast-protecting structures were damaged. Amount of damage – 138700 USD.	
April		2003	Kabadiyan	Kofarnihon	9,3 km of coast-protecting structure was damaged.	1,541,520
April		2003	Gafurov City	N/A	1,2 km of coast-protecting structure was damaged. Amount of damage – 12200 USD. 1,5 km of canals were damaged. Amount of damages – 5400 USD. 4 Hydrotechnical facilities were damaged. Amount of damages – 6000 USD. Two (2) other infrastructures were damaged. Amount of damages – 57500 USD. 5879 hectares of agricultural crops lands were affected. Amount of damages – 521000 USD. 1198 heads of livestock got murrain. Amount of damage – 6500 USD	608,600
April		2003	Asht	Pongozsoy	80 houses were damaged. Amount of damages – 28800 USD. One (1) school was damaged. Amount of damage – 6800 USD. 12 km of car roads were damaged. Amount of damages – 203000 USD. 6 bridges were damaged. Amount of damages – 40600 USD. 6 km of power line were damaged. Amount of damage – 3300 USD. 2 km of communication line was damaged. Amount of damages – 1400 USD. 6,4 km of canals were damaged. Amount of damages – 5000 USD. 20 km of coast-protecting structures were damaged. Amount of damages – 81400 USD. 3452 hectares of agricultural crops lands were affected. Amount of damages – 212100 USD	582,400
April		2003	Taboshar	Sirdaryo	3 km of car road was damaged. Amount of damage – 1200 USD. Two (2) bridges were damaged. Amount of damages – 850 USD. 8,3 canals were damaged. Amount of damages – 900 USD. One (1) Pump Station was damaged. Amount of damage – 600 USD.	3,550

**Table 2. Past Flood Damage (Source: Department of Protection of Population and Territory)**

June	2003	Penjikent	Zarafshon	441 houses were affected, 184 of them were completely destroyed. Three (3) persons were died. Amount of damages – 390428,0 USD. 43,6 km of car roads were damaged. Amount of damages – 50397,4 USD. Eight (8) bridges were damaged. Amount of damages – 233181,1 USD. 3,8 km of coast-protecting structures were damaged. Amount of damages – 3044 USD. 156 km of canals were damaged. Amount of damages – 80196,2 USD. 12 Pump Stations were damaged. Amount of damages – 39710,0 USD. 6 Transformer Sub Stations were damaged. Amount of damages – 10147,1 USD. 1212,4 hectares of agricultural crops land were affected. Amount of damages – 409436,8 USD. Amount of damages of other infrastructures – 255234,2 USD.	14,819,219
June	2003	Shahriston	Kaermasoy	148 houses were damaged. Amount of damages – 52830 USD. 12 schools were affected. Amount of damages – 15200 USD. 28 km of car roads were damaged. Amount of damages – 125100 USD. 16 bridges were damaged. Amount of damages – 42600 USD. 5,5 km of coast-protecting structure was damaged. Amount of damage – 47300 USD. 2,5 km of canals were damaged. Amount of damages – 24700 USD. 311,9 hectares of agricultural crops lands were affected. Amount of damages – 73500 USD.	38,123
June	2003	Kanibadam City	Big Fergana Canal	3731,8 hectares of agricultural crops lands were affected. Amount of damages – 276900 USD. 6 schools were affected. Amount of damages – 8800 USD. 4 Social and Cultural Facilities were affected. Amount of damages – 14100 USD.	299,800
June	2003	Isfara	Isfara	64 houses were damaged. Amount of damages – 6100 USD. Three (3) bridges were damaged. Amount of damages – 1500 USD. 1,5 km of coast-protecting structure was damaged. Amount of damages – 85000 USD. 10 Transformer Sub Stations were damaged. Amount of damages – 5000 USD. 13 other infrastructures were affected. Amount of damages – 3550 USD. 907,1 hectares of agricultural crops were affected. Amount of damages – 29700 USD. 9,4 km of car roads were damaged. Amount of damages – 1000 USD. 0,4 km of power line was damaged. Amount of damages – 16900 USD. 4 km of canals were damaged. Amount of damages – 12700 USD. 5 Pump Stations were damaged. Amount of damages – 38600 USD.	200,000
June	2003	Istaravshan	Yangi Aric	178 house were damaged. Amount of damages – 21400 USD. 11 medical and cultural facilities were damaged. Amount of damages – 39100 USD. 10,5 km of car roads were damaged. Amount of damages – 159600 USD. 6 bridges were damaged. Amount of damages – 151600 USD. 2,6 km of power line was damaged. Amount of damage – 3400 USD. 11 km of coast-protecting structures were damaged. Amount of damages – 72000 USD. 4 other infrastructures were damaged. Amount of damages – 49000 USD. 1512,2 hectares of agricultural crops lands were affected. Amount of damages – 200000 USD.	696,000
June	2003	Penjikent District	Zarafshon	132 houses were damaged. Amount of damages – 14600 USD. 9 Public Facilities were damaged. Amount of damages – 41530 USD. 6,2 km of car roads were damaged. Amount of damages – 16200 USD. 4 bridges were damaged. Amount of damages – 23700 USD. 6,5 km of coast-protecting structures were damaged. Amount of damages – 91700 USD. 7 km of canals were damaged. Amount of damages – 6400 USD. 43 hectares of agricultural crops lands – 16100 USD. One person died.	210,230
March	2003	Shahrinav	Karatag	10 km of canals was damaged. Amount of damage – 10824 USD. One (1) Hydrotechnical Facility was damaged. Amount of damage – 44580 USD. 0,6 km of coast-protecting structures was damaged. Amount of damage – 54100 USD. Center of Shahrinav District. (KARATAG RIVER) 25 houses were damaged. Amount of damages – 16200 USD. 18 km of car roads were damaged. Amount of damages – 54460 USD. 3,5 km of coast-protecting structure was damaged. Amount of damage – 440470 USD. 53,9 km canals were damaged. Amount of damages – 245100 USD. 3 km of water supply line was damaged. Amount of damage – 28750 USD. 1440 hectares of agricultural crops land were damaged. Amount of damages – 110600 USD.	1,005,084
May	2003	Hisor	Khanaka	33 houses were damaged. Amount of damage – 12850 USD. 0,87 km of coast-protecting structure was damaged. Amount of damage – 24590 USD. 300 hectares of agricultural crops land were damaged. Amount of damages – 9100 USD. 5 km of car road was damaged. Amount of damage – 1860 USD.	48,760
May	2003	Leninski	Kofarnihon	283 houses were damaged. Amount of damages – 118860 USD. 4,5 km of car road was damaged. Amount of damage – 178320 USD. 4,5 km of coast-protecting structures were damaged. Amount of damages – 1117400 USD. 3,8 km of canal was damaged. Amount of damage – 224000 USD. 608,5 hectares of agricultural crops land were damaged. Amount of damages – 181280 USD. 4 km of power line was damaged. Amount of damage – 162350 USD. One (1) Transformer and one (1) Power Sub Station were damaged. Amount of damages – 33860 USD.	2,016,100
May	2003	Vahdat (former Kofarnihon District)	Kofarnihon	17 houses were damaged. Amount of damages – 13400 USD. 10 km of car roads were damaged. Amount of damages – 16900 USD. Three (3) bridges and 1,5 km of coast-protecting structure were damaged. Amount of damages – 180000 USD. 22,5 km of canal was damaged. Amount of damage – 99500 USD. 1940 hectares of agricultural crops land were damaged. Amount of damages – 135300 USD.	468,800
May	2003	Temurmalik	Kizilsu	383 houses were damaged. Amount of damage – 23600 USD. 4,75 km of coast-protecting structure was damaged. Amount of damage – 343330 USD. 10 Pump Stations of Hydro technical Facilities were damaged. Amount of damage – 10100 USD. 1 km of canal was damaged. Amount of damage – 11200 USD. 1,7 km of water supply line was damaged. Amount of damage – 6800 USD. 485 hectares of agricultural crops land were damaged. Amount of damages – 63100 USD	458,100
May	2003	Khujand City	Sirdaryo	14 houses were affected. Amount of damages – 3000 USD. One (1) Hydrotechnical Facility was damaged. Amount of damage – 136000 USD	139,000



**Table 2. Past Flood Damage (Source: Department of Protection of Population and Territory)**

May		2003	Penjikent	Zarafshon	126 houses were damaged. Amount of damages – 91320 USD. 8 km of car roads were damaged. Amount of damages – 4100 USD. Three (3) bridges were damaged. Amount of damages – 10100 USD. Power line was damaged. Amount of damage – 2800 USD. 4 hydrotechnical Facilities were damaged. Amount of damages – 14500 USD. 31 km of canals were damaged. Amount of damages – 44600 USD. 95 heads of livestock got murrain. Amount of damages – 1900 USD. 3 other infrastructures were damaged. Amount of damages – 174320 USD.	
April		2004	Kulyab City	Surkhob	2,24 km of coast-protecting structures were damaged. Amount of damages – 216000 USD. 196 hectares of agricultural crops lands were damaged. Amount of damages – 51000 USD.	267,000
April		2004	Vose	Surkhob	247 houses were damaged. Amount of damages – 55300 USD. 8 km of car roads were damaged. Amount of damages – 500500 USD. 5 bridges were damaged. Amount of damages – 3229200 USD. 4 km of power line was damaged. Amount of damages – 39500 USD. 0,2 km of coast-protecting structure was damaged. Amount of damage – 102700 USD. 3 km of canals were damaged. Amount of damages – 9800 USD. 14 km of lodgement was damaged. Amount of damage – 4600 USD. Two (2) Transformer Sub Power Stations were damaged. Amount of damages – 10500 USD. Two (2) cattle-breeding farms were damaged. Amount of damages – 19700 USD. 550 hectares of agricultural crops lands were affected. Amount of damages – 292000 USD.	136,800
April		2004	Kabodiyon	Kofarnihon	15,95 km of coast-protecting structures were damaged. Amount of damages – 1803950 USD. 2 km of canals and lodgements were damaged. Amount of damages – 1500 USD	1,805,450
April		2004	Vahdat	Kofarnihon	3 houses were damaged. Amount of damages – 14800 USD. 5 bridges were damaged. Amount of damages – 38200 USD. 7 km of coast-protecting structures were damaged. Amount of damages – 324000 USD. One (1) cattle-breeding farm was damaged. Amount of damages – 7000 USD.	384,000
August		2004	Tojikobod	Surkhob	0,4 km of power line was damaged. Amount of damage – 3300 USD. 0,2 km of coast-protecting structures was damaged. Amount of damage – 21400 USD	24,700
July		2004	Hamadoni	Pyanj	8 houses were damaged. Amount of damages – 3900 USD. 6 bridges were damaged. Amount of damages – 38200 USD. 0,68 km of coast-protecting structures were damaged. Amount of damages – 114200 USD. 47 hectares of agricultural crops lands were affected. Amount of damages – 45100 USD.	184,000
July		2004	Asht	Daganasoy	Two(2) schools were damaged. Amount of damages – 15400 USD. 29,5 km of car roads were damaged. Amount of damages – 93200 USD. 3 bridges were damaged. Amount of damages – 1900 USD. 5 km of coast-protecting structures were damaged. Amount of damages – 71800 USD.	182,300
July		2004	Tavildara	Khingov	43 houses were damaged. Amount of damages – 3200 USD. 2 km of car roads were damaged. Amount of damages – 20700 USD. 3 bridges were damaged. Amount of damages – 88900 USD. 2 km of coast-protecting structures were damaged. Amount of damages – 1300 USD. 15 km of canals was damaged. Amount of damages – 11850 USD. 11 hectares of agricultural crops lands were affected. Amount of damages – 40600 USD	166,550
July and August		2004	Isfara City	Isfara	4 houses were damaged. Amount of damages – 14100 USD. 5,7 km of car roads were damaged. Amount of damages – 2400 USD. 17,23 km of coast-protecting structures were damaged. Amount of damages – 82100 USD. 1,5 km of canals were damaged. Amount of damages – 7300 USD. 21 of Hydrotechnical facilities were damaged. Amount of damages – 46500 USD. 2 other facilities were damaged, Amount of damages – 11600 USD. 36,8 hectares of agricultural crops lands were affected. Amount of damages – 30000 USD. 51 heads of cattle were died. Amount of damages – 1000 USD.	195,000
June		2004	Farkhor	Pyanj	0,3 km of coast-protecting structure was damaged	19,800
June		2004	Pyanj	Pyanj	1,65 km of coast-protecting structures were damaged. Amount of damages – 371400 USD. 35 hectares of agricultural crops lands were affected. Amount of damages – 1800 USD	373,200
June		2004	Aini	Zarafshon	18 houses were damaged. Amount of damages – 1500 USD. 68,5 km of car roads were damaged. Amount of damages – 7000 USD. 5 bridges were damaged. Amount of damages – 4900 USD. 6 km of coast-protecting structures were damaged. Amount of damages – 2800 USD. 131 km of canals were damaged. Amount of damages – 15000 USD. Two (2) cattle-breeding farms were damaged. Amount of damages – 500 USD. 134,7 hectares of agricultural crops lands were affected. Amount of damages – 63000 USD. 28 heads of livestock were died. Amount of damages – 1800 USD.	96,500
June and July		2004	Penjikent	Zarafshon	26 houses were damaged. Amount of damage – 15400 USD. 20,09 km of coast-protecting structures were damaged. Amount of damages – 132000 USD. 41,1 km of car roads were damaged. Amount of damages – 54700 USD. 4 bridges were damaged. Amount of damages – 7600 USD. 6,5 km of canals were damaged. Amount of damages – 58200 USD. Other agricultural facilities – 25300 USD	295,200
April		2005	Vose	Surkhob	38 houses were damaged. Amount of damages – 7800 USD. 3 km of car roads were damaged. Amount of damages – 159400 USD. One (1) bridge was damaged. Amount of damage – 15600 USD. 5 km of canals and lodgements were damaged. Amount of damages – 15600 USD. 630 hectares of agricultural crops lands were affected. Amount of damages – 29800 USD.	228,200

**Table 2. Past Flood Damage (Source: Department of Protection of Population and Territory)**

August	2005	Isfara City	Isfara	<p>18 houses were damaged. Amount of damages – 34800 USD.                  29 educational and public facilities were damaged. Amount of damages – 10700 USD.                  4,32 km of car roads were damaged. Amount of damages – 53000 USD.                  1,49 km of coast-protecting structures were damaged. Amount of damages – 7400 USD.                  4,13 km of canals were damaged. Amount of damages – 3000 USD.                  11 of Hydrotechnical facilities and transformer power sub stations were damaged. Amount of damages – 23200 USD.                  2,85 km of power line were damaged. Amount of damages – 13600 USD.                  4,56 km of water supply line was damaged. Amount of damages – 4200 USD.                  4 other facilities were damaged. Amount of damages – 60200 USD.                  13,2 hectares of agricultural crops lands were affected. Amount of damages – 19200 USD.</p>	229,300
August	2005	Rasht	Surkhob	<p>13 houses were damaged. Amount of damages – 9300 USD.                  14 km of car roads were damaged. Amount of damages – 19900 USD.                  4 bridges were damaged. Amount of damages – 1200 USD.                  1,8 km of coast-protecting structures was damaged. Amount of damages – 133800 USD.                  6,2 km of canals were damaged. Amount of damages – 8300 USD.                  Two(2) of Hydrotechnical Facilities and one pump station were damaged. Amount of damages – 8600 USD.                  10,1 hectares of agricultural crops lands were affected. Amount of damages – 24300 USD.</p>	205,400
July	2005	Hamadoni	Pyanj	<p>266 houses were damaged. Amount of damages – 633500 USD.                  Three (3) Facilities including education, medical and social and cultural were damaged. Amount of damages – 786700 USD.                  4,4 km of car roads were damaged. Amount of damages – 165000 USD.                  3 bridges were damaged. Amount of damages – 5000 USD.                  5,2 km of coast-protecting structures were damaged. Amount of damages – 2781800 USD.                  7,1 km of canals and lodgements were damaged. Amount of damages – 984500 USD.                  11 Pump Stations were damaged. Amount of damages – 53800 USD.                  One (1) Transformer Power Sub Station damaged. Amount of damages – 1500 USD.                  3 km of water supply line and sewage system were damaged. Amount of damages – 26000 USD.                  10 other infrastructures were damaged. Amount of damage – 49800 USD.                  3964 hectares of agricultural crops lands were affected. Amount of damages – 1524400 USD.                  64 heads of livestock died. Amount of damages – 14100 USD.</p>	7,026,100
July	2005	Pyanj	Pyanj	<p>1,5 km of coast-protecting structure was damaged. Amount of damage – 343800 USD.                  One (1) cattle-breeding firm was damaged. Amount of damage – 286200 USD.                  1000 hectares of agricultural crops lands were affected. Amount of damages – 49400 USD</p>	679,400
July	2005	Jirgatal	Surkhob	<p>3,8 km of car road was damaged. Amount of damage – 20600 USD.                  Two(2) bridges were damaged. Amount of damages – 98400 USD.                  1,5 km of power line was damaged. Amount of damage – 1800 USD.                  0,35 km of coast-protecting structures was damaged. Amount of damage – 32800 USD.                  Two (2) Pump Stations were damaged. Amount of damages – 3100 USD.                  0,2 km of water supply line was damaged. Amount of damage – 6200 USD.                  6 persons were died.</p>	156,700
June	2005	Farkhor	Pyanj	<p>5,75 km of coast-protecting structures were damaged. Amount of damages – 1156500 USD.                  One (1) Hydrotechnical Facility was damaged. Amount of damage – 31200 USD.                  1760 hectares of agricultural crops lands were affected. Amount of damages – 382600 USD.</p>	1,570,300
June	2005	Tursunzade City	N/A	<p>Karatag District: 13,55 km of coast-protecting structures were damaged. Amount of damages – 1761250 USD.                  Shirkent District: 1,9 km of coast-protecting structures were damaged. Amount of damages – 247000 USD.                  16 houses were damaged. Amount of damages – 21300 USD.                  1 km of car road was damaged. Amount of damage – 3200 USD.                  6 bridges were damaged. Amount of damages – 3000 USD</p>	2,035,750
June	2005	Rasht	Surkhob	<p>32 houses were damaged. Amount of damages – 16400 USD.                  0,2 km of car road was damaged. Amount of damages – 51800 USD.                  3 bridges were damaged. Amount of damages – 12800 USD.                  0,45 km of coast-protecting structures was damaged. Amount of damages – 48920 USD.</p>	129,920
June	2005	Ishkoshim	Pyanj River	<p>43 houses were damaged. Amount of damages – 69300 USD.                  11 of educational, medical and public facilities were damaged. Amount of damages – 13700 USD.                  90 km of car roads were damaged. Amount of damages – 63500 USD.                  13 bridges were damaged. Amount of damages – 28200 USD.                  20,5 km of power line were damaged. Amount of damages – 12500 USD.                  40 km of communication line was damaged. Amount of damage – 10900 USD.                  8,3 km of coast-protecting structures were damaged. Amount of damages – 139400 USD.                  57 km of canals and lodgements were damaged. Amount of damages – 45600 USD.                  Two(2) of Hydrotechnical Facilities and sub stations were damaged. Amount of damages – 17300 USD.                  2 km of water supply line were damaged. Amount of damages – 1100 USD.                  3 other facilities were damaged. Amount of damages – 64700 USD.                  510,5 hectares of agricultural crops lands were damaged. Amount of damages – 286800 USD.                  465 hectares of forests were damaged. Amount of damages – 526500 USD.                  182 heads of cattle were damaged. Amount of damages – 3100 USD.</p>	1,282,600
June and July	2005	Penjikent	Zarafshon	<p>696 houses were damaged. Amount of damages – 1326800 USD.                  13 educational and medical facilities were damaged. Amount of damages – 259100 USD.                  62 km of car roads were damaged. Amount of damages – 749900 USD.                  5 bridges were damaged. Amount of damages – 167600 USD.                  25,3 km of power line were damaged. Amount of damages – 39700 USD.                  28 km of communication line were damaged. Amount of damages – 42800 USD.                  26,2 km of canals were damaged. Amount of damages – 136600 USD.                  2,5 km of water supply and sewage system were damaged. Amount of damages – 12100 USD.                  11 other infrastructures were damaged. Amount of damages – 244500 USD.                  312,9 hectares of agricultural crops lands were affected. Amount of damages – 59900 USD.                  Five persons were died.</p>	3,039,000

**Table 2. Past Flood Damage (Source: Department of Protection of Population and Territory)**

June-August		2005	Tojikobod	Surkhob	8 km of car roads was damaged. Amount of damages – 21500 USD. 4 bridges were damaged. Amount of damages – 25600 USD. 4,25 km of coast-protecting structures were damaged. Amount of damages – 36 400 USD. 8 km of canals were damaged. Amount of damages – 12500 USD. 7 of Hydrotechnical Facilities were damaged. Amount of damages – 43400 USD. 2,5 km of power line was damaged. Amount of damage – 4800 USD. 57,7 hectares of agricultural crops lands were damaged. Amount of damages – 34000 USD.	178,200
March		2005	Kulyab City	Yakhsu	35 houses were damaged. Amount of damages – 11800 USD. One (1) bridge was damaged. Amount of damage – 800 USD. 4,25 km of coast-protecting structures were damaged. Amount of damages – 266600 USD. 173 hectares of agricultural crops lands were affected. Amount of damages – 13200 USD.	442,000
March		2005	Vose	Surkhob	65 houses damaged. Amount of damages – 13600 USD. One (1) bridge damaged. Amount of damage – 15600 USD. 0,75 km of coast-protecting structure was damaged. Amount of damage – 351600 USD. Two (2) Hydrotechnical Facilities were damaged. Amount of damages – 14300 USD. 168 hectares of agricultural crops lands were damaged. Amount of damages – 63300 USD.	458,400
March-April		2005	Farkhor	Pyanj	2,17 km of coast-protecting structure was damaged	519,600
May		2005	Kulyab City	Yakhsu	10 houses damaged. Amount of damages – 5900 USD. 1,75 km of car roads damaged. Amount of damages – 39100 USD. 6 bridges were damaged. Amount of damages – 28500 USD. 0,05 km of coast-protecting structure was damaged. Amount of damage – 2200 USD	75,700
May		2005	Shaartuz	Kofarnihon River	3 houses were damaged. Amount of damages – 1000 USD. 7 km of car roads were damaged. Amount of damages – 2800 USD. 4 km of coast-protecting structures were damaged. Amount of damages – 1946580 USD. 5 km of canals were damaged. Amount of damages – 2200 USD. 254 hectares of agricultural crops lands were damaged. Amount of damages – 50400 USD.	2,002,980
May		2005	Kabodiyon	Kofarnihon	3,5 km of car roads were damaged. Amount of damages – 70000 USD. 17,15 km of coast-protecting structures were damaged. Amount of damages – 1633440 USD. 400 hectares of agricultural crops lands were affected. Amount of damages – 31100 USD.	1,734,540
May		2005	Rudaki	Kofarnihon	255 houses were damaged. Amount of damages – 191700 USD. 5 educational and public facilities were damaged. Amount of damages – 83000 USD. 4,8 km of car roads were damaged. Amount of damages – 107000 USD. Two(2) bridges were damaged. Amount of damages – 10100 USD. 0,8 km of power line was damaged. Amount of damages – 3100 USD. 1 km of coast-protecting structure was damaged. Amount of damages – 268800 USD. 30,15 km of canals and lodgements were damaged. Amount of damages – 147000 USD. 13 pumps and Hydrotechnical facilities were damaged. Amount of damages – 154200 USD. 1,1 km of water supply line was damaged. Amount of damages – 12500 USD. 646 hectares of agricultural crops lands were affected. Amount of damages – 67200 USD. 3 other facilities were damaged. Amount of damages – 26100 USD	1,070,700
May		2005	Murgab	Karasu	20 houses were damaged. Amount of damages – 7800 USD. 41 km of car roads were damaged. Amount of damages – 72900 USD. 5 bridges were damaged. Amount of damages – 33800 USD. 7,5 km of communication line was damaged. Amount of damages – 1200 USD. 0,07 km of coast-protecting structures was damaged. Amount of damage – 7600 USD. 0,02 km of canals was damaged. Amount of damages – 21 900 USD. One (1) Hydrotechnical Facility was damaged. Amount of damage – 43700 USD. 22 other facilities were damaged. Amount of damages – 12400 USD. 1665 hectares of agricultural crops lands were damaged. Amount of damage – 53400 USD. 2223 heads of cattle were died. Amount of damages – 52400 USD	307,100
May		2005	Rushan	Pyanj	18 houses were damaged. Amount of damages – 31800 USD. 1 schools was damaged. Amount of damage – 1600 USD. 20 km of car roads were damaged. Amount of damages – 27500 USD. 20,5 km of power line and communication lie were damaged. Amount of damages – 4600 USD. 5 km of coast-protecting structures were damaged. Amount of damages – 125000 USD. 24 km of canals and lodgements were damaged. Amount of damages – 29700 USD. One (1) hydrotechnical Facility was damaged. Amount of damage – 9400 USD. 3 other facilities were damaged. Amount of damages – 64700 USD. 478,5 hectares of agricultural crops lands were damaged. Amount of damages – 269900 USD.	564,200