

**APPENDIX 2**

**INVESTMENT AND O&M SCHEDULE FOR WATER  
RESOURCES DEVELOPMENT PROJECTS IN THE  
NORTH WEST REGION**

NORTH WEST REGION: FINANCIAL REQUIREMENT FOR SHORT TERM AND MEDIUM TERM PLANS (TK. MILLION)

Name of the project	Estimated cost	Years												Total	
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	00-01	01-02	02-03	03-04		04-05
<b>ONGOING PROJECTS</b>															
Teesta Irrigation	14983.8	512.5	1139	1250	1500	1800	1800	1200	842.8						10044.
Barnai Project	905.8	180	254	200	19										653
Naogaon Polder I	923.7	195	200												395
Badalgachi Project	87.5	31.5	17.87												49.37
Tulshiganga left	74.2	36	20	2.87											58.87
Embankment															
Upper Nagor valley	55.3	25.6													25.6
upper Nagor River	82.2	1.1	0												1.1
Karatoya Left	123.11	23.77	37	25	16.41										102.18
embankment															
Jamgaon Danra	29.6	0.8	10	10	7.35										28.15
Kurigram Project	1589	0	0												
Nunlear Beel	60.2	2	0												2
Satdama Katlar	58.9	3.8													3.8
Beel															
Rehabilitation of															
Buri Teesta	98.2	31.57	44.96	17.73	0.74										94.995
Protappur	11.7														
Gangnai	71.1	12.89	34.72	23.42											71.026
Sowra Beel	0.4	0.4													0.4
Atrai Kakra Project	36	6	1												7

NORTH WEST REGION: FINANCIAL REQUIREMENT FOR SHORT TERM AND MEDIUM TERM PLANS (TK. MILLION)

Name of the project	Estimated cost	Years												Total	
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	00-01	01-02	02-03	03-04		04-05
<b>PROPOSED PROJECTS</b>															
Pabna Project Ph II	2581	188	452	614	678	482	167								2581
U Tushiganga Right	60	15	18	18	9										60
U Tushiganga left	50	12	15	15	8										50
North Rajshahi Irr	4983	74	188	1102	1774	852	646	347							4983
Rehabilitation of															
Gajaria Ichamati	590	150	180	180	80										590
Kamarnai Bundh	11	2	3	4	2										11
Morichar Danra	6.1	1	3	2.1											6.1
LLP schemes in Dinajpur	162	35	50	50	27										162
Redesign of															
Sonail Embankment	1	1													1
Nagor river	4	4	10	10	5										34
Nagor valley	2	2	20	20	5										52
Ghagot R. embankment	130	20	25	35	35	15									130
Kurigram North	596			50	100	120	90	80	36						596
Kurigram South (FS)	40.2	12.7	6.8												39.5
Baral Basin Project	300	20	20												40

NORTH WEST REGION: FINANCIAL REQUIREMENT FOR SHORT TERM AND MEDIUM TERM PLANS (TK. MILLION)

Name of the project	Estimated cost	Years											Total		
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	00-01	01-02	02-03		03-04	04-05
<b>PROPOSED FAP PROJECT</b>															
Secondary Integrated															
Town Protection Project (ph 1)	788	194	373	110	72	32	7								788
a)Panchgarh															
b)Dinajpur															
c)Kurigram															
Compartmentalisation*	389					77.8	116.7	116.7	77.8						389
Pilot project(FAP 20)															
<b>BRE river Training work *</b>															
Phase 1 priority			660	855	960	430	80								2985
Serajganj															
Mathurapara															
Sariakandi															
Phase 2/3															
Sariakandi															
Fulchhari															
Kazipur															
Betil															

NORTH WEST REGION: FINANCIAL REQUIREMENT FOR SHORT TERM AND MEDIUM TERM PLANS (TK. MILLION)

Name of the project	Estimated cost	Years												Total	
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	00-01	01-02	02-03	03-04		04-05
<b>FAP-2 PROJECTS</b>															
<b>Short term</b>															
Gaibandha	1670.1	41.7	54.4	218.1	399.8	470.2	230.5	91.3	35.6	41.7	60.3	26.5			1670.1
Sub Reg Plan	100	50	50												100
Polder C&D	404.6	20.2	20.2	20.2	51.6	120.4	137.6	34.4							404.6
Little Jamuna R B	33.6	3.4	9.1	15.1	6										33.6
<b>Mid term</b>															
Polder 3	98.3				9.8	13.3	31	35.4	8.8						98.3
SIRDP	169.3				7.7	7.7	7.7	7.7	21.9	51.2	58.5	14.6			169.3
Polder A&B	324						16.2	16.2	16.2	41.3	96.4	110.2	27.5		324
Teesta Left Bank	497.6						22.6	22.6	22.6	64.5	150.4	171.9	43		497.6
Flood Proofing		20	20	20	20	20									100
Environmental Management Plan		10	10	10											30
<b>Total</b>		1277	3410	3535	4045	4878	5546	2464	1132	835	966	923	671	600	33782

Actual expense may exceed the estimated cost in some cases of ongoing projects.

BRE cost includes cost of realignment of embankment

Cost of a compartmentalisation in NWR has been assumed as the same as the ongoing project at Tangail.

In the absence of final plan by diff FAP studies notional schedules has been made

O&M SCHEDULE FOR WATER RESOURCES DEVELOPMENT PROJECTS IN THE NWR

Name of the project	Project cost	Estimated yearly O&M cost												
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	2000-01	01-02	02-03	03-04	04-05
<b>ONGOING PROJECTS</b>														
Teeeta Irrigation	14983.8									120	120	120	120	120
Barnai Project	905.8						11	11	11	11	11	11	11	11
Naogson Polder I	923.7		8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Badalgachi Project	87.5		2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Tulshiganga left	74.2		2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Embankment														
Upper Nagor valley	55.3		1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
upper Nagor River	82.2		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Karatoya Left	123.11		3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
embankment														
Jamgaon Danra	29.6		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Kurigram Project	1589	10	10	10	10	10	10	10	10	10	10	10	10	10
Nurulear Beel	60.2	2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Satdama Katlar	58.9	3.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Beel														
Atrai Kakra	36		1	1	1	1	1	1	1	1	1	1	1	1
<b>COMPLETED PROJECTS</b>														
Pabna project Phase I	3701.3	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6	72.6
Chilimpur	19	1	1	1	1	1	1	1	1	1	1	1	1	1
Patnitala	23	1	1	1	1	1	1	1	1	1	1	1	1	1
Karnabar Barabila#	24.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.726	0.726	0.726
Bhedra beel	29.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Punarbha Fl. embk	170	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Teeeta right emb	23	1	1	1	1	1	1	1	1	1	1	1	1	1
Sati nadi	24.3	1	1	1	1	1	1	1	1	1	1	1	1	1
Tulshiganga Project	65.7	2	2	2	2	2	2	2	2	2	2	2	2	2
Mahananda right bank#	139	1	1	1	1	1	1	1	1	1	1	1	1	1
Projects#														
Mahananda left bank	80	2	2	2	2	2	2	2	2	2	2	2	2	2
Projects#														
SSFCDI Projects#	448.02	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440	13.440

O&M SCHEDULE FOR WATER RESOURCES DEVELOPMENT PROJECTS IN THE NWR

Name of the project	Project cost	Estimated yearly O&M cost													
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	2000-01	01-02	02-03	03-04	04-05	05-06
Morichar Danra	6.1			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Buri Teesta	98.2				2	2	2	2	2	2	2	2	2	2	2
Proteppur	11.7		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Gangnai	71.1			0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Sowra Beel	12.6		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Fajiar Beel#	18.0		0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
Gajaria Iohamati	59				1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Kamarnai Bunch	11				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sonail Embankment	19.2			0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Nagor river#	45.8			1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Nagor valley#	104.1			3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Roktadaha Lohachura#	54.8			1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
LLP Schemes in NWR		2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
DTWS in gr Dinajpur		20	20	20	20	20	20	20	20	20	20	20	20	20	20
Rajshahi town prot	126.3	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PROPOSED PROJECTS															
U Tulshiganga Right	60				1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
U Tulshiganga left	50				1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
North Rajshahi Irr	4983				6.8	40.7	69.3	107.5	144	144	144	144	144	144	144
Ghagot R.emb	130						4	4	4	4	4	4	4	4	4
Kurigram North	596									130	130	130	130	130	130
PROPOSED FAP PROJECT															
Secondary Integrated															
Town Protection Project (ph 1)	788				39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4	39.4
a)Panchgarh															
b)Dinajpur															
c)Kurigram															

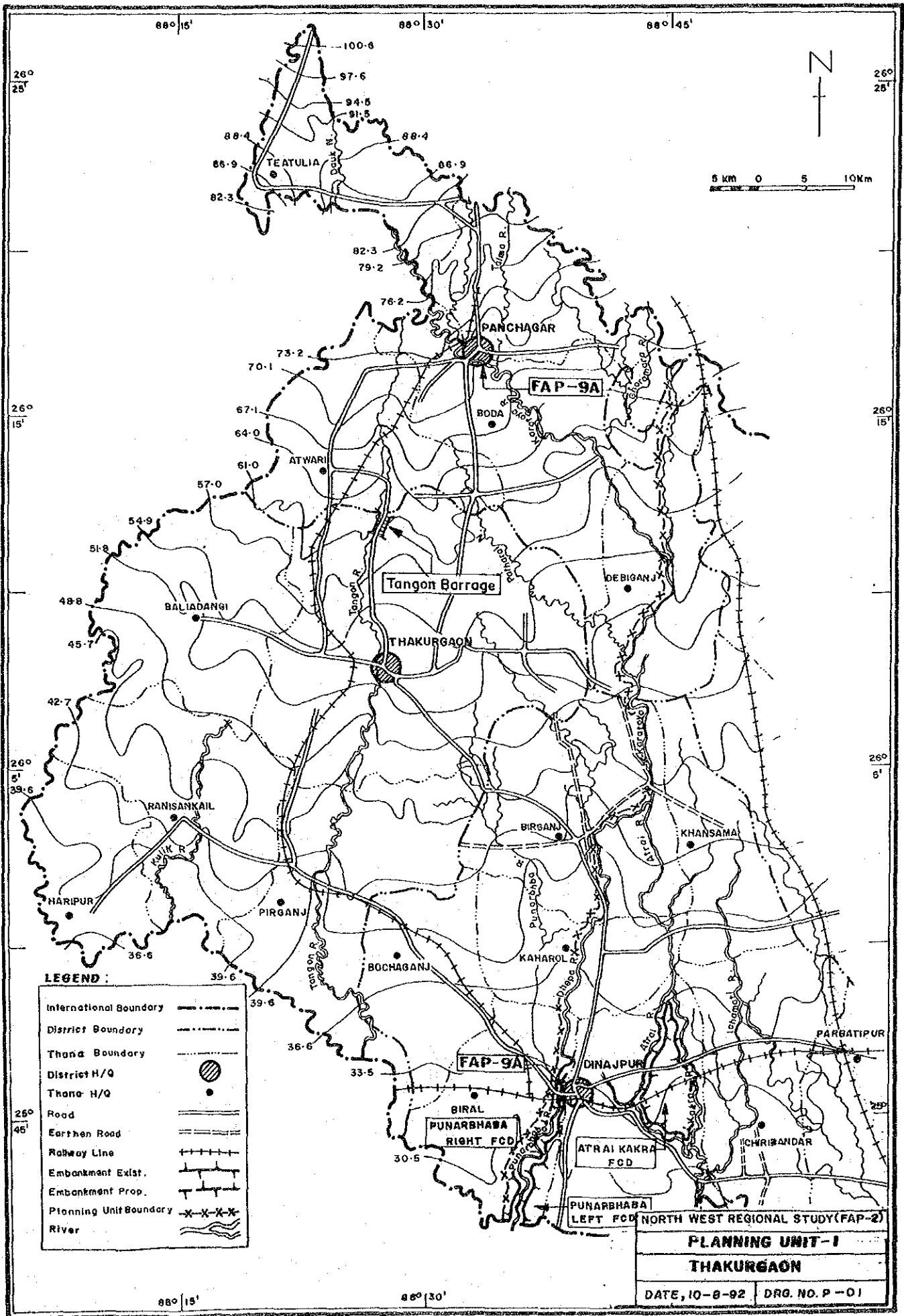
O&M SCHEDULE FOR WATER RESOURCES DEVELOPMENT PROJECTS IN THE NWR

Name of the project	Project cost	Estimated yearly O&M cost													
		92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-2000	2000-01	01-02	02-03	03-04	04-05	05-06
Compartmentalisation Pilot project(FAP 20)	389														
BRE river Training work						35	45	55	65	75	85	95	105	115	
FAP-2 Projects															
Gaibandha	1670.1											50	50	50	50
Sub Reg Plan	100														
Polder C&D	404.6							12	12	12	12	12	12	12	12
Little Jamuna R B	33.6								1	1	1	1	1	1	1
Polder 3	98.3									3	3	3	3	3	3
SIRDP	169.3													6	6
Polder A&B	324													10	10
Teesa Left Bank	497.6													15	15
Other Areas															
Related expenditure															
Environmental management work		0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1
Total		143	145	167	170	215	263	322	360	541	590	730	790	806	841

# Present cost determined Using a BBS inflator constant  
 O&M cost of some projects, where available have been taken from Project Brief prepared by BWDB  
 In a predominantly embankment project with some structure annual O&M cost is 3%  
 In a predominantly Structural project with some embankment annual O&M is 2%  
 In river training work annual O&M is 5% where O&M cost is not available  
 O&M cost in BRE does not include cost of bank retirement.



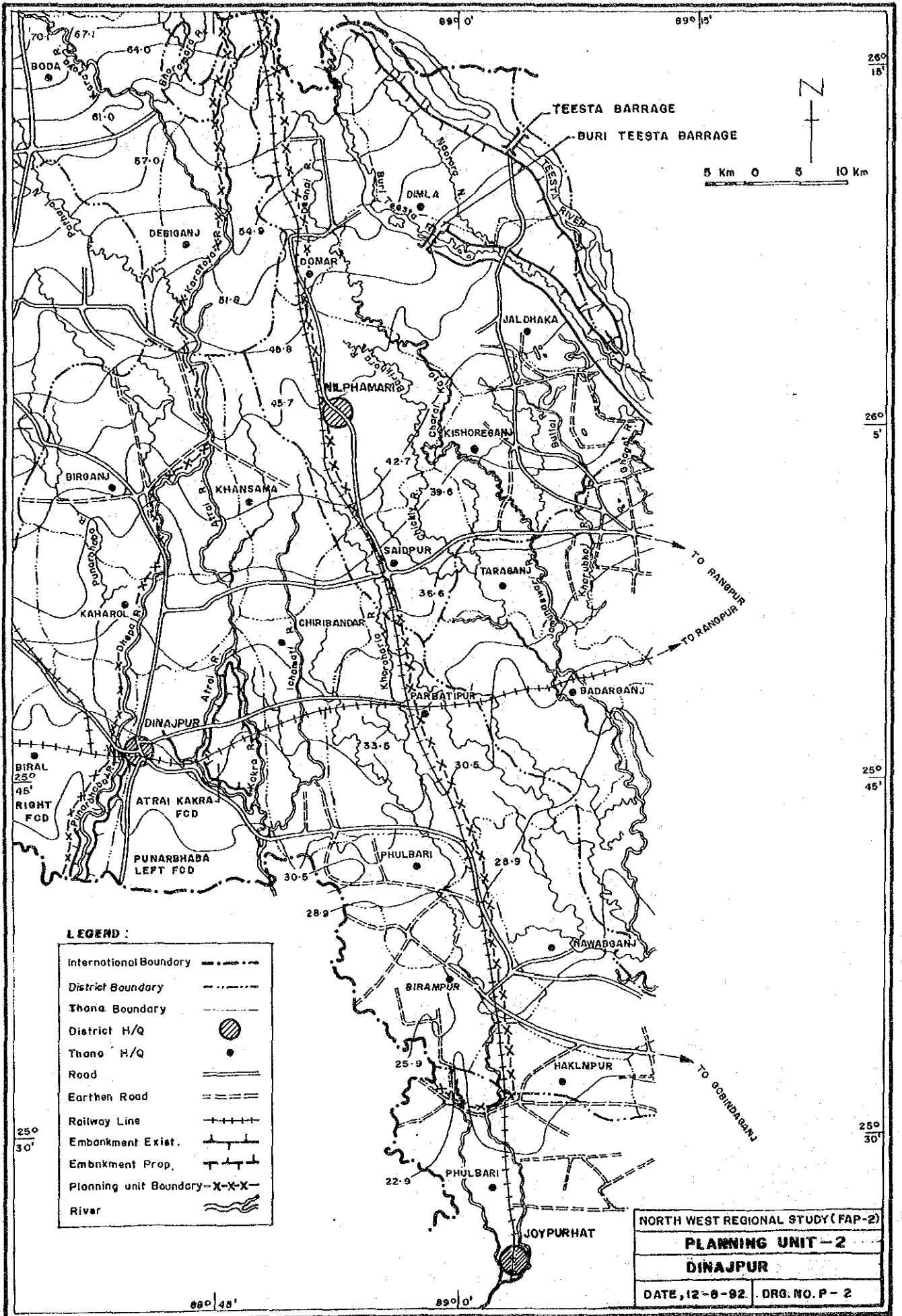
**APPENDIX 3**  
**LAYOUT PLANS**

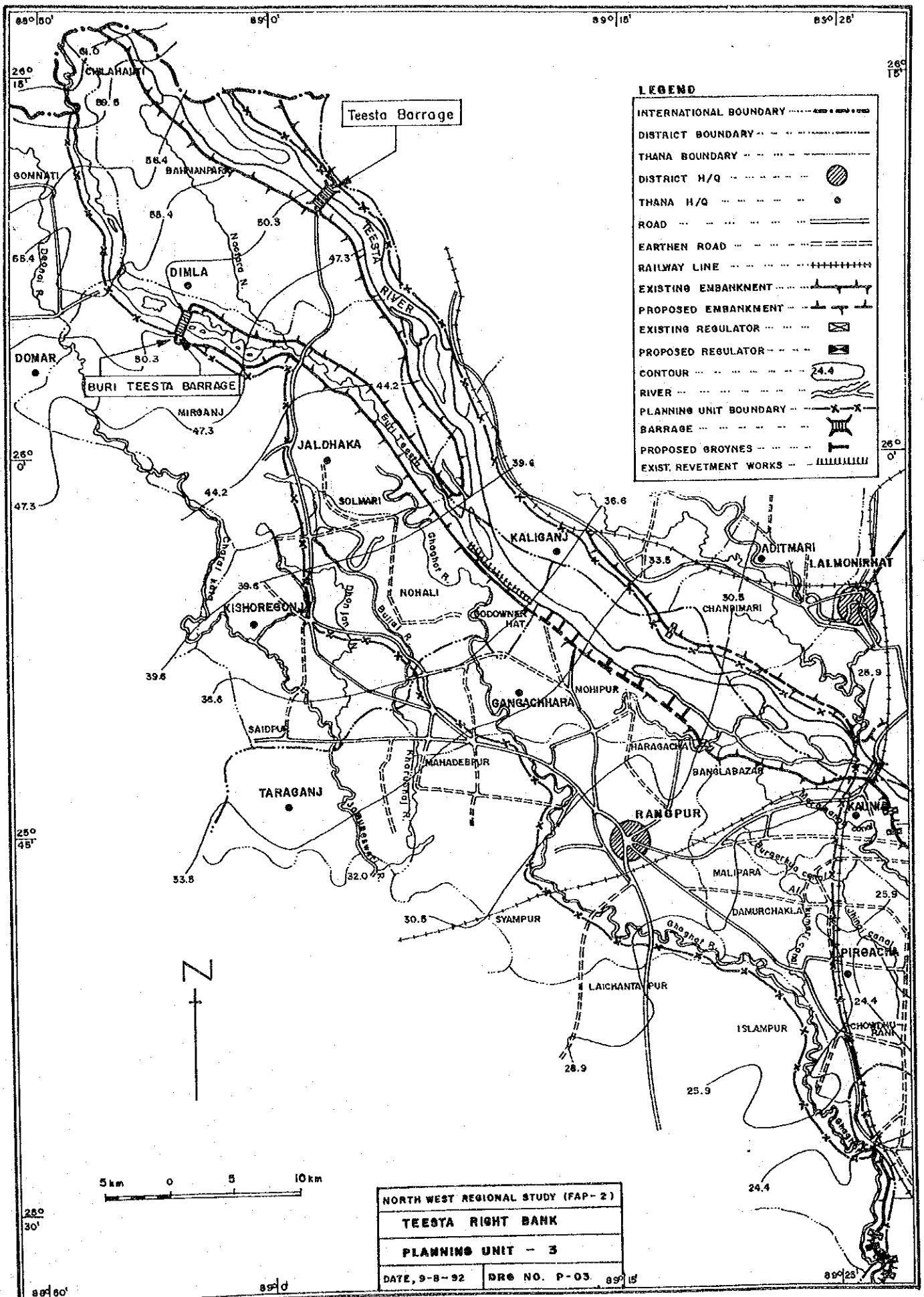


**LEGEND :**

International Boundary	-----
District Boundary	-----
Thana Boundary	-----
District H/Q	●
Thana H/Q	●
Road	====
Earthen Road	=====
Railway Line	+++++
Embankment Exist.	
Embankment Prop.	
Planning Unit Boundary	-X-X-X-
River	~~~~~

**PLANNING UNIT-I**  
**THAKURGAON**  
 DATE, 10-8-92 DRG. NO. P-01





89° 0'

89° 15'

89° 25'



**LEGEND:**

INTERNATIONAL BOUNDARY	.....
DISTRICT H/Q	.....
THHANA H/Q	.....
ROAD	.....
EARTHEN ROAD	.....
RAILWAY LINE	.....
EXIST. EMBANKMENT	.....
PROP. EMBANKMENT	.....
EXIST. REG.	.....
PROP. REG.	.....
DRAINAGE CHANNEL	.....
PROP. WCS	.....
NAVIGATION	.....
PROP. OVERFLOW WEIR	.....
DAWRF EMBANKMENT	.....
EXIST. BANK PROTECTION	.....
PROP. BANK PROTECTION	.....
PROP. GROYNES	.....
PLANNING UNIT BOUNDARY	.....
CONTOUR	.....
RIVER	.....

26° 15'

26° 5'

26° 0'

26° 0'

26° 0'

26° 0'

26° 0'

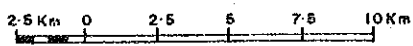
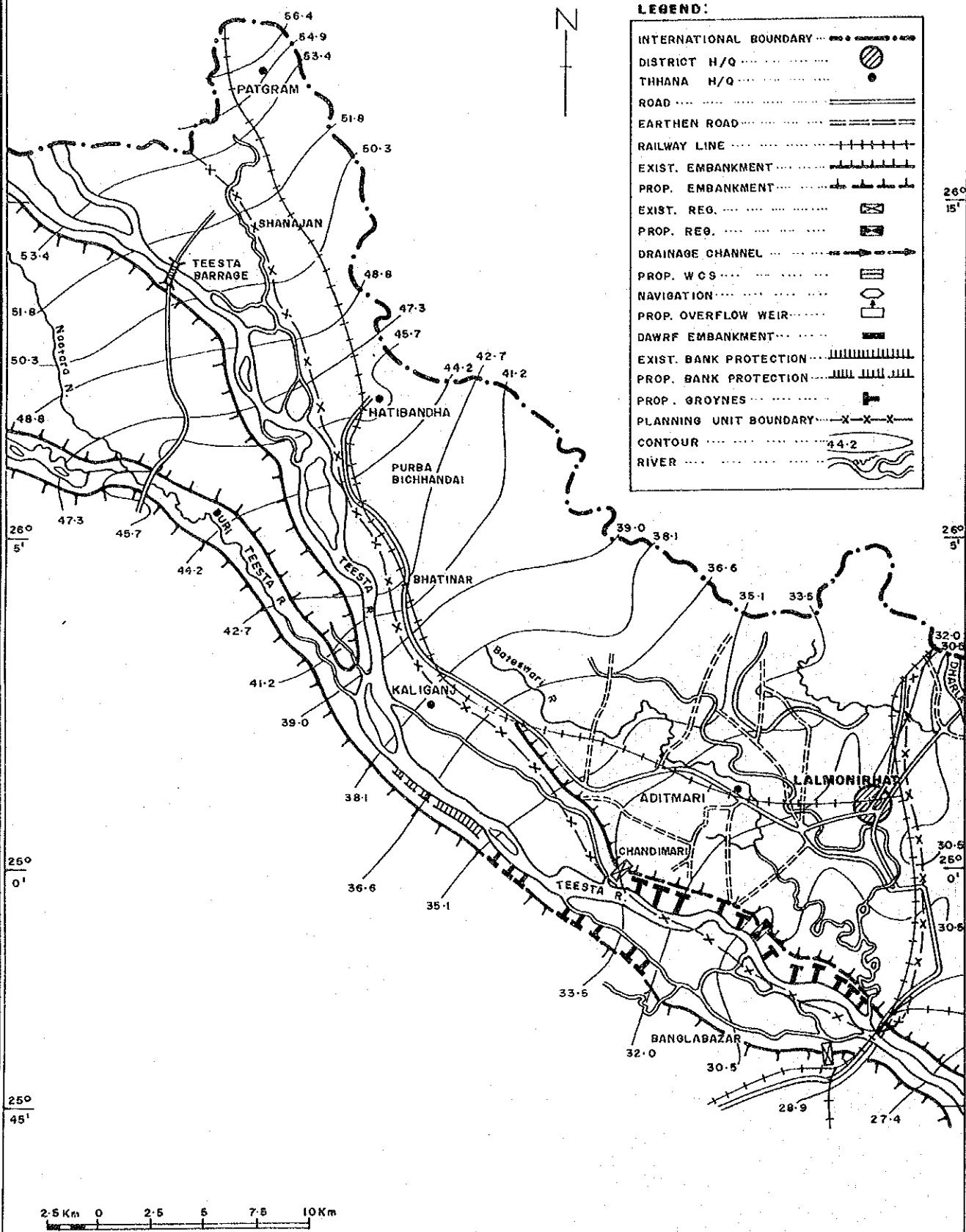
26° 0'

26° 0'

26° 0'

26° 0'

26° 0'



NORTH WEST REGIONAL STUDY (FAP-2)  
**PLANNING UNIT-4**  
**TEESTA LEFT BANK**  
 DATE, 18-10-92 DRG. NO. P-04

89° 0'

89° 15'

89° 30'

89° 45'

LEGEND :

INTERNATIONAL BOUNDARY	— · — · — · — · —
DISTRICT H/Q	⊙
THANA H/Q	●
ROAD	====
EARTHEN ROAD	-----
RAILWAY LINE	+++++
EXIST. EMBANKMENT	
PROP. EMBANKMENT	
DAWRF EMBANKMENT	
EXIST. REGULATOR	⊞
PROP. REGULATOR	⊞
PROP. WCS	⊞
PLANNING UNIT BOUNDARY	-o-o-o-
CONTOUR	24.4
NAVIGATION LOCK	⊞
PROP. OVERFLOW WEIR	⊞
RIVER	~~~~~
DRAINAGE CHANNEL (New)	→ → →
PROP. GROYNES	T
PROP. REVETMENT WORK	



26° 10'

26° 10'

26° 0'

26° 0'

25° 45'

25° 45'

25° 30'

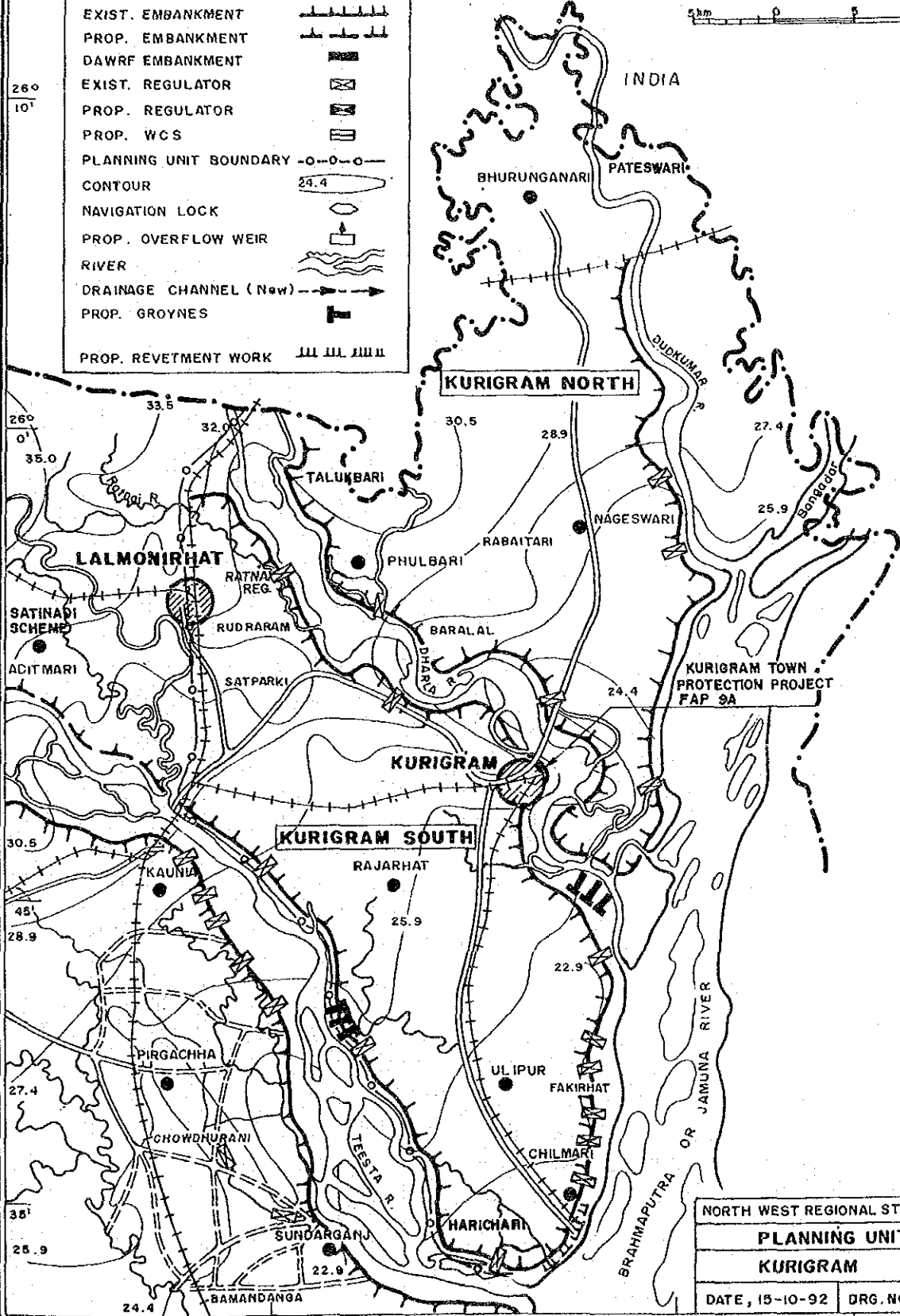
25° 30'

25° 15'

25° 15'

25° 0'

25° 0'

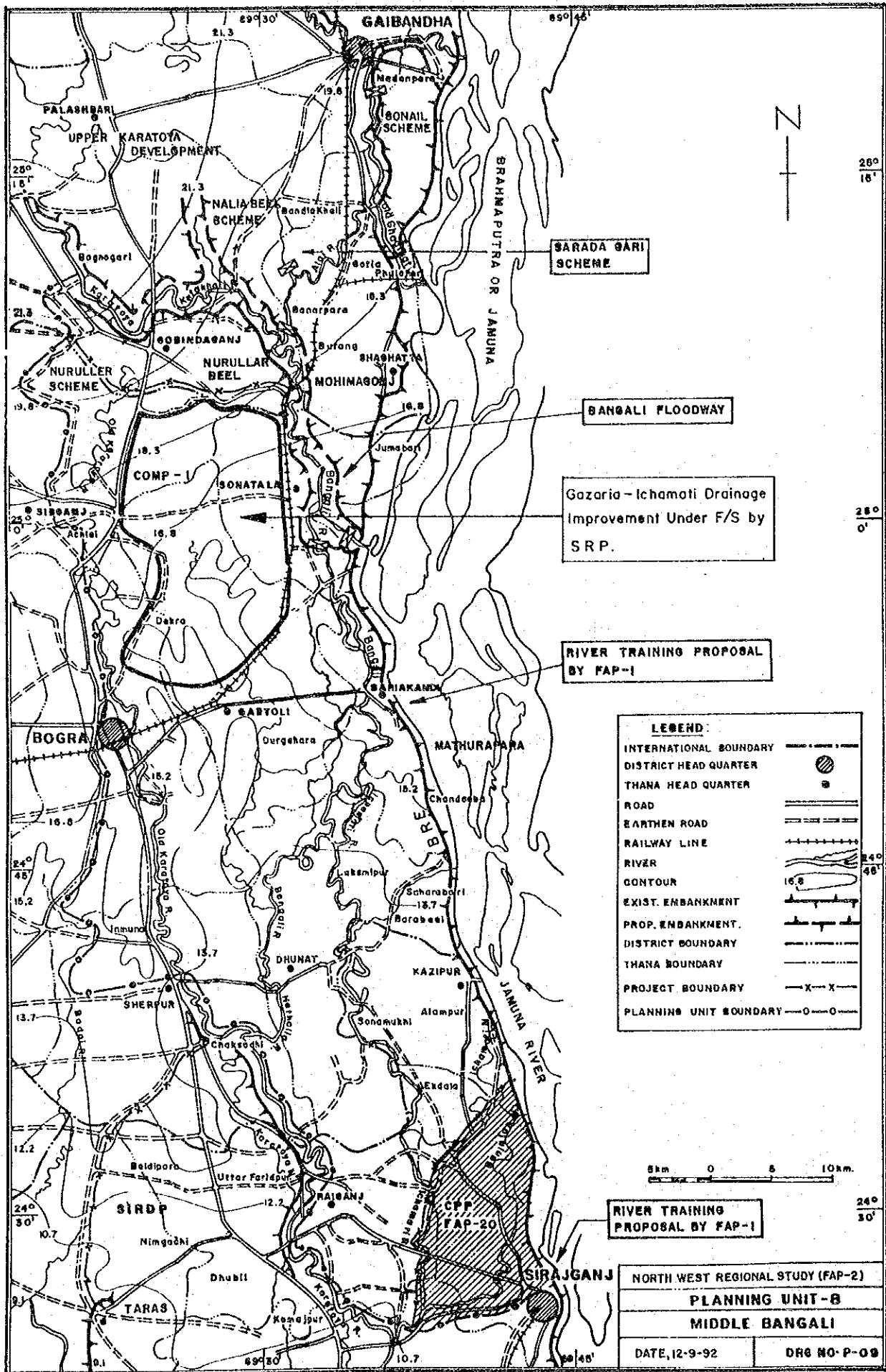


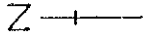
NORTH WEST REGIONAL STUDY (FAP-2)	
PLANNING UNIT-5	
KURIGRAM	
DATE, 15-10-92	DRG. NO. P-05/1











**LEGEND:**

- INTERNATIONAL BOUNDARY: - - - - -
- DISTRICT H/Q: (circle with diagonal lines)
- THANA H/Q: (circle with horizontal lines)
- ROAD: (double line)
- EARTHEN ROAD: (dashed line)
- RAILWAY LINE: (line with cross-ticks)
- EXIST. EMBANKMENT: (line with vertical dashes)
- PROP. EMBANKMENT: (line with horizontal dashes)
- EXIST. REG.: (line with diagonal dashes)
- PROP. REG.: (line with vertical dashes)
- DRAINAGE CHANNEL: (line with wavy dashes)
- OVER FLOW WEIR: (trapezoidal shape)
- CONTOUR: (solid line with numbers)
- PLANNING BOUNDARY: (dashed line)
- NAVIGATION: (line with circles)
- DAM/DF EMBANKMENT: (line with vertical dashes and a dam symbol)
- RIVER: (wavy line)



NORTH WEST REGIONAL STUDY(FAP-2)

PLANNING UNIT-9

JOYPURHAT

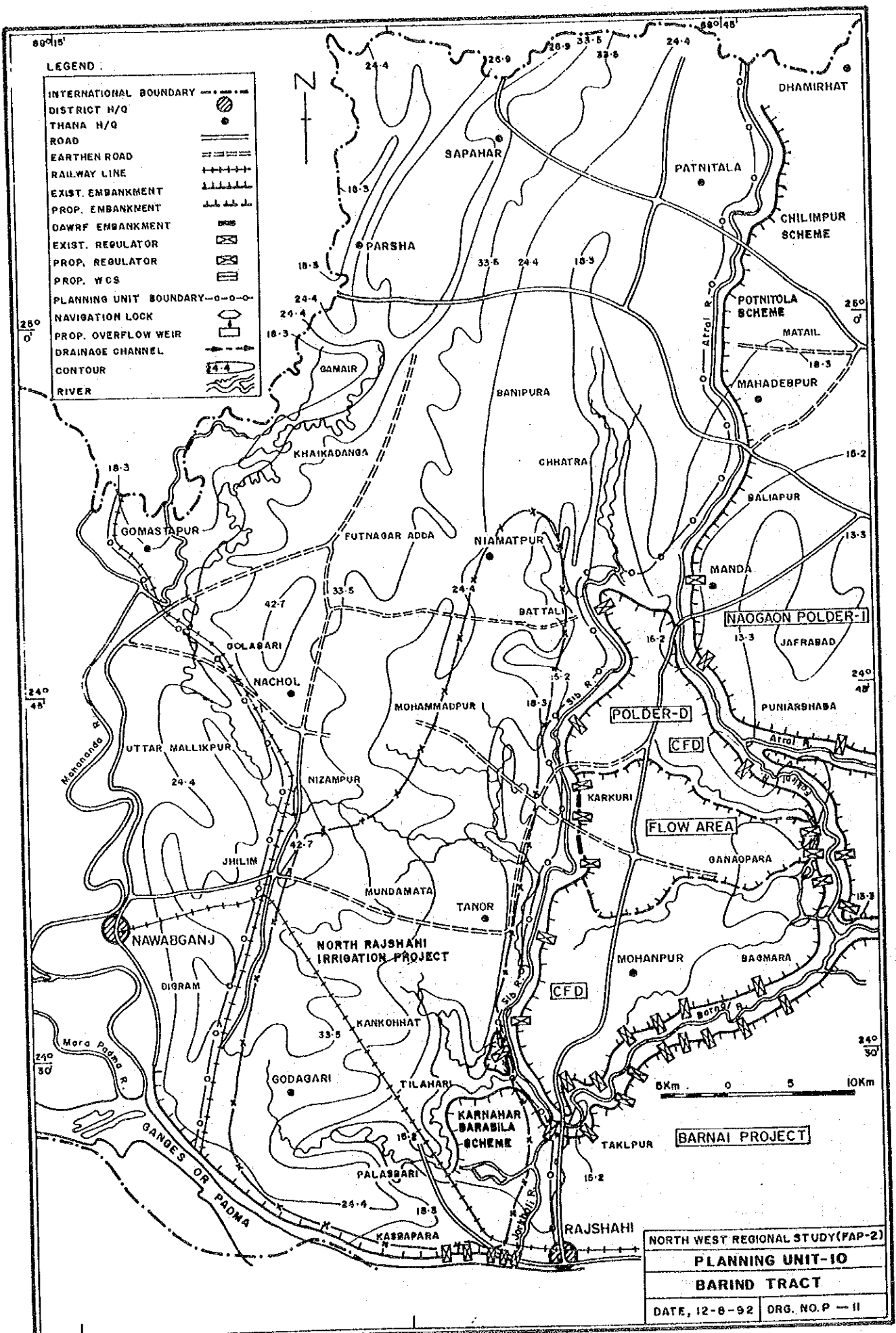
DATE, 20-9-92

DRG. NO.P-10



**LEGEND**

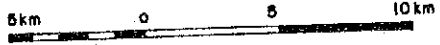
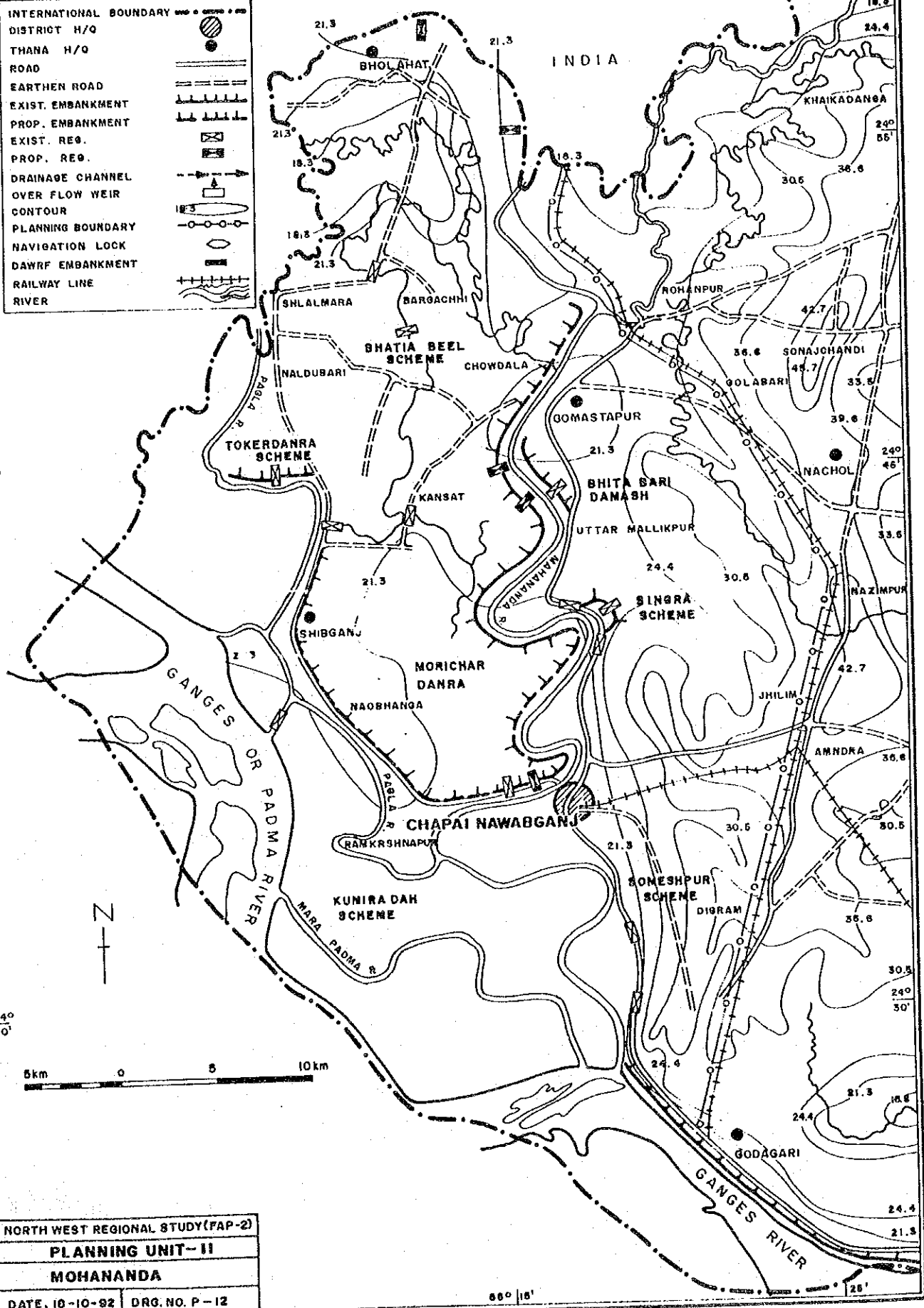
- INTERNATIONAL BOUNDARY
- DISTRICT H/Q
- THANA H/Q
- ROAD
- EARTHEN ROAD
- RAILWAY LINE
- EXIST. EMBANKMENT
- PROP. EMBANKMENT
- QAWRF EMBANKMENT
- EXIST. REGULATOR
- PROP. REGULATOR
- PROP. WCS
- PLANNING UNIT BOUNDARY
- NAVIGATION LOCK
- PROP. OVERFLOW WEIR
- DRAINAGE CHANNEL
- CONTOUR
- RIVER



NORTH WEST REGIONAL STUDY (PAP-2)  
**PLANNING UNIT-10**  
**BARIND TRACT**  
 DATE, 12-8-92    DRG. NO. P - II

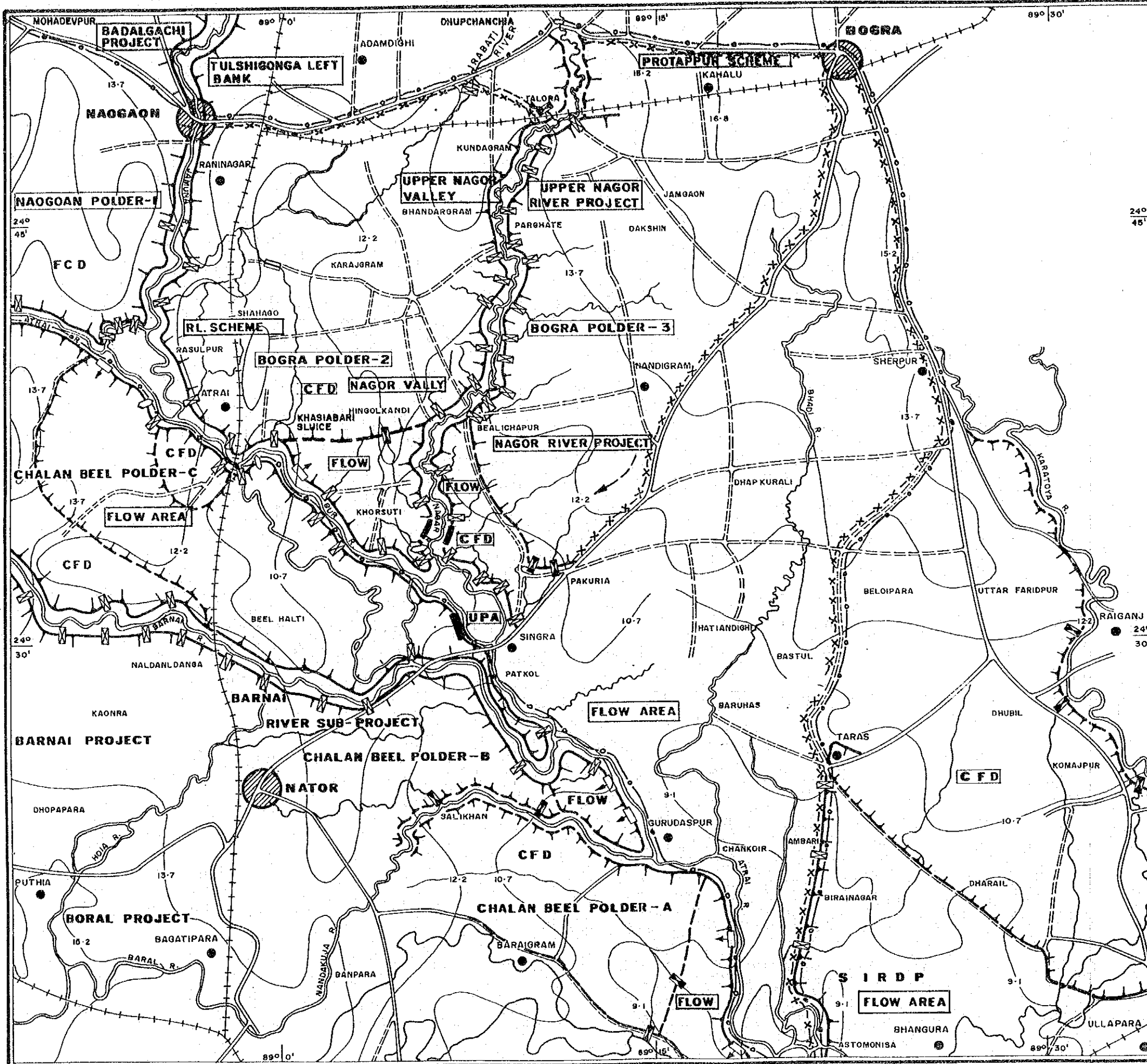
**LEGEND :**

- INTERNATIONAL BOUNDARY
- DISTRICT H/O
- THANA H/O
- ROAD
- EARTHEN ROAD
- EXIST. EMBANKMENT
- PROP. EMBANKMENT
- EXIST. REG.
- PROP. REG.
- DRAINAGE CHANNEL
- OVER FLOW WEIR
- CONTOUR
- PLANNING BOUNDARY
- NAVIGATION LOCK
- DAWRF EMBANKMENT
- RAILWAY LINE
- RIVER



NORTH WEST REGIONAL STUDY(FAP-2)  
**PLANNING UNIT-II**  
**MOHANANDA**  
 DATE, 10-10-82 DRG. NO. P-12

86° 16'

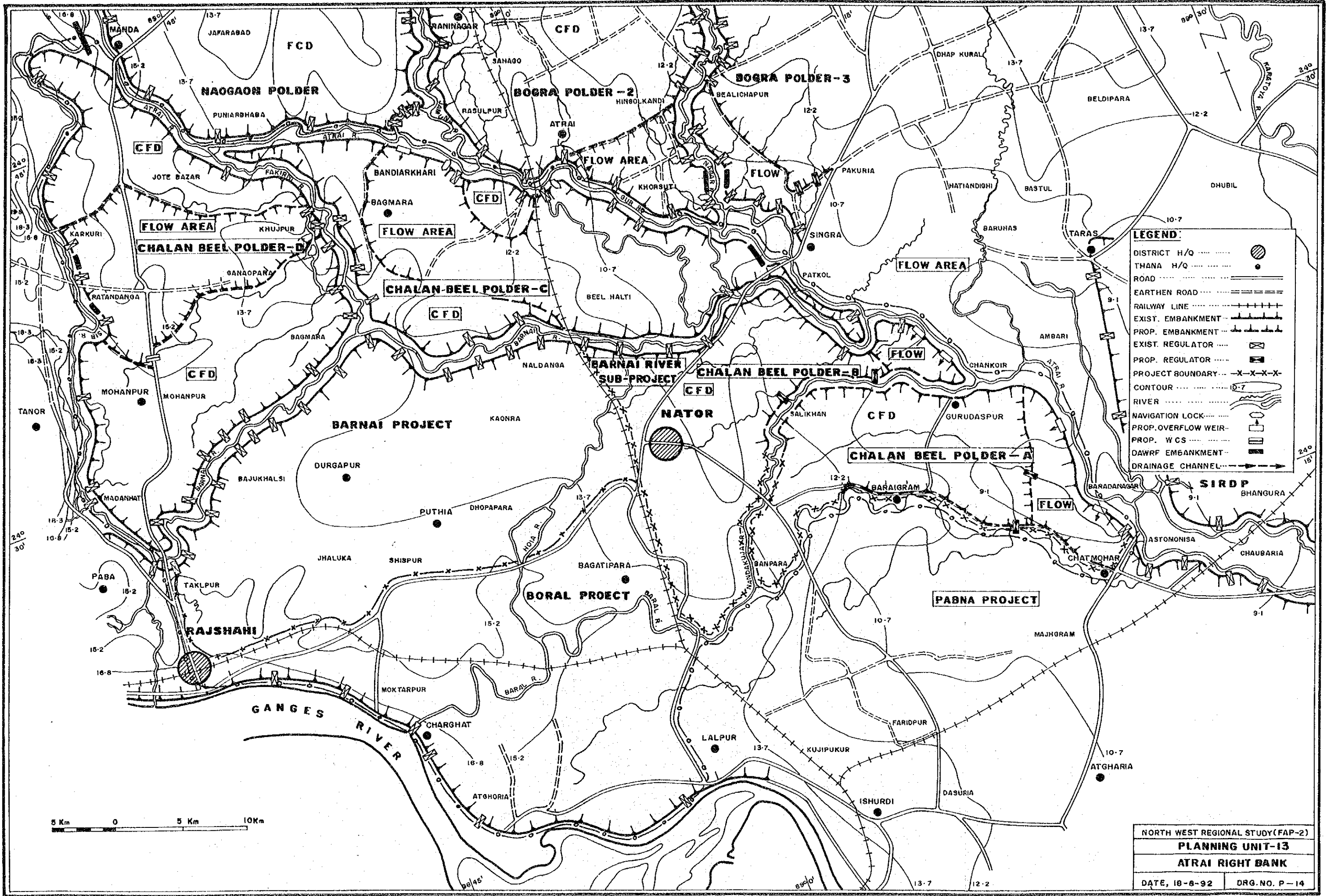


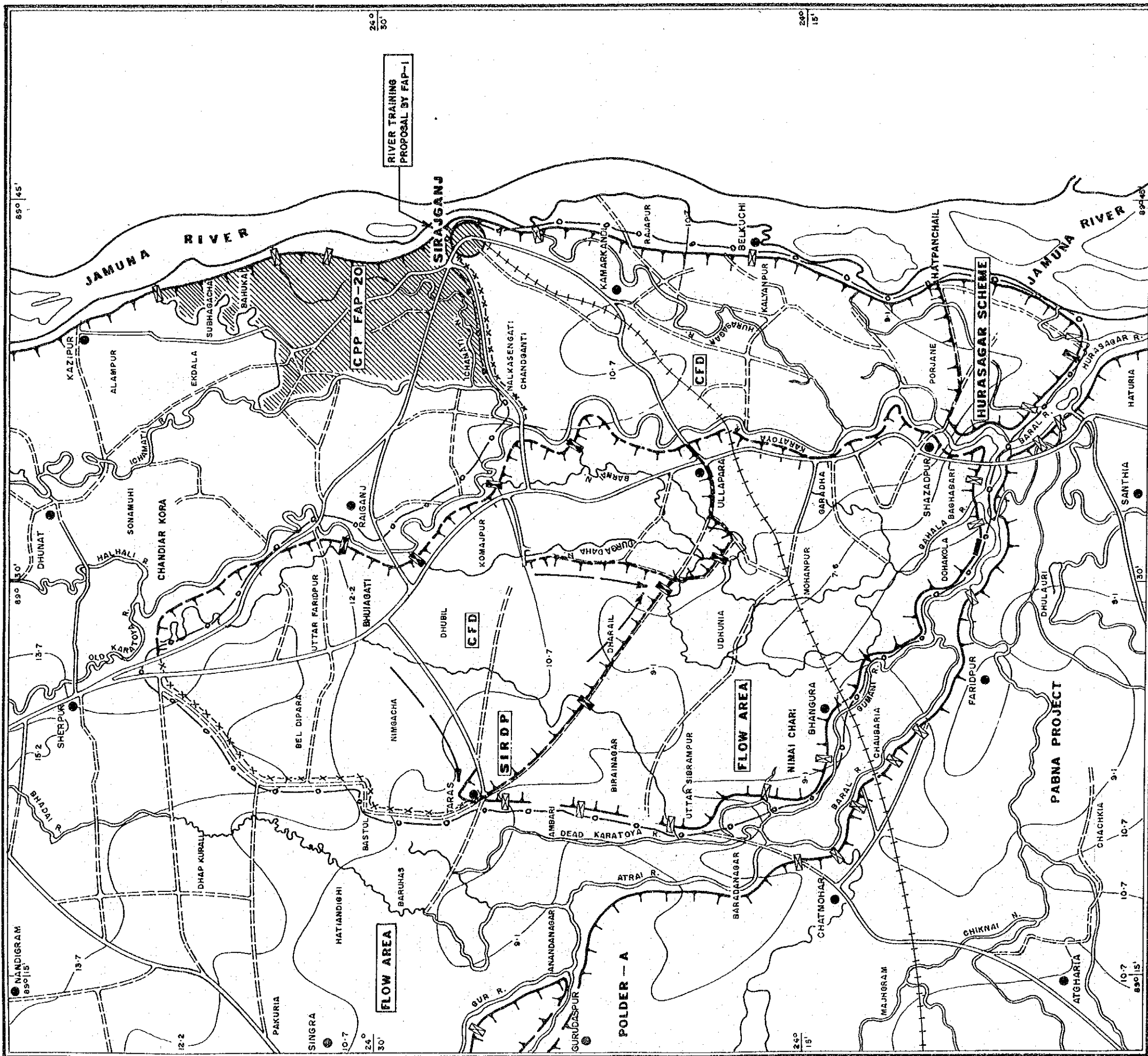
**LEGEND:**

- DISTRICT H/Q ..... [Symbol]
- THANA H/Q ..... [Symbol]
- ROAD ..... [Symbol]
- EARTHEN ROAD ..... [Symbol]
- RAILWAY LINE ..... [Symbol]
- EXIST. EMBANKMENT ..... [Symbol]
- PROP. EMBANKMENT ..... [Symbol]
- EXIST. REGULATOR ..... [Symbol]
- PROP. REGULATOR ..... [Symbol]
- PROP. W.C.S. .... [Symbol]
- PROJECT BOUNDARY -X-X-X-X-
- CONTOUR ..... [Symbol]
- RIVER ..... [Symbol]
- NAVIGATION ..... [Symbol]
- PROP. OVERFLOW WEIR [Symbol]
- DAWRF EMBANKMENT [Symbol]
- DRAINAGE CHANNEL (New) [Symbol]

5 Km 0 5 Km 10 Km

NORTH WEST REGIONAL STUDY (FAP-2)  
 PLANNING UNIT - 12  
 ATRAI LEFT BANK  
 DATE, 10-9-92 DRG NO P-13/1





**LEGEND:**

- DISTRICT H/Q ..... (Symbol: circle with diagonal lines)
- THANA H/Q ..... (Symbol: solid circle)
- ROAD ..... (Symbol: double line)
- EARTHEN ROAD ..... (Symbol: dashed line)
- RAILWAY LINE ..... (Symbol: line with cross-ticks)
- EXIST. EMBANKMENT ..... (Symbol: line with outward-pointing triangles)
- PROP. EMBANKMENT ..... (Symbol: line with inward-pointing triangles)
- DAWRF EMBANKMENT ..... (Symbol: line with vertical bars)
- EXIST. REGULATOR ..... (Symbol: rectangle with diagonal lines)
- PROP. REGULATOR ..... (Symbol: rectangle with horizontal lines)
- PROP. WCS ..... (Symbol: rectangle with vertical lines)
- PROJECT BOUNDARY ..... (Symbol: line with 'x' marks)
- CONTOUR ..... (Symbol: line with '10.7' label)
- NAVIGATION ..... (Symbol: oval with a vertical line)
- PROP. OVERFLOW WEIR ..... (Symbol: rectangle with a vertical line)
- RIVER ..... (Symbol: wavy line)
- DRAINAGE CHANNEL (New) ..... (Symbol: line with arrows)

NORTH WEST REGIONAL STUDY (FAP-2)

**PLANNING UNIT-14**

**LOWER BANGALI**

DATE, 10-8-92	ORG.NO.P-15
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